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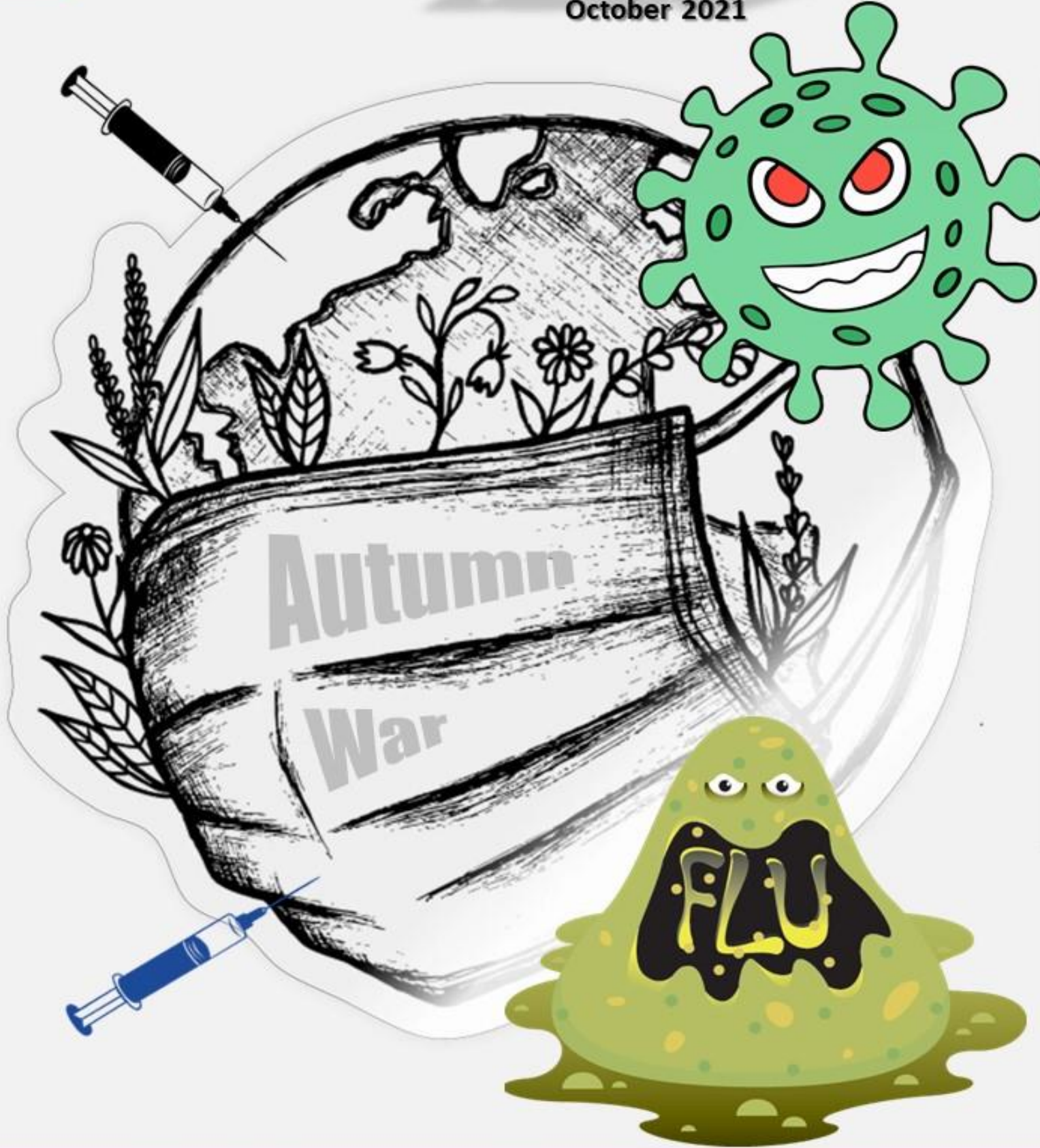
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Dedicated to Global
First Responders

DIARY

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HZS C²BRNE DIARY– 2021[©]

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EDITOR'S CORNER





Editorial

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

Editor-in-Chief
HZS C²BRNE Diary



Dear Colleagues,

The keyword for October 2021 is “*perception*”! Vaccinated people should realize that they can be infected and they can transmit the virus as those who are not vaccinated. The only vital difference is that the vaccine will increase their survivability if severely sick while those who are not vaccinated might need respiratory support that might lead to unpleasant side effects or even death. This means that vaccinated people should enforce the mask-washing-distance trio as before. Whenever I meet a person without a mask most probably his/her response to my “why” question is “but I am vaccinated”! Healthcare authorities have a share of responsibility for not being able to disseminate the right perception to the people making them believe that vaccination is the perfect solution for returning to normal. And here is another perception: Clubbing, partying and other entertaining activities are not the “normal” missing the moment that the overall economy is still in quarantine. Authorities should be taught again the basics of crisis communication management and be better prepared for a future pandemic. For the time being, we were all very optimistic that the pandemic will be under control by the first trimester of 2022 but I think it is wise to re-evaluate and target the end of 2022 (again with no 100% certainty).

All	Europe	North America	Asia	South America	Africa	Oceania	24 October 2021
#	Country, Other	Total Cases	Total Deaths	New Deaths	Serious, Critical	Population	
	World	244,146,449	4,959,763	+958	76,027		
1	USA	46,294,210	756,205		13,817	333,543,077	
2	India	34,175,468	454,301		8,944	1,397,753,851	
3	Brazil	21,723,559	605,569		8,318	214,536,737	
4	UK	8,734,934	139,461		892	68,352,779	
5	Russia	8,205,983	229,528		2,300	146,016,407	
6	Turkey	7,827,013	68,917		633	85,526,175	
7	France	7,120,863	117,463		1,049	65,462,623	
8	Iran	5,851,670	125,052		4,346	85,398,830	
9	Argentina	5,279,818	115,823		737	45,738,373	
10	Spain	4,997,732	87,132		435	46,778,493	

After the defeat in Afghanistan, the US disturbed (again) the global geostrategic map with the AUKUS agreement targeting China this time – as if they have to target somebody all the time. But this was a good opportunity for the Greek Armed Forces to get rid of the useless Ticonderoga destroyers proposed and sign a good contract with France for a combination of Belh@rra and Gowind corvettes that match well with the recent acquisition of the Rafal warplanes. This agreement was made possible because the US desired to keep France as happy as possible after losing the big deal with Australian submarines. More recently, Greece signed another long-term cooperation agreement with the US that stated that they will assist Greece in a future dispute with Turkey! Who said that Americans do not have a good sense of humor? US President Joe Biden on October 07 accused Turkey of undermining the fight against the Islamic State with its military offensive in northeast Syria, Al Arabiya [reported](#). “The situation in Syria, and in particular the actions by the government of Turkey to conduct a military offensive into northeast Syria, undermines the campaign to defeat the Islamic State of Iraq and Syria, or ISIS,



endangers civilians, and further threatens to undermine the peace, security, and stability in the region, and continues to pose an unusual and extraordinary threat to the national security and foreign policy of the United States,” Biden said in a letter to House Speaker Nancy Pelosi. At the same time, the US excluded Turkey, Nigeria, Iraq, and Pakistan from the Human Trafficking Report (referring to countries recruiting “children-soldiers) mainly to allow Turkey to purchase 40 F-16V block-70/72 requested. There is an old saying in Greece quoting “if you have friends like these who need enemies!” And all that for what? Just to keep the equilibrium in the Aegean Sea as logical as possible given the psychiatric behavior of Turkey who thinks that is a superpower and as such, it can cause troubles globally. Strategists often say that Greece is privileged to be at the crossroad of Europe, Asia, and Africa. I would say it is a curse and prefer to be in the geographical position of Portugal or Norway with no aggressive neighbors around and spend public money for education, progress, and the well-being of our citizens.

Another issue in October was the alleged use of chemical weapons from the Turkish military against Kurds. True or not, this is an issue that needs to be seriously examined by the international community and specifically the OPCW – although both show not very much interest to provide specialized on-time assistance and I wonder why – I have certain hypotheses in mind but an official answer would be much better.

We are slowly heading towards winter a season full of festivities, activities, and lots of joy. Unfortunately, all these belong to the past. The combination of the pandemic, international terrorism, the possibility of asymmetric threats, and most important of all the human stupidity dictate all CBRN First Responder to be alert and well prepared to deal with the unexpected and survive. Keep on the good work! There are many things to be done; many gaps to fill but saving human lives is the best antidote to sweat and effort!

The Editor-in-Chief



G-20 ministers urge Taliban to accept int'l aid, fight terrorism

Source: <https://english.kyodonews.net/news/2021/09/ab3eb41eac0f-g-20-ministers-urge-taliban-to-accept-intl-aid-fight-terrorism.html>

Sept 23 – Foreign ministers from the Group of 20 major economies **urged** the Taliban Islamist group, which took control of Afghanistan last month, to **accept** international humanitarian aid and implement measures against **terrorism** in a meeting Wednesday, the U.S. government said.

The online meeting arranged by Italy, which holds the rotating presidency of the G-20 this year, highlighted joint efforts by the group that includes China and Russia to address problems faced by Afghanistan, such as safe evacuations of locals wishing to leave the war-torn country.

"The international community is united in its expectations for the Taliban to adhere to their commitments," U.S. Secretary of State Antony Blinken said on Twitter.

The United Nations and other organizations have warned of food shortages and a lack of basic services affecting daily life in Afghanistan. It is also feared that human rights, particularly for women and children, could be infringed upon by the Taliban, given its record of governance.

Japanese Foreign Minister Toshimitsu Motegi, who attended the G-20 meeting while in New York, said the global community should urge the Islamist group to respect diverse ethnic and sectarian voices in political processes as well as women's rights.

The minister reiterated **Japan's plan to offer some \$200 million in aid to Afghanistan** and the surrounding countries by the end of the year, according to the Japanese Foreign Ministry.

Indian External Affairs Minister Subrahmanyam Jaishankar said the Taliban should keep its promise that Afghanistan would not be used as a base for a terrorist movement again, while Chinese Foreign Minister Wang Yi called for the lifting of "unilateral sanctions" on the conflict-ravaged country.

The Italian government aims to arrange an emergency summit of the G-20 leaders after annual speeches at the U.N. General Assembly through next Monday, according to sources familiar with the matter.

The G-20 groups Argentina, Australia, Brazil, Britain, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United States and the European Union.

EDITOR'S COMMENT: Great sense of humor from the G20 Ministers. "Urge" the Taliban; "humanitarian aid for the people (or the Taliban?)" ; "measures against terrorism". Could this be a "we pay you; keep your actions away from my country" deal? What about "female education"? What about ongoing narcotics production? And a small correction: France, Italy, and Germany belong to the EU. In that respect **G20** = G17. Or not?

Evil, Crazy, or Just Plain Stupid? Top 10 Quotes from Middle East Studies Professors

By Winfield Myers

September 23, 2021

Source: <https://www.meforum.org/62675/top-10-quotes-from-middle-east-studies-professors>

Winfield Myers is director of academic affairs at the Middle East Forum and director of its [Campus Watch](#) program.

I worked well with Bush, Obama and Trump but not Biden: Erdoğan

Source: <https://www.dailysabah.com/politics/diplomacy/i-worked-well-with-bush-obama-and-trump-but-not-biden-erdogan>

Sept 23 – "I worked well with George W. Bush, Barack Obama, and Donald Trump, but I cannot say we started well with Joe Biden," President Recep Tayyip Erdoğan said in a statement to press late Thursday, expressing discontent with the incumbent United States President.

"After 19 years in office, I can't say that we have reached a good position with the U.S.," he added.

"The U.S. must understand that **Turkey won't step back from the S-400 deal**," Erdoğan further said, referring to the Russian missile defense system that led to a row between Turkey and the U.S.



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Answering a question about Turkey's stance on the latest developments in Afghanistan, Erdoğan also pointed out the U.S.'s failure and indifference to the situation.

He underlined that the U.S. made their decision without input from Turkey, and thus could not expect Turkey to pay the price for the country's irresponsible behavior.

Erdoğan said: "It is unthinkable for Turkey to open doors and accept them (Afghan migrants). Our country is not an open-air corridor. It is not easy to accept such a thing. This action has a price and cost."

"The United States cannot say, 'Open the doors and let the Afghan people enter Turkey.' It is the U.S. that has to pay the price here. The U.S. needs to take steps in this regard," he added.

"Biden is transporting weapons to YPG terrorists operating in Syria," he also added, referring to the U.S. support to the PKK-linked terrorist group.

Under the pretext of fighting Daesh, [the U.S. has provided military training and given truckloads of military support to the YPG](#), despite its NATO ally's security concerns.

The U.S. has a total of 11 bases in the provinces of Hassakeh, Raqqa, and Deir el-Zour, which are currently under the control of the YPG. Interpol currently has a Red Notice warrant out in Ferhad Abdi Şahin's name for playing a crucial leadership role in the YPG.

He is the adopted son of the PKK's imprisoned founder Abdullah Öcalan, who is now serving a life sentence in a Turkish prison.

Şahin had been invited by White House officials to Washington, even though he is a wanted terrorist. Turkish officials have criticized the U.S. for delays and inconsistencies in their pledges to cooperate against the YPG.

EDITOR'S COMMENT: The pride of the United States was severely damaged by the recent Afghanistan case. In that respect, the behavior of the Turkish President is just a drop in a giant spit! What a disappointment for a great nation and a nuclear power. I am afraid that several other countries will adopt the Turkish behavior and this might cause global adverse effects.

Turkey: NATO's Pro-Russian, Taliban-Friendly Ally

By Burak Bekdil

Source: <https://www.meforum.org/62683/turkey-natos-pro-russian-taliban-friendly-ally>

Sept 24 – The Taliban, since its founding in 1994, has been using the most notorious shariah-based law enforcement, including beheadings, stoning women to death, forcing *burqas* on women, killing girls who are students, gang-raping, locking women in their homes and various other medieval practices. Now, for the first time in NATO's history, a member nation's president, Recep Tayyip Erdoğan, has [said](#) that the Taliban's interpretation of Islam does not contradict Turkey's.

►► **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.

Security Lessons Learned – Part 1, Boston Marathon Bombings

By Daniel Rector

Source: <https://www.domesticpreparedness.com/journals/september-2021/>

Acts of terrorism continue to affect communities worldwide. As the public tries to retain a semblance of everyday life by attending outdoor events, emergency planners must adapt to new intelligence and learn from past attacks. A review of the 2013 Boston Marathon bombings identifies the event security plans' strengths and shortcomings. Other event planners and public safety officials can use this review and recommendations to plan for large public gatherings within their jurisdictions.

Security Lessons Learned – Part 2, Las Vegas Shootings

Source: <https://www.domesticpreparedness.com/journals/september-2021/>

Many of the previous stories and after-action reviews conducted for the 2017 Las Vegas shootings have focused on organizers' and public safety officials' responses in the aftermath of the attack. In contrast,



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this article focuses on the events' security strengths and weaknesses and then offers recommendations for other event planners and public safety officials to improve their plans for future events.

Daniel Rector, MS, CEM, is a military veteran with 12+ years of experience in homeland security and emergency management operations. He served as a damage controlman in the U.S. Coast Guard and as a survey team chief on a National Guard Weapons of Mass Destruction – Civil Support Team. He currently works for Asfalit Advisors as a business resilience advisor. His career is supported by a Master of Science degree in Emergency Management and current coursework toward a Doctorate of Management with a Homeland Security focus. He has completed multiple courses in CBRN response and detection from the Defense Nuclear Weapons School, Idaho National Laboratory, Dugway Proving Grounds, the U.S. Army CBRN School, and the U.S. Army CCDC Chemical Biological Center, among others. He has completed the FEMA Professional Development Series and the Homeland Security Exercise and Evaluation Program (HSEEP) Course. He is a Certified Emergency Manager (CEM), a licensed AZMAT technician, Confined Space Rescue Technician I/II, and EMT-B. He is a recipient of multiple awards for excellence, including being the only National Guard soldier ever named the Distinguished Honor Graduate while simultaneously being nominated by his peers for the Leadership Award at the CBRN Advanced Leaders Course.

The Effect of Imports of Neodymium Magnets on U.S. National Security

Source: <https://www.homelandsecuritynewswire.com/dr20210930-the-effect-of-imports-of-neodymium-magnets-on-u-s-national-security>

Sept 30 – The [Commerce Department](#)'s Bureau of Industry and Security (BIS) has initiated an investigation under Section 232 of the Trade Expansion Act of 1962, as amended (19 U.S.C. § 1862), to determine the effects on U.S. national security from imports of **Neodymium-iron-boron (NdFeB) permanent magnets**. The Department says that interested parties are invited to submit written comments, data, analyses, or other information to BIS by 12 November 2021. The Department notes that this is the first Section 232 investigation initiated under Secretary Raimondo, and is consistent with a recommendation by the White House's 100-day supply chain [reviews](#) to evaluate whether to initiate this investigation.

Critical national security systems rely on NdFeB permanent magnets, including fighter aircraft and missile guidance systems. In addition, NdFeB permanent magnets are essential components of critical infrastructure, including electric vehicles and wind turbines. The magnets are also used in computer hard drives, audio equipment, and MRI devices.

If the Department finds that NdFeB permanent magnets are being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security, the secretary shall advise the White House in her report on the findings of the investigation. By law, the Secretary of Commerce has 270 days from initiation, until 1 June 2022, to present the Department's findings and recommendations to the White House.

Raimondo released the following statement: "The Department of Commerce is committed to securing our supply chains to protect our national security, economic security, and technological leadership. Consistent with President Biden's directive to strengthen our supply chains and encourage investments to shore up our domestic production, the Department initiated a Section 232 investigation on imports of NdFeB permanent magnets to determine whether U.S. reliance on imports for this critical product is a threat to our national security."



Top generals: Terrorists could take root in Afghanistan in less than a year

Source: <https://www.washingtontimes.com/news/2021/sep/29/top-generals-terrorists-could-take-root-afghanista/>

Sept 29 – The chairman of the Joint Chiefs of Staff told lawmakers Wednesday that terrorist organizations could regain footing in [Afghanistan](#) in as soon as **six months** leaving some lawmakers concerned that the war there is not over.

The remarks by Gen. [Mark Milley](#) came amid two consecutive days of contentious testimony before House and Senate panels escalated into heated flareups among lawmakers and calls for the [Pentagon](#)'s top brass to resign.

"I think right now, right this minute we are safer because of the efforts over the last 20 years," Gen. [Milley](#) told the House Armed Services Committee on Wednesday. "However, I do think that conditions are more



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likely than not to develop over the course of time that will allow for the reconstitution of al Qaeda and/or ISIS.”

“And that time varies depending on which analyst you’re listening to, but some time between say six to 12 and maybe 36 months,” he said.

Gen. [Milley](#)’s testimony came in hearing along with Secretary of Defense Lloyd Austin and Gen. Kenneth F. McKenzie, head of the U.S. Central Command.

Gen. McKenzie echoed the need for the U.S. to remain vigilant.

“The war on terror is not over, and the war in [Afghanistan](#) is not over either,” he said.

EDITOR’S COMMENT: What do they know? They are only Generals! The President knows better. Besides, Afghanistan is so far away from the US!

UAE (Dubai)– Super First Responders



Dubai Corporation for Ambulance Services (DCAS) – Nissan GT-R (small photo: Corvette C7 Gran Sport)

Kim must not be allowed to dictate to the world on his terms

By Dalia Al-Aqidi

Source: <https://arab.news/66u9d>

Oct 03 – Before the international uproar caused by North Korea’s two recent ballistic missile tests had died down, the communist government decided to push the envelope by testing a new supersonic gliding missile, which was immediately viewed as a severe new global threat.

The state-run Korean Central News Agency last week claimed that the test of what it described as a “strategic weapon of great significance” to the country’s self-defense strategy was successful. The launch of the Hwasong-8 confirmed the navigational control and stability of the missile, in addition to “its guiding maneuverability and the gliding flight characteristics of the detached hypersonic gliding warhead,” KCNA reported.

But why did this test raise general concerns and what are the repercussions of Kim Jong Un’s possession of such a sophisticated weapon?



For starters, the hypersonic glide vehicle is one of the world's fastest and most accurate weapons that can be designed to carry nuclear warheads. Its capability to maneuver mid-flight makes it challenging to track and decreases the possibility of it being intercepted. Moreover, a reliable defense system capable of intercepting these fast-moving weapons has not yet been fully developed. Thus, most leaders view it as one of the most dangerous military threats the world is currently facing.

HYPERSONIC MISSILES ARMS RACE

US, China, Russia & North Korea all have the terrifying weapons



In theory, a fully developed missile will not be limited by geographical range, which puts every country around the globe, including the US, at risk of being targeted at record speed if the North Korean leader chose to launch an attack.

Following the breakdown of the nuclear talks between the US and North Korea in 2019 over sanctions relief and what Kim would be willing to give up in return, Pyongyang has resumed its missile development and experiments. It has continued its focus on developing its hypersonic missile system, which the communist dictator considers one of the five top priorities of his five-year strategic weapons plan.

Despite the statements and threats of the regime in Pyongyang, the world does not have complete knowledge of its true military capabilities or the credibility and accuracy of its

statements. For instance, the speed and accuracy of the Hwasong-8 have not been revealed or confirmed by any independent source, which might mean that the hypersonic missile is not fully developed and the whole show was just a stunt to gain more political and diplomatic leverage.

This desire was clearly shown before the international community last week, when North Korea's Ambassador to the UN Kim Song accused Washington of antagonizing Pyongyang for more than 70 years. While addressing the UN General Assembly, he said the reason for his country's determination to build a nuclear weapons arsenal was the American hostility toward his government. "We have stored reliable power to defend ourselves by exerting continuous efforts, with a clear insight into the demand of the times, which necessitates us to possess sufficient might for national defense in the face of the geopolitical environment and the balance of power on the Korean Peninsula, as well as ever-straining international relations," Song told delegates.

The North Korean diplomat also conveyed his leader's desire to refrain from using military power against the US, South Korea and other neighboring countries.

Song preferred to avoid addressing the dire economic situation and medical crises that his country is currently facing, which threaten to destabilize the already-fragile regime.

Despite the South Korean military chief's statement, in which he said that the new hypersonic missile is still in its initial development phase and will take a considerable amount of time to be deployed, the threat has reached a significant level that should not be taken lightly.

Kim should not be allowed to have his cake and eat it too. The time has come for the North Korean leader to recognize that he cannot dictate to the rest of the world on his own terms. He should know that building his weapons of mass destruction arsenal, while aiming to sabotage the US-South Korea alliance, is not acceptable.



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Pyongyang's violation of international sanctions requires stricter measures be imposed until the regime shows a willingness to eliminate its nuclear weapon and ballistic missile programs and takes serious steps toward this goal.

While the US administration is already swamped with several national and foreign crises, it needs to act promptly, along with its allies, to put more pressure on Kim before he manages to destabilize the security of the Korean Peninsula and the whole Northeast Asia region.

Dalia Al-Aqidi is a senior fellow at the Center for Security Policy.

France – India – Greece Security Cooperation: Consequences for the East Mediterranean Gas Forum

By Pauline Mortel

Source: <https://rieas.gr/images/Publications/rieas184.pdf>

Sept 19 – This research paper will detail the security cooperation and close partnerships that have been developed by France, India and Greece with one another, and which have encompassed, among others, joint military exercises and arms deals. Beyond the military and economic benefits that they have brought to Paris, New Delhi and Ankara, these alliances have also enabled these three countries to develop their power and therefore intervene militarily in their region, in particular in the Eastern Mediterranean and the Indo-Pacific.



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

By Pauline Mortel is Researcher @ 2021 RIEAS Internship Program.

UAE: What a great idea!



Workers seek out their names on the monument to their efforts at Expo 2020 Dubai. Photo: James Langton / The National



UN Warns Over 5 Billion People Could Struggle to Access Water by 2050

Source: <https://www.sciencealert.com/over-five-billion-people-will-have-inadequate-access-water-in-2050>

Oct 06 – More than five billion people could have difficulty accessing water in 2050, the United Nations warned Tuesday, urging leaders to seize the initiative at the COP26 summit.

Already in 2018, 3.6 billion people had inadequate access to water for at least one month per year, said a new report from the UN's World Meteorological Organization.

"We need to wake up to the looming water crisis," [said WMO chief Petteri Taalas.](#)

[The State of Climate Services 2021: Water](#) report comes just weeks before COP26 – the UN [Climate Change](#) Conference being held in Glasgow from October 31 to November 12.

The WMO stressed that over the last 20 years, the levels of water stored on land – on the surface, in the subsurface, in snow and ice – had dropped at a rate of one centimeter per year.



The biggest losses are in Antarctica and Greenland, but many highly-populated lower latitude locations are experiencing significant water losses in areas that traditionally provide water supply, said the WMO.

The agency said there were major ramifications for water security, as only 0.5 percent of water on Earth is useable and available fresh water.

"Increasing temperatures are resulting in global and regional precipitation changes, leading to shifts in rainfall patterns and agricultural seasons, with a major impact on food security and human health and well-being," [said Taalas.](#)

'We cannot wait'

Meanwhile water-related hazards have increased in frequency over the past 20 years.

Since 2000, flood-related disasters have risen by 134 percent compared with the previous two decades.

"We have seven percent more humidity in the atmosphere because of the current warming and that's also contributing to the flooding," Taalas told a press conference.

Most of the flood-related deaths and economic losses were recorded in Asia, where river flood warning systems require strengthening, said the WMO.



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At the same time, there has been around a 30 percent increase in the amount and duration of drought events since 2000, with Africa the worst-affected continent.

Taalas urged countries at COP26 to raise their game.

He said most world leaders were talking about climate change as a major risk to the welfare of mankind, but their actions were not matching their words.

"We cannot wait for decades to start acting," he said.

"That's also a message for countries like China which has said that they would like to become carbon neutral by 2060 but they don't have a concrete plan for the coming decade."

He said the top priority at COP26 was stepping up ambition levels in climate mitigation, but more work was also needed on climate adaptations, as the negative trend in weather patterns will continue for the coming decades – and the coming centuries when it comes to the melting of glaciers and sea levels rising.

EDITOR'S COMMENT: When the UN will stop just "warning" nations and start "doing" something about a threat like this or similar?

Afghanistan – A Haven for Violent Extremism

By Richard Schoeberl and Anthony (Tony) Mottola

Source: <https://www.domesticpreparedness.com/resilience/afghanistan-a-haven-for-violent-extremism/>

Oct 06 – **The rapid collapse of Afghanistan creates uncertainty and fears around how swiftly the Islamic State (ISIS) and al-Qaida can rebuild, mobilize, and plan attacks on the West under a Taliban-led government.** As conflict breeds instability, volatility will certainly follow the U.S. withdrawal from Afghanistan. There will likely be a reconstitution of al-Qaida and growth of ISIS as two movements compete for influence in the country. It calls to question whether the recent attacks in New Zealand, inspired by ISIS, were motivated by what most would consider a victory for Jihad as the Taliban's self-proclaimed victory seeks to inspire more terrorist movements. After 20 years of U.S. occupation, many are questioning whether Afghanistan will once again become a massive draw and haven for Islamic extremists.

A Taliban-led Afghanistan will be a welcoming operating atmosphere for terrorists, insurgents, and foreign fighters alike. Al-Qaida has somewhat passionately waited in the wings and is now in the limelight following the recent Taliban victory. As proclaimed by [al-Qaida](#), "This victory has demonstrated what the Islamic nation is capable of when it unites, takes up arms, and fights in the Way of Allah to defend its Religion. These events prove that the Way of Jihad is the only way that leads to victory and empowerment."

According to the [United Nations](#), it is estimated that the current number of armed Taliban fighters ranges from approximately 58,000 to 100,000. Globally, over the past few years, Afghanistan has accounted for [41%](#) of deaths from terrorism-related violence and the Taliban was accountable for 87% of these fatalities.

Law Enforcement Concerns

It will be difficult to get independent accounts on what is happening inside Afghanistan without human intelligence. However, the intelligence community can project what is likely to take place based on what is currently known and historical precedents. Organizations like ISIS and al-Qaida have continually proven their capabilities and intent to attack the U.S. and its interests. These organizations will continue to plot new attacks and seek impressionable people to commit acts of violence against the U.S. through direct involvement or inspired attacks.



An increase of homegrown violent extremist and domestic violent extremist attacks will become a focus of local and state policing. However, the international threat certainly has been heightened as the Department of Homeland Security released the [National Terrorism Advisory System \(NTAS\) Bulletin](#) stating, “These threats include those posed by domestic terrorists, individuals and groups engaged in grievance-based violence, and those inspired or motivated by foreign terrorists and other malign foreign influences.” Making information sharing between all levels of law enforcement and intelligence community paramount, intelligence gathering and sharing will have to occur at all levels in order to be successful.

According to the National Strategy for Counterterrorism ([NSC](#)), “These groups stoke and exploit weak governance, conflict, instability, and longstanding political and religious grievances to pursue their goal of eliminating Western influence in majority Muslim countries and reshaping Islamic society.” According to the NSC, based on what is known about the organizations and what they seek to exploit, Afghanistan is perfectly aligned to become a jihadist refuge. According to the [Global Terrorism Index](#), 95% of deaths from terrorist attacks over the past 17 years have occurred in countries that are in conflict, and “Afghanistan remains the country with the highest impact from terrorism.” Most recently, U.S. chair of the Joint Chiefs of Staff, [Gen. Mark Milley](#) stated, “My military estimate is that the conditions are likely to develop to a civil war. I don’t know if the Taliban are going to be able to consolidate power and establish governance.”

Reuniting After U.S. Withdrawal

Since the attacks of 9/11, the U.S. interest in Afghanistan has primarily been focused on preventing future attacks. It has been 20 years since the U.S. led an invasion into Afghanistan in search of al-Qaida, which was embraced and protected by the Taliban. In fact, the Taliban’s rejection to hand over top al-Qaida member Osama bin Laden is what ultimately led the U.S. military insurgency and ousting of the Taliban regime. In videos posted on social media, bin Laden’s top aide, [Amin ul-Haq](#), returned to his hometown of Nangarhar, Afghanistan, just hours after U.S. forces left Kandahar.

Ul-Haq was al-Qaida’s top arms supplier, bin Laden’s chief deputy, and has been on the U.S. list of Specially Designated Global Terrorists since 2001. This development is of great significance as [reporting](#) suggests ul-Haq is now a key figure working with the Taliban. Although the Taliban and al-Qaida have different ideologies, different goals, and different languages, they have shared a long history that dates back to the 1990s, a [relationship](#) that has been strengthened by a shared struggle against global forces in Afghanistan and one that remains closely aligned. To what extent these two organizations will remain aligned going forward is yet to be seen given that the common enemy is no longer occupying the country.

On 7 September 2021, the Taliban declared Afghanistan an Islamic Emirate and announced a new government. The militant group did not include any women in the new interim government and has been using violent measures against protests. Under the new Taliban-established government, Sirajuddin Haqqani was appointed the new interior minister for Afghanistan. Sirajuddin Haqqani is the son of the founder of the [classified terrorist group](#) the Haqqani Network, which the U.S. designated as a Foreign Terrorist Organization due to its involvement in the Afghan insurgency and links to al-Qaida. Haqqani is also on the [FBI’s most wanted](#) list due to his involvement in suicide attacks and close ties with al-Qaida. The FBI believes Haqqani is connected to the 2008 hotel attack in Kabul that killed six people, as well as a U.S. citizen. It is also believed that Haqqani “coordinated and participated in cross-border attacks against United States and coalition forces in Afghanistan.” Additionally, Haqqani was involved in the planning of Afghan President Hamid Karzai assassination attempt in 2008.

Haqqani is not the only concern with the newly formed government. Mullah Mohammad Hassan Akhund, one of the Taliban’s founders, was named prime minister. He is on a UN blacklist. Mullah Abdul Ghani Baradar, a Taliban co-founder, has been tapped as deputy prime minister. Four Taliban members released from Guantanamo Bay (GTMO) are part of the Taliban’s new hardline government. In addition, a declassified 2020 [Office of National Intelligence report](#) indicated that a total of 104 of the 729 detainees released from GTMO have reengaged in terrorist activities, including conducting and planning attacks and recruiting and funding terrorists.

Establishing a Base of Operations

The Taliban is attempting to portray themselves as moderates, but their selections in the interim government leave many questions as to their true intent. In September 2021, Saudi Arabia’s foreign minister [Prince Faisal bin Farhan Al Saud](#) said, “the resurgence of al-Qaeda, ISIS and the Taliban in Afghanistan is a matter of real concern.”

Al-Qaida’s existence in Afghanistan has been diminished since the U.S.-led invasion in 2001. However, with top leadership such as Amin ul-Haq returning, there is significant concern that the region could once again develop into a terrorist haven. A recently released United Nations [report](#) suggests that the substantial leadership of al-Qaida still resides in the Afghanistan and Pakistan border regions, making it logistically effortless for them to unite out of exile. The UN further reported that al-Qaida’s presence exists in at least 15 Afghan provinces



and is reported to have upward of 500 members. This number is likely to grow quickly given the circumstances within the region and the fact that the Taliban released many senior al-Qaida operatives when it captured Bagram Air Base in mid-August. Of great concern, the report suggests that the “Taliban and al-Qaida remain closely aligned and show no indication of breaking ties.” As history has documented, the report only solidifies that al-Qaida’s long-term strategy is “strategic patience for a period of time before it would seek to plan attacks against international targets again.”

Examining [documents](#) found in bin Laden’s Abbottabad hideout, even bin Laden stressed the importance of a haven in Afghanistan. Derived from the Arabic language meaning “the base,” the term al-Qaida itself is critical. Afghanistan will likely remain the base from which al-Qaida will continue to operate.

Aside from the long historical allegiance of the Taliban and al-Qaida, an ISIS affiliate, known as ISIS Khorasan (ISIS-K) established itself in the Afghanistan/Pakistan region in 2015. The [State Department](#) designated ISIS-K as a foreign terrorist organization on 14 January 2016. ISIS-K is a smaller and more obscure branch of the Islamic State of Iraq and Syria. Named for the historical [region](#) spanning the Middle East and Asia, ISIS-K was formed mainly from defectors of the Taliban and known terrorist movement Tehrik-e Taliban. According to the [United Nations Security Council](#), ISIS-K has roughly 2,000 members. However, the group can attribute nearly 80 attacks to their name in just the first four months of 2021, including the suicide bomb that killed 75 Afghans and 12 U.S. service members days before U.S. troops pulled out of the region. Although the Taliban and ISIS-K are at odds over territory and indoctrination differences, many have supported a one-entity approach to unite under one caliphate.

Coordination & Collaboration Needed in Law Enforcement & Intelligence

The rapid rise in ISIS-K has forced the Biden administration to consider talks with the Taliban, to [coordinate counterintelligence](#) operations against ISIS-K. This decision could have longstanding implications for the future of intelligence gathering in Afghanistan. Still, the human intelligence (HUMINT) on the ground in the region has been fragmented with the abrupt withdrawal of U.S. troops and government officials. Rebuilding trust in the Afghan people after the U.S. withdrawal and creating an alliance with the Taliban can be problematic for U.S. intelligence officials. ISIS-K and the Taliban could create a haven for terrorists to train without U.S. intelligence officials’ oversight from HUMINT on the ground reporting on operations. This inability to capture real-time intelligence could certainly lead to future attacks in the U.S. and Europe from would-be terrorists trained in these camps.

As refugees attempt to flee from the Taliban and ISIS-K rule, these terror groups could attempt to embed potential terrorists within fleeing refugees. In 2016, only five years ago, the U.S. House of Representatives Committee on Homeland Security had a [hearing](#) on the infiltration of terrorists into refugee and visa programs. The committee cited two ISIS-inspired Iraqis arrested by the FBI on terror-related charges that had entered the U.S. in the refugee program. U.S. Custom Border Protection (CBP) recently arrested [two Yemeni men](#), one in January 2021 and one in March 2021, on the FBI’s terrorist watchlist and no-fly list. The combination of refugees fleeing Afghanistan and the overwhelming surge of migrants at the U.S.-Mexican border will become an intelligence and policing challenge for federal, state, and local law enforcement agencies in the U.S.

Refugees fleeing Afghanistan and surging migrants at the U.S.-Mexico border will become an intelligence and policing challenge for law enforcement in the U.S.

On 13 August 2021, the Secretary of Homeland Security, Alejandro Mayorkas, issued a [new National Terrorism Advisory System \(NTAS\) Bulletin](#) warning of possible terrorist attacks due to the 20th anniversary of 9/11. The bulletin warns of domestic and foreign threats to the U.S. and the resurrection of al-Qaida in the Arabian Peninsula’s (AQAP) English version of *Inspire Magazine* after a four-year hiatus. It is a magazine that has inspired terrorists such as the [Boston Bomber](#), Tamerlan Tsarnaev, to commit acts of terror.

To strengthen homeland security, federal, state, and local law enforcement officials must work together, and share information to protect the communities they police. Local law enforcement will feel the brunt of policing refugees and migrants entering the U.S. with limited resources and little to no training. Law enforcement agencies are already suffering from COVID-19 stressors and a lack of support with police-reform movements cutting law enforcement budgets. This creates a diverse array of threats against law enforcement that can fuel ISIS and al-Qaida leaders to strike at the U.S. with acts of violence. The combination of these red flags could lead to the possibility of future attacks.

Counterterrorism experts believe that al-Qaida is now in a position to rebuild itself in Afghanistan and in a better position to coordinate attacks against the U.S. “The current assessment probably, conservatively, is one to two years for al-Qaeda to build some capability to at least threaten the homeland,” stated [Lieutenant General Scott Berrier](#), director of the Defense Intelligence Agency. The Taliban’s governmental overthrow of Afghanistan generates significant obstacles for the U.S. to combat terrorism and terrorism financing particularly against ISIS-K and al-Qaida. The intelligence community must be proactive and collaborate to prevent attacks on U.S. soil. Particularly with a haven forming in Afghanistan.



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Richard Schoeberl, Ph.D., has over 25 years of experience, including the Federal Bureau of Investigation (FBI) and the National Counterterrorism Center (NCTC). He served a variety of positions throughout his career, ranging from supervisory special agent at the FBI's headquarters in Washington, D.C. to acting unit chief of the International Terrorism Operations Section at the NCTC. In addition to the FBI and NCTC, he is an author on numerous articles over terrorism and security and has served as a media contributor for Fox News, CNN, PBS, NPR, Al-Jazeera Television, Al Arabiya Television, and Al Hurra. He works with the international nonprofit organization Hope for Justice, combatting human trafficking, and additionally serves as a professor of Homeland Security at The University of Tennessee Southern.

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Illicit Weapons in Afghanistan

Issue 01: Taliban seizures of US-equipment are only a fraction of the story.

Conflict Armament Research, September 2021

Source: <https://storymaps.arcgis.com/stories/773ba742c1d1402582bb0ccc38414b34>

Conflict Armament Research (CAR) is an independent investigative organisation based in the UK. Established in 2011, CAR documents weapons, ammunition, and related military materiel in conflict zones, and traces chains of supply to identify points of diversion.

Between February 2019 and July 2021, CAR investigators have worked in Afghanistan to document illicit weapons in the country. CAR's data set comprises some 1,600 small arms and light weapons, more than 1,300 rounds of ammunition, and dozens of related items, such as night vision equipment, riflescopes, and components for improvised explosive devices (IEDs). In this Frontline Perspective series, CAR explores the supply dynamics that have sustained and supported the Taliban over the past few years.



►► [Read the full article at the source's URL.](https://storymaps.arcgis.com/stories/773ba742c1d1402582bb0ccc38414b34)

DEA, DOJ Warn of Lethal Fake Medication Pushed by Mexican Criminal Gangs

Source: <https://www.homelandsecuritynewswire.com/dr20211007-dea-doj-warn-of-lethal-fake-medication-pushed-by-mexican-criminal-gangs>

Oct 07 – At a press conference last week, Deputy Attorney General Lisa O. Monaco and [DEA](#) Administrator Anne Milgram announced a significant law enforcement effort to protect American communities from the flood of fentanyl and fentanyl-laced pills across the United States. Illicit fentanyl, a synthetic opioid found in most of the fake pills that were seized, is the primary driver of the recent increase in U.S. overdose deaths.

“Illicit fentanyl was responsible for nearly three quarters of the more than 93,000 fatal drug overdoses in the United States in 2020,” said Monaco. “The pervasiveness of these illicit drugs, and the fatal overdoses that too often result, are significant threats to public safety and health in this country. The



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Department will continue to use all of the resources at its disposal to save lives, complementing strong enforcement efforts with public awareness and outreach campaigns, as well.”

“During the past eight weeks, DEA has targeted the criminal drug networks flooding the U.S. with deadly, fentanyl-laced fake pills,” said Milgram. “DEA remains steadfast in its commitment reduce drug-related violence and overdose deaths by dismantling the violent, criminal drug distribution networks across the United States. The fentanyl-laced fake pills seized by DEA could potentially kill more than 700,000 Americans. I urge the American public today to talk to their loved ones about the threats and dangers of fake pills and the simple fact that one pill can kill.”

“While in the midst of the country’s opioid crisis, counterfeit prescription pills like Percocet, Xanax and Oxycontin, continue to be abused at alarming rates,” said the Special Agent in Charge of the DEA Atlanta Field Division (AFD) Robert J. Murphy. The AFD covers the states of Georgia, North and South Carolina. These dangerous, and potentially deadly pills often contain a deadly dose (about two milligrams—the approximate size of a number two (2) pencil lead) of fentanyl. Correspondently, the DEA Atlanta Field Division placed all hands-on deck and leashed an unwavering assault against the drug distribution networks directly responsible for pushing these poisonous pills. The fruitful results of this operation should let counterfeit pill pushers know that DEA will continue to confront, engage and eliminate drug trafficking in order to protect our communities.”

Mexican criminal drug networks are mass-producing illicit fentanyl and fentanyl-laced fake pills using chemicals sourced largely from China., and are distributing these pills through U.S. criminal networks. These fake pills are designed to appear nearly identical to legitimate prescriptions such as Oxycontin, Percocet, Vicodin, Adderall, Xanax, and other medicines. Criminal drug networks are selling these pills through social media, e-commerce, the dark web, and existing distribution networks. As a result, these fake pills are widely available. The U.S. Department of Justice said it will continue to collaborate closely with its international partners, within Mexico and around the world, to aggressively investigate and prosecute the members of these drug networks.

These fake pills are more lethal than ever. DEA laboratory testing reveals that today, four out of 10 fentanyl-laced fake pills contain a potentially lethal dose. Moreover, the number of fake pills containing fentanyl has jumped nearly 430 percent since 2019.

On 3 August 2021, DEA launched a nationwide law enforcement effort to address the alarming increase in the availability and lethality of fentanyl-laced fake pills. Fentanyl—in powder and pill form—is a significant U.S. public health threat that is killing tens of thousands of Americans. Over the past two months, working in concert with federal, state, and local law enforcement partners, DEA seized 1.8 million fentanyl-laced fake pills and arrested 810 drug traffickers in cities, suburbs, and rural communities spanning the United States. The amount of deadly fentanyl-laced fake pills seized by DEA since August 3rd is enough to kill more than 700,000 Americans. These recent seizures add to the more than 9.5 million potentially deadly fake pills that DEA seized in the past year, which is more than the last two years combined.

During the two-month law enforcement surge targeting fake pills, DEA also seized 712 kilograms of fentanyl powder: enough to make tens of millions of lethal pills. DEA seized 158 weapons and many of the enforcement actions are tied to violence and overdose deaths. Additionally, DEA seized 4,011 kilograms of methamphetamine and 653 kilograms of cocaine.

DEA issued a [Public Safety Alert](#) on Monday, 27 September 2021, warning the American public about the increasing availability of fake pills that are more deadly than ever before, and that are easy to purchase, widely available, and often contain deadly doses of fentanyl. DEA also launched the [One Pill Can Kill](#) campaign to inform the American public of the dangers of fake prescription pills. The only safe medications are ones prescribed by a trusted medical professional and dispensed by a licensed pharmacist. Any pills that do not meet this standard are unsafe and potentially deadly.

The Sound and the Fury: Inside the Mystery of the Havana Embassy

By Tim Golden and Sebastian Rotella

Source: <https://www.homelandsecuritynewswire.com/dr20211008-the-sound-and-the-fury-inside-the-mystery-of-the-havana-embassy>

Oct 08 – It was a cool night for Havana, with the temperature falling into the mid-70s, and the diplomat and his family were feeling very good about their assignment to Cuba. They were still settling into their new home, a comfortable, Spanish-style house in the lush enclave that had been called “el Country Club” before wealthy families abandoned it in the early years of the revolution. “We were just thrilled to be there,” the diplomat recalled. “The music, the rum, the cigars, the people — and a very important moment for diplomacy.”

Eight months earlier, in March 2016, President Barack Obama had swept into town to commemorate the two countries’ historic rapprochement, vowing to bury “the last remnant of the Cold War in the Americas.” Now, weeks after the election of Donald Trump, that entente was suddenly doubtful. Fidel Castro had just died, opening a



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new chapter in the Cuban saga. The diplomat could hardly have imagined a more fascinating time to arrive.

As the sun slid into the Florida Straits on that late-November evening, the diplomat folded back the living room doors that opened onto the family's new tropical garden. The warm night air poured in, along with an almost overpowering din. "It was annoying to the point where you had to go in the house and close all the windows and doors and turn up the TV," he recalled. "But I never particularly worried about it. I figured, 'I'm in a strange country, and the insects here make loud noises.'"

A few nights later, the diplomat and his wife invited over the family of another American embassy official who lived next door. Around

dusk, as they chatted on the patio, the same deafening sound rose from their yard again.

"I'm pretty sure those are cicadas," the first diplomat said. "Those are *not* cicadas," his neighbor insisted. "Cicadas don't sound like that. It's too mechanical-sounding."

The colleague had been hearing the same noises at home, sometimes for an hour or more at a stretch. After he complained to the embassy housing office, a couple of Cuban maintenance workers were dispatched to look around. They checked for electrical problems and scanned the yard

for strange insects, but they left without finding anything out of place. In February, the nightly racket finally began to fade. Then it went away altogether.

It was not until a Friday in late March that the diplomat realized he might be facing something more dangerous than bugs. At work that day, an embassy colleague with whom he was friendly took him aside and said he was leaving Cuba right away. A fit-looking man in his thirties, the colleague said he had just been in Miami, where medical specialists found he had a series of problems including a serious hearing loss. In late December, he said, he had been struck by a strange, disturbing phenomenon — a powerful beam of high-pitched sound that seemed to be pointed right at him. The following Monday, the diplomat's friend played him a recording of the noise: It sounded a lot like what the diplomat had heard in his backyard.

The diplomat, who agreed to discuss his experience on the condition he not be named, said neither he nor his wife had felt any signs of illness or injury. But within days, they, too, would be on their way to Miami to be examined by medical specialists. Along with 22 other Americans and eight Canadians, they would be diagnosed with a wide array of concussion-like symptoms, ranging from headaches and nausea to hearing loss. They would also find themselves caught up in an extraordinary international dispute, one that the Trump administration would use to sharply reverse the course of U.S. relations with Cuba.

Even in a realm where secrets abound, the Havana incidents are a remarkable mystery. After nearly a year of investigation that has drawn on intelligence, defense and technology expertise from across the U.S. government, the FBI has been unable to determine who might have attacked the diplomats or how. Nor has the bureau ruled out the possibility that at least some of the Americans weren't attacked at all. Officials who have been briefed on the inquiry described it as having made strikingly little progress in answering the basic questions of the case, with frustrated FBI agents reporting that they are running out of rocks to overturn.

Those frustrations have roiled the U.S. national-security community, putting the FBI increasingly at odds with the CIA over the case. In early January, after more than eight months of analysis, the bureau ruled out its initial hypothesis that the Americans were targeted with some type of sonic device. That left the FBI without a weapon, a perpetrator or a motive, and still struggling to understand how the diplomats could have been hurt or fallen ill. Intelligence officials, for their part, have continued to emphasize a pattern they see as anything but coincidental: The first four Americans to report being struck by the phenomenon — including the fit-looking man in his 30s — were all CIA officers working under diplomatic cover, as were two others affected later on. The CIA and other agencies involved in the investigation also have yet to concur with the FBI's conclusion about sonic technology.



More broadly, the Cuba problem has raised questions within the national security community about how the Trump administration is using intelligence information to guide its foreign policy. At a time when the White House has vowed to act more forcefully against North Korea, Iran and other threats, some officials see the Cuba problem as yet another lesson in the dangers of using intelligence selectively to advance policy goals. “Trump came in opposing better relations with Cuba,” said one national security official who, like others, would discuss the case only on the condition he not be named. “The administration got out in front of the evidence and intelligence.”

A ProPublica investigation of the case, based on interviews with more than three dozen U.S. and foreign officials and an examination of confidential government documents, represents the first detailed public account of how the Cuba incidents unfolded. Although the State Department has generally emphasized similarities in the medical files of the 24 affected Americans, officials and documents consulted for this story indicated that the nature and seriousness of the patients’ symptoms varied rather widely. The experiences that precipitated their illnesses were also quite different, officials said, and the experiences and symptoms of the eight Canadians differed from those of the Americans.

Many U.S. officials who have dealt closely with the problem — including several who asserted that it has been distorted for political purposes — said they remain convinced that at least some of the Americans were deliberately targeted by a sophisticated enemy. Medical specialists who reviewed the patients’ files last summer concluded that while their symptoms could have many causes, they were “most likely related to trauma from a non-natural source,” the State Department medical director, Dr. Charles Rosenfarb, said. “No cause has been ruled out,” he added. “But the findings suggest this was not an episode of mass hysteria.”

Yet it appears that secrecy, psychology and politics may all have played some part in how the phenomenon spread through the staffs of the two Havana embassies. Administration officials have been reluctant to discuss psychological factors in the case, in part because they fear offending or antagonizing the stricken diplomats (many of whom already feel badly treated by the State Department leadership). But as the mystery has deepened, U.S. investigators have begun to look more closely at the insular, high-pressure world of the Havana embassy, and they have found a picture that is far more complex than the rhetoric and headlines have suggested.

Despite the many unanswered questions, Trump administration officials have repeatedly blamed Raúl Castro’s government for failing to protect the diplomats, if not actually attacking them. Early last fall, the State Department withdrew more than half of the diplomatic staff assigned to Havana, while ordering a proportional number of Cubans to leave Washington. The department also warned U.S. citizens they could be “at risk” of attack if they visit the island. “I still believe that the Cuban government, someone within the Cuban government, can bring this to an end,” Secretary of State Rex Tillerson said last month.

Such assertions have outraged the Cuban leadership. Since early last year, U.S. officials said, Castro and his senior aides have insisted they had nothing to do with the incidents and would help in any way they could to investigate and stop them. The FBI team has found no evidence of Cuban complicity in the incidents, officials said, and has privately emphasized the government’s cooperation with its investigators. Tillerson’s statements notwithstanding, some State Department officials have also told members of Congress privately that they have assessed the Cubans’ denials of involvement to be credible, officials said. “They believe the Cuban government wants better relations with the United States,” one Senate aide said.

The other obvious suspect has been Russia, which intelligence analysts have seen as having both a possible motive and the possible means to carry out such attacks. The Putin government has harassed U.S. diplomats routinely in Moscow and sometimes abroad; during the Obama administration, it appeared determined to disrupt American foreign policy around the world. Russia also has a capacity to engineer sophisticated new weapons and a longstanding security alliance with Cuba. But investigators have not found even significant circumstantial evidence of a Russian hand in the incidents, officials said, and some analysts doubt Russia would imperil its relationship with Cuba by so brazenly undermining one of its key foreign policy goals.

While the mystery continues, U.S. policy toward Cuba hangs in the balance. With Castro scheduled to step down from the presidency in April, Washington is represented in Havana by only a skeleton staff at a potentially critical moment of transition. American travel to and business with the island have fallen sharply in recent months, and the processing of visas for Cubans wanting to emigrate to the United States has plunged, calling into question the fulfillment of a longstanding migration agreement between the two countries. The Trump administration may also have limited its options: On March 4, the State Department will face a deadline to either send its diplomats back to Havana or make permanent staff reductions. But the Secretary of State, who reportedly made the decision to pull out the diplomats, has shown no signs of changing his position.

“We don’t know how to protect people from this, so why would I do that?” Tillerson told the Associated Press when asked about returning diplomats to Cuba. “I will push back on anybody who wants to force me to do that until I’m convinced that I’m not putting people in harm’s way.”

In the crossfire of accusations, ordinary Cubans might be forgiven for wondering if they have been transported back in time. As the country prepares to be led for the first time in almost 60 years by someone not named Castro, a tectonic shift that could profoundly affect how it is governed, cold war



rhetoric has again filled the air. The next-generation Communist leader who is expected to succeed Raúl Castro, Vice President Miguel Díaz-Canel, 56, is among those who have warned of yet another imperialist plot against Havana. They are “incredible fairy tales without any evidence,” he said of the Trump administration’s claims, “with the perverse intention of discrediting Cuba’s impeccable conduct.”

The first two incidents occurred around Thanksgiving weekend of 2016, which coincided with the death of Fidel Castro on Nov. 25. During the nine days of official mourning that followed, neither American official told the embassy’s leadership what they had experienced. But both men, intelligence officers working under diplomatic cover, would later say they heard sharp, disorienting sounds in their homes at night. At least one of them would later tell investigators the noise had seemed oddly focused, officials said. Moving out of the way or into another room, it seemed almost to disappear.

If the stories sounded like science fiction, the CIA’s Havana station and the embassy leadership suspected something more mundane. Since the United States and Cuba restored limited diplomatic relations in 1977, reopening their embassies as “interests sections” in each other’s capitals, the Cubans kept a constant, often aggressive watch over American diplomats in Havana. Diplomats might come home to find a window opened, or a television set turned on (often to government news), or their belongings slightly but obviously rearranged. Some part of the game — including more provocative actions like smearing dog feces on the handles of diplomats’ car doors — was considered almost routine. There was also some noted reciprocity from the American agents who trailed Cuban diplomats around Washington.

During periods of particular tension with Washington, the Cubans sometimes went further. In the early and mid-1990s, American diplomats who met with Cuban dissidents or otherwise annoyed the government occasionally returned from meetings to find their car tires punctured. In the mid-2000s, as the Bush administration openly pursued efforts to subvert the Castro regime, Cuban harassment of the 51 American diplomats then stationed on the island ranged from delays in the release of food shipments to “the poisoning of family pets,” the State Department’s inspector general wrote in a 2007 report.

The man who headed the American diplomatic mission in late 2016, Jeffrey DeLaurentis, knew that history of harassment well, officials said. A measured, laconic career diplomat with an air of hardened patience, DeLaurentis had taken over as the chargé d’affaires in the summer of 2014, bringing more Cuban experience than perhaps any other senior official in the U.S. government. He had done previous tours in Havana as both a consular officer and a political officer, with a stint in between managing Cuban affairs on the National Security Council staff. After Obama announced a plan to normalize diplomatic relations with Cuba in December 2014, he nominated DeLaurentis to be Washington’s first ambassador to Havana since 1961, when President Eisenhower severed diplomatic relations. (Although his confirmation was blocked by Senator Marco Rubio of Florida, who argued that Cuba should demonstrate greater respect for human rights before the post was filled, DeLaurentis remained as the chargé d’affaires.)

Obama’s visit in March 2016 had left Cuban leaders ambivalent about the hand of friendship he extended: Fidel Castro, ailing and almost 90, stirred from his retirement to attack the American president’s “syrupy words,” and what he saw as an insidious plea for Cubans to forget the Americans’ dark history with the island. At a Communist Party congress that April, Raúl Castro and others peppered their rhetoric with references to “the enemy” to the north. Diplomats also noted some palpable discomfort among senior Cuban officials with the burst of capitalist bling that marked the easing of U.S. commercial restrictions — a Chanel fashion show, a free Rolling Stones concert, the brief takeover of Havana streets to film scenes for a new “Fast and Furious” movie.

But in the last months of 2016, official Cuban hostility toward the American diplomats in Havana was hovering somewhere near a 50-year low. No serious harassment had been reported for at least a few years, officials said. Most close analysts of Cuba believed the ruling party had forged a solid consensus for ending hostilities with the U.S. Fidel Castro’s last, angry diatribe notwithstanding, U.S. officials told ProPublica that he had been consulted on the rapprochement and given his approval.

While Cuban officials were notably slow to move forward with many of the proposed American business deals that poured in, they did plod ahead with work on bilateral agreements on law-enforcement cooperation, environmental protection, direct mail service and other matters. “Of course, there is a range of preferences within the regime on the speed and depth of reform,” said Fulton Armstrong, a former senior CIA analyst who handled Cuba issues on both the National Security Council staff and the National Intelligence Council. “But the debate is about the pace; there is no alternative to the Raúl strategy.”

The Cubans’ attention became more focused after the Nov. 8 presidential vote, American officials said. Although Trump had vowed during his campaign to renegotiate Obama’s “very weak agreement” with Havana, the Castro government had seemed to discount the possibility that he could be elected. Once Trump was elected — and with Obama administration officials urging the Cubans to consolidate improvements in the relationship — the Cuban government hurried to conclude work on pending agreements before the Jan. 20 inauguration.

It was during that same period between the election and the inauguration that the first U.S. intelligence officers were struck by what they described as strange noises. The initial three victims lived in the upscale neighborhoods of Havana’s western suburbs. Fidel Castro kept a home in one of those



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neighborhoods, Cubanacán, as do Vice President Díaz-Canel and other members of the island's most-privileged elite. The elegant old mansions and tropical-suburban homes of the enclave are also favored by senior foreign diplomats and business executives. There is relatively little car or pedestrian traffic, and a considerable presence of private security guards as well as the Cuban police. Although the first two officers would later report having first heard strange sounds in their homes back in late November, it was not until the end of December that the first victim sought help at the small medical clinic inside the embassy. That officer — the fit younger man in his 30s — came with a more serious complaint: He had developed headaches, hearing problems and a sharp pain in one ear, especially, following a strange experience in which something like a beam of sound seemed to have been directed at his home. The younger man's trauma was reported to DeLaurentis and the embassy's diplomatic security chief, Anthony Spotti, on Dec. 30, State Department officials said, and followed by word that the two other CIA officers had experienced something similar about a month before. But inside the modernist glass-and-concrete chancery building that rises up along Havana's iconic seawall, the Malecón, both the intelligence officials and senior diplomats guessed that the noises were "just another form of harassment" by the Cuban government, one official said. They also seemed carefully targeted to CIA officers working under diplomatic cover. If members of Cuba's state-security apparatus did not know the men were intelligence officers, they would probably have suspected them anyway, the Americans believed.

The incidents were discussed discreetly among members of the embassy's "country team," the group of roughly 15 senior diplomats that would often meet daily to discuss significant issues. But, because of counterintelligence concerns, they were kept secret from most of the other American personnel — about 32 other diplomats and eight Marine guards — a decision that was later criticized by some of those who became sick. "We have security officers at every embassy and they give us constant updates," one diplomat said. "Somebody gets pick-pocketed, somebody got their car broken into ... And then somebody got attacked by this mystery weapon and they didn't tell us?"

By mid-January, after the other two intelligence officers also sought medical attention at the embassy, the matter began to take on a more ominous cast, several officials said. Around the time that the first intelligence officers were sent to the U.S. for treatment on Feb. 6, the wife of another embassy staffer, who lived near the Havana coastline in the neighborhood of Flores, reported hearing similar, disturbing sounds, two officials familiar with her account said. The woman then looked outside and saw a van speeding away. The vehicle had apparently come from the same end of the street on which there was a house that was thought by U.S. officials to be used by the Cuban Interior Ministry. The officials acknowledged that the report was vague and uncertain. Yet they said it also constituted one of the more significant pieces of circumstantial information they had about the incidents.

In Havana, officials said, senior members of the embassy staff argued to their counterparts in Washington that they should formally protest the incidents to the Cuban government. Given the uncertainties, others thought they should try to gather more information before lodging such a complaint. Although it was a matter of concern at both the State Department and the CIA, it is unclear whether it was raised to the National Security Council staff before the decision to protest was made (one former senior official said it was not). Nor, officials said, was Secretary of State Tillerson informed of the situation until days after the department's acting assistant secretary for Western Hemisphere affairs, Francisco Palmieri, finally called in the Cuban ambassador in Washington, José Ramón Cabañas, to present a diplomatic note of protest on Feb. 17.

The Cuban government responded promptly. A few days later, officials said, DeLaurentis was called to a meeting with Josefina Vidal, the senior diplomat who had led the Cuban team that negotiated the normalization of relations with the U.S. (DeLaurentis declined to comment, referring questions about the Havana incidents to the State Department.) Vidal was joined by other officials from the Interior Ministry, which controls the country's foreign-intelligence and internal-security apparatus. The Cuban security officials questioned DeLaurentis about the incidents, what the diplomats had experienced, what symptoms they had suffered and what other circumstances might shed light on the episode, officials said.

On Feb. 23, less than a week after the U.S. démarche to the Cuban government, DeLaurentis accompanied two visiting U.S. senators, Richard Shelby of Alabama and Patrick Leahy of Vermont, to see President Raúl Castro at the Palace of the Revolution. During the conversation, officials said, Castro mentioned that he had something to discuss with the chargé, and when the meeting concluded, he asked DeLaurentis to stay behind. During what officials described as a fairly brief but substantive conversation, Castro made it clear that he was well aware of the incidents and understood that the Americans saw them as a serious problem. His response, one State Department official said, was "We should work together to try to solve it."

The Americans' meetings with Cuban diplomatic and security officials continued. The Cubans said they would bolster security around the homes of American diplomats, adding police patrols and installing closed-circuit television cameras in some areas. In a more unusual step, the Cubans also allowed a team of FBI investigators to come to Havana to investigate for themselves, building on improvements in the law-enforcement relationship that were formalized with a bilateral agreement in late 2016. (An FBI spokeswoman said the bureau would not comment on details of the investigation.)



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From the start, U.S. officials were themselves reluctant to share information with Havana about the incidents. The Cubans asked to interview the Americans identified as victims; the State Department refused. The Cubans asked for detailed medical information about their injuries; the State Department demurred, citing privacy concerns. “You could not rule out” the Cuban government’s possible involvement in the incidents, one department official said. “When you are dealing with a possible perpetrator, one is careful.” While the first embassy staff members were sent to be evaluated by specialists at the University of Miami’s Miller School of Medicine, officials in Washington also began to look more widely at what might be causing their symptoms. Initially, U.S. intelligence officials hypothesized that either the Cuban government or some other foreign regime — possibly with Cuban participation — had created a new kind of Long-range Acoustic Device, or L-Rad, enabling them to somehow focus and direct powerful sonic waves of the sort that are used by police agencies to disperse crowds, or by cargo ships to drive away pirates.

But the physics were puzzling to experts inside and outside of government. The incidents had mostly taken place at night, inside victims’ homes. Whatever sonic or directed-energy weapon was used seemed to have penetrated walls and windows. Yet others living in the immediate vicinity apparently heard nothing out of the ordinary. With known L-Rad technology, sound waves generally radiate out from the device. No one seemed to understand how it could be focused in an almost laser-like fashion and still penetrate hard surfaces.

After a lull of several weeks, the incidents began again — and there were more of them. One woman was struck in her apartment. Other diplomats were hit in their homes in the western suburbs. The differing circumstances only complicated the picture, but the effects of the phenomenon became clearer: The first patients examined in the U.S. were all found to have concrete medical symptoms, and in the case of the younger man, they were fairly serious.

On Friday, March 24, the diplomat who had first heard the noises in his backyard around Thanksgiving encountered the younger man at work and heard about his frightening diagnosis in Miami. Doctors said the man had serious damage to the small bones inside one of his ears, among other issues, and would need to wear a hearing aid. The next Monday, he played the diplomat a recording of the noise with which he had been targeted. The diplomat was stunned: It sounded much like the noises that he and his family had heard from their garden for several months.

A day later, the diplomat went to see DeLaurentis in the spacious, fifth floor ambassadorial suite that looks out over the Malecón, officials familiar with the episode said. The diplomat explained that he, too, had been exposed to strange sounds that seemed similar to what the younger man had experienced. DeLaurentis said he and others who knew about the incidents believed they were confined to a “small universe of people” whom the Cubans probably suspected of doing intelligence work, whether they were CIA officers or not. The diplomat wasn’t reassured, and he suggested that others would not be, either. “You need to call a meeting,” the diplomat told DeLaurentis. “The rumor mill is going mad.”

The next day, March 29, DeLaurentis gathered about four dozen members of the embassy’s American staff — everyone in the building who had a security clearance. This time, after surrendering their cell phones, they crowded into a windowless conference room that had been outfitted as a Sensitive Compartmented Information Facility, or SCIF (pronounced “skiff.”) It had already been more than a month since DeLaurentis delivered his formal complaint to the Cuban government, but most of the people in the room were hearing about the incidents for the first time.

According to three officials who attended the meeting, DeLaurentis calmly laid out the basic details of what some of the diplomats had experienced. There was much they still did not understand about what had happened and who might be behind it, he said, but investigations were underway, and the Cuban authorities were taking steps they had promised to increase the diplomats’ security. He encouraged anyone who thought they might have been exposed, or who had any information that could be relevant to contact him or speak with the embassy’s security officer. Medical specialists were available to examine anyone who showed signs of a problem.

If DeLaurentis was hoping to calm his troops, he appears to have been only modestly successful. Part of the problem, diplomats said, was that he concluded the meeting by asking the assembled staff to avoid talking about the situation outside the secure confines of the embassy, even with their families. Although the matter was still classified, that request struck at least some of them as unreasonable, even outrageous. “We thought that was nuts,” said one official who attended the meeting. “There were family members who were attacked at home. How could we not tell them to watch out for this?”

Concerns among the staff and their dependents about their health exploded. Within barely a month, diplomats reported a flurry of new incidents. By the end of April, more than 80 diplomats, family members and other personnel — a very high proportion for a mission that included about 55 American staff — had asked to be checked out by the Miami medical team. That group was led by an ear, nose and throat specialist, Dr. Michael E. Hoffer, who has worked extensively with military veterans who suffered vestibular trauma from explosions and fighting in Afghanistan and Iraq. Based on examinations in both Miami and Havana, it quickly identified almost a dozen new cases — nearly half the number that would eventually be confirmed.



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The affected diplomats experienced a wide range of sensations: Some heard sharp, piercing noises or a cicada-like buzz. Others felt concentrated “beams” of sound or auditory vibrations like those from the half-open window of a fast-moving car. Still others heard no sound at all. According to a one-page summary of the cases that was jointly prepared for the Cuban government by the State Department’s bureaus of Medical Services and Western Hemisphere affairs, “Some voiced feeling shocked or shaken by the exposure, or awoken (sic) from sleep, and others described a more gradual onset of symptoms that continued for days to weeks afterwards.”

Amid the fear that gripped many, some embassy staff came forward saying they might have heard or felt similar phenomena, but were found after being interviewed not to require medical attention. Among the first 20 people examined by specialists in Havana and Miami, nine were found to have no discernable symptoms, while nine others had “moderate” effects like headaches, nausea, tinnitus and dizziness. Only two had what were termed “the most severe” effects, including the younger man who reported the first symptoms in late December.

After another lull of a few weeks, a disturbing new incident occurred in late April at the Hotel Capri, a 19-story landmark that was once a favorite of various Mafia dons and the actor Errol Flynn. Now run by a Spanish firm, the hotel was one of several used by the U.S. Embassy to put up diplomats and official visitors. Around April 21, an embassy staffer who was staying there during renovations on his apartment was shaken at night by a piercing noise in his room. A day or two later, an American doctor who had just flown in with the University of Miami team experienced a similar phenomenon. Both men had rooms with relatively large windows, an official said, yet other guests apparently nearby heard nothing.

This time, the embassy responded to the Cubans more vehemently. The diplomats who had been affected earlier had been living in their homes for some time. But the two new Americans who reported being struck were in hotel rooms that were presumably known only to a small number of U.S. and Cuban officials, and the hotel staff. The doctor had just arrived on the island a day or two earlier. “Who knew that he was there?” DeLaurentis demanded of the Cuban foreign ministry, according to one official familiar with the exchange. “The U.S. government. And the Cuban government.”

Within the Trump administration, anger over the incidents grew. On May 20, Cuba’s independence day, the president issued a statement warning that “cruel despotism cannot extinguish the flame of freedom in the hearts of Cubans.” Three days later, the State Department expelled two Cuban diplomats in Washington who had been identified by the U.S. as spies. The expulsions were not made public, and no word of the acoustic mystery in Havana leaked to the news media. Yet even as diplomats and law-enforcement officials from the two countries continued to collaborate on the investigation in a limited, low-key way, the relationship veered back toward confrontation.

The Trump administration was by then finalizing plans to undo Obama’s rapprochement. Exactly what it would roll back to was uncertain; Trump suggested that the Cubans had gotten off easy on human rights, but he offered no particular rebuttal to the argument made by State Department officials and others in the government that greater engagement with Cuba was the most effective way to promote economic and eventually political liberalization there. Some American business groups and more moderate Cuban-American political groups also pushed for continued engagement. But in a new administration that had not filled senior Latin America posts at the State Department or on the NSC staff, many officials said there was a vacuum of policy leadership on the issue.

That vacuum was filled above all by the former campaign rival whom Trump had disparaged as “Little Marco.” Starting soon after the administration’s first closed-door intelligence briefing to Congress on the Havana incidents, Rubio pushed for a tougher response, officials said, and also advocated a series of hardline proposals to the broader Cuba policy. The White House “asked for my input on basically every issue in Latin America and the Western Hemisphere and ... we’ve been engaged with them and they’ve been very open,” Senator Rubio told McClatchy newspapers. “In some ways, the fact that they didn’t come in with preconceived ideas of what to do has created the space for that debate to occur.”

On June 16, Trump traveled to Miami to announce he was “canceling the last administration’s completely one-sided deal with Cuba.” Although the changes fell short of that, Trump ordered government agencies to revise regulations on travel and business to prohibit any transactions with hotels, restaurants, stores and other companies tied to the large tourism and business operations of the Cuban military. Americans other than Cuban-Americans would not be allowed to travel on their own for general tourism purposes, but only with organized educational and other groups on pre-set itineraries. Any further improvements in the bilateral relationship, Trump said, would be contingent on human rights improvements in Cuba. “Now that I am president,” Trump promised, “we will expose the crimes of the Castro regime!”

In Havana, the diplomat who had first heard the noises in his garden was sent off to Miami in early April for medical testing with a cluster of other embassy personnel. He and his wife would return only to pack their things. Before leaving Cuba, though, he stopped to say goodbye at the home of one of his Canadian neighbors and tell him a bit about why they had to leave. The Canadian diplomat was worried: His family had been hearing similar



sounds, he said. Could they have caused a mysterious nosebleed his son had suffered? Or headaches his wife had had?

In late April, DeLaurentis had invited over a small group of ambassadors from countries closely allied with the U.S.— Canada, Britain, France and others — to let them know what had been happening to his staff and ask if anyone else had experienced something similar. Other than one report from a French diplomat that was quickly discounted, the only significant response came from the embassy of Canada. In early May, the Canadian ambassador, Patrick Parisot, gathered the 18 diplomats on his staff to relay the Americans' warning and ask if anyone had heard strange noises or suffered unusual illness. Several people reported back, a Canadian official said, including one (apparently the American diplomat's neighbor) who said he had heard strange noises in his garden back in March.

As at the American embassy, fears about what was happening spread quickly through the Canadian staff. In all, 27 Canadian diplomats, spouses and children, representing 10 of the embassy's families, sought medical attention. Of those, eight people from five families — including two children — would be diagnosed with symptoms that were milder than those of almost all the American patients: nosebleeds, dizziness, headaches and insomnia. All would recover fairly quickly.

In general, a Canadian official involved with the case said, the experience that triggered the Canadian diplomats' symptoms was quite different from those reported by the Americans. In addition to the Canadian diplomat who said he had heard noises in his garden, members of another diplomatic family reported one day in June that they had heard a sudden, twanging sound, like a piece of sheet metal being waved; one family member later became ill. But the other six Canadians who were sickened did not hear or experience anything similar.

"In most cases, there weren't really attacks that we could point to," the Canadian official said. "The American experience was all about acoustic events and people feeling ill, and we had people feeling ill with limited connections to acoustic events."

The Canadian foreign ministry also managed the issue very differently from the Americans, avoiding any criticism of the Cuban government. The ministry said it had no plans to reduce diplomatic staffing levels in Havana, and it quickly replaced the three embassy families that chose to return home because of the problem. The government also said the Royal Canadian Mounted Police had received all the assistance it asked of the Cuban government. "The Cubans are pretty attached to the 1.2 million Canadian tourists who come to Cuba every year, so they've got a pretty strong incentive to nip this in the bud," the official said. "They've been very proactive in trying to help us."

However, the Canadian police have made virtually no real progress in their investigation, the official said, despite help from both the Cuban security forces and the FBI. After consulting with intelligence and technology experts, U.S. and Canadian security officials have recommended that diplomats and their families move away as quickly as possible from any unusual sound they might hear. The U.S. embassy also handed out high-frequency recorders so diplomats could record the noises, and relocated some of them from homes where the sounds or vibrations had been felt repeatedly.

The FBI investigative team, which has included members of a Miami-based unit that investigates crimes against U.S. citizens in Latin America, has visited Cuba four times since May. The group has interviewed diplomats and other officials of both countries, examined the homes and hotels where incidents took place, and conducted other inquiries. Their assessments have fed into elaborate matrices comparing the physical circumstances of the reported incidents with the sensations that the Americans described and the medical problems they later suffered. They also contributed to the still-secret report of the bureau's Operational Technology Division on Jan. 4 that concluded that the Americans' symptoms were not caused by some type of sonic device. (A State Department diplomatic security official, Todd Brown, said the investigators are still considering the possibility that sound was used to mask some other harmful agent or technology.)

The Havana investigation has also involved a wide range of U.S. scientific and technological agencies, including the CIA's Directorate of Science and Technology and the Pentagon's Defense Advanced Research Projects Agency. But officials said it is not clear that any of those have made significant progress, either. In addition to ultrasonic and infrasonic technologies, they have examined other directed-energy technologies. Some inquiry has also focused on the possible use of microwaves, harking back to the Moscow Signal, an episode from the 1970s in which Soviet intelligence beamed microwave signals into the U.S. embassy in Moscow to activate a passive receiver hidden in the office of the United States ambassador, officials said. Americans in the embassy were later reported to have been sickened by the phenomenon, but their symptoms did not closely resemble those suffered by diplomats in Cuba.

In interviews, former U.S. intelligence officers said they were also skeptical of the idea that the U.S. diplomats in Cuba might have been subjected to some new surveillance effort gone awry. Because the Cubans have always kept close tabs on American diplomats in Havana, they said, the security forces generally know they have little to fear from the recruitment or intelligence-gathering efforts of American spies stationed on the island. The intelligence experts also noted that the monitoring of diplomats at home is a labor-intensive task that would likely be reserved for the most important targets.

"In my experience, those operations at residences mean you end up sifting through a lot of trash," said Charles S. (Sam) Faddis, a former senior CIA operations officer. "The product you get is filled with



extraneous noise, daily life, every marital disagreement, the sounds of the TV, the kids, the dog. It seems like a lot of effort for that kind of target.”

Among the scientists whom the FBI team has sought out was Allen Sanborn, a biologist at Barry University in Miami Shores, Florida, who has spent 30 years studying cicada populations in Latin America and elsewhere. Dr. Sanborn said that while cicadas do make very loud noises, “it’s doubtful they could cause injury in Cuba because of the size and species.” He estimated that the Cuban cicada could reach a deafening 95 decibels at a distance of about 20 inches, but emphasized that the sound-pressure level would drop six decibels with every doubling distance. So, at 40 inches away, the sound intensity would fall to 89 decibels, and at 80 inches it would fall to 83 decibels, and so on. “It wouldn’t really hurt you unless it was shoved into your ear canal,” he said in an interview.

The four FBI agents who came to Dr. Sanborn’s home for the interview asked him a series of questions about insect calls in general and cicadas in particular. Then, they asked him to listen to about a dozen recordings made by American diplomats in Havana who had experienced what they thought at the time was some type of sonic attack. Some were shorter, some longer, Dr. Sanborn said, but all were about the same frequency and seemed to be the same sort of sound. He cautioned that the recordings were not of an extremely high quality, but he offered the agents his best judgement.

“The three possibilities are crickets, cicadas and katydids,” he said. “They sounded to me like cicadas.”

Dr. Sanborn said he gave the agents a couple of academic papers he has written that include analyses of the temporal patterns and spectral frequency of various cicada calls, but has not heard from them again.

Only the medical side of the investigation has produced somewhat more conclusive results. In early July, the State Department’s medical services bureau assembled a panel of neurological, otolaryngological and other experts to review the medical files of the Havana patients. The physicians allowed that at least some of what the diplomats had experienced could have come from other sources, including “viral illnesses, previous head trauma, aging, and even stress,” Dr. Rosenfarb said. But, he added, the experts’ consensus was that “the patterns of injuries that had so far been noted were most likely related to trauma from a non-natural source.” There had been no new attacks since April, although some of those affected only reported their symptoms weeks or months later. But then, around Aug. 21, two more incidents were reported, at least one of them at the Hotel Nacional, a fortress of 1930s luxury not far from the Capri. Shortly after doctors confirmed on Sept. 1 that the two patients showed symptoms associated with the incidents, the State Department put the Havana mission on a “voluntary departure” status, allowing any of those serving there to leave with their families. The reason the department gave for the order was the impending Hurricane Irma, which raged across the north coast of the Island a few days later.

But many of those who left temporarily would not return, or would go back only to gather their belongings. In a sweeping, punitive action on Sept. 29, the State Department ordered home 24 of the 47 diplomats assigned to Havana, including all of those with families. It effectively shut down the embassy’s consular section except for emergency services. The department then ordered 15 more Cuban diplomats to leave Washington, including some involved in visa-processing and commercial affairs.

The department still did not accuse the Cuban government of direct involvement in what it called the Havana “attacks.” But it warned Americans not to travel to the island in terms more ominous than those sometimes used for some countries wracked by political upheaval, and caveats it offered about the continuity of diplomatic relations were quickly lost in the surging rhetoric. “There is no way that someone could carry out these number of attacks, with that kind of technology, without the Cubans knowing about it,” asserted Senator Rubio, who had again been urging a more forceful response. “They either did it, or they know who did it.”

The Cubans, Trump declared, “did some very bad things.”

It was a script that the Cuban government seemed to recognize. The foreign minister, Bruno Rodríguez, who had earlier called Trump’s Miami speech in June “a grotesque spectacle,” emphasized one point above others: The United States had presented no evidence whatsoever that the Cubans had done anything but try to help investigate the problem. Although the United States has suggested that Cuba have failed to live up to its responsibilities to protect foreign diplomats under the Vienna Conventions, Cuban officials have emphasized that Washington has not cited any specific actions the Cuban government has failed to take toward that end.

“Cuba has taken absolutely no measures at all against the United States,” Rodríguez said, referring to American sanctions. “It does not discriminate against its companies. It invites its citizens to visit us, promotes dialogue and bilateral cooperation.” The actions taken by the United States, he added, “can only benefit the sinister interests of a handful of people.”

Foreign-policy experts inside and outside the government generally agree that the Havana incidents seem to run counter to the interests of the Castro government. “The Cuban regime was not interested in antagonizing the Trump administration,” said Craig Deare, who was fired last February as the National Security Council’s senior Latin America specialist after he criticized Trump’s confrontational approach to Mexico. “It didn’t make sense to me then and it doesn’t make sense to me now.”



The diplomats' expulsions and the travel warning, along with the earlier tightening of the embargo and the hurricane, have already cut the flow of American tourists to the island. American business activity has dropped off further, in part due to the departure of Cuban diplomats in Washington who set up meetings and processed visas. Cuban dissidents also have complained that declining tourism has badly hurt small, independent businesses like guest houses, family restaurants and the like.

The Cuban government's own investigation into the incidents has been another central piece of its public relations counteroffensive. According to Cuban news accounts, some 2,000 people have been involved in the inquiry, in which police detectives have questioned neighbors of the diplomats (who said they did not recall hearing anything unusual), Cuban doctors (who wondered why the Americans had never sought attention for their acute problems) and their own battery of scientists and technologists.

Cuban engineers also analyzed recordings that officials said were made by the American diplomats. The engineers also concluded that the noises were at decibel levels too low to cause hearing loss — but that the primary sounds on the recordings were made by cicadas. Other Cuban scientists have suggested that the Americans' illnesses were psychosomatic.

Despite months of scrutiny by American intelligence assets, officials said U.S. intelligence agencies have gathered virtually no secondary evidence that Cuba might have assisted directly or indirectly in attacks on the Americans. Nor is there any indication that the Cuban government has identified some rogue faction of security forces that might have wanted to undermine the rapprochement with Washington, officials said.

The idea of such a rogue element working to subvert a major government initiative has been bandied about frequently in Washington in recent months. Although the inner workings of the Castro regime have always been somewhat opaque to outsiders, many longtime analysts of the Cuban politics are skeptical. "It's hugely ironic that the rogue faction theory is coming from exactly the same people who say the Cuban government knows absolutely everything that's going on in the country," Armstrong, the former senior CIA analyst, said. "But there has never been any evidence of rogue factions working outside the system." He recalled that in the one case that perhaps came closest — the show-trial conviction of several influential military and intelligence officers for drug trafficking and other crimes in 1989 — there was even some circumstantial evidence that the illicit activities had been tolerated by superiors.

Other than a few wildly far-fetched possibilities — North Korean agents running around Havana, or perhaps a secret team of Venezuelan spies subverting their own government's closest ally — that would seem to leave only Russia. For Moscow, helping to derail the hard-won entente between Washington and Havana might constitute a geopolitical masterstroke, some U.S. officials said. It would fit into the Kremlin's aggressive campaign to undermine its western adversaries, using everything from espionage operations to election cyberattacks. Russia also has a long history of harassing American diplomats, a pattern that has intensified in Moscow since 2014, said Andrew Foxall, director of the Russia Studies Center at the Henry Jackson Society, a London think tank.

After some years of Cuban hostility following the Soviet Union's collapse and Russia's withdrawal of the vast subsidies it had provided for decades, the Kremlin has made new efforts to solidify the two countries' strategic bond. Russia has helped to offset the loss of Venezuelan oil imports with 1.9 million barrels of fuel (estimated to be worth \$105 million at discounted rates), and Russian exports to Cuba nearly doubled last year. In December, Raúl Castro received the head of the Russian state energy giant Rosneft, stirring speculation that a major oil-exploration or supply deal might be in the works. The two countries' security relationship has also grown. In December of 2016, just as the incidents affecting U.S. personnel began, Russia and Cuba signed a new agreement on defense and technology cooperation.

Along with a possible motive, the Russians might have the technological means — or at least the capacity to have plausibly developed a directed-energy weapon that U.S. scientists could not identify. Yet by now, officials said, intelligence analysts would also have expected to have culled from electronic intercepts of overseas conversations at least some secondary evidence that the Russians might be involved — suspicious telephone or email conversations, suggestive messages, movements of Russian agents — something. But officials said they have found virtually nothing that would constitute real evidence. They also wonder whether Russia would risk its growing relationship with Cuba by carrying out an operation that could undermine the island's most important diplomatic initiative in decades.

Even if Russia had developed some new and compact directed-energy weapon that could have been used to attack the American diplomats, there would still have been extremely complex logistical challenges to its deployment. Russian agents would presumably have had to locate at least two dozen American diplomats in Havana, reach them covertly and repeatedly, and in some of the most heavily policed areas of what many consider a police state. Nor have intelligence agencies documented tests of a similar weapon on some other target, or signs that Russia might have moved agents into Cuba to carry out such an operation.

In the continuing absence of any real evidence of how the Americans were stricken, the Trump administration appears to have no easy path forward. About 10 of the diplomats and spouses continue to undergo vestibular and neurological rehabilitation, both in Washington and at the University of Pennsylvania's Perelman School of Medicine. Some have moved on to new jobs in Washington or overseas, or have been kept busy in the Western



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Hemisphere Affairs bureau with such tasks as processing Freedom of Information Act requests or handling employment applications with the human resources staff, officials said.

By March 4, the State Department will have to decide whether to make the withdrawal of the diplomats a permanent reduction in staff. An internal department document obtained by ProPublica also suggests that the slowdown of consular activity may make it difficult for the United States to meet its commitment to processing at least 20,000 immigrant visas for Cubans this year, an annual target that is important to Cuban-Americans seeking to bring relatives from the island. American diplomats — including some of those forced to leave Havana — also say that the department has also reduced its ability to see, understand and perhaps influence what is happening in Cuba at a potentially historic transition point.

>“Our diplomats want to go back,” one American official who has been extensively briefed on the developments in Havana said. “But if you can’t get to the bottom of this situation, how does that happen?”

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California will require large retailers to provide gender neutral toy sections

Source: <https://www.latimes.com/california/story/2021-10-09/california-will-require-large-retailers-to-provide-gender-neutral-toy-sections>

Oct 09 – California became the first state in the nation Saturday to adopt a law requiring large retail stores to provide gender neutral toy sections under a bill signed by Gov. Gavin Newsom.

The new law, which takes effect in 2024, says that retail stores with 500 or more employees must sell some toys and childcare products outside of areas specifically labeled by gender. Retailers can continue to offer other toys and childcare goods in traditional boys’ and girls’ sections if they choose to.

Newsom offered no comment on the bill signing, one of several announced in the final batch of legislative actions weighed for the year.

Assembly Bill 1084 continues a gradual shift in the retail industry away from strictly marketing children’s products under traditional gender stereotypes, said Assemblyman Evan Low (D-Campbell), who introduced the legislation. Target dropped boys and girls toy

sections in 2015, and other retailers have since moved away from gender-specific labels.

“Part of it is to make sure if you’re a young girl that you can find a police car, fire truck, a periodic table or a dinosaur,” Low said. “And then similarly, if you’re a boy, if you’re more artistic and want to play with glitter, why not? Why should you feel the stigma of saying, ‘Oh, this should be shamed’ and going to a different location?”

Low said the daughter of one of his staff members inspired the bill when the girl questioned why she had to go to the boys’ section to find certain toys.

“Children have a very unique way of saying things that provide some common sense,” Low said. “I think it’s important that we as a state are demonstrating our values of diversity and inclusion.”

Democratic lawmakers received criticism for so-called nanny

state governing as the proposal moved through the Legislature this year, with opponents arguing that government should not tell a private company how to organize or display its merchandise.

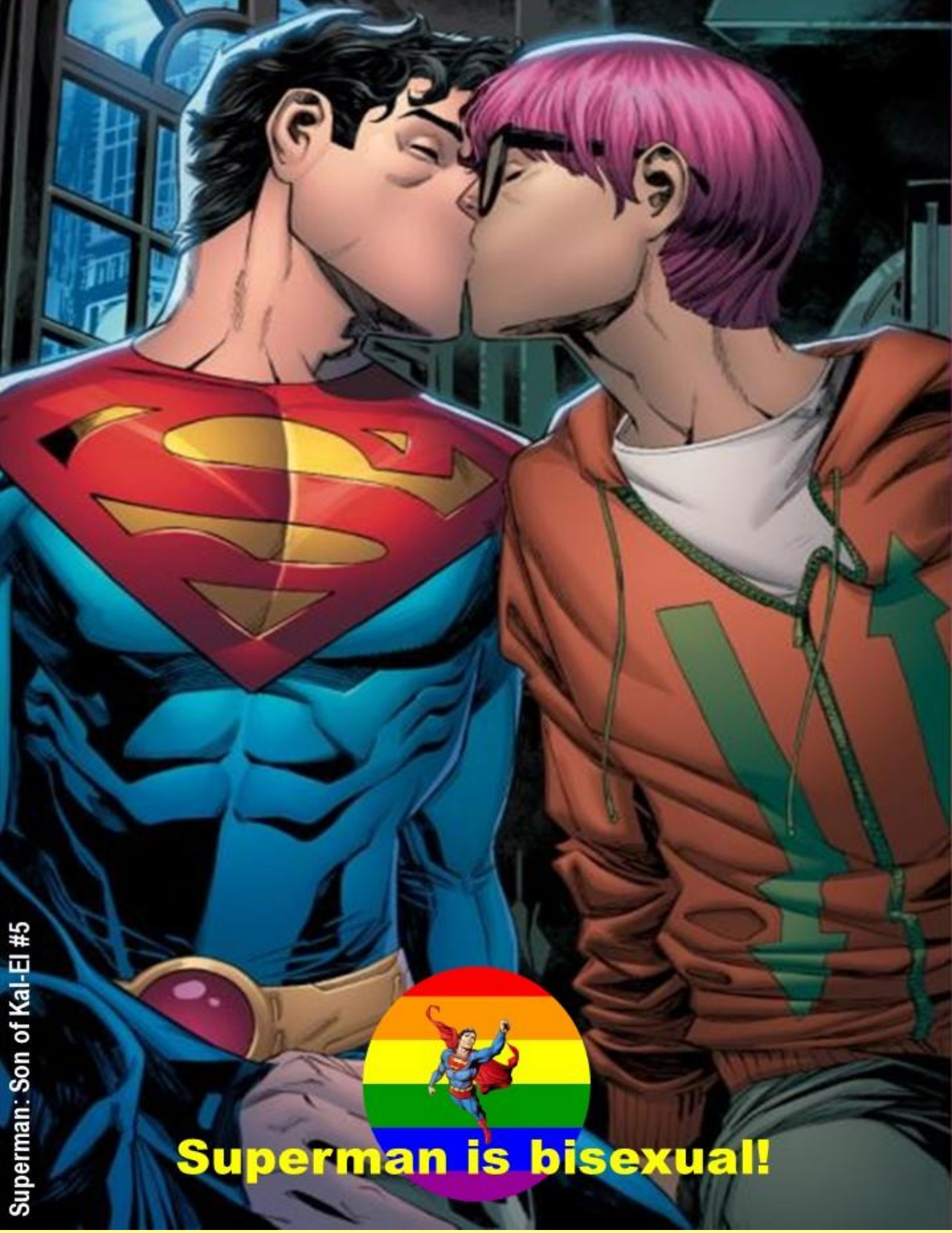
Campbell Leaper, a distinguished professor of psychology at UC Santa Cruz, said companies began using gender labels and pink and blue indicators to market products specifically to girls or boys during the 1940s and 1950s.

Research into developmental psychology says children become aware of gender categories as early as age 3 and are very sensitive to gender-based labels, he said.

“We know from a variety of different research once they have those categories in their heads and if you label something for girls or boys, children will often ignore it if it’s labeled for the other gender,” Leaper said.



O tempora o mores!



Superman: Son of Kal-El #5



Superman is bisexual!

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Children use toys to practice skills that become helpful in their lives, and stereotypes around what toys are acceptable for girls and boys can lead to disparities among genders, he said.

Kids learn spatial skills from construction toys, for example, which can help later on when they learn math in school. Similarly, playing with house sets or dolls teach children socio-emotional skills, which can improve their ability to communicate and form relationships, Leaper said.

“No one thing is determinative of where a person ends up in life, but you know these all have a cumulative effect and, especially during childhood, children spend so much time in play with toys that it’s their workshop when they’re growing up in terms of learning about different kinds of things,” he said. “It can help to foster that interest early on.”

Leaper said boys’ and girls’ section also create a stigma for children who are gender non-conforming or exploring other gender identities.

“But even for kids that identify with their birth-assigned gender there may be some children who want to play with some of these toys, but then end up avoiding them because they don’t want to be considered abnormal somehow,” Leaper said.

Low compared his legislation to earlier laws in California that require publicly traded companies to add women to their corporate boards, force employers to release pay data to improve gender equity and require many single-occupancy bathrooms to use “all gender” signs.

Retailers that fail to comply with the new law will be subject to minimal civil penalties of \$250 for a first violation and \$500 for additional violations.

EDITOR’S COMMENT: Once upon a time there was a great nation ... A very simple solution could be to remove the “boys” and “girls” plates from the store so that all children will have access to all games and items; not to create a third gender – “neutral” to satisfy a small but very active minority and subconsciously pass the message.

Lebanon Perpetual Crisis is Iran's Ploy

By Seth J. Frantzman

Source: <https://www.meforum.org/62715/lebanon-perpetual-crisis-is-iran-ploy>

Oct 11 – One can draw a clear line between the increase of Hezbollah's power in Lebanon and the consequent increase in economic and other crises affecting the country. It is true that not every time two things coincide there is necessarily a correlation. However, it appears that Hezbollah's role is the key to the hollowing out and destruction of Lebanon.

There are several facts here. Lebanon recently went days without power, and the army is now supplying fuel. However, that doesn't solve the long-term energy problem and the country's debts. Lebanon has trouble importing fuel supplies, and the power stations are out of fuel. This has set Lebanon on the path to constant and increasing crises. Yet it is not some blockaded country, such as the Hamas-run Gaza Strip. [Continue reading the full article>](#)



Special Purpose Unmanned Rifle, or SPUR on Spot’s back

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

Robot dogs don't look as cute with night-vision sniper rifles on board

You've seen Spot run. You've seen Spot jump. You've seen Spot do cute little booty-shaking dance routines. Now, see Spot fire lethal weapons. Sword Defense Systems has presented a precision rifle for robot dogs, capable of **nailling targets 1.2 km away**. [Read more](#)



Bow-and-Arrow Rampage in Norway Treated as Apparent Terrorist Attack

Source: <https://www.nytimes.com/2021/10/14/world/europe/norway-bow-and-arrow-attack.html>



Oct 14 – A 37-year-old man was charged on Thursday in connection with a bow-and-arrow rampage in a small town in Norway that killed five people and wounded three others, in what the authorities said was an apparent act of terrorism.



The police identified the suspect in the grisly assault in the town of Kongsberg, about 50 miles southwest of Oslo, as Espen Andersen Brathen.

“The incidents in Kongsberg currently appear to be an act of terrorism,” the Norwegian security agency, known as PST, said in a statement. It added that investigators were still trying to determine precisely what motivated the attacker.

Many flags across the normally bucolic town far from the bustle of the capital flew at half-staff, and grief-stricken residents placed candles and flowers at a makeshift memorial in the town square.

The regional police chief said that the suspect had been known to the authorities. Officials said Thursday that the assailant was a Danish citizen who lived in the town and who had converted

to Islam, but did not say when that happened, why his conversion had raised concerns, or what action the authorities had taken. **“We have previously been in contact with him regarding worries about radicalization,”** Ole Bredrup Saeverud, the regional police chief, said at a news conference before the suspect was named. Asked whether the assailant might have been motivated by extreme religious ideology, he added, “We don’t know that, but it’s natural to ask the question.”

Four women and one man were killed in [the assault on Wednesday evening](#). The attacker, who escaped an initial confrontation with the police, unleashed a volley of arrows at apparent strangers in Kongsberg.



Some of the victims were also found inside private homes, Ann Iren Svane Mathiassen, a lawyer with the police, told the broadcaster NRK. “We have information about the perpetrator making his way into houses and committing the murders there,” she said.

Mr. Bredrup Saeverud, the police chief, said that the last time concerns about the suspect’s radicalization had been brought to the attention of the police was last year, but he did not say who had contacted them with those concerns, or specify their nature. He said only that the police had followed up on multiple reports.

Mr. Brathen is expected to appear before a judge on Friday, when the specific charges against him will be made public.

Fredrik Neumann, his court-appointed lawyer, said in an interview that the man was cooperating with the authorities and was undergoing a mental health evaluation. He said the man’s mother was Danish and his father Norwegian.

The ages of the five people killed ranged from 50 to 70, Mr. Bredrup Saeverud said, adding that the three people wounded in the attack were expected to survive.

It was the worst mass killing in Norway since 2011, when [a far-right extremist killed 77 people](#), most of them teenagers at a camp.

On Thursday, the police offered new details about the attack. The first call to the police came at 6:12 p.m., with witnesses describing a scene of chaos and unprovoked violence at a supermarket in Kongsberg, a former silver mining village.

One woman told the local news outlet TV2 that she had seen people hiding from a man standing on a street corner with “arrows in a quiver on his shoulder and a bow in his hand.” As he shot the arrows, she said, people ran for their lives.

Six minutes after the first call came into the police, officers confronted the attacker. He fired arrows at the officers and escaped.

At one point, the attacker crossed a bridge spanning the Numedalslagen River and cut through the town.

As he made his way through the town, he attacked people seemingly at random, according to the police. One of the injured was an off-duty police officer, and a photo of him with an arrow in his back was circulated widely online.

The police on Thursday asked the public to “please stop sharing photos,” saying that doing so was “unwise and disrespectful.”

The police said the attacker had used a second weapon in the rampage, though they did not offer further details. But it was the arrows that marked the trail of devastation.

At 6:47 p.m., the police detained the suspect — 35 minutes after the first reports of violence.

A police lawyer, Ann Iren Svane Mathiassen, told TV2 that the suspect had lived in the town for several years.

Murder is rare in Norway. In a country with a population of just over five million, there were 31 murders last year, most involving people who knew each other.

Still, the nation has yet to fully reckon with the trauma of the devastating 2011 mass killing.

The Norwegian authorities have expressed concern that not enough is being done to [root out right-wing extremism](#), especially among young people. **In July, analysts with the country’s intelligence services warned that a decade after the 2011 attack, there are young men and boys who idolize the gunman.**

Norway has stringent gun-control laws, and before that attack, the country had experienced only one mass shooting: In 1988, a gunman killed four people and wounded two others.

In the past decade, the Norwegian authorities have stepped up their efforts to stamp out terrorism and political violence. That push has included [an “action plan”](#) that outlines preventive measures aimed at spotting and quelling the kind of radicalization that could lead to violence. A key part of the effort is reaching out to people who are brought to the authorities’ attention, starting with what is generally referred to in the country as a “conversation of concern.” As the fallout from the latest attack reverberated, a new center-left government was being sworn in on Thursday morning. Jonas Gahr Store, the Labor Party leader who was installed as prime minister, said at the ceremony that “what has happened in Kongsberg is terrible.” He promised a full investigation.

EDITOR’S COMMENT: Another case of a terrorist to be hosted in a luxury prison for a few years? Breivik case taught Norwegians nothing? **Update 1** (15/10): As I have predicted, the terrorist is detained in a medical facility in order to be evaluated if he is mentally ill! As if he is sick, this will bring 5 innocent people back in life ... **Update 2** (18/10): Arrows were not used to kill; he used one or more sharp instruments.

Piracy, Armed Robbery Incidents on the High Seas Decline, but Threats Remain

The first nine months of 2021 saw the lowest numbers of piracy and armed robbery incidents on the high seas since 1994. While the reduction of reported incidents is a welcome, the International Maritime Bureau warns that seafarers must remain vigilant as violence against crew remains high in many areas of the world. **Read more**



Bad humor makes bad neighbors



LEFT: What they want you to think

RIGHT: The reality

Britain's Security Officials Fear More Lone Wolf Attacks in Wake of MP's Murder

By Jamie Dettmer (VOA reporter)

Source: <https://www.homelandsecuritynewswire.com/dr20211018-britain-s-security-officials-fear-more-lone-wolf-attacks-in-wake-of-mp-s-murder>

Oct 18 – **The man held for the fatal stabbing last week of a British lawmaker had been referred to the British government's anti-extremism program, called Prevent, because of his radical Islamist views, but the country's security services, including MI5 – Britain's domestic intelligence agency – had not deemed him a serious threat requiring monitoring, confirmed British officials.**

Police have not released the name of the suspect, but local media have identified him as **Ali Harbi Ali, a 25-year-old British national of Somali descent.** Britain's Sunday Times newspaper reported that the suspect's father, Harbi Ali Kullane, a former adviser to Somalia's prime minister, said British counter-terrorism police had visited him at his home in north London.

"I'm feeling very traumatized. It's not something that I expected or even dreamed of," the suspect's father told the newspaper following the murder Friday of Conservative MP David Amess.

The lawmaker was stabbed multiple times while meeting with constituents at a church hall an hour's drive east of London. The Metropolitan Police have confirmed early investigations of the slaying suggest "a potential motivation linked to Islamist extremism," but have so far refrained from going into any details publicly.

Ali was born in London. Many members of his wider family live in Somalia, where his aunt is head of a security think tank in Mogadishu. Ali's uncle is Somalia's ambassador to China.

Britain's security and counter-terror agencies have warned cabinet ministers of a possible wave of future attacks by what they term "bedroom radicals," lone wolf militants radicalized online during pandemic



lockdowns. Investigators are trying to establish whether Ali fits that profile and whether his radicalization intensified during the lockdown.

They have so far found no evidence that he traveled overseas to train, a British official told VOA. The Sun newspaper quoted security sources as saying that Ali became increasingly radicalized after watching militant videos on YouTube.

Amess Eulogized

The 69-year-old Amess is the second British MP to have been murdered in the past five years, and his death has prompted nationwide horror and outrage. Politicians across political divides praised him as a hard-working “gentleman MP,” one who eschewed a ministerial career in favor of focusing on the needs of his constituents. An independent-minded Conservative, he was widely known as a campaigner for animal welfare.

Dozens of mourners attended a special church service Sunday in memory of the MP, one of the country’s longest serving lawmakers, who was first elected to the House of Commons in 1983. Prime Minister Boris Johnson made a rare joint appearance with Keir Starmer, the leader of Britain’s main opposition party, at the scene of the attack, where both laid flowers.

Johnson described Amess, a father of five and a devout Catholic, as a “fine parliamentarian and a much-moved colleague and friend.” Amess’s family said in a statement released Sunday: “Our hearts are shattered.” They added, “We are trying to understand why this awful thing has occurred. Nobody should die in that way. Please let some good come from this tragedy. We are absolutely broken, but we will survive and carry on for the sake of a wonderful and inspiring man.”

Ali was arrested inside the church hall as paramedics battled to save the life of the MP. He used his phone immediately after the attack, but it is unclear whether he contacted anyone or was filming the scene of the crime. Police sources say he has been cooperating with investigators. He is being held under the Terrorism Act.

Counter-Terror Efforts Questioned

Security officials told VOA under the condition of anonymity that the attack had been planned over several weeks and Amess’s suspected attacker made an appointment to see the MP, saying he was moving into the area from London. “At the moment there is not a specific reason why Amess was targeted — Ali was geared to attack any lawmaker, it was just he managed to get to Amess first,” said a security official. The referral by a teacher five years ago of Amess’ alleged killer to the Prevent program has prompted questions over the effectiveness of the de-radicalization scheme, which has been the subject of an ongoing review since January. A former counter-terror commander, Richard Walton, called on the government to “invest more” in the Prevent scheme so it is better equipped to “detect the signs and symptoms of radicalized individuals.”

The security services have raised their fears about a potential wave of attacks by so-called bedroom radicals for weeks. In September the commissioner of the Metropolitan Police, Cressida Dick, publicly cautioned that the pandemic had left many more people at risk of radicalization because militants had exploited the social isolation of lockdowns to recruit and proselytize.

As police investigators question Ali and sift through evidence, the country’s politicians are debating about how to tighten security. Amess’s murder has underlined the potential danger Britain’s lawmakers face. Friday’s stabbing attack by a lone assailant bore striking similarities to the murder of Labour MP Jo Cox in June 2016. Cox was about to hold meetings with constituents when she was shot and stabbed by a subsequently convicted far right militant. In 2010 Labour MP Stephen Timms was injured in a stabbing attack by an Islamist when he was holding a regular meeting with constituents. Some British lawmakers are likely to be offered police protection when meeting voters, Home Secretary Priti Patel acknowledged during several Sunday television appearances. Security officials are drawing up plans for a new minimum package of safety measures all police forces must offer lawmakers when they are away from the House of Commons. Not all MPs are happy with the idea of having police present during their meetings with local voters and fear it might undermine a tradition they hold dear of constituents having easy access to them. Britain’s Justice Secretary, Dominic Raab, said Monday that online hate towards MPs is “out of control.” “The elephant in the room in all this is the online hate that we all get,” he told broadcaster Sky News. Raab echoed the fear of security services that the pandemic and lockdowns had not helped the situation. “There is certainly an element of more people who are at-risk and vulnerable because they’ve been spending more time online,” he added.

EDITOR’S COMMENT: Same old story ... Terrorist was known to authorities. Terrorist was not evaluated the right way ...

There were not enough policemen and officers to become his shadow 24/7 ... Not even the slightest interest to strip his passport/ID and deport him to Somalia together with his family and 1st/2nd degree relatives that for sure “had seen something” but “said nothing”. Pre-emptive defense is less bloody than post-mortem mourning and flowers; lots of flowers ...



Beijing Winter Olympic Games 2022



The Olympic Flame is ready to travel to China from Ancient Olympia, Greece the homeland of Olympic Games!

Malhama Tactical: Now Jihadists for Hire

By Saman Ayesha Kidwai

Source: <https://www.idsa.in/idsacomments/malhama-tactical-now-jihadists-for-hire-sa-kidwai-141021>



Oct 14 – A conglomerate of elite jihadists, referred to as Malhama Tactical, has emerged as a serious threat. It was formed by an Uzbek militant, Sukhrob Baltabaev or Abu Rofiq, in 2016,¹ and is believed to be the first for-hire terrorist group, which has trained Islamist militants, including the East Turkistan Islamic Movement fighters, and those who participated as mercenaries in the Syrian war.

It has therefore gained notoriety as the “Blackwater of Jihad”.² Blackwater (renamed Academi) is an American private military company whose contractors have infamously participated in conflict-ridden states like Iraq, as part of American security operations. Jeremy Scahill, an investigative journalist, has attributed Blackwater’s catapulting rise to American demobilisation in the post-Cold war era.³

Unlike the conventional terrorist groups, Malhama Tactical is a commercial enterprise driven by a for-profit agenda and is not constrained by a specific ideology and defined enemies. Today, the market for private contractors is flourishing with a vast supply of cash and weaponry and earnings far better than that of ordinary soldiers.⁴ These factors have given Malhama Tactical much leeway in carrying out its objectives, and associating with a broad spectrum of radical and violent groups including Hayat Tahrir al-Sham, Jabhat al-Nusra and Ayn al-Kavkaz. Although the organisation reportedly has a Sunni pan-Islamic leaning, it remains ideologically opposed to groups like Islamic State.

It is also considered exclusive due to the military expertise and guerilla warfare tactics passed on by the trainers (battle-hardened and former Chechen militants) and Abu Rofiq, who was a member of the



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Russian Airborne Troops, an elite group within the armed forces.⁵ The training modules also incorporate lessons from the strategic tactics of foreign armies.⁶ Its trainers and recruits have easy access to a wide array of extravagant arms and ammunition, such as the Rocket Propelled Grenades, that amount to no less than \$800 per round.⁷ Its recruitment process is selective where trusted associates provide a reference for the incoming training recruits.



The militants have derived the word *Malhama* from Hadith literature prophesizing end-time events. They consider *Al-Malhama Al-Kubra* to be the fiercest apocalyptic war, even though descriptions of the event are highly abstruse and have been subject to varied interpretations.⁸ Although mainstream Islamic theorists have advised against taking Malhama myths literally, jihadists use the term as part of their propaganda campaigns. Combined with the word “tactical”, the attempt to invent a catchy brand that becomes popular among impressionable radical youth is obvious, even though the name in and of itself makes little sense.

Its emergence and increasing numerical strength could be attributed to the collapse of terrorist groups like Al Qaeda and the Islamic State. As a result of this development, extremist jihadists could seek an alliance with terrorist groups like Malhama Tactical. Making extensive use of forums like Telegram, the organisation advertises its propaganda videos and training programmes, and has even conducted Q&A sessions about the type of weapons preferred in armed conflicts.⁹

Notably, **Malhama Tactical has paid its core members and purchased arms and necessities using bitcoin and other forms of cryptocurrency, which are non-conventional tactics of finance terrorism for carrying out its objectives.**

Equally significant is the concept of *Nizam La Tanzim*, from which this group could be deriving its strategies and gaining mounting prominence. Tracing its origin to Abu Musab al-Suri (affiliated with Osama bin Laden and a prominent Syrian jihadist), this call refers to a global jihad being fought by a loosely connected network of fighters instead of a centralised organisation.¹⁰ It encompasses four crucial features, such as spontaneity, autonomy, decentralisation and situationist outlook.

Malhama Tactical has posed multiple challenges for global security. Hostile states can now rely on plausible deniability while conducting asymmetrical war against actors perceived as oppressors, infidels or contenders for dominance.

Secondly, it has resulted in an additional problem for states that cannot associate Malhama Tactical with a specific terrorist group and, consequently, an ideological underpinning, the base of operations, leadership and recruitment methods.

Such factors have long allowed them to formulate broadly coherent counter-terrorism initiatives by tracing past and current activities.



Furthermore, it could foment the growth of similar extremist organisations worldwide, potentially taking advantage of the security vacuum in the territories experiencing turmoil.

Although it primarily came to the fore to oust President Bashar al-Assad, it has also set its sights on expanding its influence across Central Asia.¹¹ Violent extremism has remained a potent threat across the region since the dissolution of the erstwhile Soviet Union. Significantly, most of the fighters hail from the former Soviet Republics or Russia's Muslim majority areas like Chechnya.¹²

Evolving Trends and Enemies

Malhama Tactical has indirectly targeted countries such as Russia by providing training in combat to violent extremists who are fighting against it on the Syrian battlefield. It has previously experienced waves of Islamic militancy led by Chechen terrorists. They believe that the efforts of the Syrian resistance forces are part of a much broader and intensive war against the Russian state with which they had engaged in bloody battles.¹³ Violent separatists in Chechnya had engaged in two armed conflicts against the Russian state between 1994–1996 and 1999–2009. Additionally, Russian soldiers have also come under direct attacks while supporting President al-Assad's counter-terrorism operations.

In the recent past, Sergei Lavrov, the Russian Foreign Minister, has underscored the security dilemma his country faces should this event come to pass—"There must be at least 5,000-6,000 Russian-speaking militants (fighting in the Syrian war). Their wives and children have started returning to Russia and other CIS countries. The chances are that once the militant groups are defeated, the terrorists and members of these jihadist private military companies, set up with the assistance of Russia's enemies, will follow the women and children."¹⁴

His fears are not unfounded. Ali al-Shishani, the current leader of Malhama Tactical, has called for a "new page" to be opened in the Chechen war while mentioning the group's links with the Chechen mujahedeen fighters in Russia that have persevered over the years.¹⁵

The Potential Implications

The privatisation of jihad has underscored a pertinent dilemma. As extremist Islamist groups are becoming more territorial, their reach has also become narrower. However, Malhama Tactical with a more global outlook could potentially connect and facilitate terrorist organisations worldwide.



Some Malhama Tactical fighters wear Ichkeria¹ flags (pictured) on their uniforms to display loyalty to the "Chechen liberation movement".

The situation has become considerably more challenging with the formation of the Taliban-led government in Kabul. The turn of events could embolden violent jihadist groups like Malhama Tactical to follow suit—particularly in West Asia (primary base of operations) and Central Asia (where the core fighters and trainers trace their origin to). These regions could experience further instability and violence, more so in Russia.

Additionally, jihadist groups like the Islamic State and Al Qaeda have diminished in strength or fraught with in-fighting and organisational issues. Yet, Malhama Tactical's loosely organised structure and absence of similar complexities have become a fertile ground for defecting terrorists to join its ranks. They would bring resources, expertise and connections to collectively engage in global jihad and boost its numerical strength. This has resulted in a quagmire for counter-terrorism agencies who would find it difficult to dismantle the overall organisational structure and leadership through the arrests of a significant leader, which is the case with conventional terrorist groups.

According to notable strategists like Sean McFate, the activities of this organisation have revolutionised war, and it will continue to pose a grave threat in the foreseeable future.¹⁶ The appeal of global jihad and the military and technological advancements have enabled swift implementation of radical ideas promulgated by Malhama Tactical, which could possibly bolster its consolidation as the predominant jihadist for-hire group and widen its reach.

¹ The Chechen Republic of Ichkeria was a partially recognized secessionist government of the Checheno-Ingush ASSR (Autonomous Soviet Socialist Republic). On 30 November 1991, Ingushetia would have a referendum in which the results dictated its separation from the Chechen Republic of Ichkeria, joining the Russian Federation instead as a constituent republic.



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Furthermore, given the rapidly deteriorating situation in Afghanistan, it has become imperative for India to overhaul its security and intelligence frameworks in the event of potential spillover of Malhama Tactical. Understandably, countries like Pakistan or their proxy groups like Jaish-e-Mohammed could independently use Malhama fighters to undermine Indian national interests using plausible deniability. The victory of the Taliban has rejuvenated the jihadist ambitions, including in Kashmir, where the Indian state has frequently engaged in counter-terrorism operations.

The website of Malhama Tactical is easily accessible for those seeking information about this organisation or to directly get in touch with its members.¹⁷ This degree of accessibility makes the emergence of radicalised and violent individuals a greater threat than before.

Furthermore, this organisation could result in an upsurge of lone-wolf terrorist attacks across India. The jihadists who do not want to affiliate themselves with a specific terrorist organisation could become radicalised by the propaganda disseminated by Malhama Tactical. Much of its activities, including instructional videos, appear to be directed towards individual extremists and not cohesive organisations. Therefore, violent and radical youth could potentially look towards this terrorist group as an outlet to realise their objectives. The adherence to Abu Musab al-Suri's call, facilitated by internet connectivity and social media access, could create havoc, forcing societies towards civil wars. India could face terrorist threats on multiple fronts. For now, the due diligence of the counter-terrorism agencies has curtailed the dramatic upsurge of such attacks and broadly eliminated potential threats. Counter-terrorism agencies can closely monitor and seize the bitcoin transfers via channels like Telegram to counter finance terrorism.¹⁸ The states could also reverse engineer the social media-based technology used by Malhama Tactical to neutralise its fighters and trainers.

►► References are at the source's URL.

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UAE (Dubai) – Give us a break!



Posting a video online the force showed its new Alfa Romeo Stelvio Quadrifoglio, which has a starting price of Dh349,900 for the 2021 model, and [Alfa Romeo Giulia Quadrifoglio](#) which would set you back Dh329,000 for the same year. The latest additions take the number of [supercars available with Dubai Police](#) to 31.



UAE – Anti-riot vehicle



Bozena Riot is an armored vehicle designed to stop riots in streets and urbanized areas and to protect the law-enforcement units in action. Its 24.6-ft (7.5-m) shield transforms the vehicle into an impenetrable wall, and it's also equipped with tear gas guns, speakers, cameras, as well as holes for shooting rubber bullets.



Steak knife made from hardened wood is 3 times sharper than steel

Scientists have come up with a new hardened form of wood that can be fashioned into sturdy nails or knives that are almost three times sharper than a standard dinner table knife ... and they're dishwasher safe, too. [Read more](#)

EDITOR'S COMMENT: Harder? Yes! Ecologic? Yes! A threat to others since it is not detectable when passing through metal detectors? Yes! And if you stick two of them side-by-side to create a "fish" they might go undetected in X-rays looking like a souvenir or a present or something of no (security) importance.

Taliban beheaded female volleyball player, posted photos online, coach says

Source: <https://nypost.com/2021/10/21/taliban-beheaded-afghanistan-volleyball-player-coach/>

Oct 21 – An Afghan volleyball player on the girls' national team was beheaded by the Taliban — with gruesome photos of her severed head posted on social media, according to her coach. Mahjabin Hakimi, one of the best players in the Kabul Municipality Volleyball Club, was slaughtered in the capital city of Kabul as troops searched for female sports players, her coach [told the Persian Independent](#).





Two members of Mahjabin Hakimi managed to flee the country while the rest of the team and her family were threatened into silence about Mahjabin Hakimi's death. Twitter

She was killed earlier this month, but her death remained mostly hidden because her family had been threatened not to talk, claimed the coach, using a pseudonym, Suraya Afzali, due to safety fears.

Images of Hakimi's severed neck were published on Afghan social media, according to the paper, which did not say how old she was.

Conflicting reports online suggested that happened earlier, with an apparent death certificate suggesting she was killed Aug. 13 — the final days of the Taliban's insurgency [before seizing Kabul](#).

However, the Payk Investigative

Journalism Center said its sources also [confirmed that Hakimi "was beheaded"](#) by the Taliban in Kabul." The governing group has yet to comment, Payk Media said.

Mahjabin Hakimi was slaughtered in Kabul as Taliban troops searched for female sports players. Twitter



Afzali told the Persian Independent that she was speaking out to highlight the [risk that female sports players face](#), with only two of the women's national volleyball team having managed to flee the country.

"All the players of the volleyball team and the rest of the women athletes are in a bad situation and in despair and fear," she told the paper. "Everyone has been forced to flee and live in unknown places."

One of the players who escaped, Zahra Fayazi, [told the BBC](#) last month that at least one of the players had been killed.

"We don't want this to repeat for our other players," she told



the broadcaster from her new home in the UK.

"Many of our players who are from provinces were threatened many times by their relatives who are Taliban and Taliban followers.





Many women face persecution from the Taliban due to the fact the extremist group believes that women should be subservient to men and not be allowed any rights. PA Images/Sipa USA

“The Taliban asked our players’ families to not allow their girls to do sport, otherwise they will be faced with unexpected violence,” Fayazi said. “They even burned their sports equipment to save themselves and their families. They didn’t want them to keep anything related to sport. They are scared,” she said. Another teammate who escaped told the BBC everyone was “shocked” when they heard that one of their team had been killed. “I’m sure it was the Taliban,” said Sophia, a pseudonym to protect her family members still in Afghanistan. “Maybe we will lose other friends,” she said.

EDITOR’S COMMENT: And there are countries that are willing to sit in the same table with the Taliban ... who pretend they care for the future of the Afghani people.



“When bulls fight, frogs die” (Greek adage)



Possible targets in a NATO-Russia conflict ([source](#))

PERSPECTIVES ON TERRORISM

a journal of the Terrorism Research Initiative

Volume XV, Issue 5 | October 2021

Source: <https://www.universiteitleiden.nl/binaries/content/assets/customsites/perspectives-on-terrorism/2021/issue-5/vol-15-issue-5.pdf>



The current issue features six **Articles**. The opening article, by Molly Amman and Reid Meloy, looks at indirect incitements to political violence picked up by receptive lone actors and extremist groups. Their contribution is followed by an article from the hands of Nilay Saiya, who profiles 60 jihadists behind the 9/11 and other Islamist attacks on U.S. soil. The next two articles focus on various aspects of terrorism in the West Balkans (written by Anita Perešin, Melisa Hasanović, and Kujtim Bytyqi) and in and around Nigeria (authored by Jacob Zenn and Caleb Weiss). Two more articles focus on terrorist financing from Finland (by Lotta Tuomaala-Järvinen and Juha Saarinen) and on the difficulties of implementing terrorism prevention measures in Lebanon along the lines of the 2015 UN Plan of Action to Prevent Violent Extremism (by Sharaf Hussein). These articles are followed by a **Rejoinder** from Bart Schuurman, who takes issue with some statements in Lorne Dawson’s article in the August issue of our journal on the role of religion in terrorism. The **Resources** section features five brief book reviews by Joshua Sinai, the Book Reviews Editor of our journal. This is followed by a longer review of a new dissertation by Jeanine de Roy van Zuijdewijn on ‘Meaning-Making after Terrorist Attacks in Western Europe’ by Alex Schmid. In the light of the 20th anniversary of Al-Qaeda’s 9/11 attack, Information Resources Editor Judith Tinnes scopes the newer literature on AQ. Then David Teiner, Marta Furlan, Ayse D. Lokmanoglu, and Brody MacDonald present a shorter bibliography on Rebel Governance, while Berto Jongman presents his regular survey of recent online resources on terrorism and related subjects. Finally, in **Announcements**, Olivia Kearney presents her regular Conference Calendar which, due to COVID, is still dominated by online meetings. The articles and other texts of the current issue of Perspectives on Terrorism have been selected and edited by James Forest and Alex Schmid, the journal’s principal editors. Editorial Assistant Jodi Moore handled proofreading, while the technical online launch of the October 2021 issue of our journal has been in the hands of Associate Editor for IT Christine Boelema Robertus.



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DIARY



CHEM NEWS



Saab proposes full package of CBRN fighting means

Source: https://www.armyrecognition.com/defense_news_september_2021_global_security_army_industry/saab_proposes_full_package_of_cbrn_fighting_means.html

Sept 24 – The covid-19 pandemic situation emphasizes the need for solid CBRN plans and equipment. In Sweden, Saab has always focused on CBRN threats and how they evolve for many years. This led the company to develop innovative and complex solutions from equipment manufacturing to integration in order to become an international leader in the field. Therefore Saab likes to challenge the lines by stating to its customer that “the threat is real, are you ready?”



Saab's CBRN equipment mounted on Arqus Sherpa Lights (Picture source: artist rendering by Saab)

When speaking about the CBRN threat, any relevant way to address it starts with the early detection of its appearance, followed by the very accurate sampling and identification of this threat, then the reaction to immediately implement, all this in an extremely short period of time, as CBRN weapons can kill, sometimes very quickly.

Indeed, early warnings to units and personnel in the field are a key factor in limiting the effects of CBRN threats. With Saab's coherent and integrated CBRN solutions, CBRN specialists and decision-makers will have efficient tools to detect and identify a wide range of threats and receive the support needed for providing fast and accurate early warning. « Integration » and « coherence » are key axes of Saab's proposal. The company's complete offering for the entire CBRN (Chemical, Biological, Radiological, Nuclear) chain gives the whole picture of the situation. Its Automatic Warning and Reporting (AWR) system, sampling equipment and transport packaging provide the user with everything needed, from detection to identification.

The Army includes CBRN fighting units but their ways of operating and their equipment might not match some scenarios. Hence, Saab formulates various scenarios to introduce the relevance of the company's reaction means made available to the authorities, both military and civilian.



A military scenario

Remember how much the first Gulf war in 1991 raised the fear of chemical agents expected to be used by Iraqi dictator Saddam Hussein, as he had actually used them against his own population. This fear quickly initiated the development of appropriate fighting means by the Swedish army, of which Saab is a long-time supplier. Hence, the know-how gathered by Saab is firmly established to intervene on battlefields as well as in narrow streets of a village or confined spaces.

Let's start with a military scenario focusing on a logistic problem (one could of course take many other ones into consideration, as battlefields are extremely diverse). A truck driving along a logistic route enters a contaminated area. It detects VX nerve gas using its onboard CBRN Automatic Warning and Reporting system. An automatic alert is sent out and a preliminary risk is established. Automatic alerts are instantly presented for all system installations in the sensor network before entering the risk area. Warnings and reports are exchanged with other coalition forces by way of the Command Area Detection (CAD). The truck driver turns on the onboard CBRN overpressuring system, sealing the vehicle and protecting the occupants from the threat. Units in the risk area put on their protective equipment and start the filter stations in their vehicles, as well as updating their dress code in order to protect themselves from a potential attack.

CBRN experts from theater-level connect and, to make it short, work to confirm the detection and start analyzing the nature of the threat with their Remote General Sampler and find alternate supply itineraries. A reduced risk area is calculated by the CBRN experts of the HQ, supported by readings from other chemical sensors of the area, as well as weather data. Deployed Area Detection (DAD) sensors are placed out to verify and monitor the new risk area. The truck is decontaminated before entering the base it was heading to. The CBRN sample is sealed and sent to the theater level for validation. A new supply road is ordered and the area remains monitored.

The key benefits of Saab's proposal are numerous:

- * Adaptable and modular system that meets operational requirements
- * A sensor network with distributed data enables early warnings which shortens time to action
- * Combines sensor supervision with decision support and sensor fusion to minimize false alarms
- * Remotely operated sensors from all places in the system reduces the need for CBRN experts
- * Expandable with fixed, deployable, and mobile sensors and capabilities
- * Automatic CBRN reporting and role-based information sharing
- * Combination of systems together with a simulated training environment for CBRN substances
- * AWR system that is deployed and in use with proven features and integrated CBRN capability

A civilian scenario

In the field of the civilian sector, chemical attacks already occurred, don't you remember? The Tokyo subway sarin attack (Chikatetsu Sarin Jiken, "Subway Sarin Incident") was an act of domestic terrorism perpetrated on 20 March 1995, in Tokyo, by members of the cult movement Aum Shinrikyo. In five coordinated attacks, the perpetrators released sarin gas on three lines of the Tokyo Metro (then Teito Rapid Transit Authority) during rush hour, killing 14 people, injuring 5,500 people to varying degrees, and causing temporary vision problems for nearly 1,000 others. The attack was directed against trains passing through Kasumigaseki and Nagatachō, where the Diet (Japanese parliament) is headquartered in Tokyo.

The group, led by Shoko Asahara, had already carried out several assassinations and terrorist attacks using sarin, including the Matsumoto sarin attack nine months earlier. They had also produced several other nerve agents, including VX, and attempted to produce botulinum toxin, and had perpetrated several failed acts of bioterrorism. Asahara had been made aware of a police raid scheduled for March 22 and had planned the Tokyo subway attack in order to hinder police investigations into the cult and perhaps spark the apocalypse they believed in. The leader also wanted to start a Third World War.

In the raid following the attack, police arrested many senior members of the cult. Police activity continued throughout the summer, and over 200 members were arrested, including Asahara. Thirteen of the senior Aum management, including Asahara himself, were sentenced to death and later executed; many others were given prison sentences up to life. The attack remains the deadliest terrorist incident in Japan as defined by modern standards.

So, to expose Saab's solution, let's take again the example of a chemical attack carried in an underground station at a rushing hour. A terrorist (actually, more and more coordinated attacks involve several terrorists) carrying a chemical canister (a « dirty bomb ») enters the station, unnoticed in the crowd. Once on a platform, he discretely opens the canister and lays it down or throws it away before boarding the train, escaping the scene.

The station integrated sensors detect the threat right away and display what kind of substance the agent is. They transmit a signal to the Stationary Area Detection (SAD) system. An alarm is activated in the offsite control center. The operator contacts emergency services who coordinate a rescue and



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decontamination response. The relevant operator instructs the people to leave the platform. Wearing gas masks, police forces enter the underground station with handheld sensors while closing the station. In the control center, an operator receives on-screen information and step-by-step guidance. Alerts are automatically transmitted to the police, transport operators, and fire department. Rescue services arrive on the scene and make sure the station is contained.

The competent transport operator simultaneously stops air ventilation and stops inbound and outbound trains to stop the airflow and reduce the spread of the threat. He monitors the situation thanks to charge-coupled device (CDD) cameras.

The (potentially) contaminated passengers are taken in charge by the relevant rescue services, while also using Saab's sampling and identification tools of the substance. A decontamination operation can start.

Saab proposes solutions

Saab's does not manufacture vehicles specifically dedicated to CBRN fighting, as they are (very) expensive. Instead, the company proposes specialized kits to be fitted on existing civilian or military vehicles, including robotic/unmanned ones made EMC resistant, a much more affordable solution.

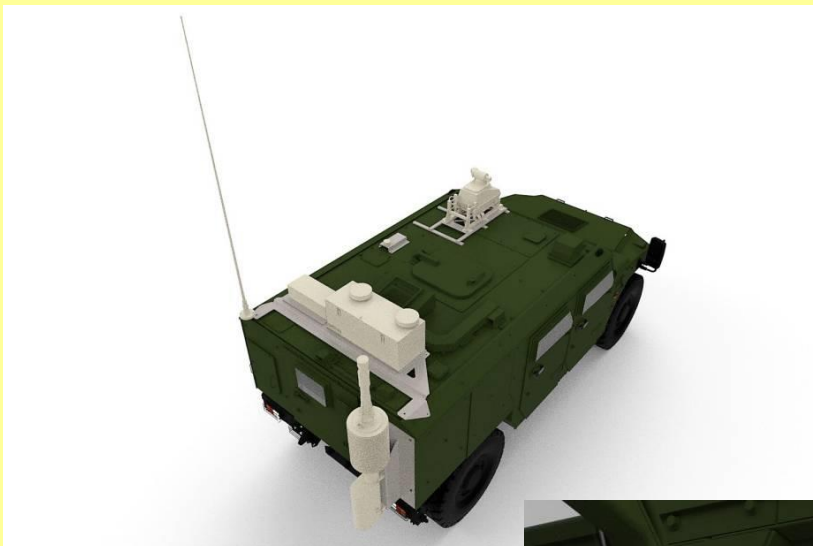
The sensors, sampling instruments, monitoring equipment, and treatment needed at all stages of the fighting against CBRN threats have been fully developed by the company, ensuring coherence at all stages of the operations required, including a communication package adapted to a wide range of scenarios enlightening integration and coherence of the proposed software, vehicle kits, and training. This integration-coherence asset makes Saab's proposal solution cheaper than a combination of solutions proposed by various suppliers.

Training is an important component of Saab's proposal. Realistic live exercises with the emission of real CBRN substances and agents are often expensive, complex, and environmentally hazardous but the need of conducting such exercises cannot be avoided.

Saab's method addresses this concern by proposing a realistic training package that combines both low-cost and relevant responses to collective and joint operation needs, both in military and civilian situations.

To match the state-of-the-art technical tools available, Saab even integrates the use of interconnected smartphones using 4G/5G among the training tools, a cheap solution as it obviously appears. Realism, relevance, efficiency, ease of use, and low cost form a guideline of Saab's strategy.

[Saab's CBRN basic reconnaissance kit mounted on an Arqus Sherpa Light](#) (Picture source: artist rendering by Saab)



Saab to work with French partners

Saab's know-how enabled the company to identify several French companies whose proven products ideally fit in its CBRN package, hence targeting both French and export markets.

So, the present details submitted by Saab enable the relevant stakeholders to answer the initial question: « The CBRN threat is real. Are you prepared? »

[Saab's CBRN equipment mounted on Arqus Sherpa Light. Inside view.](#) (Picture source: artist rendering by Saab)



High-level Briefing on the Non-Proliferation of Weapons of Mass Destruction

Source: <https://www.securitycouncilreport.org/whatsinblue/2021/09/high-level-briefing-on-the-non-proliferation-of-weapons-of-mass-destruction.php>

On Monday (27 September), the Security Council will hold a high-level briefing marking the 25th anniversary of the opening for signature of the Comprehensive Nuclear-Test-Ban Treaty (CTBT), under the agenda item “Non-proliferation of weapons of mass destruction”. Simon Coveney, Ireland’s Minister for Foreign Affairs and Minister for Defence, will chair the meeting. The expected briefers are UN High Representative for Disarmament Affairs Izumi Nakamitsu, Executive Secretary of the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) Robert Floyd, and a civil society representative. Italy and South Africa, co-chairs of this year’s Article XIV Conference—a biennial conference aimed at promoting the CTBT’s entry into force—are expected to participate in the meeting under rule 37 of the Council’s provisional rules of procedure.

Ireland circulated a concept note ahead of Monday’s briefing, which is one of the signature events of its Council presidency. It says that the meeting will focus on the CTBT’s goals and achievements and will provide Council members with an opportunity to lend impetus to promote the treaty’s entry into force. The CTBT, which prohibits states parties from carrying out “any nuclear weapon test explosion or any other nuclear explosion”, opened for signature on 24 September 1996. While it is nearly universally accepted, it has yet to enter into force. To date, 185 states have signed the treaty, and 170 have ratified it. Before entering into force, all 44 states designated as “nuclear-capable” and listed in Annex 2 of the treaty must sign and ratify it. Of the 44 specified states, China, Egypt, Iran, Israel, and the US have signed but not ratified the treaty, and the Democratic People’s Republic of Korea (DPRK), India and Pakistan have yet to sign it.

The most recent Council meeting on the CTBT took place in 2016, on the eve of the 20th anniversary of the treaty’s opening for signature. At that meeting, the Security Council adopted [resolution 2310](#), the first and only Council resolution on the CTBT to date. It stressed the vital importance and urgency of achieving the treaty’s early entry into force and affirmed that doing so will contribute to the enhancement of international peace and security. Resolution 2310 recognised that the monitoring elements of the CTBT verification regime, including the International Monitoring System (IMS), “contribute to regional stability as a significant confidence-building measure”. The resolution urged all states, particularly the eight remaining Annex 2 states, to ratify the treaty without further delay and to uphold their national moratoria on nuclear weapons testing.

During Monday’s briefing, Nakamitsu is likely to provide an update on the work of the UN Office for Disarmament Affairs (UNODA), which supports efforts aimed at the non-proliferation and total elimination of nuclear weapons. Nakamitsu may highlight the Secretary-General’s “[Securing Our Common Future: An Agenda for Disarmament](#)”, published in 2018, which outlines concrete paths to resuming dialogue and negotiations for nuclear arms control and disarmament.

Floyd, who was elected as CTBTO Executive Secretary in May, is likely to outline his plan and vision for furthering the treaty’s entry into force and advancing the work of the Preparatory Commission for the CTBTO. (Set up in 1996, the Preparatory Commission is an interim multilateral body tasked with developing the global verification regime of the CTBT, which must be operational when the treaty enters into force.) He may also draw attention to the ways in which the verification regime has proven capable of effectively monitoring nuclear testing and describe its uses in the fields of climate change research and disaster warning.

Since 1999, the UN Secretary-General has convened a biennial conference, known as the Article XIV conference (named after the relevant Treaty article), as part of ongoing efforts to promote the treaty’s entry into force. At Monday’s meeting, Italy and South Africa are expected to apprise Council members of the proceedings of this year’s Article XIV Conference, which was held on 23 and 24 September. They may also highlight key elements of this year’s [Final Declaration](#), which was adopted by conference participants on 23 September. The declaration contains a list of 15 concrete and actionable steps that can be taken to promote the treaty’s universalisation and early entry into force.

The concept note which was prepared by Ireland suggests several questions to help guide the discussion at Monday’s briefing:

- How can the entry into force of the CTBT, which is a key element of the global disarmament and non-proliferation architecture, be promoted, including through the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) Review Process?
- How can the objectives set out in resolution 2310 be advanced, and the international norm against nuclear tests strengthened, including through the important interim role that the moratorium on testing plays?
- How can the Preparatory Commission for the CTBTO be better supported to complete its work on formulating the global verification regime and to ensure that it is operational by the time the treaty enters into force?
- How can the wider community, including civil society, academia and the private sector, help to promote the CTBT?



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At Monday's briefing, several Council members may raise the threats posed by the proliferation of nuclear weapons in some country situations. During this year's Article XIV Conference, several members, including Ireland, discussed efforts to denuclearise the Korean peninsula. At that meeting, Ireland called on the DPRK to sign and ratify the CTBT, to return to the NPT, and to cooperate with the International Atomic Energy Agency (IAEA). On 3 September 2017, the DPRK announced that it had conducted its sixth nuclear test since 2006 (and its first since the adoption of resolution 2310 in 2016). The incident, which was detected by the CTBT's IMS, was met with widespread condemnation and a raft of new sanctions unanimously adopted by the Security Council.

The US may emphasise its support for the CTBT and note its zero-yield nuclear explosive testing moratorium, which it continues to observe. While all Council members recognise the importance of observing such moratoria, some will likely stress that these measures do not have the same permanent and legally binding effect as the CTBT and should therefore not be seen as a substitute for ratification of the treaty. Ireland and Mexico—both of which are members of the New Agenda Coalition (NAC), a group of countries seeking to make progress on nuclear disarmament within the General Assembly's First Committee—may be particularly critical of the eight remaining Annex 2 states and call on them to immediately sign and ratify the treaty.

It appears that Ireland had considered altering the format of Monday's meeting to an open debate, but encountered resistance from some Council members, and decided to retain the briefing format.

International CBRNe Master Courses

Department of Industrial Engineering and School of Medicine and Surgery
Università di Roma Tor Vergata



1) 1st Level Master Course in “Protection against CBRNe events” - **BASE LEVEL** for CBRNe FIRST RESPONDERS (120 ECTS).

The course is opened to persons with a bachelor's degree or equivalent title. It releases an official academic title. For more information click [HERE](#) or contact us.

2) 2nd Level Master Course in “Protection against CBRNe events” - **ADVANCED LEVEL** for CBRNe ADVISORS of DECISION MAKERS (60 ECTS).

The course is opened to persons with a master's degree or equivalent title (or to the persons that have completed the 1st level Master Course). It releases an official academic title

and opens the possibility to reach Ph.D. programs. For more information click [HERE](#) or contact us.

3) **SINGLE modules:** It is possible to apply for a single module of both the International Master Courses in Protection against CBRNe Events. contact us for more information.

OPCW launches workshop for women first responders

Source: <https://www.opcw.org/media-centre/news/2021/09/opcw-launches-workshop-women-first-responders>

Sept 24 – The Organisation for the Prohibition of Chemical Weapons (OPCW) organised a workshop to strengthen the role of women professionals in chemical emergency response and management. This inaugural event, titled “International Online Workshop for Women in a First Responder Role to Chemical Incidents”, was held from 23 to 24 September.

Opening the meeting, the Director of the OPCW's International Cooperation and Assistance Division, Ms Kayoko Gotoh, stressed: “It is my firm conviction that women engaged – or aspiring to be engaged – in first response to chemical emergencies need greater opportunities to develop and realise their potential and to be empowered to make their contribution to the cause of the Chemical Weapons Convention. To make that happen, we all must do our part to break the glass ceiling and open the doors of opportunity.”

Supported by the Assistance and Protection Branch of the Technical Secretariat, the participants examined gender-based challenges in operational issues, including gender considerations for response



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procedures. They also discussed a range of challenges that women face when building a career in fields related to chemical emergency response and management.



The new initiative follows the success of the OPCW “Women in Chemistry” project launched in 2016 to advance the role of women scientists in promoting the implementation of the Convention.

Joelle Khadra, CBRN instructor, Lebanon representative

The workshop was attended by 146 female professionals from 46 OPCW Member States: Algeria, Argentina, Armenia, Australia, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Bhutan, Brazil, Burundi, Cambodia, Cameroon, Canada, Costa Rica, Côte d'Ivoire, Croatia, Czechia, Ecuador, France, India, Iraq, Kenya, Kyrgyzstan, Lebanon, Luxembourg, Mexico, Morocco, Nigeria, Pakistan, Panama, Peru, Poland, Romania, Serbia,

Spain, Sri Lanka, Sudan, Tajikistan, Thailand, Trinidad and Tobago, Turkey, United Arab Emirates, the United States of America, and Uruguay.

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.



OSDIFE Report on CBRNe Events in the World - July and August 2021 issue

Source: https://osdife.org/wp-content/uploads/2021/09/OSDIFE-CBRNE-Report-2021-July-August_compressed.pdf

The Observatory on Security and CBRNE Defence – OSDIFE, the University of Rome "Tor Vergata", Department of Electronic Engineering (DIE), and the State University of the Republic of San Marino, Center for Security Studies – CUFS is pleased to present the "OSDIFE Report on CBRNe Events in the World". The Report aims to disseminate information related to a wide range of unconventional events worldwide, selected and systematized by our international editorial team weekly over the whole month, with relation



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to Africa, Asia, Europe, Latin America, North America, Oceania. The Report covers issues related to CBRNE threats and also has special coverage for COVID-19 pandemic, terrorism and counter-terrorism, security, and defense technological innovations. This Report endeavors to build a network of mutual information exchange.

Impact of Synthetic Biology and Non-State Actor WMDs

By Major Stephen Hummel

NCT Magazine September 2021

Source: <https://nct-magazine.com/nct-magazine-september/impact-of-synthetic-biology-and-non-state-actor-wmds/>

The application of synthetic biology to modify organisms is straightforward. The protein and system Cluster Regularly Interspaced Short Palindromic Repeats (CRISPR) was first discovered in 1993 by Francisco Mojica as a mechanism for bacteria to prevent viral invasion. It was the work of Jennifer Doudna and Emmanuelle Charpentier published in 2012 that demonstrated how CRISPR, particularly the CRISPR-Cas9 system, worked and postulated that it could be used to edit genes. This scientific discovery spurred a revolution in synthetic biology as a result of its ease of use and the hope for its application in treating genetic diseases. This hope is tempered, however, by an emerging threat landscape that envisions the possibility that biological weapons might not require graduate-level expertise at a state-run laboratory rather could be facilitated by non-state actors outside the realm of international norms and conventions due to the increasing democratization of synthetic biology and its associated technologies.

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

MAJ Stephen Hummel is currently a PhD candidate in the Biology Department at Boston College. Previously, he served in both Iraq and Afghanistan, and as a USAREUR CBRN Plans Officer, an Assistant Professor in the Department of Chemistry and Life Science at the United States Military Academy, a Nuclear Operations Officer on a Nuclear Disablement Team, and most recently as the Deputy, Commander's Initiatives Group at 20th CBRNE Command. The views expressed in this report are the author's and do not necessarily reflect those of Boston College, the Department of Chemistry and Life Science, the United States Military Academy, Department of Defense, or U.S. Government.

Country Profile: CBRNe Capabilities and Strategy: the Case of Canada

By Mr. Georgios Zacharias (Defense and Security Analyst @ IB Consultancy)

NCT Magazine September 2021

Source: <https://nct-magazine.com/nct-magazine-september/canada-country-profile/>

Canada's main security concerns are issues of violent extremism and terrorism but in the meantime, the risk caused by the proliferation of Weapons of Mass Destruction (WMD) is considered a priority. This includes CBRNe threats and the risk of proliferation of ballistic missile technology. Another major concern is the advanced activity in the Arctic which is expecting to bring on the surface new security demands, especially related to search and rescue and natural disasters. This country profile will address Canada's current CBRNe Capabilities and its approach to CBRNe threats.

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



Influence of Aum Shinrikyo on the U.S. Emergency Response

By Bobby Baker Jr.

Source: <https://www.domesticpreparedness.com/journals/september-2021/>

Reflecting on the 20th anniversary of the 9/11 terrorist attacks, it is essential to not only remember that fateful day, but to highlight the events that precipitated it, examine lessons learned and policies established, and consider programs and policies needed to sustain prevention, preparedness, response, and recovery capabilities in the U.S. and its territories. Although historical analysis and synthesis of past events often lead to relevant details about current incidents, communities often fail to implement or accept the recommended changes. The 9/11



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Commission Report cited, “The most important failure was one of imagination.” The 1995 Aum Shinrikyo Tokyo subway sarin gas attack has unique characteristics in the history of acquiring, proliferation, and distributing weapons of mass destruction (WMDs) in the chemical and biological domains, with significant influence in WMD policies and consequence management platforms

***Bobby R. Baker Jr.,** captain (RET.), retired in September 2018 after serving 20 plus years with Dallas Fire-Rescue, where he rose through the ranks as a dual-trained firefighter and paramedic. He serves as a volunteer firefighter and hazardous materials technician with the Plano-Fire and Rescue Department in Plano, Texas. He has been a certified private investigator and personal protection officer licensed by the Texas Department of Public Safety Private Security Board since 2010 assigned with the Trident Response Group in Dallas, Texas. He currently serves as a full-time principal training specialist with the Counter-Terrorism Operation Support with Mission Support Test Services LLC, the primary contractor to Nevada National Security Site and the Department of Energy. He holds a master's degree in homeland security from The George Washington University in Washington, D.C., and is a 2003 graduate of Dallas Baptist University, receiving his Bachelor of Science in history and world religion. He is a frequent speaker and guest lecturer on all matters concerning CBRNE consequence management for all response agencies, emphasizing the need for unified command and training in the response to mass casualty incidents involving CBRNE and asymmetric attacks. He is an editorial advisory member of Dom Prep and has presented at numerous CBRNE conferences around the world to include CBRNE World Nashville, the Asian CBRNE Summit in Bangkok, Thailand, and has been a guest speaker twice at the European CBRNE Summit in Birmingham, United Kingdom, and Rome, Italy.*

Leidos to develop technology for increased protection against CB threats

Source: <https://www.army-technology.com/news/leidos-develops-cb-threats-protection-technology/>



The PPB programme strives to improve stability and provide flexibility for field-forward individuals. Credit: US Department of Defense, Senior Airman Daniel Owen / WikiCommons.

Sept 30 – Leidos has received a prime contract to develop advanced protective equipment under the US Defense Advanced Research Projects Agency's (DARPA) Personalized Protective Biosystems (PPB) programme.



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The PPB programme seeks to reduce the weight of the current personal protective equipment (PPE).

Through the latest three-phase, five-year cost-plus-fixed-fee contract, Leidos will develop a technology that helps in reducing the user's protective equipment burden.

The technology will also offer increased protection against existing and future chemical and biological (CB) threats.

The contract has a cumulative value of \$19.3m.

Leidos chief technology officer Jim Carlini said: "Leidos thrives at tackling the world's toughest challenges; in this case, protecting frontline personnel against emerging threats with a revolutionary approach to personal protection equipment."

DARPA's PPB programme is aimed at improving stability and provide flexibility for field-forward individuals. It addresses the national need for lightweight and adaptive PPE for military and healthcare workforce.

The challenge was highlighted recently at a global level due to the ongoing pandemic.

EDITOR'S COMMENT (on the photo accompanying the article): Aren't we supposed to minimize secondary contamination and exposure when evacuating victims involved in a CWA or radiation incident? If you cannot do it right during a drill ...

The effect of communication during mass decontamination

By Holly Carter, John Drury, G. James Rubin, et al.

Disaster Prevention and Management; Vol. 22 No. 2, 2013; pp. 132-147

Source: https://www.academia.edu/7719305/The_effect_of_communication_during_mass_decontamination



Purpose – Reports from small-scale incidents in which decontamination was conducted suggest that a successful communication strategy is vital in order to increase public compliance with, and reduce public anxiety about, decontamination. However, it has not been possible to examine public behaviour during large scale incidents involving decontamination. The aim of the research reported here was to examine the relationship between people's positive perceptions of responding agencies' communication strategies and relevant outcome variables, such as level of compliance and level of reassurance, in several field exercises involving mass decontamination.

Design/methodology/approach – Data were collected using feedback questionnaires completed by simulated casualties, which contained items relating to casualties' perceptions of the success of responding agencies' communication strategies, their confidence in emergency responders, and their compliance with the decontamination process. Path analysis was used to examine the relationships between variables.

Findings – Results show a significant relationship between responding agencies' communication strategies, level of public reassurance, and level of public compliance. The relationship between responders' communication strategies and the outcome variables was partially mediated by public confidence in responders.

Practical implications – Emergency responders should focus on communication with members of the public as a key element of the decontamination process, as failure to do so could result in high levels of anxiety and low levels of compliance among those who are affected.

Media report claims Swiss exports fed Syrian chemical weapons

Source: <https://www.swissinfo.ch/eng/media-report-claims-swiss-exports-fed-syrianchemical-weapons/46758872>

July 05 – According to *SonntagsZeitung* newspaper, a former Syrian army chief has alleged that a 2014 shipment of chemicals from a factory in the Swiss city of Basel, intended for medical purposes, was used to make chemical weapons.

Copenhagen chlorine leak killed 96000 farmed salmon

Source: <https://www.industryglobalnews24.com/copenhagen-chlorine-leak-killed-96000-farmed-salmon>

Aug 11—A leak in a nearby tank sent about 4,000 gallons of chlorine into a fjord in Arctic Norway is believed to be the reason for the death of about 96,000 farmed salmon.

As informed by a spokesman for the salmon farming company, Grieg Seafood, Roger Pedersen, the leak might have occurred at one of its fish slaughterhouses in the town of Alta when the fishes were in a waiting cage nearby.



To all CBRN First Responders: Do your best to keep them safe!

Premier League 2021/22 Instagram Rich List



In the world of top-flight football, money is no object, with clubs willing to spend big to secure the best talent for their team. Some of the biggest names in the Premier League are earning millions each season, but what happens when they're off the pitch?

We looked at the most popular Premier League players on social media and calculated just how much they could earn by sharing sponsored posts.

This is the Premier League Instagram rich list.

	Player	Team	Followers	Cost Per Post
1.	Cristiano Ronaldo - @cristiano	Manchester United	350,000,000	£1,505,000
2.	Paul Pogba - @paulpogba	Manchester United	48,400,000	£208,120
3.	Mohamed Salah - @mosalah	Liverpool	44,000,000	£189,200
4.	Thiago Silva - @thiagosilva	Chelsea	18,000,000	£77,400
5.	Raphaël Varane - @raphaelvarane	Manchester United	17,100,000	£73,530
6.	Gabriel Jesus - @dejesusoficial	Manchester City	15,400,000	£66,220
7.	Kevin De Bruyne - @kevindebruyne	Manchester City	14,900,000	£64,070
8.	Roberto Firmino - @roberto_firmino	Liverpool	13,000,000	£55,900
9.	N'Golo Kanté - @nglkante	Chelsea	11,900,000	£51,170
10.	Marcus Rashford - @marcusrashford	Manchester United	11,800,000	£50,740

New protective kit being tested

By Captain Taylor Lynch

Australian government | Ministry of Defense

Source (+video): <https://news.defence.gov.au/capability/new-protective-kit-being-tested>

Oct 06 – Soldiers from the 7th Combat Brigade have been trialling the ADF'S new chemical, biological, radiological and nuclear (CBRN) protective equipment.

With training serials conducted in the Townsville Field Training Area, participants experienced the challenges of operating while wearing extra protective equipment and simultaneously dealing with non-conventional chemical threats.

Sergeant Mark Burgess, of the 2nd Combat Engineer Regiment, outlined the updates to the new equipment and how it better-protected soldiers on the battlefield.

"There have been some great improvements with the new Low Burden Mask, including a better field-of-view for soldiers while conducting engineering tasks, driving our fleet of vehicles, or conducting general soldier duties,"



Sergeant Burgess said. “The fit is achieved a lot easier, and the straps around the mask achieve a better and faster seal around the soldier’s face. “The new masks come with an enhanced voice amplifier, too, making it easier for soldiers to communicate with each other.” Sergeant Burgess described the training soldiers had been undergoing in the new kit. They familiarised themselves with the gear first and progressed to using it while under fire from an enemy. “The trial team has been training in the full protective dress state 4, which includes wearing the over-boots, trousers, jacket with hood, both sets of gloves, the Low Burden Mask, and the haversack,” Sergeant Burgess said. “We’ve been driving vehicles, doing patrols, search tasks, as well as chemical threat surveys, which will eventually be rolled out across Army as an All-Corps responsibility.” Sergeant Burgess said the threat of CBRN attack continued to evolve, making the equipment update essential for all members of the ADF. “Wherever there is a chemical, biological, or radiological threat, this kit will be issued to protect soldiers from a surprise attack,” he said. “It will allow them to survive in a chemical-affected area while they withdraw, regather and go through decontamination.

The CBRN Threat in World Context – How Real is the Threat?

Presentation by Prof. Alex P. Schmid, Director Centre for the Study of Terrorism and Political Violence (CSTPV), the University of St. Andrews on the occasion of the Police National CBRN Centre Conference, 31 March – 1st April 2009, Fairmont Hotel, St. Andrews

“Nuclear, biological, and chemical arms are the most inhumane of all weapons. Designed to terrify as well as destroy, they can, in the hands of either States or non-state actors, cause destruction on a vastly greater scale than any conventional weapons, and their impact is far more indiscriminate and long-lasting”.

Hans Blix et al.(2006)

Mr. Chairman,

Ladies and Gentlemen,

It is a pleasure to be here and I wish to thank you for the invitation.

The previous speaker has given you a government perspective on the CBRN threat. I would like to give you an academic perspective. Since I have only half an hour most of my remarks will be focussing mainly on the potential CBRN threat emanating from Jihadist terrorism. The reason for this narrow focus is that while Islamist organizations represent just over 7% of all terrorist organizations active between 1968 and 2005, they are, according to one recent study, representing more than 60 percent of the organizations that have pursued or tried to use CBRN capabilities or have otherwise engaged in bio-crimes and poisonings.

Table 1: Islamic Organizations That Have Used or Tried to Use CBRN Terrorism, or engage in Bio-Crimes and Chemical Poisonings, 1998 – 2005

1. East Turkistan Lib. Organization	Alleged Use
2. Hamas	Alleged Use
3. Lashkar –e-Taiba (LeT)	Alleged Use
4. Riyad us-Saliheyn Martyr’s Brigade	Alleged Use
5. Al Qaeda	Pursued
6. Hizballah	Allegedly Pursued
7. Jaish-e-Mohammad (JeM)	Allegedly Pursued
8. Jamiat ul-Mujahedin (JuM)	Allegedly Pursued
9. Jemaah Islamiya (JI)	Allegedly Pursued
10. Lashkar –e Jhangvi (LeJ)	Allegedly Pursued
11. Lashkar-e-Taiba (LeT)	Allegedly Pursued
12. Palestinian Islamic Jihad (PIJ)	Allegedly Pursued
13. Ansar al-Islam	Allegedly Pursued
14. Tawhid and Jihad	Allegedly Pursued

Adapted from: Victor H. Asal and R. Karl Rethemeyer. *Islamist Use and Pursuit of CBRN*. In: G. Ackerman and J. Tamsett (Eds.). *Jihadists and Weapons of Mass Destruction*. Boca Raton, CRC Press, 2009, p.345. – The authors analysed a total of 108 organizations motivated by Islam.



Chapter 17: CBRN



HANDBOOK OF TERRORISM PREVENTION AND PREPAREDNESS

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Counter-Terrorism - The Hague



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This table should be treated with caution as the evidence on both pursuit and actual use of chemical, biological, radiological or nuclear materials is often dubious and ambiguous. So far none of the CNRN agents and materials used had the effects of a weapon of mass destruction. However, CBRN-agent and materials - based incidents have already taken place: three major US databases list for the period 1998 – 2004 (2006 in the case of the Monterey WMD Terrorism Database) 13 (START), 40 (MIPT) and 168 (Monterey) incidents where a agent was present or used – while there were thousands of hoaxes and pranks. The combined fatalities of 165 out of the 168 incidents involving CBRN agents and materials recorded by the Center for Nonproliferation Studies at the Monterey Institute of International Studies in California were 110 deaths – which comes down on a dozen per year. In most cases these were poisonings for individual or small group murder. However, there can be little doubt about jihadist intentions if we listen to their rhetoric, exhortations, wishes and threats:

Table 2: Al Qaeda on CBRN

Osama Bin Laden:

- “Acquiring [chemical and nuclear] weapons for the defense of Muslims is a religious duty. (...)
- “It is the duty of Muslims to prepare as much force as possible to terrorize the enemies of God”.

Abu Mus’ab al-Suri:

- “...we are serious about acquiring all possible weapons and means and will deal with you the same way, in accordance with our true religion”. (...)
- “Hitting the US with WMD was and is still very complicated. Yet it is possible after all, with Allah’s help, and more important than being possible – it is vital”.
- “...if those engaged in *jihad* establish that the evil of the infidels can be repelled only by attacking them with weapons of mass destruction, they may be used *even if they annihilate all the infidels*”[emphasis added, APS)

Sources: Cit. J. Bale. *Jihadist Ideology and Strategy and the Possible Employment of WMD*. In: G. Ackerman and J. Tamsett (Eds.), *Jihadists and Weapons of Mass Destruction*. Boca Raton, CRC Press, 2009, p. 30, 34; cit. Marc Dechesne. *Obedience to Divinity? The Psychology of Jihadist WMD Terrorism*. In: G. Ackerman and J. Tamsett, op. cit., pp.72, 74; p.135. cit. Richard Miniter. *Disinformation* Washington, Regnery publishing, 2005, p.138.

We know from captured documents that the leaders of Al Qaeda decided at a given moment that it would be a priority to acquire such unconventional weapons. We also know that Al Qaeda has experimented with Cyanide on dogs, rabbits and sheep in training camps and that the leadership of Al Qaeda made efforts to obtain a culture of Anthrax.

Al Qaeda also obtained an elaborate (21 pages) fatwa (religious justification) on the use such weapons from a respected (though young) Saudi Islamic scholar, Nasir bin Hamid al-Fahd:

Table 3: Quote from Fatwa of Shaykh Nasir bin Hamid al-Fahd, May 2003 Treatise on the Legal Status of Using Weapons of Mass Destruction against Infidels” authorizing the use of WMD against the United States.

- “The attack against it [the United States] by weapons of mass destruction is accepted, since Allah said: ‘If you are attacked you should attack your aggressor by identical force’ (...)
- “Thus the situation in this regard is that if those engaged in jihad establish that the evil of the infidels can be repelled only by attacking them at night with weapons of mass destruction, they may be used even if they kill all the infidels” (...)
- “Muslims are not bound by international agreements regarding WMD because such agreements have no standing in Islamic law”.

Sources: Cit. Anne Stenersen and Brynjar Lia. *Al-Qaida’s online CBRN manuals: A real threat?* Oslo, FFI, 2007, pp.31; Nasir Bin Hamid al-Fahd, “A Treatise on The Legal Status of Using Weapons of Mass Destruction Against Infidels”, May 2003, pp. 5-10; cit Samma Salama and Edith Bursac. *Jihadist Capabilities and the Diffusion of Knowledge*. In :G. Ackerman and J. Tamsett (Eds.), *Jihadists and Weapons of Mass Destruction*. Boca Raton, CRC Press, 2009, p. 103; cit. Appendix A: *Al-Qaida’s CBRN Activities*. Compiled by Erin McNerney and Matthew Rhodes., cit. In: G. Ackerman and H. Tamsett (Eds.) p. 459; cit. Richard Miniter. *Disinformation*. Washington, Regnery Publishing, 2005, p. 144.

If you check out Jihadist websites you find a rich menu of manuals teaching you how to kill infidels and apostates, as the following Table makes clear:



Table 4: Jihadist Manuals relating to CBRN and other Weapons

- The Nuclear Bomb of Jihad and how to Enrich Uranium
- Nuclear Weapons and their Manufacture
- Ricin seeds.... praise God
- Preparation of botulinum toxin
- Radioactive Pollution
- Comprehensive course in poisons and poisonous gases
- Biological weapons
- The Military Jihad Encyclopedia

Source: Anne Stenersen and Brynjar Lia. *Al-Qaida's online CBRN manuals: A real threat?* Oslo, Forsvarets forskningsinstitutt, 2007 (FFI-report 2007/02405), pp. 87-88 & 117.

It is true that many of these on-line publications reflect only a very rudimentary understanding of the technical aspects and demonstrate, in the words of a Norwegian study, "...an apparent lack of knowledge and innovative ability regarding CBRN-related means and ends on the part of the jihadists". On the other hand, they may be good enough to "... enable terrorists to produce very crude CBRN materials, and possibly also a crude chemical device....". Among the jihadists there are scientifically trained people, as we saw in the "doctor's plot" that led to the attack on Glasgow Airport on 30 June 2007.

Risk is often calculated as a function of Vulnerability, Threat and Impact whereby Threat is expressed as a combination of Intention and Capability. The difference between a risk and an uncertainty is that a risk can be estimated on the basis of an observed frequency or theory while that is not the case for an uncertainty.

Table 5: Calculating Risk of Terrorist Attack

$$R = V \times T \times I$$

R = Risk; V = Vulnerability; T = Threat (Intention x Capability); I = Impact

Source: Alex P. Schmid. *Calculating the Risk of Terrorism. Catastrophe Risk Management*, December 2006, p. 14.

Since there have been very few significant incidents involving CBRN agents and materials and since reliable and up to date data on many terrorist organizations are hard to come by in Open Sources, it is difficult to assess the threat and the risk of non-state terrorists using CBRN as weapons of mass destruction. There is a great deal of uncertainty which, unfortunately, however, has led to a proliferation of worst-case assumptions.

When we talk about Weapons of Mass Destruction and CBRN materials and agents we talk about two different though overlapping things. Not every use of chemical, biological, radiological or nuclear materials or agents leads to mass destruction. For that, they have to be weaponized, mass produced, properly stored, brought to the target and linked to effective delivery systems.

Even with professional weaponization, not every CBRN material or agent is a weapon of Mass Destruction. The "R" in CBRN which stands for Radiological Dispersal Devices or, more popularly "Dirty Bombs". These are not, even when weaponized, weapons of mass destruction. They are at potential weapons of mass disruption and that is mainly so due to our own psychological reaction to their use rather than because of the intensity of radiological pollution.

Chemical and radiological incidents represent acute emergencies while bioterrorism is a gradually unfolding emergency depending on the incubation period of the pathogen released. A bioterrorism incident can be both disrupting and destructing if it progresses to pandemic. By definition the truly weapon of mass destruction is a nuclear weapon that can wipe out people and structures within seconds (e.g., Hiroshima and Nagasaki during WWII).

Let me briefly introduce the four types of unconventional terrorist threats starting with the least serious one.

Radiological Devices

In the context of the presentation of Contest Two, and with the upcoming G-20 summit, we were, once more, warned about the risk of terrorist trying to attempt a "dirty bomb". The 'dirty bomb' is in fact only one of four dispersal mechanism for radiation – the first on the table.



Table 6: Four Types of Radiological Dispersion

- A radiation dispersion device (RDD) in the form of a conventional explosive attached to radioactive material;
- A silent dispersal of radioactive materials in the air, the water or on the soil; e.g., by aerosol, dilution or dusting;
- A stationary radiological emission at a place where people reside (Radiological Emission Device – RED), and last but not least
- An attack on a site containing radioactive materials and its dispersal there.

Radioactive materials are stored in many places and shipped between them. There are more than 10 million devices containing radioactive substances and many of them need refueling. Every year, some 30 million radioactive shipments are made, of which 24 million consist of medical supplies like cobalt used for radiotherapy treatment.

Table 7: The Nine Most Dangerous Radio Isotopes

- Cobalt-60 (Co-60);
- Americium-241 (Am-241);
- Cesium-137 (Cs-137);
- Iridium-192 (Ir-192);
- Plutonium-239 and 238 (Pu-239, Pu-238);
- Strontium-90 (Sr-90);
- Californium-252 (Cf-252);
- Radium-226 (Ra-226);
- Lead-103 (Pd-103)

Given this huge volume of legal trafficking in radioactive substances, the cases of theft or loss are very, very small despite the fact that over 100 countries do not possess very strict control systems for radioactive devices. As a consequence, there is a black market for such materials though it is apparently more a seller's than a buyer's market. There have been more than a thousand confirmed cases (1080) of trafficking in, or illicit possession of nuclear materials since the end of the Cold War (1993-2006). Most of them involved radioisotopes that were suitable only for a dirty bomb, not a fission weapon. The International Atomic Energy Agency has in its database only 15 incidents involving unauthorized possession and trafficking of weapons-grade plutonium (Pu-239) or Highly Enriched Uranium (HEU). The quantities were, in all individual cases, below the level needed to construct a single atomic bomb. However, what was intercepted might not have been all but a sample of a larger quantity. In a handful of cases where substantial sub-critical quantities were seized by the authorities there has been a suspicion that the traffickers had more.

When I last looked into trafficking, some years ago, using a different database, I found 156 incidents of illicit trafficking in 30 countries in a seven years period.

Table 8: Total Number of Incidents, 1999 – 2005 from Our Database

Russia (lila on the template, at the base of these pillars) had the highest number of incidents with a total of 51 incidents followed by Ukraine (24), Kazakhstan (18), and Georgia (13). The price asked for materials, ranging from a few thousand to more than a million dollars, indicate that there is no adequate pricing mechanism and therefore no regular market. Most of the sellers were uneducated persons who did not know where to find potential buyers.

The good news here is that there has so far been no successful terrorist use of radiological substances. If terrorists want to produce a weapon that is radiological at least in name they can do that: go to a number of Do-it-yourself stores and buy enough smoke detectors and take the operative radioactive substance – often Americium –out of them, wrap that around a conventional high explosive and detonate it in a place where many people pass through and they have a 'dirty bomb'.

That is what here in the UK Dhiren Barot (a.k.a. Issa al-Hindi) and several others tried to do in 2004. His cell had acquired a cache of about one hundred smoke detectors but planned to collect 10,000 such detectors as well as gas cylinders for a series of coordinated attacks inside the UK. However, to create an effective radiological weapon Barot would have needed no less than about one million smoke detectors.



Table 9: Radioisotopes of Security Concern

	Half-life
● Americium-241	433 years
● Californium-252	2.7 years
● Cesium-137	30 years
● Cobalt-60	5.3 years
● Iodine	8 days
● Iridium-192	74 days
● Polonium-210	140 days
● Plutonium-238	88 years
● Plutonium-239	24,000 years
● Radium-226	1,600 years
● Strontium-90	29 years

Source: Charles D. Ferguson. *Radiological Weapons and Jihadist Terrorism*. Chapter 7, in: Gary Ackerman and Jeremy Tamsett (Eds.). *Jihadists and Weapons of Mass Destruction*. Boca Raton, CRC Press, 2009, p. 180.

An Americium dirty bomb based on smoke detector ingredients will not be a very effective bomb in terms of killing people by a radiation overdose but it might cause some panic and economic disruption. The terrorists, including Dhiren Barot, are aware of that. In a CBRN manual published on a well-known Al Qaeda website advocating Cesium-137 attacks against the West, they correctly assess some of the consequences:

Table 10: RDD Consequences according to Jihadist CBRN Manual on Al Qaeda Website:

“The important this is to disperse radioactive material in a large commercial area so the government is forced to shut down this area, which will cause this country massive economic disruption due to the following reasons:

- The high costs of decontamination of radioactive areas
- The high economic losses in this large commercial area due to closure
- Subsequent unemployment and loss of jobs
- Stoppage of general life in that area
- Large compounded problems are to follow due to these losses”

Source, Al-Mubtakkar al-Farid: *Li Irsaal al-Safah al-Athiri Ila al-Kafir al-‘Anid – The Unique Invention: To Deliver the Gaseous Killer to the Stubborn Infidel*”, *al-Firdaws*, October 2005; cit. James J.F. Forest and Sammy Salama *Jihadist Tactics and Targeting*. In : G. Ackerman and J. Tamsett, op.. cit., p.93.

Among the targets suggested in the Jihadist CBRN Manual London figured on third place after” Las Vegas (the city of fornication and gambling that does not sleep)” and New York, followed by Sidney, Tokyo and Moscow, followed by “Other large tourist cities – and commercial capitals of all infidel nations”. The main effect of such a radiological bomb would be panic among an unprepared public, and the area of contamination would be relatively small. How expensive it would be to clean it up depends on the radioactivity thresholds that one considers acceptable in terms of health risks. It might be wise to look critically at existing radiation tolerance levels and adjust them to present day knowledge about possible negative health effects rather than blindly accepting those perhaps too high standards developed in the first decade after the Second World War.

Jihadists continue to be interested in a “dirty bomb”. The leader of Al Qaeda in Iraq, Abu Hamza al-Muhajir (a.k.a. Abu Ayyub al-Masir), in September 2006, “called for nuclear scientists and explosive experts to assist his organization in making biological and ‘dirty’ radioactive weapons.” The fact that such a call had to be made indicates that Al Qaeda’s in-house expertise was weak or non-existent.

Chemical Terrorism

From the CBRN range of weapons, toxic chemical agents are the easiest to acquire, partly due to the dual-use character of many precursor materials. Some industrial chemicals produced in large quantities for peaceful commercial purposes – such as chlorine and phosgene - are highly toxic. They are therefore



the most likely to be used by non-state terrorists venturing into unconventional weapons.

Table 11: Types of Chemical Weapons

- **Blister agents** (vesicants) like sulfur mustard, lewisite and phosgene oxime which affect the skin (burns or blisters),
- **Pulmonary agents** which damage the membranes in the lungs and fills them with a watery fluid – like phosgene and chlorine.
- **Blood agents** which use cyanide as key element;
- **Choking agents** which use chlorine-rich chemicals like phosgene;
- **Tearing and incapacitating agents** like mace (CN), CS, CR and capsaicin which are used for riot control;
- **Psychopharmacological agents** like LSD;
- **Nerve agents** – substances like Tabun, Soman, Sarin and the even stronger V-agent class of nerve-agents like VX.

However, chemical weapons with a higher killing potential are not available on the free market. That's why Aum Shinrikyo had to produce nerve gas itself. It had, according to one account, at one point 80 scientists looking into producing chemical weapons, while twenty more worked on biological weapons. In 1993 it managed to produce some 30 kilograms of Sarin which it used in 1994 in Matsumoto for the attack on the Tokyo subway system Aum chemists only managed to produce impure Sarin. In the first instance 7 people were killed (while over 140 suffered injuries) and in the second instance 12 were killed (while 37 got seriously wounded and 984 suffered minor symptoms). Regrettable as these incidents were, they do not amount to mass destruction and stay far behind the effects of a vehicle-based improvised explosive device. We have since the mid-1990s seen some attacks in Iraq where conventional bombs were spiked with chlorine but that practice was soon abandoned, probably because chlorine does not distribute easily with explosives.

Chemical attacks, while the easiest to perform among the CBRN attacks, have so far not been very attractive to most terrorists. Al Qaeda has, however, shown an interest in chemical weapons and Ayman Al-Zawahiri allocated, on 7 May 1999, \$2,000 - \$ 4,000 dollars for start-up costs for such a program – a ridiculous amount when compared to the \$ 30 million that Aum Shinrikyo spent on its Sarin manufacturing program alone. Some reports suggest that Bin Laden's operatives have allegedly been trained to conduct attacks with toxic chemicals and there have apparently been some primitive experiments with rabbits, dogs and sheep.

One of Al Qaeda's experts on in the CBRN field is Abu Khabab al-Masri (real name: Midhat Mursi al-Sayid Umar), an Egyptian chemical engineer and explosives expert. He has been associated with an abandoned plot to disperse poisonous gas, with a binary weapon, called *al-mubtakkar al-farid* ('the unique invention'). It was meant to mix hydrochloric acid (HCl) with cyanide salt (NaCN) to form hydrogen cyanide gas (HCN) and be dispersed in subway cars in New York in 2003. The purpose was "to Deliver the Gaseous Killer to the Stubborn Infidel". The operation was in the end cancelled 45 days before the planned date of attack by Ayman al-Zawahiri, who said "we have something better in mind". So far "the something better" has not materialized. While there is some evidence that Al Qaeda experimented with Cyanide and that it also tried to cultivate Anthrax, there is no indication that they got beyond some primitive experiments

There have, however, nevertheless been several plans and plots, also in Europe, to use chemical agents. In 2002, for instance, a jihadist plot was uncovered when Italian authorities found that the use of Cyanide for an attack against the water supply of the American embassy in Rome was considered. Yet the chemical found in possession of the suspects – ten pounds of potassium ferrocyanide – was less toxic than pure cyanide. Water-poisoning is, because of the dilution, not a very promising avenue for creating mass casualties. There have been other alleged plots and plans to use chemical agents, including in Morocco, Jordan and Iraq. The following table lists some of them, not all chemical.

Table 12: Post 9/11 Jihadist CBR Plans and Plots

- 2002 Padilla plan of dirty bomb attack in USA (rejected by AQ leadership)
- 2002 Benchellai's Chechen Plot in France against Russian interests in Europe, involving "C" or "B" (probably Ricin)
- 2003 Bourgass' ricin poison plot from castor beans in London
- 2004 Bhiren Barot plot to construct RDD from 10,000 smoke detectors containing Americium-241
- 2007 Iraq attacks with explosives and chlorine gas containers

Source: Anne Stenersen and Brynjar Lia. *Al-Qaida's online CBRN manuals: A real threat?* Oslo, FFI, 2007, p. 57.

There are two main scenarios of a chemical attack: one is the dispersal of an odorless, invisible



substance in a closed area – like a large sport hall, where it would create panic and a stampede which might be as bad as the effects of the chemicals themselves. The other scenario – and here we can talk of a real potential for mass destruction - is to use existing ill-protected chemical plants as sitting ducks and attack these, producing an uncontrolled release of chemicals there. We only have to think of the industrial chemical accident in Bhopal, India, in 1984 to be reminded of the potential magnitude of casualties to be expected: When the Union Carbide pesticide plant released 42 tons of methyl isocyanate gas, some 8,000 people died within two weeks and an estimated additional 8,000 died subsequently from gas-related diseases. Altogether more than 500,000 people were exposed to toxic gases and between 100,000 and 200,000 of them are estimated to have suffered permanent injuries from what until now has been the world's worst industrial disaster.

To this day, many chemical plants are not sufficiently secured against major accidents or an attack involving a hijacked truck loaded with high explosives or liquid gas and steered into a major chemical plant close to urban zones. The deliberate release of chlorine gas from a chlorine tank explosion could, according to the Department of Homeland Security potentially kill almost 20,000 people in a matter of hours. So far, we have been lucky. But, as the Provisional IRA reminded Margaret Thatcher in 1984, "... we only have to be lucky once. You will have to be lucky always."

Biological Weapons

Let me now turn to biological weapons. They come in five types:

Table 13: Main Biological Warfare Agents

Bacteria (small, single-celled, free-living organisms): e.g., Anthrax, Tularemia, Pulmonary Plague, Cholera, Glanders, Q-Fever.
 Toxins (poisons produced by organic materials): e.g., Abrin, Aflatoxins, Botulinum toxins, Clostridium perfringens epsilon toxin,
 Viruses (intracellular parasites): e.g., Crimea-Congo hemorrhagic fever, Eastern equine encephalitis virus, Ebola virus, Equine morbillivirus, Lassa fever virus,
 Rickettsia (micro-organisms with bacterial and viral characteristics): *Coxiella burnetii*, *Rickettsia prowazekii*,
 Fungi (primitive plants not requiring photosynthesis): e.g., *Coccidioides immitis*.

Source: US Government, Department of Defense. Proliferation: Threat and Response. Washington, D.C., DOD, January 2001, p. 113; Jane's Information Group. A History of Biological Weapon Use, Production and Classification. Alexandria, Virg., Jane's Information Group, n.d., at: <http://chembio.com-subscribe/reference/04biological_use.html>.

While chemical and nuclear weapons have an immediate impact, radiological dispersal devices and biological weapons tend to have a delayed impact, which is linked to the varying incubation periods. Smallpox, for instance has an average incubation period of twelve days. The main problem with biological weapons is the contagiousness of some its agents. Contagion can go on for days and even a few weeks before being discovered. Given the high mortality rates of some biological agents – in the case of smallpox about 30 percent of those infected and more for some forms of it – mass destruction is a distinct possibility.

Naturally occurring pandemics like the plague in Europe in the 14th century and the Spanish Flu following the First World War produced tens of millions of fatalities. The human, costs and the economic costs – in lost business as well in decontamination costs – make biological weapons potentially second to only thermonuclear bombs.

In that sense biological weapons are different from chemical and radiological weapons and closer to nuclear weapons and potentially true weapons of mass destruction. However, they are also very difficult to produce, weaponize and disperse. Aum Shinrikyo managed to produce a crude chemical weapon (Sarin) but when it also tried to get hold of anthrax and botulinum toxin, but was unsuccessful. In the case of anthrax, for instance, Aum Shinrikyo worked with an inactive strain. Aum launched nine or ten biological attacks – all of them failed and no one was killed. Several other groups have played with biological toxins, especially Ricin but as a toxin it is not contagious and it is not a weapon of mass destruction. Its main uses have been for individual assassinations. As such it has been used by secret services though government secret services have much more effective poisons than Ricin.

While we have so far seen no radiological and nuclear attacks by non-state terrorists, we have seen a small series of biological attacks in the form of the Anthrax-powder laced letters distributed in October and November 2001 in the United States. These letters infected 23 people of which 5 died. However, we should remember that the Anthrax attack was, most probably, the work of an insider from a US government bio-weapon laboratory and not the work of jihadists. Coming so soon after 9/11, it was, however, considered by many as the work of jihadist terrorists.

Jihadists often consider biological weapons as the 'poor man's atomic weapon'.



Table 14 : Al Qaeda in Iraq on the use of biological weapons – Quote from Website of al-Tawhid wal Jihad

“Biological weapons are considered the least complicated and the easiest to manufacture from [sic] weapons of mass destruction. All the information concerning the production of these weapons is readily available in academic books, scholarly publications and even on the Internet.... In addition to the ease of production, these weapons are also considered to be the least affordable. With \$ 50,000 a group of amateurs can possess a biological weapon sufficient to threaten a superpower. It is for this reason that biological weapons are called the poor man’s atomic weapon”.

Source: “Biological Weapons”, *al Tawhid Wal Jihad*; cit. Sammy Smlama and Edith Bursac *Jihadist Capabilities and the Diffusion of Knowledge*. In: G. Ackerman and J. Tamsett., op. cit. (2009), p. 109.

However, you will not get very far if you are poor. In reality, it is exceedingly difficult to manufacture, weaponize and deliver lethal biological agents in significant quantities. Aum Shinrikyo, with millions of dollars in resources and dozens of academically trained scientists did not even succeed in producing anthrax of its own.

Al Qaeda has apparently planned, or tried, to experiment with biological agents. However, the interrogation of Khalid Shaykh Muhammad in 2003 revealed that Al Qaeda had not gotten very far in the acquisition or production of biological weapons.

I have seen no new information that would change this assessment. However, there can be little doubt that many jihadists have a desire to possess such weapons:

Table 15: Al-Qaeda Spokesman Suleiman Abu Gheith on CBRN (2002)

“We have the right to kill four million Americans, two million of them children...and cripple them in the hundreds of thousands. Furthermore, it is our obligation to fight them with chemical and biological weapons, to afflict them with the fatal woes that have afflicted Muslims because of their chemical and biological weapons”.

Source: cit. Robert Wesley. “Al Qaeda’s WMD Strategy after the U.S. Intervention in Afghanistan”. In: Jonathan D. Hutzley. (Ed.). *Unmasking Terror: A Global Review of Terrorist Activities*. Washington, D.C., Jamestown Foundation, 2005, p. 20.

Thank God, their intent is not yet matched by their capabilities.

Here in the United Kingdom, we have, to my knowledge, so far only seen a moderate interest in Ricin. In January 2003, six Algerians were arrested in London on suspicion of producing ricin from castor oil beans in their apartment. Apparently, they intended to use it on the London underground. However, in the end there was neither Ricin nor a laboratory found, only some recipes for making Ricin, downloaded from the Internet and some castor beans.

Al Qaeda has shown an interest in biological weapons and. In 1997-1998 recruited a Pakistani microbiologist to help them manufacture botulinum toxin and anthrax. In March 2002, US troops had discovered an abandoned unfinished in Kandhar, Afghanistan, which contained two pieces of elementary laboratory equipment and some experts believe it could have been linked to plans to develop biological weapons.

I have no information about more recent attempts by Al Qaeda to acquire or develop biological weapons. However, it is clear that Al Qaeda is less sophisticated in scientific terms than Aum Shinrikyo. Aum Shinrikyo attempted in total 9 or 10 biological weapons attacks. It failed in all nine or ten of them.

Nuclear Terrorism

The sum of all fears is that non-state terrorists manage to buy, steal or produce nuclear weapons. While some of them see possession of such a weapon as a defensive deterrent, others are more sanguine:

Table 17: Abu Mus’ab al-Zarqawi, former leader of Al Qaeda in Iraq, 30 April 2004

“If we had such a [nuclear] bomb – and we ask God that we have such a bomb soon – we would not hesitate for a moment to strike Israeli towns, such as Eilat, Tel Aviv and others”.

Source: BBC, 30 April 2004, “Al-Qaida Denies Jordan WMD Plot”; cit. Appendix A: Al-Qaida’s CBRN Activities. Compiled by Erin McNerney and Matthew Rhodes., cit. In: G. Ackerman and H. Tamsett (Eds.) p. 436.



The main bottleneck is arguably getting hold of a sufficient quantity of uranium or plutonium of the right sort. There is enough highly enriched uranium and separated plutonium in the world to make roughly 200,000 nuclear weapons – on top of the roughly 27,000 existing ones. The exact minimum quantity of fissile material needed for a nuclear weapon is not available in open sources. However, conservative estimates are readily available in multiple sources. Below is a table of rough estimates of the quantities needed:

Table 16: Nuclear Materials needed to construct an Atomic Bomb

● Plutonium (Pu-239)	7-8 kg
● Plutonium Oxides (PuO ₂)	10 kg
● Metallic Uranium (U-235)	25 kg
● Highly Enriched Uranium Oxide (U ₂ O ₅)	35 kg
● Intermediately Enriched Uranium Oxides	around 200 kg
● Low Enriched Uranium (20%)	around 1000 kg

In order to make an atomic fission weapon you need some 10 kilograms of Plutonium-239 or 50 kg highly enriched uranium (HEU). If you have sophisticated technology you can do with probably only a third of it but that requires state-of the art physics knowledge and equipment. The Hiroshima bomb contained some 60 kg of HEU (only part of which exploded), the Nagasaki bomb contained just 6kg of weapons-grade plutonium.

In technical terms, a uranium bomb is much easier to construct.

However, the main obstacle is not construction, it is acquisition of highly enriched uranium or plutonium. The enrichment process is a complicated one and so far, only Aum Shinrikyo, which bought a uranium mine in Australia, considered for a while to go down this road among non-state actors. Given the difficulties states like Iran have to enrich uranium, it is clearly something beyond the possibilities of any non-state actor. It makes more sense to try to buy or steal some of the 2,000 or more tons of HEU or the 500 or more metric tons of Plutonium in the world. Yet so far that has, to my knowledge, not occurred. It makes even more sense to attack the sites where uranium and plutonium is kept. The most vulnerable sites are probably some 130 university research reactors.

Table 18: Distribution of Highly Enriched Uranium (HEU) and Plutonium (Pu) in the World
HEU:

< 99% in the possession of Russia, the United States, France, United Kingdom, and China

1% spread out among 40 countries (inc. India, Pakistan, North Korea and Israel), in about 100 sites worldwide – most of it in over 130 often ill-protected research reactors

Pu:

250 metrics tons of separated plutonium in military stockpiles

250 metric tons in civilian stocks

Most Pu in Russia, United States, France, Germany, United Kingdom; some in Belgium, China, India, Israel, Japan, North Korea, Pakistan, and Switzerland.

Source: Charles P. Blair. *Jihadists and nuclear weapons*. In: G. Ackerman and J. Tamsett (Eds.), *op. cit.*, p. 199; Brian Finaly and Jeremy Tamsett. *Global and National Efforts to Prevent Jihadist Access to WMD*. In: G. Ackerman and J. Tamsett (Eds.), *op. cit.*, p. 292.

One fear is that jihadists manage to get hold of the warheads or fissionable material in Pakistan That country is said to have enough Plutonium and Uranium for 60-130 nuclear weapons. However, more than 10,000 troops guard the nuclear capability of Pakistan and extremists have been excluded from guarding duties. In addition, the nuclear core, non-nuclear components of the device and the delivery vehicle are believed to be stored in separate locations. However, suspected sites where Pakistan might keep its nuclear warheads, like Sargodha Air Force Base and the Kamra Air Weapon Complex (AWC) have been the target of jihadist plots and in some cases actualized strikes, including a suicide attack which killed eight people and wounded 27 others.

Bin Laden has tried to get hold of nuclear material since at least 1993 when he attempted, while in Sudan, to purchase uranium, reportedly for \$ 1.5 million.

However, due to their own ignorance and incompetence, Bin Laden's men were being fleeced by scam



artists, probably more than once. There is documentation of further attempts, most, and quite possibly all of them unsuccessful.

Table 19: Osama Bin Laden/Al Qaeda: pre 9/11 Attempts to Obtain R & N Materials

- In 1993, Jamal Ahmed Mohamed Al-Fadi, a senior bin Laden operative testified that he had tried to buy a cylinder of what he thought was enriched South African uranium for \$ 1.5 million from a Sudanese military commander in Khartoum;
- One of the Al-Qaeda members involved in the east-African US Embassy bombings in August 1998 claimed to have paid \$ 10,000 to buy uranium from a former Sudanese army officer;
- In March 2000, Uzbek custom officials at the border between Uzbekistan and Kazakhstan discovered 10 lead-lined containers with substantial amounts of radioactive material in a truck driven by an Iranian and ostensibly intended for a company in Quetta, Pakistan;
- In the summer of 2000, Bin Laden had 'extensive discussions' in Kabul with Dr. Bashiruddin Mahmood and Dr. Abdul Majid, two Pakistani scientists on nuclear, biological and chemical weaponry whereby he talked of radiological material acquired for him by the Islamic Movement of Uzbekistan and reportedly requested assistance for making a small nuclear or 'dirty bomb'.

Sources: Philip Webster and Roland Watson. Bin Laden's nuclear threat. *The Times*, 26 Oct. 2001; Robert Hutchinson. The struggle for control of radioactive sources. *Jane's Intelligence Review*, 1 April 2003, at <www.janes.com>, pp. 2-3; Joshua Sinai. New, The Specter of Radiological and Nuclear Terrorism. *Jane's Chem/Bio Web*, at www.janes.com, posted 6 June 2003, p.5; Robert Hutchinson. JTIC Exclusive: Weapons of Mass Disruption – The Terrorist Viewpoint (Part 2). *Jane's Terrorism and Insurgency Centre*, 12 July 2004, at www.janes.com. David Albright et al. Bin Laden and the bomb. *Bulletin of the Atomic Scientists*, Vol. 58, No. 1, January/February 2003, p. 2; G. Cameron. Nuclear Terrorism: Reactors & Radiological Attacks after September 11. Vienna, IAEA Meeting 2/11/01 Conference Paper, p. 319; M.J. Gohel and S.M. Gohel. Al-Qaida and the WMD Threat. *Asia-Pacific Foundation*, London, 23 February 2004, p.38.

In 2001, three weeks before the 9/11 attacks, Bin Laden met with the former chairman of the Pakistan Atomic Energy Commission, Sultan Bashir-ud-din Mahmood, an expert in uranium enrichment and plutonium production and, until 1999, head of Pakistan's Khosab nuclear reactor complex. Together with another PAEC scientist, Abdul Majid, he stayed for a few days with Bin Laden and Ayman al Zawahiri around a campfire in Kandahar, apparently to discuss Al Qaeda's quest for nuclear and radiological weapons. According to David Albright, a respected nuclear weapons expert, Al Qaeda is likely to have received, on that occasion "a blueprint for making nuclear weapons" as well as "classified information about producing nuclear weapons...or of facilitating access to others in the Pakistani nuclear program who had that knowledge". During one meeting Bin Laden told them about radiological material given to him by the Islamic Movement of Uzbekistan. He asked them how he could weaponize it but was apparently told that the material was insufficient for use as a weapon. If true, this implies that Al Qaeda has some materials for making a radiological weapon. When after 9/11 coalition forces took possession of documents belonging to Al Qaeda, some of them were apparently more sophisticated than what you can find in open sources through the internet. One document contained, according to Matthew Bunn, "one fact about initiating a nuclear chain reaction that remains classified....". After 9/11 Al Qaeda's attempts to procure intact nuclear weapons and weapons' grade materials have apparently continued but we have no indication that these were successful – or, for that matter, unsuccessful.

However, there have been scares in the intelligence world. Exactly one month after 9/11, for instance, President Bush was told that Al Qaeda had acquired a ten-kiloton Russian nuclear warhead and, reportedly, that this device had already been smuggled into the United States and was actually in New York. At the same time there was intelligence coming in that Russia had lost a similarly sized weapon. In the end the Department of Energy's Nuclear Emergency Search Team (NEST) found nothing and the intelligence provided by the covert CIA source (code-named *Dragonfire*) was judged to be incorrect.

The most likely nuclear scenario in the near future is, in my view, that of a Mumbai style or 9/11 style attack on a nuclear facility such as a university research reactor. In fact, the mastermind of 9/11, Khalid Sheikh Mohammed said in June 2002 that "... we first thought of striking at a couple of nuclear facilities but decided against it for fear it would go out of control". Indeed, in a Al Qaeda cache in abandoned Al Qaeda camps and facilities, documents were found in January 2002 with diagrams of U.S. nuclear power plants. That scenario also applies to Europe. In the wake of the Casablanca bombing of 2003, plans were found indicating that members of Al Qaeda had trained Moroccans to attack a French nuclear power plant at Cap de la Hague. Such an attack is feasible and has in fact already taken place in South Africa two years ago (Nov 2007) against the Pelindaba nuclear facility where hundreds of kilograms of HEU are stored.



Table 20: 2007 Attack on South Africa's Pelindaba nuclear facility

"On the night of November 8, 2007, two teams of armed men attacked the Pelindaba nuclear facility in South Africa, where hundreds of kilograms of weapons-grade highly enriched uranium (HEU) are stored.

One of the teams fired on the site security forces, who fled. The other team of four armed men disabled the detection systems at the site perimeter – possibly using insider knowledge of the security system – cut a hole in a 10,000-volt security fence, entered without setting off any alarm, broke into the emergency control center, and shot a worker in the chest after a brief struggle.

The worker at the emergency control center raised an alarm for the first time. The intruders spent 45 minutes inside the secured perimeter without ever being engaged by site security forces, and then disappeared through the same hole they had cut in the fence. No one on either team was shot or captured".

Source: Matthew Bunn. *Securing the Bomb* 2008. Cambridge, Mass, Harvard University, Nov. 2008, p. 3.

There have been several plots along these lines: In August 2003, Canadian police arrested 19 Pakistani-born residents in Canada whose activities included surveillance of a Canadian nuclear power plant and airplane lessons involving flights over a nuclear power plant. However, a direct connection between these men and a terrorist group has not been established. There has also been terrorist interest in the Sydney, Australia Lucas Heights nuclear reactor from the side of Frenchman Willie Brigitte who had been trained at a Lashkar-e-Toiba camp in Pakistan in September of 2001.

The International Atomic Energy Agency has admitted that nuclear power plants were not designed to withstand the impact of a large jumbo jet.

In 2002, the CIA reportedly intercepted a message from an Al Qaida member who boasted that Osama bin Laden was planning to carry out a "Hiroshima" against the United States. In another case, an alleged Tunisian Al-Qaeda member "confessed" in 2003 that he was involved in plans to drive a truck bomb into the US Air Force base at Kleine Brogel (Belgium) where nuclear weapons storage and security system vaults contain tactical nuclear weapons with yields of 100 and 500 kilotons each.

Here in the United Kingdom Sellafield is an attractive target as it has reportedly the world's biggest stockpile of plutonium and uranium while its storage tanks contain highly volatile radioactive waste. Attacking such a nuclear power plant could, according to one calculation lead up to 10,000 fatalities.

Table 21: Possible Scale of Terrorist Attacks

<i>Type of Attack</i>	<i>Possible Fatalities</i>	<i>Estimated likelihood</i>
● Very efficient biological attack	1,000,000	Very low
● Atomic bomb detonated in major US city	100,000	Very low
● Successful attack on nuclear or toxic chemical plant	10,000	Very low
● Simple, rel. inefficient biological or chemical attack in one skyscraper or stadium	1,000	Low
● Conventional attack on a single train or airplane	250-500	Low
● Suicide attack with explosives or firearms in a shopping mall or crowded street	50-100	Modest

Source: Adapted from Office of Technology Assessment. *Proliferation of Weapons of Mass Destruction: Assessing the Risks*. U.S. Congress, 1993; cit. Michael E. O' Hanlon et al. *Protecting the American Homeland. A Preliminary Analysis*. Washington, D.C., Brookings Institution Press, 2002, p.6.



Conclusions

More than seven years have passed since 9/11 and Al Qaeda has not managed to pull off an attack of similar magnitude. In order to keep or re-gain its credibility as a serious actor, Al Qaeda is under pressure to come up with something matching, and preferably surpassing the four simultaneous attacks of 9/11 which killed almost 3,000 people and produced up to \$ 40 billion in damage.

Counter-terrorist security measures have weakened Al Qaeda and if Al Qaeda wants to show strength it must be tempting to look for a qualitatively different type of attack – one involving CBRN materials since these are widely – but, as I tried to demonstrate, in part erroneously - seen as weapons of mass destruction. There is, therefore, a certain logic to Al Qaeda seeking such unconventional weapons and indeed, since the early 1990s Bin Laden has been consistently striving to acquire weapons of mass destruction. However, to my knowledge, there is no credible evidence that Al Qaeda has succeeded or is likely to succeed in the near future to lay its hands on weapons of mass destruction. Nevertheless, last December the US government released a “Report of the Commission on the Prevention of WMD Proliferation and Terrorism”. It identified Jihadists as key threats for using WMD and urged that “unless the world community acts decisively and with great urgency, it is more likely than not that a weapon of mass destruction will be used in terrorist attack somewhere in the world by the end of 2013”. It is perhaps no accident that 2013 was chosen – it contains the unlucky number 13. There is an element of self-fulfilling prophecy in how we talk in public about these matters. Al Zawahiri said in 1999: “The enemy started thinking about these [biological] weapons before WWI. Despite their extreme danger, we only became aware of them when the enemy drew our attention to them by repeatedly expressing concerns that they can be produced simply with available materials...” Many, including Lord West, have discussed the CBRN threat from non-state terrorists too often in terms of “it is not a question of if, only when”. Now we have been given the year 2013 as “when” chances are more than 50 percent”. There is a thin line between expressing a warning in public and being alarmist. Too often politicians and stakeholders in the homeland security industry have been playing politics with CBRN worst case scenarios for reasons that have little to do with public awareness raising and much with creating new lines of production and additional jobs in the homeland security industry. There is reason for concern but that concern needs to be shared with the public and the media in a much more responsible manner than has been done so far.

Yes, there is a threat that terrorists in general and jihadists in particular will succeed in obtaining some CBRN agents and materials that can potentially lead to massive casualties and mass destruction. However, that threat is at best moderate for chemical and radiological weapons. That threat would be very serious if non-territorial terrorists manage to master biological and nuclear terrorism. Yet there is no sign of that in the near future. Rather than engaging in scaremongering, we need to develop solid and evidence-based metrics to make better risk assessments. On the one hand, we have to weigh the factors that facilitate terrorist acquisition of CBRN agents and materials, factors like these:

Table 22: Terrorist Use of Weapons of Mass Destruction: Facilitating Factors

1. Some of the current conflict zones (e.g., in the Caucasus) contain civilian nuclear facilities or research institutes that can be used for theft or fabrication of WMD;
2. The civilian nuclear industry produces huge amounts of plutonium which, especially if separated, is attractive to thieves;
3. The information revolution (Internet), in combination with the migration of nuclear physicists, has increased the likelihood of people getting access to critical information about how to produce a nuclear weapon;
4. Organized crime might become involved in the procurement and transport of nuclear materials.
5. Concealment and transport of some of these weapons is, due to their small size, relatively easy;
6. Urbanization has increased the chance of mass fatalities in the case of an attack.

Source: Alex P. Schmid. *Terrorism and The Use of Weapons of Mass Destruction: From Where The Risk? Terrorism and Political Violence*, Vol. 11, No. 4, Winter 1999, pp. 120-121.

On the other hand, we also have to weigh the factors that work against terrorist use of weapons of mass destruction – factors like these:

Table 23: Terrorist Use of Weapons of Mass Destruction: Inhibiting Factors

1. General reluctance to experiment with unfamiliar weapons;
2. Lack of familiar precedents;
3. Fear that weapon would harm the producer (radiation hazard) or user;



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4. Fear of alienating relevant constituencies and potential supporters on moral grounds;
5. Fear of unprecedented governmental crackdown and retaliation to them, their constituencies or sponsor states;
6. Lack of a perceived need for indiscriminate, high-casualty attacks for furthering goals of the group;
7. Lack of money to buy nuclear material on the black market.

Source: partially based on Ron Purver. 'Chemical and Biological Terrorism: The Threat According to the Open Literature', *Canadian Security Intelligence Service*, June 1995, p. 7.

On the basis of careful assessments of the pros and cons for each well-resourced and highly motivated terrorist group, religious sect and criminal gang, we need to take appropriate counter-measures. However, we also have to look at the broader picture and take more general counter-measures:

Table 24: Five Measures to Counter the Threat of Biological, Chemical and Nuclear Terrorism

1. Intelligence collection priorities ought to focus more strongly on proliferation issues associated with certain types of jihadist groups and religious sects, racist groups and others who might be tempted to acquire weapons of mass destruction;
2. Trade in (precursor) materials for biological, chemical and nuclear substances must be subjected to better monitoring and greater control;
3. Existing conventions in the field of biological, chemical and nuclear weapons, terrorism and organized crime must be strengthened by adding (better) monitoring, implementation and sanction mechanisms;
4. International cooperation to counter proliferation and terrorism must be enhanced and bureaucratic red tape and turf fighting have to be dealt with by creating more flexible and intelligent organizations;
5. Existing government stockpiles of NBC weapons must be better guarded and accounted for, and gradually be phased out and destroyed. A credible multilateral NBC disarmament program by governments will also put moral pressure on non-state actors to refrain from the acquisition of such weapons.

Let me try to summarize my conclusions:

Table 25: Conclusions

- ✓ *Attacks with CBRN materials and agents are not necessarily producing mass casualties or mass destruction.*
- ✓ *A number of Islamist terrorist groups have expressed an intention to use CBRN materials and agents and not just as a defensive deterrent.*
- ✓ *However, their capabilities are at the present time, in most cases, very low or non-existent.*
- ✓ *Most likely is a chemical attack, followed by a radiological attack;*
- ✓ *A serious biological threat is currently beyond the means of most, and probably all, existing terrorist groups without state support;*
- ✓ *The same is even more true for exploding an improvised nuclear device;*
- ✓ *However, a successful suicidal attack on a nuclear power plant or storage site is a distinct possibility while such an attack on a chemical-industrial complex is an even higher possibility.*
- ✓ *In order to continue to be taken seriously, AQ might aim to produce an event bigger than 9/11 and if it cannot do so in terms of producing more casualties, it might seek a qualitative quantum jump with the help of CBRN materials and agents, especially a radioactive dispersal device ("dirty bomb").*
- ✓ *There is only a very low B & N risk of catastrophic terrorism but it is nevertheless real;*
- ✓ *On the other hand, C & R attacks are more probable than B & N terrorism but pose a lower risk of mass casualties than attacks employing B & N devices.*

In general, when it comes to CBRN terrorism, we are still talking about low-probability but potentially high consequence events. Even if the terrorists managed to assemble enough highly enriched uranium for an atomic bomb, it is, in my view, more likely that it would "fizzle" rather produce a nuclear explosion – in which case it would become a "dirty bomb".

The title of my talk was "The CBRN Threat in World Context – How Real is the Threat? I have so far not given you this "World Context" and I am running out of time. My second last PowerPoint does place the Risk of Being Killed by Terrorism only in an American context:



Table 26: Death Risk from Various Causes vs. Terrorism (USA)

<i>How Americans Might Die</i>	<i>Lifetime Odds (1 in--)</i>
● Heart Disease	1 in 5
● Cancer	1 in 7
● Motor-vehicle accident	1 in 100
● Suicide	1 in 121
● Firearm assault	1 in 325
● Drowning in your bathtub	1 in 10,455
● Being struck by lightning	1 in 83,930
● Death from dog attack	1 in 147,717
● Death from terrorism (in the period 1997 to 2006)	1 in 1,000,000

Source: Daniel Byman. *The Five Front War*. Hoboken, N.J., John Wiley & Sons, Inc, 2008, p. 153; Brian Jenkins. *Unconquerable Nation: Knowing Our Enemy, Strengthening Ourselves*. Santa Monica, RAND, 2006, pp. 154-155.

We have spent 597 billion dollars on fighting terrorism in general since 9/11. The American government alone has spent more than 50 billion dollars in preparing against bioterrorism. These are enormous sums of money with which one could do so much in other areas where the threat is more real and already present. That is expressed in the last PowerPoint:

Table 27: Annual Global Mortality Rates: Bioterrorism vs. Chemical and Biological and Viral Calamities

● HIV/TB/Malaria	6.0 million
● Diarrheal Diseases	3.5 million
● Measles	0.5 – 1.0 million
● Smoking	5.0 million
● Persons killed by CBRN agents and materials (average per year, 1998-2006)	12 (one dozen)
Total:	15. – 15.5 million

Source: Partly adapted from Milton Leitenberg. *Assessing the Threat of Biological Weapons and Bioterrorism: A Public Policy Issue*. University of Maryland, 18 March 2009.

David Rapoport, reviewing the evidence so far regarding CBRN, has concluded that they have until now, turned out to be weapons of minimum destruction. In 2007, more than 14,000 people were killed by acts of conventional terrorism. As you can see, less than one in thousand is, in the average, killed by non-conventional CBRN agents and materials. When only a dozen people are killed – is our concern for CBRN agents and materials not disproportional?

The problem we face is still one of high risk but low probability. That poses a policy dilemma.

Table 29: Policy Dilemma of Priority Setting in Contingency Planning: Preparing for Ordinary or Extraordinary Events

<i>Probability of occurrence</i>	<i>Impact of event</i>
1. frequent	1. catastrophic
2. probable	2. critical
3. occasional	3. marginal
4. remote	4. negligible
5. improbable	



Should we invest in preparing ourselves for rare and even remote contingencies or should we focus on the more immediate deadly terrorist attacks with conventional weapons? After all, more people have been killed by the Kalashnikov than by nuclear weapons since the Second World War. Given the relative rarity of CBRN attacks, my final suggestion would be to deal with CBRN threats not exclusively in the framework of counter-terrorism but embed confronting such threats in a broader all-hazards approach that might prevent a whole range of other contingencies, from industrial accidents to natural catastrophes like pandemics. ■

CBRN INCIDENTS TIME LINE

An update from the C²BRNE Diary Editor

Chemical

Terrorism

June 1994	The Matsumoto sarin attack was an attempted assassination perpetrated by members of the Aum Shinrikyo doomsday cult in Matsumoto, in Japan's Nagano prefecture, on the night of June 27, 1994. Eight people were killed and over 500 were harmed by sarin aerosol that was released from a converted refrigeration truck in the Kaichi Heights area. The sarin attack occurred in a quiet residential area in the city of Matsumoto in Nagano Prefecture. Aum Shinrikyo had two goals; to attack three judges who were overseeing a lawsuit concerning a real-estate dispute which was predicted to go against the cult, and to test the efficiency of its sarin — which the cult was manufacturing at one of its facilities — as a weapon of mass-murder. The attack was perpetrated nine months before the better-known Tokyo subway sarin attack.
March 1995	The Tokyo subway sarin attack was an act of domestic terrorism perpetrated on 20 March 1995, in Tokyo, Japan, by members of the cult movement Aum Shinrikyo. In five coordinated attacks, the perpetrators released sarin on three lines of the Tokyo Metro (then part of the Tokyo subway) during rush hour, killing 13 people, severely injuring 50 (some of whom later died), and causing temporary vision problems for nearly 1,000 others. The attack was directed against trains passing through Kasumigaseki and Nagatachō, where the Diet (Japanese parliament) is headquartered in Tokyo. More than 6000 “worried-well” citizens seek medical assistance while not actually contaminated or present at the incidence sites.
2017	Several documents from the “ Knights of Lone Jihad ” series, released by <i>Furat Wilayah</i> Channel in English in 2017, specifically suggested CBRN scenarios involving food and water contamination as possible terrorist tactics for lone actors.
July 2017	A plot to create an improvised dispersal device to release toxic hydrogen sulfide gas , which was disrupted in Australia when the suspects were arrested, illustrates the intent of jihadist terrorists to use chemical weapons in a terrorist attack in the West.
December 2017	Anarchists published threats on the internet to contaminate food products in Athens and Thessaloniki in Greece. An activist group claimed to have deliberately introduced hydrochloric acid in soft drinks, milk, sausages and sauces. A post by user Green-Black Commando titled “ Green Nemesis Act 3 ” on the Athens Indymedia website warned that the group had poisoned several drink products of multinational companies.

Assassination

February 2017	The assassination of Kim Jong-nam occurred on 13 February 2017 when he was attacked with VX nerve agent at Kuala Lumpur International Airport, Malaysia. Kim Jong-nam was the eldest son of deceased North Korean leader Kim Jong-il and the half-brother of current North Korean leader Kim Jong-un. Four North Korean suspects left the airport shortly after the assassination and reached Pyongyang without being arrested. Other North Koreans were arrested but were released without charge. Two women, one Vietnamese, the other Indonesian, were charged with murder. They claimed they thought they were part of a TV prank. In 2019, the murder charges were dropped. The
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	Vietnamese woman, Đoàn Thị Hương, pleaded guilty to "voluntarily causing hurt by dangerous weapons or means" and was sentenced to three years and four months. It is widely believed that Kim Jong-nam was likely murdered on the orders of Kim Jong-un.
March 2018	On 4 March 2018, Sergei Skripal, a former Russian military officer and double agent for the UK's intelligence services, and his daughter Yulia Skripal were poisoned in Salisbury, England, with a Novichok nerve agent, according to official UK sources and the Organisation for the Prohibition of Chemical Weapons (OPCW). After three weeks in a critical condition, Yulia regained consciousness and was able to speak. She was discharged on 9 April 2018. Sergei was also in a critical condition until he regained consciousness one month after the attack. He was discharged from hospital on 18 May 2018. A police officer was also taken into intensive care after apparent exposure to the remnants of the toxic agent at Sergei Skripal's residence. By 22 March he had recovered enough to leave the hospital

Accidental exposure (Belgium; Baltic Sea; Adriatic Sea; China; Japan)

- https://www.researchgate.net/publication/318661260_CHEMICAL_WEAPONS_DUMPED_IN_THE_BALTIC_SEA_FACT_S_TENDENCY_AND_PREDICTION_OF_LEVEL_AND_SCALES_OF_POSSIBLE_ECOLOGICAL_DISASTER
- <http://www.helcom.fi/baltic-sea-trends/hazardous-substances/sea-dumped-chemical-munitions>
- <http://www.helcom.fi/baltic-sea-trends/hazardous-substances/sea-dumped-chemical-munitions/guidelines-for-fishermen>
- <https://www.telegraph.co.uk/news/2019/05/02/first-world-war-mustard-gas-leaks-belgian-underwater-grave/>
- <https://www.armscontrol.org/act/2008-03/looking-back-continuing-legacy-old-abandoned-chemical-weapons>
- https://www.researchgate.net/figure/Map-of-sampling-sites-in-the-southern-Adriatic-CWA-dumping-site-and-Tyrrhenian-Sea_fig1_225545724

Biological

Terrorism

November 1984	In Oregon, followers of the Bhagwan Shree Rajneesh attempted to control a local election by incapacitating the local population. This was done by infecting salad bars in 11 restaurants, produce in grocery stores, doorknobs, and other public domains with <i>Salmonella typhimurium</i> bacteria in the city of The Dalles, Oregon. The attack infected 751 people with severe food poisoning. There were no fatalities. This incident was the first known bioterrorist attack in the United States in the 20th century. It was also the single largest bioterrorism attack on U.S. soil.
June 1993	In June 1993, the religious group Aum Shinrikyo released anthrax in Tokyo. Eyewitnesses reported a foul odor. The attack was a failure, as it did not infect a single person. The reason for this is that the group used the vaccine strain of the bacterium. The spores recovered from the attack showed that they were identical to an anthrax vaccine strain given to animals at the time. These vaccine strains are missing the genes that cause a symptomatic response.
September and October 2001	Several cases of anthrax broke out in the United States, apparently caused deliberately. Letters laced with infectious anthrax were concurrently delivered to news media offices and the U.S. Congress, alongside an ambiguously related case in Chile. The letters killed 5.
November 2011	Pakistan's prime minister , Yousaf Raza Gilani, received a postal package containing anthrax spores.
October and November 2013 & February 2014	Two ricin-laden letters found on two separate occasions between October and November 2003. One letter was mailed to the White House and intercepted at a processing facility; another was discovered with no address in South Carolina. A February 2004 ricin incident at the Dirksen Senate Office Building was initially connected to the 2003 letters as well. The letters were sent by an individual who referred to themselves as "Fallen Angel". The sender, who claimed to own a trucking company, expressed anger over changes in federal trucking regulations. As of 2008, no connection between the Fallen Angel letters and the Dirksen building incident has been established. A \$100,000



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	reward was offered in 2004 by the federal law enforcement agencies investigating the case, but to date the reward remains unclaimed.
October 2018	Someone appears to have sent envelopes stuffed with ricin to the US government. The tests need to be confirmed, but two suspicious letters to the Pentagon were caught in an off-site mail screening. No one was exposed. The same person is also reported to have sent letters to Senator Ted Cruz and to the White House, though the contents of those have not been confirmed to contain ricin.
March 2019	19 letters, addressed to prominent journalists, politicians and trade unionists, have been intercepted by police at the central Post Office in Tunis and taken for testing. It's unclear at this stage how many letters have been sent. The Tunisian counter-terrorism agencies have revealed in their preliminary investigations that the envelopes delivered to politicians, journalists and syndicate members contained the Anthrax toxin. This was the first terrorist plot of its kind in the country.

Hoaxes: Many cases of "white powder" in letters have been recorded worldwide – including Greece (Jan 2019: National Technical University of Athens; Universities of Crete, Korfu and Thessaly).

Accident

April 1979	On 2 April 1979, spores of anthrax were accidentally released from a Soviet military research facility near the city of Sverdlovsk, Russia (now Yekaterinburg). The ensuing outbreak of the disease resulted in approximately 100 deaths, although the exact number of victims remains unknown. The cause of the outbreak was denied for years by the Soviet authorities, which blamed the deaths on consumption of tainted meat from the area, and subcutaneous exposure due to butchers handling the tainted meat. All medical records of the victims were removed to hide serious violations of the Biological Weapons Convention. The accident is sometimes referred to as "biological Chernobyl". The death toll was at least 105 people but the exact number is unknown, as all hospital records and other evidence were destroyed by the KGB.
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Toxins

Assassination

September 1978	Georgi Ivanov Markov was a Bulgarian dissident writer. Markov originally worked as a novelist and playwright in his native country, the People's Republic of Bulgaria, until his defection in 1968. After relocating to London, he worked as a broadcaster and journalist for the BBC World Service, the US-funded Radio Free Europe and West Germany's Deutsche Welle. Markov used such forums to conduct a campaign of sarcastic criticism against the incumbent Bulgarian regime, which, according to his wife at the time he died, eventually became "vitriolic" and included "really smearing mud on the people in the inner circles". Georgi Markov was assassinated on a London street via a micro-engineered pellet containing ricin, fired into his leg from an umbrella wielded by someone associated with the Bulgarian Secret Service. It has been speculated that they asked the KGB for help.
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Radiological

Terrorism – no RDD detonation recorded so far!

November 1995	Moscow, Russia —In the first-ever attempt at radiological terror, a group of Chechen rebels contacts a Russian television station and boasts of its ability to construct a radioactive bomb. The rebels alert the press that they have buried a cache of radiological materials in Moscow's Ismailovsky Park. In the very spot where the rebels indicated it would be, authorities find a partially buried container of cesium. Neither the Chechens who planted it there nor the original source of the cesium are ever identified.
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December 1998	Argun, Chechnya —The head of the Russian-backed Chechen Security Service, Ibragim Khultygov, announces that a Security Service team has found a container filled with radioactive materials and attached to an explosive mine hidden near a railway line. They safely defuse the bomb but do not identify the radioactive substances involved. The location of the discovery—in a suburban area 10 miles east of the Chechen capital of Grozny, where a Chechen rebel group is known to operate an explosives workshop—leads nuclear specialists to suspect Chechen rebels' involvement in the incident. Shamil Basayev, the rebel leader who phoned in the dirty-bomb threat in Moscow three years earlier, is the known chief of the explosives workshop near Argun.
March 2004	Operation Crevice was a raid launched by Metropolitan and local police in England on the morning of 30 March 2004. It was in response to a report indicating cells of terrorists of Pakistani origin operating in the Thames Valley, Sussex, Surrey and Bedfordshire areas, the source of which was said to be an interception of an instruction sent from Al-Qaeda leaders in Pakistan to militants in Britain. The operation resulted in five men being found guilty in April 2007 of conspiring to cause explosions likely to endanger life. The allegations brought up by the witness testimony and evidence included planning to buy a radio-isotope bomb from the Russian mafia in Belgium and plotting to poison football crowds by selling spiked drinks at matches, and sell poisoned food from a takeaway restaurant
August 2004	Dhiren Barot (aliases: Bilal, Abu Musa al-Hindi, Abu Eissa al-Hindi, and Issa al-Britani; born December 1971) is a convicted Indian-born British terrorist who was arrested on 3 August 2004 with many offences among which he was charged for conspiracy to commit a public nuisance by the use of radioactive materials, toxic gases, chemicals and or explosives. Barot admitted to plotting to bomb the New York Stock Exchange, the International Monetary Fund headquarters, and the World Bank, among other targets. In April 2007 it was revealed that he planned to use limousines packed with explosives and radioactive "dirty" bombs for the attacks.
April 2015	A Phantom 2 drone carrying traces of radiation was found on the roof of the Japanese Prime Minister's Official Residence. It had been controlled by Yasuo Yamamoto, an anti-nuclear protester from Fukui Prefecture. Yamamoto flew the drone there carrying sand containing cesium from Fukushima prefecture on April 9, but the drone was not discovered until April 22. This caused substantial embarrassment to the authorities, both for the security breach and for the delayed discovery of the drone. Yamamoto was later given a two-year suspended sentence, and the incident led to wide-reaching changes to regulations on drones in Japan. This along with other incidents led to authorities in Japan becoming much more aware of issues related to drones.

Theft/orphan sources' exposure

September 1987	Goiania, Brazil —A scrap-yard worker pries open a lead canister that was scavenged from an abandoned cancer treatment center and dumped at the yard five days earlier. Inside the canister the man is delighted to find a sparkling blue powder; he has no idea the powder is radioactive cesium. Curious residents living near the junkyard pass the canister from home to home for nearly a week. All told more than 200 people are exposed to the cesium. The incident—a radiation disaster second only to Chernobyl in size and scope—causes the deaths of four people, including a six-year-old girl who rubbed the powder over her body and hair so that she glowed. The radioactivity contaminates soil, businesses, and homes, 85 of which are leveled during the cleanup process.
March 1998	Greensboro, North Carolina —Nineteen small tubes of cesium go missing from a locked safe in Moses Cone Memorial Hospital. Each only three-quarters of an inch long by one-eighth of an inch wide, the tubes were being stored for use in the treatment of cervical cancer. Though local, state, and federal officials scour the city using sophisticated radiation-sensing equipment, the cesium is never recovered. Authorities believe whoever stole the cesium tubes—for the loss is officially listed as a theft—may have been trained to handle the material, since unprotected contact with the tubes



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	could have caused serious injury or even death. After the loss, the hospital takes steps to better secure its nuclear assets.
September 1999	Grozny, Chechnya —Unidentified thieves attempt to steal a container of radioactive materials from the Radon Special Combine chemical factory. Half an hour after being exposed to the container, one of the suspects dies and the other collapses, even though each held the container for only a few minutes while trying to carry it out of the factory. The surviving suspect is hospitalized in critical condition, but he recovers and is placed under arrest. Chechen officials do not discuss his case publicly, nor do they identify the type of radioactivity involved in the incident, saying only that the container held 200 grams of "radioactive elements."
June 2001	Kandalaksha, Russia —Two people in Russia's Murmansk region receive powerful doses of radioactivity and are hospitalized after plundering a nuclear-powered lighthouse, one of 132 such lighthouses located along Russia's northern coast. The scavengers say they were trying to extract lead from the lighthouse for sale as scrap metal and were unaware of its dangerous strontium power source. Inspectors later detect elevated radiation levels for hundreds of feet on the route along which the two carried a leaking lead container before abandoning it. Though Russia's Soviet-era nuclear lighthouses were originally designed to withstand earthquakes and even planes crashing into them, after years of neglect these unguarded and uninspected structures are easily dismantled by thieves. In January 2003, the U.S. government announces a plan to aid Russia in safely replacing the energy sources of all of its nuclear lighthouses.
December 2001	Lja, Georgia —Three woodcutters discover two heat-emanating containers near their campsite in the remote Abkhazia region of the Caucasus. Hoping to use the containers as a heat source, the men drag them back to their tents. Within hours they become ill with nausea, vomiting, and dizziness, and leave the site to seek treatment at a local hospital. Later, the men develop severe radiation burns on their backs. The International Atomic Energy Agency (IAEA) dispatches a team to recover the containers, but severe weather prevents them for more than a month from reaching the campsite and securing the materials. When the IAEA team finally reaches the containers in February 2002, they discover that each one, previously used in Soviet-era radiothermal generators, contains 40,000 curies of strontium, an amount of radiation equivalent to that released immediately after the accident at Chernobyl.
June 2002	Chicago, Illinois —Jose Padilla, an American citizen and former Chicago gang member with known ties to Al Qaeda, is arrested in Chicago's O'Hare airport on suspicion of planning to build and detonate a dirty bomb in an American city. F.B.I agents suspect Padilla has recently undergone training in Lahore, Pakistan, where he allegedly studied the mechanics of dirty-bomb construction, including how to wire explosive devices and how to optimize bombs for radiological dispersion. Officials believe Padilla, who arrived in the U.S. carrying a suitcase packed with \$10,000 in cash, was on a reconnaissance mission for a future dirty-bomb attack. Padilla is being held as an "enemy combatant" in a military brig and may be detained indefinitely.
November 2002	Moscow, Russia —The head of Russia's nuclear regulatory agency, Yuri Vishnyevsky, announces that small amounts—a few grams here and there—of weapons-grade and reactor-grade nuclear materials are missing from the country's atomic facilities. Vishnyevsky does not provide details on when and how the materials disappeared, but he indicates that the material involved is uranium. According to experts, a few grams of weapons-grade uranium would not be sufficient to make an effective nuclear bomb, but it could provide material adequate for a dirty bomb. Moreover, small amounts of reactor-grade uranium can be enriched to weapons-grade through a process that some rogue nations possess, including Iraq. With Russia's nuclear security in severe decline due to financial troubles and disorganization, Vishnyevsky's announcement underscores a major source of concern about unsecured radioactive materials in Russia.



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January 2003	<p>Herat, Afghanistan—Based on evidence uncovered in Herat, including detailed diagrams and documents stored on computers, British intelligence agents and weapons researchers conclude that Al Qaeda has succeeded in constructing a small dirty bomb, though the device has not been found. Officials do not know how much radiation the dirty bomb could spread, but they suspect that Afghanistan's Taliban regime helped Al Qaeda build the device by providing radioactive sources from medical devices. Furthermore, Abu Zubaydah, the captured Al Qaeda lieutenant now in American custody, told interrogators that such a device existed. In Kabul, in April 2002, IAEA experts secured several powerful unguarded radiation sources, mainly cobalt, once used in medical and research applications.</p>
July 2014	<p>Iraq's ambassador to the United Nations, Mohamed Ali Alhakim, caused a stir with a letter announcing that terrorist groups had seized nearly 40 kilograms of 'uranium compounds' from Mosul University.</p> <p>https://www.theguardian.com/world/julian-borger-global-security-blog/2014/jul/13/iraq-nuclear-mosul-uranium-isis</p> <p>See also: https://www.washingtonpost.com/world/national-security/how-isis-nearly-stumbled-on-the-ingredients-for-a-dirty-bomb/2017/07/22/6a966746-6e31-11e7-b9e2-2056e768a7e5_story.html</p>

More incidents at IAEA Publications website:

<https://www.iaea.org/publications/search/topics/accident-reports>

Smuggling (indicative cases)

August 1996	<p>Five Belarusian citizens were detained on nuclear smuggling charges in the town of Borisov, roughly 60 kilometers northeast of Minsk, according to Belarusian KGB spokesman Gennadiy Senyukov. The group, which includes a Belarusian soldier, was caught by the KGB's Alpha Unit as it was preparing to ship six containers of nuclear material, reportedly worth up to \$50,000. The identity of the buyer is currently under investigation. The nuclear materials had been stored in the cellar of a private house, where radiation levels were measured at three times above normal. The Belarusian National Academy of Sciences is analyzing the highly radioactive material to determine its isotopic composition. The origin of the material is currently unknown.</p>
April 2007	<p>Two Belarus nationals were detained at the Lithuania-Belarus border on 22 April on suspicion that they attempted to smuggle radioactive cargo from Lithuania. During the inspection of the suspects' car, law enforcement officials discovered a metal container labeled in Russian Uranium-238, 1991.</p>
2010	<p>1.8kg of Uranium-238 seized in Chisinau (Moldavia) when three people tried to sell it for 9mil euros.</p>
2011	<p>Six detained for trying to sell 1kg of weapons-grade Uranium-235 for 32mil euros; they said they also had access to plutonium (Moldavia).</p>
2014	<p>Smugglers allegedly tried to sell 200gr of Uranium-235 from Russia to undercover security agents for 1.6mil USD; 1.5kg of Uranium-235 seized close to Moldovan border in Ukraine.</p>
2015	<p>Undercover agent bought ampoule of Cesium-135; materials contaminated with Cesium-137 found in central Chisinau (Moldavia).</p>
February-July 2016	<p>Three incidents within the past six months involving the attempted smuggling of radioactive materials – uranium 235 and 238, and cesium 137 – are driving concerns about Georgia. Turkey was the materials' presumed destination, some experts say. Court proceedings in the first of the cases began on July 8. Those accused in the alleged smuggling schemes face prison terms of up to 10 years, if convicted. The items transported were small in quantity, but huge in potential consequences, if ever used with malevolent intent. Uranium 235 is a fissile isotope used in nuclear reactors and atomic bombs. Uranium 238, though not fissile, can be used to produce a divisible</p>



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	isotope of plutonium, a major ingredient in nuclear weapons. Cesium 137 is a reactor-produced isotope suitable for a dirty bomb.
July 2019	Turkish authorities have begun an investigation into the case of five people who were arrested in the west of the country on suspicion of smuggling radioactive material. A statement issued by the governor's office in Bolu said on Sunday that five people had been arrested on suspicion of smuggling 18.1 grams of highly radioactive element californium used in the manufacture of nuclear warheads.

Additional sources:

- https://www-pub.iaea.org/MTCD/publications/PDF/pub1309_web.pdf
- https://fas.org/irp/cia/product/go_appendixa_032796.html
- http://www.vertic.org/media/assets/Publications/ITR_WEB.pdf
- <https://media.defense.gov/2019/Apr/11/2002115521/-1/-1/0/57TRAFFICKING.PDF>
- <https://www.nti.org/analysis/articles/nuclear-trafficking-hoaxes/>
- <https://www.nti.org/analysis/articles/cns-global-incidents-and-trafficking-database/>

Assassination

November 2016	Alexander Litvinenko was a former officer of the Russian Federal Security Service (FSB) and KGB, who fled from prosecution in Russia and received political asylum in the United Kingdom. On 1 November 2006, Litvinenko suddenly fell ill and was hospitalized. He died three weeks later, becoming the first confirmed victim of lethal polonium-210-induced acute radiation syndrome. Litvinenko's allegations about misdeeds of the FSB and his public deathbed accusations that Russian president Vladimir Putin was behind his unusual malady resulted in worldwide media coverage.
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Nuclear weapons

August 1945	The United States detonated two nuclear weapons over the Japanese cities of Hiroshima and Nagasaki on August 6 and 9, 1945, respectively, with the consent of the United Kingdom, as required by the Quebec Agreement. The two bombings killed between 129,000 and 226,000 people, most of whom were civilians, and remain the only use of nuclear weapons in armed conflict.
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Nuclear accidents

April 1986	The Chernobyl disaster was a nuclear accident that occurred on 26 April 1986 at the No. 4 nuclear reactor in the Chernobyl Nuclear Power Plant, near the city of Pripyat in the north of the Ukrainian SSR. It is considered the worst nuclear disaster in history and is one of only two nuclear energy disasters rated at seven—the maximum severity—on the International Nuclear Event Scale, the other being the 2011 Fukushima Daiichi nuclear disaster in Japan. 42 acute and delayed (several months), less than 100 at present, possibly several thousand long term extra cases of cancer.
March 2011	The Fukushima Daiichi nuclear disaster was started by the Tōhoku earthquake and tsunami on 11 March 2011. On detecting the earthquake, the active reactors automatically shut down their fission reactions. Because of the reactor trips and other grid problems, the electricity supply failed, and the reactors' emergency diesel generators automatically started. Critically, they were powering the pumps that circulated coolant through the reactors' cores to remove decay heat, which continues after fission has ceased. The earthquake generated a 14-meter-high tsunami that swept over the plant's seawall and flooded the plant's lower grounds around the Units 1–4 reactor buildings with sea water, filling the basements and knocking out the emergency generators. The resultant loss-of-coolant accidents led to three nuclear meltdowns, three hydrogen explosions, and the release of radioactive contamination in Units 1, 2 and 3 between 12 and 15 March. The spent fuel pool of



previously shut-down Reactor 4 increased in temperature on 15 March due to decay heat from newly added spent fuel rods, but did not boil down sufficiently to expose the fuel. In the days after the accident, radiation released to the atmosphere forced the government to declare an ever-larger evacuation zone around the plant, culminating in an evacuation zone with a 20-kilometer radius. Some 154,000 residents evacuated from the communities surrounding the plant due to the rising off-site levels of ambient ionizing radiation caused by airborne radioactive contamination from the damaged reactors. Large amounts of water contaminated with radioactive isotopes were released into the Pacific Ocean during and after the disaster.

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Alex P. Schmid is a Research Fellow at the International Centre for Counter-Terrorism (ICCT) in The Hague and editor of this Handbook of Terrorism Prevention and Preparedness. He is Editor-in-Chief of "Perspectives on Terrorism" and former Co-Editor of "Terrorism and Political Violence" – both leading journals in the field of Terrorism Studies. Until 2009, Prof. Schmid held a chair in International Relations at the University of St. Andrews where he was also Director of the Centre for the Study of Terrorism and Political Violence (CSTPV). Previous positions include Officer-in-Charge of the Terrorism Prevention Branch of the UN Office on Drugs and Crime in Vienna (1999-2005) and Extraordinary Professor of Conflict Resolution at Erasmus University, Rotterdam (1991-1999). Between 1978 and 2018 he also held various positions at Leiden University and its campus in The Hague. Currently, he is the Director of the Vienna-based Terrorism Research Initiative (TRI), a consortium of institutes and individual scholars seeking to enhance human security through collaborative research. Prof. em. Schmid has more than 200 publications and reports in ten languages to his name, including the award-winning volume 'Political Terrorism' (1984, 1988, 2006) and the Routledge Handbook of Terrorism Research (2011, 2013).

Latest major publication: A.P. Schmid (Ed.) [Handbook of Terrorism Prevention and Preparedness. The Hague: ICCT, 2021 \[1283 pp.\]](#)

Feds to release nontoxic particles, gases in NYC subway as part of terrorism study

Source: <https://news.yahoo.com/feds-release-nontoxic-particles-gases-020100422.html>

Oct 11 – Federal researchers will release nontoxic particles and gases into the New York City subway this month as part of a study on airborne terrorism threats, officials announced Sunday.

Researchers from the Homeland Security Department and the Massachusetts Institute of Technology aim to find "actionable data for emergency preparedness authorities," according to an advisory from the Metropolitan Transportation Authority.

The particles and gases that will be used in the study are designed to imitate biological and chemical agents, authorities said. The scientists will set up air testing devices at dozens of locations across the subway from Oct. 18-29 to conduct the study.

The Homeland Security Department did an environmental assessment of the gases and particles to be released to ensure they're safe, officials said.

It's not the first time the feds have used the city's subway system as a testing ground for potential airborne attacks.

This month's research is part of the Urban Threat Dispersion project, which in 2016 conducted similar experiments in the subway.

But U.S. officials haven't always notified straphangers they're involved in the test.

The Army in 1966 sprayed a bacteria officials said was harmless directly onto city subway riders as part of an experiment made public in 1980. The subway riders — accustomed to wild experiences underground — did not notice the test, which Army officials said made the system a prime target for a covert attack.

MTA officials promise the latest airborne tests will be much more transparent.

"Customers may see signage identifying specific locations involved in the study as they travel around New York City," the agency wrote in an advisory. "This study poses no health risks to the public, using materials that have repeatedly been used in prior outdoor and indoor airflow tests."



Kurdish student associations call for investigation into reports of Turkey's use of chemical weapons

Source: <https://anfenglish.com/features/kurdish-student-associations-call-for-investigation-into-reports-of-turkey-s-use-of-chemical-weapons-55512>

Oct 13 – The Turkish army has been using chemical weapons against the guerrillas in the mountains of southern Kurdistan for several months. For a few weeks now, a new type of chemical warfare agent has been used that is significantly stronger than the previous ones. According to HPG, the explosive effect of this weapon is extremely high, the quantities of gas released in the atmosphere develop destruction in a large area and destroy all life.

The Association of Students from Kurdistan (YXK) and the Students Women from Kurdistan (JXK) have issued a statement on this new development under the title "Bis (2-chloroethyl) sulphide and the Turkish crimes". The student associations put the questions up for discussion about what Europe has to do with it and what can be done about it.



Why does Turkey use chemical weapons?

"Turkey's illegal invasion of southern Kurdistan has been going on for more than 160 days. Despite the most modern technology and the newest weapons, which the Turkish state possesses and uses against the guerrillas, it is not making progress against the resistance of the guerrillas. We can observe that the guerrillas have adapted to the new conditions. It really has become a 21st century guerrilla. The Turkish army is desperate and is therefore resorting to the dirtiest of methods. That is why it has been using chemical weapons for months.

Who supports the Turkish chemical weapons program?

When Assad's use of poison gas against the Syrian people protesting in Syria, the Organization for the Prohibition of Chemical Weapons (OPCW) launched an investigation. It turned out that the nerve toxin sarin and chlorine gas were used. The German press reported abundantly on the cases of the use of chemical weapons in Syria. According to Tagesschau and research by the Syrian Archive and the Open Society Justice Initiative, **German companies were involved in Assad's chemical weapons program.** We must now assume that German and European companies are supporting the Turkish chemical weapons program.

NATO is the judge and Turkey the executioner

Why have no investigations started against Turkey and Erdogan? Even in the past few years, when the Turkish army used white phosphorus in Rojava against the civilian population, this was ignored by the German and European authorities, most media and the OPCW. The main difference between Turkey and Syria is that Turkey is a member of NATO. For this reason, the West is silent about the illegal use of poison gas by the Turkish army. NATO is the judge and Turkey the executioner of the international conspiracy against the Kurdish freedom movement. But we also have to ask more precisely: In October 2019, the Turkish government donated 30,000 euros to the OPCW. Can these and other gifts corrupt the OPCW?

What to do?

The headquarters of the People's Defense Center (HPG) calls on the Kurdish people abroad, women, young people and internationalists to draw attention to the crimes being committed in South Kurdistan. Above all, we as youth in Europe have a special role to play in this struggle, as the orders and decisions for these crimes are made here. We can draw attention to human rights violations in Kurdistan through social media, demos, campaigns, by contacting radios, newspapers and television or by simply speaking to friends and family. Above all, we also have to put pressure on institutions like the OPCW or the CPT to take action against the international conspiracy against Serok APO (Abdullah Öcalan) and the Kurdish movement. Those who have a conscience, who believe in the beautiful in this world, must take action to stop these unworthy crimes. Even war has its rules and ethics. Turkey violates not only human rights, but also martial law. We demand an end to the crimes against humanity! Down with fascism! High international solidarity! "

What is bis (2-chloroethyl) sulphide?

The chemical bis (2-chloroethyl) sulphide is a chemical warfare agent from the group of mustards that is harmful to the skin. Other names are mustard gas, mustard, sulphur mustard, S-mustard, yellow cross



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gas, yperite or sulfur yperite. It has not yet been proven that Turkey uses mustard gas. However, the effects of the chemical weapons used by Turkey fit the description of mustard gas. It is therefore urgent that these attacks be investigated.

- **Chemical Abstracts Service (CAS) Registry Number:** 505-60-2
- **Synonyms:** [Sulfur mustard](#); 1,1-Thiobis(2-chloroethane); 1-Chloro-2-(b-chloroethylthio)ethane; 2,20-Dichlorodiethyl sulfide; Distilled mustard; S mustard; S-lost; Schwefel-lost; Yellow cross liquid; Yperite; Kampstoff lost; HD; HT; H; Lost; HS (Hun stuff); Levinstein mustard; Mustard gas
- **Chemical/Pharmaceutical/Other Class:** Thioether
- **Molecular Formula:** C₄H₈Cl₂S
- **Chemical Structure:** Cl-CH₂-CH₂-S-CH₂-CH₂-Cl

►► **Read also:** [Bis\(2-Chloroethyl\)sulfide](#) human health effects (from Wisser)

EDITOR'S COMMENTS: (1) the CWA is not new; (2) there are no solid evidence from forensic investigation performed on-site and from victims exposed; (3) the role of European companies in the development of chemical weapons in this part of the world is known but hidden under the carpet; (4) OPCW is doing its very best to provide evidence of the use of CWAs in Syria and Iraq – this is why they were nominated the Nobel Prize (2013); I just cannot remember who was the director general before current H.E. Mr Fernando Arias (Spain).

Widely Used Chemical Linked to 100,000 American Deaths Every Year, Study Finds

Source: <https://www.sciencealert.com/study-suggests-widely-used-hormone-disrupter-chemical-linked-to-100-000-us-deaths-a-year>

Oct 13 – Daily **exposure to phthalates, a group of chemicals used in everything from plastic containers to makeup, may lead to approximately 100,000 deaths in older Americans annually**, a study from New York University warned Tuesday.

The chemicals, which can be found in hundreds of products such as toys, clothing, and shampoo, have been known for decades to be "hormone disruptors", affecting a person's endocrine system.

The toxins can enter the body through such items and are linked to obesity, [diabetes](#) and heart disease, said the study published in the journal [Environmental Pollution](#).

The research, which was carried out by New York University's Grossman School of Medicine and includes some 5,000 adults aged 55 to 64, shows that those with higher concentrations of phthalates in their urine were more likely to die of heart disease. However, higher concentrations did not appear to increase the risk of death by [cancer](#).

"Our findings reveal that increased phthalate exposure is linked to early death, particularly due to heart disease," [said study lead author Leonardo Trasande](#).

"Until now, we have understood that the chemicals connect to heart disease, and heart disease in turn is a leading cause of death, but we had not yet tied the chemicals themselves to death."

Trasande cautioned, however, that the study does not establish a direct cause and effect relationship between phthalate exposure and death, in part because the specific biological mechanisms of that relationship are unclear.

"Our research suggests that the toll of this chemical on society is much greater than we first thought," [Trasande said, adding that it](#) "is undeniably clear that limiting exposure to toxic phthalates can help safeguard Americans' physical and financial wellbeing."



Other studies have already linked phthalates to more than 10,000 deaths per year associated with reduced testosterone levels in adult men.

The study added that the economic loss due to phthalates is between \$40 billion and \$47 billion – more than four times what was previously estimated.

CBRN Patrol™ for Counter-Terrorism Monitoring

Source: http://www.resrchintl.com/CBRN_Patrol.html



The CBRN Patrol Robot is an integrated, multi-featured, remote-controlled, wheeled robotic monitoring vehicle suitable for a wide range of counter-terrorism monitoring applications. It allows the operator to test for biological contamination from a safe distance. The on-board **PTZ camera** sends real-time images to the tablet display for remote navigation. The camera can quickly convert to IR thermal mode when required.

The **biodetector** rapidly detects sudden changes in airborne bacteria, viruses, spores, or proteins. It immediately activates the **dry-filter air sampler** and notifies the operator.

A **weather station** measures and stores wind speed and angle, air temperature, and barometric pressure at the specific GPS location.

An **on-board industrial-grade computer** records all data, which can also be wirelessly transmitted over a 400-meter range to the sensor control software.

The vehicle can handle all types of **rough terrain**, wet or dry. It also climbs steep angles and negotiates most curbs and steps.

Product Features

- Air sampler
- UV-based bioaerosol detector
- Portable weather station
- Visual and PTZ thermal IR cameras
- GPS
- Control software for vehicle, camera, and sensor suite
- Vehicle handles rough terrain



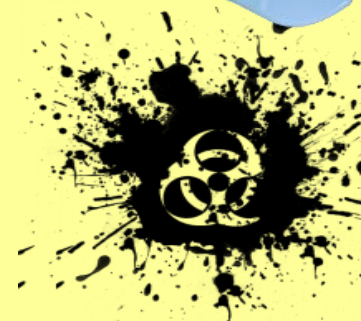
QuikChek Aerosol Simulants (Chemical and Biological)

Source: <http://www.resrchintl.com/QuikChek-Aerosol-Simulants.html>

QuikChek administers a small aerosol challenge to chemical and biological collection, detection and identification equipment. Many situations arise where it would be useful to have a method for qualitatively determining that equipment is working. With gas detectors, a small pulse of gas is commonly administered to the equipment before it is taken out into the field to see if an upscale reading is obtained. This safety measure is called a 'bump test' and shows that the equipment is operational.

For performing both chemical and biological "bump tests," we provide a medical inhaler that has been charged with a nontoxic pressurized propellant and in the case of biological bump tests, a small amount of simulant powder. When the inhaler canister base is depressed, a fixed volume of propellant and any suspended aerosol material present is discharged as a turbulent jet. Some applications include:

- Testing air sampling and extraction equipment
- Testing ultraviolet biological aerosol detectors such as Research International's TacBio™ aerosol detector
- Testing bioidentification devices such as tickets (lateral flow immunoassays)
- Testing gas detectors that have the propellant used in this product in their gas library
- Studying aerosol dispersion in various settings
- Equipment demonstrations for customers



The propellant used in RI's QuikChek aerosol simulants is the same propellant used in most medical inhalers and is of a high purity, with minimal oil and other contaminants. A special high accuracy metered-volume valve is used which provides an output dose that is consistent to within 5% from shot to shot.

Since the simulant materials are physically suspended in the propellant, it is essential that the unit be well shaken before each use. The check source size and shape minimizes issues with airline personnel who otherwise prefer to confiscate all pressurized products found in carry-on luggage.

With "Havana Syndrome," Washington Is Repeating Colin Powell's Worst Mistake

Source: <https://newrepublic.com/article/164088/havana-syndrome-colin-powell-war>



U.S. Secretary of State Colin Powell holds up a vial that he said was the size that could be used to hold anthrax, as he addresses the United Nations Security Council (Timothy A. Clary/Getty Images)

The passing of former Secretary of State Colin Powell has provided the occasion for reflection on the man's most consequential act, which also happened to be his most shameful one: his February 2003 speech at the United Nations, in which he persuasively laid out an array of phony evidence that the Iraqis harbored a substantial cache of weapons of mass destruction, or WMDs, emphatically calling for war in response.

Despite Powell's apparent misgivings behind closed doors, the influential figure wholly legitimized the warmongering fervor manufactured by jingoistic smut-peddlers throughout the Bush administration and their parrots in the media. He relayed an unflappable certainty as he described covert manufacturing processes that hadn't taken place, misrepresented intercepted conversations, and repeated sketchy conjecture as airtight truth. In doing so, Powell essentially laundered the dubious case for a simultaneously preemptive *and* retaliatory military response, lending his personal credibility to coax naysayers into cheering on an invasion. This is precisely the reason he was tapped for the task, and by all accounts it provided the necessary political cover for what would become the brutal, colossal mess whose consequences still reverberate violently, nearly two decades and a million deaths later.



Powell's later recollection of the episode as "painful" and "a blot on my record" hardly feels strong enough. It's impossible to look back at this era and not want to scream bloody murder at Powell and his fellows, who concocted an amateurish argument that Iraq possessed WMDs out of elisions and guesswork. This was the motivated reasoning of ultrarich freaks drooling all over themselves at the prospect of landing plush military contracts and installing yes-men into new global markets.

As someone too young to have lived through Powell's apparently fabled early statesman phase, I've learned little from his legacy beyond two stupefyingly obvious lessons: The threshold for insisting that a hostile foreign power is hoarding weapons to attack us ought to be incredibly high, and onlookers ought to call bullshit when those standards aren't met. So I hope you'll forgive me for being downright apoplectic to be watching this mendacious chapter of our very recent history repeating itself as "[Havana Syndrome](#)," with a new generation of reprobates shoving make-believe weapons down our throats, recklessly swearing that these are causing a series of mysterious attacks, none of which actually happened.

For nearly five years now, broad swaths of the media and federal government have pushed the idea that cutting-edge directed energy weapons—[heretofore unknown to science](#) and supposedly developed and wielded in secrecy by Russia or China—are behind extremely common medical symptoms experienced by U.S. diplomatic and intelligence officials stationed across the world. Beginning at the tail end of 2016, just as the Trump administration threatened to dramatically upend years of U.S. policy toward Cuba, individuals working there began reporting things like headaches, dizziness, fatigue, and brain fog—symptoms that can drive immense suffering but are unfortunately among the most widespread medical complaints on earth.

Because some of them recounted a high-pitched screeching sound sometime around the onset of symptoms, the improbable "high-tech weapons" thesis got entrenched early on. (That a patient-provided recording of the noise was later found by [two separate](#) investigative teams to be crickets did dismayingly little to dislodge this notion.)

Once employees in Cuba were warned to be hypervigilant about surveilling for symptoms that, according to what they'd been told, could indicate they were being targeted by a hostile foreign power, cases unsurprisingly spread as more and more presumably terrified people came forward feeling ill. In some cases, it seems likely that symptoms were triggered by stress, depression, or anxiety; in others, symptoms of any number of things were probably wrongfully ascribed to attacks. In short, as Robert Bartholomew and Robert Baloh [have persuasively argued](#), "Havana Syndrome" fits the classic pattern of mass sociogenic illness. The alleged directed energy weapons are as real as demonic hexes were in late-seventeenth-century Salem.

But maddeningly, the contention that such conditions as migraines are actually proof of targeted attacks has stuck. Just as in 2003, this was wrought from a toxic combination of bad intelligence and bad actors with a vested interest in doubling down on it: Marco Rubio, who got on board early as an excuse to do anti-Cuba chest-thumping ("There's no way the Cubans don't know who did it—if they didn't do it themselves," [he declared in 2018](#)) and now chairs the Senate committee investigating the issue, or national security hawk Jeanne Sheehan, are good examples. Their bluster—as well as that of breathless media dupes like [Julia Ioffe](#) and [Adam Entous](#) giddily trumpeting the "directed energy weapons" narrative in sensational magazine features—has never been remotely matched by credible evidence nor defeated by its absence. It's a nostalgic redux of Donald Rumsfeld's treatise on "[known unknowns](#)" from the Iraq War era, reheated for public consumption.

More insidiously, the paranoid rhetoric around "Havana Syndrome" has escalated in recent months. Both lawmakers and sycophantic reporters [hedge less and less](#) when describing the health incidents as "attacks," going so far as to name specific countries suspected of being involved. Former acting Defense Secretary Christopher Miller referred to one alleged case in suburban Virginia as an "act of war." "Havana Syndrome" has [reportedly been](#) a topic of agitation during tense meetings with Russian officials. Concern over cases once delayed Vice President Kamala Harris's diplomatic trip to Vietnam. [Rubio accused](#) high-profile skeptics of being paid by foreign governments to pump out disinformation. (For the record, I am not.)

Meanwhile, a CIA probe is intensifying and patients and their allies [are calling for](#) "possible policy responses" in retaliation. A bill calling for sanctions against whoever "directed or carried out the Havana Syndrome attacks" [is reportedly](#) in the Foreign Affairs Committee. And perhaps most shockingly, a [new story this week](#) from Ioffe anonymously quoted an intelligence officer explicitly advocating preemptive action against Russia, even though there's no evidence at hand to support a casus belli: "So far, civilian leaders feel the evidence is circumstantial and the product of a process of elimination, and therefore not enough to assign blame publicly. But some in the intelligence community are getting restless, eager to see the people who wounded so many of their comrades punished. 'Even if the intelligence is "medium confidence,'" one member of the community told me, that should be enough to go on. 'We got bin Laden with medium confidence.'"

Of course, we also invaded Iraq with "medium confidence." And the case that "Havana Syndrome" is caused by any "attacks" at all is infinitely thinner than the one Colin Powell made for WMDs before the U.N., which at least involved weapons that adhered to the laws of physics. If "Havana Syndrome" has mercifully yet to be used to agitate for war as concretely as the imaginary nukes of Iraq were, it's clearly been seized on by a national security apparatus formidably expanded since 9/11—and if more people don't come to their senses, harm will



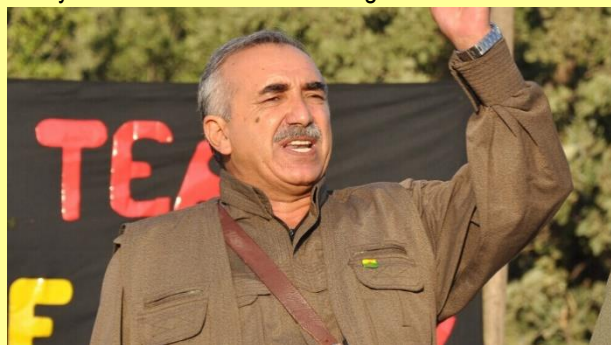
surely result. It's one thing for a former secretary of defense to toot idly about an "act of war" on America's suburbs—more sitting leaders echoing him could obligate a more serious response. This is the dire crossroads to which we're being thoughtlessly dragged. Eighteen years ago, too many people gave Colin Powell and others the benefit of the doubt. Today, "Havana Syndrome" promoters deserve none of it.

Karayilan calls for on-site investigation into Turkish chemical attacks

Source: <https://anfenglishmobile.com/features/karayilan-calls-for-on-site-investigation-into-turkish-chemical-attacks-55673>

Oct 20 – People's Defense Centre (HSM) Headquarters Commander Karayilan was interviewed by Medya News on Turkey's use of chemical weapons in its ongoing attacks against the guerrilla forces in southern Kurdistan (northern Iraq).

Karayilan stated that the invading Turkish state is using chemical weapons in its attacks and urged international institutions to



investigate the Turkish attacks. He pointed out that the Turkish state could not advance because of the guerrilla resistance and emphasised the urgent need for Kurdish national unity and a common policy. "Only an organization that can protect itself based on its self-power can achieve success," he said.

"There is no doubt that the occupying forces in Kurdistan pose constant threats to the gains of the Kurdish people," stressed the HSM commander, who further said the following:

"Currently, the biggest threat is being introduced under the leadership of the Turkish state. Almost 6 months have passed since the Turkish incursion that started on April 23. Fierce clashes have taken place in the

meantime. It is difficult to summarize them in a few sentences. The Turkish state has a specific plan for 2021. It has planned to occupy all our positions in South Kurdistan or Iraqi Kurdistan this year, to eliminate and remove the guerrillas, to destroy our headquarters there in an attempt to render our movement uncoordinated. Just as the Turkish state and conspiratorial forces wanted to conduct an attack in Syria and capture Kurdish leader Abdullah Öcalan in 1998, they have made a similar plan in 2021. Moreover, hegemonic powers such as the US, Germany and England have supported the Turkish plans. Turkey's war minister visited Hewlêr (Erbil) and the Iraqi state at the beginning of the year. They made the Kurdistan Democratic Party (KDP) an ally in such a concept. Turkey was planning to occupy all the guerrilla locations in Iraqi Kurdistan including Qandil and Garê within 2 or 3 months. This was their goal.

Turkish Army cannot advance

To this end, they carried out a surprise attack on Garê at the beginning of the year, on February 10, yet they were crushed. Their idea was that 'Garê is far from the border, there are many PKK fighters there, but if we attack them at the border, we will win'. Based on this plan, the Turkish forces launched ground and air attacks against the guerrilla positions in an area of almost 100 kilometres, from Xabur river to Şemzinan, from 3 directions. For the past six months, the Turkish troops have still been there where they reached and were stationed on the first days of the offensive. The battle is still continuing in those areas. They could not proceed as they had planned. They cannot establish dominance in the places where they have airdropped their troops. In other words, they advanced 6-7 kilometres in some places, and 3-4 kilometres in some others. That's all. The fighting is restricted to these locations.

The Turkish army uses all the modern warfare technology. They carry out aerial warfare. The Turkish army is just bombing everywhere all the time. In this way, it wants to occupy and advance. However, it has not succeeded so far. Why? The guerrilla forces have also introduced military innovations. The fighters are adopting new methods. First, they developed small, specialized and coordinated guerrilla units. Another innovation is the battle tunnels to defend the ground. The guerrillas are using both methods. A high tactical performance has thus been achieved. It seems that the Turkish state did not expect this much, and they have been puzzled by this situation. In the first week, they were quick to declare victory through the press. Yet, they have started to hide this war from Turkey and the world public opinion as they have been crushed gradually. In other words, they do not want to reveal that such a large-scale battle is taking place.

In order to hide its defeat, the Turkish state has started to use chemical weapons alongside its technologically advanced weapons. It violates international law to get rid of its debacle. In this context, the battle is continuing in the Avaşin, Zap and Metina areas.



National unity is urgently needed

Although there are conflicts among the states that have occupied Kurdistan, they come together, make joint plans and decisions and determine policies over the Kurdish issue and Kurdistan. Unfortunately, however, the four parts of Kurdistan cannot come together in the face of these policies. The Kurds cannot agree on a common policy. Undoubtedly, there are many reasons for this. Yet, there is an urgent need for national unity and a common Kurdish policy. But the colonial occupying forces play in Kurdistan politics. They have an influence on it. The PUK's situation can be understood. However, the KDP has been involved in the campaign seeking to eliminate the PKK and the Kurdish people's achievements in the person of the PKK. Today, KDP forces constitute a party of the aggression carried out by the Turkish state. In other words, the KDP forces are also besieging guerrilla areas, imposing embargoes, and blocking roads. In this way, they are almost completing the Turkish state's occupation.

Furthermore, it seems that they have reached an agreement and the KDP does not show any reaction as the Turkish state invades Iraqi Kurdistan. The Turkish attacks are causing material damage in the Kurdish villages. The Turkish state deliberately kills people and destroys their fields and gardens from time to time to intimidate our people in South Kurdistan so that they do not support the PKK. This is a policy of occupation that the Turkish state pursues on purpose. Aware of this reality, the KDP nevertheless blames the PKK. This is not right. It is obvious that it is the Turkish state that does harm to the people and carries out these attacks. What is the Turkish state doing there? Why is it carrying out so many attacks? It deliberately harms peasant people. Instead of taking a stand against the Turkish state, they claim that the PKK caused this mess. This is not true.

In the face of this state of affairs, the Kurdish freedom struggle needs a common policy in this period. Because there are many plans and schemes to invade Kurdistan's lands. We are striving for a Kurdish national, democratic and common policy to frustrate these plans. However, the KDP's alliance with Turkey shows that this will not happen soon. In other words, it seems that a Kurdish unity hoped for by the Kurds and their friends has been postponed to an unknown date for the time being. So, this won't happen anytime soon. There are family interests and organizational interests above national interests in the Kurdish politics, and therefore national interest is not promoted as the priority. A fragmentary process has developed. This is how one can explain the current situation.

Chemical weapons are used – investigation should be launched



Video footage by guerrillas shows the use of chemical gas by the Turkish army against the battle tunnels in Werxelê area of Avaşin region in guerrilla-held Medya Defense Zones in southern Kurdistan, northern Iraq.

It is certain that the Turkish state is using chemical weapons against the guerrilla forces in South Kurdistan. HPG has made several statements on the subject. There are documents and images taken inside and outside the battle tunnels. There are munitions proving the use of poisonous gases, and the



HPG has revealed many of these documents to the public. We have some ammunition remains, and continue to examine them. Maybe more concrete evidence could be found. However, the relevant international institutions remain quite indifferent despite so many appeals by our side. Why is it so? Because the Turkish state is a member of NATO. Previously, these institutions denounced that Syrian regime used chemical weapons against rival armed forces there. The whole world reacted to it, and they issued a memorandum against Syria. They also intervened and attacked the regime. So, what is the reason for this double standard? There must be a reaction against a state that uses chemical weapons against civilian people. Everything is deemed proper for NATO members, while reactions are directed against non-NATO members.

International forces and institutions can visit the areas where chemical weapons have been used. There are KDP forces deployed in some parts of the region where chemical weapons have been used. The whole world has relations with the KDP. If they come to South Kurdistan, they can also visit the guerrilla-controlled areas. The HPG announced that 6 of our comrades were martyred in chemical attacks in Girê Sor which is located on the border line. There is one kilometre between Girê Sor and the border post on the Sivri hill. The border line is found on the Girê Sor hill. A part of Girê Sor is considered Turkish soil. There is a battle tunnel there and we withdrew all our forces who were stationed there. The Turkish state still has not entered that tunnel and the mortal remains of our friends are still there. International institutions can go there and investigate whether chemical weapons have been used or not. Traces of the chemical weapons employed are still present in those tunnels, which is why the Turkish state cannot enter there. Everything is obvious. Those who seek more concrete evidence should intervene. If they do not find us credible, independent committees can come and make examinations there. The Turkish state violates the international law of war and commits crimes in Kurdistan. The relevant institutions should not turn a blind eye to the crimes of the Turkish state and should intervene. If they come and investigate, they can reach more concrete evidence. That's all we can offer. We have made appeals before during the clashes in Garê and we are making another call now. Institutions can come and make examinations on the ground and reach more concrete evidence.

Society will overcome attacks if organized

The US and global powers are introducing innovations into world politics. They are redesigning their policies in line with their own interests. However, this does not mean that they will retire from the world politics. They make changes, but they do not want to keep their hands off. The situation in Afghanistan is different. The US and NATO were defeated in Afghanistan. They had to retreat. If a society organizes itself, it can protect itself against modern warfare technologies and all kinds of attacks. This has been proven once again. Global powers would better take their hands off other parts of world. If the US withdraws from Iraq and Syria immediately, that would be better for them. Yet, these things do not happen immediately. Relying on other forces, especially the hegemonic forces, does not bring success.

Basing on self-power is the key to success. If you want to do politics with your own will, you should rely on your own self-power. This is our principle. The forces in Rojava, Syria and Iraq should also rely on their self-power. This is the right thing to do. If a political power relies on this, it will not be affected by the withdrawal or non- withdrawal of other powers. It is certain that a power that can protect itself based on its own will succeed.



2021 CBRNe-related conferences

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



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.



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.

Future Forces Forum

19-21 October 2022

<http://future-forces-forum.org/homepage/concept?lang=en>

FUTURE FORCES FORUM (FFF) is a [highly recognized and widely endorsed](#) international platform for defence & security information exchange and for promotion of the allied countries and their partners' objectives within national and global security. All events are primarily focused on the presentation of current and future needs of the armed and security forces, state-of-the-art technologies



HZS C²BRNE DIARY – October 2021

and R&D programmes with interactions between all involved participants due to the interconnected topics on the military and also civilian level.

The Forum is organized under the auspices of the Czech President, Prime Minister, Minister of Defence, Minister of the Interior, Minister of Foreign Affairs, as well as other relevant governmental bodies. The event is also held in close cooperation and partnership with the NATO structures, organisations, and agencies that are involved in the programme.



14th FFF will take place in the week of 17 - 21 October 2022. The main program including the Future Forces Exhibition will be held from Wednesday 19 October to Friday 21 October 2022 at PVA EXPO PRAHA.

DEFENCE - SECURITY - INTERNATIONAL ORGANISATIONS - GOVERNMENTS - INDUSTRY - R&D

FUTURE FORCES FORUM

5 DAYS of Information Exchange, Cooperation Development & Global Networking



200+
Exhibitors

7,000+
Participants

20+
International Panels

7+
NATO Expert Groups

1,200+
VIPs, Official Delegates and Experts

35+
National and International Organisations Represented

In conjunction with the FFF, the NATO and EU working groups usually have their annual sessions in Prague. These groups cover over 400 experts in the given areas from the NATO and partner countries.

We consider this as an excellent opportunity to exchange views on the identified areas of priority, while providing in parallel the opportunity to discuss and present a range of important issues of mutual interest with all stakeholders and partners (users, industry, and academia) involved in defence and security field.





Under Patronage The Minister of Higher Education & Scientific Research
University of Babylon

The 6th International CBRN Safety And Security Conference
14-16 November , 2021



Iraq 6th International CBRN Safety and Security Conference

14-16 November 2021

<https://cbmn.edu.iq/pdf/Brochure.pdf> | <https://cbmn.edu.iq/index.html>

Providing a world class Middle East based forum where CBRN professionals, experts, and stakeholders convene to exchange ideas, make recommendations, and outline road maps for addressing current and emerging national, regional, and global CBRN safety and security priorities.



The 2021 6th International CBRN Safety and Security Coordination Conference will take a holistic view of CBRN safety and security, spanning “prevention to response” issues and priorities.

Special sessions will be held featuring CBRN and law enforcement response efforts and highlighting women in the CBRN sector. The following represents topic areas and themes that will be covered in focused panel discussions, expert presentations, working groups, or selected papers or poster presentations:

1. CBRN Attack Prevention

- Mapping the Threat Landscape
- Roles and Responsibilities
- Multi-Stakeholder Communication and Coordination

2. Public and Private Sector Cooperation

- Import and Export Considerations
- National CBRN/Hazardous Material Transportation
- Storage and Inventory Management

3. Special Joint Session: CBRN Response and Law Enforcement

- CBRN Investigations, “Post-Event”
- Importance of Frameworks for Coordination
- Technological Tools and Protocols for Information Sharing

4. Spotlight on National CBRN Response Efforts

- Partnerships in “Prevention and Response” (national, regional, international)



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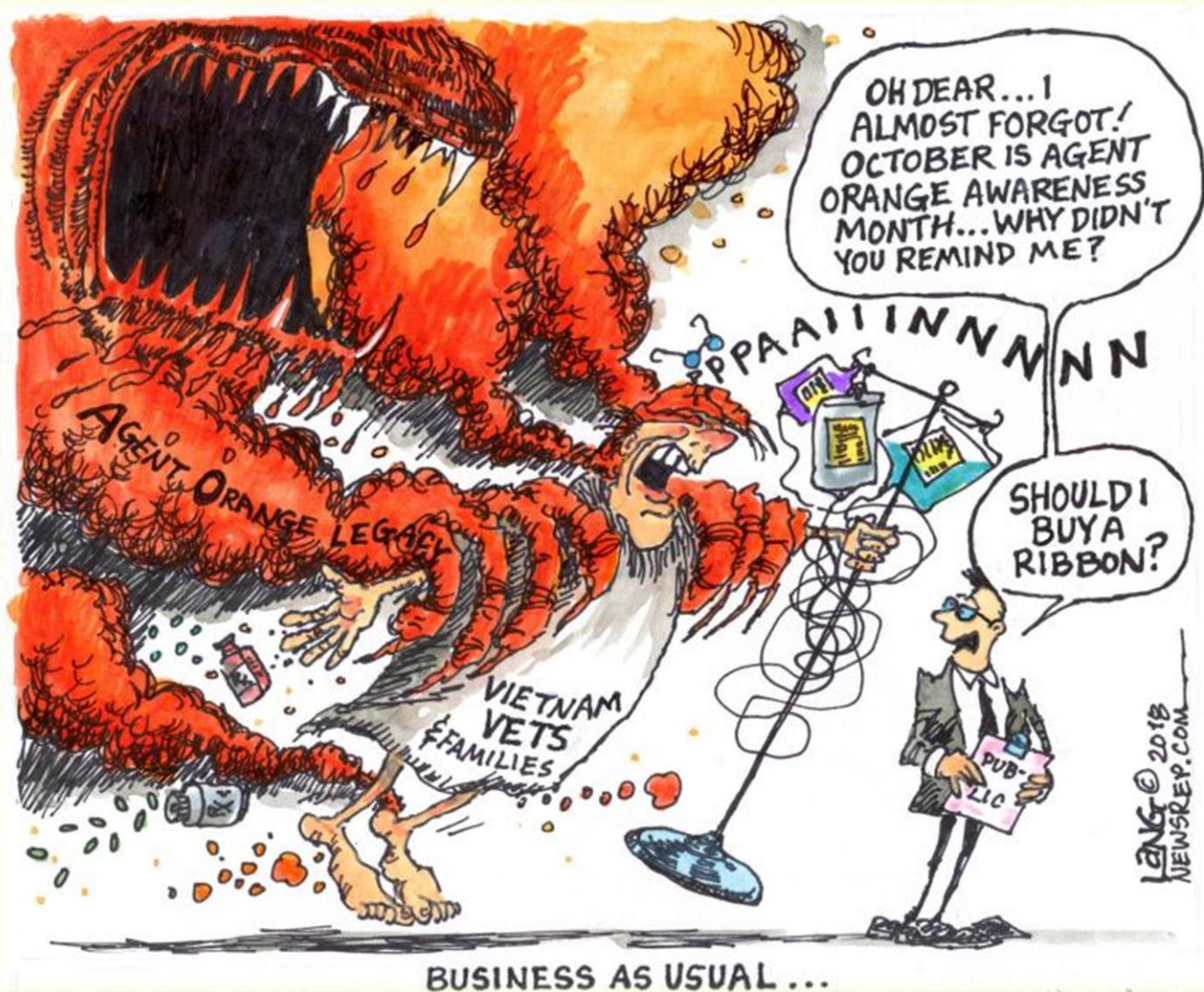
- Technical Solutions: Equipment and Material Resource Requirements

5. Special Session on Women in CBRN – Importance, Roles, and Opportunities

The organizers of this 6th conference will build on the success of the 5th International CBRN Safety and Security Coordination Conference by continuing to coalesce and give voice to the full spectrum of CBRN stakeholders and practitioners. Convening public and private, government and nongovernmental, and civilian and military partners encourages comprehensive, collaborative, and complementary outcomes, fully-informed, efficient, and effective solutions to address gaps, and whole-of-ecosystem buy-in to work toward understanding and solving some of the world's most challenging security threats. In 2021, due to continued uncertainties regarding international and national travel, the organizing committee and Government of Iraq sponsors have decided to conduct this conference as a hybrid event, accessible both via a virtual platform and in person at a location TBD.

Contact

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BIO NEWS



Epitopes of SARS-CoV-2's Spike Mapped by International Consortium

The Coronavirus Immunotherapy Consortium (CoVIC) analyzed antibodies to SARS-CoV-2 that may offer an advantage over traditional antibodies. Originally discovered by Twist Bioscience, the antibodies were found to have potent effects on multiple SARS-CoV-2 variants. One antibody candidate TB202-3, demonstrated binding to diverse SARS-CoV-2 variant mutations in pseudovirus assays, indicating this therapeutic antibody may be effective in treating many strains of COVID-19. [+ MORE](#)

It's Not 'Weakness' to Change Your Mind About Something Like Vaccines. Here's Why

By Art Markman

Source: <https://www.sciencealert.com/changed-your-mind-about-something-like-vaccines-here-s-why-that-s-not-weakness>

Sept 24 – Culturally, this is an era in which people are held in high esteem when they stick with their beliefs and negatively labeled as "flip-floppers" or "wishy-washy" when they change what they think.

While the courage of convictions can be a plus in situations where people are fighting for justice, sticking with beliefs in a dynamic world is shortsighted and dangerous, because new evidence can and should be taken into account. Rapidly changing environments are uncomfortable for people, because you can't effectively use experience to guide choices about the future.

Consider the [COVID-19 pandemic](#). All aspects of the pandemic response have evolved over time because knowledge of the disease and its prevention and treatment has changed significantly since the [coronavirus](#) made its appearance in early 2020.

The problem is many opponents of masking and vaccination made bold public pronouncements on social media, broadcasting positions like they'll never get the COVID-19 shot. Once someone's taken a strong stand like that, it can be hard to make a switch.

As a [psychology researcher who focuses on decision-making](#), I know there are powerful psychological and social forces that promote consistency of belief and action. Early commitments can be difficult to dislodge – though sometimes outside forces can help.

Changing course once you've doubled down

Social psychologists know that, on the one hand, people are motivated to [maintain consistency](#) across their beliefs.

Because people want their [web of beliefs to be coherent](#), they tend to give a lot of weight to beliefs that are consistent with their overall worldview and to discount those that are contradictory. As a result, people will continue to hold on to a set of beliefs even in the face of mounting evidence that they should revise what they think.

Psychologists describe this unconscious strategy as a way for people to minimize any cognitive dissonance they experience – when things don't add up, it can be disturbing, so to avoid those uncomfortable feelings, they ignore what doesn't fit well with their existing beliefs as a way to maintain balance.

In the context of COVID-19, for example, someone who is predisposed to dislike the vaccine will give little weight to new evidence of vaccine effectiveness, because that evidence contradicts their current worldview.

Eventually, though, enough counterevidence can lead to what psychologists call a shift in coherence, in which people can come to believe that their initial viewpoint was wrong. But additional [social forces](#) such as the desire to appear consistent or to show solidarity with a community can still lead people to resist changing their beliefs and behavior.

Indeed, there is [considerable research](#) on the trade-off between what psychologists call exploitation and exploration in decision-making.

Exploitation refers to people's tendency to pick the option that has been best in the past. As a simple example, exploitation would be choosing your usual favorite dish from a restaurant where you often order takeout.

Exploration describes picking options that were not optimal in the past but may now be better than the best previous choices. In the restaurant scenario, exploration involves choosing a new dish or one that you tried in the past and didn't like as much as your old standby. Exploration gives you information about options other than your current favorite.

When environments change a lot, exploration is important. Good decision-makers will often forego the best-known option in order to determine whether other options are now actually better. If your favorite restaurant is constantly hiring new cooks and tinkering with the menu, then exploration is probably a good strategy.

The tendency toward consistency that people display – particularly in situations where they have expressed a strong preference – is most harmful in environments that change. The COVID-19 pandemic is just such a case.



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In these situations, helping people to change behavior requires reducing their need to feel bound to act in a way that is consistent with the attitudes they have expressed. This is where external forces come to play.

When a mandate pushes against your position

As an example, think about two people: Al and Barb. Both of them are opposed to getting vaccinated for COVID-19 and have a variety of reasons for that – like being mistrustful of the science and concerned about long-term safety. Both of them have also posted their opposition to vaccination to their social media sites.

Al doesn't know anyone who has gotten sick from COVID-19 and hasn't really read many stories about the effectiveness of the vaccine, so he has a strong coherent set of beliefs against vaccination.

Barb has friends who have gotten sick, and one died from COVID-19. She has read some of the news articles with data supporting vaccination. While this information isn't enough to flip her opinion, she is wavering.

Al and Barb are likely to have different reactions to the [government-issued mandate that employers](#) with more than 100 employees must require their staff to be vaccinated or frequently tested.

Al is strongly opposed to vaccination, so the mandate is outweighed by all the rest of his beliefs. He is likely to fight the mandate and to make a public display refusing to get vaccinated.

Barb is in a different position. The vaccination mandate fits with some of her beliefs. While Barb may be uncomfortable getting the vaccine, she is more likely to use the mandate as social cover to get vaccinated, blaming the mandate for her ultimate choice.

For people who are on the fence about whether to get vaccinated because they have conflicting knowledge and beliefs, vaccine mandates serve two purposes. First, mandates provide one more fact that can make their pro-vaccine beliefs more consistent than their anti-vaccine beliefs.

Second, even for people who are still largely anti-vaccine, it allows them to get vaccinated while still saving face by blaming the mandate for an action that they are not as strongly opposed to as they appear to be.

More generally, people are creatures of habit. You likely feel most comfortable doing what has worked for you in the past. The more you learn to pay attention to how much change there is in the environment, the more you can work to push yourself to explore new options and change your beliefs and behavior based on new evidence.

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EDITOR'S COMMENT: In the example given above I would add a third person; let us call him John. John is not an anti-vaxxer. He is an educated senior citizen with some heart problems under medication who is having a good life taking all precautions suggested by (heart/covid) experts. All say that vaccines are safe. This is a statistical conclusion. Let us assume that safety is 99%. John's wonder is "what if I am the 1% that will have a severe or deadly adverse effect?" And this might happen after the first dose; after the second dose; after the third dose and so on. No expert can answer his question. They will all say "you have done so many vaccines in your life, so ..." John will reply "yes, but that was 50-60 yrs ago when I was young and healthy as a bull! I have a few years to live to the average 70-80 years; so why play the roulette?". Then the experts will say "well, you know, yes but ... etc."



Two Decades After 9/11: What We've Learned About Public Health Preparedness and Leadership

By Lauren Eichberger (Reynolds)

Source: <https://www.homelandsecuritynewswire.com/dr20210924-two-decades-after-9-11-what-we-ve-learned-about-public-health-preparedness-and-leadership>

Sept 24 – September 11th, 2001 is a date the United States will never forget. Following this tragedy, there were calls to improve our national security against "physical" attacks and amend preparedness plans. Now, in 2021, two years into the COVID-19 pandemic, the nation finds itself in a comparable situation with a call for greater biosecurity and health care preparedness. The Association of State and Territorial Health Officials ([ASTHO](#)) held a virtual event, "[Two Decades After 9/11: What We've Learned About Public Health Preparedness and Leadership](#)" that discussed these two calls-to-action.

The first session was a keynote address by [Dr. Philip Zelikow](#), former Executive Director of the 9/11 Commission, who provided his unique insight on the preparedness of the United States for both 9/11 and COVID-19. Dr. Zelikow recalled the events of 9/11 and his role as the director of the 9/11



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Commission. He stated, “[the] best learning comes from rigorous investigation.” He envisions a COVID-19 commission tasked with assessing how the United States responded, and identifying what can be improved in future responses.

As a nation, this is not our first pandemic. In the United States alone, [743,452](#) “excess” (potentially preventable) deaths occurred from COVID-19 between February 2020 and September 4th, 2021, according to the CDC National Center for Health Statistics. Dr. Zelikow stated this figure exceeds the number of excess deaths that occurred during the 1918-19 influenza pandemic, which was



caused by an even deadlier virus. Amid our medical and technological advancements, Dr. Zelikow noted that, “our net outcomes are comparable to 100+ years ago!” He also notes that this may be, in part, due to the science being ahead of our ability to apply it in practice. Even so, our science was able to produce a vaccine faster than ever before, yet we are still “losing” to this virus.

The bones of our current health care system, which is employer sponsored, can be dated as far back as the late 1800s and early 1900s when employers of lumberjacks and those who lived in rural settings hired doctors to be on-site (Emanuel, 2020). In the 1930s and 1940s, states began offering health care via Blue Cross Blue Shield with no change in policy until the 1950s when Medicare and Medicaid were introduced at the federal level (Emanuel, 2020). Since then, the healthcare system has not

made the sweeping changes needed to best care for the population, which has changed over the last several decades. As Dr. Zelikow stated, we need to redesign our health care system by focusing on “What worked, what is needed, and how do we make the US stronger and safer, besides just terrorist attacks?” A rigorous investigation of the choices the United States made is needed. As Dr. Zelikow put it, “without hindsight; it blinds!”

After 9/11, the nation came together and painfully learned what they could do to prevent a major terrorist attack on the homeland from happening again. Now, scientists, politicians, and the public have a “generational opportunity” to come together and learn from our mistakes with COVID-19.

A Q&A session moderated by ASTHO President [Dr. Nirav Shah](#) focused on the preparedness of the Department of Human and Health Services (HHS), which houses the Assistant Secretary for Preparedness Response (ASPR). Answers were provided by two former ASPRs, Dr. Craig Vanderwagen and Dr. Nicole Lurie. Dr. Vanderwagen started the session by addressing the challenges that ASPR faces today, such as adding emerging infectious diseases to the ASPR Health Care Preparedness and Response Capabilities document, which guides hospitals and health care providers on how to properly train and respond to emergencies that stress their systems, such as a mass casualty shooting or infectious disease outbreak. Dr. Vanderwagen also noted that requiring more responsiveness from HHS would improve preparedness by health care providers. Indeed, the ASPR document is updated every few years, with the [current](#) document covering 2017-2022. Dr. Lurie agreed, stating that the COVID-19 pandemic was predicted and that, as a nation, we can learn from this pandemic to better prepare for the next.

“Where did we go wrong?” Dr. Shah asked. Answers ranged from policy to science to public opinion. Dr. Lurie first explained how many scientists and leaders forgot that Mother Nature could produce such a horrific virus, even one that could be worse than a biological weapon. For that reason, the world did not take the virus as seriously as it should have. Secondly, she called out scientists for their own pride and ownership of data. In general, science is not published unless every fact has been substantiated. Also, scientists are often prone to competitiveness rather than collaboration. Dr. Lurie opposed this mindset and explained how in dire emergencies, such as a global pandemic, scientists need to work collaboratively with the information available, even if the information is not deemed perfect. However, she also noted that scientists have been under extreme pressure from politicians, leaders, and the public, and may fear backlash. As a trained immunologist and research scientist herself, Dr. Lurie highlighted her concern that science is being silenced.

Where can our nation go from here? Dr. Lurie and Dr. Vanderwagen agreed that our nation’s healthcare system needs to be redesigned with preparedness in mind, starting with an Emergent Infectious Disease



Fund. In case of a future pandemic or infectious disease outbreak, this fund could immediately be used when a disease strikes. Perhaps such a fund could have decreased the excess deaths Dr. Zelikow mentioned.

Another Q&A session, moderated by [Dr. Leonard J. Marcus](#), focused on what the 9/11 attacks taught us about preparedness. Panelists [Sherry Adams](#), a registered nurse and Director of the Office of Preparedness and Response for the Maryland Department of Health; Dr. [Georges Benjamin](#), Executive Director of the American Public Health Association; and Dr. [Howard Zucker](#), the Commissioner of Public Health for New York state, provided their unique perspectives on the topic.

The discussion started with a focus on whether or not there was a failure of imagination in the public health system. As Dr. Benjamin pointed out, there is a complacency born of the belief that “the feds [Federal Government] have our back.” Ms. Adams added that she believes the problem stems from the lack of knowledge the current generation has in how the government operates, a lack of acceptance of science, and emotional responses to the pandemic that overwhelmed thoughtful responses.

The panel also addressed the importance of public communication. The 9/11 attacks taught us how important communication is without the “noise” of misinformation and disinformation. Fast forward 20 years and the information overload in this country means there is even more noise that clutters the facts. This led to another important point: tell the truth to educate the public and be coherent. According to Dr. Zucker, in order to tell the truth, we need to start with better education (and the funding to do so) to rebuild the public health workforce. With a solid foundation and understanding across all healthcare workers, the truth can be told. When asked what will become of public health preparedness, Dr. Zucker recalled that after 9/11, the nation became more focused on security but failed to update our public health system accordingly. Ms. Adams pointed out that strengthening public health is a long-term strategy, but “society is used to a magic bullet, magic pill, etcetera.” Dr. Georges agreed, reminding everyone that, “Prevention works! We can get ahead of these things.” He also asserted that “we must normalize health security.” In order to do so, the panel stressed that the public must take interest in public health to improve our nation’s preparedness. This ASTHO event highlighted the common challenges faced after 9/11 and during the current pandemic to identify the right lessons to be learned. While this conference featured the perspectives of health policy experts and former public health officials, the issue of improving health security needs to become an everyday conversation if we are going to put in place the right policies to implement these lessons. Just as our nation became stronger after 9/11, the United States can emerge stronger and more resilient after this pandemic.

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A Deterrence by Denial Strategy for Addressing Biological Weapons

Source: <https://www.homelandsecuritynewswire.com/dr20210924-a-deterrence-by-denial-strategy-for-addressing-biological-weapons>

Sept 24 – The U.S. political failures have loomed large in coverage of the COVID-19 crisis. Christine Parthemore and Andy Weber write in [War on the Rocks](#) that, what is more, a [number of analysts](#) have [warned](#) that, after watching these failures play out, hostile powers might take a new interest in using biological weapons to target the United States. “This risk is real. Fortunately, the pandemic has also brought into use cutting-edge technologies that can help counter it,” they write, adding:

Defending against biological attacks with a strategy of deterrence by denial is now more possible than ever before. Such a strategy would involve developing robust capabilities to prevent biological weapons from causing mass damage, essentially deterring their use by preventing them from having the effect that attackers intend.

The note that, ultimately, a strategy of deterrence by denial will only be credible in the right political environment — one in which Americans and their leaders are united in confronting biological threats. “But the sooner Washington begins working toward this goal at the technical level, the sooner it can become a reality. As the government prepares its new national biodefense strategy, the Pentagon should embrace its role in rendering mass-effect biological attacks so ineffective as to be futile.”

They conclude:

National security leaders should make it clear that the tools now exist to stop biological threats more effectively than ever, and that America intends to use them. They should also invest in the research and programs that will make this claim credible.

Articulating a strategy of deterrence by denial would help combine all the assets on display during the pandemic into a coherent, easy to understand vision. It would also demonstrate how specific activities — such as preventing access to bioweapons-potential materials, increasing rapid medical countermeasure development capabilities, strengthening biosafety and biosecurity practices, and planning and exercising combined military and civilian responses to biological attacks with allies and partners — can operate



together to keep the country safe. Moreover, articulating this strategy might also inspire America's allies to consider whether their governments are well positioned to adopt it.

At the start of the COVID-19 pandemic, America had many of the capabilities required for effective responses. Due to significant political challenges, among other factors, Washington stumbled in its first attempt to use them. Now the government can use the lessons of COVID-19 to do better. The United States needs to leverage the technological edge embedded in its bioeconomy, take full advantage of the Pentagon's strong assets for addressing biological threats, and form a coherent strategy centered on blunting mass-casualty biological attacks.

Deterrence by denial is achievable, but not simple. Alternatively, if the nation chooses to perpetuate the problems that led to the death of more than 650,000 Americans in less than two years, we can expect adversaries to continue contemplating how to exploit them.

Terrorist Attacks Against Vaccinators

Source: <https://www.homelandsecuritynewswire.com/dr20210924-terrorist-attacks-against-vaccinators>



Sept 24 – Vaccinators fulfill an important role in a nation's public health by reducing the burden of disease on the population. Understanding patterns of attack employed against vaccinators is important to determine how to protect them.

[Pandora Report](#) notes that a [new study](#) has conducted a search of the Global Terrorism Database for terrorist attacks against vaccinators which occurred between 1970 and 2018. Using the search terms "hospital," "healthcare," "clinic," "doctor," "nurses," "vaccinators," and "vaccinations," 2,322 healthcare-related entries were identified.

The researchers then manually searched the dataset for incidents related to attacks on vaccinators, which resulted in the identification of 133 attacks against vaccinators. The majority (128 out of 133) of attacks occurred during or after 2010. Every attack except one has occurred in the Middle East, South Asia, or sub-Saharan Africa. **Pakistan** has seen the most attacks against vaccinators, with 112 incidents recorded.

Terrorist Groups That Have Carried Out Attacks Against Vaccinators

Terrorist Group	Number of Attacks
Al-Shabaab	1
Baloch Liberation Front	1
Bangsamoro Islamic Freedom Movement	1
Boko Haram	5
Front for the Liberation of the Enclave of Cabinda	1
Jamaat-ul-Ahrar	1
Jundallah (Pakistan)	3
Khorasan Chapter of the Islamic State	1
Lashkar-e-Islam (Pakistan)	5
Rubicon (Rouvikonas)	1
Sudan People's Liberation Army	1
Taliban (Afghanistan)	4
Tehrik-i-Taliban Pakistan	22
Unknown	85
Zimbabwe African Nationalist Union	1



Pandora Report says that "vaccinators continue to be vulnerable to terrorist attacks. Protection of healthcare personnel during mass vaccination efforts is critical so that they can continue their life saving mission."



The Evidence Is in – One Mask Type Stands Out as The Best Protection Against COVID-19



By Laura (Layla) H. Kwong

Source: <https://www.sciencealert.com/the-evidence-is-in-one-mask-type-stands-out-as-the-best-protection-against-covid-19>



Sept 25 – **Do masks work? And if so, should you reach for an N95, a surgical mask, a cloth mask, or a gaiter?**

Over the past year and a half, researchers have produced a lot of laboratory, model-based, and observational evidence on the effectiveness of masks. For many people it has understandably been hard to keep track of what works and what doesn't.

I'm an [assistant professor of environmental health sciences](#). I, too, have wondered about the answers to these questions, and earlier this year I led a study that examined the [research about which materials are best](#).

Recently, I was part of the largest randomized controlled trial to date testing the [effectiveness of mask-wearing](#). The study has yet to be peer reviewed but has been [well received](#) by the [medical community](#).

What we found provides gold-standard evidence that confirms previous research: Wearing masks, particularly surgical masks, prevents [COVID-19](#).

Lab and observational studies

People have been [using masks to protect themselves from contracting diseases](#) since the [Manchurian outbreak of plague in 1910](#). During the [coronavirus pandemic](#), the focus has been on masks as a way of preventing infected persons from contaminating the air around them – called source control. Recent laboratory evidence supports this idea.

In April 2020, researchers showed that people infected with a coronavirus – but not [SARS-CoV-2](#) – exhaled [less coronavirus RNA into the air around them if they wore a mask](#). A number of additional [laboratory studies](#) have also supported the efficacy of masks.

Out in the real world, many epidemiologists have [examined the impact of masking and mask policies](#) to see if [masks help slow the spread of COVID-19](#). One observational study – meaning it was not a controlled study with people wearing or not wearing masks – published in late 2020 looked at demographics, testing, lockdowns and mask-wearing in 196 countries.

The researchers found that after controlling for other factors, countries with cultural norms or policies that supported mask-wearing saw weekly per capita coronavirus mortality increase 16 percent during outbreaks, compared with a [62 percent weekly increase in countries without mask-wearing norms](#).

Large-scale randomized mask-wearing

Laboratory, observational, and [modeling studies](#) have [consistently supported the value of many types of masks](#). But these approaches are not as strong as large-scale randomized controlled trials among the general public, which compare groups after the intervention has been implemented in some randomly selected groups and not implemented in comparison groups.



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One such study done in Denmark in early 2020 was inconclusive, but it was [relatively small and relied on participants to self-report mask-wearing](#).

From November 2020 to April 2021, my colleagues Jason Abaluck, Ahmed Mushfiq Mobarak, Stephen P. Luby, Ashley Styczynski and I – in close collaboration with partners in the Bangladeshi government and the research nonprofit [Innovations for Poverty Action](#) – conducted a large-scale randomized controlled trial on masking in Bangladesh. Our goals were to learn the best ways to increase mask-wearing without a mandate, understand the effect of mask-wearing on COVID-19, and compare cloth masks and surgical masks.

The study involved 341,126 adults in 600 villages in rural Bangladesh. In 300 villages we did not promote masks, and people continued wearing masks, or not, as they had before. In 200 villages we promoted the use of surgical masks, and in 100 villages we promoted cloth masks, testing [a number of different outreach strategies](#) in each group.

Over the course of eight weeks, our team distributed free masks to each adult in the mask groups at their homes, provided information about the risks of COVID-19 and the value of mask-wearing. We also worked with community and religious leaders to model and promote mask-wearing and hired staff to walk around the village and politely ask people who were not wearing a mask to put one on.

Plainclothes staff recorded whether people wore masks properly over their mouth and nose, improperly or not at all.

Both five weeks and nine weeks after starting the study, we collected data from all adults on symptoms of COVID-19 during the study period. If a person reported any symptoms of COVID-19, we took and tested a blood sample for evidence of infection.



Mask-wearing reduced COVID-19

The first question my colleagues and I needed to answer was whether our efforts led to increased mask-wearing. Mask usage more than tripled, from 13 percent in the group that wasn't given masks to 42 percent in the group that was. Interestingly, physical distancing also increased by 5 percent in the villages where we promoted masks.

In the 300 villages where we distributed any type of mask, we saw a 9 percent reduction in COVID-19 compared with villages where we did not promote masks. Because of the small number of villages where we promoted cloth masks, we were not able to tell whether cloth or surgical masks were better at reducing COVID-19.

We did have a large enough sample size to determine that in villages where we distributed surgical masks, COVID-19 fell by 12 percent. In those villages COVID-19 fell by 35 percent for people 60 years and older and 23 percent for people 50-60 years old. When looking at COVID-19-like symptoms we found that both surgical and cloth masks resulted in a 12 percent reduction.

The body of evidence supports masks

Before this study there was a lack of gold-standard evidence on the effectiveness of masks to reduce COVID-19 in daily life. Our study provides strong real-world evidence that surgical masks reduce COVID-19, particularly for older adults who face higher rates of death and disability if they get infected.

Policymakers and public health officials now have evidence from laboratories, models, observations and real-world trials that support mask-wearing to reduce respiratory diseases, including COVID-19. Given that COVID-19 can so easily spread from person to person, if more people wear masks the benefits increase.



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So next time you are wondering if you should wear a mask, the answer is yes. Cloth masks are likely better than nothing, but high-quality surgical masks or masks with even higher filtration efficiency and better fit – such as KF94s, KN95s and N95s – are the most effective at preventing COVID-19.

Laura (Layla) H. Kwong, Assistant Professor of Environmental Health Sciences, University of California, Berkeley.

Based on this comparison, it is reasonable to consider China KN95, AS/NZ P2, Korea 1st Class, and Japan DS FFRs as "equivalent" to US NIOSH N95 and European FFP2 respirators, for filtering non-oil-based particles such as those resulting from wildfires, PM 2.5 air pollution, volcanic eruptions, or bioaerosols (e.g. viruses). However, prior to selecting a respirator, users should consult their local respiratory protection regulations and requirements or check with their local public health authorities for selection guidance.

Certification/ Class (Standard)	N95 (NIOSH-42C FR84)	FFP2 (EN 149-2001)	KN95 (GB2626-2006)	P2 (AS/NZ 1716:2012)	Korea 1 st 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.

Bottom Line: The Difference Between N95 vs. KN95 Masks

N95s and KN95s are both rated to capture 95% of particles. Among the minor differences, only KN95 masks are required to pass fit tests, while N95 masks have slightly stronger breathability standards.





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What Do I Do in an Emergency? The Role of Public Libraries in Providing Information During Times of Crisis

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Published online: 08 Dec 2011.



How do rapid antigen COVID-19 tests work?

Source: <https://newatlas.com/health-wellbeing/rapid-covid-antigen-tests-cost-how-to-use/>

Sept 21 – Why did the US government just pledge to buy 280 million of them? And is that even enough to help curb the spread of the virus?

As part of President Biden's recent "[Path out of the Pandemic](#)" plan, increased testing was flagged as an important part of containing the spread of COVID-19. The plan indicates nearly US\$2 billion will be spent procuring 280 million rapid COVID-19 tests. Plus, major retailers will be required to sell these tests at cost, approximately 35 percent less than current prices.

These numbers certainly sound big – 280 million tests is a lot. But what is the best way to use these rapid tests? How accurate are they? And is the government underestimating how many tests will actually be needed to make a difference?

What is a rapid antigen test?

The gold-standard test for SARS-CoV-2 is known as a reverse transcriptase-polymerase chain reaction (PCR) test. This test, involving the infamously fun experience of having a swab inserted deep into one's nasal cavity, looks for viral RNA.

PCR tests are incredibly accurate. So much so they can pick up minute traces of viral RNA that may only result in innocuous asymptomatic infections, or even offer positive diagnoses weeks after a person has passed their infectious phase. But PCR testing is also time and energy intensive, requiring samples

to be sent to diagnostic laboratories. At best, the results of a PCR test can take several hours. And at worst, when labs are overwhelmed, it can be days before a result comes back.

Rapid COVID-19 tests, on the other hand, sacrifice a degree of accuracy for speed and simplicity. [These tests look for proteins](#) on the surface of viruses called antigens, or antibody generators.

A rapid test contains a panel of antibodies designed to respond to SARS-CoV-2 antigens, and they can return a positive or negative result within around 15 minutes.



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How accurate are they?

Rapid antigen tests are without a doubt not as accurate as PCR tests. However, rapid antigen tests are incredibly accurate at catching cases at their most infectious point.

Rapid tests require substantial volumes of virus to be present in any given swab. This means these tests can't confirm someone is not currently infected with SAR-CoV-2 but instead can confirm whether a person may be infectious at the time of taking the test.

“Rapid tests are designed to identify cases with a high enough viral load in the nasal passage to be transmissible – not to diagnose all COVID-19 cases,” [explains public health expert Zoe McLaren](#), from the University of Maryland. “The Abbott BinaxNOW rapid antigen test may only detect 85 percent of the positive cases detected by PCR tests. But the key is that published studies found that they detect over 93 percent of cases that pose a transmission risk, which is what matters most for getting the pandemic under control. Ellume correctly identifies 95 percent of all positive cases, and Quidel QuickVue accurately identifies 85 percent. All three tests correctly identify upwards of 97 percent of all negative cases, regardless of symptoms.”



So what is more important in a diagnostic test for COVID-19, speed or sensitivity?

[One article published in early 2021](#) suggested widespread and frequent use of rapid antigen tests could more effectively help contain the pandemic compared to solely relying on slower PCR testing.

The study modeled viral spread across a population taking into consideration several variables, including test sensitivities, frequency, and sample-to-answer reporting times. The research found test sensitivity is less important than frequency of testing and the time it takes for a test to deliver results.

“These results demonstrate that effective screening depends largely on frequency of testing and speed of reporting and is only marginally improved by high test sensitivity,” the researchers wrote. “We therefore conclude that screening should prioritize accessibility, frequency, and sample-to-answer time; analytical limits of detection should be secondary.”

So, essentially, a less-sensitive but simple-to-use test administered frequently would be more helpful in managing a pandemic than a slow and difficult-to-access but highly sensitive test.



How to best use rapid antigen tests

Both [the FDA](#) and [the CDC](#) recommend serial testing when using rapid antigen tests. Because these tests require a relatively high viral load to return a positive result it is possible to test negative for SARS-CoV-2 but still be infectious. To overcome these false-negative results it is recommended people test themselves at least twice over a few days to be sure of the negative status.

Earlier this year a massive publicly funded program in [England offered every citizen](#) free rapid testing kits. The goal of the government funded program was for every citizen to test themselves at home twice a week.

It is estimated nearly 100 million tests have been distributed since the program began, and around 620,000 positive COVID-19 cases have been linked to the diagnostic program. The UK government [recently announced](#) it would be stopping the free rapid test program from the start of next year.

In the US, President Biden's recently announced plan to ramp up access to rapid testing has been criticized by some as too little, too late. [An editorial](#) by Eric Topol and Daniel Oran from the Scripps Research Institute called for the US government to drastically increase rapid testing manufacturing, arguing an order for 280 million tests at \$7 a test is far too few tests for far too much money.

"Instead, the U.S. should plan for a several-month surge of rapid testing, aiming to test a substantial proportion of the population at least twice a week," Oran and Topol write in the editorial [published by StatNews](#). "That would require around one billion tests a month. And the goal should be to get the price per test much closer to one dollar."

[Polling earlier this year](#) found nearly 80 percent of Americans would regularly test themselves for COVID-19 at home if rapid antigen tests cost around one dollar. However, only 33 percent of those polled were likely to engage in frequent home testing if the tests cost upwards of \$25.

Currently, even with the White House's "sell at cost" decree for major retailers, the cheapest price for a two-pack rapid antigen home test is about \$15. In Germany, [rapid tests can be bought](#) from local grocery stores for less than one dollar. In Singapore, [vending machines are being set up](#) across the city allowing those flagged as close contacts of positive cases to pick up free rapid tests.

Harvard epidemiologist Michael Mina has long advocated for widespread and frequent rapid antigen testing. He says the cost of these tests is high in America due to onerous regulatory burdens that have limited production.

"The reason it's so expensive here is because we have no market competition," Mina said in an [interview with NPR](#). "The actual cost of the devices is very inexpensive. But what we need is market competition. We need more producers to get into the United States market. And to do that, we have to release some of the regulatory barriers that we have thus far had."

Even Mild COVID-19 Can Affect The Brain, And We Don't Know How Long It Lasts

By Jessica Bernard

Source: <https://www.sciencealert.com/even-mild-covid-19-can-affect-the-brain-and-we-don-t-know-how-long-it-lasts>

Sept 27 – With more than [18 months of the pandemic](#) in the rearview mirror, researchers have been steadily gathering new and important insights into the effects of [COVID-19](#) on the body and brain. These findings are raising concerns about the long-term impacts that the [coronavirus](#) might have on biological processes such as aging.

As a [cognitive neuroscientist](#), [my past research](#) has focused on understanding how normal brain changes related to aging affect people's ability to think and move – particularly in middle age and beyond.

But as more evidence came in showing that COVID-19 could affect [the body and brain](#) for months or longer following infection, my research team became interested in exploring how it might also impact the natural process of aging.

Peering in at the brain's response to COVID-19

In August 2021, a [preliminary but large-scale study](#) investigating brain changes in people who had experienced COVID-19 drew a great deal of attention within the neuroscience community.

In that study, researchers relied on an existing database called the [UK Biobank](#), which contains brain imaging data from over 45,000 people in the [UK going back to 2014](#). This means – crucially – that there was baseline data and brain imaging of all of those people from before the [pandemic](#).

The research team analyzed the brain imaging data and then brought back those who had been diagnosed with COVID-19 for additional brain scans. They compared people who had experienced COVID-19 to participants who had not, carefully matching the groups based on age, sex, baseline test date and study location, as well as common risk factors for disease, such as health variables and socioeconomic status.



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The team found marked differences in gray matter – which is made up of the cell bodies of neurons that process information in the brain – between those who had been infected with COVID-19 and those who had not.

Specifically, the thickness of the gray matter tissue in brain regions known as the frontal and temporal lobes was reduced in the COVID-19 group, differing from the typical patterns seen in the group that hadn't experienced COVID-19.

In the general population, it is normal to see some change in gray matter volume or thickness over time as people age, but the changes were larger than normal in those who had been infected with COVID-19.

Interestingly, when the researchers separated the individuals who had severe enough illness to require hospitalization, the results were the same as for those who had experienced milder COVID-19. That is, people who had been infected with COVID-19 showed a loss of brain volume even when the disease was not severe enough to require hospitalization.

Finally, researchers also investigated changes in performance on cognitive tasks and found that those who had contracted COVID-19 were slower in processing information, relative to those who had not.

While we have to be careful interpreting these findings as they await formal [peer review](#), the large sample, pre- and post-illness data in the same people and careful matching with people who had not had COVID-19 have made this preliminary work particularly valuable.

What do these changes in brain volume mean?

Early on in the pandemic, one of the most common reports from those infected with COVID-19 was the loss of [sense of taste and smell](#).

Strikingly, the brain regions that the UK researchers found to be impacted by COVID-19 are all linked to the olfactory bulb, a structure near the front of the brain that passes signals about smells from the nose to other brain regions. The olfactory bulb has connections to regions of the temporal lobe.

We often talk about the temporal lobe in the context of aging and [Alzheimer's](#) disease because it is where the [hippocampus](#) is located. The hippocampus is likely to play a key role in aging, given its involvement in memory and cognitive processes.

The sense of smell is also important to Alzheimer's research, as some data has suggested that those at risk for the disease [have a reduced sense of smell](#).

While it is far too early to draw any conclusions about the long-term impacts of these COVID-related changes, investigating possible connections between COVID-19-related brain changes and memory is of great interest – particularly given the regions implicated and their importance in memory and Alzheimer's disease.

Looking ahead

These new findings bring about important yet unanswered questions: What do these brain changes following COVID-19 mean for the process and pace of aging? And, over time does the brain recover to some extent from viral infection?

These are active and open areas of research, some of which we are beginning to do in my own laboratory in conjunction with our ongoing work investigating brain aging. Our lab's work demonstrates that as people age, the brain thinks and [processes information differently](#). In addition, we've observed changes over time in how [peoples' bodies move](#) and how people learn new motor skills.

Several [decades of work](#) have demonstrated that older adults have a harder time processing and manipulating information – such as updating a mental grocery list – but they typically maintain their knowledge of facts and vocabulary. With respect to motor skills, we know that [older adults still learn](#), but they do so more [slowly than young adults](#). When it comes to brain structure, we typically see a decrease in the size of the brain in adults over age 65. This decrease is not just localized to one area. Differences can be seen across many regions of the brain. There is also typically an increase in cerebrospinal fluid that fills space due to the loss of brain tissue. In addition, white matter, the insulation on axons – long cables that carry electrical impulses between nerve cells – is also [less intact in older adults](#). As [life expectancy has increased](#) in the past decades, more individuals are reaching older age. While the goal is for all to live long and healthy lives, even in the best-case scenario where one ages without disease or disability, older adulthood brings on changes in how we think and move.

Learning how all of these puzzle pieces fit together will help us unravel the mysteries of aging so that we can help improve quality of life and function for aging individuals. And now, in the context of COVID-19, it will help us understand the degree to which the brain may recover after illness as well.

Jessica Bernard is an Associate Professor @ Texas A&M University.

EDITOR'S COMMENT: I was wondering if we have similar studies for H1N1, SARS, or MERS CoV. And if not, why?



Nature Medicine publishes phase 3 anakinra study results in patients with COVID-19 pneumonia

Source: <https://www.sobi.com/en/press-releases/nature-medicine-publishes-phase-3-anakinra-study-results-patients-covid-19-pneumonia>

Sept 03 – Swedish Orphan Biovitrum AB (publ) (Sobi™) (STO:SOBI) and the Hellenic Institute for the Study of Sepsis today announce that *Nature Medicine* has published positive results from the investigator-sponsored phase 3 SAVE-MORE study evaluating anakinra plus standard of care (SOC) in patients with moderate-to-severe COVID-19 pneumonia. The study demonstrated that early and targeted use of anakinra, in addition to current SOC, reduces risk of death, reduces ICU admission and increases likelihood of full recovery in hospitalised COVID-19 patients with poor prognosis due to risk of severe respiratory failure (SRF).

KEY HIGHLIGHTS

- Early treatment with anakinra showed considerable efficacy and reduced risk of disease progression and death by 64 percent, according to day 28 results from the SAVE-MORE study.
- Relative decrease of mortality was 55%, reaching 80% for patients with cytokine storm.
- Proportion of patients who fully recovered exceeded 50 percent, and number of patients remaining with severe disease reduced by 54 percent. Average time until hospital and intensive care unit (ICU) discharge was reduced by one and four days.

[The SAVE-MORE study](#), conducted by the Hellenic Institute for the Study of Sepsis, is the first large, pivotal randomised controlled trial to specifically evaluate a patient population at risk of progressing to critical state and demonstrate considerable benefit of earlier intervention for the prevention of disease progression and death. Co-administered treatments were similar between the two arms of the study and included dexamethasone, anticoagulants and remdesivir. The study results were [previously reported](#) in May. "The results published in *Nature Medicine* provide the only data available on prevention from early stage progressing to critical status, indicating that the inflammatory disease needs to be treated earlier with a specifically targeted approach to IL-1 alpha and IL-1β," [said lead investigator Evangelos J. Giamarelos-Bourboulis, Professor of Internal Medicine and Infectious Diseases, National and Kapodistrian University of Athens, President of the European Shock Society, and Chairman of the European Sepsis Alliance.](#)

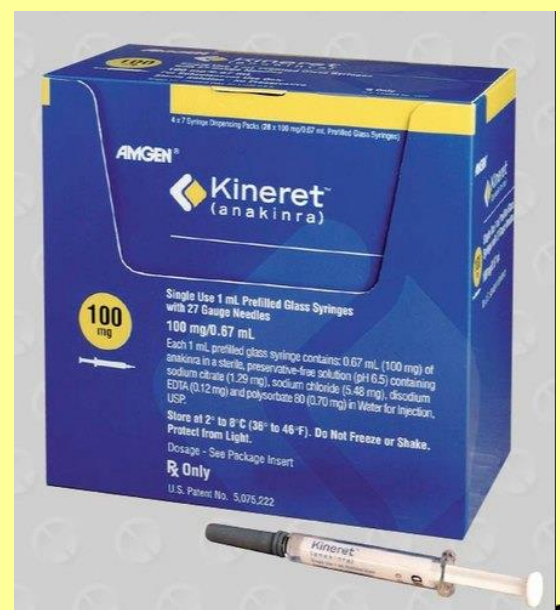
"Publication of the SAVE-MORE study results in *Nature Medicine* demonstrates the significance of these data and further advances our understanding of the role of IL-1 in COVID-19," says Guido Oelkers, CEO of Sobi. "We hope to contribute to an improvement of care for patients during this critical time and welcome the opportunity to work closely with the EMA and other regulatory agencies regarding these results."

About SAVE-MORE

SAVE-MORE ([NCT04680949](https://clinicaltrials.gov/ct2/show/study/NCT04680949)); suPAR-Guided Anakinra Treatment for Management of Severe Respiratory Failure by COVID-19) is a large, pivotal, confirmatory, phase III randomized controlled trial (RCT) in over 600 hospitalised patients. The trial aims to evaluate the efficacy and safety of early start of anakinra guided by suPAR in patients with LRTI by SARS-CoV-2 in improving the clinical state of COVID-19 over 28 days, as measured by the ordinal scale of the 11-point World Health Organization (WHO) clinical progression scale (CPS). Anakinra was administered at a dose of 100mg/day SC for up to 10 days. Of 1,060 patients screened, 606 patients were randomised 2:1 across 37 sites in Greece and Italy. SAVE-MORE is an investigator-sponsored study conducted independently by Professor Giamarelos-Bourboulis, with the Hellenic Institute for the Study of Sepsis being the sponsor. Sobi has supported the study with study drug and funding.

About Kineret® (anakinra)

Kineret® is an interleukin-1 α and β receptor antagonist that is indicated in the US for reduction in signs and symptoms and slowing the progression of structural damage in moderately to severely active rheumatoid arthritis, in patients 18 years of age or older who have failed



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one or more disease modifying antirheumatic drugs (DMARDs), for the treatment of neonatal-onset multisystem inflammatory disease (NOMID, a form of cryopyrin-associated periodic syndromes (CAPS)), and for the treatment of Deficiency of Interleukin-1 Receptor Antagonist (DIRA).

In Europe, Kineret is indicated in adults for the treatment of the signs and symptoms of rheumatoid arthritis (RA) in combination with methotrexate, with an inadequate response to methotrexate alone. In addition, Kineret is indicated in adults, adolescents, children and infants aged 8 months and older with a body weight of 10 kg or above for the treatment of cryopyrin-associated periodic syndromes (CAPS), including - neonatal-onset multisystem inflammatory disease (NOMID)/chronic infantile neurological, cutaneous, and articular syndrome (CINCA), Muckle-Wells syndrome (MWS) and familial cold auto inflammatory syndrome (FCAS). Kineret is indicated for the treatment of Familial Mediterranean fever (FMF). Kineret should be given in combination with colchicine, if appropriate. It is also indicated in adults, adolescents, children and infants aged 8 months and older with a body weight of 10 kg or above for the treatment of Still's disease, including Systemic Juvenile Idiopathic Arthritis (SJIA) and Adult-Onset Still's Disease (AOSD), with active systemic features of moderate to high disease activity, or in patients with continued disease activity after treatment with non-steroidal anti-inflammatory drugs (NSAIDs) or glucocorticoids. Kineret can be given as monotherapy or in combination with other anti-inflammatory drugs and disease-modifying antirheumatic drugs (DMARDs).

For full US prescribing information visit www.kineretrx.com and for full European prescribing information visit the EMA website. Anakinra has not been approved for the treatment of COVID -19.

About suPAR and suPARnostic®

suPAR (soluble urokinase plasminogen activator receptor) is the biomarker detected by ViroGates' suPARnostic® products and is a protein in plasma, measurable in every human being. suPAR is considered a general risk status biomarker indicating disease presence, disease severity and progression, organ damage and mortality risk across disease areas such as cardiovascular diseases, kidney diseases, type 2 diabetes, cancer, etc.

About the Hellenic Institute for the Study of Sepsis

The Hellenic Institute for the Study of Sepsis (HISS) is a non-profit organisation situated in Athens. HISS coordinates the research activities in sepsis and severe inflammatory disorders since 2010 of 58 departments of Internal Medicine and Intensive Care Units in Greece and abroad. HISS has sponsored the conduct of more than 30 clinical studies and has a track record of providing support for more than 100 publications. The phase II SAVE trial and the phase III SAVE-MORE trial were sponsored by HISS. For more details visit www.sepsis.gr

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Covid VAERS data – September 2021

↓	↑ ↓	
Event Outcome	Count	Percent
Death	15,386	2.12%
Permanent Disability	20,789	2.86%
Office Visit	114,126	15.7%
Emergency Room	57	0.01%
Emergency Doctor/Room	82,798	11.39%
Hospitalized	66,456	9.14%
Hospitalized, Prolonged	186	0.03%
Recovered	231,285	31.82%
Birth Defect	475	0.07%
Life Threatening	16,056	2.21%
Not Serious	312,402	42.97%
TOTAL	† 860,016	† 118.3%

† Because some cases have multiple vaccinations and symptoms, a single case can account for multiple entries in this table. This is the reason why the Total Count is greater than 726965 (the number of cases found), and the Total Percentage is greater than 100.

Deaths

- ❖ Janssen 1049
- ❖ Moderna 3794
- ❖ **Pfizer** 10503
- ❖ Unknown 40



Antibodies in breast milk remain for 10 months after Covid infection – study

Source: <https://www.theguardian.com/lifeandstyle/2021/sep/27/antibodies-in-breast-milk-remain-for-10-months-after-covid-infection-study>

Sept 27 – **Breastfeeding women who have been infected with Covid-19 continue to secrete virus-neutralising antibodies into their milk for up to 10 months, data suggests.**

Besides emphasising the important role breastfeeding could play in helping to protect infants from the disease, researchers believe that such antibodies could be used to treat people with severe Covid-19, preventing their condition from getting worse.



Although young children are less at risk of developing severe Covid-19 than older people or those with underlying health conditions, approximately one in 10 infants under the age of one will require significant hospital care if they become infected.

Researchers took breast milk samples from 75 women who had recovered from Covid-19, and found 88% contained antibodies capable of neutralising Sars-CoV-2. Photograph: Anthony Devlin/PA

“This is the breastfeeding population, so knowing if there are antibodies in the milk, how long they’ll be protective after being infected, or which vaccine is going to give your baby the

best antibody protection, is very important information, and will be relevant for a long time to come,” said Dr Rebecca Powell at Mount Sinai hospital in New York, who led the research.

The antibodies in breast milk are somewhat different to the Immunoglobulin G (IgG) antibodies that predominate in blood and are triggered by vaccination – although some of these are also secreted into breast milk. The main antibody is Secretory Immunoglobulin A (IgA), which sticks to the lining of babies’ respiratory and intestinal tracts, helping to block viruses and bacteria from entering their bodies. Although researchers had previously detected antibodies against Sars-CoV-2 in breast milk, it was unclear whether they could neutralise the virus, or how long women continue to produce them after encountering coronavirus.

To investigate, Powell and colleagues took breast milk samples from 75 women who had recovered from Covid-19, and found that 88% contained IgA antibodies. In most cases these were capable of neutralising Sars-CoV-2, meaning they could block infection.

Further measurements revealed that women continued to secrete these antibodies for up to 10 months. “It means that if you continue breastfeeding, you’re still giving those antibodies in your milk,” said Powell, who presented the results at the Global Breastfeeding and Lactation Symposium on 21 September. She believes IgA antibodies extracted from breast milk could also be beneficial to adults with severe Covid-19. “It could be an incredible therapy, because Secretory IgA is meant to be in these mucosal areas, such as the lining of the respiratory tract, and it survives and functions very well there,” Powell said. “You could imagine if it was used in a nebuliser-type treatment, it might be very effective during that window where the person has gotten quite sick, but they’re not yet at the point of [being admitted to intensive care].” Her team also [investigated the transfer](#) of coronavirus-specific antibodies into breast milk in 50 women after vaccination with either the Pfizer, Moderna, or Johnson & Johnson (J&J) jabs. All women injected with the Moderna vaccine, and 87% of those who received the Pfizer vaccine had coronavirus-specific IgG antibodies in their milk, while 71% and 51% respectively had virus-specific IgA antibodies. For the J&J vaccine, only 38% of women had IgG antibodies and 23% had IgA antibodies against coronavirus in their milk. Powell said: “We know that the level of antibodies produced by RNA vaccines is extremely high compared to other vaccines. You don’t necessarily need that much antibody to protect you from infection, but the milk effect really depends on there being a lot of antibody in your blood that’s transferring into your milk. Because there’s a lower level stimulated by the J&J vaccine ([a viral vector vaccine](#)), that’s probably why there’s very low levels in the milk.”

The team is now investigating the antibody response in breast milk triggered by the AstraZeneca vaccine.

►► **Read the paper presented at the 15th Global Breastfeeding and Lactation Symposium 21-22 September 2021:** <https://www.medela.com/dam/medela-com/breastfeeding-professional/documents/general/symposium-2021/null.pdf>

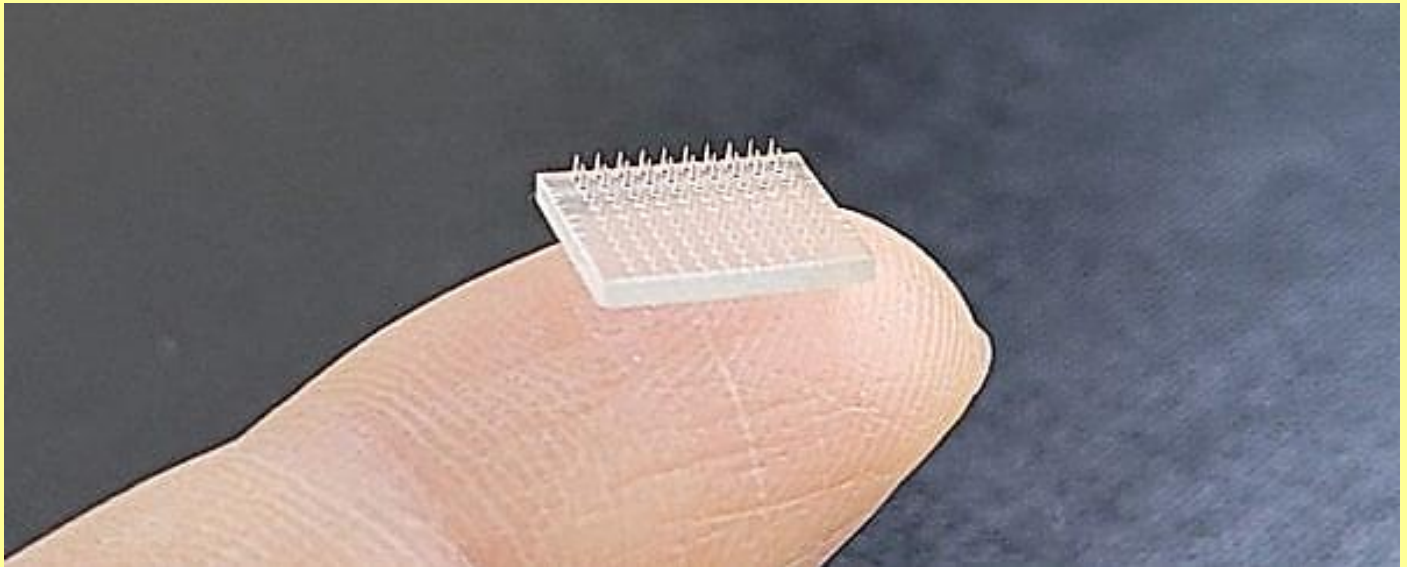


CDC studies confirm mask-wearing in schools reduces spread of COVID-19

Two studies from the CDC are offering evidence of universal mask-wearing practices in schools reducing rates of COVID-19 outbreaks. The research conducted across July and August delivers insights into how the Delta variant can spread in children. [Read more](#)

This Tiny 'Vaccine Patch' Could Prompt Stronger Immune Response Than a Needle

Source: <https://www.sciencealert.com/this-tiny-vaccine-patch-could-prompt-stronger-immune-responses-than-a-needle>



Sept 28 – Scientists have developed a microneedle 'vaccine patch' that promises a much greater immune response than traditional vaccine shots – and all without the potential pain and anxiety associated with conventional needles.

While [microneedle patches](#) have been in development for years, they have proved difficult to successfully manufacture at scale. What's more, it can be challenging to adapt the same patch for different types of vaccine.

This new research overcomes those problems with an advanced 3D-printing technique called [continuous liquid interface production](#) or CLIP, using ultraviolet light and a special resin to create the patches – patches that are consistent in size, shape, and needle spacing, no matter how many are made.

"Our approach allows us to directly 3D-print the microneedles, which gives us lots of design latitude for making the best microneedles from a performance and cost point-of-view," [says microbiologist Shaomin Tian](#) from the University of North Carolina at Chapel Hill.

The ease and speed with which these microneedle patches can be developed could bring them into much wider use, the researchers say. Besides avoiding conventional needles altogether, another advantage of these patches is that they can be self-administered – there's no need to book an appointment with a doctor or a nurse to get your shot.

This is because the short needles only have to penetrate just below the surface layer of the skin (transdermal), and not all the way through it (subcutaneous) like traditional vaccines.

The drugs get directly delivered in the vicinity of skin immune cells, which is perfect for vaccines. With a more efficient delivery system, it's possible that dosages can be lowered accordingly.

In lab tests in mice, the researchers found that their patch generated a T-cell and antigen-specific [antibody](#) response some 50 times greater than a traditional, subcutaneous injection delivered under the surface of the skin.

"Using model vaccine components, we demonstrated that 3D-printed microneedle delivery resulted in enhanced cargo retention in the skin, activation of immune cells, and more potent humoral and cellular immune responses as compared with traditional vaccination routes," the researchers explain in their [paper](#).

The team says that its design and approach can be adapted to cover vaccines for flu, measles, hepatitis, and even [COVID-19](#). There's no need for special handling or refrigeration in terms of transportation, which could help boost vaccination rates. The patches can even use [recent improvements](#) in the field to combine multiple drugs on the same patch.

While the patches have yet to be tested on humans, similar benefits should apply as have been seen in mice, enabling faster and more efficient vaccine responses to epidemics and pandemics in the future.



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The researchers aren't standing still with their microneedle vaccine patch – next, they're looking at how RNA vaccines (including the Pfizer and Moderna COVID-19 vaccines) might be incorporated into this design.

"In developing this technology, we hope to set the foundation for even more rapid global development of vaccines, at lower doses, in a pain and anxiety-free manner," [says chemical engineer Joseph DeSimone](#) from Stanford University.

▶▶ The research has been published in [PNAS](#).

A Daily Pill to Treat COVID Could Be Just Months Away, Scientists Say



Source: <https://www.medscape.com/viewarticle/959705>

Sept 24 – Within a day of testing positive for covid-19 in June, Miranda Kelly was sick enough to be scared. At 44, with diabetes and high blood pressure, Kelly, a certified nursing assistant, was having trouble breathing, symptoms serious enough to send her to the emergency room.

When her husband, Joe, 46, fell ill with the virus, too, she really got worried, especially about their five teenagers at home: "I thought, 'I hope to God we don't wind up on ventilators. We have children. Who's going to raise these kids?'"

But the Kellys, who live in Seattle, had agreed just after their diagnoses to join a clinical trial at the nearby Fred Hutch cancer research center that's part of an [international effort](#) to test an antiviral treatment that could halt covid early in its course.

By the next day, the couple were taking four pills, twice a day. Though they weren't told whether they had received an active medication or placebo, within a week, they said, their symptoms were better. Within two weeks, they had recovered.

"I don't know if we got the treatment, but I kind of feel like we did," Miranda Kelly said. "To have all these underlying conditions, I felt like the recovery was very quick."

The Kellys have a role in developing what could be the world's next chance to thwart covid: a short-term regimen of daily pills that can fight the virus early after diagnosis and conceivably prevent symptoms from developing after exposure.

"Oral antivirals have the potential to not only curtail the duration of one's covid-19 syndrome, but also have the potential to limit transmission to people in your household if you are sick," said Timothy Sheahan, a virologist at the University of North Carolina-Chapel Hill who has helped pioneer these therapies.

Antivirals are already essential treatments for other viral infections, including hepatitis C and HIV. One of the best known is [Tamiflu](#), the widely prescribed pill that can shorten the duration of influenza and reduce the risk of hospitalization if given quickly.

The medications, developed to treat and prevent viral infections in people and animals, work differently depending on the type. But they can be engineered to boost the immune system to fight infection, block receptors so viruses can't enter healthy cells, or lower the amount of active virus in the body.

At least three promising antivirals for covid are being tested in clinical trials, with results expected as soon as late fall or winter, said Carl Dieffenbach, director of the Division of AIDS at the National Institute of Allergy and Infectious Diseases, who is overseeing antiviral development.

"I think that we will have answers as to what these pills are capable of within the next several months," Dieffenbach said.

The top contender is a medication from Merck & Co. and Ridgeback Biotherapeutics called [molnupiravir](#), Dieffenbach said. This is the product being tested in the Kellys' Seattle trial. Two others include a candidate from Pfizer, known as PF-07321332, and AT-527, an antiviral produced by Roche and Atea Pharmaceuticals.

They work by interfering with the virus's ability to replicate in human cells. In the case of molnupiravir, the enzyme that copies the viral genetic material is forced to make so many mistakes that the virus can't reproduce. That, in turn, reduces the patient's viral load, shortening infection time and preventing the kind of dangerous immune response that can cause serious illness or death.

So far, only one antiviral drug, remdesivir, [has been approved to treat covid](#). But it is given intravenously to patients ill enough to be hospitalized, and is not intended for early, widespread use. By contrast, the top contenders under study can be packaged as pills.

Sheahan, who also performed preclinical work on remdesivir, led an [early study in mice](#) that showed that molnupiravir could prevent early disease caused by SARS-CoV-2, the virus that causes covid. The formula was discovered at Emory University and later acquired by Ridgeback and Merck.

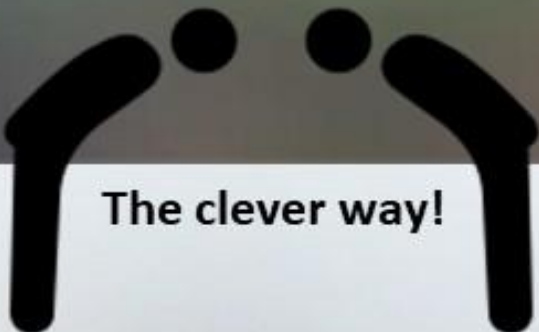
Clinical trials have followed, including an [early trial](#) of 202 participants last spring that showed that molnupiravir rapidly reduced the levels of infectious virus. Merck chief executive Robert Davis said this month that the company expects data from its larger phase 3 trials in the coming weeks, with the potential to seek emergency use authorization from the Food and Drug Administration "before year-end."



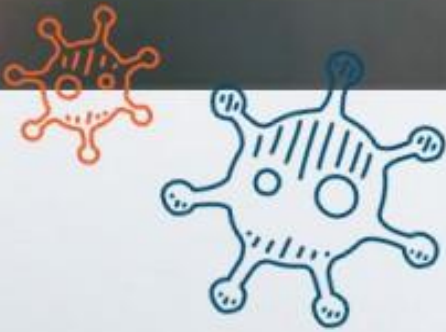
The SARS-CoV-2-Stupidity virus



No virus here



The clever way!



Virus here

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Pfizer launched a combined [phase 2 and 3 trial of its product Sept. 1](#), and Atea officials said they [expect results](#) from phase 2 and phase 3 trials later this year.

If the results are positive and emergency use is granted for any product, Dieffenbach said, "distribution could begin quickly." That would mean millions of Americans soon could have access to a daily orally administered medication, ideally a single pill, that could be taken for five to 10 days at the first confirmation of covid infection.

"When we get there, that's the idea," said Dr. Daniel Griffin, an infectious diseases and immunology expert at Columbia University. "To have this all around the country, so that people get it the same day they get diagnosed."

Once sidelined for lack of interest, oral antivirals to treat coronavirus infections are now a subject of fierce competition and funding. In June, the Biden [administration announced](#) it had agreed to obtain about 1.7 million treatment courses of Merck's molnupiravir, at a cost of \$1.2 billion, if the product receives emergency authorization or full approval. The same month, the administration said it [would invest \\$3.2 billion](#) in the Antiviral Program for Pandemics, which aims to develop antivirals for the covid crisis and beyond, Dieffenbach said.

The pandemic kick-started a long-neglected effort to develop potent antiviral treatments for coronaviruses, said Sheahan. Though the original SARS virus in 2003 gave scientists a scare — followed by Middle East respiratory syndrome, or MERS, in 2012 — research efforts slowed when those outbreaks did not persist.

"The commercial drive to develop any products just went down the tubes," said Sheahan.

Widely available antiviral drugs would join the monoclonal antibody therapies already used to treat and prevent serious illness and hospitalizations caused by covid. The lab-produced monoclonal antibodies, which mimic the body's natural response to infection, were easier to develop but must be given primarily through intravenous infusions.

The federal government is covering the cost of most monoclonal products at \$2,000 a dose. It's still too early to know how the price of antivirals might compare.

Like the monoclonal antibodies, antiviral pills would be no substitute for vaccination, said Griffin. They would be another tool to fight covid. "It's nice to have another option," he said.

One challenge in developing antiviral drugs quickly has been recruiting enough participants for the clinical trials, each of which needs to enroll many hundreds of people, said Dr. Elizabeth Duke, a Fred Hutch research associate overseeing its molnupiravir trial.

Participants must be unvaccinated and enrolled in the trial within five days of a positive covid test. Any given day, interns make 100 calls to newly covid-positive people in the Seattle area — and most say no.

"Just generally speaking, there's a lot of mistrust about the scientific process," Duke said. "And some of the people are saying kind of nasty things to the interns."

If the antiviral pills prove effective, the next challenge will be ramping up a distribution system that can rush them to people as soon as they test positive. Griffin said it will take something akin to [the program set up last year](#) by UnitedHealthcare, which sped Tamiflu kits to 200,000 at-risk patients enrolled in the insurer's Medicare Advantage plans.

Merck officials [predicted the company](#) could produce more than 10 million courses of therapy by the end of the year. Atea and Pfizer have not released similar estimates.

Even more promising? Studies evaluating whether antivirals can prevent infection after exposure.

"Think about that," said Duke, who is also overseeing a prophylactic trial. "You could give it to everyone in a household, or everyone in a school. Then we're talking about a return to, maybe, normal life."

Will 'Dr Disinformation' Ever Face the Music?

Source: <https://www.medscape.com/viewarticle/959248>

Sept 22 – Earlier this month, Dr. Rashid Buttar [posted on Twitter](#) that covid-19 "was a planned operation" and [shared an article](#) alleging that most people who got the covid vaccine would be dead by 2025.

His statement is a recent example in what has been a steady stream of spurious claims surrounding the covid vaccines and treatments that swirl around the public consciousness. Others include testimony in June by [Dr. Sherri Jane Tenpenny before](#) Ohio state legislators that the vaccine could cause people to become magnetized. Clips from the hearing went viral on the internet. On April 9, 2020, [Dr. Joseph Mercola posted a video titled](#) "Could hydrogen peroxide treat coronavirus?" which was shared more than 4,600 times. In the video, Mercola said inhaling hydrogen peroxide through a nebulizer could prevent or cure covid.

These physicians are identified as members of the "Disinformation Dozen," a group of top superspreaders of covid vaccine misinformation on social media, according to a [2021 report by the](#)



[nonprofit Center for Countering Digital Hate](#). The report, based on an analysis of anti-vaccine content on social media platforms, found that 12 people were responsible for 65% of it. The group is composed of physicians, anti-vaccine activists and people known for promoting alternative medicine.

The physician voices are of particular concern because their medical credentials lend credence to their unproven, often dangerous pronouncements. All three continue to hold medical licenses and have not faced consequences for their covid-related statements. But leaders of professional medical organizations increasingly are calling for that to change and urging medical oversight boards to take more aggressive action.



In July, the Federation of State Medical Boards, the national umbrella organization for the state-based boards, [issued a statement](#) making clear that doctors who generate and spread covid misinformation could be subject to disciplinary action, including the suspension or revocation of their licenses. The American Board of Family Medicine, American Board of Internal Medicine and American Board of Pediatrics issued [a joint statement Sept. 9](#) in support of the state boards' position, warning that "such unethical or unprofessional conduct may prompt their respective Board to take action that could put their certification at risk."

And the superspreaders identified by the center's report are not alone. KHN identified 20 other doctors who have made false or misleading claims about covid by combing through published fact checks and other news coverage.

For example, at an Indiana school board meeting in August, [Dr. Dan Stock claimed the surge in covid cases this summer](#) was due to "antibody mediated viral enhancement" from people receiving covid vaccines. PolitiFact [rated his claim "Pants on Fire" false](#).

Dr. Stella Immanuel, a member of a group [America's Frontline Doctors, which has consistently made false statements about covid](#), said in a video that went viral in July 2020 that masks weren't needed because covid could be cured by hydroxychloroquine. [Immanuel's website](#) currently promotes a set of vitamins, as well as hydroxychloroquine and ivermectin, as covid treatments.

Two of the doctors mentioned by name in this article responded to requests for comment. Mercola offered [documents](#) to rebut criticisms of his hydrogen peroxide covid treatment and took issue with the center's "Disinformation Dozen" report methodology. Buttar defended his positions, saying via email that "the science is clear and anyone who contests it, has a suspect agenda at best and/or lacks a moral compass." He also pointed to data from the Centers for Disease Control and Prevention's Vaccine Adverse Event Recording System, [considered inconclusive](#) by many experts.

Since the onset of the covid pandemic, misinformation has been widespread on social media platforms. And many experts blame it for undermining efforts to curb the coronavirus's spread. A [recent poll](#) showed



that more than 50% of Americans who won't get vaccinated cited conspiracy theories as their reasons — for example, saying the vaccines cause infertility or alter DNA.

Some physicians have gained notoriety by embracing covid-related fringe ideas, quack treatments and falsehoods via social media, conservative talk shows and even in person with patients. Whether promoting the use of ivermectin, an anti-parasitic drug for animals, or a mix of vitamins to treat covid, doctors' words can be especially powerful. [Public opinion polls](#) consistently show that Americans have high trust in doctors.

"There is a sense of credibility that comes with being a doctor," said [Rachel Moran](#), a researcher who studies covid misinformation at the University of Washington. "There is also a sense they have access to insider info that we don't. This is a very confusing time, and it can seem that if anyone knows what I should be doing in this situation, it's a doctor."

While covid is a novel and complicated infectious disease, physicians spreading misinformation generally have no particular expertise in infectious diseases. Dr. Scott Atlas, who endorsed [former President Donald Trump's unproven statements](#) about the course of the pandemic, is a radiation oncologist.

Traditionally, the responsibility of policing physicians has fallen to state medical boards. Beyond overseeing the licensing process, these panels investigate complaints about doctors and discipline those who engage in unethical, unprofessional or, in extreme cases, criminal activity. Any member of the public can submit a complaint about a physician.

"The boards are relatively slow and weak and it's a long, slow process to pull somebody's license," said [Arthur Caplan](#), founding head of the Department of Medical Ethics at New York University. "In many states, they have their hands full with doctors who have committed felonies, doctors who are molesting their patients. Keeping an eye on misinformation is somewhat down on the priority list."

To date, only two doctors have reportedly faced such sanctions. In Oregon, [Dr. Steven LaTulippe had his license suspended](#) in December 2020 for refusing to wear a face mask at his clinic and telling patients that masks were ineffective in curbing the spread of covid, and even dangerous. Dr. Thomas Cowan, a San Francisco physician [who posted a YouTube video](#) that went viral in March 2020 stating that 5G networks cause covid, voluntarily surrendered his medical license to California's medical board in February 2021.

[Dr. Humayun Chaudhry](#), president of the Federation of State Medical Boards, however, said it's possible some doctors could already be the subject of inquiries and investigations, since these actions are not made public until sanctions are handed down.

KHN reached out to the medical and osteopathic boards of all 50 states and the District of Columbia to see if they had received covid misinformation complaints. Of the 43 that responded, only a handful shared specifics.

During a one-week period in August, Kansas' medical board received six such complaints. In all, the state has received 35 complaints against 20 licensees about spreading covid misinformation on social media and in person. Indiana has received about 30 in the past year. South Carolina said it had about 10 since January. Rhode Island didn't share the number of complaints but said it has taken [disciplinary action against one doctor for spreading misinformation](#), though it hasn't moved to suspend his license. (The disciplinary measures include a fine, a reprimand on the doctor's record and a mandate to complete an ethics course.) Five states said they had received only a couple, and 11 states reported receiving no complaints regarding covid misinformation.

Confidentiality laws in 13 states prevented those boards from sharing information about complaints.

Social media companies have also been slow to take action. Some doctors' accounts — specifically those among the Disinformation Dozen — have been suspended, but others are still active and posting misinformation.

[Imran Ahmed](#), CEO of the Center for Countering Digital Hate, said social media platforms often don't consistently apply their rules against spreading misinformation.

"Even when it's the same companies, Facebook will sometimes take posts down, but Instagram will not," Ahmed said, referring to Facebook's ownership of Instagram. "It goes to show their piecemeal, ineffective approach to enforcing their own rules."

A Facebook spokesperson said the company has removed over 3,000 accounts, pages and groups for repeatedly violating covid and vaccine [misinformation policies](#) since the beginning of the pandemic. Buttar's Facebook and Instagram pages and Tenpenny's Facebook page have been removed, while Mercola's Facebook posts have been demoted, which means fewer people will see them. Tenpenny and Mercola still have Instagram accounts.

Part of the challenge may be that these doctors sometimes present scientific opinions that aren't mainstream but are viewed as potentially valid by some of their colleagues.

"It can be difficult to prove that what is being said is outside the range of scientific and medical consensus," said Caplan. "The doctors who were advising Trump — like Scott Atlas — recommended herd immunity. That was far from the consensus of epidemiologists, but you couldn't get a board to take his license away because it was a fringe opinion."

Even if these physicians don't face consequences, it is likely, experts said, that the public health will.



"Medical misinformation doesn't just result in people making bad personal and community health choices, but it also divides communities and families, leaving an emotional toll," said Moran, the University of Washington researcher. "Misinformation narratives have real sticking power and impact people's ability to make safe health choices."

Sputnik V demonstrates 97.2% efficacy and high safety profile against COVID during the vaccination campaign in Belarus

Source: https://rdif.ru/Eng_fullNews/7080/

Sept 15 – The Russian Direct Investment Fund (RDIF, Russia's sovereign wealth fund) announces the real world data of the Ministry of Health of the Republic of Belarus on the Russian Sputnik V coronavirus vaccine confirming its high efficacy during the vaccination campaign in the country.

The Russian vaccine has demonstrated 97.2% efficacy against coronavirus in Belarus. The efficacy of Sputnik V was measured based on data from more than 860,000 people vaccinated between January and July 2021.

The data from the Ministry of Health also confirms high safety of Sputnik V:

- No severe adverse events associated with vaccination;
- **No deaths related to the vaccination;**

Belarus was the first foreign country to register Sputnik V and use it for vaccination of the population.

RDIF and partners have facilitated the technology transfer to localize the production of Sputnik V by Belarus's Belmedpreparaty company, which is successfully manufacturing Sputnik V. In April 2021 the vaccine produced in Belarus was authorized by the Ministry of Health.

In April 2021 the single-dose Sputnik Light vaccine (the first component of Sputnik V based on human adenovirus serotype 26) was also registered in Belarus.

Sputnik V has a number of key advantages:

- *Efficacy of Sputnik V is 97.6% based on the analysis of data on the coronavirus infection rate among those in Russia vaccinated with both components of Sputnik V from December 5, 2020 to March 31, 2021;*
- *The Sputnik V vaccine is based on a proven and well-studied platform of human adenoviral vectors, which cause the common cold and have been around for thousands of years.*
- *Sputnik V has pioneered the use of heterogeneous boosting (two different vectors for the two shots in a course of vaccination among COVID vaccines). This approach provides for immunity with a longer duration than vaccines using the same delivery mechanism for both shots.*
- *The safety, efficacy and lack of negative long-term effects of adenoviral vaccines have been proven by more than 250 clinical studies over two decades.*
- *There are no strong allergies caused by Sputnik V.*

Russian Direct Investment Fund (RDIF) is Russia's sovereign wealth fund established in 2011 to make equity co-investments, primarily in Russia, alongside reputable international financial and strategic investors. RDIF acts as a catalyst for direct investment in the Russian economy. RDIF's management company is based in Moscow. Currently, RDIF has experience of the successful joint implementation of more than 80 projects with foreign partners totaling RUB 2.1 tn and covering 95% of the regions of the Russian Federation. RDIF portfolio companies employ more than 800,000 people and generate revenues which equate to more than 6% of Russia's GDP. RDIF has established joint strategic partnerships with leading international co-investors from more than 18 countries that total more than \$40 bn.

New long COVID studies show symptoms linger up to one year after infection

Source: <https://newatlas.com/health-wellbeing/long-covid-studies-symptoms-one-year-later/>

Sept 29 – **Two new long COVID studies are reporting persistent symptoms in patients up to a year after infection. A large UK study found one in three COVID-19 patients report at least one lingering symptom six months after recovery, while a more focused study from China detected nearly half of hospitalized COVID-19 patients having one symptom up to a year after discharge.**



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In a new study published in *JAMA Network Open* a team of Chinese researchers assessed 2,433 recovered COVID-19 patients, around one year after they had been discharged from hospital. Offering some of the first long-term insights into long COVID the study found 45 percent of patients report at least one symptom persisting twelve months later.

Fatigue, sweating, chest tightness, anxiety, and myalgia were the most common long-term symptoms cited by the cohort. Around a quarter of all hospitalized patients reported persistent fatigue one year later.

Old age and severe illness were linked to a higher risk of experiencing at least three long-term symptoms. However, the researchers do note their 12-month follow-up study detected lower overall rates of lingering symptoms compared to six-month long COVID studies, offering some hope that signs of long COVID may decrease over time.

“The findings provide valuable information about the long-term health outcomes of COVID-19 survivors and identify risk factors for sustained symptoms and poor respiratory health status, which is of importance with the coming of the post-COVID-19 era,” the researchers conclude.

Another new long COVID study, this time led by researchers from the University of Oxford, looked at more general characteristics of the condition in a massive cohort of 273,618 recovered subjects. Overall, nearly 37 percent of all those recovered from COVID-19 reported at least one long-term symptom lasting between three and six months beyond the acute infection.

The most commonly cited long COVID symptom in this massive cohort was anxiety or depression, reported by 15 percent. Other persistent symptoms present three to six months later include abnormal breathing (reported by 8%), abdominal symptoms (8%), chest/throat pain (6%), cognitive problems such as ‘brain fog’ (4%), fatigue (6%), and headache (5%).

“The results confirm that a significant proportion of people, of all ages, can be affected by a range of symptoms and difficulties in the six months after COVID-19 infection,” says lead on the study, Max Taquet. “These data complement findings from self-report surveys, and show that clinicians are diagnosing patients with these symptoms.”

One of the interesting findings in the Oxford study was a comparison of the prevalence of persistent long COVID symptoms to those experiencing long-term symptoms from influenza. The researchers found a number of flu cases reporting at least one symptom lingering up to six months beyond the acute infection, but long-term symptoms were much more frequent in COVID-19 cases. In fact, COVID-19 cases were 1.5 times more likely to experience long-term symptoms compared to influenza cases.

“The fact that the risk is higher after COVID-19 than after influenza suggests that their origin might, in part, directly involve infection with SARS-CoV-2 and is not just a general consequence of viral infection,” the researchers write in the study. “This might help in developing effective treatments against long-COVID.” Over 18 months after the appearance of this novel coronavirus, these new studies add to picture of the long-term effects of infection researchers are now beginning to generate. The US government [recently awarded nearly half a billion dollars](#) to a variety of long COVID research projects and Oxford’s Paul Harrison says this kind of work is urgently necessary so we can deal with any long-term health consequences that may appear across the world over the coming years. “Research of different kinds is urgently needed to understand why not everyone recovers rapidly and fully from COVID-19,” says Harrison. “We need to identify the mechanisms underlying the diverse symptoms that can affect survivors. This information will be essential if the long-term health consequences of COVID-19 are to be prevented or treated effectively.”

►► The one-year follow-up long COVID study was published in [JAMA Network Open](#).

Over 7,000 Doctors and Scientists Sign “Rome Declaration” Accusing COVID Policy-Makers of ‘Crimes Against Humanity’

Sept 29 – A “Physicians’ Declaration” produced by an international alliance of physicians and medical scientists strongly condemns the global strategy to treat COVID, accusing policy-makers of potential “crimes against humanity” for preventing physicians from providing life-saving treatments for their patients and suppressing open scientific discussion. [Read more...](#)

Lying Through Their Teeth: Health Officials Know Vaccines Don’t Stop Transmission but Talk About ‘A Pandemic of the Unvaccinated’

If this were a “pandemic of the unvaccinated,” it would be the unvaccinated who would be getting infected and dying in overwhelming numbers. This, however, is demonstrably not the case. [Read more...](#)



Merck says research shows its COVID-19 pill works against variants

Source: <https://finance.yahoo.com/news/1-merck-says-research-shows-183245783.html>



Sept 29 – Laboratory studies show that Merck & Co's experimental oral COVID-19 antiviral drug, molnupiravir, is likely to be effective against known variants of the coronavirus, including the dominant, highly transmissible Delta, the company said on Wednesday.

Since **molnupiravir does not target the spike protein of the virus - the target of all current COVID-19 vaccines - which defines the differences between the variants, the drug should be equally effective as the virus continues to evolve**, said Jay Grobler, head of infectious disease and vaccines at Merck.

Molnupiravir instead targets the viral polymerase, an enzyme needed for the virus to make copies of itself. It is designed to work by introducing errors into the genetic code of the virus.

Data shows that the drug is most effective when given early in the course of infection, Merck said.

The U.S. drugmaker tested its antiviral against nasal swab samples taken from participants in early trials of the drug. Delta was not in wide circulation at the time of those trials, but molnupiravir was tested against lab samples of the variant behind the latest surge in COVID-19 hospitalizations and deaths.

Merck said earlier this year that a small, mid-stage trial found that after five days of molnupiravir treatment, none of the patients taking various doses of the drug tested positive for infectious virus, while 24% of placebo patients did have detectable levels.

Merck is currently conducting two Phase III trials of the antiviral it is developing with Ridgeback Biotherapeutics - one for treatment of COVID-19 and another as a preventive.

Merck anticipates that the Phase III treatment study will finish in early November, Grobler said.

The trial enrolled nonhospitalized COVID-19 patients who have had symptoms for no more than five days and are at risk for severe disease.

The latest analysis was presented during IDWeek, the annual meeting of infectious disease organizations, including the Infectious Diseases Society of America.

Shares of Merck were up 2.3% at \$75.04 on Wednesday afternoon on the New York Stock Exchange.

We're Already Barreling Toward the Next Pandemic

Source: <https://www.homelandsecuritynewswire.com/dr20210930-we-re-already-barreling-toward-the-next-pandemic>

Sept 30 – This pandemic is far from over, but the window to prepare for future threats is closing fast, Ed Yong writes in [The Atlantic](#). He adds:

A year after the United States [bombed its pandemic performance](#) in front of the world, the Delta variant opened the stage for a face-saving encore. If the U.S. had learned from its mishandling of the original SARS-CoV-2 virus, it would have been better prepared for the variant that was already [ravaging India](#).

Instead, after a quiet spring, President Joe Biden [all but declared victory](#) against SARS-CoV-2. The CDC [ended indoor masking for vaccinated people](#), pitting two of the most effective interventions [against each other](#). As cases fell, Abbott Laboratories, which makes a rapid COVID-19 test, [discarded inventory, canceled contracts, and laid off workers](#). The New York Times reported. Florida and Georgia [scaled back on reporting COVID-19 data](#), according to Kaiser Health News. Models failed to predict [Delta's early arrival](#). The variant then ripped through the U.S.'s half-vaccinated populace and once again [pushed hospitals and health-care workers to the brink](#). Delta's extreme transmissibility would have challenged any nation, but the U.S. nonetheless set itself up for failure. Delta was an audition for the next pandemic, and [one that America flubbed](#). How can a country hope to stay 10 steps ahead of tomorrow's viruses when it can't stay one step ahead of today's?

America's frustrating inability to learn from the recent past shouldn't be surprising to anyone familiar with the history of public health. Yong writes that many public-health experts, historians, and legal scholars worry that the U.S. is lapsing into neglect, that the temporary wave of investments isn't being channeled into the right areas, and that COVID-19 might actually leave the U.S. weaker against whatever emerges next.

"Donald Trump's egregious mismanagement made it easy to believe that events would have played out differently with a halfway-competent commander who executed preexisting pandemic plans. But that ignores [the many vulnerabilities](#) that would have made the U.S. brittle under any administration," he writes.



Yong concludes:

“To be ready for the next pandemic, we need to make sure that there’s an even footing in our societal structures,” Seema Mohapatra, a health-law expert at Southern Methodist University, in Dallas, told me. That vision of preparedness is closer to what 19th-century thinkers lobbied for, and what the 20th century swept aside. It means shifting the spotlight away from pathogens themselves and onto the living and working conditions that allow pathogens to flourish.

Some may have protective version of gene that resists severe Covid-19, study finds

Source: <https://www.thenationalnews.com/health/2021/09/28/some-may-have-protective-version-of-gene-that-resists-severe-covid-19-study-finds/>

Sept 29 – **Some people have a version of a gene which could restrain Sars-CoV-2**, the coronavirus that causes Covid-19, a study has indicated.

The findings offer an explanation as to why some people have better natural defences against serious infection, scientists say.

Research suggests anti-viral responses are better in people who have a more protective, **“prenylated” version of the OAS1 gene**, while others have a version that fails to detect the virus.

But if new variants learn to evade the protection offered by the prenylated gene, they could become “substantially more pathogenic and transmissible in unvaccinated populations”, experts say.

The study, [A Prenylated dsRNA Sensor Protects against Severe Covid-19](#), has been published in the journal *Science* and is the result of work led by the MRC-University of Glasgow Centre for Virus Research.

Prenylation, the attachment of a single molecule of fat to a protein, allows OAS1 to “seek out” the invading virus and “sound the alarm”, researchers say.

The study indicated that patients in hospital who expressed a prenylated version of the gene were associated with protection from severe Covid-19, suggesting it is a “major component of a protective antiviral response”.

It is likely to have given many people natural protection throughout the pandemic.

Researchers also noted those with the “bad” form of OAS1 experienced significantly more frequent levels of severe disease, with intensive care admission or death about 1.6 times more likely in these patients.

The scientists said that about 55 million years ago, horseshoe bats, the presumed source of Sars-CoV-2, lost this protective gene, so the virus did not have to adapt to evade the defence.

“We know viruses adapt, and even Sars-CoV-2 has likely adapted to replicate in the animal reservoir in which it circulates,” said Prof Sam Wilson, of the University of Glasgow’s Centre for Virus Research.

“Cross-species transmission to humans exposed the virus Sars-CoV-2 to a new repertoire of antiviral defences, some of which Sars-CoV-2 may not know how to evade.”

Prof Wilson said the study showed the coronavirus that caused the Sars outbreak in 2003 had learnt to evade prenylated OAS1.

“If Sars-CoV-2 variants learn the same trick, they could be substantially more pathogenic and transmissible in unvaccinated populations,” he said.

“This reinforces the need to continually monitor the emergence of new Sars-CoV-2 variants.”

The study was mainly funded by the Medical Research Council, Wellcome and UK Research and Innovation.

Newly discovered biomarker predicts COVID-19 death days in advance

Source: <https://newatlas.com/medical/ekg-heart-electrical-activity-predicts-coronavirus-death-mount-sinai/>

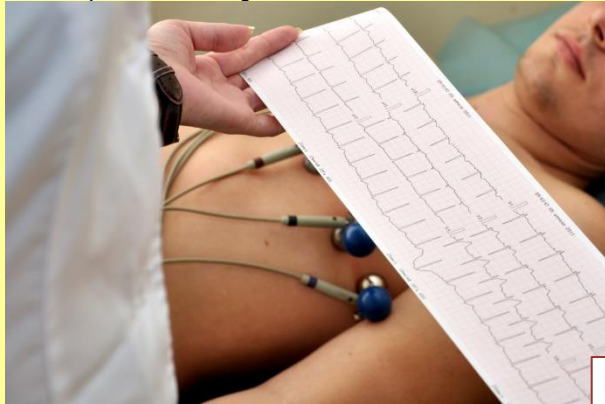
Sept 30 – Researchers from The Mount Sinai Hospital have found changes to electrical activity in the heart can help predict which hospitalized COVID-19 patients are more likely to decline and die. The biomarker is easily measurable and potentially predicts death several days in advance.

When hospitals are overwhelmed with COVID-19 patients it can be challenging for doctors to work out where to best focus their limited attention and resources. A number of [blood-based biomarkers have been found](#) to help assess those patients most at risk of severe disease decline.



But blood tests take time to be collected and analyzed. This new biomarker can be measured using a simple electrocardiogram (EKG) machine, at a patient's bedside. And the researchers claim it can predict whether a patient is likely to die at least two days in advance.

A retrospective investigation of health records from 140 COVID-19 patients revealed diminishing QRS waveforms were an indication of a patient declining in 74 percent of cases.

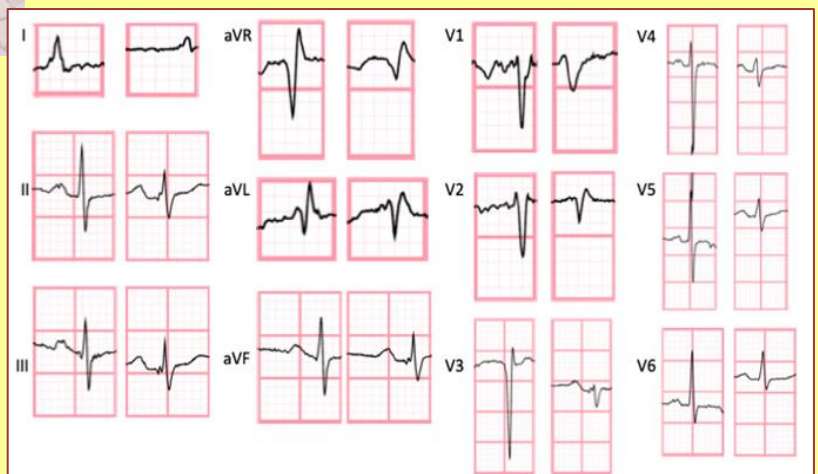


The criteria developed by the Mount Sinai team is **dubbed LoQRS**, and they propose it to be an effective way of triaging those patients most likely to decline. The median time to death from the first LoQRS reading detected in the study was 52 hours.

“Our study shows diminished waveforms on EKGs over the course of COVID-19 illness can be an important tool for health care workers caring for these patients, allowing them to catch rapid clinical changes over their hospital stay and intervene more quickly,” says Joshua Lampert, senior author on the new study. “With COVID-19 cases and hospitalizations

continuing to rise again, EKGs may be helpful for hospitals to use when caring for these patients before their condition gets dramatically worse.”

Precordial electrocardiographic QRS diminution. QRS amplitudes are demonstrated meeting criteria for precordial LoQRS. From left to right in each column, an ECG QRS complex on admission is compared with an ECG QRS complex on the last available ECG



Interestingly, the researchers also found LoQRS measures were effective in detecting those patients with influenza who were most likely to die. The median time to death from the first LoQRS measure in influenza patients, however, was around six days. The researchers point out this indicates COVID-19 is a much more virulent disease than influenza.

As LoQRS measures can only be detected over time across several EKG tests, Lambert proposes EKG measurements are taken for all COVID-19 patients when they are initially admitted.

“When it comes to caring for COVID-19 patients, our findings suggest it may be beneficial not only for health care providers to check an EKG when the patient first arrives at the hospital, but also follow-up EKGs during their hospital stay to assess for LoQRS, particularly if the patient has not made profound clinical progress,” says Lampert. “If LoQRS is present, the team may want to consider escalating medical therapy or transferring the patient to a highly monitored setting such as an intensive care unit (ICU) in anticipation of declining health.”

►► The new study was published in the [American Journal of Cardiology](#).

Anthrax Attacks: 20 Years On

Source: <https://www.homelandsecuritynewswire.com/dr20211001-anthrax-attacks-20-years-on>

Oct 01 – Twenty years ago this month the United States experienced the scary anthrax letter attacks, which targeted major media outlets and members of Congress. The anthrax spores were sent in letters, killing five people and sickened several more.

Scientists note that *Bacillus anthracis*, which causes anthrax, and its spores can “[remain inactive for decades](#) until they find a favorable environment to germinate, such as blood or tissue.” Infection can occur via inhalation, ingestion, and skin contact. Anthrax can be treated by certain antibiotics; however, inhalational anthrax is usually lethal if not diagnosed and treated very early.

[IEEE Spectrum](#) reports that in 2001, before the attacks, the Armed Forces Radiobiology Research Institute (AFRRI) was studying “[how to render anthrax spores harmless through irradiation](#).” AFRRI’s



work confirmed that [electron beams and X-rays](#), both forms of ionizing radiation, could sanitize mail. An electron beam “[passes through an electromagnetic lens, which focuses the beam on the target](#),” but due to limited penetration, e-beams could only be used on letters and flat envelopes. X-rays penetrate deeper, making them a better option for parcels and boxes.

Since the Postal Service needed to process about [1.8 million pieces of contaminated mail](#), e-beam and X-ray machines needed to be scaled up. Scaling up became a [logistical nightmare](#) as the processing facility could only push through about 2,000 kilograms per hour. Though it took weeks to process all the mail items and up to a few months to get the items to their intended destination, [irradiation](#) was the key to [decontaminating nearly 2 million pieces of mail after Amerithrax](#).

Bioweapons Research Is Banned By an International Treaty – but Nobody Is Checking for Violations

By Gary Samore

Source: <https://www.homelandsecuritynewswire.com/bioweapons-research-banned-international-treaty-nobody-checking-violations>

Oct 01 – Scientists are making dramatic progress with techniques for “gene splicing” – modifying the genetic makeup of organisms. This work includes bioengineering pathogens for medical research, techniques that also can be used to create deadly biological weapons. [It’s an overlap](#) that’s helped [fuel speculation](#) that the SARS-CoV-2 coronavirus was bioengineered at China’s Wuhan Institute of Virology and that it subsequently “escaped” through a lab accident to produce the COVID-19 pandemic.

The world already has [a legal foundation](#) to prevent gene splicing for warfare: [the 1972 Biological Weapons Convention](#). Unfortunately, nations have been unable to agree on how to strengthen the treaty. [Some countries](#) have also pursued bioweapons research [and stockpiling](#) in violation of it.

As a member of President Bill Clinton’s National Security Council from 1996 to 2001, I had [a firsthand view](#) of the failure to strengthen the convention. From 2009 to 2013, as President Barack Obama’s White House coordinator for weapons of mass destruction, I led [a team that grappled with](#) the challenges of regulating potentially dangerous biological research in the absence of strong international rules and regulations.

The history of the Biological Weapons Convention [reveals the limits](#) of international attempts to control research and development of biological agents.

1960s-1970s: International Negotiations to Outlaw Biowarfare

The United Kingdom [first proposed](#) a [global biological weapons ban](#) in 1968.

Reasoning that bioweapons had no useful military or strategic purpose given the awesome power of nuclear weapons, the U.K. had [ended its offensive bioweapons program](#) in 1956. But the risk remained that other countries might consider developing bioweapons as a [poor man’s atomic bomb](#).

In the original British proposal, countries would have to identify facilities and activities with potential bioweapons applications. They would also need to accept on-site inspections by an international agency to verify these facilities were being used for peaceful purposes.

These negotiations gained steam in 1969 when [the Nixon administration ended](#) America’s offensive biological weapons program and supported the British proposal. [In 1971, the Soviet Union announced its support](#) – but only with the verification provisions stripped out. Since it was essential to get the USSR on board, the U.S. and U.K. agreed to drop those requirements.

In 1972 the treaty was finalized. After gaining the required signatures, it took effect in 1975.

Under [the convention](#), [183 nations have](#) agreed not to “develop, produce, stockpile or otherwise acquire or retain” biological materials that could be used as weapons. They also agreed not to stockpile or develop any “means of delivery” for using them. The treaty allows “prophylactic, protective or other peaceful” research and development – including medical research.

However, the treaty lacks any mechanism to verify that countries are complying with these obligations.

1990s: Revelations of Treaty Violations

This absence of verification was exposed as [the convention’s fundamental flaw](#) two decades later, when it turned out that the Soviets had a great deal to hide.

In 1992, Russian President Boris Yeltsin revealed the Soviet Union’s massive [biological weapons program](#). Some of [the program’s reported experiments](#) involved making viruses and bacteria more lethal and resistant to treatment. [The Soviets also](#) weaponized and mass-produced a number of dangerous



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naturally occurring viruses, including the anthrax and smallpox viruses, as well as the plague-causing *Yersinia pestis* bacterium. Yeltsin in 1992 [ordered the program's end](#) and the destruction of all its materials. [But doubts remain](#) whether this was fully carried out. [Another treaty violation](#) came to light after the U.S. defeat of Iraq in the 1991 Gulf War. United Nations inspectors discovered [an Iraqi bioweapons stockpile](#), including 1,560 gallons (6,000 liters) of anthrax spores and 3,120 gallons (12,000 liters) of botulinum toxin. Both had been loaded into aerial bombs, rockets and missile warheads, although Iraq never used these weapons.

In the mid-1990s, during South Africa's transition to majority rule, evidence emerged of [the former apartheid regime's chemical and biological weapons program](#). As revealed by the South African Truth and Reconciliation Commission, [the program](#) focused on assassination. Techniques included infecting cigarettes and chocolates with anthrax spores, sugar with salmonella and chocolates with botulinum toxin.

In response to these revelations, [as well as suspicions](#) that North Korea, Iran, Libya and Syria were also violating the treaty, the U.S. began urging other nations to close the verification gap. But despite 24 meetings over seven years, a specially formed group of international negotiators [failed to reach agreement on how to do it](#). The problems were both practical and political.

Monitoring Biological Agents

Several factors make verification of the bioweapons treaty difficult.

First, the types of facilities that research and produce biological agents, [such as vaccines](#), antibiotics, vitamins, [biological pesticides](#) and [certain foods](#), can also produce biological weapons. Some pathogens with legitimate medical and industrial uses can also be used for bioweapons.

Further, large quantities of certain biological weapons can be produced quickly, by few personnel and in relatively small facilities. Hence, biological weapons programs are more difficult for international inspectors to detect than nuclear or chemical programs, which typically require large facilities, numerous personnel and years of operation.

So an effective bioweapons verification process would require nations to identify a large number of civilian facilities. Inspectors would need to monitor them regularly. The monitoring would need to be intrusive, allowing inspectors to demand "challenge inspections," meaning access on short notice to both known and suspected facilities.

Finally, developing [bioweapons defenses](#) – as permitted under the treaty – typically requires working with dangerous pathogens and toxins, and even delivery systems. So distinguishing [legitimate biodefense programs](#) from illegal bioweapons activities often comes down to intent – and intent is hard to verify.

Because of these inherent difficulties, verification faced stiff opposition.

Political Opposition to Bioweapons Verification

As the White House official responsible for coordinating the U.S. negotiating position, I often heard concerns and objections from important government agencies. The Pentagon expressed fears that inspections of biodefense installations would compromise national security or lead to false accusations of treaty violations. The Commerce Department opposed intrusive international inspections on behalf of the pharmaceutical and biotechnology industries. Such inspections might compromise trade secrets, officials contended, or interfere with medical research or industrial production. Germany and Japan, which also have large pharmaceutical and biotechnology industries, raised similar objections. China, Pakistan, Russia and others opposed nearly all on-site inspections. Since the rules under which the negotiation group operated required consensus, any single country could block agreement.

In January 1998, seeking to break the deadlock, [the Clinton administration proposed](#) reduced verification requirements. Nations could limit their declarations to facilities "especially suitable" for bioweapons uses, such as vaccine production facilities. Random or routine inspections of these facilities would instead be "voluntary" visits or limited challenge inspections – but only if approved by the executive council of a to-be-created international agency monitoring the bioweapons treaty.

But even this failed to achieve consensus among the international negotiators.

Finally, in July 2001, the George W. Bush administration [rejected the Clinton proposal](#) – ironically, on the grounds that it was not strong enough to detect cheating. With that, [the negotiations collapsed](#).

Since then, nations have made [no serious effort to establish a verification system](#) for the Biological Weapons Convention.

Even with the amazing advances scientists have made in genetic engineering since the 1970s, there are few signs that countries are interested in taking up the problem again.

This is especially true in today's climate of accusations against China, and China's refusal to fully cooperate to determine the origins of the COVID-19 pandemic.

Gary Samore is Professor of the Practice of Politics and Crown Family Director of the Crown Center for Middle East Studies, Brandeis University.



Neurology and COVID-19: Scientific brief, 29 September 2021

Source: <https://www.who.int/publications/i/item/WHO-2019-nCoV-Sci-Brief-Neurology-2021.1>

Variables	Number of studies	Pooled events	Pooled sample size	Pooled prevalence (%)	95% CI (%)
Corticospinal tract signs ^a	2	128	198	65	58–71
Agitation	3	145	468	45	3–93
Fatigue	169	14 121	45 766	32	30–35
Myalgia or fatigue	22	619	2 246	31	25–37
Taste impairment	38	2934	12 631	21	15–29
Myalgia	207	12 183	59 821	20	18–23
Smell impairment	51	4 647	30 925	19	13–25
Smell or taste impairment	14	518	3 100	18	10–28
Headache	202	8 609	51 969	13	12–15
Headache and dizziness	9	676	3 520	12	8–17
Acute confusion/ delirium	19	2 318	23 921	11	7–16
Disturbance of consciousness	25	693	15 129	7	5–10
Dizziness	46	809	13 473	7	5–8
Tinnitus	5	30	884	5	1–10
Vision impairment	10	126	2 904	4	1–9
Hearing impairment	6	20	819	3	1–5
Sensory impairment	4	23	1 082	2	1–5
Cognitive impairment	3	22	1 131	2	0–5
Cranial nerve palsy	3	7	463	2	0–8
Hemiplegia/ paresis	2	5	467	2	0–10
Neuralgia	7	41	3 183	1	0–3
Seizure	15	127	15 467	1	0–2
Ataxia	5	25	2 266	1	0–2

CI: confidence interval.
^a Corticospinal tract signs are diffuse hyperreflexia, ankle clonus and bilateral extensor plantar reflexes.

Pooled prevalence of neurological symptoms included in the meta-analysis

Variables	Number of studies	Pooled events	Pooled sample size	Pooled prevalence (%)	95% CI
Neuropsychiatric disorders	3	243	1 293	24	2–61
Skeletal muscle injury ^a	4	111	1 545	5	1–12
Myopathy ^b	3	55	5 736	2	0–4
Stroke	29	664	43 024	2	1–2
Ischaemic stroke/TIA	29	527	43 024	1	1–2
Movement disorder	5	48	6 581	1	0–1
CIN/ polyneuropathy	5	48	7 251	1	0–2
Status epilepticus	2	2	282	1	0–5
Haemorrhagic stroke	21	133	36 972	0.31	0.15–0.50
Encephalitis	4	8	4 658	0.30	0–1
Guillain-Barré syndrome	4	22	7 403	0.28	0–1
Parainfectious radiculitis	2	2	858	0.23	0–1
Cerebral venous thrombosis	2	4	14 573	0.12	0–2
PRES	3	6	4 311	0.12	0.02–0.27

CIN: critical illness myopathy; PRES: posterior reversible encephalopathy syndrome; TIA: transient ischaemic attack.
^a Includes significant creatinine kinase elevation and rhabdomyolysis.
^b Includes CIN, PRES and TIA.

Pooled prevalence of neurological diagnoses included in the meta-analysis



DRC: Bubonic and Pulmonary Plague

Source: <https://apps.who.int/iris/bitstream/handle/10665/342715/OEW28-0511072021.pdf>

July 13 – According to World Health Organization, in Ituri province has reported a total of 117 suspected cases of bubonic and pulmonary plague and 13 deaths (CFR: 11.1%) from 8 health zones. Fataki health zone has reported a total of 37 cases of bubonic and pulmonary plague with 12 deaths (CFR: 32.4%).

India – New health alarm in India with 45 thousand infections from "black fungus" and 4,200 dead

Source: <https://www.tgcom24.mediaset.it/mondo/india-nuovo-allarme-sanitario-45milacontagi-da-fungo-nero-4-200-decessi-35756192-202102k.shtml>

July 22 – The Ministry of Health has communicated to the parliament that the cases of "black fungus" in India have risen to 45 thousand, adding that in the last two months 4,200 people have died from the infection. **The virus has a mortality rate of 50%.**

20 Years After the Anthrax Attacks, We're Still Unprepared

By Maryn McKenna

Source: <https://www.wired.com/story/20-years-after-the-anthrax-attacks-were-still-unprepared/>



Workers in biohazard equipment outside a building on Capitol Hill that received anthrax-tainted mail in October, 2001. Photograph: SHAWN THEW/Getty Images

Oct 04 – It was still early when Larry Bush reached the gurney in the emergency room of JFK Medical Center in Atlantis, Florida, part of a strip of towns that stretches from Miami to West Palm Beach. Bush was the hospital's chief of staff and an infectious diseases physician, on his way to a regular morning meeting, but some ER physicians had asked that he drop by. A 63-year-old man named Bob Stevens had been brought in at about 2:30 am with a roaring fever. Now he was comatose and plugged into a ventilator, with his

frightened wife by his side.

The wife told Bush their story. As he recalled it later, she said they lived a few miles away, closer to the ocean. Her husband worked in Boca Raton for a company that published supermarket tabloids, but they had been out of state for a week, visiting their daughter. He had started to feel ill the day before on the long drive home, and had gone to bed as soon as they arrived. He had woken her up in the middle of the night, wandering around the house, confused.

Fever, confusion, rapid collapse: That sounded to Bush like meningitis, an infection in membranes around the spinal cord and brain that can be caused by several organisms. He headed to the hospital's lab to check test results, and found himself staring down a microscope at one he had not expected to see: strings of bright-purple rod-shaped bacilli, threaded end to end like train cars on a track.



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Bush recognized the arrangement, but he couldn't make sense of it. Infections with the organism he was looking at are so rare that they had occurred in the United States fewer than 20 times in a century, and only among people in a narrow range of occupations—cattle ranchers and drum-makers, not photo editors in a Florida suburb.

"If this is anthrax," he said to himself, "it's bioterrorism until proven otherwise."

That was October 2, 2001. It took two days for Bush's suspicions to be confirmed. When his diagnosis was announced at a press conference on October 4—20 years ago today—it launched the most complex and concentrated public health response in US history to that point, rivaled only today by the effort to respond to Covid.

You could not open a laptop or turn on the news three weeks ago without being reminded of the 20th anniversary of the World Trade Center attacks of September 11, 2001. Compared to that honored memory, the anthrax-letter attacks—the first fatal bioterror attack on US soil—are barely remembered, though in the days following Bush's announcement they killed five people, sickened another 17, sent 30,000 people to doctors, put 10,000 of them on preventive antibiotics, and convulsed Capitol Hill and the New York media world.

But people who were involved in the response then, including Bush—who continues to work as an infectious disease specialist at the medical center where Stevens later died—say the anthrax attacks presented hard lessons that could have helped the Covid response if they had been remembered. "What went well was our ability to recognize it right away, and report it," says Bush, who is now also an affiliate professor at the medical schools of Florida Atlantic University and the University of Miami. "But we are not better prepared now than we were then."

A brief recap, though with something as complicated as the anthrax attacks it's difficult to be brief: Stevens was not the first case; he was only the first to be diagnosed. The anthrax had been sent through the mail that September and October. All the victims had some contact with spore-laced letters that were sent to offices in Congress and the media, or were exposed after the letters spread spores into mail-processing equipment and contaminated other mail, workplaces, and homes.

The massive investigation that spun off from Stevens' diagnosis eventually discovered that he was the ninth person infected, though everyone exposed before him developed only lesions from getting the organism on their skin. His case was fatal because he had inhaled it.

The perpetrators at first were believed to be foreign terrorists; two of the World Trade Center attackers had taken flying lessons in the same part of Florida. In 2008 the Federal Bureau of Investigation linked the attacks to a scientist working at the US Army Medical Research Institute of Infectious Diseases, the federal government's bioterror-defense lab. That scientist, Bruce Ivins, died by suicide as the FBI was investigating him. In 2011 an [independent review](#) by the National Research Council concluded the case against him was not proved.

But in the autumn of 2001, the response to anthrax swamped public health. Tens of thousands of Capitol Hill, TV network, and postal workers had to be checked for unrecognized exposure. Random citizens terrified by unexplained spills of anything powdery clogged phone lines. The Centers for Disease Control and Prevention later estimated that it put more than 2,000 agency personnel on the response. The CDC-supported Laboratory Response Network analyzed more than 125,000 samples taken from possible patients. The National Pharmaceutical Stockpile, established three years earlier, delivered 3.75 million doses of antibiotics to health departments in the locations—Florida, and also New York, New Jersey, Connecticut, and Washington, DC—where people were believed to be at risk.

Twenty years later, those public health workers are stunned all this has almost vanished from collective memory. "I mentioned this to a probably 25-year-old recently, and his response was, 'What was that?'" says Ali S. Khan, a physician and dean of the College of Public Health at the University of Nebraska Medical Center, who was part of the CDC's Washington investigative team in 2001. Federal reassessment of the nation's vulnerability to bioterror following the attacks sent a lot of money flowing out to states, and Khan's university was one beneficiary: It now houses the National Quarantine Center, where anyone potentially exposed to a rare disease can be checked out—including the first Americans repatriated from Wuhan last year. "We're much better prepared for a bioterror attack now, 20 years later," Khan says. "But we still remain woefully unprepared. I know that's a dichotomy, but this pandemic is proof. We don't have the public health practitioners and the information systems that we need."

The anthrax attacks were a harbinger of public health challenges to come. In 2001, the US had been spared major epidemics for years. The first cases of AIDS had been recognized in 1981, but the first versions of the multi-drug cocktails that would make HIV a survivable disease debuted in 1996. The H5N1 avian flu that leaped to humans in Hong Kong in 1997, sickening 18 people and killing six, did not surge out of Asia because authorities slaughtered more than 1 million chickens to deny the virus a host.

But after anthrax, other disease crises showed the US how it might be at risk. H5N1 leapfrogged out of China in 2004. Then H1N1 avian flu sparked a worldwide epidemic—fortunately, of mild disease—in 2009.

Ebola [surged in West Africa](#) in 2014, killing 11,325 people there—one of whom, before his death, flew to the US and infected two nurses, both of whom survived. In 2015, Zika virus moved [into the Americas](#),



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infecting several million people and causing [thousands of cases](#) of birth defects. Yet after each crisis, the US failed to learn the after-anthrax lesson that public health needs sustained investment—in adequate staff, digital surveillance and abundant lab capacity—to handle the unpredictable.

“Public health funding has always followed the pattern of, ‘Out of sight, out of mind,’” says Thomas Frieden, a physician, former CDC director, and CEO of the nonprofit Resolve to Save Lives. “You get big infusions of money, but you really can’t build capacity effectively with one-time dollars.”

As much as public health didn’t learn a lesson about funding, it also didn’t learn lessons about communicating. A good portion of the stress on the system was caused by members of the public not understanding whether they were at risk of anthrax exposure. “In New York, we received two letters and had eight cases and one death,” says Sandra Mullin, who was communications director for the city’s health department in 2001 and handled its twice-daily press conferences. “But we had 1,700 people on antibiotics and 3,000 ‘powder events.’ It was really a psychological terrorism event, more than one that created impact in terms of illness and death.” Mullin, who is now senior vice president at the global health nonprofit Vital Strategies, says one lesson of the New York anthrax experience was that politicians tended to soft-pedal bad news, rather than “directly and frankly and bluntly” delivering information that residents needed. That same mistake was made at the start of the Covid pandemic, she points out—especially by the Trump White House, which perpetually insisted that the virus was [going to disappear](#). “We haven’t quite mastered how to trust that people can bear bad news,” she says, “and bear uncertainty, and bear the truth about the risks they might be facing.”

Amerithrax: Deadly event turned into [movie](#) 20 years later

This leaning isn’t unique to politicians. Confusion about what’s the best message for the public to hear has been threaded through the Covid response. Tensions over mask-wearing might not have been so acute if [everyone in the US had been told](#) to wear them right from the start, instead of that [masks would not](#) be helpful—and people might not resist wearing them now if they hadn’t been told in the spring that [they could take them off](#). And it’s likely to have been dizzying for the public to see health officials disagree; as recently as two weeks ago, federal agencies and their advisory committees split over backing the White House’s call for broad access to Covid [booster shots](#)—a back and forth that ended with the CDC director [endorsing wider approval](#) than her committee did.

People who worked in public health in 2001 recall the shock of learning how patchy health communication was. Medical care was just starting to move health records into digital form, encouraged by the passage of the Health Insurance Portability and Accountability Act, or HIPAA, five years earlier. But systems weren’t interoperable (and many still are not now). That made it impossible to automate alerts about worrisome symptoms, leaving public health reliant on astute clinicians such as Bush. At the state level, some health departments discovered they did not possess email addresses for doctors in their jurisdictions, and had to rely on faxes to communicate.

Twenty years later, public health is still struggling to get access to data that could help officials respond. That was evident during the early days of Covid, when the civilian-run Covid Tracking Project assembled a corps of volunteers to assemble [case count](#) and [testing data](#) faster than the CDC could publish it, when the Department of Health and Human Services took responsibility for Covid hospital data [away](#) from the CDC, and when HHS’s own data [diverged](#) from that of the states sending information to it.

The experience of this pandemic made clear to investigators how much remains to be done to create rapid, sensitive systems for gathering information. “A public health system is only as strong as its weakest link,” says Rima Khabbaz, a physician who directs the CDC’s National Center for Emerging and Zoonotic Infectious Diseases, and who was part of its Washington deployment in 2001. “We need to modernize systems for surveillance and laboratory exchange of information. Travelers’ health, border issues, migrant populations, there is lots of work to do.”

If there is a single lesson that could echo down the years from the anthrax attacks and response, it is that looking back—something that is built into public health systems, which tend to analyze outbreaks and trends after they occur—is insufficient for future protection.

“We have this cycle of complacency, and then panic, and then complacency again,” says Lawrence O. Gostin, who directs the O’Neill Institute for National and Global Health Law at Georgetown University. “We haven’t learned the lessons of anthrax and Ebola and influenza and Zika. We just keep having one crisis after another, and we react, and we never prepare.”

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degree in journalism from Northwestern University, and was a Knight journalism fellow at University of Michigan and MIT. She is the author of *Big Chicken*, *Superbug* and *Beating Back the Devil*.

Polyethylene Glycol Linked to Rare Allergic Reactions Seen With mRNA COVID-19 Vaccines

Source: <https://www.medscape.com/viewarticle/959824>

Sept 27 – A **common inert ingredient** may be the culprit behind the rare allergic reactions reported among individuals who have received mRNA COVID-19 vaccines, according to investigators at a large regional health center that was among the first to administer the shots.

Blood samples from 10 of 11 individuals with suspected allergic reactions reacted to **polyethylene glycol (PEG)**, a component of both the Pfizer and Moderna mRNA vaccines, [according to a report in JAMA Network Open](#).

In total, only 22 individuals had suspected allergic reactions out of nearly 39,000 mRNA COVID-19 vaccine doses administered, the investigators reported, noting that the reactions were generally mild and all fully resolved.

Those findings should be reassuring to individuals who are reticent to sign up for a COVID-19 vaccine because of fear of an allergic reaction, said study senior author Kari Nadeau, MD, PhD, director of the Parker Center for Allergy and Asthma Research at Stanford University, Stanford, California.

"We're hoping that this word will get out, and then that the companies could also think about making vaccines that have other products in them that don't include polyethylene glycol," Nadeau said in an interview with *Medscape Medical News*.

PEG is a compound used in many products, including pharmaceuticals, cosmetics, and food. In the mRNA COVID-19 vaccines, PEG serves to stabilize the lipid nanoparticles that help [protect and transport](#) mRNA. However, its use in this setting has been linked to allergic reactions in this and previous studies.

No immunoglobulin E (IgE) antibodies to PEG were detected among the 22 individuals with suspected allergic reactions to mRNA COVID-19 vaccine, but PEG immunoglobulin G (IgG) was present. That suggests non-IgE mediated allergic reactions to PEG may be implicated for the majority of cases, Nadeau said.

This case series provides interesting new evidence to confirm previous reports that a mechanism other than the classic IgE-mediated allergic response is behind the suspected allergic reactions that are occurring after mRNA COVID-19 vaccine, said Aleena Banerji, MD, associate professor at Harvard Medical School and clinical director of the Drug Allergy Program at Massachusetts General Hospital in Boston.

"We need to further understand the mechanism of these reactions, but what we know is that IGE mediated allergy to excipients like PEG is probably not the main cause," Banerji, who was not involved in the study, said in an interview with Medscape.

In a recent research letter published in [JAMA Internal Medicine](#), Banerji and co-authors reported that all individuals with immediate suspected allergic reactions to mRNA COVID-19 vaccine went on to tolerate the second dose, with mild symptoms reported in the minority of patients (32 out of 159, or about 20%).

"Again, that is very consistent with not having an IgE-mediated allergy, so it seems to all be fitting with that picture," Banerji said.

The case series by Nadeau and co-authors was based on review of nearly 39,000 mRNA COVID-19 vaccine doses administered between December 18, 2020 and January 26, 2021. Most mRNA vaccine recipients were Stanford-affiliated healthcare workers, according to the report.

Among recipients of those doses, they identified 148 individuals who had anaphylaxis-related *ICD-10* codes recorded over the same time period. In a review of medical records, investigators pinpointed 22 individuals as having suspected allergy and invited them to participate in follow-up allergy testing.

A total of 11 individuals underwent skin prick testing, but none of them tested positive to PEG or to or polysorbate 80, another excipient that has been linked to vaccine-related allergic reactions. One of the patients tested positive to the same mRNA vaccine they had previously received, according to the report.

Those same 11 individuals also underwent basophil activation testing (BAT). In contrast to the skin testing results, BAT results were positive for PEG in 10 of 11 cases (or 91%) and positive for their administered vaccine in all 11 cases, the report shows.

High levels of IgG to PEG were identified in blood samples of individuals with an allergy to the vaccine. Investigators said it's possible that the BAT results were activated due to IgG via complement activation-related pseudoallergy, or CARPA, as has been hypothesized by some [other investigators](#).

read.



The negative skin prick testing results for PEG, which contrast with the positive BAT results to PEG, suggest that the former may not be appropriate for use as a predictive marker of potential vaccine allergy, according to Nadeau.

"The take-home message for doctors is to be careful," she said. "Don't assume that just because the person skin-tests negative to PEG or to the vaccine itself that you're out of the woods, because the skin test would be often negative in those scenarios."

Insights into COVID Vaccine Hesitancy

By Lianna Matt McLernon

Source: <https://www.homelandsecuritynewswire.com/dr20211005-insights-into-covid-vaccine-hesitancy>

Oct 05 – Two *JAMA Network Open* studies last Thursday that looked at COVID-19 vaccine acceptance in minority groups and opinions around less-preferred vaccines provide clues for how officials might better encourage immunization.

- The first [study](#), involving 13 focus groups, reaffirmed a lack of communication and trust among racially and ethnically diverse communities in the United States.
- The second [study](#) examined the effect of emphasizing different data around the Johnson & Johnson and AstraZeneca/Oxford COVID-19 vaccines: People were more interested in uptake when they were presented with the vaccines' effectiveness against death versus their effectiveness against symptomatic infection.

Concerns about Trust, Unequal Treatment

The virtual focus groups involved 70 Los Angeles residents from Nov 16, 2020, to Jan 28, 2021. (Pfizer/BioNTech, the first emergency-use approved vaccine in the United States, received its emergency-use authorization in mid-December 2020.)

Most participants (71.4%) were female, and none were White (24.3% Black, 24.3% American Indian, 21.4% Latino, 15.7% Filipino, and 14.3% Pacific Islander). About 55.7% lived in a zip code area with high poverty, and 48.6% were essential workers.

Overall, 52.9% said they were likely to be vaccinated against COVID-19 when an option became available, and 77.1% said it was important for all people in the community to receive a COVID-19 vaccine. However, themes of medical mistrust, concern about inequitable access or differential treatment, fears around politicization or pharmaceutical influence, and uncertainty around COVID-19 vaccine information, cost, and scheduling contributed to vaccine hesitance.

For instance, participants brought up specific examples of unethical or exclusionary research as well as worries that they were being experimented on. Some were concerned that White people or those having more power might be the first to receive the vaccine or simply get a better vaccine than those offered to the marginalized. And still others discussed the difficulties that they had in scheduling and attending a COVID vaccine appointment.

"Consistent with prior COVID-19 vaccine acceptability qualitative research, we found information gaps, concerns about the vaccine's rapid development, and an absence of scientific evidence translated for diverse communities," write the researchers.

Recommendations offered or endorsed by study participants include using community engagement; improving empathetic bidirectional deliberation; ensuring timely access to critical information; promoting altruistic and culturally congruent messaging; increasing data transparency, translation, and data collection for diverse populations; and increasing accessibility through navigational and logistical vaccination support.

In a related [commentary](#), Lilia Cervantes, MD, of the University of Colorado, adds, "The focus group study by Carson et al highlights the need for well-planned and funded health policies at the federal, state, and local levels that will not only improve COVID-19 vaccine equity but also improve investment in social resources for racial and ethnic minority groups.

"To build trust, we must engage racial and ethnic minority-serving community organizations and invite them to sit at the head of the table as we partner on strategies that will close the gaps on COVID-19 vaccine disparities."

Death Prevention May Be Key

In the second study, which was based on an online survey from Mar 24 to 30, Canadians were randomized to answer questions about either the AstraZeneca or Johnson & Johnson vaccine. Some received no other information, some received information about vaccine effectiveness (VE) against COVID-19 symptomatic infection, some received information about VE against COVID-related death, and some received information on both statistics.

At the time, Canada had four COVID-19 vaccines authorized for emergency use—Moderna, Pfizer, AstraZeneca, and Johnson & Johnson—although each had different eligibility profiles. As an example, AstraZeneca was recommended only for adults 50 to 55 years old at first but eventually expanded to those 30 to 55.



Almost 2,560 Canadian adults responded to the survey, of whom 52% were women. The median age was 50 years. The self-reported likelihood of receiving their assigned vaccine was higher for those who were given information about its effectiveness against COVID-related death compared with those who received no information at all (*b*, 0.04; 95% confidence interval [CI], 0.01 to 0.06). Receiving information about the VE against symptomatic infection, however, was linked with lower likelihood (*b*, -0.03; 95% CI, -0.05 to 0.00). Perceived effectiveness followed these same trends.

“Unfortunately, information about the impressive record of AstraZeneca and Johnson & Johnson at death prevention did not appear [to] counteract the negative association between providing information on their overall efficacy and perceived effectiveness or intention to vaccinate,” the researchers write. “Both pieces of information simply canceled each other out. This suggests that there is a need to focus communication strategies on this metric of performance rather than the arguably less important indicator of overall effectiveness at preventing symptomatic COVID-19.” The researchers noted that gender and age also appeared to influence the connection between death prevention and vaccine intention. Women and those who were 35 to 54 years old scored 7% and 8% higher, respectively, in their likelihood of vaccination after receiving death prevention information compared with those of other age-groups (95% CIs, 0.04 to 0.11, *P* < 0.001; 0.04 to 0.12, *P* < 0.001, respectively). When stratifying data by vaccine brand, age—but not gender—was significant for those evaluating AstraZeneca, the researchers note. No other subgroup differences were found when analyzing the relationship between receiving all possible VE information and vaccination likelihood. “These results can inform public health communication strategies to reduce hesitancy toward specific COVID-19 vaccines,” write the researchers. “Considering the importance of the Johnson & Johnson and AstraZeneca COVID-19 vaccines to global supply, identifying ways to mitigate hesitancy toward these specific vaccines is vitally important.”



Lianna Matt McLernon is editor/writer at CIDRAP.

**Is there DMSO (dimethyl sulfoxide) in the Pfizer vaccine?
Is there a connection with ALC-0315?²**

World's First [Malaria Vaccine](#) Approved in Major Breakthrough Against Deadly Infection

Potent Dengue Antiviral Effective against All Known Variants

Researchers have developed a potent inhibitor of the dengue virus, which causes roughly 100 million cases of symptomatic cases of dengue fever annually. The antiviral is exceptionally effective against all known dengue variants and could be used for therapeutic and prevention purposes. The molecule reveals a previously undescribed mechanism of antiviral action by preventing the formation of the viral replication complex by blocking the interaction between two viral proteins. **+ MORE**

Do-it-yourself vaccines in a pandemic: democratized science or home-brewed pipe dream?

By Yong-Bee Lim

Source: <https://thebulletin.org/2021/10/do-it-yourself-vaccines-in-a-pandemic-democratized-science-or-home-brewed-pipe-dream>

Oct 07 – [Experts predict](#) that more pandemics are coming. Climate change will drive migrations and other ecological disruptions that put species into greater contact with one another. Continued human encroachment on nature will increase the risks that a pathogen will jump from animals to people.

² ALC-0315 (((4-hydroxybutyl)azanediyl)di(hexane-6,1-diyl) bis(2-hexyldecanoate)) is a synthetic lipid. A colorless oily material, it has attracted attention as a component of the SARS-CoV-2 vaccine, BNT162b2, from BioNTech and Pfizer. Specifically, it is one of four components that form lipid nanoparticles (LNPs), which encapsulate and protect the otherwise fragile mRNA that is the active ingredient in these drugs. These nanoparticles promote the uptake of therapeutically effective nucleic acids such as oligonucleotides or mRNA both *in vitro* and *in vivo*.



For the next pandemic, instead of waiting a year for scientists, governments, and companies to produce and distribute life-saving vaccines, wouldn't it be nice to whip something up ... in [your own kitchen](#)?

Strange as the notion sounds, at the outset of the COVID-19 pandemic, a few independent and some professional scientists thought made-at-home vaccines might help overcome what they viewed as the seemingly slow and unequal distribution of coronavirus vaccines. Ranging from self-identified biohackers to members of a collaborative that included prominent experts, these researchers sought to develop home-brewed, do-it-yourself (DIY) vaccines.

Two of these DIY vaccines focused on developing immunity by inducing the body to recognize SARS-CoV-2's unique spike, a protein structure on the surface of SARS-CoV-2 that allows it to adhere to, infiltrate, and infect host cells. By creating and introducing a person to these spike proteins via injection or nasal spray, the researchers theorized that the inoculated individual's immune system could be induced to produce antibodies that would recognize SARS-CoV-2 and drastically reduce the virus' ability to infect its host. If successful, this process could have been a first step toward creating not just a vaccine for COVID-19, but a proof of concept and potential path forward for responding faster and more equitably to future emerging disease threats.

But after more than a year-and-a-half since the first cases of COVID-19 were reported, the results, so far, are not promising. Non-traditional vaccine makers have yet to create a scientifically tested vaccine or provide a workable alternative to the existing public-private partnership model that has created the bulk of the world's safe and effective COVID-19 vaccines.

Instead, because they have promoted a DIY product and process that is prone to human error and which has not been scientifically validated, the DIY vaccine makers have come to be [seen by some critics](#) as irresponsible. DIY vaccines, after all, offer people—particularly people in vaccine-starved parts of the world and parents with children ineligible for a government-approved vaccine—a potentially false and dangerous hope. Ironically, the DIY vaccine makers may also have set back the movement known as DIYbio, which stands for do-it-yourself biology, a cause they had hoped these vaccine efforts would shine a favorable light on.

Who are the DIY vaccine makers?

To the uninitiated, the mention of amateur biological scientists who make up the DIYbio community can conjure up images of overconfident and reckless people injecting themselves with possibly dangerous substances that they do not fully understand. To experts in biosecurity and related fields, the concerns have historically run even deeper. In 2012, *New York Times* writer Carl Zimmer [quoted](#) renowned biosecurity experts and virologists to make the case that amateur scientists could create mutant flu viruses in garage labs.

Despite this bad press, the DIYbio movement has asserted the possibility of not only producing real innovations, but also creating a fairer distribution of scientific knowledge and technologies, particularly in the developing world. The movement attempts to do this through the four main activities it facilitates in virtual and physical spaces: exploration, education, empowerment, and entrepreneurship.

At least two groups have tried to make DIY vaccines against the virus that causes COVID-19. Although these groups were not associated with broader DIYbio community activities and platforms, some of the motivations were similar: a desire to do good and help others during a global crisis.

The Rapid Vaccine Deployment Collaborative (RaDVaC), composed largely of trained scientists and engineers from academia and industry, set out to develop the instructions for DIY vaccines that others could then develop and use via a creative commons license. The group says initiatives like RaDVaC offer a path toward vaccine equity. "RaDVaC's rapid-response vaccine platform is uniquely simple and modular, and easily modified for deployment in response to future outbreaks," the group's website says.

Preston Estep, who co-founded the group and has a doctorate in genetics from Harvard University, told me that he was motivated to ease the suffering associated with serious COVID-19 cases where "people were dying, slowly suffocating, all alone, trapped in a room." He said that self-experimentation was not unprecedented and pointed to the work of Australian [Neil Noakes](#), who handed his colleague Barry Marshall a solution filled with *H. pylori* to drink. Marshall went on to win the [Nobel Prize](#) for his work linking the bacteria to ulcers.

Many people associated with RaDVaC have impressive scientific pedigrees. Estep has been involved in [biotech startups](#) and was the director of gerontology for the Harvard [Personal Genome Project](#), a large study that sequences and shares project-participant genome data to shed light on the relationship between genetic data and human traits. The group's other co-founders also have significant backgrounds in research and analysis. Beyond the core founders, RaDVaC also includes notable scientists, including George Church, the famed Harvard Medical School genetics professor. These names and reputations help lend RaDVaC legitimacy and prestige that other organizations in the DIYbio space lack.

To [make its DIY vaccine](#), a core group at RaDVaC looked at past papers on vaccines developed for other coronaviruses such as Severe Acute Respiratory Syndrome (SARS) and Middle Eastern Respiratory Syndrome (MERS). This research, combined with the goal of using readily-available



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materials and mail-order ingredients, led the group to produce a subunit vaccine candidate—a vaccine that, in this case, uses short bits of amino acid chains and protein subunits to mimic parts of the protein structure of SARS-CoV-2, in hopes of eliciting an immune response.

Since there is no infectious material associated with RaDVaC's subunit vaccine prototype, which is delivered as a nasal spray, it cannot cause COVID-19. Given COVID-19's targeting of the respiratory tract, RaDVaC product developers reasoned that a nasal spray might enhance mucosal immunity. As part of the DIY and open-source ethos this group adopted, it aims to make vaccines that others can replicate. "It's actually easier than a lot of recipes in cookbooks," Estep [told Bloomberg News](#).

Estep told me that more than 100 people have self-experimented with the group's vaccines, many with ties to the organization. Another of the DIY vaccine efforts, Josiah Zayner's Project McAfee (named after the anti-virus computer software), is rougher around the edges than RaDVaC. Zayner, a biophysics PhD, former NASA researcher, and now biohacker and bioentrepreneur, founded the project in May 2020. Among the DIYbio and biohacker communities, Zayner is a polarizing figure who has alienated some with risky and ostentatious experiments in the past. A long-time critic of the scientific establishment, Zayner operates [a company](#) called The ODIN, which sells materials DIYbio experimenters can use in their research. Beyond his penchant for self-experimentation, Zayner [built a curriculum](#) around his COVID-19 project to teach basic science and wetlab skills to amateurs.

To [make his vaccine](#), Zayner used a study of rhesus macaques in a Harvard University paper. First, he ordered the DNA sequence that codes for the [same coronavirus spike protein](#) used in the paper, paying \$1,600 to a DNA synthesis company. After a series of intermediate tests, the McAfee team suspended the DNA in solution and [injected it into themselves](#) during a YouTube livestream event on August 2020.

The Project McAfee team said that the team members who injected themselves all had antibodies that would react to the virus and that none of them appeared to have been harmed by their self-experimentation. But even [Zayner agreed](#) that his self-experimentation results were inconclusive.

Zayner, who said he was banned from YouTube after publishing his vaccine work, wrote in a [blog post](#) that his efforts were important nonetheless: "Even if it didn't work, the fact that someone could have designed a vaccine in June 2020 for under \$5k is fucking profound."

Zayner did not respond to a request for comment for this piece.

DIY vaccines weren't a speedy pandemic solution

One of RaDVaC's goals is to reduce the amount of time it takes to produce vaccines during a pandemic. Though the [first Pfizer shots](#) were given less than a year after the World Health Organization [declared](#) COVID-19 a Public Health Emergency of International Concern, RaDVaC believes society could do better.

"When many thousands are dying every day, and with the scientific capability largely in place, rapid [vaccine deployment] must mean a few weeks, not several months or years," the group's website says.

But in the case of both Project McAfee and the RaDVaC collaborative, the research, development, and self-administration of prototype DIY vaccines happened around the same time Pfizer completed its Phase 1 trial in August 2020; the DIY vaccine projects were no swifter in reaching the goal of trying out a product on people than Pfizer's vaccine candidate. Moreover, Pfizer and other vaccine makers gained robust data from Phase 1 trials that then allowed their products to undergo Phase 2 and Phase 3 trials, ultimately leading to regulators green-lighting their products.

Traditional science takes time, but the results—unlike those from self-experimentation—are reproducible. While the DIY groups have shared anecdotal data on their self-experimentation, they have released little to no [good-quality data](#) on any significant results on the safety or effectiveness of their products so far.

Why DIY vaccines aren't a substitute for the current mode

Zayner told *Bloomberg* that he was "suspicious of my own data" and that large-scale trials would be necessary for vaccine work. Similarly, Estep and Church both acknowledged to me the anecdotal nature of their results. The work of RaDVaC could be considered "pre-research," they said: preliminary observations that could help guide more formalized, scientific trials in the future.

Estep told me he is planning on pursuing trials of RaDVaC in animal models with a pharmaceutical company—a step in the right direction towards gaining data through animal-model clinical trials and one that replicates the more traditional model of pharmacological research and development.

But neither RaDVaC nor Project McAfee is a viable alternative to the large-scale efforts by governments and pharmaceutical companies to produce vaccines at this time.

In the face of the devastating effects of a disease like COVID-19, people might be tempted to try something like what RaDVaC or Project McAfee produced, particularly if the home-brew process is



presented as “[extremely simple](#)” and “[actually easier than a lot of recipes in cookbooks](#).” Whatever their motivation, it is highly likely that [amateurs and untrained citizens](#) will not have the proper biosafety and wetlab skills and knowledge necessary to safely or responsibly home-brew and inoculate themselves with either DIY vaccine.

The ultimate question is what lessons are to be learned from these DIY vaccine self-experimentation projects?

Neither of these projects accomplished its objectives. As problematic as they were in some ways, these DIY vaccine efforts did attempt to respond more quickly and equitably to this pandemic than the medical establishment could. In the future, clearly, faster pandemic response would be better pandemic response. Therefore, the world could use a new vision, one that updates existing institutions in ways that accelerate research, development, and evaluation of medical interventions—and distributes those interventions quickly around the world—without sacrificing standards for the safety and efficacy of vaccines and other therapeutics.

Yong-Bee Lim is a fellow at the Council on Strategic Risks. He focuses on a broad variety of issues, including biosecurity, biodefense strategy, emerging and converging technologies, national security policy, and issues that arise at the nexus of climate change, ecological degradation, and biology. He was chosen as a Johns Hopkins Center for Health Security Emerging Leaders in Biosecurity Initiative Fellow in 2018. In addition, he was a recipient of the Presidential Scholarship for the Biodefense Program at George Mason University's Schar School of Policy and Government. In the past, he also worked as a researcher in a number of government institutions, including the Health and Human Services Department, the Department of Defense, and the Department of Energy's Lawrence Livermore National Laboratory. Yong-Bee holds a doctorate and a master degree in biodefense from George Mason University, as well as a bachelor's degree in psychology from the same institution. Lim is a member of the [Bulletin Editorial Fellows Program](#).

Biodistribution and Spike Protein Safety of mRNA Vaccines: An Update

It's easy to misinterpret science, and it takes more effort to understand the true narrative.

By Shin Jie Yong

Source: <https://medium.com/microbial-instincts/biodistribution-and-spike-protein-safety-of-mrna-vaccines-an-update-788fe58e39b9>

July 07 – In the past few months, there has been a push for [the idea](#) that the spike proteins related to mRNA vaccines are [toxic](#) to our bodies. The vaccine [can cause](#) spike protein deposition in the ovaries, for example, but is this really

read.



true? I wish there's a yes or no answer to this question, but the science behind it isn't so straightforward. Rest assured, however, that the mRNA vaccines aren't toxic to the ovaries or any other tissues.

This article will explain why, as objectively as possible, and also serve as an update to [a related article](#) about spike protein safety I wrote back in December 2020 and [another one](#) about mRNA vaccine biodistribution I wrote four months ago.

How Covid-19 vaccines work in brief

[Nearly all the vaccines](#) against Covid-19 use the SARS-CoV-2's spike protein to induce immunity in some way or another. (SARS-CoV-2 is the coronavirus that causes Covid-19.)

The [mRNA vaccine](#), for example, uses lipid nanoparticles (LNPs) to deliver mRNA into cells. This mRNA instructs the cell to make the spike

proteins of SARS-CoV-2 that provoke immune reactions. The [DNA vaccine](#) acts similarly, using adenovirus to carry spike protein-encoding DNA into cells. The [protein subunit vaccine](#), on the other hand, directly administers purified spike proteins into the body. In contrast, [inactivated vaccine](#) uses dead virions with intact spike proteins to induce immunity.

SARS-CoV-2 has spike proteins on its surface that latch on the ACE2 receptor on human cells. The spike protein-ACE2 binding allows SARS-CoV-2 to infect cells to replicate itself. Thus, vaccines aim to train our immune system to neutralize the spike proteins, preventing SARS-CoV-2 from infecting cells.

The biodistribution and toxicity concern

In [an interview](#) on 28 May 2021 that went viral, Byram W. Bridle, Ph.D., an associate professor specializing in virology and immunology, claimed that he and collaborators had obtained a '[biodistribution study](#)' of the mRNA vaccine from the Japanese regulatory agency.



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Prof. Bridle then said spike protein is a known toxin, which will harm the tissue it accumulates in. He speculates that this could be the culprit behind the blood clots (in the brain and other organs) and heart inflammation cases that are associated with Covid-19 vaccines.

Basically, Prof. Bridle said:

It's the first time ever scientists have been privy to seeing where these [mRNA] vaccines go after vaccination. Is it a safe assumption that it stays in the shoulder muscle? The short answer is: absolutely not. It's very disconcerting. The spike protein gets into the blood, circulates through the blood in individuals over several days post-vaccination...It accumulates in a number of tissues, such as the spleen, the bone marrow, the liver, the adrenal glands [and particularly] the ovaries...The conclusion is we made a big mistake. We didn't realize it until now. We thought the spike protein was a great target antigen. We never knew the spike protein itself was a toxin and was a pathogenic protein. So by vaccinating people, we are inadvertently inoculating them with a toxin."

J. Patrick Whelan, MD, Ph.D., a pediatric rheumatologist, shared the same concern, [warning](#) the Food and Drug Administration (FDA) via a [public submission](#) in December 2020 that:

I am concerned about the possibility that the new [mRNA] vaccines aimed at creating immunity against the SARS-CoV-2 spike protein have the potential to cause microvascular [small blood vessels] injury to the brain, heart, liver, and kidneys in a way that does not currently appear to be assessed in safety trials of these potential drugs.

In June 2021, Robert W. Malone, MD, MS, one of the pioneers of mRNA and DNA vaccine technology, also said that spike proteins are 'cytotoxic' (toxic to living cells) in a [podcast](#) and [tweet](#):

The SARS-CoV-2 spike protein is cytotoxic. That is a fact. Who says so? Multiple peer reviewed references. The Salk Institutue. It is

the responsibility of the vaccine developers to demonstrate that their expressed version is not toxic. Show us. Therefore, the overall cause for worry is that spike protein-based vaccines could distribute cytotoxic spike proteins throughout the body, beyond the injection site, and harm the host.

Addressing the biodistribution concern

Prof. Bridle mentioned that the vaccine-derived spike proteins could enter the bloodstream and settle on various tissues, particularly the ovaries, based on the [Japanese biodistribution study](#) of the Pfizer mRNA vaccine.

[Source:](#) Japanese government report. Page 6–7 of 'Pharmacokinetics Overview' section (or pdf page 16–17).

Japan insisted on [completing its own](#) preclinical and clinical trials before authorizing the vaccine for use for Japanese people. Although this action has delayed vaccine roll-out, we also get more data on the Pfizer mRNA vaccine in addition to other [governmental reports](#).

In this Japanese study, a substantial amount of the Pfizer mRNA

2.6.5.5B. PHARMACOKINETICS: ORGAN DISTRIBUTION CONTINUED		Test Article: [³ H]-Labelled LNP-mRNA formulation containing ALC-0315 and ALC-0159 Report Number: 185350													
Species (Strain):		Rat (Wistar Han)													
Sex/Number of Animals:		Male and female/3 animals/sex/timepoint (21 animals/sex total for the 50 µg dose)													
Feeding Condition:		Fed ad libitum													
Method of Administration:		Intramuscular injection													
Dose:		50 µg [³ H]-08-A01-C0 (lot # NC-0552-1)													
Number of Doses:		1													
Detection:		Radioactivity quantitation using liquid scintillation counting													
Sampling Time (hour):		0.25, 1, 2, 4, 8, 24, and 48 hours post-injection													
Sample	Mean total lipid concentration (µg lipid equivalent/g (or mL) (males and females combined))							% of administered dose (males and females combined)							
	0.25 h	1 h	2 h	4 h	8 h	24 h	48 h	0.25 h	1 h	2 h	4 h	8 h	24 h	48 h	
Adipose tissue	0.057	0.100	0.126	0.128	0.093	0.084	0.181	0.007	0.013	0.020	0.016	0.011	0.010	0.009	
Adrenal glands	0.271	1.48	2.72	2.89	6.80	13.8	18.2	0.001	0.007	0.010	0.015	0.035	0.066	0.106	
Bladder	0.041	0.130	0.146	0.167	0.148	0.247	0.365	0.000	0.001	0.001	0.001	0.001	0.002	0.002	
Bone (femur)	0.091	0.195	0.266	0.276	0.340	0.342	0.687	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Bone marrow (femur)	0.479	0.960	1.24	1.24	1.84	2.49	3.77	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Brain	0.045	0.100	0.138	0.115	0.073	0.069	0.068	0.007	0.013	0.020	0.016	0.011	0.010	0.009	
Eyes	0.010	0.035	0.052	0.067	0.059	0.091	0.112	0.000	0.001	0.001	0.002	0.002	0.002	0.003	
Heart	0.282	1.03	1.40	0.987	0.790	0.451	0.546	0.018	0.056	0.084	0.060	0.042	0.027	0.030	
Injection site	328	394	311	338	213	195	165	19.9	52.6	31.6	28.4	21.9	29.1	24.6	
Kidneys	0.391	1.16	2.05	0.924	0.590	0.426	0.425	0.050	0.124	0.211	0.109	0.075	0.054	0.057	
Large intestine	0.013	0.048	0.093	0.287	0.649	1.10	1.34	0.008	0.025	0.065	0.192	0.405	0.692	0.762	
Liver	0.737	4.63	11.0	16.5	26.5	19.2	24.3	0.602	2.87	7.33	11.9	18.1	15.4	16.2	
Lung	0.492	1.21	1.83	1.50	1.15	1.04	1.09	0.052	0.101	0.178	0.169	0.122	0.101	0.101	

2.6.5.5B. PHARMACOKINETICS: ORGAN DISTRIBUTION CONTINUED		Test Article: [³ H]-Labelled LNP-mRNA formulation containing ALC-0315 and ALC-0159 Report Number: 185350													
Sample		Total Lipid concentration (µg lipid equivalent/g (or mL) (males and females combined))							% of Administered Dose (males and females combined)						
		0.25 h	1 h	2 h	4 h	8 h	24 h	48 h	0.25 h	1 h	2 h	4 h	8 h	24 h	48 h
Lymph node (mandibular)		0.064	0.189	0.290	0.408	0.534	0.554	0.727	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Lymph node (mesenteric)		0.050	0.146	0.530	0.489	0.689	0.985	1.37	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Muscle		0.021	0.061	0.084	0.103	0.096	0.095	0.192	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ovaries (females)		0.104	1.34	1.64	2.34	3.09	5.24	12.3	0.001	0.009	0.008	0.016	0.025	0.037	0.095
Pancreas		0.081	0.207	0.414	0.380	0.294	0.358	0.599	0.003	0.007	0.014	0.015	0.015	0.011	0.019
Pituitary gland		0.339	0.645	0.868	0.854	0.405	0.478	0.694	0.000	0.001	0.001	0.001	0.000	0.000	0.001
Prostate (males)		0.061	0.091	0.128	0.157	0.150	0.183	0.170	0.001	0.001	0.002	0.003	0.003	0.004	0.003
Salivary glands		0.084	0.193	0.255	0.220	0.135	0.170	0.264	0.003	0.007	0.008	0.008	0.005	0.006	0.009
Skin		0.013	0.208	0.199	0.145	0.119	0.137	0.253	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Small intestine		0.030	0.221	0.476	0.879	1.28	1.30	1.47	0.024	0.130	0.319	0.543	0.776	0.906	0.835
Spinal cord		0.043	0.097	0.169	0.250	0.106	0.085	0.112	0.001	0.002	0.002	0.003	0.001	0.001	0.001
Spleen		0.534	2.47	7.73	16.3	22.1	20.1	23.4	0.013	0.095	0.325	0.385	0.982	0.821	1.03
Stomach		0.017	0.065	0.115	0.144	0.268	0.152	0.215	0.006	0.019	0.034	0.030	0.040	0.037	0.039
Testes (males)		0.031	0.042	0.079	0.129	0.146	0.304	0.320	0.007	0.010	0.017	0.030	0.034	0.074	0.074
Thymus		0.088	0.243	0.340	0.335	0.196	0.207	0.331	0.004	0.007	0.010	0.012	0.008	0.007	0.008
Thyroid		0.155	0.536	0.842	0.851	0.544	0.578	1.00	0.000	0.001	0.001	0.001	0.001	0.001	0.001
Uterus (females)		0.043	0.203	0.305	0.140	0.287	0.289	0.456	0.002	0.011	0.015	0.008	0.016	0.018	0.022
Whole blood		1.97	4.37	5.40	3.05	1.31	0.909	0.420	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Plasma		3.97	8.13	8.90	6.50	2.36	1.78	0.805	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Blood:Plasma ratio ^a		0.815	0.515	0.590	0.510	0.555	0.530	0.540	0.000	0.000	0.000	0.000	0.000	0.000	0.000



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vaccine settled in the injection site, liver, spleen, adrenal glands, and ovaries of rats at 48 hours following intramuscular injection (see yellow highlights below). But these numbers alone can be misleading.

As [Abraham Al-Ahmad](#), Ph.D., an associate professor of pharmacology, [who specializes](#) in drug biodistribution in the brain, expertly [explained](#):

That person is providing us with amount of the radiolabeled tracer detected in the tissue (e.g. ug/g tissue), with the approximation of total lipids amount in tissue. This assumes that the nanoparticles made it through the tissue complete, but we cannot exclude that we are maybe measuring only the 08-A01-C0 compound accumulation. In practice, we usually focus our attention on the percentage of injected dose (% ID) when it comes to appreciate the distribution and the delivery of a drug into an organ/tissue.

Basically, the numbers highlighted in yellow refer to total lipid content, including both the mRNA vaccine's LNPs (lipid nanoparticles) and lipid tracer (i.e., 08-A01-C0 compound). Thus, the more appropriate numbers to look at should be the "% of administered dose" highlighted in cyan.

Now, the numbers are no longer nerve-racking: Only <1% of the injected mRNA vaccine got into the ovaries, adrenal glands, heart, brain, and other tissues at 48-hour. Most of the vaccine remained in the injection site and went into the liver, "suggesting these LNPs may be eliminated mostly via hepatic [liver] clearance route," Prof. Al-Ahmad wrote.

Even the dose the Japanese study used is very high when controlled for weight; that is, 18–35-times higher than what is injected into humans. As David H. Gorski, MD, Ph.D., a professor of surgery and [blogger](#), [explained](#):

The human vaccine contains...[~0.46 mg lipids or 460 µg](#). Let's just round it up to 500 µg (0.5 mg). That's approximately 10x the dose given to the rats. However, for the typical '70 kg' male, 0.5 mg represents a per-weight dose of 0.0071 mg/kg, or 7.1 µg/kg. Let's compare to the rats, which generally weigh around 200 g (0.2 kg)...That would translate to a per-weight dose of ~250 µg/kg. Even if you used much older rats, who can weigh as much as twice as much, that would still translate to a dose of 125 µg/kg. So we're looking at a lipid nanoparticle [dose] of ~18–35 times higher (as a rough estimate) than the typical adult human dose.

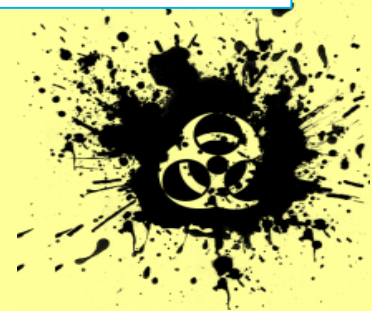
The Japanese biodistribution study results are consistent with Pfizer's that was submitted to the European Medicines Agency (EMA) in February 2021. Pfizer also found that the LNP-encapsulated mRNA vaccine was mainly metabolized in the liver and did not enter other tissues easily. They also noted no effects on fertility or ovarian functions.

As the EMA report [stated](#):

The biodistribution was also studied in rats using radiolabeled LNP and luciferase modRNA (study 185350). The radiolabeling data, measuring distribution to blood, plasma and selected tissues, of IM injection of a single dose of 50 µg mRNA over a 48-hour period is considered more sensitive than the bioluminescence method and indicate a broader biodistribution pattern than was observed with bioluminescence. Over 48 hours, distribution from the injection site to most tissues occurred, with the majority of tissues exhibiting low levels of radioactivity.

Radioactivity was detected in most tissues from the first time point (0.25 h) and results support that injections site and the liver are the major sites of distribution. The greatest mean concentration was found remaining in the injection site at each time point in both sexes. Low levels of radioactivity were detected in most tissues, with the greatest levels in plasma observed 1-4 hours post-dose. Over 48 hours, distribution was mainly observed to liver, adrenal glands, spleen and ovaries, with maximum concentrations observed at 8-48 hours post-dose. Total recovery (% of injected dose) of radiolabeled LNP+modRNA outside the injection site was greatest in the liver (up to 21.5%) and was much less in spleen (≤1.1%), adrenal glands (≤0.1%) and ovaries (≤0.1%). The mean concentrations and tissue distribution pattern were broadly similar between the sexes. No evidence of vaccine-related macroscopic or microscopic findings were found in the ovaries in the repeat-dose toxicity studies (Study 38166 and Study 20GR142) and no effects on fertility were identified in the DART study.

[Source](#): EMA assessment report on the Pfizer mRNA vaccine; page 47 out of 140. Note: DART stands for Development and Reproductive Toxicology (in rats).



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For the Moderna mRNA vaccine, the EMA assessment report has [previously released](#) its biodistribution data that also finds no cause for concern. Although the Moderna LNP-encapsulated mRNA vaccine entered various tissues at low amounts, they are mostly gone by the third day.

As [stated](#) in the EMA report :

Concentrations of mRNA-1647 were quantifiable in the majority of tissues examined at the first time point collected (2 hours post-dose) and peak concentrations were reached between 2- and 24-hours post-dose in tissues with exposures above that of plasma. Besides injection site [muscle] and lymph nodes [proximal and distal], increased mRNA concentrations (compared to plasma levels) were found in the spleen and eye. Both tissues were examined in the frame of the toxicological studies conducted with mRNA-1273 final vaccine formulation. Low levels of mRNA could be detected in all examined tissues except the kidney. This included heart, lung, testis and also brain tissues, indicating that the mRNA/LNP platform crossed the blood/brain barrier, although to very low levels (2-4% of the plasma level). Liver distribution of mRNA-1647 is also evident in this study, consistent with the literature reports that liver is a common target organ of LNPs.

Assessment report
EMA/15689/2021

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The $T_{1/2}$ of mRNA-1647 was reliably estimated in muscle (site of injection), proximal popliteal and axillary distal lymph nodes and spleen with average $T_{1/2}$ values for all vaccine components of 14.9, 34.8, 31.1 and 63.0 hours, respectively. mRNA-1647 was rapidly cleared from plasma during the first 24 hours with the $T_{1/2}$ estimated in a range of 2.7 - 3.8 hours. The mean concentrations of all vaccine components became undetectable after 24 hours, except for gH, which was detectable up to the last time point of 120 hours but which was also detectable in 2 pre-dose plasma samples. The mRNA constructs were not measurable after maximum 3 days in tissues other than the muscle, lymph nodes, and spleen (~25 hours in brain).

Reference with regards to the mRNA biodistribution is made to the respective adverse findings observed in rat spleens in toxicological studies. No adverse findings were detected in the ophthalmological examinations or the brain/CNS.

[Source](#): EMA assessment report on the Moderna mRNA vaccine; page 47–48 out of 169.

Overall, these biodistribution studies show that the Pfizer and Moderna mRNA vaccines do not enter other tissues or organs easily. Even if the mRNA vaccines did enter the ovaries in tiny amounts, there's no evidence that ovarian cells can translate the mRNA into spike proteins. Even if ovarian cells somehow managed to manufacture some spike proteins, there's no evidence that this can harm the ovaries. Maybe the spike proteins expressed on ovarian cells degrade within hours or days and disappear in a few days. [Animal studies have shown](#) that



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cells that take up the mRNA vaccine only express the mRNA-encoded proteins on its surface for about 48 hours, which then quickly decline to zero in a few days.

Thus, multiple stringent biochemical conditions and steps must be met to even allow for the tiniest possibility of mRNA vaccine harming the ovaries or other tissues. (I discussed this in-depth for the brain [here](#).)

Addressing the biodistribution concern part II

But critics will question three things: (1) such studies are done in rats; (2) such studies used luciferase-encoding mRNA rather than the spike protein-encoding mRNA; and (3) such studies do not measure the spike proteins. All these critics are, honestly, valid limitations of the biodistribution studies.

- For (1): While rats are mammals like humans, the more convincing animal model is non-human primates like monkeys.
- For (2): Luciferase is a type of protein that lights up under imaging scans, enabling researchers to see where the LNPs had carried the mRNA (that encodes luciferase) into. So, luciferase-based studies only show biodistribution of LNPs, not spike proteins.
- For (3): Since luciferase-based studies don't inform spike protein biodistribution, we still don't know where the manufactured spike proteins go after vaccination. For instance: when the mRNA vaccine instructs muscle cells (at the injection site) to make spike proteins, where will these spike proteins go?

As points (1) and (2) are not really major issues, point (3) needs to be taken more seriously. Thankfully, the mRNA vaccines are designed in such a way that the vaccine-derived spike proteins are [anchored onto the cell surface](#). This means that the manufactured spike proteins (at the instruction of the mRNA vaccine) get stuck on the cell. Hence, spike proteins made by muscle cells at the injection site will stay at the injection site.

“A mutation where amino acids 986 and 987 are replaced with prolines (S-2P), stabilizing the transmembrane-anchored S glycoprotein in the prefusion conformation but still allowing for cleavage of the S1 and S2 subunits, is the approach used in the licensed vaccines [mRNA-1273](#) [Moderna] and [BNT162b2](#) [Pfizer],” immunologists [wrote](#). The keyword is transmembrane-anchored, where the vaccine-derived S glycoprotein (or spike protein) is anchored on the cell membrane.

But some will question that maybe some of the spike proteins get unstuck from the cells. As a result, spike proteins made at the injection site might go and wreak havoc elsewhere. To this end, during the interview, Prof. Bridle cited [a study](#) from Harvard Medical School that detected spike proteins in the bloodstream of 11 out of 13 recipients of the Moderna mRNA vaccine on day-1.

Besides the small sample size, this study actually detected [very tiny amounts](#) of spike proteins with an ultrasensitive technology that's not often used. Plus, the Harvard study found that spike protein amount in the blood declined after day-1 and was no longer detectable on day-14.

However, this study has been used to push the notion that authorities and experts lied about the vaccine-derived spike proteins being anchored on the cell surface. But all assays (or tools) have a limit of detection. It's just that the Harvard study used a special assay called Simoa that reached the picograms (a trillionth of a gram) level of detection.

Deplatform Disease, a science blog many experts have cited, calculated that the detected levels of spike proteins in the Harvard study were [100,000-times lower](#) than the amount that might cause harm.

While the root cause is unclear, the detected spike proteins in the blood of vaccinated persons in this study might be due to (1) too many anchored spike proteins on the cell surface that a few got released or (2) usual day-to-day cell death that release some of the anchored spike proteins.

Addressing the spike protein toxicity concern

...100,000-times lower than the amount that might cause harm? Yes, [many studies using](#) cultured cells and animals have [found](#) that the spike protein of SARS-CoV-2 alone — without its genome — is sufficient to harm blood vessels at a certain concentration. (Such concentrations are 100,000-times higher than the amount detected in the Harvard study.)

But all of such studies have one thing in common: they use the spike protein of SARS-CoV-2, not vaccine-derived ones. [The one](#) Dr. Malone particularly [pushed](#) is from Salk Institute, where researchers injected SARS-CoV-2 spike proteins into hamsters, which [injured the](#) lungs and blood vessels due to angiotensin-converting enzyme 2 (ACE2) dysregulation.

This ACE2 dysregulation finding is very crucial. ACE2 is the receptor that the spike protein of SARS-CoV-2 binds to in order to infect human cells. Too much binding and activation of ACE2 [throws off the balance](#) in the renin-angiotensin system (RAS). RAS regulates blood pressure and the vascular system, so its dysregulation will upset blood vessel functions.

But Carolyn Machamer, Ph.D., a professor of cell biology, [explained](#):



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There are changes that were made on purpose that would prevent the spike protein from being able to undergo binding to the [ACE2] receptor and fusion. And so, all this business about toxicity that has been shown for the real spike protein, the one that doesn't have that block, is totally irrelevant for the vaccine.

Deplatform Disease further [added](#):

...the spike protein in the Pfizer and Moderna vaccines is not quite the same as the wild-type spike protein found on the virus. This protein has been [prefusion stabilized](#) which means it lacks the ability to change conformation into its postfusion state (via a double proline substitution). This change is thought to significantly enhance the ability of the spike protein to elicit neutralizing antibodies from the immune system, but it also has another functional consequence: the spike protein has [drastically less ability](#) to cause syncytium formation...[that may] play a direct role in the disease process of COVID-19.

All these mean that the vaccine-derived spike proteins, at least for the mRNA ones, are modified so that they won't bind to the ACE2 receptor. No binding means no activation, and there won't be any problems in ACE2 or RAS in vaccinated persons.

A real SARS-CoV-2 infection, in contrast, [floods the body](#) with infectious virus particles, each with its own spike proteins that can bind to the ACE2 receptor and dysregulate RAS. One can only imagine the countless amount of spike proteins that Covid-19 deposits in its victims. No wonder blood vessel injury and blood clots are so common in Covid-19 patients.

Closing remarks

I must admit that this article can be heavy to read. Even I would not be able to comprehend all of this without the written explanations of other experts. No wonder it's easy to misinterpret science, and it takes effort to understand the true narrative. And I hope this article provides a coherent read on this complicated matter.

In brief, while it's true that the mRNA vaccine has a broad biodistribution in our body and that the spike proteins of SARS-CoV-2 are dangerous, the narrative doesn't end there. Minuscule amounts of mRNA vaccine entering other tissues or organs are only of minuscule significance, and membrane-anchored spike proteins from the vaccines are not dangerous. Although there will always be people and even experts who insist otherwise, let's stay informed to differentiate between a good and bad scientific argument.

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2001 anthrax attacks were the catalyst for today's COVID defenses

By David Malet

Source: <https://thehill.com/opinion/national-security/575741-the-2001-anthrax-attacks-were-the-catalyst-for-todays-covid>

Oct 07 – Twenty years ago this month, a mentally-ill American scientist unleashed a wave of terror on his own country by mailing a series of letters tainted by spores of the deadly anthrax bacteria to targets including the offices of two United States Senators and two television networks. Five people died in the “Amerithrax” attacks, and more than a dozen were sickened.

Although I was a survivor of those attacks, in 2001 it seemed obvious that the 9/11 attacks had a much bigger impact on America and the rest of the world. But in 2021, it is Amerithrax that is continuing to affect all of our daily lives. That is because the bioterrorist attack jump-started investment in [biosecurity research](#), and ultimately in responses to [pandemics](#), that has given us social distancing strategies and the availability of COVID-19 vaccines mere months after the virus was identified. We would have been less prepared for the pandemic and potentially lost many more lives if not for lessons from Amerithrax.

The anthrax attacks were dubbed [Amerithrax](#) by the FBI because the anthrax (*Bacillus anthracis*) spores had a domestic source despite the pro-Jihad letters that accompanied them. During October and November 2001, five Americans in locations as far apart as Connecticut and Florida [died](#) and another 17 became ill because of exposure to contaminated mail. The letter sent to the office of Sen. Tom Daschle (D-S.D.), where I worked, caused the closure of the Hart Senate Office Building for more than three months.

Nearly seven years after the attacks, new genetic-analysis technology identified the Amerithrax spores as a laboratory sample used exclusively by Dr. Bruce Ivins, head of the U.S. Army's anthrax defense research program. The FBI [speculated](#) that Ivins was trying to exploit the 9/11 attacks to gain funding for his own research. Ivins committed suicide before trial, leaving behind many questions.

In terms of both reputational damage and [legal settlement](#), Amerithrax seemingly undermined the Cold War legacy biological weapons defense program. Still, bioterrorism was clearly a real threat. President George W. Bush made biodefense a main component of early homeland security initiatives, including spending [\\$5.6 billion](#) in the Project BioShield Act of 2004, to develop countermeasures to unconventional health threats.



In 2002, the White House insisted that all military personnel, postal workers and first responders have access to an [anthrax vaccine](#) even though it had not been approved by the FDA. Like our COVID-19 vaccinations today, the information and misinformation about the vaccine had caused controversy for years; servicemen had taken [dishonorable discharges](#) rather than get the shot. Ultimately the FDA issued an emergency use authorization (EUA), greatly increasing the ranks of the vaccinated, just as it would on a much greater scale with COVID.

By 2005, after reading a book about the 1918 influenza pandemic and with fresh experience with the SARS-1 coronavirus and other outbreaks, Bush ordered the federal government to prepare for the next pandemic. One result was that, after intense internal debate, the United States built [social distancing](#) into its epidemic mitigation strategies.

New outbreaks, such as the 2009 [H1N1 swine flu pandemic](#), led to expanding the use of EUAs to treat the public. By the 10 anniversary of Amerithrax, research programs to rapidly create [genetically-engineered vaccines](#) for each new outbreak were in place. In 2011, the Pentagon's Defense Advanced Research Projects Agency (DARPA) [was developing](#) the first RNA-based vaccines — precursors of the Pfizer and Moderna vaccines that hundreds of millions of Americans received in 2021.

[In 2017](#), DARPA set the project goal of being able to develop antibodies for any virus within 60 days of obtaining a blood sample. Researchers fell just short of this once-unthinkable goal with COVID-19. But that research helped the pharmaceutical industry create COVID antibodies [within weeks](#) of obtaining the first samples.

As a survivor of Amerithrax, I have complicated feelings about the 20th anniversary of the attacks, and I have come to terms with the fact that most Americans consider them to be just a historical footnote. But one thing that is clear to me this year is that the measures that have protected millions of people during the pandemic grew directly out of America's experience with bioterrorism 20 years ago.

David Malet is associate professor of Public Affairs at American University. He is the author of "Biotechnology and International Security."

No, your antibodies are not better than vaccination: An explainer

By Beth Mole

Source: <https://arstechnica.com/science/2021/10/prior-infection-vs-vaccination-why-everyone-should-get-a-covid-19-shot/>

Oct 08 – As long as there have been vaccines against COVID-19, there have been arguments for why people shouldn't get those vaccines. One of the more persistent—and hairier—arguments is that people who have already been infected with the pandemic coronavirus, SARS-CoV-2, don't need a vaccine. An infection will generate immune responses similar to those generated by vaccines, the thinking goes. So, why waste coveted vaccine doses on people who already have immune responses against the virus—which may also needlessly put those people at risk of vaccine side effects, however rare?

It's a reasonable question, and there is legitimate scientific debate about it. There are also different approaches to the issue in terms of public health policy. In Israel, for example, people who have recovered from COVID-19 after testing positive on a PCR test can get a vaccination "[Green Pass](#)" that's valid for up to six months. The pass allows them entry into various places just as it does for people who are fully vaccinated. In the European Union, some member states offer a similar "[Digital COVID Certificate](#)" to people who have recovered from COVID-19 *and* received just one dose of a two-dose mRNA vaccine regimen.

In the US, however, public health officials are unequivocal in their approach: people are categorized as either vaccinated or unvaccinated, regardless of prior infection. It's an approach with many strengths, including robust scientific data supporting vaccination for people who have recovered. That data—which we'll get into below—has consistently shown that immune responses from natural infections are extremely variable, thus unreliable. Vaccines, on the other hand, have repeatedly been proven to generate highly protective immune responses.

The vaccines are also remarkably safe, with few serious side effects that occur [extremely rarely](#). One of the most concerning side effects is [myocarditis \(inflammation of the heart muscle\)](#). But even there, the rate of myocarditis in the most at-risk group (males ages 12 to 29) is only estimated to be [41 in a million](#), and the cases are generally mild.

Comparing that with actual COVID-19 infections—which can cause severe disease even in [young](#), healthy people and may cause [persistent, months-long symptoms](#) in up to [half of people infected](#)—there's no contest. Vaccines are safer. And they're just as safe for people who have previously recovered. [People with past COVID-19 cases are no more likely to have serious side effects from vaccines](#) than people who haven't been previously infected, though they may have more side effects.

The US approach also has logistical benefits. Simple categories of "vaccinated" and "unvaccinated" skip over the messy and difficult step of figuring out who has been infected and when. From the early stages of the pandemic, the US has struggled—and is still struggling—to roll out accurate, widely available tests



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for SARS-CoV-2. Many people who have been infected never officially tested positive. Others assumed they were infected when they may have actually had one of many other respiratory infections. And antibody tests that look for evidence of past infections are notoriously inaccurate.

Though opponents argue that mass vaccination is driven by "evil corporations" out for prodigious profits at all costs, the fact is that vaccines are extremely safe and offer recovered people strong, lasting protection against a virus that has already killed more than 700,000 Americans.

Efficacy and variability

That's not to say that there aren't weaknesses to the US's approach. For one thing, the approach can make vaccines look bad. In many instances, vaccine effectiveness is gauged by comparing COVID-19 case rates between vaccinated and unvaccinated people. But in the US, the unvaccinated include people who have no immunity *and* recovered people, who have some immunity and are, thus, expected to have fewer infections. This waters down case rates in the unvaccinated group and ends up lowering the vaccine efficacy estimates.

Still, the vaccines' efficacy estimates are extraordinarily good. A recent study found that the Pfizer-BioNTech mRNA vaccine was holding steady with [90 percent efficacy](#) against COVID-19 hospitalization for at least six months. A separate study found that the Moderna mRNA vaccine was [93 percent effective](#) against hospitalizations among people without immunocompromising conditions. Johnson & Johnson's vaccine was 71 percent effective.

And again, many vaccine efficacy numbers don't account for past infection and may be artificially lower because of that. How much lower? It's unclear. Since the beginning of the pandemic, researchers have noted time and again that immune responses generated by SARS-CoV-2 infections vary wildly, with some of the weaker responses seen in people with mild disease and stronger responses in people with severe disease.

In one study [Ars reported on back in June of last year](#), researchers looking at SARS-CoV-2 antibodies in people who had recovered found that the difference between the highest and lowest levels varied by a factor of over 1,000. The researchers saw even more variability when they looked at neutralizing antibodies—those known to bind to the virus and prevent it from infecting cells. Neutralizing antibody levels in recovered people varied over a range of 40,000-fold, and up to 20 percent of people didn't have any detectable level of neutralizing antibody.

Antibodies

Of course, antibodies are not the entirety of the immune responses that determine if a person will get infected or not and, if they do, how severe their infection will become. However, antibodies can provide a reasonable gauge of how well someone is protected. A study late last year that tracked 12,500 health care workers found that the [higher the antibody levels, the lower the risk of infection](#). And in May of this year, researchers found ["a remarkably strong" relationship](#) between neutralizing antibody levels and vaccine protection. A fundamental difference between the immune responses generated by vaccines and natural infection is their specificity. In a natural infection, whole SARS-CoV-2 viruses infect cells in the respiratory tract. Responding immune cells can target any number of facets of those whole viruses. This creates a relatively large diversity of antibodies that bind to different bits of SARS-CoV-2. The vaccines, meanwhile, only offer to the immune system key snippets of SARS-CoV-2—namely the virus's spike protein. This is the protein that SARS-CoV-2 uses to enter human cells, and it's a key target of neutralizing antibodies. All antibodies in vaccinated people will target the spike protein. Though vaccinated people have less antibody diversity than previously infected people, they have high levels of highly targeted antibodies. Think of it as the difference between hunting a tiny virus with a shotgun and a sniper rifle. With variable immune responses after infection comes variable real-world data on how well past infection protects against reinfection, which has led to the different public policy approaches. In [a study conducted at Cleveland Clinic and posted online in June](#), researchers found that among 52,238 employees, there were no differences in COVID-19 case rates between employees who were unvaccinated but previously infected, vaccinated and previously infected, and vaccinated people with no previous infection. "Individuals who have had SARS-CoV-2 infection are unlikely to benefit from COVID-19 vaccination," the authors concluded.

Yet, in another study published in August by the Centers for Disease Control and Prevention, researchers looked at the vaccination status of more than 200 Kentucky residents who had tested positive for SARS-CoV-2 in 2020 and then tested positive again during May and June 2021. The CDC researchers found that people [previously infected but unvaccinated were 2.34 times more likely to get reinfected](#) than people who were previously infected and fully vaccinated.

Delta difference

The timeframe for the CDC study coincides with the rise of the delta coronavirus variant in the US, which may also play a role in protection levels from past infection. In [a French study published in July in Nature](#),



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researchers examined antibodies in 56 unvaccinated people who had recovered from a SARS-CoV-2 infection prior to the rise of delta. Six months after their infection and amid the rise of delta, the researchers found that their neutralizing antibody levels were 4 to 6 times lower against delta than they were against earlier variants.

The researchers next looked at a different group of 47 people who had gone a year since a SARS-CoV-2 infection. Of those 47, 26 were still unvaccinated and 21 had received one dose of a vaccine. At that point, the unvaccinated 26 had extremely low levels of neutralizing antibodies against any SARS-CoV-2 variants, particularly delta. Many people had no detectable levels of neutralizing antibody against delta. The vaccinated group, meanwhile, had high levels of neutralizing antibody similar to or above the levels seen in people who were fully vaccinated.

That finding has played out in several studies. A March study from researchers in Washington state, for instance, found that one dose of an mRNA vaccine in people who had recovered [boosted levels of neutralizing antibody against all SARS-CoV-2 variants up to a thousandfold](#). And several [other studies](#) have found that vaccine doses after infection cause sky-high spikes in antibody levels. [Some data](#) has also suggested that antibody levels in the vaccinated recovered are even higher than people who have only been vaccinated.

Overall, the variable immune responses to infection, lower neutralization against delta, and the clear boost in protection from a very safe, highly effective vaccine make a strong argument for vaccinating the recovered.

Beth Mole is Ars Technica's health reporter. She's interested in biomedical research, infectious disease, health policy and law, and has a Ph.D. in microbiology.

The 2,000-year-old airborne disease theory that blinded Covid experts

By Paul Nuki (Global Health Security Editor, London) ; Jennifer Rigby (Global Health Security Correspondent) and Anne Gulland (Global Health Security Deputy Editor)

Source: <https://www.telegraph.co.uk/global-health/science-and-disease/every-medical-authority-failed-realise-covid-airborne-late/>

Oct 02 – There is no word more likely to rile an infectious diseases doctor than the word “miasma”. It's the root of all quackery, the mother of misconception - and for over 2,000 years it misdirected medicine and medics.

The word comes from the ancient Greek for pollution and describes a “bad air” that spreads illness. In cartoons, a miasma is inevitably drawn as a noxious green cloud that can drift on the breeze for miles.

The idea was first proposed by Hippocrates. “Whenever many men are attacked by one disease at the same time, the cause should be assigned to that which is most common, and which we all use most. This it is which we breathe in,” he wrote.

The observation is both brilliant and wrong. It captures the idea that something we share is causing disease but puts it down to something fantastical and external to us - bad air - rather than human-to-human contagion.

Hippocrates is not known as the father of medicine for nothing and his “miasmatisers” dominated medical thinking right up until the 20th century, beating up on anyone who disagreed with them.

Poor old John Snow, the English physician who discovered that cholera spread through dirty water, was just one of many who died before their alternative explanations were accepted. No wonder then that modern doctors recoil from miasma theory or anything that resembles it.

But if this sounds like progress, you may be in for a surprise. A new paper published by leading academics argues that the western medical profession's centuries-long battle against miasma theory initially blinded it to the fact that Sars-CoV-2 was airborne.

Unnecessary delays

As a result, a whole string of precautions, including the [wearing of masks](#) and the [better ventilation](#) of hospitals, schools, airports and other public spaces, were tragically and unnecessarily delayed, it says.

Entitled Echoes Through Time: The Historical Origins of the Droplet Dogma and its Role in the Misidentification of Airborne Respiratory Infection Transmission, the paper is co-authored by more than 20 leading academics from around the world and is likely to cause a major stir as it moves through the peer-review process.

“Resistance to the idea of airborne spread of a respiratory infection is not new,” says the paper. “It has occurred repeatedly over much of the last century and greatly hampered understanding of how diseases transmit.

“The slow and haphazard acceptance of the evidence of airborne transmission of Sars-CoV-2 by major public health organizations contributed to a suboptimal control of the pandemic.”



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Only now - 160 years after John Snow - has there finally begun a new “paradigm shift in the understanding of disease transmission”, say the authors.

“Not only are respiratory diseases not transmitted exclusively by droplets, but also it is likely that many or most respiratory diseases have an important airborne component.

“This does not mark a return to past miasmatic ideas, but a more informed understanding of airborne transmission.”

Five disease transmission pioneers

Hippocrates: The father of modern medicine, who linked 'bad air' or miasma to pestilence back in the 5th century BC

Marcus Terentius Varro: (116-27 BC) whose theories on 'minute creatures' living in swamps causing disease led the Roman Empire to drain swamps and inadvertently reduce the incidence of malaria

John Snow: A wealthy doctor who theorised that London's 1854 cholera epidemic was spread by water, not gases. He died before his theories were accepted

Ignaz Semmelweis: Proved in Vienna in 1847 that handwashing hugely cut deaths of 'childbed fever' in a maternity clinic - but his struggle to convince colleagues was so uphill that the term 'Semmelweis reflex' is now used to describe the instinctive reaction against new evidence if it contradicts established norms

Carl Flügge: In the 1890s in Germany, droplet theory was effectively born, as a means of transmission for tuberculosis - but the results actually referred to all fresh particles, including aerosols

Experimental error...

Professor Jose-Luis Jimenez, lead author of the paper and a chemistry professor at the University of Colorado, says the medical profession's history left it blinkered to a startling degree.

He says it helps explain an experimental error made over a century ago which has been taught in medical schools ever since.

In 1910, an American doctor, Charles Chapin, made a name for himself by proving pathogens could spread via exhaled droplets but he over interpreted his results.

His finding that pathogens could be “sprayborne” was accepted - wrongly - as proof that more general aerosol transmission did not exist.

Droplet borne infection freed us “from the specter of infected air - a specter which has pursued the race from the time of Hippocrates”, declared Dr Chapin at the time.

Policymakers and politicians also have a natural bias against the idea that diseases may be airborne, says Professor Jimenez.

“Droplets and surfaces are very convenient for people in power - all of the responsibility is on the individual,” he said. “On the other hand, if you admit it is airborne, institutions, governments and companies have to do something.”

Infectious diseases and how they spread

Influenza, smallpox, measles, and tuberculosis all have significant aerosol transmission, as well as droplets transmitted when people cough or sneeze

Surface or fomite transmission can also play a role - when viruses or bacteria, for example from a sneeze, remain on surfaces

Some diseases, like HIV, are sexually transmitted or can be spread by blood or breast milk

Contact with blood but many other bodily fluids is also how Ebola spreads

Mosquitoes spread diseases like malaria and dengue, and other parasites or 'vectors' spread disease too

Cholera and typhoid are water-borne infections, while hookworm spreads by direct contact with contaminated soil

...experimental evidence

Is it now proven that Sars-Cov-2 really spreads through the air in aerosols? Certainly the world's leading institutions have changed their minds.

[The World Health Organization \(WHO\)](https://www.who.int) and the US Centers for Disease Control, both of which initially declared the virus to be transmitted only via large droplets, now accept that aerosol spread is important.

There is also good experimental evidence. Just as guinea pigs were used in the 1960s to prove TB was airborne, experiments on both hamsters and ferrets have shown that Sars-Cov-2 can be transmitted via aerosols.

Another reason public health organisations recoil at the idea of airborne transmission is that it is frightening and can induce fatalism and panic in people.



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Professor Jimenez and his co-authors acknowledge this but say that airborne transmission “doesn’t have to be scary”. “We can do lots of things to diminish the fear, and many of them are free - the most effective is meeting outdoors, opening the windows, even talking less loudly,” he says.

Major costs of realisation

But the realisation that Sars-Cov-2 and almost certainly most influenza viruses are to some extent properly airborne will bring with it major costs.

Dr Julian Tang, associate professor of respiratory sciences at the University of Leicester Hospitals, and one of the paper’s authors, said [major investment](#) would be needed to update the ventilation systems in Britain’s hospitals.

“I’ve worked in hospitals in Singapore, Hong Kong and Canada. And NHS hospitals are falling apart,” he says.

He describes a hospital in Singapore whose infectious disease wards were updated after the 2003 SARS outbreak.

“This hospital is really something to behold,” he says. “Isolation rooms have glass walls and sliding doors so nurses can see inside - without needing to physically go inside. They have reversible airflow ventilation systems that can provide negative or positive pressure.”

The portable air purifiers now being used in some NHS hospitals to try and stop the spread of Covid through their wards was “Heath Robinson” by comparison, he said.

COVID-19 Could Nudge Minds and Societies Towards Authoritarianism

By Leor Zmigrod

Source: <https://www.homelandsecuritynewswire.com/dr20211008-covid19-could-nudge-minds-and-societies-towards-authoritarianism>

Oct 08 – It is a little-known fact that humans have not one but two immune systems. The first, the biophysical immune system – the one we’ve all heard much about – responds to infections as they enter the body, detecting and eliminating intruders such as the coronavirus.

The second is the [behavioral immune system](#), which adapts our behavior to preemptively avoid potentially infectious people, places and things. The behavioral immune system is the first line of defense against infectious disease. It prompts people to socially conform with known traditions and to avoid foreign, dissimilar and potentially infectious groups.

In a [recently published study](#), my colleagues and I at the University of Cambridge examined the impact of the behavioral immune system on our attitudes towards obedience and authority. We found that high rates of infectious diseases – and the disease-avoidance they promote – may fundamentally shape political opinions and social institutions.



Infection Drives Authoritarianism

We collected data from over 250,000 people across 47 countries and looked at the relationship between the (pre-COVID) infection risk where they lived and their authoritarian attitudes – the degree to which they endorsed conformity and obedience to authority.

We were curious as to whether high risk of infection would activate the behavioral immune system in ways that promoted authoritarian beliefs. We made sure to measure authoritarianism in a politically neutral way, to avoid our results reflecting people’s religious beliefs or commitments to certain political parties.

We found a clear relationship between people’s authoritarian attitudes and their region’s levels of infectious diseases: areas with a higher prevalence of infectious diseases had more authoritarian citizens. Additionally, areas with high infection rates tended to vote conservatively and were governed by more authoritarian laws – laws that are imposed on some members of society but not all.

Examples of authoritarian laws include legal restrictions surrounding LGBT civil liberties or extreme criminal punishment. Infection rates were specifically related to these “vertical” hierarchical laws, and not to “horizontal” laws that affect all citizens equally – suggesting rates of infectious disease uniquely affect people’s preferences for hierarchical power structures.

Strikingly, the pattern of results was consistent when comparing the 47 countries as well as US states and US metropolitan regions and cities. These effects persisted even after accounting for regional demographic variables such as educational attainment, wealth and inequalities, suggesting direct and significant relationships between infectious diseases and authoritarian beliefs and behaviors. We further discovered that the relationship between infection rates and authoritarianism was specific to infections that can be acquired from other humans, such as measles or cholera. The effect was absent for infectious diseases that can only be acquired from nonhuman species, such as rabies or Lyme disease.

These results support the idea that there is a social and behavioral mechanism connecting infection risk and authoritarianism. A high prevalence of human-to-human infections appears to lead to conformist



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and obedient social arrangements that potentially reduce the risk of people being infected by those who do not conform or resemble the majority. Social diseases like COVID-19 may therefore sculpt social ideologies and institutions.

How to Overcome COVID's Influence

In the COVID-19 era, we have all been living with overactivated behavioral immune systems. We have changed how we socialize and relate to other people; who we allow to enter our countries; and how we calculate the balance between personal freedom and collective safety.

What does this mean for our political futures? Will the fear of COVID-19 push us towards living in more authoritarian societies? How do we restore a psychological balance – and a preference for political anti-authoritarianism – without endangering ourselves and others?

The first inevitable step is to decrease real infection risks. Without a reduction in real health risks through effective vaccination programs and health policies, our all-too-human bodies will naturally tend towards defensiveness, conformity and an aversion to threat.

Indeed, COVID-19 has brought about a global wave of authoritarian policies that have justified the tightening of national borders and limitations of everyday rights. In our study, we found that even historical infection rates from decades earlier predict what citizens believe, who they vote for and how they are governed today. Pandemics may have long-lasting and profound ramifications for politics. However, while our instincts to avoid infection are inbuilt – the behavioral immune system has been [documented in species](#) as varied as mice, frogs and chimpanzees – humans are endowed with magnificent mental capacities to overcome biases and [flexibly adapt to change](#). If it is our highly evolved imagination that facilitates the behavioral immune system, then it is also our rich and passionate imagination that can pull us out of its toxic side-effects.

Safe contact with those who we are instructed to avoid – even imaginary, intellectual or virtual contact, through film or literature or news or friends – is a powerful antidote to the xenophobia that can emerge when we fear infection. These forms of [nonphysical touch](#) can remind us of all we have in common and all we can lose if we shun contact and care.

Perhaps the way forward lies in adopting anti-authoritarian stances that champion openness, inclusion and scientific reasoning rather than mythical, ideological or conspiratorial thinking. Overcoming the COVID-19 pandemic and the contagious divisions within our politics may thus be intertwined tasks. The health of society – the collective “body politic” – requires the health and resilience of our bodies and minds. [Immunity is fundamentally political](#).

Leor Zmigrod is Research Fellow in the Psychology of Ideologies, University of Cambridge.

New, \$125 Million Project Aims to Detect Emerging Viruses

Source: <https://www.homelandsecuritynewswire.com/dr20211008-new-125-million-project-aims-to-detect-emerging-viruses>

Oct 08 – [Washington State University](#) (WSU) says that to better identify and prevent future pandemics, WSU has entered into a cooperative agreement with the [U.S. Agency for International Development](#) (USAID) to head up a new five-year, approximately \$125 million global project.

The USAID Discovery & Exploration of Emerging Pathogens – Viral Zoonoses, or **DEEP VZN project**, will build scientific capacity in partner countries to safely detect and characterize unknown viruses which have the potential to spill over from wildlife and domestic animals to human populations.

“To make sure the world is better prepared for these infectious disease events, which are likely to happen more frequently as wild areas become increasingly fragmented, we need to be ready,” said Felix Lankester, lead principal investigator for USAID DEEP VZN and associate professor with [WSU College of Veterinary Medicine's Paul G. Allen School for Global Health](#). “We will work to not only detect viruses but also build capacity in other countries, so the United States can collaborate with them in carrying out this important work.”

The project plans to partner with up to 12 targeted countries in Africa, Asia and Latin America to carry out large-scale animal surveillance programs within their own countries, safely, using their own laboratory facilities.

DEEP VZN builds on previous work by significantly scaling up USAID's efforts to understand where and how viruses spill over from animals to humans. With more than 70 percent of viral outbreaks in people originating from animals, understanding future threats helps protect the U.S. as well as the global community.

The project will focus on finding previously unknown pathogens from three viral families that have a large potential for viral spillover from animals to humans: coronaviruses, the family that includes SARS-CoV-



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2 the virus that causes COVID-19; filoviruses, such as the Ebola virus; and paramyxoviruses which includes the viruses that cause measles and Nipah.

The goals are ambitious: to collect over 800,000 samples in the five years of the project, most of which will come from wildlife; then to detect whether viruses from the target families are present in the samples. When those are found, the researchers will determine the zoonotic potential of the viruses, or the ability to transfer from animals to humans.

This process is expected to yield 8,000 to 12,000 novel viruses, which researchers will then screen and sequence the genomes of the ones that pose the most risk to animal and human health.



To meet these goals, WSU will draw on the strengths of a consortium of partners including the virology expertise of University of Washington and Washington University School of Medicine in St. Louis as well as data management and in-country expertise of public health nonprofits PATH and FHI 360. WSU along with their partners have established presence in countries in the target regions of Africa, Asia, and Latin America.

WSU will also draw on its own strengths in veterinary medicine and on-the-ground expertise from the Allen School for Global Health, which has done extensive work on infectious disease transmission globally.

“Our approach is to collaborate with in-country partners, working side-by-side with their scientists and institutions.” said Tom Kawula, director of WSU’s Allen School for Global Health. “Our consortium partners help extend our reach and have the same philosophy of working with the people as well as existing structures and expertise in each country.” One of the consortium’s first tasks is to select the exact countries for DEEP-VZN based on their high risk for emerging infectious disease, capacity to safely conduct viral discovery work and commitment to share data with global partners.

Addressing Biocrises After COVID-19: Is Deterrence an Option?

By Al Mauroni

Source: <https://warontherocks.com/2021/10/addressing-biocrises-after-covid-19-is-deterrence-an-option/>

Oct 08 – [Hollywood movies](#) and [fiction novels](#) have long used disease outbreaks as a nation-ending threat to drive their plots. However, there is nothing like an actual pandemic to stir the concerns of the American public and politicians about the potential dangers of biological weapons and biological terrorism. A number of public health and national security professionals have pointed to the [challenged U.S. response to COVID-19](#) as evidence that adversaries may be planning a deliberate biological attack against the nation. Given a poorly responding national public health system and recent advances in biotechnology, [a nation-state](#) or [terrorist group](#) could easily cause tens of thousands of deaths, if not millions. This hypothesis leads to urgings that the national security



community needs to take steps to deter this threat if the public health community cannot protect Americans from contagious diseases.

Editor’s comment: Perhaps the wrong photo to accompany a B-related article?

Gen. Mark Milley stated that [“We’re at war with COVID-19, we’re at war with terrorists, we’re at war with drug cartels as well.”](#) This particular viewpoint is not uncommon when the national security community looks at public health challenges — in particular, pandemic disease outbreaks that have [a significant impact on U.S. national security interests](#). This idea that “we’re at war with COVID-19” and that we need a “battle plan” to mitigate the coronavirus effects

evokes military concepts that people naturally gravitate to. The nation’s shortfalls in addressing this public health threat has led to a concern that hostile nation-states may make the United States its next target in an attack [that “could kill millions”](#) and that the Department of Defense has a role to play in [“rendering mass-effect biological attacks” to become “so ineffective as to be futile.”](#) But is this a valid concern? And what role should the Department of Defense play to deter attackers from using biological weapons against the nation?



What is Deterrence?

Determining if biological attacks can be deterred requires a quick review of two topics: First, what are the basic tenets of deterrence, and second, how does this theory apply to biological threats? While the national security community has talked about deterrence theory for decades, understanding deterrence still eludes many people who apply its concepts to contemporary security issues. [Michael Mazaar defines deterrence](#) as “the practice of discouraging or restraining someone ... from taking unwanted actions, such as an armed attack.” The intent is to stop or prevent an action from occurring. This is in contrast to compellence, which is an effort to force an actor to do something. While military force is often at the center of deterrence operations, this is a political concept that can involve diplomatic or economic threats and assurances as well.

Deterrence theory in the 1960s talked about “deterrence by punishment” and “deterrence by denial” as concepts on how nations might use nuclear weapons to protect against a strategic attack on the homeland. [This is simple enough to envision](#) — deterrence by punishment means that the defender will retaliate with force to cause significant damage to the attacker so that the costs exceed the value of its goals, while deterrence by denial posits that an attacker will fail in reaching its goals because of measures undertaken by the defender. To be successful in either case, the defender must demonstrate that the capability to deny benefits to the attacker exists, that the defender’s actions are credible given a particular context, and that the attacker perceives the probability of failure so as to be persuaded toward the defender’s preferred outcome. This last part is particularly important — the adversary, not the one threatening to use force, gets to decide whether deterrence is successful based on its views of cost and benefits. As [Robert Jervis pointed out in 1982](#), deterrence can fail if there are misperceptions of the actors’ values, their credibility, or rationality.

There are ample academic writing and defense analyses on nuclear deterrence in particular, but this theory also applies to [conventional weapons](#), [space](#) and [cyber](#) weapons, and [chemical and biological weapons](#). Different contexts require different approaches — what works for nuclear weapons may not work for space and cyber weapons, but the general theory of how two actors perceive deterrence challenges is sound. Adding to this, there is a great deal of debate as to [whether deterrence “works” during crises](#) between two [\(or three\)](#) adversaries. Without going over this well-trodden trail, let’s look specifically at how deterrence theory works in confronting biological threats.

Does Deterrence Work Against Biological Threats?

The efficacy of deterrence against biological threats depends, of course, on what the biological threat is. [“Biological threat”](#) has been a catch-all phrase to include natural disease outbreaks, deliberate biological incidents, and accidental releases. The [Biden](#), [Trump](#), and [Obama](#) administrations have all used the term “biological threats” in their respective national biodefense strategies. While one can envision a common medical response to all biological threats, this should not be construed as one strategy to prevent or protect against all biological threats against the nation. Within the context of a national biodefense strategy, biological threats can take the form of anti-human, anti-crop, or anti-animal. The [Federal Select Agent Program](#) identifies 67 biological threats that pose a severe threat to humans, animals, and plants. The Centers for Disease Control and Prevention have a [prioritized list of about 20 biological threats](#) for use in preparing for biological terrorism.

Assuming the political objective is to deter an actor from using biological threats against the nation to cause mass effect, we can rule out natural diseases and accidental releases in biological laboratories. Because a deterrence posture needs to be understood by a reasoning actor, one cannot deter natural disease outbreaks or accidents at biological research laboratories as they have no human actor with malign intent to cause harm. On one hand, there is no way to use force to deter or compel good behavior. You can’t win a war against a pandemic outbreak, but you can manage it. On the other hand, deterrence could reduce the possibility of deliberate biological incidents, since nation-states and terrorist groups both have leaders who might be persuaded by robust deterrent strategies.

Throughout history, U.S. policy has been to rely on deterrence by punishment to discourage nation-states from using chemical or biological weapons in strategic attacks against the nation and its military. In the opening phase of World War II, President Franklin Roosevelt and Prime Minister Winston Churchill [announced the policy](#) of using biological weapons in retaliation against any Axis use. During the Cold War, every presidential administration [developed policies](#) on using chemical and biological weapons in retaliation to adversary use. Every president [up through Nixon](#) retained this retaliatory policy. Following the U.S. government’s unilateral abandonment of an offensive biological weapons program, the U.S. policy shifted to the [threat of nuclear weapons as an option](#) for retaliating against biological weapons. [That was the policy in 1991](#) when U.S. forces were preparing to invade Iraq. [This policy remains in place today.](#)

Relying on deterrence by denial as a strategy to prevent biological weapons attacks has some significant problems because of [technological challenges involved with biodefense](#). To be successful with a deterrence by denial approach, one would have to openly demonstrate that a nation or its military force is so resilient and has such a strong defensive posture that an adversary would not succeed through the



use of biological weapons. The U.S. government has two FDA-approved vaccines against the top 10 list of biological warfare agents. Current biodetection capabilities remain limited to “detect to treat,” which means that a significant population cannot avoid exposure. “Early warning” actually means 24–48 hours after a biological release. There are so many biological weapons and so many scenarios for attacking critical infrastructure across the nation that this approach would be impossible to execute to the degree of convincing an adversary that any deliberate biological attack would fail.

Deterring terrorists from using harmful biological organisms against the unprotected public is a little more difficult to parse, but [terrorist organizations can be deterred](#) by threats of retaliation. It is often due to the [lack of confidence that terrorists are rational actors](#), and the desire that some level of defense is necessary, that the U.S. government feels compelled to emplace [additional measures to provide early warning and response](#) to a potential bioterrorist incident. These measures [by no means cover](#) the entire United States against all biological threats, but the U.S. government has not chosen to fund a more robust effort. However, academics suggest that a [deterrence by denial strategy may be effective](#) against terrorists if used to deny them the resources they need, such as weapons material, money, and support by state sponsors. As a result, U.S. strategies to counter weapons of mass destruction terrorism have often included both deterrence by punishment and deterrence by denial.

The Right Funds to the Right Organization

Over the past ten years, this idea of [“health security”](#) has emerged to suggest that a nation has a responsibility to take appropriate measures to prepare for and respond to external and catastrophic health threats to the public. Given [criticisms of the U.S. government's response to COVID-19](#), one might anticipate calls for a more muscular, preventive approach to pandemic outbreaks from the national security community. The Trump administration put the [Department of Health and Human Services as the lead for national biodefense](#). The Department of Homeland Security has a [significant national biodefense role](#) as well. However, there should be no question that the Department of Health and Human Services is the [designated lead](#) and [is funded for](#) biological incident response and emergency preparedness.

The public health community likes to use the [threat of bioterrorism as a rationale for asking for more funding](#). To that point, [U.S. health care spending has risen to \\$3.8 trillion in 2019](#), while [defense expenditures were about \\$1.2 trillion](#). Within those budgets, annual public health spending for infectious diseases is about \$20 billion, as compared to about \$2 billion in the U.S. defense program's biodefense efforts. Obviously, this spending is not just about biological threats, and the public health community's concerns are [not solely focused on deliberate threats](#). This comparison should, however, demonstrate as to who in the federal government is leading the medical response to biological threats. The public health community [has definite ideas](#) as to where funding for bioterrorism should go, and it's not to overseas laboratories working under the [Biological Threat Reduction Program](#), a Department of Defense initiative that seeks to improve the security of medical biological research facilities in other countries.

The [Department of Defense Chemical and Biological Defense Program](#) focuses on biological defense for U.S. forces with the understanding that deterrence may fail. The [U.S. Army has](#) a medical biological defense program for biological warfare agents and a medical infectious disease research program for natural infectious diseases. The two programs are separated due to budgetary reasons, but they [collaborate on research](#) with the Department of Health and Human Services. The Department of Defense CBRN (Chemical, Biological, Radiological, Nuclear) Response Enterprise [supports the federal response to weapons of mass destruction incidents](#), but its ability to provide assistance at biological incidents is largely limited to assessment and advice. [Operation Warp Speed](#) wasn't a deterrence by denial program — nor was [“Able Response”](#) in its efforts to improve the Republic of Korea's health surveillance program (both Department of Defense-led efforts). On the other hand, the National Institute of Allergy and Infectious Disease does have a [significant national medical biodefense research program](#). None of these are deterrence by denial capabilities, but rather, mitigation measures to reduce mass casualties.

For deterrence to work, there must be communication between the defender and attacker as to expectations and consequences, and it requires the accurate perception of both to maintain stability and a balance of power. A deterrence by denial strategy for countering biological threats will not work given the disparity between the significant number of biological warfare agents and hundreds of unprotected U.S. cities and available defensive countermeasures. U.S. political leaders have never formulated a deterrence by denial concept for biological attacks. Department of Defense leadership hasn't advocated for this area as other government agencies already have the role for responding to deliberate biological incidents. As such, these reasons require that the United States retain deterrence by punishment as its primary approach to discouraging deliberate biological attacks.

Al Mauroni is the director of the U.S. Air Force Center for Strategic Deterrence Studies and author of the forthcoming book, [BIOCRISIS: Defining Biological Threats for U.S. Policy](#). The opinions, conclusions, and recommendations expressed or implied within are those of the author and do not necessarily reflect the views of the Air University, U.S. Air Force, or Department of Defense.



Japanese scientists edge closer to developing a single vaccine against all coronaviruses

Source: <https://www.thenationalnews.com/coronavirus/2021/10/10/japanese-scientists-edge-closer-to-developing-single-vaccine-against-all-coronaviruses/>

Oct 10 – Scientists in Japan have developed a vaccination approach that could lead to protection against a wide range of coronaviruses – not just the one that causes Covid-19.

Developing a more widely applicable vaccine has been a major goal of researchers, as some existing vaccines have proved to be less effective against emerging variants of Sars-CoV-2.

The strategy of the researchers in Japan could potentially be used to provide protection even against new pandemics caused by different coronaviruses. Their strategy, described in a [newly published paper](#) in the *Journal of Experimental Medicine*, involved genetically engineering proteins from Sars-CoV-2.

Part of the immune response to one coronavirus will almost certainly give you cross-immunity to other coronaviruses. There are shared parts of coronaviruses.

Central to the research was the spike protein of the virus, which includes the receptor-binding domain that latches on to a receptor on human cells called ACE2. After the spike protein attaches to ACE2, the virus enters cells and multiplies.

A part of the receptor-binding domain, known as the head region, is highly specialised, but another section, the core region, is by contrast similar in multiple coronaviruses.

Immunity induced by vaccination typically involves the production of antibodies against the specialised head region, making the protection very specific to a particular coronavirus.

To get around this, researchers at Osaka University in Japan genetically engineered the receptor-binding domain of the spike protein to have sugar molecules attached to the head region.

Mice exposed to these engineered proteins produced a greater proportion of antibodies against the core region instead of, as would normally be the case, the head region.

The antibodies they made were a type of what scientists call broadly neutralising antibodies, and in tests, these were found to neutralise not just Sars-CoV-2, but also Sars-CoV-1, which caused the Sars outbreak of 2002.

They were effective too against three similar coronaviruses in pangolins and bats, an important finding as coronaviruses currently found in some animals could, in the future, go on to infect people.

“Given that prior coronavirus epidemics such as Sars-CoV-1 and Mers-CoV [Middle East Respiratory Syndrome] have occurred due to zoonotic coronaviruses crossing the species barrier, the potential for the emergence of similar viruses in the future poses a significant threat to global public health, even in the face of effective vaccines for current viruses,” one researcher involved in the study, Prof Tomohiro Kurotaki, from the WPI Immunology Frontier Research Centre at Osaka University in Japan, said.

The way that some current Covid-19 vaccines are less effective against emerging variants of Sars-CoV-2, particularly the Delta variant, demonstrates that the immunity they confer is highly specific.

Updated vaccines that cope with a wider variety of variants are being developed, but producing them takes time and then people have to be re-vaccinated, so a universal coronavirus vaccine would be preferable.

While the researchers in Japan focused on antigens (foreign substances that stimulate an immune response) that are common to different coronaviruses, researchers in the US, also working on mice, took a different approach.

In a study published in February, they described how mice could be given immunity against a range of coronaviruses with a “mosaic vaccine” made of multiple antigens.

Because of challenges such as ensuring that immunity is durable and broad enough to cope with emerging diseases, scientists have predicted that it may take several years to develop a universal coronavirus vaccine.

Dr Andrew Freedman, an infectious diseases specialist at Cardiff University in the UK, said while he has not analysed the latest study in mice, it was “probably realistic” to hope that a universal coronavirus vaccine could be developed.

“There’s almost certainly cross-immunity,” he said.

“We know you can get repeated coronavirus infections, so immunity is not perfect, but part of the immune response to one coronavirus will almost certainly give you cross-immunity to other coronaviruses. There are shared parts of coronaviruses.”

He cautioned, however, that with the latest study having been carried out on mice, “there would be a long way to go” before such broad-based protection in humans could be created.



Aspirin lowers risk of COVID: New findings support preliminary Israeli trial

Source: <https://m.jpost.com/health-and-wellness/aspirin-lowers-risk-of-covid-new-findings-support-preliminary-israeli-trial-681127/amp>



Oct 06 – Over-the-counter aspirin could protect the lungs of COVID-19 patients and minimize the need for mechanical [ventilation](#), according to new research at George Washington University.

The team investigated more than 400 COVID patients from hospitals across the United States who take aspirin unrelated to their COVID disease and found that the treatment reduced the risk of several parameters by almost half: **reaching mechanical ventilation by 44%, ICU admissions by 43%, and overall in-hospital mortality by 47%.**

“As we learned about the connection between blood clots and COVID-19, we knew that aspirin – used to prevent stroke and heart attack – could be important for COVID-19 patients,” said Dr.

Jonathan Chow of the study team. “Our research found an association between low-dose aspirin and decreased severity of COVID-19 and death.”

Low-dose aspirin is a common treatment for anyone suffering from blood clotting issues or in danger of stroke, including most people who had a heart attack or a myocardial infarction. Although affecting the respiratory system, the coronavirus has been associated with small blood vessel clotting, causing tiny blockages in the pulmonary blood system, leading to ARDS - acute respiratory distress syndrome.

[Israeli researchers](#) reached similar results in a preliminary trial at the Barzilai Medical Center in March. In addition to its effect on blood clots, they found that aspirin carried immunological benefits and that the group taking it was 29% less likely to become infected with the virus in the first place.

“Aspirin is low cost, easily accessible and millions are already using it to treat their health conditions,” said Chow. “Finding this association is a huge win for those looking to reduce risk from some of the most devastating effects of COVID-19.”

Missing link between severe COVID-19 and Alzheimer’s disease discovered

Source: <https://newatlas.com/health-wellbeing/gene-variant-severe-covid19-alzheimers-disease-dementia/>

Oct 10 – **Early in the pandemic researchers saw disproportionately high rates of dementia patients suffering from severe COVID-19.** A common hypothesis was that memory impairments associated with neurodegeneration affect a person’s ability to consistently follow infection control measures such as social distancing and mask wearing. But a new study led by scientists from



University College London is proposing a key gene variant, known to heighten one’s risk for Alzheimer’s, stimulates the body’s inflammatory responses and can lead to greater susceptibility to severe COVID-19.

In 2019 a team of researchers [discovered a handful of genes](#) that could be associated with heightened risk of Alzheimer’s disease. [A separate study](#) last year found variants in one of these **Alzheimer’s risk genes, OAS1, correlated with severe COVID-19 outcomes.**

This new study, published in the journal *Brain*, proposes OAS1 regulates the inflammatory responses of certain cells. And some OAS1 variants dampen that regulatory response leading to pro-inflammatory activity, which can explain how it both heightens Alzheimer’s risk and severe COVID-19.

“While Alzheimer’s is primarily characterized by harmful build-up of amyloid protein and tangles in the brain, there is also extensive inflammation in the brain that highlights the importance of the immune system in Alzheimer’s,” says lead author Dervis Salih. “We have found that some of the same immune system changes can occur in both Alzheimer’s disease and Covid-19. In patients with severe Covid-19 infection there can also be inflammatory changes in the brain.” Homing in on one particular OAS1 variant, dubbed rs1131454, the research first confirmed the variant can increase a person’s baseline risk of developing Alzheimer’s disease by up to 22 percent. This variant is thought to be extremely common, carried by over 50 percent of Europeans.

Studying the molecular mechanisms of this OAS1 variant the researchers discovered it can lead to overactive inflammatory responses, and it is this action that plays a role in the progression of severe COVID-19. David Strain, a researcher from the University of Exeter, calls the new study “robust”



and suggests the findings fit with what we know of the "[cytokine storms](#)" that are part of the severe stages of COVID-19.

"We do know that one of the key pathways in development of Alzheimer's disease is inflammation within the brain tissue, and, as our understanding of the pandemic has grown, we have seen many other inflammatory conditions be highlighted as risk factors for poor outcomes, therefore the results are not overly surprising," says Strain, who did not work on the this new research.

Of course, these new findings do raise a whole heap of new questions. Salih indicates the UCL research team are now looking at what role this gene variant could be playing in long COVID, or how it could be influencing some of the more acute neurological symptoms that can be associated with the disease.

"We are also continuing to research what happens once this immune network has been activated in response to an infection like Covid-19," says Salih, "to see whether it leads to any lasting effects or vulnerabilities, or if understanding the brain's immune response to Covid-19, involving the *OAS1* gene, may help to explain some of the neurological effects of Covid-19."

Perhaps a more immediate outcome from these new findings could be a way to easily detect those patients most at risk of severe COVID-19. Salih even speculates a simple blood test identifying this particular genetic variant could serve as a way to identify early Alzheimer's patients.

"If we could develop a simple way of testing for these genetic variants when someone tests positive for Covid-19, then it might be possible to identify who is at greater risk of needing critical care, but there is plenty more work to be done to get us there," says Salih. "Similarly, we hope that our research could feed into the development of a blood test to identify whether someone is at risk of developing Alzheimer's before they show memory problems."

►► **The new study was published in the journal [Brain](#).**

A primer on what we know about mixing and matching Covid vaccines

By Helen Branswell

Source: <https://www.statnews.com/2021/10/12/a-primer-on-what-we-know-about-mixing-and-matching-covid-vaccines/>

Oct 12 – Later this week an expert committee that advises the Centers for Disease Control and Prevention will hear about the results of a clinical trial that could influence how Covid vaccines are used in this country at some point in the future. The trial, conducted by the National Institute of Allergy and Infectious Diseases, is a so-called mix-and-match trial, testing the Covid vaccines authorized in the U.S. in combinations with each other.

The goal of the trial was to see whether using a different vaccine as a booster shot improves protection. So does getting a dose of Pfizer vaccine after getting a single dose of Johnson & Johnson's vaccine trigger production of more antibodies than a second dose of the J&J would? Are the messenger RNA vaccines made by Pfizer and Moderna virtually interchangeable, or does switching even there produce a broader set of immune responses?

This isn't theoretical. The booster shot most vaccinated Americans are in the process of getting or booking may not be the last needed. Figuring out how to optimize use of the current generation of Covid vaccines is critical, a number of experts have told STAT. Michael Osterholm, director of the University of Minnesota's Center for Infectious Diseases Research and Policy, said we need to realize that many questions remain to be answered about use of these vaccines. We don't know the optimal dose. We don't know the most effective interval between doses. We don't know how many doses we're going to need and we don't know whether we would get more durable protection if we mix up the vaccines each person receives, he said.

In terms of how we use Covid vaccines, we're in the very early days, Osterholm said, adding that now that we have effective vaccines, we need to start figuring out how best to use them. "We have to start adopting a public health mindset for decision making," he said. What follows is a primer on what we know about mixing Covid vaccines.

Let's start with the terminology

If you get a booster jab that is of the same brand as your previous jab or jabs, you are getting a *homologous* booster. In the United States, most people who have been vaccinated have had homologous vaccine series and homologous boosters.

There may be some exceptions. Earlier in the vaccine rollout, when supplies were scarce, the CDC advised that people could be given a second shot of whatever vaccine was on hand if they were due for their second shot of vaccine and no supplies of the brand they were due to get were available.

If your original series of vaccines or the booster were from different manufacturers, you have what's called a *heterologous* vaccine series or a heterologous boost.

A few vaccines are actually designed to capture the benefits of heterologous boosting. For instance, Johnson & Johnson's Ebola vaccine uses two different types of vaccines — one of which is made using



a similar design to the company's Covid vaccine. Likewise, the Sputnik V vaccine is made up of two doses of similar but not identical vaccines, each made using a different adenovirus that has been modified to carry genetic material from the SARS-CoV-2 virus. In both cases, the goal was to ensure that the immune response the first dose generated didn't prevent the second shot from taking effect.

Necessity is the mother of invention

As mentioned above, most immunized people in the United States were vaccinated with a homologous series of vaccines. But elsewhere heterologous regimens were used for a couple of different reasons.

In the early days of the vaccine rollout, some countries opted to use heterologous boosts because they didn't have adequate supply to be able to give people a matching shot when they were due for their second dose. And after the AstraZeneca vaccine was seen to cause serious clotting problems in some people who received it (a problem later seen with the J&J vaccine too), some countries stopped using it or limited its use to older adults, for whom the risk of a clotting event after vaccination appeared to be lower. Younger adults were offered one of the mRNA vaccines as their second dose instead.

Kathryn Edwards, a vaccines researcher at Vanderbilt University, suggested the United States should probably look at whether specific brands of booster doses should be targeted at certain populations — or more specifically, if certain people should be steered away from certain vaccines when it comes time for them to get boosters. With concerns about myocarditis in young males associated with mRNA vaccines and clotting problems reported mainly with younger women who got one of the viral vectored vaccines, such as the J&J, maybe it's time to think about who gets which type of Covid vaccine, Edwards said.

A natural experiment turns into a border barrier

Countries like the United Kingdom, Canada, France, and Germany that used heterologous vaccine approaches have created a travel conundrum for their citizens.

A number of countries — the United States among them — do not consider people who received two different brands of vaccines fully vaccinated, even if the person's home country does. This means someone who got an mRNA vaccine as a second dose after receiving an AstraZeneca shot as a priming dose is not deemed fully vaccinated and is not eligible to travel to the U.S. or other countries with the same rule.

Canada has roughly 4 million people who were vaccinated on a heterologous schedule. The U.S. and its northern neighbor share the world's longest border and in pre-Covid times, travel across it was brisk. Now many Canadians are in limbo, unsure if or when they will be allowed to cross into the U.S.

Figuring out how to deal with a range of vaccines used in a variety of ways around the world is going to be a challenge that the Biden administration and other governments will have to grapple with as international travel increases.

All combos may not be created equal

Is it possible that any combination of vaccine types or brands will work as well — or better — than if the shots were all of a single brand? That's not yet clear, but it's possible — even likely — that the combinations and the order in which the vaccines are given will matter.

"A followed by B may not be the same as B followed by A," explained Bruce Gellin, chief of global public health strategy for the Rockefeller Foundation's pandemic prevention institute.

A number of small studies done in Europe have shown that following up AstraZeneca's adenovirus-vectored vaccine with a Pfizer or a [Moderna](#) mRNA booster elicits a greater immune response than what is seen from two doses of the AstraZeneca alone. But an ongoing research effort at Britain's University of Oxford comparing Covid vaccine combinations called the Com-CoV trials suggests that the inverse may not be true.

Scientists conducting the original [Com-CoV trial](#) gave volunteers two doses apiece of either AstraZeneca or Pfizer, comparing the antibody levels those regimens elicited to AstraZeneca followed by Pfizer or Pfizer followed by AstraZeneca. Pfizer after AstraZeneca generated higher antibody levels than two doses of AstraZeneca alone; but AstraZeneca after Pfizer was not better than two doses of Pfizer.

"The priming event is really important," said [Barney Graham](#), who was deputy director of the National Institutes of Health's Vaccine Research Center until the end of August and who played a critical role in the design of the Moderna and other vaccine prototypes.

Graham explained that the kind of immune response one gets from Covid vaccines is determined by the first dose. "And so it kind of locks you into a repertoire and a pattern of antibody, T-cell balances that carry on through subsequent boosters," he said.



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Much remains to be learned about how to effectively mix Covid vaccines — and it will take time to answer these questions, Graham said. “Those are the kind of things that happen over a 12-year development program. We didn’t do that this time.”

Mixed vaccines carry a punch

In general, Covid vaccines are what’s known as reactogenic; they can carry a wallop. Fevers, sore arms, fatigue, and malaise — a lot of people report feeling kind of crappy in the hours or even day or two after getting a Covid shot.

Complaints about reactogenicity were even greater among people who got mixed vaccine brands, the [Com-CoV trial](#) reported. So, potentially more post-vaccination side effects, but nothing unmanageable. “It is reassuring that all reactogenicity symptoms were short lived,” the Com-CoV researchers said in a short study published in late May in *The Lancet*.

The challenge ahead

If evidence continues to amass suggesting that mixing vaccine brands would be of benefit, how do those data get translated into public policy? That won’t be easy, experts warn.

Typically, regulators like the Food and Drug Administration act on requests from companies. They review data provided by a manufacturer and decide yes, this vaccine or drug can be given to these people or no, it should not be.

But when you are talking about a plan that involves combining products from two different companies, things become much more complex. None of these companies have asked to have a rival’s vaccine used as a booster for their Covid shot — and they’re not likely to.

“Normally the manufacturer puts in an application to do something,” said Glen Nowak, director of the Center for Health and Risk Communication at Grady College of Journalism and Mass Communication. “Who then has that responsibility to bring forward a recommendation to mix and match? I think it’s a very good question.”

The CDC could address the issue, said Norman Baylor, president and CEO of Biologics Consulting and a former head of the FDA’s Office of Vaccines. Its advisory panel, ACIP, could evaluate the data and, if it supports using heterologous boosts, recommend that this is the way the vaccines could be used. Such advice could take the form of what is known as preferential recommendations — effectively not saying that vaccine B must be used after vaccine A, but noting it would be advisable to do so.

Could that happen? Possibly. But if it does happen, it will likely affect the way Covid vaccines are used in the future — in people who haven’t yet started to be vaccinated, or if and when people in the country need a fourth dose of Covid vaccine. Because by the time there are enough data to move forward with this type of policy, most Americans who are currently due for a booster jab will likely have had one.

Helen Branswell is a senior writer at STAT covering infectious diseases and global health; she joined STAT at its founding in 2015. Helen was introduced to epidemic reporting during the 2003 SARS outbreak; in the years since she has written about bird flu, the H1N1 flu pandemic, Ebola, Zika, polio, and measles, and now leads STAT’s coverage of the coronavirus pandemic. Helen spent the summer of 2004 embedded at the Centers for Disease Control and Prevention as a CDC Knight Fellow and was a 2011 Nieman Global Health Fellow at Harvard. In 2018, she won the AHCJ award for beat reporting. She was the recipient of the 2020 George Polk Award for Public Service for coverage of the Covid-19 pandemic and was awarded the 2021 Victor Cohn Prize for Excellence in Medical Science Reporting.

First-of-Its-Kind Drug Cuts Risk of Severe COVID-19 in Half, AstraZeneca Says

Source: <https://www.sciencealert.com/astrazeneca-s-antibody-cocktail-cuts-severe-covid-19-in-half>

Oct 11 – AstraZeneca’s antibody drug cut the risk of severe [COVID-19](#) by at least 50 percent in a late stage study, [the company announced on Monday](#).

The injection, called [AZD7442](#), contains two different [antibodies](#) developed from the the blood of people who previously contracted COVID-19. It’s the first drug of its kind shown to both prevent and treat COVID-19 in late-stage trials, the company [said in a press release](#).

[The company has already requested Food and Drug Administration \(FDA\)](#) approval to use AZD7442 to prevent COVID-19, after late-stage trial results in August showed it reduced the risk of COVID-19 with symptoms by 77 percent.

It would now discuss the latest data with health authorities, it said.

The results come after Merck, the US pharmaceutical company, [said on Monday it would ask the FDA](#) to authorize its [oral COVID-19 pill](#), which [halved the risk of hospitalization or death](#) in a trial.



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The latest AstraZeneca results, from the TACKLE trial, showed that the risk of severe COVID-19 or death was halved if people took the drug within seven days of COVID-19 symptoms, AstraZeneca said. Out of 407 people who got the drug, 18 developed severe COVID-19 or died – compared with 37 of 415 people who got a saline injection.

If AZD7442 was given earlier, within five days of symptoms, the risk of severe COVID-19 was reduced by 67 percent, the company said. On this timing, nine of 253 participants in the AZD7442 group got severe COVID-19 or died, compared with 27 out of 251 in the placebo group.

AstraZeneca tested the drug on 822 adults with mild to moderate COVID-19 in 13 countries, including the US and UK, it said. The drug, which works by stopping the [virus](#) that causes COVID-19 from binding to the body's cells, was "generally well tolerated," it said in the release. It didn't detail any side effects.

Protection for vulnerable people

Mene Pangalos, executive vice president at AstraZeneca, [said in a statement](#) that "early intervention with our antibody can give a significant reduction in progression to severe disease, with continued protection for more than six months".

AstraZeneca looked at the drug's impact at day 29 of the TACKLE study, which is expected to follow participants for up to 15 months.

AstraZeneca's early stage studies have previously shown that [antibodies](#) last at least nine months after the drug is given.

Penny Ward, visiting professor in pharmaceutical medicine at Kings College, London, said in a statement that long-lasting protection, up to 12 months, may be "a useful addition for immune-suppressed individuals whose response to vaccination is suboptimal".

Most people in the trial, 90 percent, had comorbidities that put them at high risk of severe COVID-19, including [cancer](#), [diabetes](#), obesity, chronic lung disease or asthma, cardiovascular disease, or immunosuppression, and 13 percent were aged over 65, AstraZeneca said.

Ward said that unlike oral pills, monoclonal antibody treatments given as an injection, such as AstraZeneca's, don't interfere with other medicines. This "may potentially make administration simpler for these patients," she said.

The origin of COVID-19: Evidence piles up, but the jury's still out

By Matt Field

Source: <https://thebulletin.org/2021/10/the-origin-of-covid-19-evidence-piles-up-but-the-jurys-still-out/>

Oct 11 – It's been more than 600 days since the Wuhan Municipal Health Commission [reported](#) a "cluster of pneumonia of unknown etiology," almost 200 days since the WHO issued a major report on the origins of COVID-19, and more than a month since the Biden administration in the United States released an inconclusive intelligence review on that issue. Yet, despite the many investigations, studies, and scientific debates on how COVID-19 emerged, cold, hard evidence for how people started getting sick in Wuhan in 2019 remains elusive.

Circumstantial evidence, on the other hand, is piling up. Judgements about whether that circumstantial evidence points more toward one of two general theories of the pandemic's origin—a natural spillover from an animal reservoir versus a leak from a laboratory studying coronaviruses—seems, at this point, to depend on the judge.

Broadly, there's a growing body of new research and [analysis](#) showing how common spillover of animal coronaviruses [may be](#). New research has also identified viruses in nature with striking similarity to SARS-CoV-2, the virus that causes COVID-19. At the same time, a group of online sleuths found and leaked to the press a major [grant proposal](#) from 2018 that demonstrates the high-level of interest researchers, including those in Wuhan, had in manipulating bat coronaviruses, suggesting to some that such work could indeed have played a role in causing the pandemic.

On the one hand, the scientists advocating a natural origin for the pandemic can point to the tens of thousands of wild animals that were being sold in Wuhan, including at the Huanan seafood market where many of the initial cases of COVID-19 were reported. A [study](#) published over the summer documented that vendors there were illegally selling a variety of wildlife, including mammals such as raccoon dogs, which can [carry and transmit](#) the COVID-19 virus. Raccoon dogs are a potential [intermediate host](#) for the virus that caused an outbreak of severe acute respiratory syndrome (SARS) in the early 2000s, an event that many see as having been a preview of the COVID-19 pandemic. The study found that animals were frequently "sold alive, caged, stacked and in poor condition." During a recent panel discussion hosted by *Science* magazine, Michael Worobey, an evolutionary biologist at the University of Arizona, said that those who believe the pandemic may have begun with a lab accident have to grapple with a seeming contradiction: "You face this fundamental issue of, if it started with research, why does it look like it actually started at one of these markets selling these animals that were implicated in the first SARS outbreak?"



In Laos, meanwhile, researchers identified a virus that is 96.8 percent identical to SARS-CoV-2; it is one of three viruses found in caves there that are each more than 95 percent identical to the COVID-19 virus. Their study was released as a preprint last month, meaning it has yet to be peer-reviewed. The previous record was a virus documented by researchers at the Wuhan Institute of Virology that is [96.2 percent identical](#). The Lao viruses are [nearly exactly the same](#) as SARS-CoV-2 in one particularly important area of their structure, the receptor binding domain that attaches to human cells. They don't, however, contain "the so-called furin cleavage site on the spike protein that further aids the entry of SARS-CoV-2 and other coronaviruses into human cells," a recent article in *Nature* notes.

The Lao viruses are still not genetically close enough to SARS-CoV-2 to have spawned COVID-19. The so-called progenitor virus should be 99.9 percent the same as the pandemic virus, Linfa Wang, the director of the emerging infectious diseases program at Duke-NUS Medical School in Singapore told the *Science* panel. However, "[t]he core, functional part of SARS-CoV-2 has a natural origin," Wang [told Science](#) for a piece on the Laos find. "It's proven."

But researchers who believe an accident at one of the labs studying bat coronaviruses in Wuhan, the Wuhan Institute of Virology, may have started the pandemic also have a straightforward argument to make. Alina Chan, a molecular biologist at the Broad Institute of MIT and Harvard who co-authored a forthcoming book about the pandemic's origins, told the *Science* panel, "in 2019, a novel SARS coronavirus with a novel genetic modification appeared in a city where there's a lab studying novel SARS coronaviruses with novel genetic modifications. We cannot rule out the lab origin right now."

Advocates of the lab-leak theory have seized on the recent revelation of a research proposal submitted to the US Defense Advanced Research Projects Agency (DARPA) in 2018—a proposal that, if accepted, would have led to modification of bat viruses in a way that lines up strikingly with the lab-leak theory. The Wuhan Institute of Virology was to be a key player in that multimillion-dollar effort to study bat viruses, according to the DARPA proposal, which was first made public by an amateur research group known as DRASTIC. DARPA did not fund the proposal.

EcoHealth Alliance, a US nonprofit involved in pandemic pathogen research, submitted the proposal listing its president, Peter Daszak, as the principal investigator. Among its other elements, the study would have involved altering the spike protein of bat coronaviruses by inserting a furin cleavage site, according to [an analysis](#) of the project by Sharon Lerner and Maia Hibbett of the online investigative news organization *The Intercept*. The furin cleavage site on the SARS-CoV-2 virus allows its spikes to be cut and ["primed"](#) as it moves out of one cell and into another. The site is thought to make the virus more transmissible. While other coronaviruses also have this site, [none](#) of the COVID-19 virus's closest relatives do, a fact that has been the focus of lab-leak proponents, who believe the presence of a furin cleavage site suggests the SARS-CoV-2 virus was engineered in a lab—a belief hotly disputed by scientists who support a natural origin of the virus.

The proposal to DARPA indicated the bulk of work to build the hybrid bat viruses would be done not in China but in North Carolina, an important indication, some experts say, of how far removed the EcoHealth Alliance proposal was from the lab-based pandemic origins scenario. "It's hard to assess any bearing on the origin of SARS-CoV-2," one virologist, Stephen Goldstein, told *The Intercept*. Another *Intercept* report from September, however, [highlighted](#) the extent to which genetic engineering on bat coronavirus was being done in Wuhan. EcoHealth Alliance was the lead entity on US government-funded work that tested hybrid bat coronaviruses on genetically engineered mice. In some cases, the new viruses replicated faster and caused more notable symptoms (increased weight loss) in "humanized mice." These experiments involved viruses that could not have evolved into SARS-CoV-2, scientists told *The Intercept*.

The Intercept has based much of its recent reporting on US government funding for EcoHealth Alliance and Wuhan researchers on results from Freedom of Information Act requests—results that the outlet had to sue to get. The proposal to DARPA was leaked by DRASTIC. These revelations are just the latest illustrations of how the origins investigation has time and again faced stonewalling from the [Chinese](#) and [US](#) governments, as well as from key private-sector players, including Daszak. As EcoHealth Alliance's president, Daszak presumably knew about the proposal to insert the very genetic modification into bat viruses that had many scientists so concerned. Nonetheless, he publicly discounted the possibility that such research had been contemplated.

The opaqueness of key figures and institutions in the origins debate appears to have had real repercussions.

In an [interesting analysis](#), *The Atlantic*'s Daniel Engber and Adam Federman wrote that "[i]n May 2020, only a few months into the pandemic, EcoHealth's Peter Daszak [ridiculed discussions of the furin cleavage site](#) and whether it might be bioengineered as the ranting of conspiracy theorists." That month, the EcoHealth Alliance president tweeted, "[m]ore evidence refuting conspiracy theory! The presence of a Furin cleavage site in SARS-CoV-2 glycoprotein is widely touted by conspiracy theorists as evidence of lab culture or bioengineering. This paper shows these sites can evolve naturally in bat-CoVs..." As *The Atlantic* authors note, just a half-a-year later, Daszak would play key roles in [two major, international investigations](#) into the origins of COVID-19—the WHO's origins investigation and a commission put together by the prestigious medical journal *The Lancet*.



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Daszak's presence on the WHO team [raised questions](#) early on, given his ties to the Wuhan lab. Ultimately, criticism of the team's review of the lab-leak theory minimized whatever impact the investigation might have had. On the same day the team briefed the public on its report, WHO Director-General [Tedros Adhanom Ghebreyesus](#) tweeted a rebuttal of its efforts. "I do not believe that this assessment was extensive enough," adding that all hypotheses for how the pandemic began "remain on the table." In a similar setback, *The Wall Street Journal* [reported](#) in September that the head of *The Lancet's* [commission on COVID-19](#) disbanded a task force put together to investigate the pandemic's origins because of its ties to EcoHealth Alliance. "I just didn't want a task force that was so clearly involved with one of the main issues of this whole search for the origins, which was EcoHealth Alliance," Columbia University professor Jeffrey Sachs, who heads *The Lancet* commission, told the paper last month. EcoHealth Alliance has not responded to a request for comment for this story. One important response to the pandemic has been to [double down](#) on the [hunt for viruses](#) in animal populations. On its face, this effort sounds like an unalloyed good; if some nasty pathogen is out there in a forest or cave somewhere, "we should get ahead of it," the thinking goes. But doing so also means finding these viruses and bringing them out of their hiding places. And viral discovery work can coincide with work to manipulate viruses. This research not only risks exposing [the people involved](#) to new viruses, but also represents something that is perhaps even more grave. Kevin Esvelt, a professor at MIT and expert in genetic engineering, wrote in *The Washington Post* that work aiming to identify potentially pandemic pathogens is providing legions of people in labs around the world who can engineer viruses—he counted five in his own lab—with [the blueprints](#) for a bioweapon.

Given the risks involved in finding and manipulating viruses in the name of pandemic prevention, ruling out with near certainty that such research led to the SARS-CoV-2 outbreak is critical. Even as some new findings seem to be piling up on the natural origins side of the ledger, the jury is still out on how the pandemic began.

Matt Field is Editor, Disruptive Technologies at the Bulletin of the Atomic Scientists. Before joining the Bulletin, he covered the White House, Congress, and presidential campaigns as a news producer for Japanese public television. He has also reported for print outlets in the Midwest and on the East Coast. He holds a master's degree in journalism from Northwestern University.

Reporting All Biosafety Errors Could Improve Labs Worldwide – and Increase Public Trust in Biological Research

By David Gillum, Kathleen Vogel, and Rebecca Moritz

Source: <https://www.homelandsecuritynewswire.com/dr20211012-reporting-all-biosafety-errors-could-improve-labs-worldwide-and-increase-public-trust-in-biological-research>

Oct 12 – The [origin of SARS-CoV-2](#) remains a mystery. One theory is that the coronavirus that causes COVID-19 was transmitted from animals to humans – [a fairly common occurrence](#). Another is that it came from a laboratory accident – [a more infrequent circumstance](#). Around the world, scientists conduct many kinds of biological research experiments – from basic studies exploring how living systems operate to synthesizing novel organisms. Applications range from developing medical treatments to protecting the food supply to modifying bacteria to cleaning up oil spills and much more. A subset of experiments may also involve [gain-of-function research](#), which involves modifying an organism to gain a new property or ability. The idea that a pathogen could escape from a laboratory and infect the entire world is the stuff of horror movies. Working with biological materials does have inherent risks, and [laboratory incidents will happen](#) – the goal is to minimize risks to laboratory personnel, the community and the environment. We are [biosafety and biosecurity](#) professionals with expertise in mitigating risks associated with biological research. Without a standardized, international framework for reporting laboratory incidents and responses, the task of mitigating such risks is quite difficult. If laboratories were more open about when things go wrong, others could learn from their mistakes and lessen the chances of a future accident.

Science and Technology Mishaps

In 1984, [30 tons of a highly toxic gas](#) were released in Bhopal, India. Considered one of the [world's worst industrial accidents](#), the explosion killed several thousand people. When one of Chernobyl's radioactive nuclear cores had a meltdown in 1986, the Soviet government hid details and [spread misinformation](#) about the event, even though the heat from the reactor could be [seen from space](#). By contrast, when an accident occurs with a biological material, it is not a spectacular event like an explosion or meltdown. A disease caused by a



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biological organism takes time to appear. It may take days or weeks for symptoms to present after infection. The [1979 Sverdlovsk Anthrax Outbreak in the Soviet Union](#) and the [2007 Pirbright Institute's foot-and-mouth incident in the U.K.](#) are examples where biological materials unintentionally escaped the laboratory. People got sick and farm animals died. Laboratory-related infections are frequently tied to the breakdown of a particular laboratory safety procedure, equipment or organizational process. Here in the U.S., several well-documented laboratory errors have resulted in potential exposures, including the [2014 unintentional release of potentially viable anthrax bacteria](#), the [2014 potential exposure of a laboratory technician to Ebola virus](#) and the [2015 discovery of improperly inactivated anthrax bacteria](#) that was shipped around the globe. In each case, medical care was provided and no one became ill.

Biological Incident Reporting

In the U.S., a [standardized system to report](#) all biological incidents and potential exposures does not exist. The U.S. [National Institutes of Health](#) has requirements for reporting any [significant problems, accidents and illnesses](#) involving experiments with altered genetic material. If a research institution receives U.S. government funding, failure to comply with NIH rules can result in a loss of this funding, no matter where in the world the lab is located. But private, corporate or [DIY biology laboratories](#) operate with even less government oversight and fewer reporting requirements – though many have adopted their own [biosafety practices](#) and follow local requirements and best management practices. Outside the U.S., the [robustness of biosafety and biosecurity oversight](#) varies significantly from country to country.

Sharing Information

Although reporting to the U.S. government is required in certain circumstances, the information contained in the reports may never reach the public. Some institutions openly publish information about their incidents, while others keep that data private. Reasons may include concerns about reputation, protection of personal health information or even sensationalism in the media. Some fear reprisal from a disgruntled employee, a competitor or even a nation-state. Others are concerned about the spread of misinformation by [individuals who fear biological labs](#) or those who seek to [end human genetic engineering research](#) or [ban animal experiments](#). Even with these concerns, we believe a more transparent and comprehensive system of reporting biological incidents to a neutral third party would help reduce the number of laboratory incidents – and could improve public trust in the scientific enterprise. If this type of system had been in place prior to COVID-19, more data would presumably have been available to help evaluate the Wuhan laboratory leak hypothesis and cut down on speculation. In the U.S., a possible way to do this is to expand the American Biological Safety Association's [Laboratory Acquired Infection database](#). Currently, it contains incident data only from published research papers. But it could be broadened to include all kinds of incident data. In our opinion, an international version of such a reporting system would also help reduce the number and severity of laboratory incidents, both locally and worldwide. The more information available about the root cause of incidents, the more it could be used to help improve training, procedures and controls – and prevent future problems. It would also suggest how safety systems break down and what systems might be at risk. Biosafety and biosecurity professionals have been discussing this topic for a [long time](#), including at a [U.S. Trans-Federal Task Force on Optimizing Biosafety and Biocontainment](#) and by a [Federal Experts Security Advisory Panel](#). But to make a centralized reporting system a reality, key players will need to commit and act. They include governments, international agencies, industry partners and the scientific community.

David Gillum is Executive Director of Environmental Health and Safety and Chief Safety Officer, Arizona State University.

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Rebecca Moritz is Biosafety Director and Responsible Official, Colorado State University.

China: Swine flu strain with human pandemic potential

By Jon Cohen

Source: <https://www.science.org/content/article/swine-flu-strain-human-pandemic-potential-increasingly-found-pigs-china>

June 29 – What the world doesn't need now is a pandemic on top of a pandemic. So a new finding that pigs in China are more and more frequently becoming infected with a strain of influenza that has the potential to jump to humans has infectious disease researchers worldwide taking serious notice. Robert



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Webster, an influenza investigator who recently retired from St. Jude Children's Research Hospital, says it's a "guessing game" as to whether this strain will mutate to readily transmit between humans, which it has not done yet. "We just do not know a pandemic is going to occur until the damn thing occurs," Webster says, noting that China has the largest pig population in the world. "Will this one do it? God knows."

When multiple strains of influenza viruses infect the same pig, they can easily swap genes, a process known as "reassortment." The new study, published today in the *Proceedings of the National Academy of Sciences*, focuses on an influenza virus dubbed G4. The virus is a unique blend of three lineages: one similar to strains found in European and Asian birds, the H1N1 strain that caused the 2009 pandemic, and a North American H1N1 that has genes from avian, human, and pig influenza viruses.

The G4 variant is especially concerning because its core is an avian influenza virus—to which humans have no immunity—with bits of mammalian strains mixed in. "From the data presented, it appears that this is a swine influenza virus that is poised to emerge in humans," says Edward Holmes, an evolutionary biologist at the University of Sydney who studies pathogens. "Clearly this situation needs to be monitored very closely."



Nasal swabs from more than 30,000 pigs in China over 7 years found an increase in an avianlike influenza virus that has swapped genes from several strains. Honglei Sun

As part of a project to identify potential pandemic influenza strains, a team led by Liu Jinhua from the China Agricultural University (CAU) analyzed nearly 30,000 nasal swabs taken from pigs at slaughterhouses in 10 Chinese provinces, and another 1000 swabs from pigs with respiratory symptoms seen at their school's veterinary teaching hospital. The swabs, collected between 2011 and 2018, [yielded 179 swine influenza viruses](#), the vast majority of which were G4 or one of five other G strains from the Eurasian avianlike lineage. "G4 virus has shown a sharp increase since 2016, and is the predominant genotype in circulation in pigs detected across at least 10 provinces," they write.

Sun Honglei, the paper's first author, says G4's inclusion of genes from the 2009 H1N1 pandemic "may promote the virus adaptation" that leads to human-to-human transmission. Therefore, "It's necessary to strengthen the surveillance" of pigs in China for influenza viruses, says Sun, also at CAU.

Influenza viruses frequently jump from pigs to humans, but most do not then transmit between humans. Two cases of G4 infections of humans [have been documented](#) and both were dead-end infections that did not transmit to other people. "The likelihood that this particular variant is going to cause a pandemic is low," says Martha Nelson, an evolutionary biologist at the U.S. National Institutes of Health's Fogarty International Center who studies pig influenza viruses in the United States and their spread to humans. But Nelson notes



that no one knew about the pandemic H1N1 strain, which jumped from pigs to people, until the first human cases surfaced in 2009. "Influenza can surprise us," Nelson says. "And there's a risk that we neglect influenza and other threats at this time" of COVID-19. The new study offers but a tiny glimpse into swine influenza strains in China, which has 500 million pigs. While Nelson thinks the predominance of G4 in their analysis is an interesting finding, she says it's hard to know whether its spread is a growing problem, given the relatively small sample size. "You're really not getting a good snapshot of what is dominant in pigs in China," she adds, stressing the need for more sampling in the nation's pigs.

In the paper, Sun and colleagues—including George Gao, head of the Chinese Center for Disease Control and Prevention—describe lab dish studies that show how G4s have become adept at infecting and copying themselves in human airway epithelial cells. The viruses also readily infected and transmitted between ferrets, a popular animal model used to study human influenza. The researchers found antibodies to the G4 strain in 4.4% of 230 people studied in a household survey—and the rate more than doubled in swine workers.

In addition to stepping up surveillance, Sun says it makes sense to develop a vaccine against G4 for both pigs and humans. Webster says at the very least, the seed stock to make a human vaccine—variants of a strain that grow rapidly in the eggs used to make a flu vaccine—should be produced now. "Making the seed stock is not a big deal, and we should have it ready," Webster says.

China rarely uses influenza vaccines in swine. Nelson says U.S. farms commonly do, but the vaccine has little effect because it's often outdated and doesn't match circulating strains.

Ideally, Nelson says, we would produce a human G4 vaccine and have it in the stockpile, but that's an involved process that requires substantial funding. "We need to be vigilant about other infectious disease threats even as COVID is going on because viruses have no interest in whether we're already having another pandemic," Nelson says.

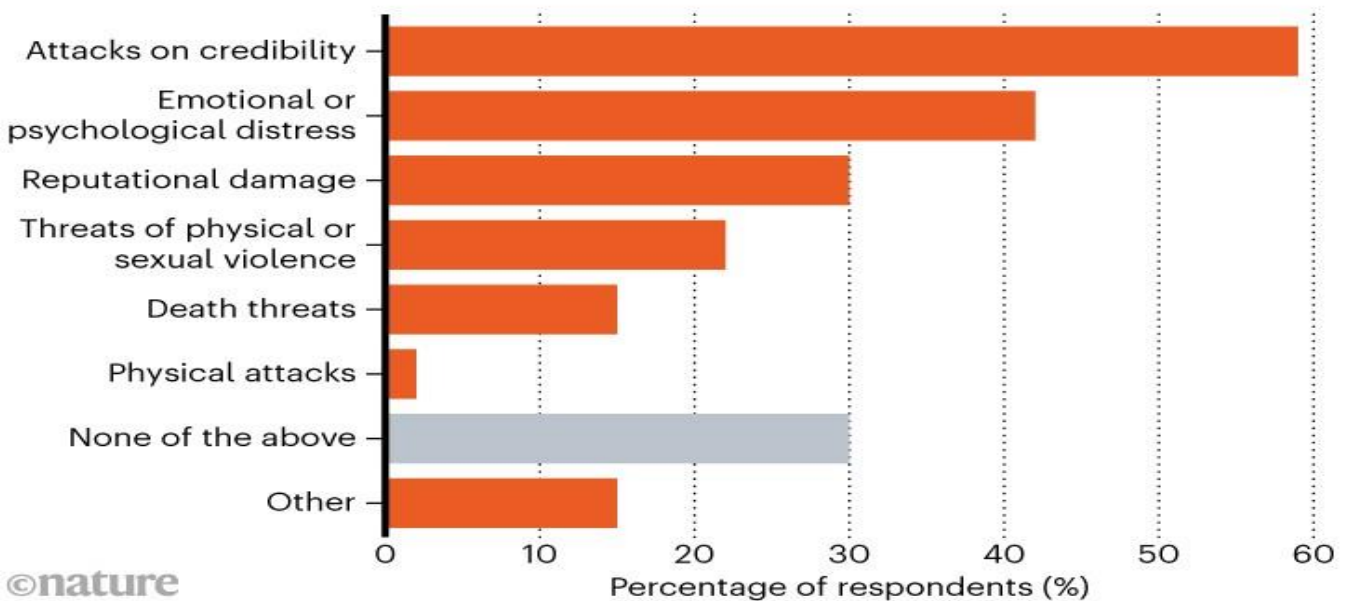
'I hope you die': how the COVID pandemic unleashed attacks on scientists

Source: <https://www.nature.com/articles/d41586-021-02741-x>

NEGATIVE IMPACTS

In a *Nature* survey of scientists who have commented about COVID-19, 15% of 321 respondents said they had received death threats.

Question: Have you experienced any of the following negative impacts after speaking about COVID-19 to the media, or posting on social media? (You may select multiple options.)



Oct 13 – Dozens of researchers tell *Nature* they have received death threats or threats of physical or sexual violence.



Russian Health Ministry allows testing Sputnik V nasal spray – register

Source: <https://interfax.com/newsroom/top-stories/72875/>

Oct 13 – The Russian Health Ministry has approved Phase II trials of the Sputnik V coronavirus vaccine in the form of nasal spray, according to the state register of authorized clinical trials. The materials indicate that the permit was issued on Tuesday. The nasal spray is reportedly set to be administered in two doses in a St Petersburg clinic. The test will be conducted among adult volunteers.

Video: “The PCR-RT is a Process. It Does Not Tell You that You Are Sick”: The Late Dr. Kary Mullis, Nobel Laureate and Inventor of the PCR-RT

By Kary B. Mullis

Oct 12 – Nobel Prize Laureate Kary B. Mullis was the inventor of the polymerase chain reaction technique. Dr. Kary B. Mullis, who passed away on August 7, 2019 at age 74, stated emphatically that no infection or illness can be accurately diagnosed with the PCR-RT. [Read more...](#)

In-ear sensor successfully monitors high-risk COVID-19 patients at home

Source: <https://newatlas.com/health-wellbeing/high-risk-covid19-patients-at-home-ear-sensor-monitoring/>

Oct 14 – New research from the Technical University of Munich has found remote monitoring of COVID-19 patients can effectively identify the earliest stages of deterioration and admit them to hospital for necessary treatment. The system uses an in-ear sensor to measure and transmit data in near real-time to doctors who then evaluate when patients need hospital admission.

As many places in the world have experienced, hospitals can quickly fill up with COVID-19 patients when waves of infections spread through a local community. As well as helping those patients most in need of acute treatment, doctors try to admit patients at a high-



risk of deterioration so they can be treated effectively at the earliest opportunity. But sometimes it is not easy to identify those patients quickly, and many sick people have been sent home only to return days later in dire straits.

The sensor measures body temperature, blood oxygen levels and respiration rates (Andreas Heddergott / TUM)

This new research trialed a system whereby newly diagnosed COVID-19 patients flagged at high risk of severe disease were sent home with a device designed to monitor a number of vital signs. The health data captured by the device was monitored remotely by

a team of health care workers and patients were called in to hospital when vital signs indicated a deterioration in their condition. The study utilized a commercially available in-ear sensor produced by a company called [cosinuss](#). The sensor resembles a small hearing aid and contains a photoplethysmography (PPG) sensor element, a contact temperature sensor and an accelerometer. It can measure heart rate, core body temperature, blood oxygen saturation, and respiratory rate.



The device connects to a smartphone via Bluetooth and takes measurements of vital signs every 15 minutes. The data is then transmitted to a telemedicine center allowing for constant oversight from a team of doctors.

Around 150 patients were recruited for the study. The median age of the cohort was 60 and each participant had at least one pre-existing condition including diabetes, obesity, or cardiovascular disease.

Over the course of the study 20 patients were flagged for deteriorating vital signs and admitted into hospital. Seven of those patients ended up in intensive care, and one sadly passed away.

Unsurprisingly, blood oxygen levels were a key indicator of deterioration. The average measurement in patients before hospitalization was 88 percent, whereas the average measurement in patients not hospitalized was 96 percent.

"To our knowledge, this is the first study worldwide to continuously monitor patients in home isolation remotely and to prompt immediate hospitalization in the event of critical health deterioration," explains Georg Schmidt, a researcher working on the study.

The majority of those participating in the study said the monitoring system made them feel safer and improved their subjective well-being. A striking 90 percent of those patients ultimately hospitalized said they would not have come to hospital at the time they were contacted to be admitted. This suggests monitoring vital signs remotely can catch disease deterioration before someone is conscious of their declining condition.

As the study obviously had no conventional care group to act as a control, it is impossible to determine whether this kind of remote monitoring leads to better outcomes than the alternative. The researchers do speculate that the monitoring often led to calling patients into hospital before they would have voluntarily chosen to come, meaning treatment could be administered at earlier stages, likely resulting in better outcomes and ultimately, shorter hospital stays.

"We assume that in the event of a pandemic, such remote monitoring will help to relieve the burden on general practitioners and medical officers," the researchers propose. "Patients can be well cared for by telemedicine without the need for direct contact with a doctor or a nurse. This means that no unnecessary resources are bound and, additionally, the risk of infection for medical and nursing staff can be reduced. At the same time, the patient's chances of survival are likely to be increased, as their clinical course is continuously monitored."

►► The new study was published in the journal [PLOS One](#).



More Die After Vaccination Than From COVID-19 in Taiwan

Source [+video]: https://www.ntd.com/more-die-after-vaccination-than-from-covid-19-in-taiwan_688004.html

Oct 13 – In Taiwan, the number of people dying after their [COVID-19 vaccination](#) is exceeding the number of deaths from the virus itself. Taiwan's health authorities say that as of Monday, deaths after vaccination reached 865. While deaths from the virus are 845. Available vaccines in the country: *AstraZeneca, Moderna, Pfizer-BioNTech* and (*made in Taiwan*) *Medigen*

Anaphylaxis and Coronavirus Disease 2019 Vaccine: A Danger Relationship?

By Luciana Kase Tanno; Mariana Castells; Marco Caminati; Gianenrico Senna and Pascal Demoly

Curr Opin Allergy Clin Immunol. 2021;21(5):411-417

Source: https://www.medscape.com/viewarticle/957579?uac=82598DG&faf=1&sso=true&impID=3715000&src=wnl_tp10n_211016_mscpedit

According to the World Health Organization's (WHO) report, globally, as of 22 May 2021, there have been 165 771 430 confirmed cases of coronavirus disease 2019 (COVID-19), including 3 437 545 deaths.^[1] Long-term sequelae manifestations and serious complications have been reported among COVID-19 survivors, including individuals who initially presented with mild acute illness.

Since the start of the COVID-19 outbreak, scientists started a global run to reach safe and effective vaccines, in what we can consider as a true scientific evolution. There are no doubts that the vaccine against COVID-19, combined with other preventive barrier measures, is an essential global intervention to stop the pandemic, save lives and reduce widescale social disruption.

The United Kingdom, Bahrain, Canada, Mexico, USA, Singapore, Oman, Saudi Arab, Kuwait and European Union began their vaccination programme with the BNT162b2 (Pfizer-BioNTech) vaccine, whereas USA and Canada also started the mRNA-1273 (Moderna) vaccination programme in mid-December 2020.



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Broader COVID-19 vaccination programs have been launched in many countries in early 2021. On 11 December 2020, the US Food and Drug Administration (FDA) issued an Emergency Use Authorization (EUA) for Pfizer-BioNTech COVID-19 vaccine.^[2,3] This followed by the authorization of Moderna mRNA-1273 vaccine for use by other regulatory agencies, such as the European Commission, UK Medicines and Healthcare Products Regulatory Agency (MHRA), Israel Ministry of Health among others^[3-6] and several other vaccines in many other countries.

As of 21 May 2021, a total of 1 488 242 899 vaccine doses have been administered according to the WHO report. Globally, in the past week (10–16 May 2021), the number of new cases and deaths continued to decrease with just over 4.8 million new cases and just under 86 000 new deaths reported; a 12 and 5% decrease, respectively compared to the previous week.^[4] Efforts are ongoing to vaccinate as many people as possible.

First Reports of Anaphylaxis and Their Consequences

As of 23 December 2020, first doses of Pfizer-BioNTech COVID-19 vaccine had been administered in the United States and 4393 (0.2%) adverse events reported, and among these, 175 cases of severe allergic reactions, including anaphylaxis.^[2] Further surveillance data reported for the United States suggested a rate closer to 1:200 000 doses for the Pfizer-BioNTech vaccine and 1:360 000 for the Moderna vaccine.^[2,4]

In the United Kingdom, after the two recipients of Pfizer-BioNTech vaccine experienced anaphylaxis reported personal history of prior anaphylaxis,^[7] the UK regulators issued an advisory statement, which listed prior anaphylaxis to vaccine, medicine or food as a contra-indication,^[8] generating an initial concern that patients with atopic diseases might be more likely to develop allergic reactions to COVID-19 vaccines. This recommendation was initially followed by the US Food and Drug Administration (FDA) and the US Centers for Disease Control and Prevention (CDC), but later changed their recommendations.^[9] On 30 December 2020, the UK Minister of Health reviewed the previous recommendations, limiting the contra-indications to patients who reacted to the first injection or who had a confirmed allergy to any component of the vaccine, as it has long been recommended for any vaccine. However, it generated considerable fear worldwide by the population and many inquiries from health professionals dealing with COVID-19 and vaccination programs. As a consequence, the international and national allergy academies have produced guidelines and recommendations to support patients and healthcare professionals according to current evidence-based data.^[10-12]

The introduction of a new vaccination is always the subject of debate, even inducing reactions of rejection. This problem echoes the significant public mistrust of the vaccine programme, mistrust amplified by the internet, false rumors, opportunistic colleagues and deleterious media frenzy. More than ever the science of real data must prevail and communication must be mastered and scientific.

The Truth Regarding Anaphylaxis due to Vaccines

Anaphylaxis, both immunoglobulin E (IgE)- or non-IgE-mediated, is clinically known as a systemic hypersensitivity reaction characterized by rapid onset and the potential to endanger life through airway, breathing or circulatory involvement. It is usually, although not always, associated with skin and mucosal changes.^[13] Its heterogeneous clinical presentation and sudden occurrence in virtually any setting without warning hampers the prompt recognition and treatment of this condition, increasing the risk of death. This multifaceted disease can occur at any age and in varying degrees of severity.^[13] European data indicated incidence rates of all-cause anaphylaxis ranging from 0.3 to 7.9/10⁵ people/year, with an estimate that 0.3% (95% confidence interval [CI] 0.1–0.5) of the population will suffer from anaphylaxis at some point in their life, known as the 'lifetime anaphylactic risk'.^[14,15] The calculation made at the Montpellier University Hospital Center is 0.32/10⁵ (95% CI 0.28–0.65).^[15] Although it is a cause of death well known by physicians, anaphylaxis has never been properly monitored due to the difficulties of classification and coding in the different versions of the WHO International Classification of Diseases (ICD). For this reason, anaphylaxis has never been considered underlying cause of death in death certificates leading to under notification, until recently thanks to the construction and implementation of its 11th version, ICD-11 by the WHO Collaborating Center in Montpellier with the WHO governance for international classifications.^[16,17] Strikingly however, it has been listed for a long time in vaccine safety surveillance programs.^[18]

Although severe, anaphylaxis due to vaccine is extremely rare, estimated at 2.5–11/1 000 000, and specific cases should receive individualized investigation and care.^[19-21] However, this data is based on passive reports and most of cases have not been deeply evaluated or validated by allergists. Also, difficulties in recognition anaphylaxis, in particular of less severe cases, can hamper the collection of accurate epidemiological data of reported cases.

The frequency of anaphylaxis^[21] varies from vaccine to vaccine as follows: DPT (diphtheria, pertussis and tetanus) (0.36/100 000, usually due to the vaccine agent), influenza (0.08/100 000, exceptionally due to ovalbumin), MMR (measles, mumps and rubella) (0.18/100 000, less and less due to the porcine gelatin stabilizing it, never to the egg proteins it actually barely contains).



Anaphylaxis to mRNA-corona Virus Disease 2019 Vaccines: A Matter of its Components?

Allergic reactions to vaccines are generally due to adjuvants and other excipients/components in the vaccine such as preservatives and antibiotics, rather than to the active component itself.^[10] Although the exact cause of vaccine-associated anaphylaxis with mRNA vaccines is still unknown, a polyethylene glycol (PEG)-conjugated lipid derivative in the lipid nanoparticles was immediately suspected to be the causative agent, a 'crime of dirty faces'.^[22]

PEG, also known as macrogols, are a group of polyether compounds that are widely used in medicinal, cosmetic and household products (including creams and lotions, shampoo, hair dye, and dental hygiene products). They are formed via the polymerization of ethylene oxide, resulting in PEG polymers of variable chain length and thus molecular weight.^[23]

In COVID-19 vaccines, the inclusion of pegylated nanoparticle encapsulating the mRNA impairs enzymatic degradation of the mRNA, increases the water-solubility and, therefore, the bioavailability of the lipid nanoparticles. The Pfizer-BioNTech vaccine contains two novel lipid nanoparticles, one of which is 'pegylated' (polyethylene glycol of molecular weight 2000 Da, abbreviated to PEG-2000). The Moderna mRNA vaccine also includes a different pegylated lipid (also a PEG-2000).

PEG allergy is very uncommon, despite the widespread use in medicines, foods and household products. The majority of reports are due to high molecular weight PEG present as excipients in intra-articular corticosteroids or as active ingredients of laxative and bowel preparations.^[23,24] The PEG-induced reactions publications appear to be at the more severe spectrum, most describing multiple episodes of anaphylaxis, often requiring multiple doses of epinephrine.^[24]

The underlying mechanism of PEG-associated anaphylaxis is largely unknown, although IgE-dependent and IgE-independent mechanisms have been proposed. Recent report suggests that basophil activation tests to PEGylated liposomal drugs may be useful for the assessment of BNT162b2- (Pfizer-BioNTech COVID-19 vaccine) associated anaphylaxis.^[24,25]

There is very little data to link the anaphylactic reactions to mRNA vaccines Pfizer and Moderna to the PEG that forms the nanoparticles for two reasons: we have not been able to do skin testing with vaccine products in large series and we have not been able to confirm positive PEG skin testing in the patients who have reacted, so that the allergenic components in the vaccines remain unknown and may be different for each patient.

Evidence-based Data: Coronavirus Disease 2019 Vaccine Surveillance

Monitoring and surveillance platforms are key to identify potential dangerous adverse effects to vaccines and trigger rapid and appropriate response accordingly. Data are produced and used in global, regional or national immunization programmes, regulatory authorities, ministries of health, partners and pharmacovigilance centers as well as vaccine manufacturers. Most of worldwide programs follow the WHO vaccine safety surveillance guidelines, but are adapted according to the needs and possibilities of national or regional levels.^[26] The passive surveillance system supported by the CDC and the FDA in the United States is the Vaccine Adverse Event Reporting System (VAERS).^[27,28] The European Medicines Agency (EudraVigilance), and the WHO (VigiBase) are as well robust international pharmacovigilance databases. Postmarketing safety trials will be essential to continue to increase knowledge about COVID-19 vaccine safety and efficacy, particularly in populations absent or underrepresented in preauthorization clinical vaccine trials, such as children and pregnant women.

Populational-based studies and national surveillance programs do not count with specific investigation to confirm (or not) allergies and understand the mechanisms involved. However, clinical complaints that arise immediately after the administration of a vaccine, whether or not compatible with an allergic reaction, have a significant impact on the public's perception of vaccines and their willingness to be vaccinated more.

Early safety monitoring of the Pfizer-BioNTech COVID-19 vaccine detected 21 cases of anaphylaxis after reported administration of 1 893 360 first doses of Pfizer-BioNTech COVID-19 vaccine (11.1 cases per million vaccine doses administered) as well as cases of less severe nonanaphylactic reactions, based on US data on 14–23 December 2020.^[29] Most (86%) anaphylactic cases developed symptoms within 30 min of vaccination, and 81% had a personal history of allergies or allergic reactions, including previous anaphylaxis. Most (90%) reported anaphylaxis cases after receipt of Pfizer-BioNTech COVID-19 vaccine occurred in women, although 64% of the vaccine doses administered were given in women.^[2]

Since the initial UK reports, in which two cases of anaphylaxis after mRNA Pfizer/BioNTech COVID-19 vaccine, only one patient was confirmed to be allergic to PEG,^[7] other reports have followed, without allergy work up so far. Therefore, the level of evidence that PEG-2000 is the culprit agent is so far null.

US CDC estimated that anaphylaxis to the mRNA COVID-19 vaccines would occur in 2.5–11.1 cases per million of doses, largely in individuals with a history of allergy with no indication of a confirmed role of PEG.^[7] Blumenthal *et al.*^[30] observed from all 64 900 subjects who received the first dose of mRNA COVID-19 vaccine, 16 developed self-reported anaphylaxis (0.025% [95% CI 0.014–0.040%]), 7 cases from the Pfizer/BioNTech vaccine (0.02% [95% CI 0.011–0.056%]) and 9 from Moderna vaccine (0.023% [95% CI 0.011–0.044%]), which



dramatically raises the possible incidence to 30 (Pfizer) to 70 (Moderna) per million. Most of the vaccine recipients with anaphylaxis had allergy histories, with 31% having prior anaphylaxis. The main limitation of this study is that the data presented was based on self-reported reports and covered 81% of all vaccinated subjects in their area.

The last publication from the French National Agency for the Safety of Medicines and Health Products (ANSM), reports lower number of cases. From overall 13 610 000 doses in 8 April 2021, 9 889 000 were Pfizer/BioNTech vaccines, 994 000 were Moderna vaccine and 2 725 089 AstraZeneca vaccine. Sixty-seven severe hypersensitivity reactions were reported (0.0005% per application), 58 cases (5.86 per million) from Pfizer/BioNTech vaccine, four cases (4.02 per million) from Moderna vaccine and five cases (1.83 per million) from AstraZeneca vaccine.^[20] [Table 1](#) shows the current rate of anaphylaxis per million of doses according to the COVID-19 vaccine surveillance platforms and records.

Lessons From the Field

We are dealing with a new generation of vaccines, with innovative mechanisms and promising effects, but with potential adverse reactions, as for any drug. We still have limited data so far regarding the allergic or hypersensitivity effects associated with COVID-19 vaccines, but what is truly known are three facts that are novel and have never been reported before for any vaccination campaign:

There is a Predominance of Females who Present Hypersensitivity Reactions and Anaphylaxis (Over 90% of the Patients Reported in all Published Studies are Females)

One possible explanation for the sex imbalance is that sensitization to PEG (if confirmed the major culprit) is more common in women due to the relatively frequent exposure to PEG-containing products, such as cutaneous exposure to cosmetics or the use of medications such as contraceptives. Preexisting anti-PEG antibodies have been reported to be associated with severe allergic reactions upon administration of a PEGylated drug,^[22,31] suggesting that prior exposure to the PEG-containing products may sensitize subjects and establish anti-PEG hypersensitivity. The female-biased severe allergic reaction against mRNA COVID-19 vaccines is partly supported by a higher prevalence of anti-PEG antibodies in women than in men.^[22] Another possible explanation is the effect of hormones, such as estrogens, in allergic immunological responses. Hormonal status and the X-chromosome coded factors are deeply involved in the regulation of T-cell and B-cell responses, which may influence the sex differences noticed in allergic diseases.^[32] Although the influence of hormones is not fully understood in anaphylaxis, the possible role of sex hormones is indirectly suggested through the rare phenotype of catamenial and breastfeeding anaphylaxis.^[33,34] Estrogen and progesterone affect mast cells *in vitro* but *in vivo* effects are still unknown.^[35,36] An animal model has demonstrated that anaphylaxis is more severe in female than male mice and that estrogens upregulate endothelial nitric oxide synthase and mast cell degranulation, resulting in increased vascular permeability and systemic manifestations.^[37]

Sixty Percent of the Patients who Reacted had Previous Food Allergy, Drug Allergy, Hymenoptera Allergy or Reacted to Allergen Immunotherapy and/or Carry an Epinephrine Device

If we consider that about 30% of persons in the general population might have a personal history of some allergic condition, the data provided so far indicates that patients who experienced mRNA vaccine-related anaphylaxis reports two-fold more associated allergic or hypersensitivity conditions when compared to the general population. However, it is still not clear the reasons for this association. Even with this association, the formal recommendation is that people get vaccinated even if they have a history of severe allergic/hypersensitivity reactions not related to vaccines or injectable medications. Patients with a personal history of allergies to oral medications or familiar history of severe allergic/hypersensitivity reactions should also be vaccinated.^[2]

Thirty Percent of the Patients who Reacted had Prior Anaphylaxis

In the context of new vaccines development and licensed at an unprecedented pace, there is additional pressure to properly distinguish symptoms directly related to mast cell degranulation from other mechanisms of action, to discern true immune-mediated allergic reactions within the larger context of adverse reactions. Overestimating anaphylaxis rates after COVID-19 vaccine injections is able to delay or deter vaccination programs. Public health bodies and healthcare professionals must apply the most accurate criteria to assign the diagnosis of anaphylaxis.

All cases of the personal history of anaphylaxis to the vaccine or a parenteral biological, an injected steroid, colonoscopy preparation, or laxatives and personal history of idiopathic anaphylaxis should receive individualized evaluation before receiving the mRNA vaccine.^[11]



Relevance of Allergy in Patient Selection for Vaccination

Healthcare workers must follow local authorizations and policy in terms of indications and contra-indications for vaccines against COVID-19. Even with high number of guidance and recommendations from the allergy academies, all convey that the only recommendation should be addressed to patients who experienced prior allergic reaction to the vaccine in question or its components. These cases should be referred to allergists for risk stratification and allergy work-up to tailor the etiological diagnosis and recommendations. Allergists worldwide are currently testing these patients and documented case series will likely soon be published.

Potential risk factors should be controlled before the vaccination, such as asthma, as for any vaccine. Although patients with clonal mast cells disorders, including mastocytosis, are at risk for mast cells activation and anaphylaxis when exposed to certain drugs and procedures, there is no evidence of increased sensitization or reactivity to COVID-19 vaccine components. Patients with mast cells activation disorders may be good candidates for mRNA COVID-19 vaccines, with premedication, in an appropriate setting and under medical surveillance. [\[38–40\]](#)

Various diagnostic algorithms have emerged to investigate allergy to vaccine and PEG, however, the main concerns are: the choice of vaccine after anaphylaxis to a first vaccine dose and, the patients with proven PEG allergy, not to mention the potential cross-reactivity between PEG and polysorbates. Generally, subjects who developed a systemic allergic reaction to a vaccine, should not receive a second dose of the same type of vaccine, nor a vaccine with similar excipients without prior allergy work up.

Conclusion

Vaccines against COVID-19 are an essential global intervention to control the current pandemic situation. Anaphylactic reactions have been reported after severe acute respiratory syndrome coronavirus 2 RNA vaccines. This risk is estimated at 2.5–11/1 000 000 in the context of vaccine safety surveillance programs. The COVID-19 vaccination is rolling out vastly and surveillance programs are key to monitor severe adverse reactions, such as anaphylaxis. Anaphylaxis due to vaccine is extremely rare and specific cases should receive individualized investigation and care. The role of PEG still needs to be proven.

Even Highly Allergic Adults Unlikely to React to COVID-19 Vaccine

Source: <https://www.medscape.com/viewarticle/957843>

Aug 31 – About 2% of highly allergic individuals had a reaction to the Pfizer-BioNTech COVID-19 vaccine, according to new research from Israel [published online](#) August 31 in *JAMA Network Open*. Symptoms resolved in a few hours with medication, and no patients required hospitalization.

About 2% of highly allergic individuals had a reaction to the Pfizer-BioNTech COVID-19 vaccine in a study from Israel published August 31 in *JAMA Network Open*. Symptoms resolved in a few hours with medication, and no patients required hospitalization.

Risk for allergic reaction has been one of several obstacles in global vaccination efforts, the authors, led by Nancy Agmon-Levin, MD, of the Sheba Medical Center, Ramat Gan, Israel, write. Clinical trials for the Moderna and Pfizer-BioNTech COVID-19 vaccines excluded individuals with allergies to any component of the vaccine or with previous allergies to other vaccines. Early reports of [anaphylaxis](#) in reaction to the vaccines caused concern among patients and practitioners. Soon after, the Centers for Disease Control and Prevention and other authorities [released guidance](#) on preparing for allergic reactions. "Despite these recommendations, uncertainty remains, particularly among patients with a history of anaphylaxis and/or multiple allergies," the authors write.

In response to early concerns, the Sheba Medical Center opened a COVID-19 referral center to address safety questions and to conduct assessments of allergy risk for the Pfizer-BioNTech vaccine, the first COVID-19 vaccine approved in Israel. From December 27, 2020, to February 22, 2021, the referral center assessed 8102 patients with allergies. Those who were not clearly at low risk filled out a questionnaire about prior allergic or anaphylactic reactions to drugs or vaccines, other allergies, and other relevant medical history. Patients were considered to be at high risk for allergic reactions if they met at least one of the following criteria: previous anaphylactic reaction to any drug or vaccine, multiple drug allergies, multiple other allergies, and mast cell disorders. Individuals were also classified as high risk if their healthcare practitioner deferred vaccination because of allergy concerns.

Nearly 95% of the cohort (7668 individuals) were classified as low risk and received both Pfizer vaccine doses at standard immunization sites and underwent 30 minutes of observation after immunization. Although the study did not follow these lower-risk patients, "no serious allergic reactions were reported back to our referral center by patients or their general practitioner after immunization in the regular settings," the authors write.

Five patients were considered ineligible for immunization because of known sensitivity to polyethylene glycol or multiple anaphylactic reactions to different injectable drugs, following recommendations from



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the Ministry of Health of Israel at the time. The remaining 429 individuals were deemed to be at high risk and underwent observation for 2 hours from a dedicated allergy team after immunization. For these high-risk patients, both vaccine doses were administered in the same setting. Patients also reported any adverse reactions in the 21 days between the first and second dose.

Women made up most of the high-risk cohort (70.9%). The average age of participants was 52 years. Of the high-risk individuals, 63.2% reported prior anaphylaxis, 32.9% had multiple drug allergies, and 30.3% had multiple other allergies.

During the first 2 hours following immunization, nine individuals (2.1%), all women, experienced allergic reactions. Six individuals (1.4%) experienced minor reactions, including skin flushing, tongue or uvula swelling, or a cough that resolved with antihistamine treatment during the observation period. Three patients (0.7%) had anaphylactic reactions that occurred 10 to 20 minutes after injection. All three patients experienced significant bronchospasm, skin eruption, itching, and shortness of breath. Two patients experienced [angioedema](#), and one patient had gastrointestinal symptoms. They were treated with adrenaline, antihistamines, and an inhaled bronchodilator. All symptoms resolved within 2 to 6 hours, and no patient required hospitalization.

In the days following vaccination, patients commonly reported pain at the injection site, fatigue, muscle pain, and [headache](#); 14.7% of patients reported skin eruption, itching, or [urticaria](#).

"Epinephrine is the first-line management for anaphylaxis, but sadly, many patients with anaphylaxis are still treated with antihistamines, glucocorticoids, or antiemetics before they are treated with epinephrine."

Marcus S. Shaker, MD, FAAP, FACAAI, FAAAAI, Professor of pediatrics and of medicine at the Dartmouth Geisel School of Medicine and a physician at the Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire, USA.

As of February 22, 2021, 218 patients from this highly allergic cohort received their second dose of the vaccine. Four patients (1.8%) had mild allergic reactions. All four developed flushing, and one patient also developed a cough that resolved with antihistamine treatment. Three of these patients had experienced mild allergic reactions to the first dose and were premedicated for the second dose. One patient only reacted to the second dose.

The findings should be "very reassuring" to individuals hesitant to receive the vaccine, [Elizabeth Phillips, MD](#), the director of the Center for Drug Safety and Immunology at Vanderbilt University Medical Center, told *Medscape Medical News*. She was not involved with the research and wrote an invited commentary on the study. "The rates of anaphylaxis and allergic reactions are truly quite low," she said. Although about 2% of the high-risk group developed allergic reactions to immunization, the overall percentage for the entire cohort would be much lower, she noted.

The study did not investigate specific risk factors for and mechanisms of allergic reactions to COVID-19 vaccines, Phillips said, which is a study limitation that the authors also acknowledge. The National Institute for Allergy and Infectious Diseases is currently trying to answer some of these questions with a multisite, randomized, double-blinded [study](#). The study is intended to help understand why people have these allergic reactions, Phillips added. Vanderbilt is one of the sites for the study.

While researchers continue to hunt for answers, the algorithm developed by the authors provides "a great strategy to get people that are at higher risk vaccinated in a monitored setting," she said. The results show that "people should not be avoiding vaccination because of a history of anaphylaxis."

What Can Masks Do?

Source: <https://www.homelandsecuritynewswire.com/dr20211015-what-can-masks-do>

Oct 15 – Facemasks have been a contentious issue since the outbreak of the COVID-19 epidemic, and the discussion of whether or not the wearing of facemasks should be required – and who has the right, if any, to mandate the wearing of facemasks – has become thoroughly politicized.

Lisa M Brosseau and colleagues, in a 2-part series in [CIDRAP](#), examine the important issues: whether facemasks are effective in preventing or slowing down the spread of COVID-19, and whether the various studies of facemask effectiveness were properly conducted. Their answer to both questions is a qualified "no."

The authors write:

we want to make clear that we are not "anti-mask." Rather, we are in favor of wearing the most protective facepiece for the setting—such as a non-fit tested respirator when spending more than a few minutes in a crowded indoor space—and in combination with other interventions.

The data are clear that most cloth face coverings and surgical masks offer very limited source control (protection of others from pathogens by limiting emissions from an infected



person) and personal protection against small inhalable infectious particles and should not be considered a replacement for other, more effective methods of reducing one's exposure to SARS-CoV-2, such as vaccination and good ventilation.

They add:

Mask wearing has been an extremely polarizing and politicized topic across the world, but especially in the United States. Endless unrealistic expectations, along with gross misinterpretation and overconfidence, have been evident, including claims that masks alone would “flatten the curve,” “end the pandemic,” or “reduce the clinical severity of COVID-19.” Now, one and a half years into the pandemic, if masks were as effective as many believed them to be, we should have seen significant impacts. But that has not been the case anywhere on the globe.

This is not to say that masks do not play a role in disease control, but that public health officials should not oversell the role of masks. Rather, they need to encourage appropriate mask use in the context of other highly effective interventions such as vaccination.

They conclude:

It is time to lower the unrealistic expectations about masks—or any single intervention. Public health messaging needs to be focused on many interventions, starting with those at the top of the hierarchy. Masks offer very limited source control, and personal protection and should not be considered a replacement for vaccination or equivalent to interventions such as limiting time and numbers of people in a shared space or improving air movement.

Scientists must return to the time-honored practice of waiting for peer review before touting their study findings. No single study, regardless of the number of subjects, deserves to skip that important step in the process of building a body of evidence.

We urge journalists to not be taken in by scientists' claims for their non-peer-reviewed studies, even if those scientists hail from highly reputable institutions. Rather, we urge journalists and news outlets to question closely why scientists find it necessary to advertise their study ahead of peer review.

We are well past the emergency phase of this pandemic, and it should be well-known by now that wearing cloth face coverings or surgical masks, universal or otherwise, has a very minor role to play in preventing person-to-person transmission. It is time to stop overselling their efficacy and unrealistic expectations about their ability to end the pandemic.

EDITOR'S COMMENT: They wrote “if masks were as effective as many believed them to be, we should have seen significant impacts. But that has not been the case anywhere on the globe.” What if no masks were used at all? What would be the course of the pandemic during these 18 months? This is a carrot and whip approach trying to balance between the pro and cons to be politically correct. I do not agree with them. People must wear surgical masks and above. People must not wear cloth masks. Plus hands washing and crowd avoiding/proper ventilation. So simple – end of story!



Commission warns critical infrastructure at biological risk

Source: <https://biodefensecommission.org/reports/insidious-scourge-critical-infrastructure-at-biological-risk/>

Oct 05 – As the Biden Administration and Congress continue to negotiate details of a federal infrastructure package, the Bipartisan Commission on Biodefense released a new report today entitled, **Insidious Scourge: Critical Infrastructure at Biological Risk**. The report urges the Administration, Congress, and the private sector reduce biological risk by protecting infrastructure, sharing and securing information, maintaining public works and services, and ensuring public health and safety.

“COVID-19 decimated many organizational operations across all 16 of the critical infrastructure sectors that keep this Nation going,” said Commissioner and former U.S. Representative Jim Greenwood. “Current estimates see the COVID-19 pandemic costing the United States at least \$16 trillion. Working together to implement the recommendations in this report, public and private sector critical infrastructure



leaders can prevent the sort of cascading failures they experienced during the pandemic and get ahead of the next biological event.”

“COVID-19 continues to demonstrate just how devastating a biological event can be to our Nation’s critical infrastructure (the 16 sectors composed of physical and virtual assets, systems, and networks vital to national security, economic security, and public health and safety). Pandemics caused by coronaviruses, influenza, and other pathogens have decreased available manpower for all critical infrastructure due to illness and death, and specifically impeded aviation and other transportation systems commercial facilities that host mass gatherings, schools, efficient operation of government facilities, our ability to produce and provide medical countermeasures, while increasing demand for power, water, and other critical resources,” said Commission Co-Chair, former Senator Joe Lieberman. “The federal government needs to exert leadership and work with the private sector and international partners to manage and reduce biological risk to critical infrastructure now.”

“I’ve seen the good work the federal government and private sector have accomplished in the critical infrastructure arena firsthand. COVID-19 is not the first biological event to which they have responded and it will not be their last,” said former Secretary of Homeland Security and Commission Co-Chair, Governor Tom Ridge. “The critical infrastructure community should reflect on their historical experience dealing with outbreaks, epidemics, and pandemics; take the targeted actions identified in this report, and ensure that the critical infrastructure we need for our economy and society will continue to function during any biological crisis.”

▶▶ Those interested can download the new report [here](#).

COVID-19: How Do School Closures Affect Youth Mental Health?

By MDEdge News Author: Kate Johnson; CME Author: Laurie Barclay, MD Faculty and Disclosures

Source: <https://www.medscape.org/viewarticle/960619>

Oct 15 – During the COVID-19 pandemic, in-person schooling was disrupted for most school-aged youths, with negative, inequitable mental health sequelae. Low-income, Black, and Hispanic populations are most likely to receive fully remote instruction.

Study Synopsis and Perspective

Back-to-school jitters are heightened this year, as children head back to the risk for COVID-19 transmission in class, but one upside to the return of in-person school may be better mental health for students.

New research shows that virtual schooling, which dominated in many districts last year, was associated with worse mental health outcomes for students: especially older ones, and youths from Black, Hispanic, or lower-income families were hit hardest because they experienced the most closures.

“Schools with lower funding may have had more difficulty meeting guidelines for safe reopening, including updates to ventilation systems and finding the physical space to create safe distancing between children,” explained lead author Matt Hawrilenko, PhD, of the department of psychiatry and behavioral sciences at the University of Washington, Seattle, Washington, in an interview.

“In the context of complex school reopening decisions that balance competing risks and benefits, these findings suggest that allocating funding to support safe in-person instruction may reduce mental health inequities associated with race/ethnicity and income,” he and his coauthors noted in the study, published in *JAMA Network Open*.^[1] “Ensuring that all students have access to additional educational and mental health resources must be an important public health priority, met with appropriate funding and work force augmentation, during and beyond the COVID-19 pandemic.”

The study used a cross-sectional population-based survey of 2324 parents of school-aged children in the United States. It was administered in English and Spanish online and over the telephone between December 2 and December 21, 2020, and used the parent-report version of the Strengths and Difficulties Questionnaire (SDQ)^[2] to assess mental health difficulties of 1 child per family in 4 domains: emotional problems, peer problems, conduct, and hyperactivity. Researchers asked parents about what kind of schooling their child had received in the last year (remote, in-person, or hybrid) and about demographic information such as child age, sex, household income, parent race and ethnicity, and parent education.

The results showed that, during the 2020 school year, 58% of children attended school remotely, 24.1% attended fully in person, and 18% attended in a hybrid format.

“Fully remote schooling was strongly patterned along lines of parent race and ethnicity as well as income,” the authors noted. “Parents of 336 children attending school in person (65.8%) but of 597 children attending school fully remotely (44.5%) were White, whereas all other racial/ethnic groups had larger proportions of children attending school fully remotely ($P < .001$).”



In terms of mental health, the findings showed that older children who attended school remotely had more difficulties compared with children who attended in person, but among younger children, remote learning was comparable or slightly better for mental health. Specifically, “a child aged 17 years attending school remotely would be expected to have a total difficulty score 2.4 points higher than a child of the same age attending school in person, corresponding to a small effect size in favor of in-person schooling,” the authors wrote. “Conversely, a child aged 4 years attending school remotely would be expected to have a total difficulty score 0.5 points lower than a child of the same age attending school in person, corresponding to a very small effect size in favor of remote schooling.”

Age of Child Proves Critical

“Our best estimate is that remote schooling was associated with no difference in mental health difficulties at age 6, and with slightly more difficulties with each year of age after that, with differences most clearly apparent for high school-aged kids,” explained Hawrilenko, adding the finding suggests that school reopenings should prioritize older children.

“What kids are doing at home matters,” he added. “In the youngest age group, the biggest work kids are doing in school and childcare settings is social and emotional development... Finding opportunities for regular, safe social interactions with peers -- perhaps during outdoor playdates -- can help them build those skills.”

He emphasized with the anticipated starts and stutters of the new school year there is an important role that doctors can play.

“First, they can help families assess their own risk profile, and whether it makes sense for their children to attend school in person or remotely [to the extent that is an option],” Hawrilenko explained. “Second, they can help families think through how school closures might impact their child specifically. For those kids who wind up with long chunks of remote schooling, scheduling in regular interactions with other kids in safe ways could make a big difference. Another driver of child anxiety might be learning loss, and this is a good place to reinforce that not every mental health problem needs a mental health solution.

“A lot of kids might be rightfully anxious about having fallen behind over the pandemic,” he continued. “These kids are preparing to transition to college or to the workforce and may be feeling increasingly behind while approaching these moments of transition. Pointing families toward the resources to help them navigate these issues could go a long way to helping quell child anxiety.”

Research Helps Fill Vacuum

Elizabeth A. Stuart, PhD,³¹ who was not involved in the study, said in an interview that this research is particularly valuable because there have been very few data on this topic, especially on a large-scale national sample.

“Sadly, many of the results are not surprising,” said Stuart, a statistician and professor of mental health at Johns Hopkins University, Baltimore, Maryland. “Data have shown significant mental health challenges for adults during the pandemic, and it is not surprising that children and youth would experience that as well, especially for those whose daily routines and structures changed dramatically and who were not able to be interacting in-person with teachers, staff, and classmates. This is an important reminder that schools provide not just academic instruction for students, but that the social interactions and other services (such as behavioral health supports, meals, and connections with other social services) students might receive in school are crucial.

“It has been heartening to see a stronger commitment to getting students safely back into school this fall across the country, and that the Centers for Disease Control and Prevention highlighted the benefits of in-person schooling in their COVID-19–related guidance for schools,” she commented.

Stuart added that, as students return to classes, it will be important for schools to tackle ongoing mental health challenges: “Some students may be struggling in obvious ways; for others it may be harder to identify. It will also be important to continue to monitor children’s and youth mental health... as returning to in-person school may bring its own challenges. For some individuals and communities, the mental health impacts of the pandemic may last even after the physical health risks resolve.”

Hawrilenko agreed: “From a policy perspective, I am quite frankly terrified about how these inequities – in particular, learning loss – might play out long after school closures are a distant memory,” he said. “It is critical to provide schools the resources not just to minimize risk when reopening, but additional funding for workforce augmentation – both for mental health staffing and for additional educational support – to help students navigate the months and years over which they transition back into the classroom.”

Study Highlights

- Participants (n = 2324; 71.9% women; 10.5% Black, 16% Hispanic; 18.1% high school or less educated) were surveyed between December 2 and December 21, 2020.
- Children attending school in person vs remotely had higher household incomes (mean difference, \$9719 [95% CI: 4327, 15,111]; $P < .001$) and were more likely to be White (65.8% vs 44.5%; $P < .001$).



- Older children in remote vs in-person schooling had more mental health difficulties, mostly emotional, on SDQ, with small effect sizes favoring in-person schooling for older children and very small effect sizes favoring remote schooling for younger children.
- Children from families with higher vs lower income benefited more from in-person but not hybrid schooling, with differences driven by conduct and hyperactivity.
- Learning pods fully buffered the associations of hybrid but not remote schooling, with negative mental health outcomes.
- The investigators concluded that older and Black and Hispanic children and youths from lower-income families who attend school remotely may experience greater mental health problems than their younger, White, and higher-income peers.
- During and beyond the COVID-19 pandemic, providing all students with access to additional educational and mental health resources must be an important public health priority, requiring appropriate funding and workforce.
- Even with return to in-person instruction, mental health inequities may not resolve spontaneously.
- Given complex school reopening decisions weighing competing risks and benefits, allocating funding to support safe in-person instruction may reduce racial/ethnic and income mental health inequities.
- Identifying persons at greatest risk for poor mental health may help inform resource allocation during the pandemic.
- Reopenings to date have prioritized younger children because of their lower transmission rates and relatively higher burden of care needed from working parents.
- Nonetheless, these findings suggest that school closings have disproportionately harmed mental health adjustment for older children, who may most need targeted support now and as children fully return to school.
- Emotional problems from less social connection and disrupted health behavior routines, including less physical activity, may resolve naturally with return to in-person schooling.
- Academic -- not mental health -- interventions may better address anxiety over learning loss during remote schooling.
- Learning pods buffered the negative associations of hybrid but not remote schooling, possibly by keeping children engaged and supporting them to transition effectively across the hybrid modalities.
- Available options may influence school modality differences.
- Relatively affluent Non-Hispanic Whites are more likely to attend private schools, which were more likely open during the pandemic.
- As less affluent and Black and Hispanic families have lower confidence that their child's school can adequately reduce COVID-19 risk and are more likely to have a high-risk family member, they may more likely choose remote schooling.
- Higher vs lower family income was associated with greater benefit from in-person schooling, suggesting higher-resource schools are better equipped to help regulate child behavior because of smaller classes, closer student-teacher relationships, and more school counselors per student.
- During remote instruction, school counselors had less direct contact with students as they filled logistical or administrative roles.
- Adequate funding and role prioritization is essential for trained clinical personnel in schools to focus on student mental health care, but inadequate staffing predated the pandemic.
- Responding to the pandemic's consequences presents opportunities for longer-term changes strengthening school funding for mental health personnel and connections to school- and community-based mental health supports (eg, screening or routine check-ins with school counselors and online interventions).
- Remote schooling may impair child mental health by social connection loss, reduced mental health services access, difficulty identifying youth abuse, missed meals, disrupted routines, and stress from online learning.
- Older children forming more complex social relationships and navigating higher-stakes academic outcomes may be at greater risk.
- Youths may be uniquely susceptible to negative mental health outcomes if pandemic-related disruptions to in-person schooling accompany racism, poverty, food insecurity, home instability, or other adverse circumstances.

Clinical Implications

- Older children and youths from lower income families had more mental health problems linked to school closures during the COVID-19 pandemic.
- Providing all students with access to additional educational and mental health resources must be an important public health priority.



- Implications for the Healthcare Team: Youths from Black, Hispanic, or lower-income families were hit hardest because of more closures; therefore, members of the healthcare team must provide diversity-appropriate mental health support and resources.

Detector Dogs Have New Role in Airports

Source: <https://i-hls.com/archives/111119>



Oct 15 – Studies have demonstrated that detector dogs are one of the most reliable tools available to identify substances based on the odors they emit. Previous studies include demonstrating that detector dogs can reliably detect persons that have diseases, such as diabetes, epilepsy, and certain cancers. Detector dogs have the potential for immediate detection and response to the virus in public spaces like airports. A new option currently under testing is **COVID-19 sniffing canines**. Miami International Airport (MIA) is now testing detector dogs specially trained with protocols created by the Global Forensic and Justice Center (GFJC) at Florida International University (FIU).



The 30-day COVID-19 detector dog pilot program is the first in a U.S. airport. The dogs are deployed at an employee security checkpoint.

After hundreds of training sessions at FIU's Modesto Maidique Campus in Miami this year, the detector dogs achieved accuracy rates from 96 to 99 percent for detecting COVID-19 in published peer-reviewed, double-blind trials. After the pilot program ends, FIU will continue to work on the accuracy

and specificity, which will assist in COVID variant detection, of the canine following scientifically validated methods.

The two dogs in the pilot program at MIA have been trained to alert to the scent of COVID-19. The virus causes metabolic changes in a person that result in the production of volatile organic compounds (VOCs). The VOCs are excreted by a person's breath and sweat, producing a scent that trained dogs can detect. The metabolic changes are common for all people, regardless of their individual scents. If a dog indicates an individual is carrying the odor of the virus, that person is directed to get a rapid COVID test, as reported by miami-airport.com. It will be interesting to see if the procedure gains momentum in other airports around the world.



What to know about the covid-19 treatment molnupiravir

Source: <https://www.washingtonpost.com/health/2021/10/18/molnupiravir-anti-covid-pill-merck/>

Oct 18 – The world could soon be armed with another tool to fight the [coronavirus](#) pandemic: a twice-daily pill that has been shown to reduce the risk of hospitalization and death among people infected with the coronavirus.

The drug, **molnupiravir**, offers another tool alongside vaccines for countries to manage the coronavirus pandemic. Here's what you need to know about it:



What is molnupiravir?

Molnupiravir is an antiviral pill by pharmaceutical giant Merck that aims to prevent mild to moderate cases of covid-19 from becoming severe cases that result in hospitalization or death.

People who have covid-19 take the drug twice a day for five days, starting within five days of the onset of symptoms.

It was [shown in an international clinical trial](#) of 775 high-risk, unvaccinated people to cut the risk of hospitalization and death in half (the participants had at least one risk factor for severe covid-19, such as obesity or advanced age). The treatment was also shown in a separate [trial](#) to accelerate the clearance of infectious virus from the nose and throat, indicating that it may also help reduce the spread of the virus.

Still, medical experts warn that vaccines remain the primary tool against the coronavirus, as it is better to prevent people from getting the virus than to treat it after infection.

When will molnupiravir become available?

Merck has submitted data to the Food and Drug Administration following the success of its trial — which was ended early because of its positive results — seeking emergency use authorization for molnupiravir.

Merck and its partner Ridgeback Biotherapeutics said in a [news release](#) that, in addition to submitting their FDA application, they plan to apply for emergency use or marketing authorization in other countries “in the coming months.” Ahead of a decision by U.S. regulators, the companies have already started producing the pill, and have agreed to sell courses of the treatment to the United States and other countries if they get the green light.

An FDA advisory committee will [meet](#) Nov. 30 to discuss the emergency use authorization request, setting a timeline that could have the drug available by the end of the year.

How is molnupiravir different from other covid-19 drugs?

Molnupiravir stands out from other covid-19 treatments for its ease of use. The use of monoclonal antibodies, a treatment that is infused or injected, did not take off widely in the United States, as medical experts say that the treatment is costly and difficult to deliver.

Remdesivir, which, like molnupiravir is an antiviral drug, is administered by injection. It has been shown to shorten hospital stays, but for much of the past year it had [unclear results](#) on other aspects of covid-19 infection, such as severe illness or death. Gilead, the maker of remdesivir, [said](#) last month that it reduces risk of hospitalization.

In contrast, molnupiravir can be prescribed like other pills, taken at home and stored easily.

An older steroid medication, dexamethasone, has been shown in rigorous, placebo-controlled trials to reduce death by a third in patients on ventilators. It is being widely used in intensive care units, often in tandem with remdesivir.

A drug that can treat covid-19 could be a more palatable option for those seeking treatment and turning to unproven coronavirus cures. [Ivermectin](#), a deworming drug commonly used in livestock and sometimes in humans, gained traction among some as a covid-19 treatment after misinformation about it spread online, prompting the FDA to warn people not to use it to treat covid-19.

Hydroxychloroquine, an anti-malaria drug President Donald Trump touted in the spring of 2020, won an emergency authorization from the FDA that proved to be premature. Clinical trials showed it did not work, and the FDA withdrew the authorization in June.



Where will molnupiravir be used?

The United States, with millions of people still unvaccinated, has made an advance purchase of \$1.2 billion worth of molnupiravir — about 1.7 million treatments. Australia, Singapore and South Korea have also made purchase agreements.

The simple process to deliver, store and administer the drug could prove particularly useful in poorer nations. Vaccine distribution efforts in countries that lacked a robust medical infrastructure struggled to get shots in arms, even if they had an adequate supply, as the vaccine doses require extremely cold refrigeration and people trained to administer the shots.

Merck licensed the drug to five generic drugmakers in India to accelerate its availability in low- and middle-income countries.

Still, some experts and public health organizations have raised concerns that without a clearly articulated plan to supply countries or to negotiate contracts, global efforts to secure the drug for poorer countries could run into the same challenges Covax, the World Health Organization-backed initiative to distribute vaccine doses equitably, ran into in distributing vaccines.

"Anticipatory and preparatory work is needed to ensure rapid availability and uptake of any new treatments," an [independent report](#) commissioned by the WHO urged, noting that the United States' advance purchases of molnupiravir presented an example of that risk.

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Open Medicine 2021; 16: 955–963


Research Article

Vladan Radosavljevic*

Analysis of COVID-19 outbreak origin in China in 2019 using differentiation method for unusual epidemiological events



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There May Be People Who Are Genetically Resistant to COVID-19, Scientists Say

 Source: <https://www.sciencealert.com/scientists-think-that-there-are-people-out-there-who-could-be-genetically-resistant-to-covid>

Oct 19 – **Two humans are at least 99.9 percent genetically identical to each other. But it's that 0.1 percent or so that makes us special.**

This is what determines all our differences, from the unique ways we look, to our resistance or susceptibility to diseases such as [HIV](#). Certain tiny tweaks in the genetic code can be incredibly helpful not only for the individual, but society.

The more we know about these special genes (and the people who have them) the better, as it might be possible to [create drugs](#) that can mimic useful genetic differences.

With that in mind, researchers are searching for people around the world who might be resistant to the [SARS-CoV-2 virus](#). Your genes could hold the keys to potentially treating [COVID-19](#).

"The introduction of SARS-CoV-2 to a naive population, on a global scale, has provided yet another demonstration of the remarkable clinical variability between individuals in the course of infection, ranging from asymptomatic infections to life-threatening disease," a team of researchers, led by immunologist Evangelos Andreakos from the Academy of Athens, [writes in a new paper](#).

"Our understanding of the pathophysiology of life-threatening COVID-19 has progressed considerably since the disease was first described in December 2019, but we still know very little about the human genetic and immunological basis of inborn resistance to SARS-CoV-2."

Although we might not have much information about this inborn resistance, it doesn't mean it doesn't exist.

The researchers note that sometimes whole households can be infected, with just a spouse being spared, while there's been other reports of people [somehow avoiding COVID](#) even after being in the 'line of fire' multiple times.



HZS C²BRNE DIARY – October 2021

There's also been some serious research into this already, but so far, the results have only revealed small differences.

For example, [we reported last year](#) that blood type (particularly type O blood) seemed to show a slight resistance to severe SARS-CoV-2 infection. Then there's been other studies looking at proteins such as the [ACE2 receptor](#) or [TMEM41B](#) that the [coronavirus](#) seems to require to either enter or replicate once inside the cell.

The researchers have suggested that we need to be doing more to uncover those secret few in the population who might be genetically resistant to SARS-CoV-2. And they have some ideas about how.

"We propose a strategy for identifying, recruiting, and genetically analyzing individuals who are naturally resistant to SARS-CoV-2 infection," [the team writes](#).

"We first focus on uninfected household contacts of people with symptomatic COVID-19. We then consider individuals exposed to an index case without personal protection equipment, for at least 1 hour per day, and during the first 3-5 days of symptoms in the index case."

This would then be checked with negative PCR tests and negative blood work four weeks after the exposure, particularly looking for T cells to confirm that the person hasn't been infected in the past.

If this sounds like you – good news! The researchers are still looking for participants for their research.

"We have already enrolled more than 400 individuals meeting the criteria for inclusion in a dedicated resistance study cohort," the researchers wrote.

"The collaborative enrolment of study participants is continuing ([link here](#)), and subjects from all over the world are welcome."

With vaccines, promising drugs, and more understanding about the virus, we're seeing life – in some places – start to look a bit more normal.

But COVID will likely be with us for a long time yet to come, and finding people who have some genetic way of being spared by the virus could be a real boon for the rest of us – especially if new, highly virulent strains emerge.

►► This perspective was published in [Nature Immunology](#).

House-to-house polio vaccination to resume in Afghanistan

Source: <https://www.science.org/content/article/house-house-polio-vaccination-resume-afghanistan#.YW7HBB79OXw.twitter>



Oct 18 – The new Taliban government of Afghanistan has given the green light for house-to-house polio vaccination to resume across the entire country on 8 November.

[In November, women may resume giving polio vaccines to children in southern Afghanistan, where the Taliban had banned a vaccination program in 2018.](#) AP Photo/Rahmat Gul

The 18 October announcement is "huge," says Hamid Jafari, who directs operations in the region for the Global Polio Eradication Initiative (GPEI). It will give the program access to 3.3 million Afghan children who have been out of reach for 3.5 years—and might bring the

world closer to the ultimate goal of global polio eradication.

A decadeslong campaign against the disease has left Afghanistan as one of just two countries, along with neighboring Pakistan, to still harbor the wild polio virus. But the fight has been hamstrung there since 2018, when the Taliban, suspicious that vaccinators were helping the U.S. government target drone strikes, banned house-to-house vaccination in its stronghold in southern Afghanistan. Since then, roughly 85% of the country's polio cases have occurred in areas that are off limits to the vaccinators.



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The new government's decision comes at an opportune time, polio officials say. After years of struggle and wildly fluctuating case counts, only one case of wild polio has been detected this year in Afghanistan, and one in Pakistan. (Despite the Taliban's ban, polio surveillance across both countries has remained strong—as has vaccination outside of southern Afghanistan.) Cases resulting from vaccine-derived polio viruses are down, too. "It's a unique opportunity," says Aidan O'Leary, who directs GPEI at the World Health Organization (WHO) in Geneva. "We have to be sure we grab it."

GPEI has quietly negotiated with the Taliban since it imposed the ban in 2018, and those talks intensified when the group began its dizzying blitz this summer and assumed power on 15 August.

Key discussions occurred in September, when WHO Director-General Tedros Adhanom Ghebreyesus and Ahmed Al-Mandhari, WHO's regional director for the Eastern Mediterranean, toured the country and met with senior Taliban leaders. In those talks, says Jafari, who was part of WHO's delegation, Taliban officials made clear that their first priority was to shore up the Sehatmandi Project, the backbone of Afghanistan's health system. (*Sehatmandi* means "health" in Urdu.) Its major donors, including the World Bank, the European Union, and the U.S. Agency for International Development, froze funds when the Taliban took over. By 1 month ago, just 17% of the system's more than 2300 health facilities were operating, and many of its 20,000 health workers had not been paid. The system was on "the brink of collapse," Tedros and Al-Mandhari said in a 22 September statement, warning of "an imminent humanitarian catastrophe."

Routine childhood immunization has fallen off, says Godwin Mindra, a senior immunization specialist and deputy polio team lead for UNICEF in Kabul, Afghanistan, and measles outbreaks are raging. Many COVID-19 hospitals are closed, and COVID-19 vaccine is sitting unused and near expiration. With local facilities closed, people are crowding into regional hospitals, Mindra says. "I went to one regional hospital in Kandahar, and the patient load had increased three to four times. In the children's ward, there were three to four children in one bed."

On 20 September, the Global Fund threw Afghanistan a lifeline: \$15 million to support Sehatmandi for the month of October. Two days later, the United Nations, through its Central Emergency Response Fund, kicked in \$45 million to carry Sehatmandi through January 2022. Then on 24 September, the U.S. Department of the Treasury issued licenses that will allow organizations to provide humanitarian assistance to Afghanistan without violating U.S. sanctions. However, no new money has yet come through.

The November polio campaign will target 10 million children. It's "our strong desire to vaccinate and protect as many children in Afghanistan as we can, and the persistently missed children in particular," O'Leary says. As usual, the vaccinators will be women—under Afghan custom, only women can enter a home. This time they must wear hijabs, but most do anyway, Jafari says.

Jafari says the program intends to help address other health needs, too. Polio vaccinators will also administer vitamin A, and the program hopes to help deliver measles and COVID-19 vaccines when feasible.

GPEI will conduct a second campaign in December, synchronized with one in Pakistan. Polio has to be tackled in both countries at once, Jafari says. "If not, one will surely reinfect the other country."

Six more polio vaccination campaigns are planned for Afghanistan in 2022. But with support for Sehatmandi assured only through January, their prospects are uncertain. "The global community needs to find a sustainable solution or Afghanistan will go into the next level of crisis," Jafari says. And as for polio, "The risk of resurgence remains very high."

Experts claim the new Bond film is "nearly on the mark" in depicting terrorists capable of causing pandemics.

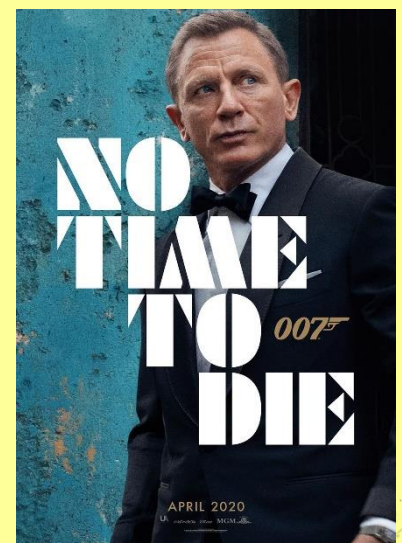
Source: <https://en.brinkwire.com/news/experts-claim-the-new-bond-film-is-nearly-on-the-mark-in-depicting-terrorists-capable-of-causing-pandemics/>

Oct 19 – Experts claim the new Bond film is "nearly on the mark" in depicting terrorists capable of causing pandemics.

One of the world's foremost biological warfare scientists cautioned Friday night that the latest James Bond film is "nearly on the money" in terms of depicting how terrorists might manipulate diseases to develop bioweapons, and governments must do more to safeguard populations from this threat.

The lack of any police of 3,000 Level 3 laboratories, which contain lethal diseases, is a major issue, according to Col Hamish de Bretton-Gordon.

Many of these can be located in "untrustworthy" countries including Pakistan, Iraq, Syria, and Iran. Mozambique and Russia, where either a state-led or rogue, terrorist-led bioterrorism threat exists.



What is biohacking?

Source: <https://www.newsanyway.com/2021/10/05/what-is-biohacking/>

Oct 18 – Biohacking is body modification, human augmentation or human enhancement aimed at enhancing abilities, improving performance, health, and wellbeing through intentional interventions. Biohacking is a practice of changing the chemistry and physiology of the body by self-experimentation to energize and enhance the body.

The concept is constantly evolving. It focuses on self-improvement, by incorporating numerous ways and methods working beyond traditional medical or scientific research environment. The concept is rooted in the idea that by changing the body and brain, one can become healthier, smarter and efficient human beings.

Biohackers use science and technology to make their body function more efficiently by:

- Implementing lifestyle changes and adopting a healthy diet to improve the health and well-being of the body.
- Using wearable technology such as smartwatches or fitness-tracking bands to track and monitor body functions.
- Using implant technology and genetic engineering to monitor and regulate physiological function.



What are the Types of Biohacking?

Typically, biohacking is categorized into three types: nutrigenomics, do-it-yourself biology and grinder biohacking.

- **Nutrigenomics**

Nutrigenomics explores how different nutrients in food affect the body's genetic expression and how a person perceives, reasons and behaves. Nutrigenomics companies evaluate the DNA for certain genetic markers and prescribe a personalized diet plan.

Nutrigenomics may benefit the body in numerous ways, such as:

- Attaining physical, mental and emotional well being
- Decreasing risk of genetically predisposed disease
- Losing weight
- Optimize body function
- Reducing depression symptoms

Though the food one takes has an influence on genes, everyone responds in different ways to dietary changes or routines. Other factors such as exercise, stress and weight also play a role in how the body responds to food.

- **DIY Biology**

DIY biology is a type of biohacking directed by people with scientific knowledge and experience. They share tips and also techniques to help non-experts conduct self-experiments on themselves outside experimental environment, such as labs or medical offices. There can be dangerous or fatal consequences if one is not trained. Exposure to harmful biological agents could also cause health complications or break international bioterrorism laws.

- **Grinder**

Grinder is a biohacking method that considers every part of the human body as hack-able. In general, grinders turn themselves into cyborgs, with a combination of implants, embedding magnets, chips or computers, devices, injections and other inserts under their skin, to make the body work the way they want it to. Though the grinder idea may sound innovative and futuristic, it can be dangerous. Implanting foreign objects into the body can cause inflammatory reactions, chronic infections and may also increase risk of developing cancer.

How do you do Bio-hacking?

Bio-hacking can be done through one of the following methods:

- **Cryotherapy**



Cryotherapy or cold therapy is a method of biohacking which exposes the entire body to very cold temperatures causing vasoconstriction throughout the body. When the body returns to normal temperature, blood rushes back to the tissues with lots of nutrients and minerals as well as endorphins rush which increases the feeling of well-being and reduces pain and discomfort. This biohacking technique takes only three minutes and is becoming popular.

- **Red Light Therapy**

Studies show that the red and near-infrared wavelengths of sunlight, which ranges from 600 to 900 nm are absorbed by the skin after which the mitochondrial chromophores absorb the photons activating various nervous system and metabolic processes. Red light therapy has become popular because it is a non-invasive and non-chemical form of biohacking.

Some of the possible benefits of red light therapy include:

- Anti-aging effects on skin
- Enhanced muscle recovery
- Improved skin tone
- Increased circulation
- Reduced depression
- Relieves pain
- Reduces inflammation and restores function

Compression Therapy

The lymphatic system removes the waste and lactic acid that builds up in the body due to from natural bodily processes and working out. Compression therapy increases blood flow to certain parts of the body which in turn flushes out toxins, cleanses, detoxifies and speeds up recovery.

- **Osteostrong**

A decrease in bone health and bone density over time makes people susceptible to developing osteoporosis when older.

OsteoStrong, is a non-pharmaceutical biohacking technique for improving bone density, strength and balance. OsteoStrong utilizes the Spectrum System, which is part of the Robotic Musculoskeletal Development System (RDMS).

This biohacking technique improves bone density (4-12% per year), posture, balance, athletic performance, reduces joint pain and enhances overall health by providing extra support to the skeletal system. OsteoStrong takes only about seven minutes per week and can be done by anyone at any age.

- **Intermittent Fasting**

Intermittent fasting is a common biohacking method intended to control blood sugar and a healthy weight. Intermittent fasting is more of an eating pattern that, alternates between fasting periods and eating window, allowing one to reap the benefits of a true fast. During the fasting state there is an increase in levels of growth hormones which boosts metabolic rate. There are many versions of intermittent fasting. The most popular include:

- 16/8 method
- Alternate day fasting
- The 5:2 method

Intermittent fasting can reduce insulin resistance, which lowers blood sugar and burns more stored body fat. Intermittent fasting may also have other benefits including improved cognitive function, reduced risk heart disease, cancer prevention, increased cellular autophagy and lower levels of inflammation.

- **Functional Music**

Music has an amazing effect on the brain. Things which can affect brainwaves include the current activity, rest, food and drink. Audio entrainment is a type of music biohacking in which binaural beats and tones are used to harmonize with brain waves, resulting in a peaceful, contemplative state.

- **Gratitude**

How we view life has a huge impact on our moods and levels of fulfillment. When a person has an abundance mindset, they're consistently grateful for everything that comes their way and are always positive.

Changing mindset is nothing more than practice. One needs to consistently re-focus the brain to see the positive in every situation until it becomes second nature. These biohacking techniques and tools can help:

- Maintaining a gratitude journal
- Taking a gratitude walk
- Write a weekly letter of gratitude to someone
- Begin the day with a ritual, such as meditating.



Supplements

People often don't get all the vitamins and minerals needed for peak performance through diet. Biohacking incorporates high-quality supplements can close the nutritional gap and help boost performance, detoxify the system, increases energy and help the body benefit from the available nutrients.

- **Caffeine**

Caffeine is a well-known productivity booster. One can start with drinking 8-ounce of black coffee, green tea or eating caffeinated foods like dark chocolate. Have caffeine at the same time every day and keep a journal on its effects on focus, anxiety and tiredness. Try tweaking the dose of caffeine intake until finding the amount that works for individual goal.

- **Elimination diet**

Elimination diet, removes something from the diet and then slowly re-introduces it to see how it affects the body. This is especially a popular option if allergic to a food or are concerned that a particular food may be causing inflammation.

There are two primary steps in elimination diet:

- Remove one or more foods from the diet completely.
- After about two weeks, reintroduce the eliminated foods slowly back into the diet.

Keep a close eye on any symptoms that develop during the reintroduction phase, such as:

- Constipation
- Diarrhea
- Fatigue
- Other abnormal symptoms
- Pain
- Rashes
- Stomach pain.

Appearance of symptoms may mean that one is allergic to that food.

Biohacking with PEMF

PEMF therapy or Pulsed electromagnetic field therapy is a safe and effective biohacking treatment method that promotes wellness and improves the quality of life. PEMF therapy offers several health benefits that can improve life, such as:

- Improves blood flow and circulation
- Improves mood
- Improves overall quality of life
- Improves recovery times
- Increases cell metabolism
- Increases energy levels
- Increases mobility
- Increases nutrient absorption
- Promotes natural healing processes
- Promotes wellness
- Reduces healing times
- Reduces inflammation and swelling
- Reduces pain
- Reduces stress and anxiety
- Strengthens immune system
- Treats migraine headaches

[Sentient Element](#) is best PEMF biohacking tool. Sentient Element has superior capabilities to the original [Ampcoil](#) machine which Larry invented.

Extreme Biohacking

Some biohackers push medical procedures such as harvesting stem cells from bone marrow and inject those cells into every joint in the body in their quest for health and longevity.

Some dangerous biohacking methods include people trying out young blood transfusions or injecting themselves with genes edited with CRISPR technology.



Does Biohacking work?

Different people react differently to biohacking methods. Biohacking makes lasting, positive change to the body, health and brain to reach individual goals and achieve an enhanced state of mind.

Some forms of biohacking may be safe and effective. Some biohacking methods maybe unsafe or even illegal.

Conclusion

Biohacking has some merits but one has to be careful. Some methods of biohacking are easy to do at home and maybe easy to reverse when something goes wrong.

Self – experimenting without taking proper precautions can leads to unexpected side effects. One should talk to a doctor before making any significant changes to diet and ensure to do sufficient research before putting any foreign substance into the body.

Few JAK Inhibitor Users Have Reduced Response to COVID Vaccines

Source: <https://www.medscape.com/viewarticle/961103>

Oct 18 – Patients who are being treated with Janus kinase (JAK) inhibitors overall show a high immune response rate to COVID-19 vaccination, one that matches the rates seen in patients on other immunosuppressants, a new study has found.

The patients taking a JAK inhibitor who are most at risk of a diminished response may be those on upadacitinib (Rinvoq) and anyone 65 years or older, wrote Raphaële Seror, MD, PhD, of Paris-Saclay (France) University and coauthors. The study was published in [The Lancet Rheumatology](#).

To gauge the effectiveness of COVID-19 vaccines in this subset of immunosuppressed patients, the researchers analyzed 113 participants in the [MAJIK-SFR Registry](#), a multicenter study of French patients with rheumatoid or psoriatic arthritis. The participants were treated at 13 centers throughout France; their mean age was 61.8 years (standard deviation, 12.5), and 72% were female. A total of 56 were taking baricitinib (Olumiant), 30 were taking tofacitinib (Xeljanz), and 27 were taking upadacitinib.

Serologic assessment was performed an average of 8.7 weeks (SD, 5.2) after the last dose of vaccine. The overall response rate – defined as the proportion of patients with detectable anti-spike antibodies per manufacturer's cutoff values – was 88% (100 of 113). The nonresponse rate was higher with upadacitinib (7 of 27 patients, 26%) than with baricitinib (5 of 56, 9%) or tofacitinib (1 of 30, 3%). The only nonresponders who were not age 65 or older were four of the seven who received upadacitinib. The interval between the last vaccine dose and serologic assessment was somewhat longer in nonresponders (11.3 weeks) than in responders (8.3 weeks).

Earlier this year, the American College of Rheumatology [recommended](#) withholding JAK inhibitors for 1 week after each vaccine dose because of "concern related to the effects of this medication class on interferon signaling that may result in a diminished vaccine response. Only two patients in the study had treatment with JAK inhibitors stopped before or after vaccination.

Questions About Antibody Levels Remain Difficult to Answer

"This study does further confirm a big point," said [Alfred Kim, MD, PhD](#), of Washington University, St. Louis, in an interview. "Most people on any sort of immunosuppression, with rare exceptions, can mount responses to COVID-19 vaccination."

"What level of response is going to be sufficient, of course, is not clear," he added. "Even though most people generate responses, at the population level those responses seem lower than those in non-immunosuppressed people. Particularly for those on upadacitinib, which is lower than patients on the other JAK inhibitors. Is that problematic? We don't know yet."

Kim, who was part of a separate, earlier [study](#) that assessed vaccine response in patients with chronic inflammatory disease who were being treated with immunosuppressive medications, noted that many of the questions patients are asking about their antibody levels cannot yet be answered.

"It's kind of the Wild West of serologic testing out there right now," he said. "Even though we're recommending that people still don't check their antibody levels because their results are largely inactionable, everyone is still getting them anyway. But each of these tests are slightly different, and the results and the interpretation are further clouded because of those slight performance differences between each platform."

Kim highlighted the number of different tests as one of this study's notable limitations: 11 different assays were used to determine patients' immune responses. "The authors made the argument that these tests are FDA approved, and that's true, but that doesn't necessarily mean much. Approval does translate to technical reliability but not to comparisons between the tests."

As for next steps, both the authors and Kim recognized the need for a prospective trial. "To do a vaccine effectiveness–type study and show clinical protection against either infection or hospitalization — those are going to take a while, simply because of the nature of how many people you need for each of these



studies," he said. "Time will tell whether or not the data that are being presented here will translate literally into protective outcomes downstream."

Scientists Are Closely Tracking a New Delta Subtype Spreading in the UK

Source: <https://www.sciencealert.com/scientists-are-closely-tracking-a-new-delta-subtype-spreading-in-the-uk>

Oct 20 – Scientists worldwide are closely tracking a descendent of the [highly infectious Delta variant](#) that is spreading in the UK. England's public-health authority said in a report on [Friday](#) that it was monitoring a subtype of the [Delta variant](#) called **AY.4.2**, which had infected more and more people recently.

Francois Balloux, director at the University College London Genetics Institute, said on [Twitter on Saturday](#) that data about AY.4.2 suggested it could be 10 percent more transmissible than the most common [Delta variant](#) in the UK, called AY.4.

"As such, it feels worthwhile keeping an eye on it," he said.

As of 27 September, 6 percent of UK sequenced tests were AY.4.2, Public Health England (PHE) said in its report on Friday, adding that estimates could be imprecise because it was difficult to sequence the variant's mutations.

Dr. Scott Gottlieb, the former Food and Drug Administration commissioner, said that the new variant wasn't an "immediate cause for concern," but called for "urgent research" to work out if it was more infectious or able to avoid the body's immune response.

"We should work to more quickly characterize these and other new variants. We have the tools," he said on [Twitter on Sunday](#), adding that a coordinated, global response was required.

Dr Jeffrey Barrett, medical genomics group leader at the Wellcome Trust Sanger Institute, [said on Twitter on Tuesday](#) that AY.4.2 was the only Delta descendant that was steadily increasing, suggesting a "consistent advantage" over Delta.

Barrett cautioned that AY.4.2 was replacing Delta at a much slower rate than Delta had replaced the formerly-dominant Alpha variant. The Delta variant is estimated to be about 60 percent more infectious than Alpha.

The same pattern for AY.4.2 hasn't yet been seen in other countries.

Balloux said in a statement on Tuesday that the variant was "rare" outside of the UK, with only three cases detected in the US so far. "In Denmark, the other country that besides the UK has excellent genomic surveillance in place, it reached a 2 percent frequency but has gone down since," he said.

New mutations

The [virus](#) that causes [COVID-19](#) gets about two new mutations per month, and there are now 56 Delta descendants, [according to Scripps University's Outbreak.info](#), which includes data from the Centers for Disease Control and Prevention. Before AY.4.2, PHE had tended to group Delta and its descendants together. AY.4.2 has two new mutations in the part of the virus that attaches to human cells, which is called the spike protein. It's not yet clear how these mutations will affect the virus' behavior. Balloux said neither of these mutations had been found in other variants of concern.

Marvel-inspired smart face mask could be future of PPE technology

Source: <https://www.thenationalnews.com/uae/2021/10/21/marvel-inspired-smart-face-mask-could-be-future-of-ppe-technology/>

Oct 21 – If there is one thing the coronavirus pandemic has taught us, it is that face masks are not going anywhere any time soon. But technology is always one step ahead, finding ways to make our lives easier, as demonstrated by this year's [Gulf Information Technology Exhibition](#), or Gitex, in Dubai.

One of the many futuristic innovations on display was the **Xupermask**, introduced as "new generation" personal protective equipment that aims to create a seamless user experience.

The face wear was designed by Jose Fernandez, a Hollywood designer who created costumes for some of the most widely recognised [superheroes in film](#), including Batman, Spider-Man, Wolverine, Wonder Woman, Thor and Black Panther.

Fernandez collaborated with American rapper and entrepreneur will.i.am and software and technology company Honeywell to create Xupermask.

The end result was a blend of innovation, smart technology and integrated audio design.

Some of the most prominent features of Xupermask include built-in Bluetooth earbuds and pleated high-efficiency particulate-absorbing (HEPA) air filters.

"This is more than a face mask," said Roman Poludnev, general manager for Honeywell Safety and Productivity Solutions in the Middle East, Russia, Turkey and Africa.





“It is also an audio device and a fashion accessory.” Since its release on the market in early 2021, the Xupermask has regularly sold out. Mr Poludnev said the device offers protection against many biohazards, not only the coronavirus, owing to its active air delivery technology.



Captain Marvel

“There’s always fresh air coming in, which prevents users from feeling suffocated,” he told *The National*. “Absolutely

no effort is needed from those wearing it to achieve that.”

Aside from its protective purpose, the mask also aims to provide a “unique experience” by serving as a means for both communication and music consumption.

“You no longer have to worry about your voice not being heard when you’re wearing a mask and talking on the phone,” said Mr Poludnev.

The device’s noise cancellation feature makes it easier to converse with a mask on, and its built-in Bluetooth earbuds are an added value to music lovers.

In terms of design, [the face mask](#) creators say it was made “for the modern superheroes of today”.

It comes in two colour combinations and has LED lights on the front for a futuristic look.

The smart mask certainly caught the interest of passers-by at the trade show, and delegates regularly stopped to ask about the sleek device.

“We have had very good attendance at Gitex,” Mr Poludnev told *The National*. “We never miss the event, not even in 2020, in the wake of the coronavirus pandemic.”

“It is the most important technology event in the wider region, and one of special importance to us too.”

EDITOR’S COMMENT: I am not sure if this mask was Marvel-inspired at all. In all photos and movies with Captain Marvel’s adventures the nose-mouth area was not covered by any kind of mask.



What Colin Powell's death can and can't tell us about COVID breakthrough cases

Source: <https://www.npr.org/sections/health-shots/2021/10/20/1047727415/what-to-know-about-the-risk-of-serious-or-fatal-breakthrough-covid-infections>

Oct 20 – When Colin Powell died this week from complications related to COVID-19, it was a shock to many Americans.

Though scientists and federal health officials are adamant that the vaccines work well to protect against hospitalization and death, it's unnerving to hear of fully vaccinated people like Powell, or perhaps your own friends and neighbors, falling severely ill with COVID-19.

So how well *do* the vaccines work? How serious is the risk of a serious breakthrough infection, one that could land you in the hospital?

In Powell's case, of course, there are several reasons he was at higher risk. He was 84 and had been treated in recent years for multiple myeloma — a blood cancer that forms in plasma cells, which are critical for the immune system. These facts alone would put him at very high risk for a breakthrough illness, says Dr. [Rachel Bender Ignacio](#), who directs COVID-19 clinical research at the Fred Hutchinson Cancer Research Center.

"We shouldn't change our risk estimation on one good or bad outcome that happens to a single person," she says. "The vaccines are still holding up extremely well."

Even with concerns about the possibility of waning protection from the vaccine, scientists say the best data in the U.S. still tell a clear story: people who are fully vaccinated have a far lower risk of getting infected or dying from COVID-19 than the unvaccinated, according to data representing about 30% of the U.S. population from the Centers for Disease Control and Prevention.

Who is getting severely ill from COVID after being vaccinated?

Those who do have severe breakthrough illnesses tend to be older or have serious underlying health conditions, or a combination of those risk factors.

"People who are of advanced age or who have impaired immune systems always respond less well to vaccines — that's true whether it's flu vaccine or really any other vaccine," says Bender Ignacio.

The effect of age on the risk of breakthrough infections is stark. The CDC released data separating breakthrough infections and deaths by age. Among fully vaccinated people, those aged 80 or older had a almost 13 times greater risk of dying from COVID than people of all ages. However unvaccinated people in their 80s were at far greater risk than vaccinated ones.

Research shows that people who fare the worst tend to be especially medically fragile. A [study of vaccinated patients](#) hospitalized at the Yale New Haven Health System found that the median age was about 80 and many had underlying problems, including cardiovascular disease, lung disease, diabetes and some were also on immunosuppressive drugs.

While those findings came before the surge of the delta variant, [Dr. Hyung Chun](#), who led the study, says their ongoing research shows these types of patients still account for most breakthrough illnesses "even with the shifting landscape of breakthrough infections."

Chun says those who are vaccinated generally tend to do better once they are in the hospital, compared to those who aren't vaccinated.

"Even if you were hospitalized [with a breakthrough infection], the trend we've been observing is that you will likely be far less sick in terms of needing things like supplementary oxygen or mechanical ventilation, or even your risk of death," says Chun, an associate professor of cardiology at the Yale School of Medicine.

As of mid July, the CDC found that people who were immunocompromised [accounted for 44% of breakthrough hospitalizations](#) — a figure that supported the decision to recommend a third shot of the vaccine to people who met the criteria of having a weakened immune system. A [more recent study](#) conducted by the vaccine maker Pfizer and not yet peer reviewed, found that study participants who were immunocompromised accounted for about 60% of the breakthrough hospitalizations and were three times more likely to have an infection compared to people who weren't immunocompromised.

The three major clinical trials done by the vaccine makers did not include immunocompromised people, so researchers are still trying to tease apart how different medical conditions affect a person's immune response to the vaccine, says [Dr. Jonathan Golob](#), an assistant professor at the University of Michigan in the Division of Infectious Diseases.

"The vaccines are still stellar, including against delta for just about everyone, except for people with very, very impaired immune systems," he says. That list includes patients who've had an organ transplant, with active cancer, or some other severe autoimmune disease that requires a lot of medicine to treat it.



HZS C²BRNE DIARY – October 2021

"All those people, I would say, still need to be cautious and the best thing to protect them is to have everyone around them vaccinated," he says.

How common is it to have a severe breakthrough illness?

It's currently hard to answer that in the U.S. To date, 7,178 people are [reported to have died](#) from COVID-19 after being vaccinated and about 85% were 65 and older, according to the CDC, but these figures are meant to be a "snapshot" and are an undercount, an agency spokesperson told NPR. In that same time period, approximately 190 million have been fully vaccinated in the U.S.

As more Americans get vaccinated, the raw numbers of serious breakthrough infections will inevitably increase as long as the virus is spreading, but those figures can be misleading.

"Hospitalizations due to breakthrough infection are higher than even a few months ago, but this should be viewed in light of the fact that more people are fully vaccinated," says Chun. "You're working with a much bigger denominator of patients."

Bottom line: The risks of hospitalization are far greater for the unvaccinated. The [chance of being hospitalized](#) in the U.S. for COVID-19 is 12 times higher if you are unvaccinated, according to recent CDC data. These rates may vary week to week, the agency notes. And they vary by age group. Unvaccinated adults aged 18-49 were 14 times more likely to be hospitalized, while those over 65 were 9 times more likely.

Some of the most compelling data also comes directly from what hospitals are seeing in their communities.

A study of [hospitalized COVID-19 patients at Beaumont Health](#) — Michigan's largest hospital system — found a "dramatic" difference in hospital visits between the vaccinated and unvaccinated, says [Dr. Amit Bahl](#), an emergency physician who authored the study.

"If you were fully vaccinated, you had a 96% reduction in the chance of being hospitalized or going to the emergency room," he says. "A bad outcome for a patient that's fully vaccinated was exceedingly rare."

Some states that track breakthrough hospitalizations are finding a similar pattern.

For example, New York's [data shows](#) that 0.06% of the vaccinated population has ended up in the hospital for COVID-19. Minnesota has a [similar rate](#).

However, it's still hard to quantify how often a breakthrough infection leads to someone being hospitalized, because the U.S. is not tracking this data closely on a national level, says [Angela Rasmussen](#), a virologist at the University of Saskatchewan.

"I don't think we're there yet," she says. "We don't really know the denominator — how many breakthrough infections there have been overall."

Has the chance of getting very sick increased and is that why the government is starting to roll out boosters?

The push for booster shots reflects the concern that certain groups of Americans — namely those who are older — appear to be now [slightly less protected](#) against a severe case of COVID-19 than they were in the spring, and worries that the risk of infections has risen because of the delta variant. The data vary between the vaccines. The one-shot Johnson & Johnson vaccine appears to be the least effective against hospitalization. But scientists are still trying to untangle exactly what's behind this increased risk.

Older Americans were already more susceptible to the virus. They were also some of the first groups to get vaccinated. "So, we have not only a higher risk population, but now a longer time since they received the vaccine," says Bender Ignacio. "And this is exactly why boosters have been recommended for those populations." The arrival of the delta variant and a surge in cases among the unvaccinated has put many more people in contact with the virus, including people who may be especially vulnerable, says Rasmussen. "Unfortunately, even though we have a lot more people getting vaccinated, it's still not enough and we still have a lot of viruses around," she says. "When those two conditions are met, you're just going to have more breakthrough cases."

Ultimately, the protection against hospitalization — while it may be waning for some groups — doesn't appear to have translated into a major spike of severely sick vaccinated patients, even as the country has dealt with a huge surge in cases. "Everyone I've seen this week who is critically ill from COVID is unvaccinated," says Golob of the University of Michigan health care system.

Targeted Interventions: Containing Pandemics, Minimizing Societal Disruption

Source: <https://www.homelandsecuritynewswire.com/dr20211019-targeted-interventions-containing-pandemics-minimizing-societal-disruption>

Oct 19 – The COVID-19 pandemic has led to more than 218 million infections and over 4.5 million deaths as of 3 September 2021. Nonpharmaceutical interventions (NPIs), such as case isolation, quarantining contacts, and the complete lockdown of entire countries, were implemented in an effort to contain the pandemic. But these NPIs often come at the expense of economic disruption, harm to social and mental well-being, and costly administration costs to ensure compliance.



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Given the slow rollout of vaccination programs worldwide and the rise of several mutations of the coronavirus, the use of these types of interventions will continue for some time. In [Chaos](#), by [AIP Publishing](#), researchers in China use a data-driven agent-based model to identify new and sustainable NPIs to contain outbreaks while minimizing the economic and social costs.

“Based on the proposed model, we proposed targeted interventions, which can contain the outbreak with minimal disruption of society. This is of particular importance in cities like Hong Kong, whose economy relies on international trade,” said author Qingpeng Zhang.

The researchers built a data-driven mobility model to simulate COVID-19 spreading in Hong Kong by combining synthetic population, human behavior patterns, and a viral transmission model. This model generated 7.55 million agents to describe the infectious state and movement for each Hong Kong resident.

Since mobile phone data is difficult to obtain in most countries, the researchers calibrated their model with open-source data, so it could be easily extended to the modeling of other metropolises with various demographic and human mobility patterns.

“With the agent-based model, we can simulate very detailed scenarios in Hong Kong, and based on these simulations, we are able to propose targeted interventions in only a small portion of the city instead of city-level NPIs,” said Zhang.

The researchers found that by controlling a small percentage (top 1%-2%) of grids in Hong Kong, the virus could be largely contained. While such interventions are not as effective as citywide NPIs and compulsory COVID-19 testing, such targeted control has the benefit of a much smaller disruption of society.

The proposed model leading to the targeted interventions has the potential to guide current citywide NPIs to achieve a balance between lowering the risk and preserving human mobility and economy of the city.

“Our findings also apply to other major cities in the world, such as Beijing, New York, London, and Tokyo, as COVID-19 is likely to be around indefinitely, and we have to learn how to live with it,” said Zhang.

COVID-19 vaccine side effects for booster shots

SIDE EFFECT	MODERNA BOOSTER	PFIZER BOOSTER	J&J BOOSTER
Injection site reaction	81%	70%	25%
Fatigue	61%	51%	15%
Muscle aches	50%	36%	21%
Headache	50%	38%	19%
Fever	36%	22%	6%
Joint pain	33%	23%	17%
Chills	31%	18%	8%
Nausea	19%	14%	8%
Diarrhea	10%	9%	8%
Abdominal pain	8%	6%	4%
Rash	2%	2%	4%
Vomiting	2%	1%	2%



All the differences between COVID-19 vaccines, summarized in a simple table

Source: <https://www.businessinsider.com/covid-vaccines-compared-vaccine-pfizer-oxford-moderna-astrazeneca-side-effects-2021-2>



EDITOR'S COMMENT: In this website, scroll down and left click on "How it works"; then choose a comparison point

In Africa, an unknown disease claimed the lives of 165 children

Source: <https://www.perild.com/2021/10/21/in-africa-an-unknown-disease-claimed-the-lives-of-165-children/>

In the area of the city of Gungu in the southwestern part of the Democratic Republic of the Congo, at least **165 children have died** from an unknown disease in the past two months, writes [Actualitte](#).



For the first time, the mysterious disease became known in August. The disease affects babies **no older than five years**. The course of the disease **resembles malaria**.

According to the head of the communities of the villages of Lozo-Munene and Kinzamba Alain Nzamba, **four children die a day**.

"The course of the disease resembles malaria, but is accompanied by anemia," said doctor Jean-Pierre Basache.

Specialists from the Ministry of Health went to the area to determine the source of the infection and develop measures to protect against the disease.



Kills children. Outbreak of an unknown disease in India

As previously reported, 15 people have died from an unknown disease in Tanzania. The disease is accompanied by vomiting of blood. Those who turned to doctors late are dying. An outbreak of a similar disease occurred three years ago.

From CRISPR babies to super soldiers: challenges and security threats posed by CRISPR

By Sonia Ben Ouaghram-Gormley

The Nonproliferation Review

Source: <https://www.tandfonline.com/doi/full/10.1080/10736700.2020.1880712>

Oct 05 – The gene-editing technique CRISPR—clustered regularly interspaced short palindromic repeats—is often depicted as a security threat because it could theoretically allow scientists or amateurs to edit the genome of a variety of organisms and potentially cause harm to humans, plants, and animals. The recent use of CRISPR by Chinese scientist He Jiankui to edit the genome of viable embryos, which resulted in the birth of twin girls, has exacerbated those fears. This article reviews the timeline of the CRISPR-babies experiment, highlights the challenges that contributed to the experiment's failure, and evaluates the risks of CRISPR's use for malevolent purposes. It concludes that although the potential for abuse is great, the technical obstacles are still too significant to allow successful modification that would threaten security.

Viruses could be harnessed by bioterrorists

Source: <https://www.telegraph.co.uk/global-health/science-and-disease/viruses-could-harnessed-bioterrorists-warns-leading-chemical/>

Oct 23 – Research into viruses with pandemic potential should be policed in the same way as work on atomic bombs or sarin gas, according to the British Army's former chemical and nuclear weapons chief.

Hamish de-Bretton Gordon, now a bio security fellow at Cambridge University, told *The Telegraph* that the impact of Covid-19 could inspire "bad actors" to explore the potential of viruses as bioweapons.



“We must not sit back and allow the next pandemic to happen,” he said. “Sadly, bad actors will be galvanised by Covid-19, and with



the ease of synthetic biology, could try and replicate its awfulness for their own gains. The chances of a deadly accident occurring is also too risky to ignore.”

Hamish de Bretton-Gordon (left) in 2018, briefing doctors working in Syria on how to correctly collect evidence of chemical weapons attacks Credit: Sam Tarling/The Telegraph

Colonel de-Bretton Gordon, alongside MP Tobias Ellwood, chair of the parliamentary

defence committee, said the risks must be better policed, either by extending the work of the Organisation for the Prohibition of Chemical Weapons (OPCW) to cover bioweapons, or by setting up a new organisation.

The pair also want the World Health Organization’s powers beefed up – as do many global health security experts. Others have called for a new body to mimic the International Atomic Energy Agency (IAEA), which monitors nuclear weapons.

Pressure has ramped up globally for better biosafety and security in the wake of the pandemic.

While there is no proof that a lab leak had anything to do with this outbreak – [and most experts believe a natural origin is more likely](#) – the debate has shone a light on laboratories working around the world on dangerous pathogens.

Their work aims to study the threat to understand and mitigate it, but experts point out that regulation can be patchy: while there are international guidelines and standards, it is up to nation states to regulate the work.

Biosafety levels, which run from one to four, monitor how safe a lab is and which pathogens it can study; biosecurity is more about protecting the lab from external bad actors seeking to access its work.

The explosion of gene-editing technologies, which can now be bought by mail-order, also needs to be monitored, experts argue.

This week, US evolutionary engineer Professor Kevin Esvelt – among the first to build a CRISPR-based gene editing drive, who has described waking up in cold sweats about the potential of the technology – argued that research into building or editing viruses should stop altogether.

“Many physicists who contributed to the Manhattan Project lived to see nuclear proliferation threaten the world. For pandemics, the critical experiments have not yet been performed. I implore every scientist, funder and nation working in this field: **Please stop,” he wrote in the *Washington Post*.**

However, scientists said the work was critical: for example, if we stop studying viruses that [spill over from animals to humans in secure labs](#), that does not make the natural spillover any less likely – and leaves us far less prepared when it does happen.

Professor Stuart Neil, a virologist at King’s College London, said: “There are two questions here. One: did it [Covid-19] actually come from a lab? Two: how can we make laboratories safer for working on viruses that have pandemic risk, and prevent the risk of a future pandemic that is caused by a lab leak?”

“I think some sort of international agreement where we can come by a set of absolutely required standards is essential.”



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- Sampling & Analysis
- Protection
- Decontamination
- Destruction & Waste Management
- Scene Management Training
- Instructional Equipment
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