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HZS CBRNE DIARY

Dedicated to Global First Responders

July 2021

Α ALPHA (al-fah)	Β BETA (bay-tuh)	Γ GAMMA (gam-uh)	Δ DELTA (del-tuh)
Ε EPSILON (ep-si-lon)	Ζ ZETA (zay-tuh)	Η ETA (A-tuh)	Θ THETA (thay-tuh)
Ι IOTA (eye-o-tuh)	Κ KAPPA (cap-uh)	Λ LAMBDA (lamb-duh)	Μ MU (mueu)
Ν NU (new)	Ξ XI (zie) or (zee)	Ο OMICRON (om-i-cron)	Π PI (pie)
Ρ RHO (row)	Σ SIGMA (sig-muh)	Τ TAU (taw)	Υ UPSILON (yoop-si-lon)
Φ PHI (fye)	Χ CHI (kie)	Ψ PSI (sie)	Ω OMEGA (o-may-guh)

A HOTZONE SOLUTIONS GROUP PUBLICATION

HZS C²BRNE DIARY– 2021©

July 2021

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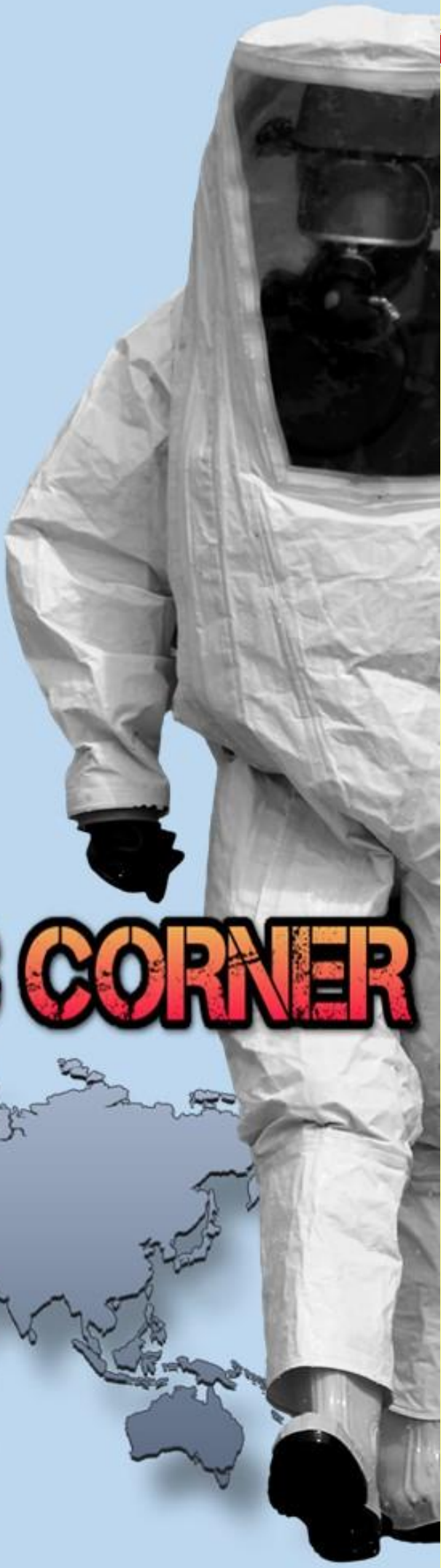


EDITOR'S CORNER

Editorial

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

Editor-in-Chief
HZS C²BRNE Diary

Dear Colleagues,

July – another pandemic month, and life goes on with no sign of returning to normal (old or new).
Important or interesting things that happened or will happen soon!

Cuba: Such a small and poor nation has its own vaccines against Covid-19 the moment that many mighty others do not! I wonder why?

Greek alphabet: SARS-CoV-2 continues to produce new variations and this will make the entire planet learn the Greek alphabet by heart! 😊

Variants: Are they a normal multiplication error or an effort of the virus to survive the immune system, drugs, and vaccines?

Greece: In the aftermath of the pandemic, all experts teaching crisis management will use the example of Greece as an avoidance paradigm and those involved as a case study of the Dunning-Kruger effect. Greece is making small steps to develop diplomatic ties with the enemy of my enemy – that is India, Israel, and GCC countries while keeping in mind that if things get ugly then it will be alone (e.g., article 42; paragraph 7 of the European Union Convention and France – remember the story?).

Europe-Asia: What is more important? Peace in the SE Mediterranean region or selling German U-214 submarines to Turkey?

Afghanistan: Taliban are progressing after US withdrawal from their country. Turkey wishes to take control of Kabul's airport – there is something fishy here but since there is no sea it might be the smell of poppy fields. Brits will collaborate with the Afghanis if they are behaving – I adore the forever British humor that reminded me of a similar joke with Cyprus!

Japan: While writing this editorial there are only a few days left for the virtual opening ceremony for the Tokyo2020/2021 Olympic Games – not for the promotion of sports and competition ideas but to save as much money possible due to the pandemic. And there is no time to listen to the Olympic Chief mumbling about a triple threat: pandemic (100 cases already in the Olympic village), *E.coli*, and radioactive cesium – small details in a mega event.

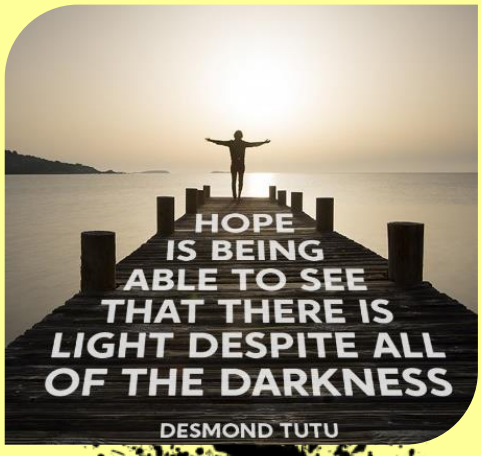
USA: Dr. Fauci quoted (CNN Newsroom) "smallpox and polio would still be spreading in the U.S. if today's "false information" were present then." And he is so right! Too much democracy might be bad for public health …

Israel: A new vaccine-capsule is on the way by Oravax Medical.

EU: EMA (fasttrack) approved the use of the Moderna vaccine to children 12-17 yo; still silence for the Sputnik V vaccine.

First Responders be prepared. The unexpected always happens! The stupidity virus is airborne as well! Check your gear,

The Editor-in-Chief



NOTE: Editor's Corner contains articles that caught the attention of the Editor covering many aspects of our daily disturbed life.

Sheikha Fatima launches Women, Peace and Security Centre of Excellence

Source: https://www.thenationalnews.com/uae/government/sheikha-fatima-launches-women-peace-and-security-centre-of-excellence-1.1247491

June 23 – Sheikha Fatima, Mother of the Nation and Chairwoman of the General Women's Union, has launched the Women, Peace and Security Centre of Excellence.

The centre highlights the UAE's commitment to the participation of women across all sectors, with a focus on peace and security.

Its launch is in line with the Sheikha Fatima bint Mubarak Women, Peace and Security Initiative, a joint project with the General Women's Union, with technical support from UN Women.

"The centre will strengthen the capabilities of relevant authorities working in government entities related to the women, peace and security agenda, to support women's participation in leadership positions across local and international peacekeeping operations," said Sheikha Fatima.

"The United Arab Emirates is a pioneering model in supporting the full, equal and effective participation of women in all vital and developmental fields with a focus on the security sector," added Sheikha Fatima, who also serves as President of the Supreme Council for Motherhood and Childhood and Supreme Chairwoman of the Family Development Foundation.

Sheikh Abdullah bin Zayed, Minister of Foreign Affairs and International Co-operation, agreed to provide continued support to Emirati women's empowerment, noting their key contribution to national achievements.

The initiative follows the launch of the UAE's National Action Plan for the Implementation of UN Security Council Resolution 1325.

The action plan is in line with the UAE's efforts to promote gender equality as an essential policy, and to emphasise the important role of women in the peace and security sectors.

This can be done by unifying the efforts of 14 national bodies, including federal, local and civil society committee members who prepared the National Action Plan headed by the General Women's Union.

Last September, UN Women announced the Sheikha Fatima bint Mubarak Women, Peace and Security Initiative to train and build **women's capacities in the military, security and peace sectors**.
Sponsored by the UAE government and **hosted by Khawla bint Al Azwar Military School in Abu Dhabi**, the initiative featured 357 participants from a number of Arab, African, and Asian countries in two rounds of training during 2019 and 2020.
The second round coincided with the 20th anniversary of the adoption of UN Security Council Resolution 1325 on women, peace and security.
"The centre represents a significant opportunity and model in consolidating international cooperation in sharing knowledge and promoting the exchange of information and best practices on the women, peace and security agenda," said Sheikha Fatima.

EDITOR'S COMMENT: Excellent initiative and a good example for the GCC countries!

Terrorists Tried to Take Advantage of the Pandemic: EUROPOL's Report

Source: http://www.homelandsecuritynewswire.com/dr20210623-terrorists-tried-to-take-advantage-of-the-pandemic-europol-s-report

June 23 – Terrorists use any opportunity to erode democratic structures, spread fear and polarize society. In 2020, terrorist organizations attempted to take advantage of the global pandemic to spread hate propaganda and exacerbate mistrust in public institutions. The New EU Terrorism Situation and Trend Report 2021 outlines the features, facts, figures and trends concerning terrorist attacks and arrests in the European Union in 2020.

2020 Main Figures

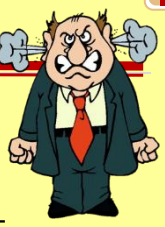
- 57 completed, failed and foiled terrorist attacks in the European Union (reported by Austria, Belgium, France, Germany, Italy and Spain);
- 21 people died because of terrorist attacks in the European Union;
- 449 individuals were arrested on suspicion of terrorism-related offences in 17 EU Member States, a decrease of one-third compared with previous years.

The COVID-19 Ramifications

Terrorists exploit polarization in society to pollute the social climate with violent ideologies. In recent years, polarization of the political discourse has increased in the European Union. The COVID-19 pandemic has further accelerated this development. There has been a notable increase in intolerance of political opponents, while the number of individuals conducting verbal or physical violence is also increasing. Mental health remains an issue in relation to terrorism and violent extremism. The situation created by the pandemic might be an additional stress factor, potentially encouraging vulnerable individuals to turn to violence. Extremists and terrorists have found new opportunities in the increased time spent online during the COVID-19 pandemic. With a large amount of disinformation actively disseminated online, extremists and terrorists have exploited social dissatisfaction to reach out and propagate their ideologies.

Jihadist Terrorism: Lone Actors Behind All Deadly Attacks

Jihadist terrorism remains the greatest threat to the European Union and is still influenced by developments abroad. The so-called Islamic State (IS), still active in Iraq and Syria, reaches out to supporters in Europe to incite them to perpetrate attacks. Global affiliates serve to uphold the group's image of success – particularly those in Africa, which expanded in 2020. While hundreds of individuals are still held in detention camps in Syria, very few have returned to Europe during the past year.
In 2020, the number of completed attacks increased compared with 2019. Ten attacks killed 12 people and injured more than 47. A significant threat for several years, lone actors were behind all of the completed attacks. Some of the jihadist terrorists acting alone were in contact with terrorist groups. One example was the Vienna (Austria) attacker, who managed to transmit a video statement to IS.
Some of the lone actors have displayed a combination of extreme ideologies and mental health issues. Social isolation with fewer contacts who could pick up signs of crisis and increased stress as a result of the pandemic may have played a role in some cases. Other motivating factors may have included the controversy around the republication of cartoons depicting the Prophet Muhammad, and anti-Islam actions by some right-wing actors in different countries.



Right-Wing Terrorism: Increased Prominence of the Online Communities

Very heterogeneous with regard to forms of organization, core ideological elements and political objectives, right-wing extremists unite against diversity and the democratic constitutional order. Right-wing extremists incorporate newly emerging narratives into their ideology to infiltrate communities that might not share the entire set of core right-wing extremist views. As an example, Identitarian movements have succeeded in reaching out to younger, more educated populations. Some are connected to protests against government measures aimed at containing the COVID-19 pandemic.

Increased social awareness concerning climate and ecological issues has also impacted right-wing propaganda. Blaming the climate crisis on increased immigration and overpopulation, for example, eco-fascism aims to act as a bridge towards ideologies based on accelerationism, anti-Semitism and nationalism.

Suspects, linked to online communities with different degrees of organization, are increasingly younger – with some of them being minors at the time of arrest. Right-wing propaganda is mainly disseminated online and gaming platforms have been increasingly used for spreading extremist and terrorist narratives. The perpetrators of 2019 attacks such as the one in Christchurch (New Zealand) were linked to transnational virtual communities. Members of such communities were also arrested in 2020.

The attacker who killed nine people in February 2020 in Hanau (Germany) was motivated by xenophobic and racist ideology. He had his own website, which he used to propagate his dehumanizing views. By contrast, he does not seem to have been connected to transnational online communities.

Left-Wing Terrorism: New Topics Integrated into the Narrative

The numbers of left-wing and anarchist terrorist attacks remained stable in 2020, while the threat to public order is still significant in many countries. Italy reported 24 of the 25 left-wing and anarchist terrorist attacks in the European Union, while the remaining one was reported by France. The attacks targeted private and public property such as financial institutions and government buildings and included one attempted letter bomb attack.

In addition to topics such as anti-fascism, anti-racism and perceived state repression, left-wing narratives have integrated new ones, including skepticism about technological and scientific developments, COVID-19 containment measures and environmental issues. The support for an independent Kurdish state remained an important topic for left-wing and anarchist extremists.

Higher Use of Simple Weaponry and "Easy-to-Make" Explosive Devices

The lockdowns related to the COVID-19 pandemic and the closure of public spaces for mass gatherings probably had an effect on the use of explosives in terrorist attacks. In 2020, terrorists primarily used simple means of attack such as stabbing, vehicle ramming and arson. Two attacks involved the use of firearms – the right-wing attack in Hanau and the jihadist attack in Vienna – while one planned bomb attack was foiled.

Homemade explosives are mainly used by terrorists, with an increased proliferation of low-explosive mixtures such as gunpowder and a decreased use of the unstable triacetone triperoxide (TATP). The dissemination of bomb-making instructions and new ideas on bomb manufacturing decreased in 2020. This may explain the decreased use of more sophisticated improvised explosive devices.

Terrorists and extremists saw an opportunity in weaponizing the SARS-CoV-2 virus. Jihadist propaganda and right-wing extremists both suggested different ways to use the virus against different targets. However, no attempts to use the virus as a bioweapon have been reported in the European Union.

Terrorist Propaganda Online: An Increasing Threat

With the increased use of the internet during the pandemic, virtual communities have become increasingly prominent in the dissemination of extremist and terrorist propaganda. Since the Telegram takedown in late 2019, jihadists have been struggling to find new dissemination channels. As a result, jihadist propaganda has become dispersed across a variety of platforms. However, IS supporters tried to ensure the jihadist messaging reached target audiences. Terrorists exploited different events to amplify their propaganda. Al-Qaeda exploited the issue of discrimination in Western societies to present itself as an alternative protecting the rights of the oppressed, while different jihadist groups used the controversy concerning the republication of cartoons depicting the Prophet Muhammad to gain new supporters and inspire attacks.

Online communities are having an increased role in the propagation of right-wing extremism. In recent years, such communities have coalesced around white supremacist or neo-Nazi views and shared language. The interactions in these groups further radicalize members with the idea that survival of their racially defined in-group depends on the destruction of the current system.

Imran Khan's controversial comments linking temptation to women's dressing widely criticised

Source: https://timesofindia.indiatimes.com/world/pakistan/imran-khans-controversial-comments-linking-temptation-to-womens-dressing-widely-criticised/articleshow/83744435.cms

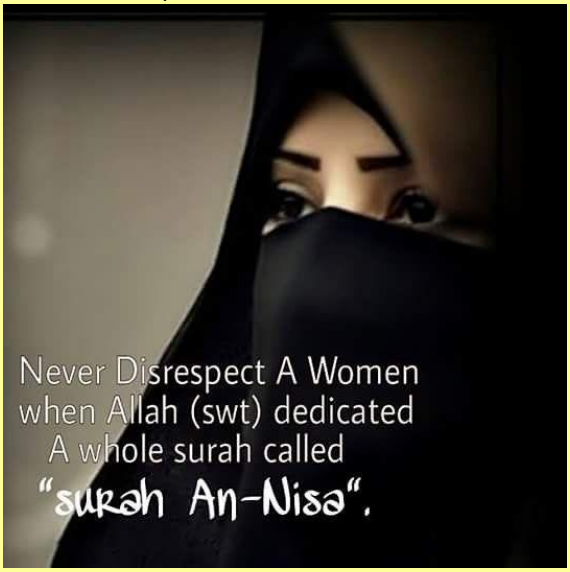
June 22 – Angry women opposition parliamentarians in Pakistan have criticised Prime Minister Imran Khan over his controversial statement on women's dressing, amidst growing cases of rapes in the country.

In a recent interview, Khan was asked if he thought what women wear has any effect on the temptation that leads to rapes, the Prime Minister replied, "If a woman is wearing very few clothes it will have an impact, it will have an impact on the men, unless they are robots. I mean it is common sense."

Apparently stunned by Khan's response, interviewer Jonathan Swan rephrased his question, “But is it really going to provoke acts of sexual violence?”

Maintaining his stance, the 68-year-old flamboyant cricketer-turned-politician went on to elaborate, “It depends on which society you live in."

He added that: “If in a society people haven't seen that sort of thing, it will have an impact [on them]. Growing up in a society like yours, maybe it won't impact you. This cultural imperialism… Whatever is in our culture must be acceptable to everyone else."



Criticising the Khan's controversial remarks, Opposition Pakistan Peoples Party (PPP) Senator Sherry Rehman tweet ed that, "Whether it's our laws or even our religion, which is very clear that respect for women is the responsibility of the beholder, no man has the right to blame women or how they dress, for violence, rape and crimes against women. Shocked that our PM is doing this.”

“Does IK [Imran Khan] not know that by saying women should dress a certain way, he is giving oppressors and criminals against women a new narrative to justify their behaviour. There is NO justification for a prime minister to talk this way. Highly irresponsible and condemnable," she said in another tweet.

Sindh Minister for Women Development Shehla Raza said Prime Minister Khan should focus on the issues being faced by the country instead of “keeping an eye on the women”.

The provincial minister said Khan should not have said this while sitting on the seat of the prime minister of the country, the Dawn newspaper reported.

“The world got an insight into a mindset of a sick, misogynistic, degenerate & derelict IK. It's not women's choices that lead to sexual assault rather the choices of men who choose to engage in this despicable and vile CRIME,” Pakistan Muslim League-(Nawaz) spokesperson Marriyum Aurangzeb in a tweet.

“Maybe the misogynist, degenerate can defend paedophiles and murderers, as he advocates for rapist, after all men cannot be expected to control temptation. Just FYI Mr degenerate, self-control is a little thing upon which Allah places a great premium,” she added.

Stung by the angry reaction to Khan's controversial comments, the ruling Pakistan Tehreek-e-Insaf (PTI) fielded prominent party women leaders to defend the prime minister.

Minister of State for Climate Change Zartaj Gul and PTI lawmakers Maleeka Ali Bokhari and Kanwal Shauzab held a press conference on Tuesday to tell everyone they misinterpreted Khan's comments.

The PTI-led government mobilised women for the first time in Pakistan, she was quoted as saying by Geo News. "A woman like me became a member of Parliament from a tribal area," she said, adding that there are five women in the Cabinet for the first time.
She described Khan as a "symbol of women's empowerment".
"We are strong women and we have been strengthened by our leader Imran Khan," Bokhari said. Shauzab said she believes that if you are among those who are "fighting" against the premier's statement in his interview, then you are "disagreeing with the orders of Allah".
She went on to say that Prime Minister Khan explained the commands of Allah regarding women.
During the HBO interview, Khan was also asked about his earlier comments about temptation, women's dressing and men's "willpower" — and how he was accused of rape victim blaming.
Khan, brushing it off as nonsense, said the concept of purdah is to avoid temptation in society.
"We don't have discos here, we don't have nightclubs, so it is a completely different society, way of life here, so if you raise temptation in society to the point and all these young guys have nowhere to go, it has consequences in the society," Khan said. **There are at least 11 rape cases reported in Pakistan every day with over 22,000 rape cases reported to police across the country in the last six years, according to official statistics reported by the Pakistani media. However, only 77 accused have been convicted which comprise 0.3 per cent of the total figure, The News International reported in November last year.**

EDITOR'S COMMENT: This article sheds light to a recent rape case in Greece involving 3 young Pakistanis (and an Afghani) who raped a 25yo pregnant woman with mental disability in Athens. Most probably they are pro-gov illegal immigrants doing their "duty".

Iran's Christian Boom

By Daniel Pipes
Source: https://www.meforum.org/62458/iran-christian-boom

June 24 – Something religiously astonishing is taking place in Iran, where an Islamist government has ruled since 1979: Christianity is flourishing. The implications are potentially profound.
Consider some testimonials: David Yeghnazar of Elam Ministries stated in 2018 that "Iranians have become the most open people to the gospel." The Christian Broadcast Network found, also in 2018, that "Christianity is growing faster in the Islamic Republic of Iran than in any other country." Shay Khatiri of Johns Hopkins University wrote last year about Iran that "Islam is the fastest shrinking religion there, while Christianity is growing the fastest."

The Shah Mosque in Isfahan, empty

This trend results from the extreme form of Islam imposed by the theocratic regime. An Iranian church leader explained in 2019: "What if I told you Islam is dead? What if I told you the mosques are empty inside Iran? What if I told you no one follows Islam inside of Iran? ... What if I told you the best evangelist for Jesus was the Ayatollah Khomeini[, the founder of the Islamic Republic]?" An evangelical pastor, formerly an Iranian Muslim, concurred as far back as 2008: "We find ourselves facing what is more than a conversion to the Christian faith. It's a mass exodus from Islam."
As a clandestine phenomenon, the practice of what are sometimes called Muslim Background Believers (MBBs) lacks clergy and church buildings but instead consists of self-starting disciples and tiny house churches of four to five members each, with either hushed singing or none at all. Its lay leadership, in striking contrast to the mullahs who rule Iran, consists mainly of women.

In another contrast to the government, Iranian MBBs tend to be fervently pro-Israel. They are, explains a documentary, "bowing their knees to the Jewish Messiah – with kindled affection toward the Jewish people." A convert states, "we fall in love with Jews." Converts have even expressed a hope to build a "resistance church" in Iran to counter regime threats to Israel.

Given the Iranian house church movement's underground nature, estimates of its size are necessarily vague. Open Doors found 370,000 MBBs in 2013 and 720,000 in 2020; Duane Alexander Miller approximates as many as 500,000, Hormoz Shariat at least 1,000,000, and GAMAAN even more than that.

The mullahs have usually responded with predictable repression that includes prohibiting Christian missionaries and Gospel preaching. The U.S. State Department reported in 2012 that "Government officials frequently confiscate Christian Bibles and pressure publishing houses printing Bibles ... to cease operations." Also, Christians "reported the presence of security cameras outside their churches."

Iranian authorities routinely arrest and jail MBBs, often for extended periods; for example, the United Nations reported in 2013 on "more than 300 Christians" who were arrested in the prior three years, mostly for vague security-related offenses. An inquiry found that "Those arrested have been subjected to intensive and often abusive interrogation."

The punishment can be severe: in 1990, for example, the Rev. Hossein Soodmand was executed for apostasy. In 2008, the government advanced legislation to impose the death penalty on anyone born to Muslim parents who converts to another faith. Indeed, "As more Iranians convert," Khatiri notes, "their situation is getting worse."

"You're creating problems in the country," an Iranian convert reported being told during a 2018 police interrogation. In this spirit, Iran's Intelligence Minister Mahmoud Alavi in 2019 spoke of his ministry's research into conversions to Christianity, its questioning of ordinary people, such as sandwich-sellers, to explain their motives, and its efforts to "counter the advocates of Christianity." Iran's leading Islamic seminary sees the domestic fight against Christianity as one of its top priorities and former president Mahmoud Ahmadinejad reportedly once vowed to "stop Christianity in this country." The supreme leader, Ali Khamenei, blames house churches on "Zionists and other enemies."

Christian satellite television stations have a huge potential audience in Iran

Indeed, Lela Gilbert and Arielle Del Turco argue that the regime considers Christianity "an existential threat" to the Islamic Republic. And it should, notes Reza Safa, the Iranian-born founder of Nejat TV ("ministering to Muslims living in Farsi-speaking nations"), who titled a book *The Coming Fall of Islam in Iran*. He sees Iran's Christians as "an army of God" who are bringing Iran to "the brink of another revolution, this time orchestrated" by a Christian spirit.

If this analysis is even partially correct, the consequences are enormous. The collapse of Khomeini's regime would not only fundamentally alter the balance of power in the Middle East; it would also likely terminate the Islamist surge that Iranian revolutionaries forwarded in 1978-79, ending the malign historical cycle that largely began in Iran.

***Daniel Pipes** is president of the Middle East Forum.*

Perspectives on Terrorism

Volume XV, Issue 3June 2021

Source: https://www.universiteitleiden.nl/perspectives-on-terrorism/archives/2021#volume-xv-issue-3

The current issue is a **Special Issue**, published on the occasion of the 10th anniversary of the July 22, 2011 terrorist attacks in Oslo and Utøya. It is guest-edited by Tore Bjørgo and Anders Ravik Jupskås from the Center for Research on Extremism (C-REX), University of Oslo. In their Introduction, they explain the rationale behind this Special Issue – why it is

relevant to explore the long-term impacts of major terrorist attacks – and introduce both topics and authors.

The two biggest problems in Europe and Middle East

Yemen – forensic architecture

Source: https://yemen.forensic-architecture.org/

EU manufactured arms continue to play a major role in the humanitarian crisis in Yemen. Together with Forensic Architecture, we've launched a **new interactive map** which charts the complicity of Europe's governments and arms manufacturers in the Saudi and UAE coalition-led airstrikes on Yemeni civilians.

Steve Fuller: it's time for Humanity 2.0

Source: https://www.theguardian.com/technology/2011/sep/25/steve-fuller-time-for-humanity

Steve Fuller holds the Auguste Comte chair in social epistemology in Warwick University's Department of Sociology. His new book, *Humanity 2.0: What it Means to be Human, Past, Present and Future,* is published by Palgrave Macmillan.

What do you mean by Humanity 2.0?

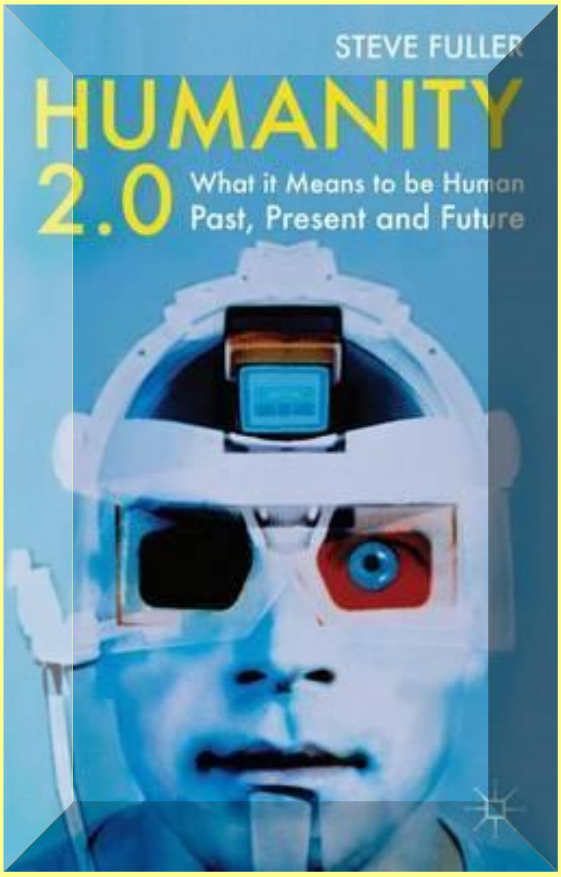
Humanity 2.0 is an understanding of the human condition that no longer takes the "normal human body" as given. On the one hand, we're learning more about our continuity with the rest of nature – in terms of the ecology, genetic make-up, evolutionary history. On this basis, it's easy to conclude that being "human" is overrated. But on the other hand, we're also learning more about how to enhance the capacities that have traditionally marked us off from the rest of nature. Computers come to

mind most readily in their capacity to amplify and extend ourselves. Humanity 2.0 is about dealing with this tension.

In what areas have we reached 2.0 already?

Let's put it this way: we've always been heading towards a pretty strong sense of Humanity 2.0. The history of science and technology, especially in the west, has been about remaking the world in our collective "image and likeness", to recall the biblical phrase. This means making the world more accessible and usable by us. Consider the history of agriculture, especially animal and plant breeding. Then move to prosthetic devices such as eyeglasses and telescopes.

More recently, and more mundanely, people are voting with their feet to enter Humanity 2.0 with the time they spend in front of computers, as opposed to having direct contact with physical human beings. In all this, it's not so much that we've been losing our humanity but that it's becoming projected or distributed across things that lack a human body. In any case, Humanity 2.0 is less about the power of new technologies than a state of mind in which we see our lives fulfilled in such things.



Wouldn't someone like Archimedes describe us as Humanity 3.0 compared to his era?

Yes, Archimedes would probably see us as pretty exotic creatures. He would already be impressed by what we take for granted as Humanity 1.0, since the Greeks generally believed that "humanity" was an elite prospect for ordinary *Homo sapiens*, requiring the right character and training. Moreover, he would be surprised – if not puzzled – that we appear to think of science and technology as some long-term collective project of self-improvement – "progress" in its strongest sense. While the Greeks gave us many of our fundamental scientific ideas, they did not think of them as a blueprint for upgrading the species. Rather, those ideas were meant either to relieve drudgery or provide high-brow entertainment.

Is it desirable or possible to put the brakes on the move to 2.0?

Well, here's my proviso: these developments do have the potential to create whole new deep class divisions, maybe not along the lines of the old industrial class divisions, but just as deep. Sometimes, people talk about this as the "knows" versus the "know-nots". Divisions open up along the lines of who has access to all of these potential enhancements. At the moment, the problem is that the state is dwindling away and it is becoming less of regulator of any kind of activity, so market forces are basically determining the development of all these things I'm talking about. And what that means is that the rich get access to them more quickly and the poor get left behind.

For example, in terms of the NHS, we don't deprive people of prosthetic enhancements such as hearing aids and eyeglasses along the lines of income, so we should be thinking about what other future enhancements we want people to have access to as part of being human 2.0.

Such as?

A good example would be cosmetic neurology, which is essentially plastic surgery for the brain. Where you go in every so often and you get a tune-up of your synapses. This is done at the University of Pennsylvania medical school.

What does this have to do with my daily life?

I think a lot. You already see the problem of smart drugs – people taking drugs to do well in exams or job interviews. The use of these substances is much more widespread than the official records indicate. People are taking the stuff and pretty soon people are going to feel they can't be left behind.

People who work within the disability sector talk about "able-ism" – the idea that we're going to be living in a world in the future where everyone will take having a disability as the normal state because you will never be doped up enough, you will always be worried about the next enhancement, about whether you have enough enhancement for your next job interview, or

whether someone else has a smarter drug that you don't have access to. So people will feel that they have to somehow keep up. And that's a real issue, especially in an unregulated market environment.

So, our ideas of what is normal change?
Yes, there does need to be wide-ranging discussion about what is means to be normal. To be in normal health – how does your brain or body have to function in order to be "normal"? We've had a fairly constant view of what normalcy is for quite a long time but I think we need to reopen this debate and then define the minimal requirements for medical care.

So, you foresee an enhanced generation emerging because of their ability to take advantage of various drugs and treatments?
It's going to happen through individuals taking choices about getting treatments or not and then, within a generation or two, you'll start seeing interesting effects on society at large. What I can imagine is that life expectancy won't uniformly go up, it'll start to be bimodal distribution – some people will live beyond 100 and there'll be a large number of people who die under the age of 70. And that won't be because of some government mandate, that will be because people will definitely take advantage of the enhancements on offer, but others won't have those choices open to them.

Are you optimistic about Humanity 2.0?
We need to be always reminding ourselves that we have always been enhancing ourselves, that science has always been enhancing the human condition, that we have been trusting machines over our own bodies for at least 300-400 years now. We've already broken through that barrier – we do live in a very artificial world. Even though the stuff on the horizon may amplify our powers tremendously, it is nevertheless part of the same process. It is a step change but it's the same story, the story of scientific progress.

Global Coalition to Defeat ISIS Stresses 'Grave Concern' About Terror Group in Africa

By Bridget Johnson
The Global Coalition to Defeat Daesh/ISIS said after the group's Monday meeting in Rome that they have "grave concern" about the growth and threat posed by ISIS affiliates and networks in Africa's Sahel region and in East Africa, particularly Mozambique. The Central African Republic, Democratic Republic of the Congo, Mauritania, and Yemen were also welcomed as new members of the coalition, bringing the total of partners to 78 nations and five institutions: the Arab League, CEN-SAD, EU, INTERPOL, and NATO. **Read more>>**

Professor Celal Şengor: Anatolians only have 7% genes from Central Asia, we are Rûm (Greek) Muslims

Source: https://greekcitytimes.com/2021/06/30/professor-celal-sengor/
▶ Rûm is a derivative of the term Rhomaioi-East Roman (Ῥωμαῖοι) and is used in many Islamic countries to refer to Greeks.

Turkey to pull out of Istanbul Convention on violence against women

Source: https://www.dw.com/en/turkey-to-pull-out-of-istanbul-convention-on-violence-against-women/a-58114681

June 30 – The Council of Europe framework was drawn up to protect women from physical abuse, among other things. But Turkey is determined to ditch the agreement, which rights organizations say is unlawful.

US adds Turkey (and Pakistan) to list of countries using child soldiers

Source: https://www.al-monitor.com/originals/2021/07/us-adds-turkey-list-countries-using-child-soldiers

Will USA regain its lost legacy?

By Dr Ikramul Haq

Source: https://dailytimes.com.pk/784741/will-usa-regain-its-lost-legacy/

July 04 – July 4, 1776 has special significance in American history. The great liberation movement against colonial rule was pioneered in this land and founding-fathers of this historic struggle showed the subjugated nations a novel path of hope. They started a new beginning of self-rule. It took a couple hundred years for American society to struggle on all fronts and make its mark as one of the leading nations of the world. For many countries, the United States of America (USA) became a role model in political evolution achieving great cohesion and solidarity amongst federating units within the constitutional framework. Great movements for human rights and against bigotry, intolerance, discrimination, exploitation, inequality and racism made the country a noteworthy example for others to follow. The democratic set-up is a unique and noteworthy achievement quite different from the conventional British system backed by monarchy, and stems from indigenous roots that has established and developed its own principles.

What happened on May 25, 2020 in Minneapolis in the aftermath of death of George Floyd, a handcuffed black man, while in police custody, reminded the Americans that struggle for a just society free of racial biases and hate, maltreating the black and other non-white races, is a continuous process. It has never ended, and will not go away as long as there are hate mongers, war maniacs, bigots, people with vested interest and those who use race, caste and creed and all other aberrated forms of superiority for their political gains. In this context, the *Time* magazine wrote in 2018 that Trump "***rode the race, the third rail of American politics, straight to the White House. He challenged Obama's citizenship, called Mexicans rapists and criminals, proposed to ban all Muslims from entering the country, insisted on the need for "law and order," argued that immigration was changing the "character" of the United States and openly courted white supremacists***".

Though punishment was given on June 25, 2021 to the offender Derek Chauvin of 22 1/2 years in prison—a punishment that exceeded the state's minimum guidelines but falls short of prosecutors' request of a 30-year sentence. However, the issue remains what Jenipher Camino Gonzalez raised in *Systemic racism is the real 'American carnage*: "**A majority of white Americans still cannot come to terms with what black people have known forever: Racism is systemic, systematic, and nowhere near gone. White America must step up not just for peace, but for justice".** Hopefully, now that the era of Donald Trump has ended, his awful legacy dividing the great nation will not last long. The 9/11 type inquiry on Capitol Hill was still blocked by the Republicans. People get punished, hawkish presidents lose elections, but changing the thinking process takes decades.

From the day of Trump's taking oath (January 20, 2017) to the inaugural speech of 46th President Joe Biden amidst deadly Covid-19 endemic on January 21, 2021, Americans suffered immensely. Not only due to deadly coronavirus, but also due to 4-year criminal rule and the way matters pertaining to blacks and other minorities were handled. It was thus not surprising that Joe Biden in his inaugural speech said: "**This is democracy's day" and that the US "has much to do in this winter of peril, much to repair**".
David Smith of *The Guardian* rightly noted: '*Trump's entire political identity was constructed around conflict. At the height of the demonstrations, he staged a bizarre photo op outside a church after law enforcement used tear gas to clear peaceful protesters outside the White House. In an unprecedented announcement….General Mark Milley, the chairman of the joint chiefs of staff, apologised for taking part".*
Nell Irvin Painter, author of *Exodusters: Black Migration to Kansas After Reconstruction and The History of White People* in an article, **Trump revives the idea of a 'white man's country', America's original sin,** published in *The Guardian* on July 20, 2019 noted that, "***Just as Trump has carried his just-happen-to-be-white into proud-to-be-white followers and into white nationalism, anti-Trump Americans must carry the nation in a saner direction. And just as Trump's racism calls up old themes in America's history, anti-racists must now act on a history of their own, one sufficiently powerful to defeat Trumpism, as it defeated slavery, segregation and disfranchisement***.
The USA of Trump was different from what its founding fathers conceived. But it was also not close to George W. Bush Jr. who tried to make the USA a hegemonic state committed to waging wars for oil, drugs and weapons with Dick Cheney and the late Donald Rumsfeld, who died on June 29, 2021. Trump, committed all possible sins but above all converted America into 'Land of Conflicts".
The day Bush was installed as president of USA in 2000 by a 5-4 vote of the US Supreme Court, Zalmay Khalilzad headed the Bush-Cheney transition team for the Defence Department and advised incoming Defence Secretary Donald Rumsfeld, USA became a different state—captive in the hands of hawkish war mongers—such was never dreamt of by its founder fathers, nor the people. At that point, only a few commentaries in the American media unveiled the military campaign of Bush-Cheney, including the *San Francisco Chronicle* on September 26, 2001 as its staff writer Frank Viviano, observed: "**The hidden stakes in the war against terrorism can be summed up in a single word: oil. The map of terrorist sanctuaries and targets in the Middle East and Central Asia is also, to an extraordinary degree, a map of the world's principal energy sources in the 21st century…It is inevitable that the war against terrorism will be seen by many as a war on behalf of America's Chevron, Exxon, and Arco; France's TotalFinaElf; British Petroleum; Royal Dutch Shell and other multinational giants, which have hundreds of billions of dollars of investment in the region."**
Later events testify his point. The invasion of Iraq by US and its allies using the myth of weapons of mass destruction [which was just a hoax] and appointment of Khalilzad as US Ambassador proved beyond any doubt that the reality of 'war against terrorism' was nothing but quest for **OIL**. Donald L. Barlett and James B. Steele [*TIME*, May 19, 2003] remarkably exposed the dark side of American oil policy from classified government documents and oil industry memos, involving a pair of Iraq's neighbours, Iran and Afghanistan.
The USA first changed from enviable democracy to a fanatic state under Bush-Cheney and then to 'Land of Hatred and Racism' under Trump. On both occasions, the state made subservient to billionaires, running all kinds of businesses, especially oil, arms and drugs, who know how to move money from one part of the world to another, buy government functionaries, control politicians, law enforcement officials and get the profits they want—all at the expense of innumerable poor and helpless people around the world.
But the movement started for justice after the brutal killing of George Floyd at the hands of police and the victory of Joe Biden rekindled the hope that the people of the USA would regain justice for all—the substance of democracy. The enlightened Americans undoubtedly deserve salutation. The country has produced in the modern era scholars like Edward W. Said and Noam Chomsky, who showed the world how one can struggle and expose those who exploit others for their petty interests. The great historic tradition of resistance against injustice by the majority of Americans, a vibrant nation, and their ongoing movement against racism at its heart is to end economic exploitation, war hysteria and achieve equality for all human beings beyond class and race. The USA under Joe Biden and his team from various origins can lead to a new America becoming inspiration for all those, who have been fighting against all forms of oppression and exploitation in any part of the world.
The real test of American nation will now be how to avert the start of biological warfare and improve its relations with Russia, China, Iran and Pakistan. The Hindutva of Modi must be denounced and atrocities at state level in India or any part of the world—may it be Kashmir, Israel-occupied Palestine or wherever rights of the weak and minorities are violated without any exception on economic and political interests. Americans have a long history of standing with the victims of atrocities and ethnic cleansings or genocides on any grounds. This I personally discussed in a one-to-one meeting with Richard Charles Albert Holbrooke during my visit to Washington in 2010 after he was made Special Envoy for Afghanistan and Pakistan. I appreciated him for playing a vital role in helping to stop the genocide of Muslims in Bosnia Herzegovina. We discussed the exit of Americans from Afghanistan while ensuring peace and tranquility in the region. The details I will write in my

new book **New Great Game** and its ramifications, glimpsed were highlighted in **Friend for all seasons**, *Narratives*, May 8, 2021 and **Phony wars**, *Daily Times*, June 25, 2017.
It is hoped that Joe Biden has evaluated the ramifications of leaving Afghanistan to Taliban/Daesh and allowing Tehreek-i-Taliban Pakistan (TTP) and similar networks in Pakistan or elsewhere to destabilise the entire areas. It can be an irreparable mistake, more dangerous than earlier one as explained in **Taliban, Americans, terrorism & drug trade**, *Business Recorder*, June 25, 2021 and **Hidden agenda & "deal" with Taliban—I**, *Business Recorder*, September 11, 2020 and **Hidden agenda & "deal" with Taliban—II**, *Business Recorder*, September 13, 2020.
Misha Ketchell in his write-up aptly concludes: **The American story is indeed the story of a heroic perennial battle between good (light and unity) and evil (darkness and division), between idealism (what we must be) and the sometimes "harsh ugly reality" that has "long torn the country apart." Biden called it once again a "time of testing," "our historic moment of crisis and challenge," a chance to "come out stronger for it**." Joe Biden has a historic chance to come out stronger and successful from Afghanistan and unlike his predecessors avoid pushing the region into another dark era.

***Dr. Ikramul Haq**, Advocate Supreme Court, specializes in constitutional, corporate, media, IT, intellectual property, arbitration and international tax laws. He established Huzaima & Ikram in 1996 and is presently its chief partner as well as partner in Huzaima Ikram & Ijaz. He studied journalism, English literature and law. He is Chief Editor of Taxation. He is Visiting Faculty at Lahore University of Management Sciences (LUMS) and member Advisory Board and Visiting Senior Fellow of Pakistan Institute of Development Economics (PIDE).*

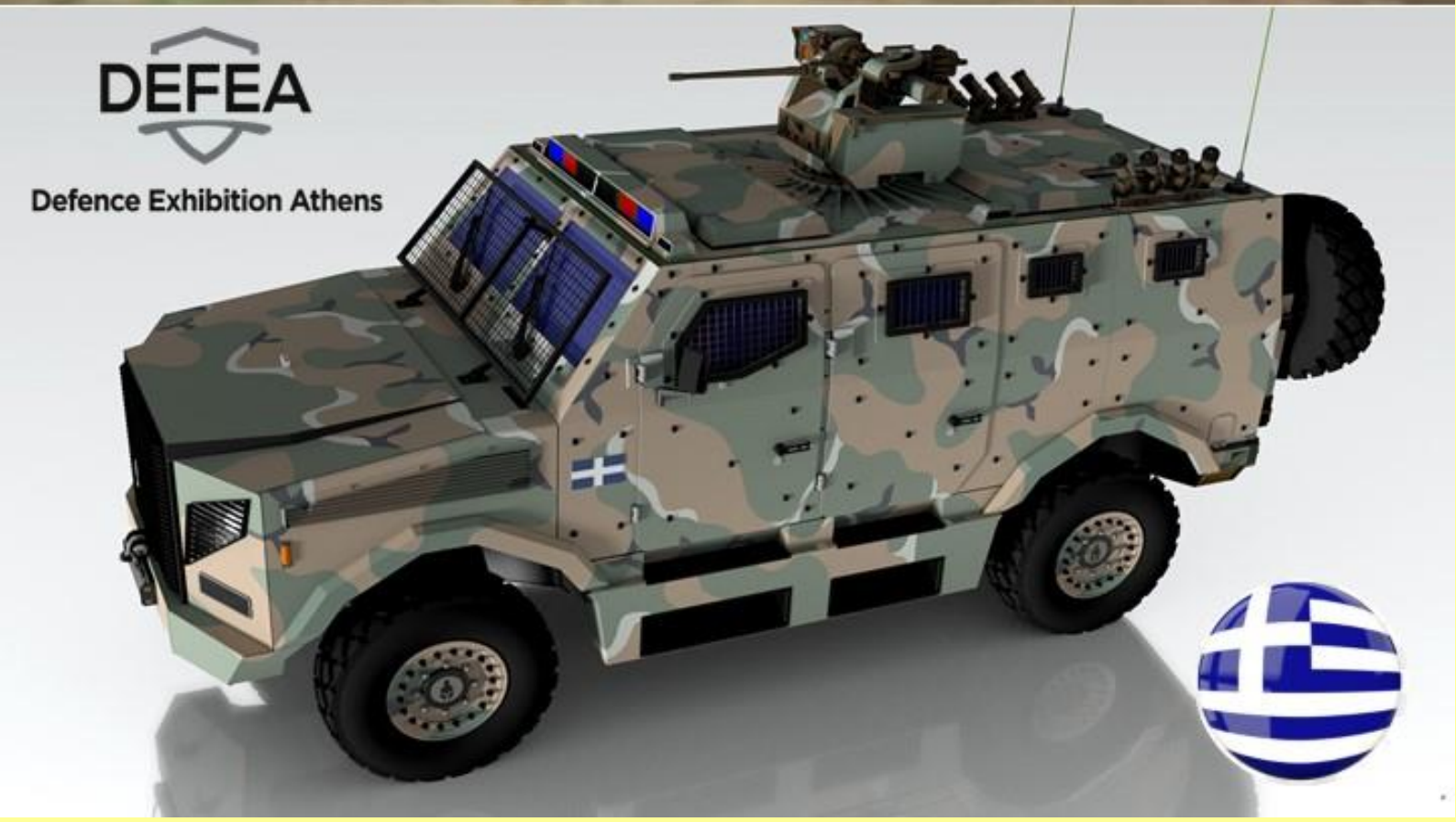
EDITOR'S COMMENT: It is very easy to judge others but very difficult to judge what is happening in your own nest!

Ukraine – O tempora, o mores!

Simply ridiculous!

DEFEA

Defence Exhibition Athens



Student designs device to save stabbing victims' lives

Source [**+video**]: https://newatlas.com/good-thinking/react-stabbing-victims-device/

REACT consists of a tamponade that is inserted into a stab wound (left), and an actuator that is then used to inflate the tamponade (Loughborough University)

July 05 – When someone is suffering from a deep stab wound, it's important to apply pressure *within* that wound, not just down onto it. A new student-designed device is intended to let first responders do just that, potentially saving lives that might otherwise be lost.
Police officers are often the first people to arrive at the scene of a stabbing. If the knife or other implement is still inside the wound, it's typically left in place until an ambulance arrives. This is because it acts somewhat like a cork, with the pressure that it's applying actually helping to limit internal bleeding.
In many cases, however, police arrive to find an open stab wound that urgently needs to be "plugged." It was with such scenarios in mind that Joseph Bentley – a final-year Product Design and Technology student at Britain's Loughborough University – created the REACT tool.
Its name an acronym for "rapid emergency activating tamponade," the handheld device consists of two parts. One of these parts – the tamponade – is a medical-grade silicone sleeve that's initially inserted into the wound. The other part, called the actuator, is then coupled to a valve on the tamponade and used to inflate it.
Before that happens, though, the user selects the relevant region of the body on an LCD interface on the back of the actuator. Once activated, the device then rapidly inflates the tamponade to an air pressure that's best suited to reducing blood loss from a stab wound in that area.
The actuator is then disconnected, and the inflated tamponade is left in place until paramedics arrive. It can then be deflated and withdrawn quickly and easily, unlike some other setups that pack wounds with materials that have to be pulled out a bit at a time.

The 3D-printed prototype (left), and a couple of the tamponades (Loughborough University)

REACT currently exists in the form of a 3D-printed prototype that is optimized for use on regions such as the armpit, groin and abdomen. That said, Bentley is now working on adapting it for other body areas, plus he's perfecting its air pressure settings and making it completely battery-powered.

"I'm hoping one day it will be carried by all emergency services – police, ambulance staff, even the military, but the absolute goal is to get this product in use as soon as possible," he says.

Bizarre sci-fi mask blasts purified air into your face all day

Source [+video]: https://newatlas.com/wearables/airing-air-purifier-mask/

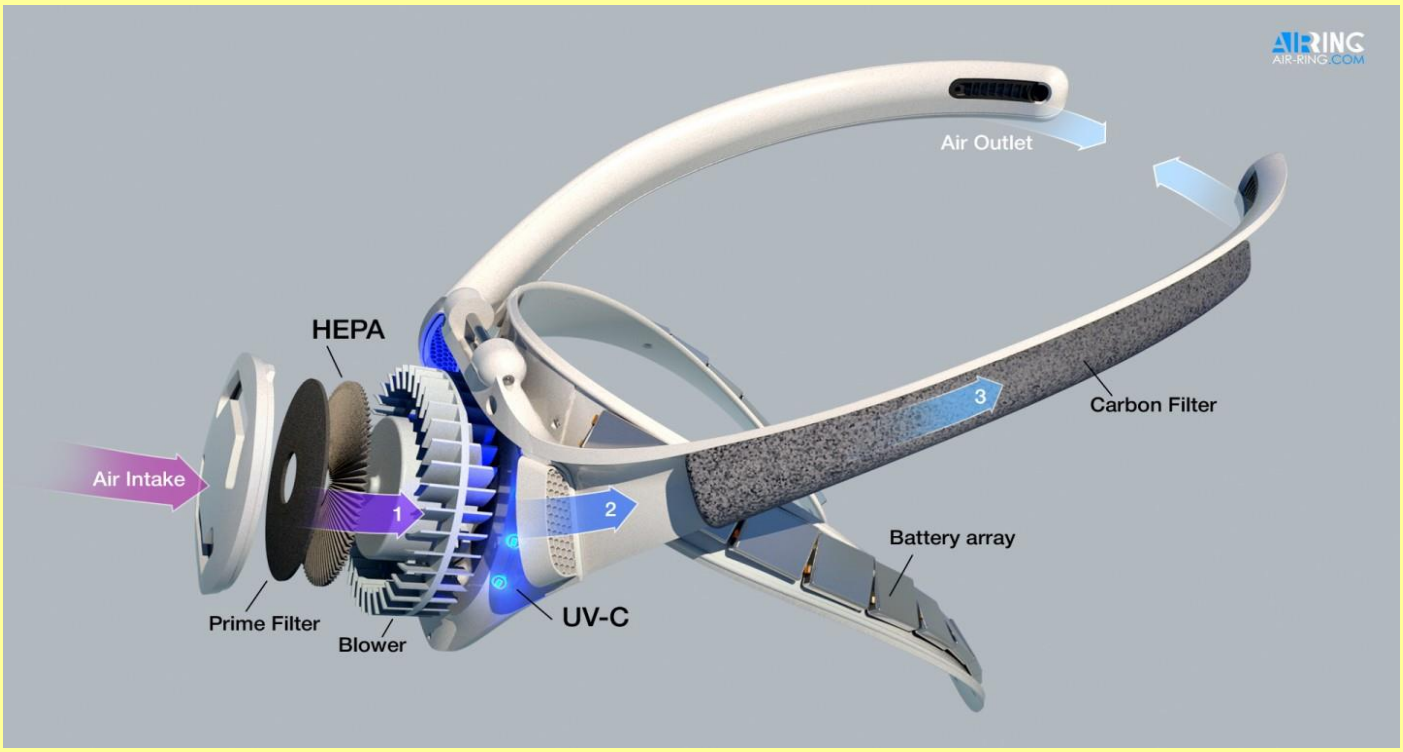
Air-Ring is a personal air purifying headset for people that don't mind looking like this (Air-Ring)

July 07 – It looks like something straight out of dystopian sci-fi, but then here we are. Biotlab has presented a neck-mounted wearable that provides you with a range of magnetic face shields, and a personal supply of HEPA-filtered, UV-sterilized air.

The Air-Ring drapes around your neck, with the guts of the device at the back and battery arrays resting down your chest. It slips on and off easily, with twin adjustable arms rising up to frame your face.

Air is drawn into the unit at the back through a

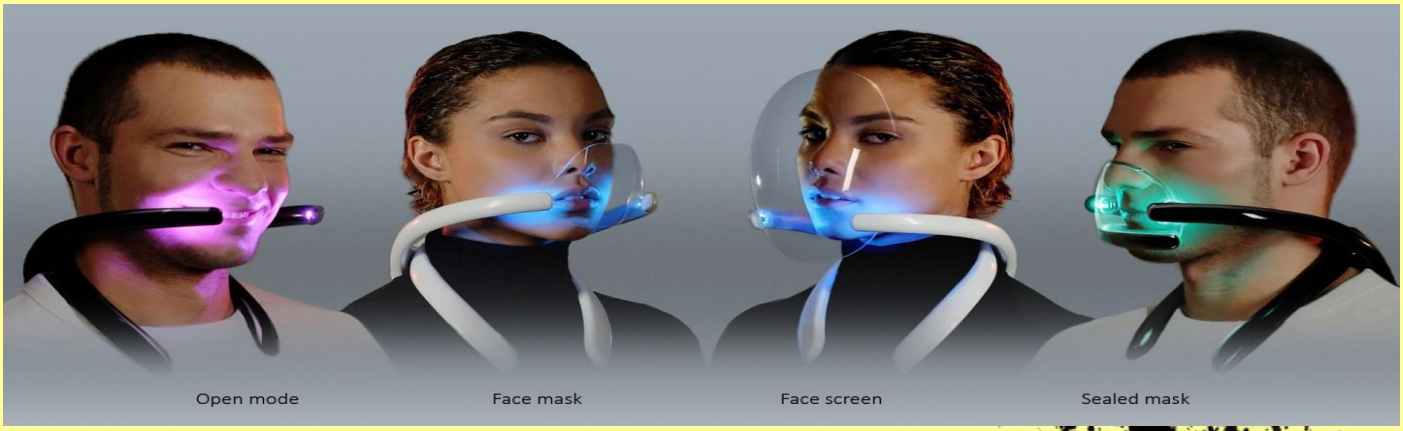
powered blower, which sucks it through a foam filter and a HEPA filter before sending it through a UV-C LED array and photocatalytic sterilizers, then pushes it up the adjustable arms through a final set of carbon filters. All this before blowing it directly into your mouth and nose area, allegedly free from viruses, pathogens and particulate matter. The battery lasts up to eight hours, and if you plug it in to a power bank in your jacket pocket, you can run it even longer.



Incoming air is filtered and sterilized several times before being blown right at your breathing holes (Air-Ring)

A pair of LEDs in the arm tips helpfully light up your lower face in a range of colors, for no apparent reason other than making you look like you're wearing a Hollywood space helmet. If I was being totally honest, I'd begrudgingly admit this looks kinda cool in the pictures and videos; I can see these things being used in sci-fi stage performances. But I sure hope you can switch them off when it stops being fun getting stared at all day by regular earthlings. At least without the lights, you could try to play it off as some kind of dental device or a neck brace or something.

Magnetic buttons near the arm tips let you snap on and off a range of clear face screens, from a small, open mask for the nose and mouth, to a full-size open-face screen and a sealed lower-face mask – well, it's sealed as long as you actively press your face into it. One problem with this whole design is that if you move your neck back or turn your head, the mask stays exactly where it was. But hey, Darth Vader learned to look around by turning his whole body, so you can too.



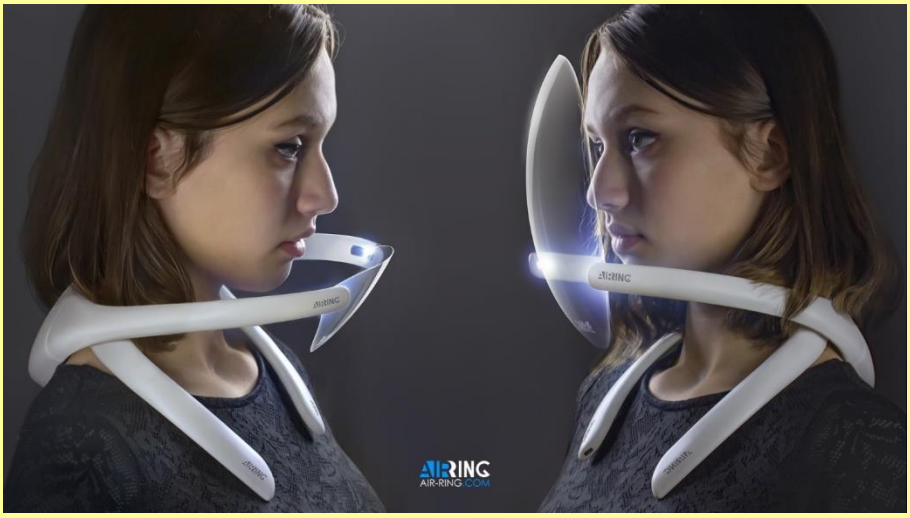
A range of snap-on clear shields allow you to look like several different grades of space criminal (Air-Ring)

Some of these face screens will magnetically snap onto the back of the unit if you want to pop them off and run the Air-Ring open, and just enjoy a stream of fresh air blowing in your face instead. If you *really* want to get crazy, the company seems willing to build this system into a full-sized hood that covers your entire head.

This ain't a COVID mask, or anything like the protection a N95-style medical mask offers. Indeed, as the Dyson Airblade shows, if you're sick and you walk around wearing one of these, it'll likely do a great job of launching any viruses and pathogens in your exhalations around the room with excellent efficiency.

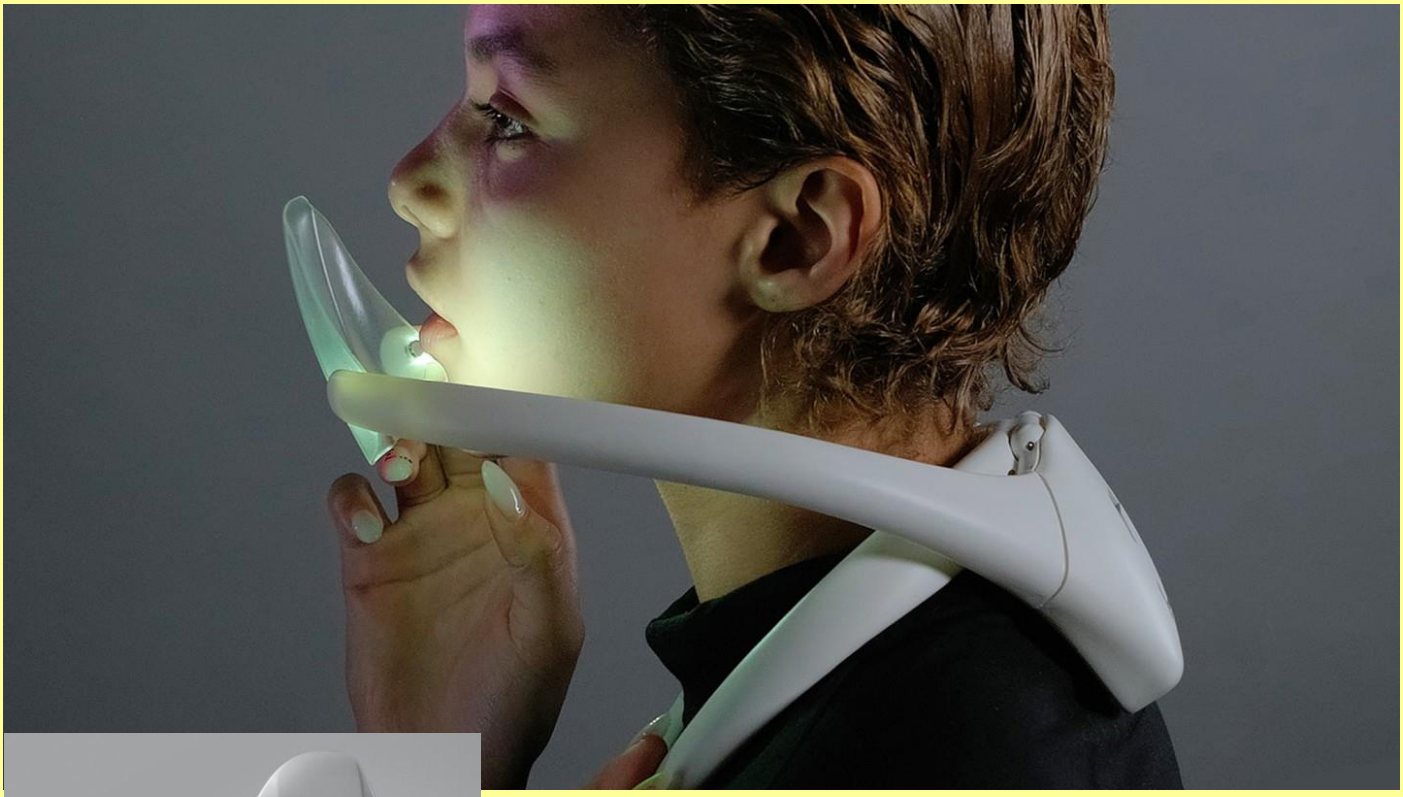
Instead, this is something else entirely: a personal supply of fresh, filtered air blasted right into your face, all day long. And we can see it being very handy for a number of uses. You could whack one on to go out for a jog in a heavily polluted city – there are many areas monitored by the real-time World Air Quality Index showing air quality rated from "unhealthy for sensitive groups" through to flat-out "hazardous."

Full hood version lets you go for a proper "I've come to kidnap ET" look (Air-Ring)



Plenty of people with allergies report that their irritation improves if they sleep in a room with an air purifier, or turn on "biohazard defense mode" in a Tesla. Plenty of people have to spend time in dusty spaces. And plenty of people, my office-mates at New Atlas included, frequently have to work around unpleasant smells. Apologies, fellas.

While the world moves toward a cleaner future, with carbon and particulate emissions



in the cross-hairs due to climate change, there are still plenty of times when fresh air would be a pleasant change. And if you're willing to look like a *5th Element* extra to get it, maybe this device is for you.

Biotlab says it's gearing up for an Indiegogo crowdfunding campaign to kick this thing off, but that's not live yet and there's no pricing information available, so aspiring Air-Ringers will have to wait.

In the meantime, whatever your thoughts on this device, you owe it to yourself to watch the video below, in which an extremely professional fashion model smoulders sexily through the weirdest gig in her career, mostly winning a monumental struggle against cracking a giggle without turning or nodding her head to expose the central weakness of this design. She's accompanied by one of the most excitable, gravelly-voiced, borderline sarcastic narrations we've had the pleasure of listening to. Truly a masterpiece.

Senate Confirms First Female Director of the U.S. National Counterterrorism Center

Source: https://www.hstoday.us/people-on-the-move/senate-confirms-first-female-director-of-the-u-s-national-counterterrorism-center/

June 29 – The Senate has voted through the first confirmed female director of the U.S. National Counterterrorism Center, officials announced Friday, giving the Biden administration another key player in the intensifying battle against enemies both foreign and domestic.

The confirmation of Christine S. Abizaid by a voice vote Thursday comes as the terrorist threat intensifies at home from domestic extremists and overseas as the U.S. pullout from Afghanistan has spurred the Taliban and al-Qaida affiliates to launch increasingly deadly attacks.

Director of National Intelligence Avril Haines praised Abizaid on Friday for her "leadership acumen, thoughtfulness, and an enterprising approach that will enable her to effectively steer the Intelligence Community's work on these issues and lead the CT (counterterrorism) mission into the future."

▶▶ Read more at USA Today

EDITOR'S COMMENT: There is no doubt that her CV (USA Today) is impressive but I would prefer somebody with active field/combat experience instead of an excellent analyst. On the other hand, certain parts of experience are not always available in public. Good luck in a very difficult task against the Hydra!

PM Suga says Tokyo Olympics may be held without spectators

Source: https://www.japantimes.co.jp/news/2021/07/01/national/natsuo-yamaguchi-komeito-olympics-covid-19-tokyo/

July 01 – The Tokyo Olympics could be held without spectators depending on the COVID-19 situation in Japan, Prime Minister Yoshihide Suga reiterated Thursday amid growing concern the games in three weeks' time may trigger a surge in infections.

The remarks came as Suga appeared to have no choice but to ext end a quasi-state of emergency covering the capital and three adjacent prefectures that is set to expire on July 11.

"I've said before there is a possibility of there being no spectators," Suga told reporters. "In any case, we will act with the safety and security of the Japanese people as our top priority."

The organizers of the Olympics, due to begin July 23, decided last month to fill venues up to 50% of capacity with an upper limit of 10,000 people.

But infections in Tokyo have climbed since a state of emergency was lifted last month, fueling uncertainty over whether it is possible to stage the games with that many fans.

The Tokyo Metropolitan Government reported 673 new COVID-19 cases on Thursday, up from 570 a week earlier, marking 12 straight days of week-on-week rises. The capital's daily count topped 700 on Wednesday for the first time since May 26.

Health experts have warned that at the current pace the daily figure could balloon to 3,000 in August.

Suga said any new decision on how to handle local fans at venues will be made by consensus among the five organizing bodies of the Tokyo Games — which are the central and metropolitan governments, the Japanese organizing committee, the International Olympic Committee and the International Paralympic Committee.

They already decided in March to bar overseas spectators.

The 10,000-person attendance cap is contingent on the capital and other prefectures where the Olympics will be held exiting the quasi-state of emergency before the opening of the games.

Under the quasi-state of emergency, spectators are restricted to 50% of venue capacity with an upper limit of 5,000 people, a rule government official have said may apply to the Olympics if an extension is deemed necessary.

In anticipation of such a scenario, the organizers are considering delaying the planned announcement next Tuesday of fresh lottery results for venue tickets, according to a government official with knowledge of the matter.

But reworking the lottery to accommodate a lower attendance cap "would be no easy feat," said a senior official at the prime minister's office, adding if the quasi-state of emergency is extended "we should just accept there won't be spectators."

A total of 10 prefectures are currently under a quasi-state of emergency, which entails restrictions on business activity including asking restaurants to stop serving alcohol at 7 p.m. and close by 8 p.m.

The central government is considering an extension for Tokyo and neighboring Chiba, Saitama and Kanagawa prefectures, according to sources with knowledge of the matter.

Many in Japan remain worried about having fans at the Summer Games, with about 40% of respondents in a Kyodo News poll last month saying the stands should remain empty.
Infectious disease experts including Suga's top COVID-19 adviser, Shigeru Omi, have also said holding the games without spectators is the "safest option."
Suga's remarks on Thursday came in response to a question about comments made by the leader of Komeito, the ruling Liberal Democratic Party's junior coalition partner, who said holding the Olympics without fans in attendance should remain an option.
"I've said we need to be on the lookout for a rebound in infections, and that's exactly what we are seeing now," Natsuo Yamaguchi said. "I hope the government will remain open to the possibility of there being no spectators and inform the public of any decisions in a timely manner."
Meanwhile, athletes and staff participating in the Olympics have begun arriving en masse in Japan and heading to training camps.
More than 100 people touched down on Thursday, according to the Cabinet Secretariat, including the German boxing and boat racing teams, the Irish boxing team and the Australian soccer squad. Around 400 are slated to arrive by Sunday.
The central government has imposed stricter COVID-19 rules on athletes and staff from abroad after a member of the Ugandan delegation tested positive upon arrival at Narita Airport near Tokyo but the rest of the team was allowed to continue by chartered bus to Osaka Prefecture, where another member was also found to be infected.
Under the new protocols, people who may have been in close contact with someone with a positive test must self-isolate, with offenders facing disqualification from competition, fines and even deportation.

EDITOR'S COMMENT: An excellent solution since the thousands of athletes and team officials are immune to SARS-CoV-2! Many hated glory, but none hated money (a Greek saying).

We're coming for your children': San Francisco Gay Men's Chorus pushes woke agenda

Source: https://thepostmillennial.com/were-coming-for-your-children-san-francisco-choir
July 08 – In honor of Pride Month this past June, the San Francisco Gay Men's Chorus released a song outlining how they'll "convert your children."

Hungary's recovery ratification on hold, amid anti-LGBTIQ row

July 08 – The EU Commission and most MEPs have called on Hungary on Wednesday (7 July) to repeal discriminatory new laws against LGBTIQ people or face legal consequences. Meanwhile, the commission is assessing Budapest's Covid-19 pandemic recovery plan. Read on »

Was Afghanistan worth the pain?

By Paul T Horgan (works in the IT Sector in Berkshire, UK)
Source: https://www.conservativewoman.co.uk/was-afghanistan-worth-the-pain/

July 10 – IT is natural for us to concentrate on our military victories. The coverage of the Dardanelles campaign, the Fall of Singapore and Tobruk, and Operation Market Garden is but a fraction of that of the Battle of Britain, El Alamein and D-Day.
We are able to boast that we have at one time or another taken on and defeated most of the countries of the world. While the Americans will brag of their victory in the Colonial Civil War (or 'War of Independence' as they persist in calling it), they do not want to be reminded of the burning of Washington DC in 1814. The White House was quite scorched.
One thing we and the Americans have in common is Afghanistan, which seems to have been the graveyard of military ambition of the Great Powers for the last two centuries. While the Napoleonic Wars gave us Lady Butler's stirring image of the Scots Greys at full gallop in her painting 'Scotland Forever!', the enduring image of British military adventure in Afghanistan is the same artist's 'Remnants of an Army'. depicting William Brydon, reportedly the last survivor of the approximately 16,000 soldiers and camp followers from the 1842 retreat from Kabul in the First Anglo-Afghan War.
Why is this? Why could the army which triumphed over Napoleon not subdue one unruly backward country? Our forces and those of the USA will be out of Afghanistan by the 20th

anniversary of 9/11. The Taliban are poised to reassume power. Nothing seems to have changed, other than – we hope – the Taliban no longer permitting the basing of Islamist terrorist organisations on Afghan soil.

The problem from a military perspective is geography, which is, other than opposing forces, the primary consideration. Despite technological advances, conventional wars are still won by boots on the ground. Afghanistan is mountainous; where it is not mountainous, it is hilly. When Neil Kinnock was quizzed about his unilateralist policy and the risk of a Soviet invasion of the United Kingdom, his response, based on the totality of his expertise in matters military, was that people should 'take to the hills' to defy the invader. It was the Germans' ability to defend hill after hill in Italy after 1943 which slowed the Allied advance. In the case of Afghanistan, the people have already taken to the hills. It's where they live.

Western militaries have evolved from the conditions found in most European wars over the last millennia, being primarily conducted on plains and using ever-larger formations of infantry and cavalry. The major obstacle to an army's advance was a river which would require bridging, resulting in choke-points that would be defended. The Fall of France in 1940 started not with the surprise German attack from the Ardennes, but when the French Army failed to stop the Germans from crossing the Meuse.

In Afghanistan this century, the major obstacle was hills, hills, and more hills that would overlook every route down which mechanised forces could travel. Western forces, trained in fighting on broad fronts against recognisable opposition, found themselves facing the prospect of having to run the gauntlet from hidden foes every time they moved. In a twist of irony, US forces found themselves at the mercy of the Afghan version of minutemen, as their enemy was virtually indistinguishable from the general population. There did not appear to be any part of Afghanistan that was ever fully pacified.

Faced with a similar problem of civilian insurgency in the Second Boer War, British commanders instituted a harsh strategy; the civilian population was deported into concentration camps. Thousands died, and there was a public outcry back in Britain.

There is only one person in the last 100 years who could permanently have brought Afghanistan to bay. That was Joseph Stalin. A Soviet invasion of Afghanistan in the 1930s might have experienced the same kind of insurgency as did our forces, but with one crucial difference. Stalin would have been perfectly happy to use weapons of mass destruction to achieve his aims. Like Mussolini in Abyssinia, Stalin could have used poison gas dropped from aeroplanes or fired from artillery to clear concealed opposition. Mass deportations of the civilian population could have followed. Afghanistan would have been at peace.

In fact, Stalin did send forces into Afghanistan twice, first to intervene in the Afghan Civil War of 1928-1929, and then in 1930 as part of the campaign against an Islamist insurgency in Russian lands which has been running since 1916. But these were limited operations with specific goals. Had Stalin invaded Afghanistan with the aim of subjugation, he would have come up against the British Empire. Afghanistan was a buffer state and a key piece in the Great Game played by Britain to curb Russia's southward expansion.

Of course, the use of poison gas, concentration camps and mass deportation as methods of pacification is rightly unacceptable, as would be the failed German method in two world wars of hostage-taking, razing towns and mass executions. But this does mean that recent forces in Afghanistan faced the same problem experienced by all armies of occupation since the advent of mass-produced small arms and home-made explosives. The concept is called asymmetrical warfare, where a power armed to the gills with the latest in modern weaponry faces off against a low-technology force hiding amongst the civilian population that mounts deadly ambushes by gun or bomb. These attacks do not defeat an entire force but require it to be on guard all the time while experiencing a kind of death of a thousand cuts. Arguably the only uncompromising victory in an asymmetrical war has to be when our forces defeated communist rebels in the Malayan Emergency, but it did require 12 years to do it. The Mau-Mau uprising in Kenya was put down after eight years of fighting, but the methods our forces used have attracted increasing controversy since.

The hard fact is that it is difficult, to the point of impossible, for a major power to win an asymmetrical war unless the power is willing to commit war crimes, and even then, this is no guarantee of victory. Indigenous populations will fight to prevail against an invader to a point beyond rational behaviour or military logic, in the full knowledge that all they have to do is require the power to keep sending body bags home for a few years before the voting public despair at the death of their sons and tire of the drip-feed of death and the ongoing expense of it all. The war in Vietnam was the first major example of this, and the Soviets were not immune in Afghanistan themselves. In the USA, Vietnam brought down President Lyndon Johnson. In the USSR, Afghanistan brought down the country.

So was our fighting in Afghanistan worthwhile, given that the Taliban are ready to fill the vacuum left by departing Western forces? Yes, it was. An armed clash between Islamists and the West was inevitable at some stage in the 21st century. It was inevitable that the fighting would be asymmetrical. Islamist violence had been on the rise since the 1980s, accelerating in the 1990s with a civil war of unprecedented brutality in Algeria that set the pattern for future Islamist attacks. So a war after the 9/11 atrocity had to be fought, and fought well. Time will tell if the Taliban have learned their lesson, and keep their extremist beliefs to their borders.

Another ongoing issue is that Western involvement in Afghanistan, Iraq and Syria has resulted in barbaric terrorist attacks on our soil committed by people born in, or welcomed to, our country. But the violence committed by Islamists in Algeria was a preview of what

was to come. There was no possible outcome other than the West fighting Islamism abroad, and Islamists using every dirty trick to murder civilians on our shores. This war was inevitable and had to be fought. Our enemy is uncompromisingly barbaric. **Our victory is taking it on without descending into the barbarism ourselves.** Our enemy knows we are willing to fight for our values, and that we can maintain our values while we fight to destroy them. That is our continuing victory and it should be better appreciated.

EDITOR'S COMMENT: If I understand well, the US win the war in Afghanistan and now the new Afghanistan under Taliban will behave nice and let the Western world be away of terrorism. I also liked two views expressed in this article (1) "*The hard fact is that it is difficult, to the point of impossible, for a major power to win an asymmetrical war unless the power is willing to commit war crimes, and even then, this is no guarantee of victory*" – I was not aware that there are rules in a war other than winning; and (2) "*Our enemy is uncompromisingly barbaric*" – depleted uranium just popped into my mind and I wonder why?

Al-Qaeda Poses 'Serious Risk' to U.K.- Expert Warns of 'Power-Sharing Deal' with Taliban

Source: https://www.express.co.uk/news/uk/1460033/afghanistan-war-taliban-al-qaeda-terrorists-uk-troops-defence-news-uk

July 08 – Twenty years after it carried out the 9/11 attacks the jihadist group remains active and has retained close ties with the Taliban. The network now poses a major risk to the security of the UK and its interests abroad, according to Robert Clark, a defense fellow at the Henry Jackson Society, who called it "incredibly worrying". He told Express.co.uk: "In terms of the threat that Al-Qaeda more significantly poses is absolutely the threat of further radicalization and the fact that they can inspire through their messaging such large, disenfranchised sections of both British communities, Western communities and the local population as well. "Similarly to ISIS, they can inspire British citizens to conduct atrocities and terrorist activities and attacks in Britain in their name which we've seen over the last 20 years from both Al-Qaeda and ISIS. "If they're allowed to gain more control, power, terror, recruitment, funding, then, of course, those capabilities will only magnify. "You cannot rule out the threat posed by returning fighters from ISIS, we saw this in Iraq and Syria and the threat that they posed, and the aspects of radicalization have to be considered of people returning from those areas.

▶▶ **Read also:** Taliban Win in Afghanistan Could Fuel Hamas, Hezbollah

An Urgent NATO Priority: Preparing to Protect Civilians

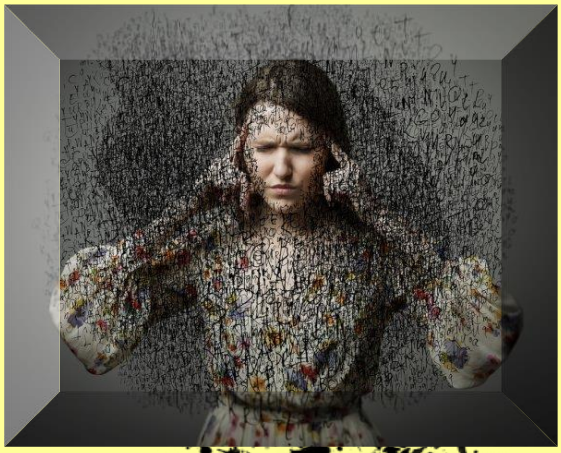
Source: http://www.homelandsecuritynewswire.com/dr20210712-an-urgent-nato-priority-preparing-to-protect-civilians

July 12 – Writing in *War on the Rocks*, Victoria Holt and Marl Keenan invite us to reflect on **the following scenario:**

It is 2030. The Russian military and intelligence services, targeting the citizens of NATO's member state, have been conducting a pervasive, methodical disinformation campaign. The campaign has deepened divisions and created strife in the target population, increasing civil unrest. Russian government actors proceed to conduct daily cyberattacks on critical infrastructure, causing prolonged electrical blackouts, cutting off access to water, paralyzing hospitals in major cities, and disrupting financial markets.

But this is not all. Well-coordinated, large-scale terrorist attacks at airports and seaports have increased fear and anxiety. A well-equipped and trained proxy force, backed by the Russian government, start launching attacks against the NATO ally's security forces. The ally's military forces are losing ground, and violence spreads into urban areas near the frontlines.

The citizens of the NATO ally now must make hard decisions: should they flee or stay put?



"The impact on the population is purposeful and immense: Harming civilians and civilian infrastructure is integral to the adversary's strategy," Holt and Keenan write, adding:

Should NATO prepare for this scenario? Absolutely. The contingency above is a simplified version of what many who study the future of war are thinking through. In this imagined crisis, the conflict forces civilians to seek protection, even to cross borders to other NATO allies and partners. In turn, allies and partners see that a strong and skilled NATO force is needed to push back the incursion and assist the allied government in protecting its civilians. That could lead the North Atlantic Council, NATO's governing body, to enact Article 5, launching plans for a collective defense mission.

For NATO to succeed in the type of hybrid warfare scenario described above, alliance leaders would need to specify protection of civilians as an explicit mission objective. The good news is that the alliance already has a strong basis for doing that successfully, thanks to its existing policy and supporting documents. However, work on policy implementation — building the skills, knowledge, and capabilities to protect civilians — has been insufficient. That's the clear finding of the research that our team has been conducting since 2019. We've convened workshops focused on this issue with more than 100 practitioners, academics, and representatives of militaries and governments, and we presented a series of findings in a March 2021 report authored by our colleague Kathleen Dock.

NATO should take urgent actions now to ensure that it emphasizes protection of civilians as a core capability for future alliance missions — not only "out-of-area" ones, but also any conducted on NATO territory — and it should embrace protection of civilians as a cross-cutting requirement in NATO's new strategic concept.

Victoria K. Holt *is a distinguished fellow at the Stimson Center. Her areas of expertise focus on issues relating to international security and multilateral tools, including peace operations and conflict prevention, the United Nations and U.N. Security Council, protection of civilians, crisis regions, and U.S. policymaking. Prior to joining Stimson, Holt was the deputy assistant secretary of state for international security in the Bureau of International Organization Affairs at the U.S. Department of State, serving from 2009 to early 2017.*

Marla B. Keenan *is an adjunct senior fellow at the Stimson Center. Her areas of expertise focus on issues relating to international security, including human rights in armed conflict, protection of civilians, civilian harm tracking and analysis, and civil-military relations in armed conflict. Marla is also an International Security Program senior fellow at New America, working to strengthen partnerships between non-governmental organizations and academic institutions on applied research in armed conflict, and a security fellow at the Truman National Security Project.*

EDITOR'S COMMENT: Here is another dreadful scenario: It is also 2030. Out of nowhere, US and NATO bombers attack major Russian cities (Moscow including) with millions of tons of flowers. Repeated bombing waves cover almost all the critical infrastructure of Russia leading to immediate surrender and begging without hesitations to join the NATOPeace organization rejecting all the bad propaganda spread for decades indicating how bad Americans and its allies are. And we all lived happily ever after! For sure, Russians are not angels. No mighty power is angelic! But scenarios like the one proposed in the article reveals a psychiatric condition called obsession – and it is serious for the global peace.

A sample of serious journalism . . .

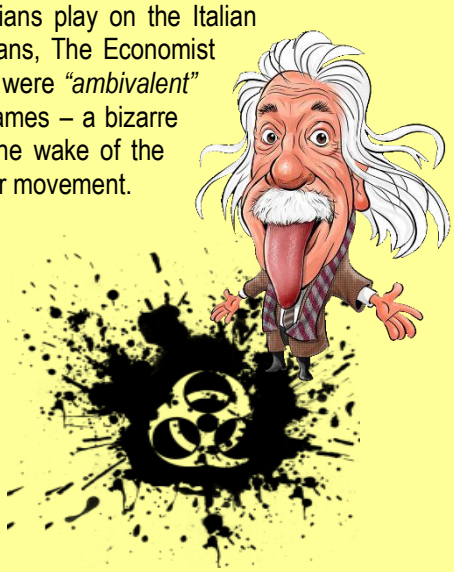
Source: https://www.rt.com/news/529203-italy-team-white-racism/

…

Anyway, the end result is that Italians play on the Italian team. But they're not just any Italians, The Economist continued, they're bad Italians who were *"ambivalent"* about taking a knee before their games – a bizarre gesture imported from the US in the wake of the ethno-narcissistic Black Lives Matter movement.

Not only that, by winning the championship, the Italian team made right-wing politicians in Italy happy, which of course is a crime.

…



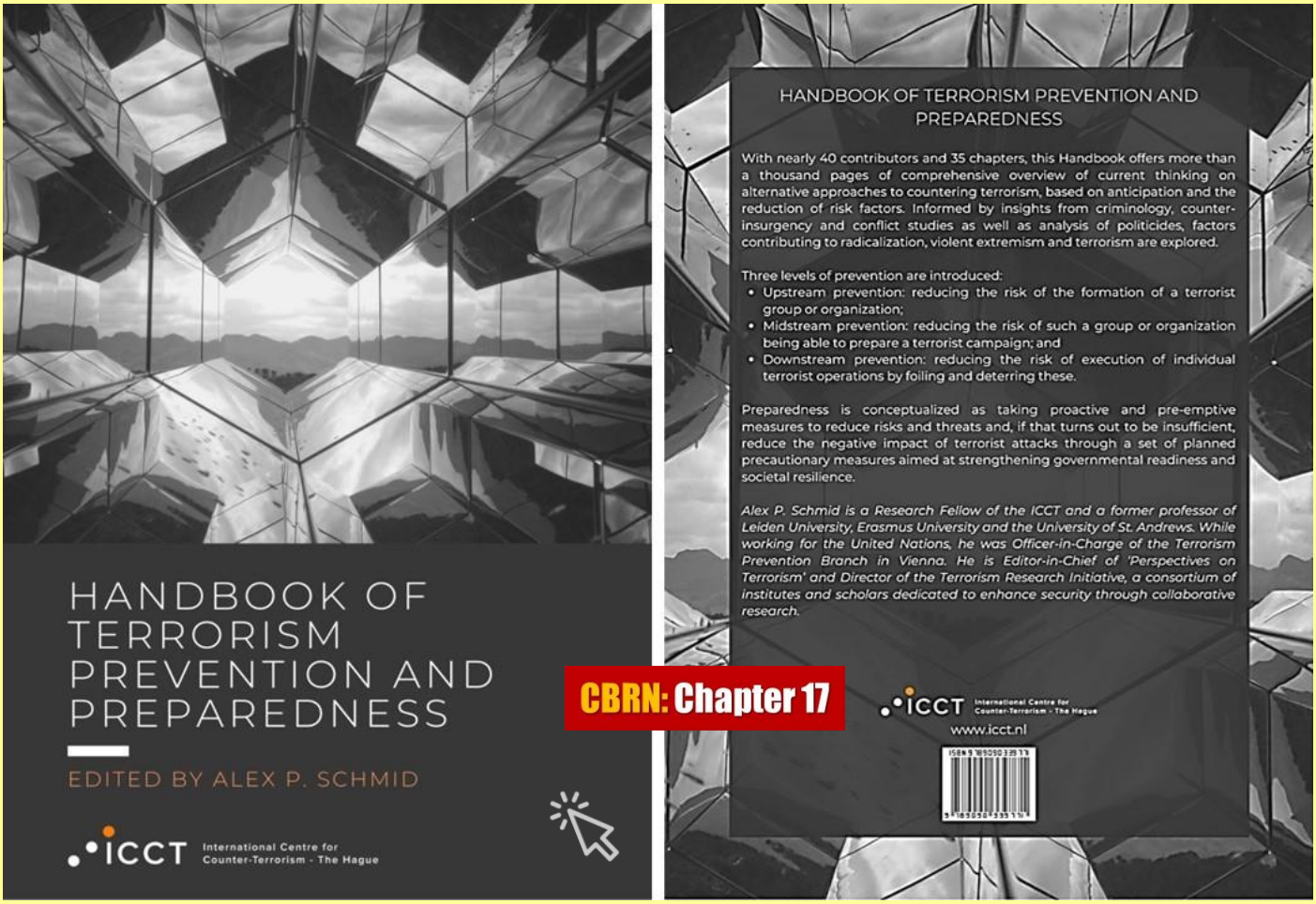
How to evaluate the cultural level of a nation

England is dealing with an eruption of racism directed at Black National Team players after its team's loss in the Euro 2020 final (3-2 in penalties).

A must see documanetary . . .

Source: https://topdocumentaryfilms.com/grandmas-tattoos/

Handbook on Terrorism Prevention and Preparedness (ICCT 2021)



Innovative Textile Development will Save Lives

Source: https://i-hls.com/archives/109599

July 16 – New **bite-resistant clothing** for both commercial and military uses will prevent contamination in diseases transmitted by mosquitos, such as Zika, Dengue fever, and yellow fever.
North Carolina State University researchers have created insecticide-free, mosquito-resistant clothing using textile materials they confirmed to be bite-proof in experiments with live mosquitoes.
They developed the materials using a computational model of their own design, which describes the biting behavior of *Aedes aegypti,* the mosquito that carries viruses that cause human diseases.

Ultimately, the researchers reported in the journal Insects that they were able to prevent 100 percent of bites when a volunteer wore their clothing — a base layer undergarment and a combat shirt initially designed for the military — in a cage with 200 live, disease-free mosquitoes.
The researchers think their computational model could be used more widely to develop clothing to reduce the transmission of diseases.
Researchers said they believe the materials could be effective against other mosquito species in addition to A. aegypti because of similarities in biology.
The researchers compared the fabrics' ability to prevent bites and repel mosquitoes to fabrics treated with an insecticide. "The final garments that were produced were 100 percent bite-resistant," said Michael Roe, William Neal Reynolds Distinguished Professor of Entomology at NC State. "Clothes that you wear every day can be made bite-resistant. Ultimately, the idea is to have a model that will cover all possible garments that person would ever want—both for the military as well as for private use."
Vector Textiles, a startup company, has licensed the related patent rights and intends to make clothing for commercial sale in the United States. as reported by phys.org.
right groups.

QUIZ

Can you guess the origin of the flag and the building where it was placed?

▶ Answer at the end of Part A

ISIS risk in Europe 'significantly' reduced, says EU counter-terrorism coordinator

Source: https://www.politico.eu/article/risk-of-terrorist-attacks-on-eu-soil-has-significantly-reduced-says-eu-anti-terrorism-coordinator/

July 17 – **Islamic State "no longer has the capacity to send terrorists onto European soil**" thanks to "action taken by the international coalition," the EU's counter-terrorism coordinator Gilles de Kerchove, told Le Monde in an interview published Saturday.

However, he warned "the threat remains complex" including through "isolated actors, with no direct link to the organization." De Kerchove cautioned, in particular, against growing extremist strength in parts of Africa, saying it was "essential to prevent the emergence on this continent of a new 'caliphate', which could directly threaten Europe."

"Europe has significantly reduced its vulnerabilities, but there are still uncertainties," de Kerchove told the French newspaper. He noted that cooperation among national intelligence services has "considerably" increased since the 2015 terrorist attack against the French satirical newspaper Charlie Hebdo, which left 12 dead.

De Kerchove, who is set to retire at the end of August, said there is no plan for creating a European version of the U.S. Central Intelligence Agency because "we have not determined what would be the added value of Europe in this field, or the purpose of such a body."

But he sees Europol — the EU's law enforcement agency — playing a more important role in the future. "Europol is going to improve in the collection of digital information and now plays a crucial role in judicial investigations of terrorism."

De Kerchove added that far-right movements are also a threat and in some EU countries, including Germany, they are considered "as worrying as jihadism."

"Even though I still see jihadism as the main threat, we have to be careful," he said, pointing to internet links between diverse far-right groups.

Th e three wi se monkeys[1] go to Tokyo . . .

[1] The three wise monkeys are a Japanese pictorial maxim, embodying the proverbial principle "see no evil, hear no evil, speak no evil". The three monkeys are Mizaru, who sees no evil, covering its eyes Kikazaru, who hears no evil, covering its ears, and Iwazaru, who speaks no evil, covering its mouth.

Vienna Is the New Havana Syndrome Hot Spot

By Adam Entous

Source: https://www.newyorker.com/news/news-desk/vienna-is-the-new-havana-syndrome-hotspot

July 16 – Since Joe Biden took office, about two dozen U.S. intelligence officers, diplomats, and other government officials in Vienna have reported experiencing mysterious afflictions similar to the Havana Syndrome. U.S. officials say the number of possible new cases in the Austrian capital—long a nexus of U.S. and Russian espionage—is now greater than the number reported by officials in any city except for Havana itself, where the first cases were reported.

The exact cause of the ailments in Vienna, which U.S. government agencies formally refer to as "anomalous health incidents" or "unexplained health incidents," remains unknown, but in response to the surge the C.I.A., the State Department, and other agencies are redoubling their efforts to determine the cause, and to identify the culprit or culprits. A C.I.A. spokesperson said that the agency's director, William Burns, was "personally engaged with personnel affected by anomalous health incidents and is highly committed to their care and to determining the cause of these incidents." Privately, Burns has called the maladies "attacks" rather than incidents. A State Department spokesman said, "In coordination with our partners across the U.S. government, we are vigorously investigating reports of possible unexplained health incidents among the U.S. Embassy Vienna community."

The Havana Syndrome derives its name from the Cuban capital, where C.I.A. officers and State Department employees first reported experiencing strange sensations of sound and pressure in their heads in 2016 and 2017. Some of the patients said the sensations seemed to follow them around their homes, apartments, and hotel rooms in the Cuban capital. Some of the patients described feeling as though they were standing in an invisible beam of energy. Many of them suffered debilitating symptoms, from headaches and vertigo to vision problems. Specialists at the University of Pennsylvania's Center for Brain Injury and Repair used advanced MRIs to study the brains of forty of the original patients from Havana. They found no signs of physical impact to the patients' skulls—it was as if they had "a concussion without a concussion," one specialist told me—and the team detected signs of damage to their brains.

Senior officials in the Trump and Biden Administrations suspect that the Russians are responsible for the syndrome. Their working hypothesis is that operatives working for the G.R.U., the Russian military-intelligence service, have been aiming microwave-radiation devices at U.S. officials, possibly to steal data from their computers or smartphones, which inflicted serious harm on the people they targeted. But American intelligence analysts and operatives

have so far been unable to find concrete evidence that would allow them to declare that either microwave radiation or the Russians were to blame.

The F.B.I. launched its own investigation into the events in Havana but agents have so far found no dispositive evidence of any attacks. Profilers with the Bureau's Behavioral Analysis Unit conducted their own assessments of the Havana patients without interviewing them directly.The unit concluded that they were suffering from a mass psychogenic illness, a condition in which a group of people, often thinking that they have been exposed to something dangerous, begin to feel sick at the same time. The patients themselves—as well as their University of Pennsylvania doctors and many government officials who have met with them—were infuriated by the Behavioral Analysis Unit's assessment, which was based on transcripts of previous interviews that the F.B.I. had done with some of the patients, and on "patient histories" compiled by the individuals' doctors, who had already ruled out mass psychogenic illness as the cause. According to these doctors, many of the patients didn't know that the other people were sick, and their bodies could not have feigned some of the physical symptoms that they were exhibiting. A U.S. official told me that the F.B.I. is now reassessing its mass-psychogenic-illness conclusion in light of the newly reported cases.

After the events in Cuba, a handful of potentially related cases involving C.I.A. and State Department personnel emerged in other countries; one of them involved a C.I.A. officer who, in 2017, woke up in a Moscow hotel room with severe vertigo. In 2018, American diplomats at the consulate in Guangzhou, China, reported more possible cases, though State Department officials have never disclosed how many of those patients were confirmed to have the syndrome. In early June, 2019, two White House staffers reported Havana Syndrome-like episodes in a hotel room in London during a state visit by then President Donald Trump. One of those victims subsequently reported an incident outside her home in Virginia. By mid-2020, at the direction of Trump's National Security Council, government agencies started to report possible syndrome cases to a special unit within the Office of the Director of National Intelligence. In the months that followed, dozens of American officials, including members of the U.S. military, came forward to report similar episodes. Among them were at least two other White House staff members who said they were afflicted while crossing the Ellipse, near the White House. Other cases were reported in Colombia, Kyrgyzstan, and Uzbekistan, among other places.

On December 3, 2020, Gina Haspel, Trump's C.I.A. director, whom White House national-security officials described as "skeptical" that the syndrome was real, sent a message to C.I.A. officers worldwide, encouraging them to report any unexplained health incidents that might be Havana Syndrome. The State Department and other government agencies sent similar messages to their employees. When Trump left office, there were no reported cases at the U.S. Embassy in Vienna, whose C.I.A. station is one of the largest in the world.

Vienna has long been a den of spies. The city is home to many large U.N. agencies, the Organization of the Petroleum Exporting Countries, and the International Atomic Energy Agency, among other international bodies that employ officials from around the world who have access to information of interest to U.S. and foreign intelligence services. In addition to significant numbers of American, British, Chinese, French, and Russian spies, the Iranians, the Syrians, and the North Koreans, among others, are believed to have operatives on the ground in Vienna.

Traditionally, Austria's domestic-security services have turned a blind eye to foreign-intelligence operations on Austrian soil as long as those operations don't threaten Austrian interests. "If you spy against other governments in Vienna, you're left alone. That's what everybody likes," Siegfried Beer, the founder of the Austrian Center for Intelligence, Propaganda, and Security Studies, located on the campus of the University of Graz, said. "This is why, when spies are detected, they disappear quickly."

U.S. intelligence officers, especially those with families, have long sought out assignments in Vienna because the city is seen as a safe, comfortable, and interesting place to live and work. "Our job is to try to get access to people and recruit them," John Sipher, who retired from the C.I.A. in 2014 after a twenty-eight-year career in the National Clandestine Service, which included serving in Moscow and running the C.I.A.'s Russia operations, said. "Vienna is perfect. Everyone is there. It's good living and it's good hunting—and you don't have to worry too much about getting caught."

As famously depicted in the Graham Greene classic "The Third Man," Austria was occupied by the Soviets, the Americans, the British, and the French after the Second World War. When the occupation ended, in 1955, the Austrian Parliament declared the country's neutrality, committing to neither being in the U.S. nor Soviet camp. Their hope was to be a bridge between East and West. When the Cold War ended, Austrian neutrality remained formally in place. At times, Vienna's insistence on staying neutral, even in the face of blatant acts of aggression by Russian President Vladimir Putin and his intelligence services, became a source of frustration in Washington. One of those moments came in early 2018, when Trump's national-security team tried to persuade the Austrians to join the British and other Europeans in expelling Russian spies to protest the G.R.U.'s attempted assassination in Britain of Sergei Skripal, a former Russian military-intelligence officer who had been a double agent for the U.K.'s intelligence services. "Our point was, 'Look, they're using your territory as a proving ground,' " a former Trump Administration

official told me. “And they said, ‘This isn’t our fight. We’ve never had problems like this. They’re actually kind of nice to us.’ ”
Later that same year, Putin attended the wedding of Karin Kneissl, who at the time was Austria’s Foreign Minister. The two were seen embracing and dancing together at the event. White House officials were “gobsmacked” by the images, which undercut U.S. and European Union foreign policy. “The Russians value Austria. They have always thought that they had a special relationship,” a former U.S. diplomat told me. European officials told their American counterparts that they believed Putin himself had a vacation home on a lake somewhere in Austria.
One of the Trump Administration’s foreign-policy objectives was to pull Central and Eastern European states, including Austria, closer to the United States. The former U.S. Ambassador to Austria, Trevor Traina, told me that his message to the Austrian leadership was, “Despite your formal neutrality, you guys are with the West. We’re not just some casual friends. We’re allies.” Traina and his allies in Washington arranged a flurry of high-level meetings between Austrian and American leaders—“the most in history,” Traina explained. The outreach effort even got its own German word—*Verbundenheit*—which translates as “new closeness” or “connectedness.”
In support of Traina’s *Verbundenheit* campaign, Trump invited the conservative Austrian Chancellor, Sebastian Kurz, who is known in Europe for his hard-line stance against refugees, to meet with him at the White House. Some members of Trump’s National Security Council staff opposed the move and argued, “The Austrians were unhelpful on Russia,” according to the former Trump Administration official. Traina and his allies insisted that bringing the Chancellor into the Oval Office would improve bilateral relations and further isolate Russia. Asked how the Russians felt about the *Verbundenheit* campaign, the former U.S. diplomat told me, “I think they hated it.”
In September, 2019, three weeks before a snap Austrian election, Kurz’s conservative People’s Party disclosed that its computer networks had been hacked. Kurz said the goal of the hackers was “removing, inserting, manipulating and falsifying data” and to “damage us at the election.” He added, “This is not just an attack on the People’s Party but also an attack on the democratic system.” Then, in January, 2020, Austria’s Foreign Ministry was targeted by a cyberattack, which officials blamed on a state actor that they did not name. The former Trump Administration official said, of the cyber intrusions, “These were shots across Austria’s bow by the Russians. The Austrians were waking up.”
Later that year, the Austrians took what U.S. officials saw as an extraordinary step: the Austrian Foreign Ministry expelled a Russian diplomat who reportedly had been engaged for years in economic espionage at a technology firm. The Russian Embassy said it was “appalled by the unfounded decision of the Austrian authorities, which is damaging to constructive Russian-Austrian relations.” Russia’s Foreign Ministry retaliated in kind by declaring an Austrian diplomat persona non grata.
Senior American diplomats and spies in Vienna were on the lookout for Havana Syndrome. The Embassy in Vienna was better prepared for the ailment than most—it has its own relatively well-equipped health clinic. The U.S. Embassy is well guarded, with the street in front of it closed off on both ends to prevent vehicles from parking nearby. Pedestrians who try to take pictures of the building are often stopped and questioned by security guards, who patrol the area. Employees don’t live in the Embassy compound—they rent houses and apartments all around the city, where, presumably, they have far less security.
Burns, the C.I.A. director, who had twice served in Moscow as a State Department diplomat, believed that the agency had failed to direct enough intelligence resources to the syndrome investigation under Trump. He assembled a new “targeting team” of senior analysts and operators to try to answer two questions as quickly as possible: What is causing Havana Syndrome, and who is responsible? Burns’s new targeting team has not yet uncovered new intelligence that would allow the C.I.A. to assess with confidence the cause of the syndrome or to identify who is responsible, a process that U.S. intelligence agencies call “attribution.” “The analytic line has not changed in the intelligence community in terms of cause and possible attribution,” a senior Biden Administration official told me. “But we are intensively trying to determine the cause, intent, and the role of any foreign actor.”
The number of possible syndrome cases around the world fluctuates frequently as new suspected cases are added to the list while other cases, deemed by doctors to be unrelated ailments, are removed from the list. As of late May, more than a hundred and thirty possible cases had been reported around the world. The C.I.A. accounted for some fifty of those cases. The rest were mostly U.S. military and State Department personnel and their family members. A senior national-security official recently told me, of the latest case count, “The only thing we can say definitively on the number is that we don’t know the exact number.”
The first possible syndrome case in Vienna was reported a couple of months after Biden’s Inauguration. That case and subsequent ones were reported to officials in Washington soon after they occurred. But the Biden Administration decided not to announce the Vienna outbreak—officials were concerned that any public disclosure about the cases would hamper ongoing U.S. intelligence and law-enforcement investigations, which are still under way in Vienna. The Austrian Embassy in Washington declined to comment on the cluster of cases.

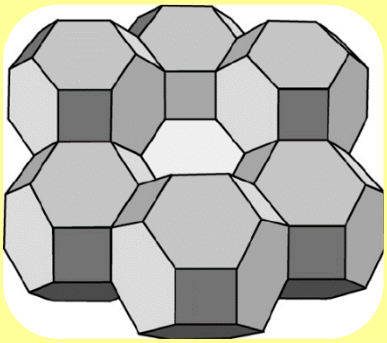
Many American officials, who suspect that Russian operatives and technology were responsible for the syndrome, believe that among Moscow's goals in Cuba was to see whether they could force the U.S. to scale back its presence on the island. If so, then Moscow's mission was accomplished. The C.I.A. station in Havana was shuttered by the agency's then director, Mike Pompeo, and the U.S. diplomatic presence was curtailed dramatically by then Secretary of State Rex Tillerson.
It is unclear what impact, if any, the new cases have had on U.S. diplomatic and intelligence activities in Vienna. If the Russians are, in fact, to blame, as many top Biden Administration officials believe, their goal remains unknown. They may have hoped that the incidents in Vienna would force U.S. diplomats and spies to leave the city—there's no indication that the Embassy or the station have been downsized. They may also have been trying to hamper American efforts to close ranks with the Austrians. The senior Biden Administration official told me, "We have not determined intent or motive. We do not have a view on that yet."

***Adam Entous** became a staff writer at The New Yorker in 2018. He was a member of a team at the Washington Post that won the Pulitzer Prize for national reporting.*

New Material Could Mean Lightweight Armor, Protective Coatings

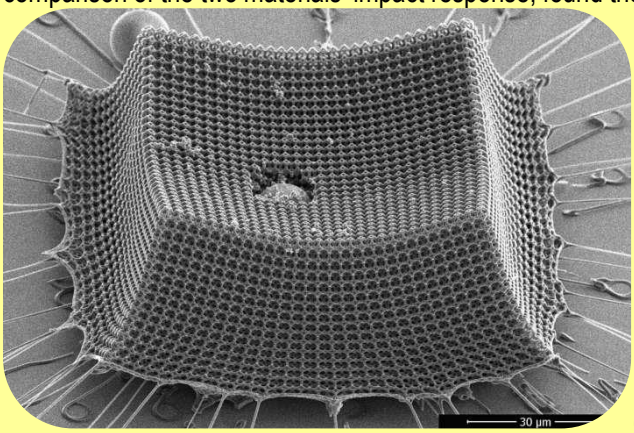
Source: http://www.homelandsecuritynewswire.com/dr20210719-new-material-could-mean-lightweight-armor-protective-coatings

July 19 – Army-funded research identified a new material that may lead to lightweight armor, protective coatings, blast shields and other impact-resistant structures.
Researchers at the U.S. Army's Institute for Soldier Nanotechnologies at the Massachusetts Institute of Technology, Caltech and ETH Zürich found that materials formed from precisely patterned nanoscale trusses are tougher than Kevlar and steel.
In experiments, the ultralight structures, called nanoarchitectured materials, absorbed the impact of microscopic projectiles accelerated to supersonic speeds.
"Increasing protection while simultaneously decreasing the weight that soldiers carry is an overreaching theme in our research," said Dr. James Burgess, ISN program manager for the U.S. Army Combat Capabilities Development Command, known as DEVCOM, Army Research Laboratory. "This project is a really good example of such efforts where projectile energy absorption is nanostructured mechanism based."
The research, published in Nature Materials, found that the material prevented the projectiles from tearing through it.
The researchers calculate that the new material absorbs impacts more efficiently than steel, Kevlar, aluminum and other impact-resistant materials of comparable weight.
"The knowledge from this work…could provide design principles for ultra-lightweight impact resistant materials [for use in] efficient armor materials, protective coatings, and blast-resistant shields desirable in defense and space applications," said co-author Dr. Julia R. Greer, a professor of materials science, mechanics, and medical engineering at Caltech, whose lab fabricated the material.
Nanoarchitected materials are known to feature impressive properties like exceptional lightness and resilience; however, until now, the potential for additional applications has largely been untested.



"We only know about its response in a slow-deformation regime, whereas a lot of their practical use is hypothesized to be in real-world applications where nothing deforms slowly," Portela said.
To help fill this vital knowledge gap, the research team set out to study nanoarchitected materials undergoing fast deformation, such as that caused by high-velocity impacts. At Caltech, researchers first fabricated a repeating pattern known as a **tetrakaidecahedron**—a lattice configuration composed of microscopic struts—using two-photo lithography, a technique that uses a high-powered laser to solidify microscopic structures in photosensitive resin.
To test the tetrakaidecahedron's resilience to extreme, rapid deformation, the team performed experiments at MIT using the ISN-developed laser-induced particle impact array. This device aims an ultrafast laser through a glass slide.. As the laser passes through the slide, it generates a plasma, an immediate expansion of gas that launches the particles toward the target.
By adjusting the laser's power to control the speed of the microparticle projectiles, the researchers tested microparticle velocities within the supersonic range.
Using a high-speed camera, the researchers captured videos of the microparticles impacting the nanoarchitected material. They had fabricated material of two different densities. A

comparison of the two materials' impact response, found the denser one to be more resilient, and microparticles tended to embed in the material rather than tear through it.



To get a closer look, the researchers carefully sliced through the embedded microparticles and nanarchitectured target. They found that the struts below the embedded particle had crumpled and compacted in response to the impact, but the surrounding struts remained intact.

"We show the material can absorb a lot of energy because of this shock compaction mechanism of struts at the nanoscale, versus something that's fully dense and monolithic, not nanoarchitected," Portela said.

Going forward, Portela plans to explore various nanostructured configurations other than carbon, and ways to scale up the production of these nanostructures, all with the goal of designing tougher, lighter materials.

"Nanoarchitected materials truly are promising as impact-mitigating materials," Portela said. "There's a lot we don't know about them yet, and we're starting this path to answering these questions and opening the door to their widespread applications."

The U.S. Army established the MIT Institute for Nanotechnologies in 2002 as an interdisciplinary research center to dramatically improve the protection, survivability and mission capabilities of the Soldier and of Soldier-supporting platforms and systems.

In addition to Army funding through the institute, the U.S. Office of Naval Research and the Vannevar Bush Faculty Fellowship supported the research.

What a plane!

Russian LTS Checkmate (Su-75)

Olympic chief confirms Games could STILL be called off at the last-minute as Tokyo faces a TRIPLE health threat

Source: https://www.the-sun.com/sport/3315558/tokyo-olympic-games-cancelled-covid/

July 20 – As Games-linked Covid cases continue to rise in a city rising in indignation at the Olympics taking place, Tokyo 2020 chief Toshiro Muto said he was prepared to discuss a last-minute cancellation.
The first events of the Games were taking place overnight, with Team GB's women footballers in action against Chile this morning.
But Muto said: "We can't predict what will happen with the number of coronavirus cases. So we will continue discussions if there is a spike in cases.
"We have agreed that based on the coronavirus situation, we will convene five-party talks again.
"At this point, the coronavirus cases may rise or fall, so we will think about what we should do when the situation arises."
Muto's stunning intervention, just hours after IOC President Thomas Bach admitted he had suffered 'sleepless nights' and feared the Games would not be able to take place, came as Tokyo suffered another two health and safety body blows.
The first was the finding of elevated levels of the potentially deadly E-coli bacteria in the Tokyo Bay waters due to host the triathlon and open water swimming events.
Local residents have complained about the sewage smell, with heavy rain forecast for next week which could see further leakage into the Bay.

Food for thought

Meanwhile, Korean team chiefs said they planned to screen food from Fukushima Prefecture, scene of the 2011 nuclear disaster, claiming it might have been contaminated by radioactive Caesium.
But it was Muto's comments which were the most eye-opening, after yet more Covid chaos in and around the Olympic Village.
While the six Team GB athletes ordered to isolate after 'close contact' with a Covid-positive passenger on their flight to Tokyo have now been fully cleared to return to training, confirmed cases in other teams are rising.

And a team of journalists from BBC Scotland were 'pinged' as close contacts following their flight and must isolate for 14 days in their h otel.
Muto's unexpected statement, coming after Japanese PM Yoshihide Suga promised 'we can bring success to the delivery of the Games', was another sign of the public backlash as feeling against the Olympics hardens.
It was viewed, however, as more of a damage limitation exercise designed to show that Tokyo 2020 was not a mere rubber-stamp for the IOC than a genuine threat.
Nevertheless, with Bach conceding he refused to acknowledge the possibility of the Games being scrapped because it would have become 'a self-fulfilling prophecy', the possibility of the Olympics not happening has now been aired.
Despite the chaos, Brisbane will be confirmed this week as the host of the 2032 Olympics after being designated the 'preferred bidder' by the IOC.

New Handheld Screening Wands Could Reduce the Need for Airport Pat-Downs

Source: https://www.dhs.gov/science-and-technology/news/2021/07/22/feature-article-new-handheld-screening-wands-could-reduce-need-airport-pat-downs

July 22 – We've all walked through a metal detector at the airport, hoping we didn't forget anything in our pockets that will set off the alarm. When security personnel can't immediately identify what is triggering the alarm, the process is halted for a pat down. Though this slows the screening process significantly for people waiting in line and can be an uncomfortable

experience for the individual being screened, it is an essential element of keeping *all* travelers safe.
To improve airport security, both for screeners and for those being screened, the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) continually invests in research and development (R&D) to build solutions for the future. S&T's Screening at Speed Program partners with government, academia, and industry to increase security effectiveness at the airport from curb to gate, while dramatically reducing screening wait times and improving the passenger experience.
In 2020, Screening at Speed leveraged the DHS Small Business Innovation Research (SBIR) Program to develop improved handheld screening wands using millimeter wave (MMW) technology to resolve alarms and reduce the need for pat-downs. Design concepts defined by Screening at Speed included detecting metallic and non-metallic anomalous objects, classifying object materials, and using automated algorithms that protect privacy while distinguishing between concealed objects and clothing or skin.

"We leveraged our SBIR program to fund two different innovative handheld scanners based on newly-available and low-cost 5G electronics," said federal project manager Karl Harris, Ph.D., of S&T's Screening at Speed program. "Development and implementation of these wand technologies will improve passenger experience, reduce transportation security officer (TSO) burden, and allow more thorough screenings."
Developing a multi-functional touchless screening solution also enables on-demand security screening in environments where traditional screening systems aren't in place. This will allow DHS to more efficiently support the mission of its component agencies who protect our borders, coasts, and government. Solutions could also be used to enhance security at large-scale gatherings and sporting events.
While handheld screening technology of this caliber has been an S&T goal for several years, the data requirements and hardware costs were prohibitive until recent technology advancements made development a reality. The rise in 5G cell phones, automotive radars, embedded computing, and other critical enabling technologies creates the perfect opportunity for small companies to integrate commercial-off-the-shelf (COTS) technologies to build and transition next-generation screening solutions like the handheld millimeter wave wand.
In April 2021, S&T awarded Spectral Labs Inc. of San Diego, California, and TeraMetrix LLC of Ann Arbor, Michigan, 24-month SBIR Phase II contracts to build on the prototypes they demonstrated in 2020 after completing six months of Phase I development. Key requirements given to the performers for both phases of development include compensation for intentional or unintentional shaking of the wand, a minimum three to four hours of battery life, and a targeted volume cost of $5,000 or less.
At the end of Phase I, Spectral Labs' prototype exhibited detection capability for objects under thin clothing and a variety of material classes. Their focus during Phase II will be on improving object detection in more challenging scenarios, meeting environmental concerns, and detecting and classifying explosive materials. The goal is to add these features to two different prototypes by the end of Phase II and to meet non-screening design parameters such as size, weight, durability, and battery life.
TeraMetrix is using a variety of simulated threat objects to test the detection capabilities of different configurations of COTS Frequency Modulation Continuous Wave (FMWC) hardware. The FMWC hardware improves the measurement accuracy and simplifies the computing process. Their Phase I wand prototype demonstrated initial object reconstruction capabilities, using the sensors data to create a representation of what the wand is scanning. During Phase II, they are focused on integrating the feature into three new prototypes. They will also be attempting to provide alarm resolution screening data in real time.
At the conclusion of Phase II contracts, the prototypes and performance for both companies will be evaluated by the Screening at Speed team to determine next steps for the development program. Once a prototype is ready for commercialization, potential applications include use as a secondary screening tool to reduce the number of pat downs TSOs at the Transportation Security Administration (TSA) need to perform; as a primary and secondary screening tool at border crossings; as a primary screening tool at ad-hoc security checkpoints and large events managed by law enforcement; and as part of the security apparatus for high-profile security screenings.
"The DHS SBIR partnership has proven extremely valuable for pursuing innovative concepts like handheld millimeter wave wands," said Sharene Young, S&T's TSA portfolio manager. "Development of contactless alarm resolution tools are a game-changing capability for reducing physical contact during the screening process and staying ahead of the changing threat landscape. We are very excited to see how this capability matures during Phase II."

Norway Mourns Victims of Worst-Ever Terror Attack 10 Years On

Source: http://www.homelandsecuritynewswire.com/dr20210722-norway-mourns-victims-of-worstever-terror-attack-10-years-on

July 22 – The bomb and shooting attacks by a far-right extremist have been described as the Nordic country's worst peacetime violence. On Thursday, Norway came to a standstill to remember those who died.

Norway is marking the tenth anniversary of the Nordic country's worst-ever terror attack.

On July 22, 2011, Norwegian far-right extremist Anders Behring Breivik planted a bomb in the capital, Oslo, killing eight people after disguising himself as a police officer.

He then headed to the tiny island of Utoya where he gunned down 69 mostly teen members of the Labor Party's youth wing.

"I was 16 years old and I couldn't decide which funerals to go to because there were so many," survivor Astrid Eide Hoem told the AFP news agency.

"I had never lost anyone close to me before, but also now, being in my mid-20s, I think about what would have become of them, the job they might have had, the children."

It turned out that the killer had published a 1,500-page "manifesto" shortly before the attacks that laid out his racist, neo-Nazi views.

A court ruling meant his testimony was not televised, denying him a chance to broadcast his views to a wide audience.

But Breivik was convinced that he would inspire other right-wing fanatics to follow in his footsteps.

Just over a year later, judges sentenced Brevik to 21 years in prison, the maximum possible term.

However, the courts have an option to extend his sentence indefinitely. It means the 42-year-old extremist will likely spend the rest of his life behind bars.

Events were taking place around the country, including a service in Oslo Cathedral that ended with bells ringing in churches across the entire nation. At one televised memorial, survivors read aloud the names of the 77 victims. King Harald of Norway spoke at an event in the Norwegian capital attended by past and present leaders of the Nordic country.

Norway's prime minister at the time was Jens Stoltenberg, who is now the chief of the NATO military alliance.

Stoltenberg called for "more democracy, more openness, and more humanity" two days after the attacks took place.

"Ten years ago, we met hatred with love," he said in a speech Thursday. "But the hatred is still present."

What has been the fallout of the attack?

But a decade on, there is a debate about whether Norway has truly come to terms with the ideology that Breivik laid out his in the manifesto.

"The far-right ideas that inspired the attack are still a driving force for right-wing extremists at home and abroad," the Norwegian intelligence service (PST) warned this week.

The PST said Breivik had inspired copycat attacks, citing the targeting of mosques in New Zealand's Christchurch and Oslo.

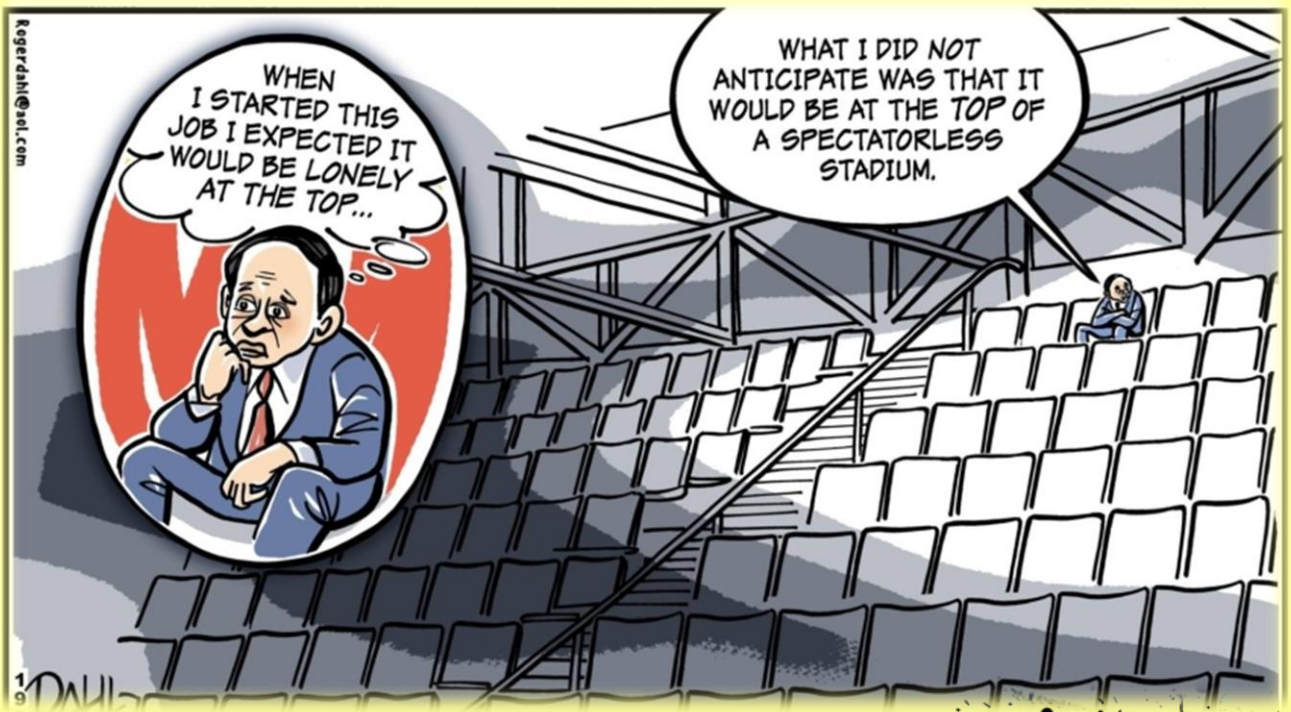
On Tuesday, vandals scrawled "Breivik was right" on a memorial for Benjamin Hermansen, a Norwegian-Ghanian teenager who was brutally stabbed to death by neo-Nazis in 2001 in what has been called Norway's "first racist crime".

EDITOR' COMMENT: Have you read "**Manifesto 2083**" (1515 pages)? Especially the WMD part of the document (pp.957-1061)?

Observation test

Do you see something strange in this photo from a Turkish military parade in occupied Cyprus?

▶ Read answer at the end of Part A



ICI International CBRNE INSTITUTE

CBRNE-Terrorism Newsletter

HOTZONE SOLUTIONS GROUP

C²BRNE DIARY

CHEM NEWS

Terrorists prepare false-flag chemical attacks in Syria

Source: https://www.plenglish.com/index.php?o=rn&id=68743&SEO=terrorists-prepare-false-flag-chemical-attacks-in-syria

June 23 – Syrian authorities on Wednesday denounced that terrorist groups advised by the United States and other Western Governments persist in their attempts to stage chemical weapons attacks to accuse the syrian Army.

Radical groups and members of the so-called 'White Helmets' are preparing to carry out criminal actions by using chemical weapons in some regions of Idlib and Hama provinces, and the objective is to accuse Damascus, the Ministry of Foreign Affairs announced at a press release.

The document revealed that the Front for the Liberation of the Levant, formerly Al Nusra Front, which was included in the international terrorism list, moved tankers carrying crude chlorine from the border with Turkey to Atma town, in Syria's northern province of Idlib, where it is processed at a laboratory and turned into gas.

This toxic substance is filled into projectiles and then fired at residential areas in rural Idlib, the note stated.

The Ministry of Foreign Affairs reiterated that such criminal actions will not prevent the Syrian army from continuing its fight against terrorism until its final eradication and regain stability across the national territory.

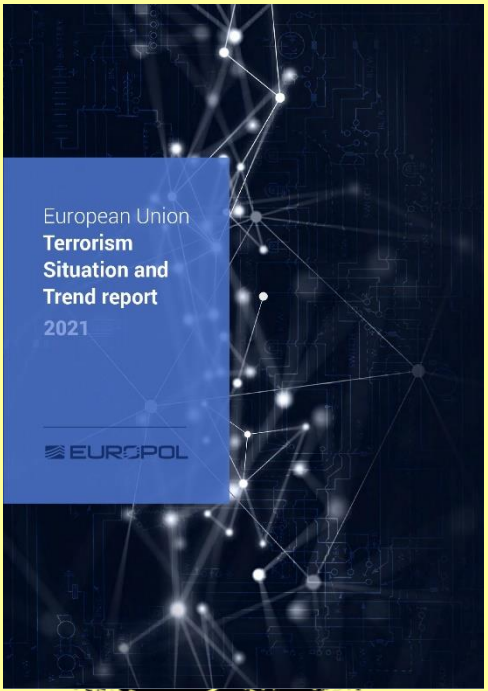
Syria repeatedly rejected reports by the Organization for the Prohibition of Chemical Weapons accusing Damascus of using such weapons and claimed that terrorists stage attacks to accuse the State.

It denounced that this Organization became a tool to implement aggressive plans by the United States and its allies and a scenario to settle political scores with Syria.

EUROPOL – TESAT 2021

CBRN threats

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



In 2020, as in 2019, no terrorist attacks using chemical, biological, radiological or nuclear (CBRN) materials were recorded in the EU Member States. Nevertheless, trials of cases involving the use of CBRN materials were concluded in 2020 or were ongoing at the time of writing. For example, the perpetrators of the 2018 Germany ricin plot were sentenced to 10 and 8 years in prison, respectively29,30 and other cases in which suspects were arrested for acquiring explosives and manifested the intention to purchase CBRN materials through the dark web came before the courts31.In 2020, CBRN materials were used in attacks, sometimes in transnational contexts. In September 2020, envelopes containing ricin, which remains the preferred toxin for committing attacks, were sent from Canada to several authorities in the USA32. In August, Russian citizen Alexei Navalny was hospitalised after showing symptoms of exposure to hazardous material. The presence of a chemical warfare agent (Novichok) was confirmed by Germany33, the Organisation for the Prohibition of Chemical Weapons (OPCW)34, and later a report published in a prestigious medical peer-reviewed journal35. If CBRN substances are used by different actors, this also implies a risk of collateral damage. For example, in the case

in 2018 in Salisbury (UK), persons other than those allegedly targeted were harmed36.In 2020 no terrorist incidents involving radiological or nuclear material were reported. Nevertheless, it should still be considered possible that some actors intend to use these materials to conduct attacks. This issue warrants particular concern with regard to safeguarding and restricting access to such materials, since there have been reports of radiation sources under regulatory control being stolen from education facilities in EU Member States37.Biosecurity and biosafety were of heightened public interest in 2020 due to the COVID-19 pandemic. This also applied to extremist circles. Online propaganda and discussions in closed online forums continued to trend, and the COVID-19 crisis expanded the CBRN focus to include biological threats. Nevertheless, although some people have discussed weaponsing SARS-CoV-2 or intend to do so, most often technical information does not have the appropriate scientific background.No attempts to use COVID-19 as a bioweapon have been reported in the EU. Nevertheless, terrorists and extremists quickly perceived the pandemic as an opportunity to enrich their agendas, spread misinformation or even conspiracy theories. Terrorist propaganda and online chatter suggested possible ways of weaponising the virus. Publications inciting jihadists to take the coronavirus as an opportunity to spread fear and launch indirect attacks were observed along with suggestions to distribute poisoned masks to the public on the streets. Right-wing extremists discussed methods to use COVID-19 as a weapon: close contact, airborne and fomite transmissions were suggested as sources of contamination targeting minorities, politicians, police officers and medical staff. Shipping of contaminated products was also suggested. Taking advantage of the COVID-19 crisis, right-wing extremists further suggested attacks on critical infrastructure, governmental facilities and the use of cyanide to contaminate drinking products.

Brexit flagship to be fitted with bomb-proof panic room - inside the £200m vessel

Source: https://www.express.co.uk/news/politics/1455125/royal-navy-flagship-pirate-proof-panic-room

June 27 – It comes amid growing threats that it may be targeted by pirates, Jihadi groups and terrorist organisations including Iran-backed Houthi rebels. The £200m vessel - to be built in Britain to showcase “the UK's burgeoning status as a great, independent maritime trading nation” - will be staffed by Royal Navy sailors and carry an armed protection party.

A mocked up image of what the new flagship might look like has been released

But last night sources confirmed that its final design will include a so-called "**NBC citadel**" – **a bomb-proof room that will ensure members of the royal family, ministers and trade ambassadors are safeguarded should other methods fail.**

The stronghold will be designed to carry a maximum of **25 people** though it will be able to accommodate more in its four rooms - which will include a kitchen and bathroom.
It will be robust enough to protect against nuclear, chemical and biological attack, contain a global communications suite and generate **its own safe air supply for as long as 24 hours**, sources added.
Though dubbed the new "royal yacht" the 7,500-tonne vessel will be a ship rather than a luxury yacht , powered by diesel-electric engines and boasting VIP suites, a conference centre and reception room big enough to hold 200 people.
At 125 metres in length, it is also expected to accommodate a flight deck big enough to land a Merlin or Chinook helicopter.
It will replace HMY Britannia (photo below), presented to a young Queen Elizabeth in 1954 and which steamed 1,087,623 nautical

miles on 696 foreign visits and 272 domestic visits until she was decommissioned in 1994.
Like Britannia, the new vessel will be escorted by a Royal Navy warship on foreign tours, following a decision not to produce a fully armed dual-role military vessel.
Sources confirmed this was to ensure it would always be available for so-called “soft power operations” and, carrying only classified defensive capabilities, would be less likely to present as a military target to hostile nations.
Last week suggestions by Downing Street that its complete cost would have to be met by the cash-strapped Ministry of Defence erupted into an inter-departmental scrap.
It came after the Government was forced to classify the yacht a military vessel in order to bypass WTO rules which state all civilian vessels must be open to tender from other countries.
However, it was later confirmed that only the initial procurement process would be paid out of the defence budget.
While other costs have yet to be allocated, the Royal Navy will be expected to foot its annual £5m running costs, however.
Last night a senior naval source at Fleet Command confirmed there has been a major spike in maritime terrorism since the last Royal Yacht left the operational fleet, and such threats will be of concern.
“Vessels are facing an increased range of threats from shore-based missiles to attempted boardings and maritime UAVs,” said the source.
“While it’s unlikely the new yacht will actually find itself dealing with hostile situations, the decision has been made to include the citadel.
“It will provide a highly secure space that is sealed from chemical and biological attack. While guests take shelter in this locked area, the Captain and his team will have to operate in chemical warfare suits and respirators and sail the ship away from danger at best speed.”

The inclusion of citadels is now considered best practice on merchant ships following an increase in piracy and other types of attack. In October last year 22 crewmembers of the Liberia-flagged Nave Andromeda took shelter in a citadel when the vessel was overrun by stowaways in the English Channel. The suspected hi-jack was ended when members of the SBS stormed the ship.
Tom Chant, chief executive of the Society of Maritime Industries, said: "The installation of citadels on board merchant vessels and large yachts is common security practice, providing crews with a secure space with means of communication and emergency supplies."
Construction of the vessel is expected to begin as soon as 2022 and it will enter service within the next four years.

EDITOR'S COMMENT: Too expensive solution and I am not sure that it will work in a real incident. If the target is the VIPs on board, then most probably it would be an inside job and the central HVAC system will be used to disperse CWAs acting within minutes. If this is the case the time required to access the citadel will be the cause of death of those contaminated. If there is a CR incident followed by a contaminated plume while the vessel is in the port then there might be sufficient time to use the specialized citadel. CR attack in open sea – very poor option given the measures terrorists have access to; better option for a rogue state attack but the possibility looks remote. A RED attack set by a member of the crew? Easy and possible but requires a lot of planning and many individuals involved to surpass security measures. Food poisoning equally possible. There are some more sophisticated scenarios as well but my overall conclusion is that it will be more effective and cheaper to have gas masks or PAPRs in all rooms (VIPs; crew) and escape hoods (one size fit all) in areas with mass gatherings while on board (e.g., dining rooms; conference center, etc.) plus one hour of specialized training on how to use them – it is one of the rare instances that security personnel cannot be of help. In addition, it is self-evident that the bridge will be CBRN-proof at all times and for obvious reasons.

OPCW launches chemical safety and security management guidelines

Source: https://www.miragenews.com/opcw-launches-chemical-safety-and-security-587115/

June 30 – The Organization for the Prohibition of Chemical Weapons (OPCW), today launched new Guidelines for Chemical Safety and Security for Small and Medium-sized Enterprises (SMEs) to Foster the Peaceful Uses of Chemistry.

The Director of OPCW's International Cooperation and Assistance Division, Ms Kayoko Gotoh, highlighted in her opening remarks at the online launch: "This publication constitutes the first step in crafting non-binding guidelines on chemical safety and security and we will continue to explore the opportunities for similar outcomes for other stakeholders in the future."

The indicative guidelines provide a global overview of chemical safety and security management for small and medium businesses, relevant for Member States from all five OPCW regions. The document does not set out to cover all the detailed technical elements of chemical safety and security management but rather provides a reference for SMEs implementing chemical safety and security measures.
Following the introduction of the guidelines, experts from Brazil, China, Germany, Italy, the United States of America, as well as from relevant international organisations and chemical industry shared their knowledge and experiences.
The initiative to compile chemical safety and security guidelines for small and medium-sized enterprises was launched in 2019 at the Workshop on Developing Tools for Chemical Safety and Security. The goal of this initiative was to strengthen chemical safety and security best practice in support of peaceful uses of chemistry and international cooperation among OPCW Member States.
The launch event involved 120 participants from the following 39 OPCW Member States: Algeria, Argentina, Bangladesh, Belarus, Brazil, Cameroon, China, Costa Rica, Croatia, Cuba, Ethiopia, Germany, Ghana, Guatemala, India, Indonesia, Ireland, Italy, Madagascar, Malaysia, Maldives, Mexico, Myanmar, Nigeria, Oman, Pakistan, Philippines, Poland, Qatar, Saint Vincent and the Grenadines, Saudi Arabia, Seychelles, Spain, Togo, Turkey, United Arab Emirates, the United States of America, Venezuela, and Zambia.
Representatives of the International Council of Chemical Association (ICCA), the Organisation for Economic Co-operation and Development (OECD), and the United Nations Environment Programme (UNEP) also attended the launch.

Background

At its Sixteenth Session, the Conference of the States Parties adopted decision C 16/DEC.10 (dated 1 December 2011) on the components of an agreed framework for the full implementation of Article XI of the Chemical Weapons Convention. In accordance with paragraph 2 of that Decision, States Parties and the OPCW Technical Secretariat undertook to "conduct, based on input from National Authorities and relevant stakeholders, a needs assessment on tools and guidance that would be helpful for promoting chemical safety and security".

Following the Decision, and building on OPCW's efforts to systematically gather knowledge and best practice through capacity building activities, the Technical Secretariat invited Member States to provide information, on a voluntary basis, about their tools and practices in chemical safety and security management.

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

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

The benefits of an app-based simulation system for CBRNe training

By Steven Pike

Source: https://www.argonelectronics.com/blog/the-benefits-of-an-app-based-simulation-system-for-cbrne-training

As the use of toxic industrial chemicals (TICs) in industry has become more prevalent, so too has the risk of an accidental release which could have potentially devastating consequences for human life, the environment and critical infrastructure.

At the same time too, there is the very real threat, however small, of industrial chemicals being used as weapons by a terrorist group or lone agent.

Many of the chemicals produced for industrial purposes are inherently dangerous due to their reactive, flammable, explosive, toxic or carcinogenic properties.

The toxic industrial gases elemental chlorine, anhydrous ammonia and hydrogen fluoride (often referred to as toxic inhalation hazards or TIHs) have been identified as being of particular concern from both a safety and security perspective.

In the event that any significant quantity of these chemicals was to be discharged, whether due to an accident or a deliberate act, the resulting toxic gaseous plume would almost certainly have disastrous consequences for human life and the environment.

A case in point is the Union Carbide gas tragedy which occurred in Bhopal India in 1984. The accidental leak of 45 tons of methyl isocyanate over the course of one night created a toxic plume that was responsible for the deaths of at least 3000 people and which injured more than 100,000.

Even today, the Bhopal gas disaster is still regarded as being the world's worst industrial accident.

It is not too difficult then to imagine the effects that a deliberate attack using similar types or quantities of chemicals might have on a densely populated civilian target.

Training for chemical threats

A crucial aspect of CBRNe training and preparedness is providing responders with the opportunity to experience first-hand the challenges of low probability / high risk events.

The question though is how to effectively replicate the nature of chemical incidents in a manner that is both highly realistic and completely safe.
What is also vital is to be able to conduct exercises that involve a wide variety of scenarios - from searches of clandestine laboratories to the detection of Chemical Improvised Explosive Devices or large-area survey, reconnaissance, threat assessment and decontamination.
When live chemical training is not an option, the use of simulation and simulator-based training tools can provide a powerful way to depict the powerful characteristics of chemical events without posing any risk to personnel, environment or infrastructure.

Simulator training systems offer the advantage of providing instructors with complete control of their exercises and of being able to set up a broad range of scenarios in any location.
For smaller organisations however, investment in substantial quantities of CBRNe training equipment may not always be feasible.
In such situations, the use of an app-based training system such as PlumeSIM-SMART can provide an instantly accessible and cost-effective training solution.

Gain instant access to world-class CBRNe training
Argon Electronics' app-based training system, PlumeSIM-SMART, enables CBRNe instructors to offer practical and highly engaging wide-area, tabletop and live field exercise training without the need for any significant capital outlay or for the purchase of any additional equipment.
Trainers are able to rapidly deploy highly realistic scenarios involving toxic industrial chemicals, chemical warfare agents (CWAs) and radiological sources.
Using app-based simulation instruments, trainees are able to experience all of the characteristics of an evolving threat environment as they maneuver through the exercise area tracked by GPS or using a virtual gamepad for Tabletop exercises.
PlumeSIM-SMART offers the ability to simulate single or multiple threats, real-time chemical or radiation plume variation, changing meteorological conditions, hot spots, static emissions and hidden devices
The system facilitates training in the standard five-gas chemical system, radiation survey and personal dosimetry.
There is also the option to subscribe to a chemical warfare simulation that has been designed around the use of the LCD3.3 and AP4C chemical detectors.

Enhanced learning outcomes
Having the ability to monitor, record and review trainee movement is a vital feature of an effective simulation training system.
PlumeSIM-SMART records all student movement in real time and offers dynamic After Action Review capability.
Bread crumb trails also provide exercise controllers with vital data which can be used to review their trainees' decision making processes, the time taken and how effectively they have communicated specific information.
For Incident Commanders there is also the advantage of being able to demonstrate to the appropriate authorities that the desired level of competency has been achieved.

MDG-1 CBRN Decontamination Glove

Source: https://www.mirasafety.com/products/mdg-1-personal-cbrn-decontamination-glove

Get instant, on-demand decontamination anywhere you go with MIRA Safety MDG-1 Personal CBRN Decontamination Gloves. These decontamination gloves were originally developed for the Serbian military, where exposure to chemical threats like Sarin or VX are a daily threat.
Using a nontoxic formulation that immediately contains or neutralizes a wide range of CBRN threats, our decontamination gloves are lightweight, easy to deploy, and ideal for instantly

minimizing exposure. Just rub the exposed area for proven 90% decontamination efficiency against common threats, including everything from VX to caustic mustard gas.

MDG-1 CBRN Decontamination Glove Key Features:

- ✓ Fingerless fabric glove for rapid, single-use emergency decontamination
- ✓ Slides on over existing gloves for rapid deployment
- ✓ Uses Velcro fixture to secure over your palm
- ✓ Rub exposed skin, equipment, or accessories for up to 90% decontamination efficiency in minutes
- ✓ Uses nontoxic, noncorrosive, nonflammable, ultra-fine (as small as 63 microns) powder/clay compound to adsorb and wipe away toxins
- ✓ Hazards are chemically bound to the surface of the montmorillonite powder, minimizing off-gassing and further spread
- ✓ Decontaminates a surface area of up to 1 meter per glove
- ✓ Based on a design developed and deployed by the Serbian Armed Forces
- ✓ Ultra-compact, smartphone-sized package is waterproof, easy to store, and deploys in seconds
- ✓ Weighs in at 5.3 oz, making it a perfect addition to a bug out bag or EDC Kit
- ✓ Lasts up to five years in storage

Technical Specifications

Based on a design developed and deployed by the Serbian military, the MDG-1 Personal CBRN Decontamination Glove is a simple, practical solution for unexpected exposure to toxic chemicals and other CBRN threats.

The MDG-1 uses a dry, nontoxic, and noncorrosive montmorillonite-based compound that yields an ultra-fine powder with massive amounts of surface area (particles are as small as 63 microns). Much like the activated carbon in a gas mask filter, this huge surface area allows for the adsorption of toxic threats—effectively lifting them from the affected area before brushing them away seconds later.

Proven through years of testing to deliver effective decontamination against common threats (from liquid to particulates and gas, even some of the most corrosive agents), MDG-1 Personal Contamination Gloves don't require the same precision or experience as traditional decontamination efforts. They're ideal for use in the field (without even needing to remove your gas mask).

Everyday exposure to dangerous toxins can happen in a wide variety of places, from public transport to government facilities, laboratories, factories, healthcare facilities, police/fire or other emergency response professions, and anywhere else hazardous chemicals are present.

When minutes or even seconds matter, having a decontamination plan—and especially a tool like the MDG-1 Personal CBRN Decontamination Glove—can realistically save lives.

Guidelines recommend carrying at least two MDG-1 packages for each member of your party, depending on anticipated exposure. The glove can be used for 5-10 minutes before the embedded powder has reached its capacity.

Dimensions	170mm x 120mm x 35mm
Total Mass in Package	~150 grams
Clay Mass	~100 grams
Operating Temp. Range	–25° C to +55° C
Shelf Life	5 years
Active Component	Clay (montmorillonite content >55%)
	1-3% Free moisture content
Decontamination Efficiency	**91.5% for VX exposure**
	90.1% for Soman
	98.2% for S-Yperite
Ion Exchange Capacity	0.6 mmol/gram minimum
Total number of cations Ca2+ + Mg2+	0.28 mmol/gram minimum

MIRA Safety MDG-1 Personal CBRN Decontamination Gloves should be stored in their original packaging in a dark room with a temperature between 41°F and 77°F with relative humidity of less than 75%. Stored in the original packaging, MDG-1 Personal CBRN Decontamination Gloves have a 5-year shelf life.

IMPORTANT NOTES

- Once used, the glove and powder will be contaminated with any toxins or CBRN threats to which they've been exposed. Safe disposal of hazardous materials is crucial. Consult your local authority or your organization for guidelines on the disposal of hazardous materials. Each unit comes with one MDG-1 CBRN Decontamination Glove. Butyl gloves (as pictured being worn underneath the MDG-1), are not included and are essential to using this product with live agents.
- The MDG-1 CBRN Decontamination Glove is currently on pre-order, with the first units shipping sometime in late July. If you have any questions about this product, please feel free to email us at support@mirasafety.com, chat us via the bubble on the bottom right, or click "ask a question" below to help contribute to the knowledge bank.

CM-3M CBRN Child Escape Respirator / Infant Gas Mask with PAPR

- Designed to protect babies and small teens against CBRN threats
- Comes as a complete system including an expandable mask, blower unit, tubing, back/waist carrier and integrated water bottle
- Integrated hydration system allows for safe drinking, even in dangerous environments
- Tested to provide up to 240 minutes of effective protection from mustard gas (CWA) according to MIL-STD-282 (method 204.1.1.)

75% of Pueblo Chemical Depot mustard agent has been destroyed

Source: https://eu.chieftain.com/story/news/2021/07/01/pueblo-chemical-depot-has-destroyed-75-mustard-agent/7826943002/

July 01 – The Pueblo Chemical Depot administration has announced that 75% of the mustard agent held at the depot has been destroyed, meeting the milestone just over a year after announcing that half of the mustard agent had been destroyed.

The U.S. Army has been working to destroy the approximately 780,000 decades-old shells since September 2016. The shells held a total of 2,500 U.S. tons of mustard agent, and are being destroyed as part of the 1997 Chemical Weapons Convention treaty which bans chemical weapons.

The operations are still on schedule to be completed by the end of 2023, a Congressionally-mandated deadline for the depot. There were three kinds of rounds stored at the Pueblo Depot: 105mm rounds, 155mm rounds and 4.2-inch mortar rounds.

Since Dec. 11, 2020, more than 137,000 projectiles of the 105mm campaign have been destroyed out of approximately 380,000 such rounds.

On Sept. 5, 2020, workers completed the destruction of the nearly 300,000 155mm projectiles, which is the last of that category of munition. As of June 25, a total of 1,953 tons of mustard agent out of the total 2,500 tons have been destroyed at the depot.

Since the destruction of 300,000 larger 155-millimeter munitions wrapped up in September, the 1,615 technicians on the Bechtel Pueblo Team — consisting of employees with the Bechtel, Amentum, Battelle and General Physics companies — have retrofitted processing equipment, making specialized components needed to destroy the smaller 105mm projectiles.

The neutralization of mustard agent molecules occurs through a process using hot water and a caustic solution that makes hydrolysate — a common industrial chemical that is readily biodegradable. Hydrolysate is then broken down into salts, water and organics using living microbes.

The first of the 4.2-inch mortar rounds are expected to be destroyed sometime before the end of the year, according to Sandy Romero, communications manager for the Bechtel Pueblo team. Construction is expected to be completed this year for three Static Detonation Chamber units which will be used to destroy the mortars.

Recent change of command preceded destruction announcement

The Chemical Depot welcomed a new commander on Thursday, June 24 in advance of the 75% destruction checkpoint news. The previous Pueblo Chemical Depot Commander Col. Michael W. Cobb relinquished his

Col. Lacroix comes to the Depot after serving as the Senior Military Advisor for the Deputy Assistant Secretary of Defense for Countering Weapons of Mass Destruction, Office of the Under Secretary of Defense for Policy, The Pentagon, Washington, D.C.

"With only a few days in command, I am incredibly excited to be part of this effort.

For decades the depot has ensured these weapons remain safe and secure prior to their destruction," he said in a press release.

"While hitting this 75% of agent eradicated milestone is exciting and a true testament to the workforce and relationship between PCD and PCAPP, we remain focused on the safety and security of the remaining 25% of the agent stockpile. We will continue to work closely with regulators and community partners to meet the milestones set by the Chemical Weapons Convention Treaty and Congressional mandates."

The current Pueblo Chemical Depot operates on approximately 7,000 acres for the Cantonment Area, wastewater treatment lagoon and the Pueblo Chemical Agent Destruction Pilot Plant. In December 2013, the Army formally declared about 15,847 acres of the Depot property as federal surplus, which is now rebranded as PuebloPlex. The land agreement between the Army and PuebloPlex has not yet been finalized, according to PuebloPlex CEO Russell DeSalvo.

The agreement is set to be finalized this year, he said.

PuebloPlex passed a redevelopment plan in 2016 discussing what the land will be used for after all chemical agents have been neutralized or destroyed. The goal is to use the land for industry and create a hoped-for additional 58,000 jobs in Pueblo.

CBRN-E crime and offenders' motives. What is it? Why people do it?

By Marian Kolencik
June 2021
Source: https://www.researchgate.net/publication/352860728_CBRN-E_crime_and_offenders'_motives_What_is_it_Why_people_do_it

Topics related to chemical, biological, radiological, nuclear and explosive materials are increasingly being discussed in today´s society. Their connection with crime leads us to another dimension, which necessarily requires deeper investigation. This significantly affects several types of crime, including environmental crime, because they are closely related to each other. From practice, we feel that there is no comprehensive (and) global view of law enforcement activities in the existing complex CBRN-E crime. We also perceive the shortcomings in the standard operational procedures of security forces for CBRN-E incidents, which must be regularly updated in connection with emerging technologies. These shortcomings often stem from the different terminology from which many activities are derived. This applies in particular to CBRN police units, teams such as SWAT, EOD, K9, special operation teams (undercover), security and protection forces, CSI-forensics, public order police, environmental police, and anti-narcotics force, etc. Literature writes mostly about CBRN-E terrorism, and only a minimal amount of information on wide range of CBRN-E crimes is mentioned. Therefore, linking this topic only to terrorism is not relevant today. It is necessary to perceive this phenomenon in a broader context. The aim of this article is to present the results of our comparative study related to the definitions of CBRN-E and HazMat materials, threats, and incidents. In the article, we also propose our own definition and categorization of CBRN-E crime, including related concepts based on our examination of real cases around the world, a study of the literature, legislation and history. Another aim of this paper is to create a basis for in-depth qualitative and quantitative research by the ISEM Institute related to the prevalence of CBRN-E crime in selected countries, as well as a framework for a deep case comparative study. In the final part of the article, we will focus on the motivation, motive and intents in committing CBRN-E crime using specific analysed cases, which may be used in the future in the investigation of similar cases and case linkage.

NYC Subway Sensors Could Provide Early Warning for Potential Chemical and Biological Threats

Source: https://www.hstoday.us/subject-matter-areas/transportation/nyc-subway-sensors-could-provide-early-warning-for-potential-chemical-and-biological-threats/

June 29 – Public transportation is the backbone of a city. It moves people safely and quickly from place to place for work, school, events, meetings, and running errands. It connects businesses and families together.
Keeping these systems safe without impeding or slowing the flow of traffic is critical. So how do you monitor public transit spaces for potential biological or chemical hazards without slowing anyone down?
The Department of Homeland Security (DHS) works tirelessly with its public transportation partners to help make transit systems safer while maintaining their efficiency. The DHS Science and Technology Directorate (S&T) has been developing and perfecting various sensor technologies for public transit through the Urban Security Initiative, a portfolio of collaborative projects with the City of New York, to help protect high-density urban areas against threats. One such collaboration, called Underground Transport Restoration, involved a simulated airborne health hazard that was dispersed and measured in the NYC subway system in May 2016. This work, ongoing since 2010, uses science, technology and simulation modelling to help make public transit safer, even during the pandemic.
Quickly detecting and mitigating biological or chemical threats in the subway is critical for preventing the spread of hazardous materials should the unthinkable occur. However, technologies that are currently in use do not perform fast enough for a subway environment, and false alarms may cause unnecessarily disruptive and expensive closures.

Chemical and Bio-Defense Testbed addresses chemical and biological threats
Fast forward to present day and S&T's latest collaborative project—Chemical and Bio-Defense Testbed (CBT)—which tests and evaluates cost-effective technologies to detect chemical and biological threats inside an actual subway environment, as well as mitigation strategies if threats are detected. This project is a collaboration between S&T, the Massachusetts Institute of Technology (MIT) Lincoln Laboratory, the Metropolitan Transportation Authority (MTA) New York City Transit (NYCT),

New York Police Department, Port Authority of New York and New Jersey, and the New York City Department of Health and Mental Hygiene.

"As North America's leader in adopting technology for improving transportation safety and reliability, the MTA values its partnership with DHS to ensure that riders are protected from emerging threats," said Mark Dowd, MTA Chief Innovation Officer. "Out of an abundance of caution, we embrace S&T's expertise in evaluating detection protocols that could provide early notification should someone seek to threaten our customers."

A testbed is a real-world environment where researchers can see how technology performs. Several testbeds already exist in New York, examining new technologies for different hazards. The CBT is designed to detect a wide range of threats with the help of chemical and biological sensor technologies. The initial phase of CBT focuses on biological threats (such as *Bacillus anthracis*, the anthrax-causing bacteria), as they are more difficult to detect early (during the incubation period) and can multiply for days before being noticed. Contrarily, when a chemical hazard is released, the effects are typically immediately visible.

The current testbed consists of eight secured cabinets in a NYC subway station. The biodetection sensors are not yet installed, but inside the cabinets presently lie environmental sensors, power and communication equipment, and a nearby command center that will support the functioning of the sensors.

After the new biodetection technology is installed (sourced from government, academia and the private sector), researchers from S&T and MIT Lincoln Laboratory will gather data to assess the technologies' performance. These data will include false alarm rate, probability of detection, time to detection and cost of ownership, as well as environmental data gathered from the support equipment like temperature, pressure, relative humidity, wind speed and direction. The data can also be used for technology improvements.

"To keep up with evolving threats, S&T wants the subway testbed to be enduring, because this will continually enable assessment of current and emerging chemical and biodefense-related detection and identification technologies, as well as evaluation of rapid subway response and mitigation actions," said Dr. Don Bansleben, S&T's CBT Program Manager.

The testbed will achieve that and be cost-effective, as the cabinets can be used again and again to test new technologies, saving taxpayer dollars while providing a real-world environment to evaluate performance.

Biosensors scan the air for dangerous organisms

Biowatch, a biodetection technology currently used by several major cities in the United States, can detect and confirm pathogens such as *Bacillus anthracis* via DNA analysis, which can take 12-36 hours.

"We need information faster," Bansleben said. "Rapid identification of a chem-bio attack is imperative to save lives and prevent spread."
CBT is aiming for biodetection and confirmation within about two hours. Different types of biodetection sensors will be installed inside the testbed. Some will collect samples on a filter and potentially analyze captured microscopic organisms, like the anthrax bacteria. While other sensors will look for distinctive characteristics of the organisms, like fluorescence, that indicate a potential hazard. Regardless of their type, the sensors will be networked and monitored for alarms. The future goal for these technologies is to alarm immediately when a threat is suspected, so swift response decisions and actions can be taken.
"Multiple sensors using different physical principles to detect a threat would be ideal and provide higher confidence that something unusual may be happening," said Bansleben.
After an alarm belonging to a sensor with a filter goes off, then the filter will be collected and analyzed. Biodetection must follow the CDC Laboratory Response Network process, which requires confirmation by laboratory analysis. If the analysis confirms viable threat bacteria or viruses, response and mitigation actions will immediately follow.
The testbeds will also support mitigation testing. Train motion produces airflow that carries particulates (a mixture of visible and microscopic solid particles and liquid droplets found in the air), including released hazard pathogens. To diminish the spread of biohazardous plume, S&T is looking at mitigation strategies like altering train position, speed and schedule, and particulate removal via filtration or liquid spray knockdown curtains and air curtains. If there is a bioterrorist attack, the sensors will send a signal to emergency operations centers triggering potential future mitigation strategies.
"The idea of the spray knockdown curtains is to physically knock particles out of the air to stop trains from pushing them along to other stations or to stop the particles from escaping aboveground where people might breath them in," said Bansleben.
We have all encountered air curtains in stores—jets of air creating an air wall—to prevent cold air from coming through the doorway. For this project, the air curtain will prevent biological particles from reaching the next station, thus containing the contaminated area.
"It is important to know as quickly as possible that you have been attacked so that appropriate countermeasures can be taken to inform the public and to distribute the medical countermeasures to protect people's health and save lives," Bansleben said. "Our goal is to have sensors that perform extremely well, are low cost, low maintenance," Bansleben said.

What's ahead?
Installation of the biodetection sensors at the subway station testbed will take place in summer 2021, followed by other stations by the end of 2022. The biodetection sensors will also be used in a major testing event led by the S&T Urban Threat Dispersal project. S&T will observe how the technologies operate by themselves and with other sensing technologies, with a goal to network together different types of sensors for a cost-effective, efficient, high-quality system. This testbed methodology can be applied to other critical locations like densely populated urban areas, special events and critical infrastructure, with an initial focus on mass transit hubs in major urban areas.
"If we are successfully able to identify a system that detects biological hazards correctly and efficiently, we will be able to help New York City and other cities improve their security, emergency planning and readiness," Bansleben said.

SOFINS 2021: Ouvry showcases CBRN protection equipment

Source:https://www.armyrecognition.com/sofins_2021_news_online_show_daily/sofins_2021_ouvry_showcases_cbrn_protection_equipments.html

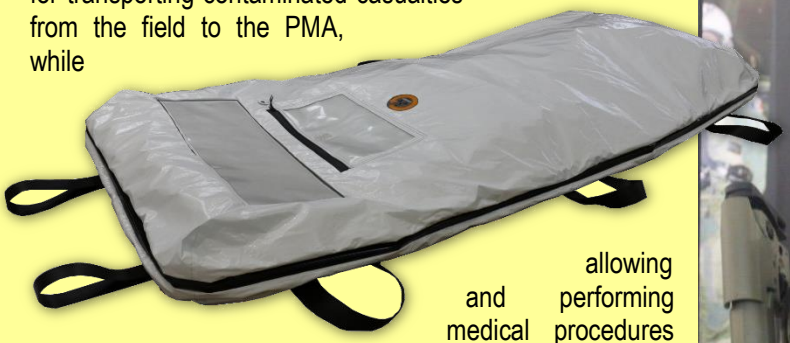
Lyon-based SME specializing in the design and manufacture of latest generation CBRN protection and decontamination systems, Ouvry develops its products in partnership with end users to meet their operational needs. These innovative products are intended for all types of operators: soldiers, Special Forces, pilots, deminers, law enforcement, firefighters, first responders, Civil Security, critical infrastructure and transport services. The French company showcases CBRN protection equipment during the Special Forces Exhibition, SOFINS.

Mask FM53
Developed to face the multiple threats encountered in the field, it is dedicated to specialized applications where the operator is faced with unstable situations. It can switch from negative pressure (cartridge) to positive (ARI) in less than 2 seconds. FM53 is a single mask for positive and negative protection.

CBRN Protective Suit (Picture source: Army Recognition)

Evacops

New contaminated victim evacuation bag, specially designed for transporting contaminated casualties from the field to the PMA, while allowing and performing medical procedures emergency during transport. Ensures containment of contamination to prevent contamination of personnel, vehicle or aircraft used to extract the victim.



TFI (Intervention Forces Uniform) and OBOOTS overboots

It is a filtering suit that protects against CBRN agents in liquid, vapor and aerosol form for 24 hours according to NATO recommendations. Lightweight, ergonomic and very robust, it provides optimal comfort and protection adapted to operational needs. Adopted by special forces, intervention teams, RESCO, CTLO. The TFI can be completed with the new French OBOOTS overboots which guarantee optimum protection against liquids, comfort and high resistance to heat.

TFI® Training overall must only be used for instruction or training purposes. This overall does not protect against CBRN threats

The materials used for the conception of this overall have equivalent characteristics to the TFI ® CBRN operational overall. The training overall has the same weight and grants the user the same thermal comfort. Thanks to these materials, operating costs can be reduced as the overall can be used several times and is easy to wash.

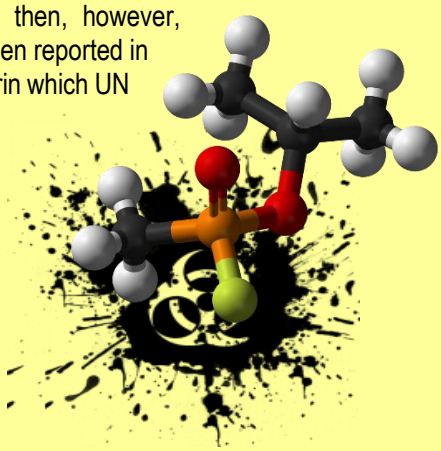
How four tons of a sarin-linked chemical 'disappeared' in Syria

Source: https://brian-whit.medium.com/how-four-tonnes-of-a-sarin-linked-chemical-disappeared-in-syria-63b5673ac22e

Four tons of a chemical supplied by a German firm and supposedly intended for making pharmaceuticals vanished after arriving in Syria, according to a Swiss newspaper investigation. The chemical — isopropanol — has multiple civilian uses but also is a **crucial ingredient in the nerve agent sarin**. If diverted for military purposes it would be enough to produce about eight tones of sarin.

Brenntag's distribution center in Switzerland

In 2013, under international pressure following a sarin attack on rebel-held Ghouta, Syria joined the Chemical Weapons Convention. That meant it had to declare all existing chemical weapons stockpiles together with related equipment and production facilities, and then destroy them under supervision by the OPCW. Since then, however, numerous chemical attacks have been reported in Syria, including several involving sarin which UN and OPCW investigations have blamed on Syrian government forces.



In 2014 a Syrian company called Mediterranean Pharmaceutical Industries (MPI) ordered more than **five tons of isopropanol and 280 kilos of diethylamine** from a German company, Brenntag. Exporting isopropanol to Syria from EU countries requires a special

license but Brenntag sent the chemicals from Germany to one of its subsidiaries — Brenntag Schweizerhall — in non-EU Switzerland, from where they were legally shipped to Syria.
MPI originally wanted the chemicals to be flown to Syria but in the event, they took an extraordinarily long and circuitous route. After reaching Switzerland they were sent back through Germany along the Rhine to the North Sea, and from there were shipped around the coast of France and Spain and across the Mediterranean, arriving at the Syrian port of Latakia in January 2015.
Documents obtained by the Swiss newspaper Basler Zeitung (BaZ) show conflicting accounts of what happened to the chemicals once they were in Syria. MPI initially claimed it had used all the isopropanol between 2015 and 2018 for producing Voltaren Emulgel, a painkilling gel which it manufactured under license from the Swiss company Novartis.
On the face of it this was a plausible explanation, since the gel consists of 20% isopropanol, but according to BaZ's report there were a couple of problems. One was that MPI had lost its license for the gel in 2015. The other was that in reality it had not used any of the isopropanol for making gel but for coating pills — which needed far less of it. The amount actually used by MPI was only 1,120 kg and BaZ says the remaining four tons never reached the factory.

▶▶ The detailed report from BaZ can be found here. It is in German and readers have to sign up for a free subscription. There's a shorter summary in English here.

First nerve agent rockets destroyed at Blue Grass Army Depot

Source: https://www.wtvq.com/2021/07/12/first-nerve-agent-rockets-destroyed-at-blue-grass-army-depot/

Blue Grass Chemical Agent-Destruction Pilot Plant operators place the first M55 rockets containing VX nerve agent on a conveyor to begin the destruction process July 9. This marks the fourth of five destruction campaigns to begin at the Blue Grass Army Depot. (A portion of this photo has been blurred in accordance with Department of Defense guidelines.)

July 12 – The **first M55 rockets** containing VX nerve agent were destroyed at the Blue Grass Chemical Agent-Destruction Pilot Plant July 9. This marks the fourth of five chemical weapons destruction campaigns to begin at the Blue Grass Army Depot (BGAD).
"Rockets are the most complex munitions in our stockpile," said Dr. Candace Coyle, BGCAPP site project manager. "We are eager to see this portion of the chemical weapons in Kentucky destroyed. The team is focused and ready to accomplish the mission safely."
"Our team has successfully completed two projectile campaigns involving nerve agent," said Ron Hink, Bechtel Parsons Blue Grass (BPBG) project manager. "As with the previous campaigns, safety will remain the top priority as we begin rocket destruction."
Under the observation of trained operators, automated equipment will disassemble nearly 18,000 rockets and drain the chemical agent.

The agent will be neutralized by mixing it with water and caustic to produce hydrolysate.

After the agent is confirmed destroyed, the hydrolysate will be pumped to holding tanks to be processed later at an off-site disposal facility.

The drained rocket warheads will be containerized and destroyed in a Static Detonation Chamber unit located on the depot. The rocket motors will be placed on pallets and safely transported to Anniston, Alabama, to be destroyed in a Static Detonation Chamber unit.

Throughout the campaign, the BGCAPP team will work closely with BGAD and Blue Grass Chemical Activity (BGCA) partners to destroy the chemical weapons.
"The professionalism, leadership and day-to-day level of teamwork between Team BGAD continues to demonstrate a superior level of capability and expertise between all parties," said Col. Stephen Dorris, BGAD commander. "I couldn't be prouder of the focused intensity going into the effort to quickly and safely rid Madison County, the Commonwealth of Kentucky, the United States and the people of planet earth, from the threat of chemical weapons."
"Blue Grass Chemical Activity is proud to be a part of the team that continues to make history as we support our nation's commitment to destroy the chemical weapons stockpile," said Lt. Col. Edward Williams, BGCA commander. "Even while we supported the destruction of VX projectiles at BGAD this past May while operating under COVID-19 pandemic precautions, BGCA personnel were at the same time preparing to support transport of VX rockets for the mission."
"The start of VX rocket destruction in Kentucky is an important step toward fulfilling the United States' commitment to the Chemical Weapons Convention," said Michael S. Abaie, program executive officer for Assembled Chemical Weapons Alternatives. "Our teams are working diligently to eliminate an entire category of weapons of mass destruction, with safety always at the forefront."
The Program Executive Office, Assembled Chemical Weapons Alternatives is responsible for destroying the remaining U.S. chemical weapons stockpile in Colorado and Kentucky. The organization oversees the contract for design, construction, systemization, operation and closure of BGCAPP with BPBG and subcontractors Amentum, Battelle Memorial Institute and GP Strategies.
The project also works closely with community advisory groups to keep them informed about chemical weapons destruction progress.
"The start of VX rocket destruction is a big step forward for BGCAPP," said Doug Hindman, Kentucky Chemical Demilitarization Citizens' Advisory Commission chair. "Their successful destruction of projectiles should give workers the experience to tackle the more dangerous rockets."
The chemical weapons stockpile at the depot originally consisted of 523 tons of chemical agent configured in 155mm projectiles containing mustard and VX nerve agent, 8-inch projectiles containing GB nerve agent, and M55 rockets containing GB and VX nerve agent.
In June 2019, the BGCAPP team began destroying the mustard stockpile using the Static Detonation Chamber, an explosive destruction technology.
The mustard campaign is more than 90% complete. From January through May 2020, nearly 4,000 8-inch projectiles containing GB nerve agent were destroyed at BGCAPP.
From January through May 2021, nearly 13,000 155mm projectiles containing VX nerve agent were destroyed at BGCAPP.
As of July 2, more than 28% of the original 523 tons of chemical agent have been destroyed in Kentucky.
The stockpile sites in Colorado and Kentucky account for the last 10% of what was originally a national stockpile of more than 30,000 tons of chemical weapons.

The U.S. Army Chemical Materials Activity destroyed the initial 90%, which was stored at seven other sites across the U.S. and on Johnston Atoll in the Pacific. Chemical weapons destruction in Colorado began in 2015. **Both sites are on target to complete destruction of chemical weapons by Dec. 31, 2023.**

New "Metafabric" Passively Cools the Human Body by Almost 5 Degrees Celsius

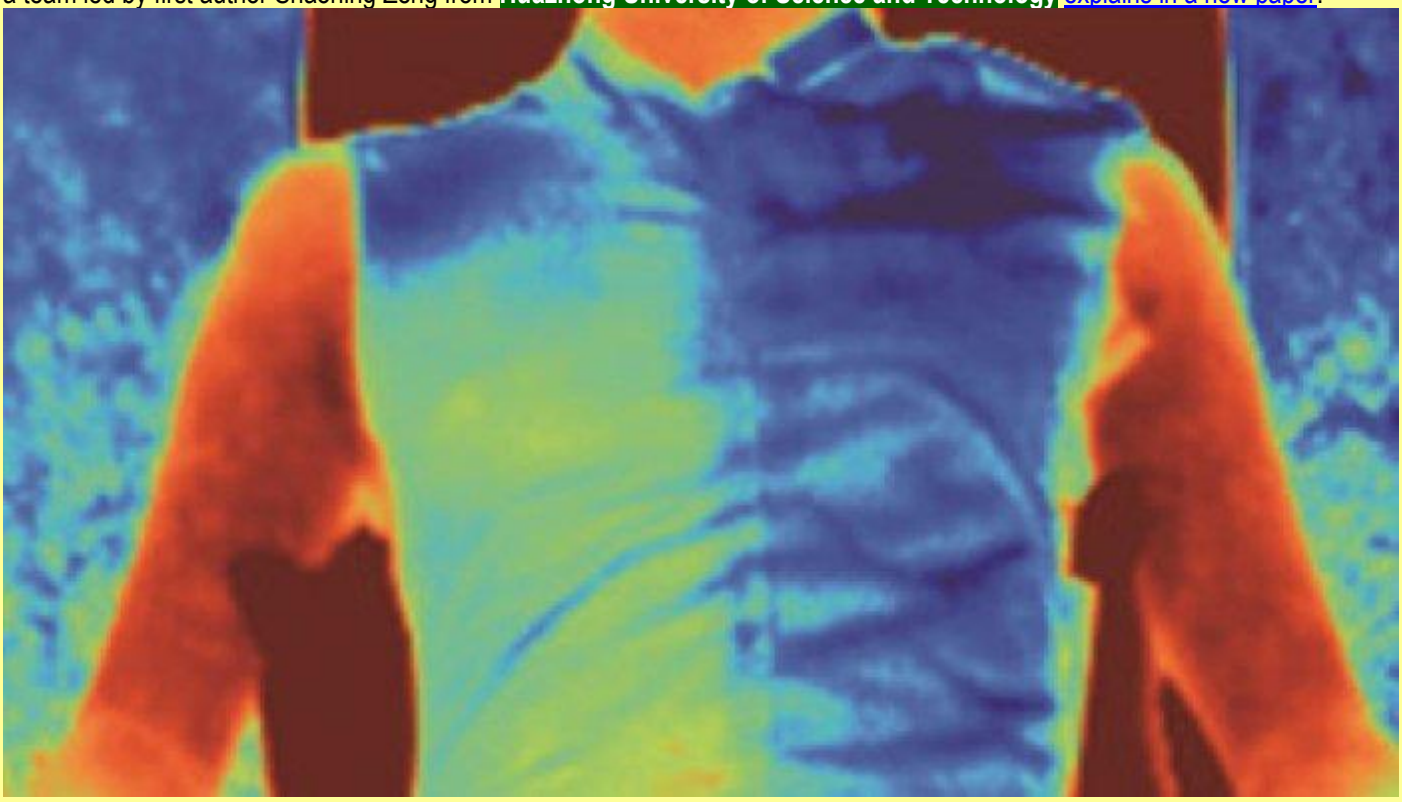
Source: https://www.sciencealert.com/new-metafabric-could-passively-cool-the-human-body-by-almost-5-degrees-celsius

July 12 – As the world gets hotter with climate change, one of the ongoing challenges humans will face is simply surviving worsening heat, with projected temperature increases expected to bring increasingly deadly heatwaves, even rendering some parts of the world uninhabitable.

Against such harsh heat, a new material developed by scientists in **China** could have the potential to help keep human bodies much cooler, thanks to a fabric that reflects light and heat away to a remarkable degree.

This nascent field of technology is called personal thermal management (PTM), and in a new study, researchers say their 'metafabric' could one day help wearers to beat excessive heat stress.

"The metafabric exhibits efficient radiative cooling performance and provides necessary breathability and wearing comfort for PTM," a team led by first author Shaoning Zeng from **Huazhong University of Science and Technology** explains in a new paper.



Metafabric vest (right), showing cooler temperatures in blue than cotton (left) (Zeng et al., Science, 2021).

In this case, the metafabric uses titanium oxide-polylactic acid composite nanoparticles laminated with a thin layer of polytetrafluoroethylene (PTFE), and is designed to strongly reflect light, encompassing both visible light (VIS) and wavelengths in the mid-infrared (MIR) and ultraviolet (UV) ranges.

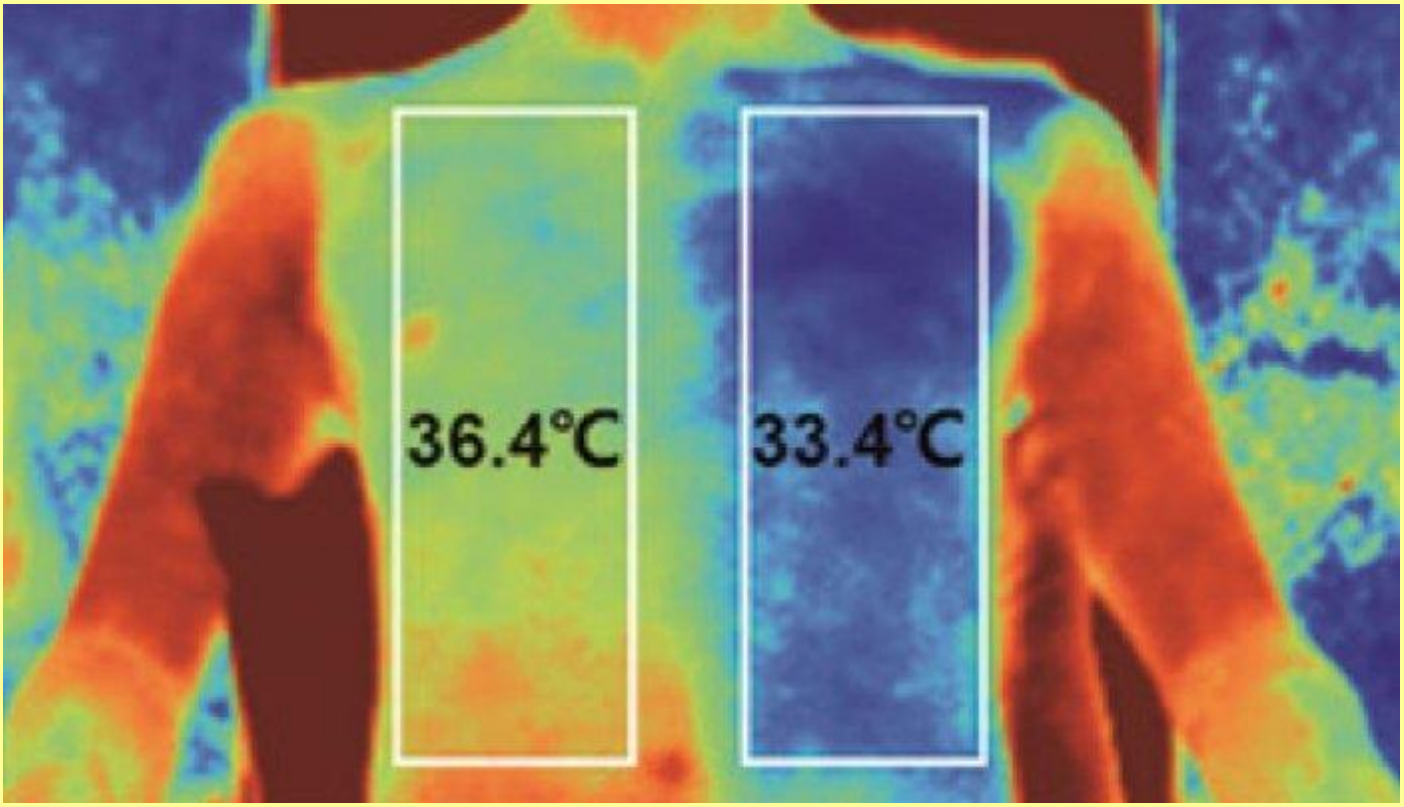
In theory, by reflecting much of the light across those wavelengths, the material should also reflect heat away before it has a chance to be absorbed.

"Such a wide distribution of nanoparticles, when combined with PTFE nanobeads, provides broad-spectrum scattering and reflectivity across the UV-VIS-NIR [near-infrared] band," the researchers write in their study.

To test the metafabric's cooling potential under sunlight, the researchers trialed the material in clear sky conditions in Guangzhou, China, measuring the temperature of the fabric in comparison to other common materials lying on a panel.

Photo of the resulting white-ish metafabric. (Zeng et al., Science, 2021)

"Under peak solar irradiance between 11:00 and 15:00, the temperature of the metafabric was approximately 5.0°, 6.8°, 7.0°, 5.8°, and 10.2° C lower than that of the cotton, spandex, chiffon, linen, and bare skin simulators, respectively," the researchers explain. In another test closer to real-world conditions, a volunteer reclined under direct sunlight for an hour while wearing a special vest, made from the metafabric on one half, and a commercial cotton fabric on the other side.



Once disrobed, skin from under the metafabric (right) displays as significantly cooler than skin from under the cotton fabric (left) (Zeng et al., Science, 2021).

An external thermal camera measured a 3.4 °C temperature difference between the two sides of the vest, but thermal sensors underneath the fabrics showed the difference underneath the vest was more pronounced – with the metafabric half being approximately 4.8 °C cooler than the cotton-covered side.

In another experiment where the metafabric was draped over a car, the interior temperature of the car was approximately 30 °C cooler than a car with no covering, and about 27 °C cooler than the interior of a car using a commercial vehicle cover.
While the metafabric certainly shows considerable promise for cooling both people and things, it remains to be seen how effective the reflectance might be on moving individuals wearing the fabric as their clothing, as the results reported here only involved stationary subjects and objects.
It's also not understood yet how the material would cope with dyes and colors, which may affect its ability to reflect light, but future research and experimentation can hopefully address these unknowns.
On the plus side, the researchers say the material is compatible with commercial sewing techniques, and exhibits mechanical properties comparable to those of commercial fabrics, including durability and water resistance.
The team estimates the metafabric is inexpensive to produce, perhaps only adding about 10 percent to the costs of typical clothing manufacturing, the researchers told Science News.
If manufacturing partners come on board, the researchers are hopeful products made with the metafabric could be available in as soon as a year's time.
"These results show the great potential for commercial applications in various complex scenarios, such as smart textiles, sunshade products, logistics transportation," the authors write in their paper.
"Through embroidery, cutting and sewing, the metafabric can be integrated into various products for different scenarios, such as clothing, tents, car covers, curtains, and awnings."

▶▶ **The findings are reported in *Science*.**

EDITOR'S COMMENT: Very interesting fabric for a new generation of PPE – we all know how hot is inside the CBRN gear!

Razavi *et al. DARU Journal of Pharmaceutical Sciences* 2012, **20**:51
http://www.darujps.com/content/20/1/51

DARU Journal of Pharmaceutical Sciences

REVIEW ARTICLE Open Access

A review on delayed toxic effects of sulfur mustard in Iranian veterans

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Abstract

Iranian soldiers were attacked with chemical bombs, rockets and artillery shells 387 times during the 8-years war by Iraq (1980–1988). More than 1,000 tons of sulfur mustard gas was used in the battlefields by the Iraqis against Iranian people. A high rate of morbidities occurred as the result of these attacks. This study aimed to evaluate the delayed toxic effects of sulfur mustard gas on Iranian victims. During a systematic search, a total of 193 (109 more relevant to the main aim) articles on sulfur mustard gas were reviewed using known international and national databases. No special evaluation was conducted on the quality of the articles and their publication in accredited journals was considered sufficient. High rate of morbidities as the result of chemical attacks by sulfur mustard among Iranian people occurred. Iranian researchers found a numerous late complications among the victims which we be listed as wide range of respiratory, ocular, dermatological, psychological, hematological, immunological, gastrointestinal and endocrine complications, all influenced the quality of life of exposed victims. The mortality rate due to this agent was 3%. Although, mortality rate induced by sulfur mustard among Iranian people was low, variety and chronicity of toxic effects and complications of this chemical agent were dramatic.

Keywords: Chemical injuries, Chemical victim, Chemical warfare agents (CWA), Sulfur mustard, Mustard gas, Toxic effects of sulfur mustard

DTRA's Historic Chemical Weapons Destruction Efforts in Former Soviet Union

By Andrea Chaney (DTRA)
Source: https://www.dvidshub.net/news/400863/dtras-historic-chemical-weapons-destruction-efforts-former-soviet-union

Photo By Andrea Chaney | Scott Crow (left) and Paul McNelly stand in front of a stockpile of destroyed chemical weapons munitions in Russia in 2011.

July 14 – Throughout 2021, the Defense Threat Reduction Agency's (DTRA) Cooperative Threat Reduction (CTR) Program is celebrating 30 years of collaboration with foreign partners to prevent the proliferation of weapons of mass destruction (WMD) by securing and eliminating chemical, biological, radiological and nuclear (CBRN) material, infrastructure, and expertise. To commemorate CTR's milestone, DTRA will highlight significant contributions from CTR, among them the Chemical Security and Elimination (CSE) program. The CSE program, formerly known as the Chemical Weapons Elimination (CWE) program and Chemical Weapons Destruction (CWD) program, started in 1992 to assist the states of the Former Soviet Union (FSU), namely Russia and Uzbekistan, to reduce the threat from chemical weapons (CW) by securing and eliminating CW stockpiles, chemical research capabilities, and production facilities, while also redirecting scientists to peaceful purposes. Early CSE projects required DTRA project managers and contractors to work directly with and in FSU countries, an unfamiliar concept at the time to those involved. From 1992 through 2013, CSE partnered with Russia by providing an analytical lab for monitoring CW destruction and separately secured two nerve agent storage sites. CSE also dismantled two nerve agent production plants, built a chemical weapons destruction facility, and provided technical support for the elimination operations.

Scott Crow, current DTRA Department Chief overseeing the CSE Program and former project manager for chemical security in Russia, began his career at DTRA in uniform in 2003. His projects took him almost exclusively to Russia as a member of the nuclear weapons site security and transportation teams before transitioning to a civilian role four years later. He said one of his biggest takeaways working in Russia was how similar the people were to himself and Americans.

"I grew up at the tail end of the cold war as a junior naval flight officer," said Crow. "We developed a healthy respect for the Russian military and the country in general," he said. "However, there was this notion that Russia was the big bad bear and they were the enemy. But when I got there to work certain projects, I realized they were just like us; regular people, with families they loved and wanted to live in peace," he said. "I really respected that."

The chemical security project Crow later managed in Russia began right after Congress enacted the 1991 Nunn-Lugar legislation. This legislation included authorities to destroy and safeguard chemical weapons in the Soviet Union, its republics and successor entities. This legislation coincided with U.S. support for the development and implementation of the Chemical Weapons Convention (CWC). On July 30, 1992, the Department of Defense (DoD) and the President's Committee on Conventional Problems of Chemical and Biological Weapons signed the Chemical Weapons Destruction Implementing Agreement. DTRA agreed to partner with Russia to destroy its chemical weapons in a safe, secure, and environmentally-sound manner, with both the U.S. and Russia acceding to the CWC.

Crow's responsibilities later included management of the chemical demilitarization facility in Russia. Crow inherited a completed facility design with construction already started, so he needed to learn the mission and partners quickly.

"They had 50 percent of construction completed but there was still so much left to do," he said. I remember today the dollar amount we had and couldn't surpass because it was such an important figure."

Crow said due to time and budget constraints, CSE had to shift its strategy to complete the infrastructure improvements at hand. He said the Russians came to them and offered to manage the contract themselves and with assurance the work would be complete on time and under budget.

"We took a leap of faith and came up with a trilateral agreement," Crow said. "The Russians lead the contractors and provided oversight for the subcontractors, while we verified the work and paid the bill. That worked exceptionally well," he said. It worked so well, and they saved so much money, CSE leveraged the remaining budget to progress further on the project and focus on sustainment.

"We were only mandated to complete the construction of the facility and turn it over to the Russians to operate," he said. "But the money saved allowed us to provide technical support for operations from 2009 to 2013."

Crow said it was rewarding to lead the project through its evolution and to completion.

"It was neat to be at the nexus of important national policy and actually see something get built, then operate and watch the shells spill out the backside of the destruction building and become big piles of steel that would go off to salvage yards," he said. "It was a remarkable project that I'm still proud I was a part of."

CSE remains postured to support the security, elimination, and disposition of chemical weapon stockpiles, delivery systems, components, materials, equipment, infrastructure, and technology.

Counterinf Weapons of Mass Destruction

GAO-21-105332

Source: https://www.gao.gov/assets/gao-21-105332.pdf

In April 2016, GAO evaluated Department of Homeland Security (DHS) plans to consolidate chemical, biological, radiological, and nuclear security programs into the Countering Weapons of Mass Destruction (CWMD) office. GAO recommended DHS use, where appropriate, the key mergers and organizational transformation practices identified in prior work, such as conducting adequate stakeholder outreach. DHS agreed with and addressed the recommendation by soliciting employee feedback on the transformation and formed a leadership team for the consolidation, among other practices. However, GAO observed that significant challenges remained at the CWMD office—such as low employee morale and questions about program efficacy. GAO has ongoing work valuating these issues and plans to issue a report in early 2022. Over the past decade, GAO has also conducted extensive work evaluating legacy and ongoing programs managed by the CWMD office and has identified program management challenges and opportunities for improvement in the following program areas:

• **Biosurveillance programs:** Since 2009, GAO has reported on progress and challenges with two of DHS's biosurveillance efforts—the National Biosurveillance Integration Center

and the pursuit of replacements for the BioWatch program (aimed at detecting aerosolized biological attacks). For example, DHS faced challenges defining these programs' missions and acquiring suitable technologies. In December 2009 and September 2012, GAO highlighted the importance of following departmental policies and employing leading management practices to help ensure that the mission of each program is clearly and purposefully defined and that investments effectively respond to those missions. DHS agreed with and addressed these recommendations. Most recently, DHS agreed to a May 2021 GAO recommendation that it should follow best practices for conducting technology readiness assessments for a biodetection effort and described planned efforts to conduct one before the next key decision event.

• **Nuclear/radiological detection:** In May 2019, GAO found that the CWMD office lacked a clear basis for proposed changes to the strategies of the Securing the Cities program, which is designed to enhance the nuclear detection capabilities of federal and nonfederal agencies in select cities. GAO found the strategies were not based on threats or needs of the participating cities. DHS agreed with our recommendations aimed at improving communication and coordination with participating cities, but has not fully implemented them.

• **Chemical defense:** In August 2018, GAO found that DHS had not fully integrated and coordinated its chemical defense programs and activities, which could lead to a risk that DHS may miss an opportunity to leverage resources and share information. Improved program integration and coordination could lead to greater effectiveness addressing chemical threats. DHS agreed to develop a strategy and implementation plan to aid integration of programs, which it expects to finalize in September 2021.

3 years since Aum leaders executed, society must remain intolerant of terrorism

Source: https://the-japan-news.com/news/article/0007594335

July 18 – Three years have passed since the Aum Supreme Truth cult's top leaders were executed for their role in orchestrating a number of terrorist acts including the sarin gas attack on the Tokyo subway system. Hopefully, people will not forget the lessons learned from the attacks and will renew the pledge to realize a society that will not tolerate such indiscriminate terrorism.

Besides the sarin gas attack on the subway system, Aum members also murdered lawyer Tsutsumi Sakamoto and his family members and perpetrated a sarin gas attack in Matsumoto, Nagano Prefecture, among other terrorist acts, that altogether killed 29 people and injured more than 6,500 others from 1989 to 1995.

Death sentences were finalized in court for 13 former senior members of Aum, including cult founder Chizuo Matsumoto, and each of them was executed in July 2018.

The terrorist acts continue to torment victims today. Many victims suffer from full-body numbness due to the highly noxious sarin gas or post-traumatic stress disorder.

Compensation for victims has been delayed. Last November, the Supreme Court finalized an order for Aleph, the main successor to Aum, to pay about Â¥1 billion in compensation, but Aleph has not complied with the order. The victims and bereaved family members are aging. This attitude to avoid paying compensation is unacceptable.

Aleph, Hikari no Wa and Yamada-ra no Shudan, the three groups that are successors to Aum, reportedly have a total of about 1,650 members. These three groups are said to have inherited the doctrines taught by Matsumoto.

The groups describe themselves as yoga clubs and volunteer organizations, soliciting new members through social media and online bulletin boards, such as by encouraging youths among others to participate in their activities.

Eleven of the 13 Aum leaders who were executed in July 2018 had joined the cult in their teens or 20s. Behind their joining was a pervasive social unease felt during the end of the 20th century. At present, many young people also feel increasingly isolated due to the novel coronavirus pandemic. The current situation is perhaps similar to what it was then.

The number of people who are unfamiliar with the Aum terrorist acts has grown. Schools and households should inform children about the terrorist acts to prevent the cult's deeds from fading away.

To pass on the facts to future generations accurately, it is important to use resources such as court documents that recorded the details of the terrorist acts as well as the suffering of victims. As soon as possible, the government should develop a system in which such documents can be used to help fight terrorism and support victims.

The vulnerability of densely populated metropolitan centers was exposed by the sarin attack on Tokyo's subway system, which targeted morning commuters by releasing the poisonous gas into the trains in the heart of the capital. In its wake, law enforcement authorities set up special units to prepare for nuclear, biological and chemical terrorist attacks.

The Tokyo Games will start later this month. Many event venues will be closed to spectators, but athletes and dignitaries from various nations are visiting Japan. In anticipation of incidents including cyber-attacks from overseas, all possible precautions must be taken.

OPCW's mistakes have developed into system of fakes, says Russian diplomat

Source: https://tass.com/politics/1315157

July 18 – Inconsistencies and mistakes in reports of the Organization for the Prohibition of Chemical Weapons (OPCW) have become systemic and fit well into the strategy of falsifications and fakes set forth by the West as far back as the anti-Iraqi campaign, Russian Foreign Ministry Spokeswoman Maria Zakharova said on Sunday, commenting on the OPCW report on the incident with Russian blogger Alexey Navalny.

"There have been lots of such mistakes for years and when there are that much of them, it becomes a system. We saw the same not only in the case of this invented story about Navalny's alleged poisoning, but also in the Salisbury saga about the alleged poisoning of Skripal, his daughter and British nationals with Novichok," she said in an interview with the Rossiya-1 television channel. "The same chain of discrepancies, typos, mistakes, incoherencies, attempts to dodge a direct answer."

She recalled Washington's anti-Iraqi campaign when at a UN Security Council meeting in February 2003 the then US Secretary of State Colin Powell had demonstrated a vial of white powder as evidence of the presence of weapons of mass destruction in Iraq. He claimed that the white powder was a piece of chemical weapons found in Iraq, which was a reason to stage a military operation against Baghdad. "We have seen that from the beginning to the end, with a subsequent exposure of fraud. This is a story with the forgery of the same evidence like during and before the anti-Iraqi campaign," Zakharova stressed. "It was a fabricated pretext. History repeats itself. Moreover, it is nit mere repetition, it is the development of the same, so to say, trend or vector. This vector has been set. Regrettably, our Western partners cannot change. They think they must change all others, first of all, international law."

Russian Foreign Ministry Spokeswoman Maria Zakharova said earlier that the OPCW draft report had revealed fatal inconsistencies for the version of events claiming Navalny was poisoned, which the Technical Secretariat was unable to explain to Moscow. The document indicated that the OPCW Technical Secretariat had deployed a mission for technical assistance related to the suspected "poisoning of a Russian citizen" at Germany's request on August

20, 2020 - the day of the Navalny incident. The diplomat emphasized that the drafting of Germany's request to the OPCW had to take a considerable amount of time, as that could not have happened immediately.
On Wednesday, German Foreign Ministry Spokesperson Rainer Breul said that time discrepancies in the OPCW draft report in the part related to the alleged poisoning of blogger Alexey Navalny were caused by a mistake in the date, which was corrected in the second version.
Alexey Navalny was rushed to a local hospital in the Siberian city of Omsk on August 20, 2020, after collapsing on a Moscow-bound flight from Tomsk. He fell into a coma and was put on a ventilator in an intensive care unit. On August 22, he was airlifted to Berlin and admitted to the Charite hospital. On September 2, the German government claimed that the blogger had been affected by a toxic agent belonging to the Novichok family. Kremlin Spokesman Dmitry Peskov pointed out that no poisonous substances had been detected in Navalny's system prior to his transfer to Berlin.

908 Devices Adds New Capabilities to Identify and Respond to Toxic Threats

Source: https://americansecuritytoday.com/908-devices-adds-new-capabilities-to-identify-and-respond-to-toxic-threats/

July 19 – Whenever an elite operator encounters a highly toxic advanced threat, they must be able to move forward with fast and intelligent remediation supported by rapid access and data sharing capabilities.
908 Devices, a pioneer of purpose-built handheld and desktop mass spec devices for chemical and biomolecular analysis, *and the newest competitor to the 2021 'ASTORS' Homeland Security Awards Program*, has introduced the MX908 Aerosol Module for military and civilian responders and Bluetooth capability for the device.

This first-of-its-kind aerosol accessory expands the capability of the field-deployable MX908 to detect and identify aerosolized and vaporized chemical threats, including chemical warfare agents, fourth-generation agents, pharmaceutical-based agents and more.
Teams need results more rapidly to mitigate threats and the new Bluetooth capability will provide investigators rapid access and data sharing capabilities through MX Mobile App, an Android app.
Newly added targets allow first responders to recognize additional priority drug substances; and activation of a Bluetooth capability to export reports and device history to Android devices.
These added capabilities address gaps in responders' workflows and speed chemical detection at the point-of-need for multiple missions.

Hydrogel Composite Developed to Help Protective Gear Rapidly Degrade Toxic Nerve Agents

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/hydrogel-composite-developed-to-help-protective-gear-rapidly-degrade-toxic-nerve-agents/

July 18 – Scientists at Northwestern University in Evanston, Illinois have developed a hydrogel integrated with **zirconium-based robust metal-organic frameworks** (MOFs) that rapidly degrades organophosphate-based nerve agents used in chemical warfare. Unlike

existing powdered MOF adsorbents, this hydrogel composite does not require added water and may be easily scaled up for use in protective masks or clothing. The work appears July 14 in the journal *Chem Catalysis*.

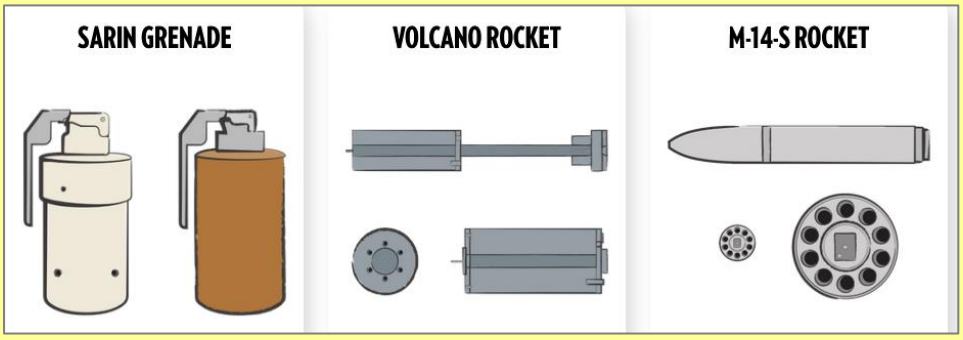
"Organophosphate-based nerve agents are among the most toxic chemicals known to humanity," says senior author Omar Farha, a professor of chemistry at Northwestern University. "Their use in recent global conflicts reflects the urgent need for personal protective gear, as well as the bulk destruction of chemical weapon stockpiles. In this work, we integrate MOFs and amine-containing cross-linked hydrogel into cloth to build a proper microenvironment to facilitate the fast degradation of nerve agents and supply real-time protection."

While MOFs have previously demonstrated an exceptionally fast ability to break down organophosphorus agents and chemicals that simulate them in the lab, these powdered adsorbents have proven difficult to directly integrate into protective cloths. When the nerve agents bind to their zirconium-6 clusters, they often deactivate the powder and fibrous composite catalysts. This pitfall calls for the use of alkaline solutions to regenerate the MOFs' catalytic sites — a requirement that does not prevent such MOFs from being used to eliminate stockpiled chemical weapons but which does impede their use in wearable protective gear.

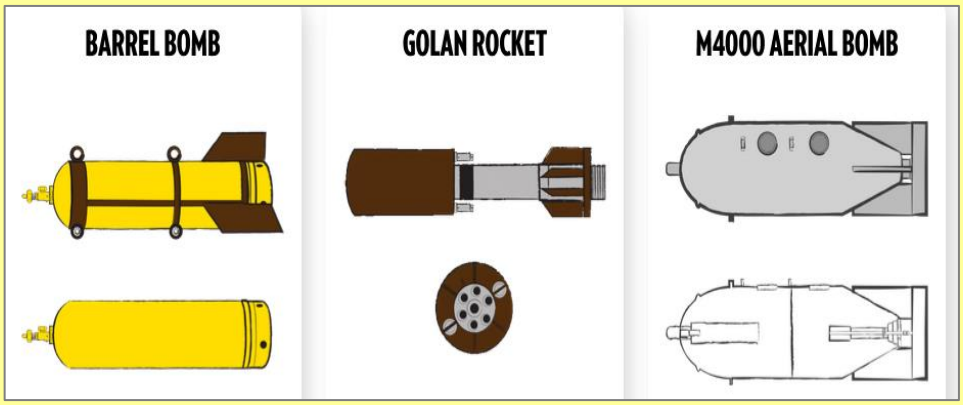
Munitions Typology: Chemical Weapons Deployed in the Syrian War

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/munitions-typology-chemical-weapons-deployed-in-the-syrian-war/

July 18 – In the aftermath of chemical weapons attacks, the remnants of munitions – ranging from small shards to large metal hulks – are usually the first and most important pieces of material evidence recovered from the scene. This is especially true in Syria, where most chemical attacks are executed using domestically produced munition designs, including weapons containing highly volatile and dangerous nerve agents. Whether spent or intact, munitions tell us a lot about the nature and evolution of the Syrian chemical weapons program as well as its operational integration into the government's conventional war machinery.



In our review of hundreds of reported cases, we found that certain munitions are closely associated with specific attack patterns by Syrian government forces. These consistencies help us to pinpoint particular military units as the likely perpetrators of each attack. By examining these cases, we are able to connect material evidence recovered from attack sites across Syria to government forces as they move from front line to front line. For further details on the patterns of chemical weapons use, see our report Nowhere to Hide.



This munitions typology is based on a review of existing investigations into dozens of chemical weapons attacks as well as a collection of primary source imagery related to **53 incidents** compiled by the research team. We aim to provide a reference guide for understanding the evolution of the Syrian chemical weapons complex. For those seeking justice for war crimes committed by the Assad regime, we hope this typology can serve as a starting point for investigators to draw connections between material evidence from impact sites and broader patterns of violations, as well as likely perpetrators of chemical weapons attacks. This typology is not exhaustive, but focuses on those munition types which have been attributed to specific chemical attacks and are backed by clear evidence.

▶▶ Read the Global Public Policy Institute report

The many lessons to be drawn from the search for Iraqi WMD

By Terence Taylor

Source: https://thebulletin.org/premium/2021-07/the-many-lessons-to-be-drawn-from-the-search-for-iraqi-wmd/

July 21 – It was no accident that I came to join the UN Special Commission. I had experience in the technical aspects of all three weapons of mass destruction categories: nuclear, chemical, and biological. I served as an infantry officer in the British Army engaged in counterinsurgency, counter-terrorism, and UN peacekeeping operations. During that time, I spent periods as a staff officer in scientific and technical appointments related to nuclear, chemical, biological and conventional weapons and their means of delivery. I was also involved in international negotiations on related treaties and agreements, and I knew many of the diplomats, scientists, and engineers from bilateral and multilateral activities in both regional and global settings. This experience gave me a solid foundation on which to draw as the UN sought to rid Iraq of weapons of mass destruction.

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

Terence Taylor *has held various appointments in the field of international security, in particular related to weapons of mass destruction, in the UK government, United Nations and the NGO sector. He currently serves on boards of directors of companies in the biotechnology and food sectors. He was an UNSCOM commissioner and biological chief inspector.*

2021 CBRNe-related conferences

NCT Virtual Hub - Syn-Bio: the Threat of "Designer pathogens"

3 August, Online

https://nct-events.com/event/nct-virtual-hub-synbio-the-threat-of-designer-pathogens

For the third NCT Virtual Hub our panelists will be addressing another CBRNe hot-topic: Enhancing Nuclear Security! How can the threat be minimised? Should nuclear security be the responsibility of the whole international community? What are the international safeguards in place? Is the current non-proliferation treaty framework effective enough?

NCT USA 2021

7-9 September 2021, USA

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

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

NCT Virtual Hub - Trends in the fight against IEDs

8 September, Online

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

NCT Europe 2021

5-7 October 2021, Italy

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

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

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

7 October, Online

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

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

TBD, Online

NCT Asia Pacific 2021

10-12 November 2021, Korea

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

NCT CBRNe Asia Pacific is coming to Seoul, Republic of Korea, for its third edition in the peninsula, organized in official partnership with the Korean Society of Chemical, Biological and Radiological Defense (KSCBRD). The event will kick start with a live capability demonstration led by the ROK Army CBRN Defense Command and will be followed by an international conference and industry exhibition in the field of CBRNe.

NCT Virtual Hub - Future Trends in CBRN Decon

TBD, Online

CTX 2021

14-16 September 2021, London, UK

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

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

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

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

CBRNE Summit USA

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

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

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

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

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

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

NATO EOD Demonstration & Trials

13-14 October 2021, Slovakia

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

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

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

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

CBRNE Summit Europe

30 Nov-02 December 2021, Brno, Czech Republic

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

CBRNe Summit Europe is returning to Brno, Czechia for our 7th annual event. Many major cities across Europe have faced critical incidents over the past few years. With terrorism threat levels high across Europe and the increased use of chemical agents being used by terrorist organizations this is a key event to attend. During our international event you will hear perspectives from military and civil officials who deal with CBRNe incidents. Many governments across the region have realized the importance of CBRNe capabilities and preparedness and budgets have been increased to deal with the new type of threats faced to civilians. CBRNe Summit Europe will focus on a number of key topics across the whole CBRNe domain such as CBRNe capabilities of military and civil agencies, first responder techniques, asymmetrical threats, medical countermeasures to chem-bio threats, decontamination developments and techniques, countering IED's, CBRNe threat intelligence, CBRNe forensics and many more.

To be part of the largest gathering of CBRNe professionals in Europe please contact us via email at **events@intelligence-sec.com** or by phone +44 (0)1582 346 706.

Demining and EOD Seminar

7-9 September 2021, Sarajevo, B&H

https://intelligence-sec.com/events/deminingandeodseminar2021/

Demining operations are still taking place in Bosnia and Herzegovina and neighboring nations. We are pleased to be bringing our inaugural Demining and EOD Seminar to Sarajevo to review the current situation and the plan for the next few years to finally make Bosnia and Herzegovina a mine free country.

Many IGOs and NGOs are working tirelessly to clear the minefields in the region and there is a key importance on international cooperation in making the world mine clear by 2025. Technology in demining is also evolving with many new solutions being adopted to clear mines to help lower casualties. Solutions such as robotics and drones are now being used to assist with clearing mine sites especially in areas where it is difficult to detect mines.

Our Demining and EOD Seminar will bring together leading officials who are working on mine clearance in Bosnia and Herzegovina as well as across the Balkans. You will

hear in-depth presentations and case studies from regional Mine Action Centres as well as other international organizations who are supporting local governments to clear the mine fields.
To be part of our inaugural Demining and EOD Seminar in Sarajevo, Bosnia and Herzegovina on the 7th – 9th September 2021 either as a speaker, sponsor or delegate please contact us at events@intelligence-sec.com or +44 (0)1582 346 706.

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

CALL FOR ABSTRACT
EVENT DATE: Friday Oct 6th, 2021
Theme: TC17 VRISE2021 - Topical Event on Robotics for Risky Interventions and Environmental Surveillance

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

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

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

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

Please note the following for the event

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

Event Coordinators
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Event Organizers Supporting the Event:

- ICI
- IEEE Galveston Bay Section, Region 5

PLEASE SEND YOUR ABSTRACT TO THE FOLLOWING

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

Qatar Health 2022

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

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

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

Conference Objectives

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

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

7th Crisis Management in Healthcare Sector

11-12 September 2021, Athens, Greece
Website: https://www.crisis-management2021.eu/
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A Single Shocking Statistic Reveals Why Global Herd Immunity Is Out of Reach

By Maria de Jesus

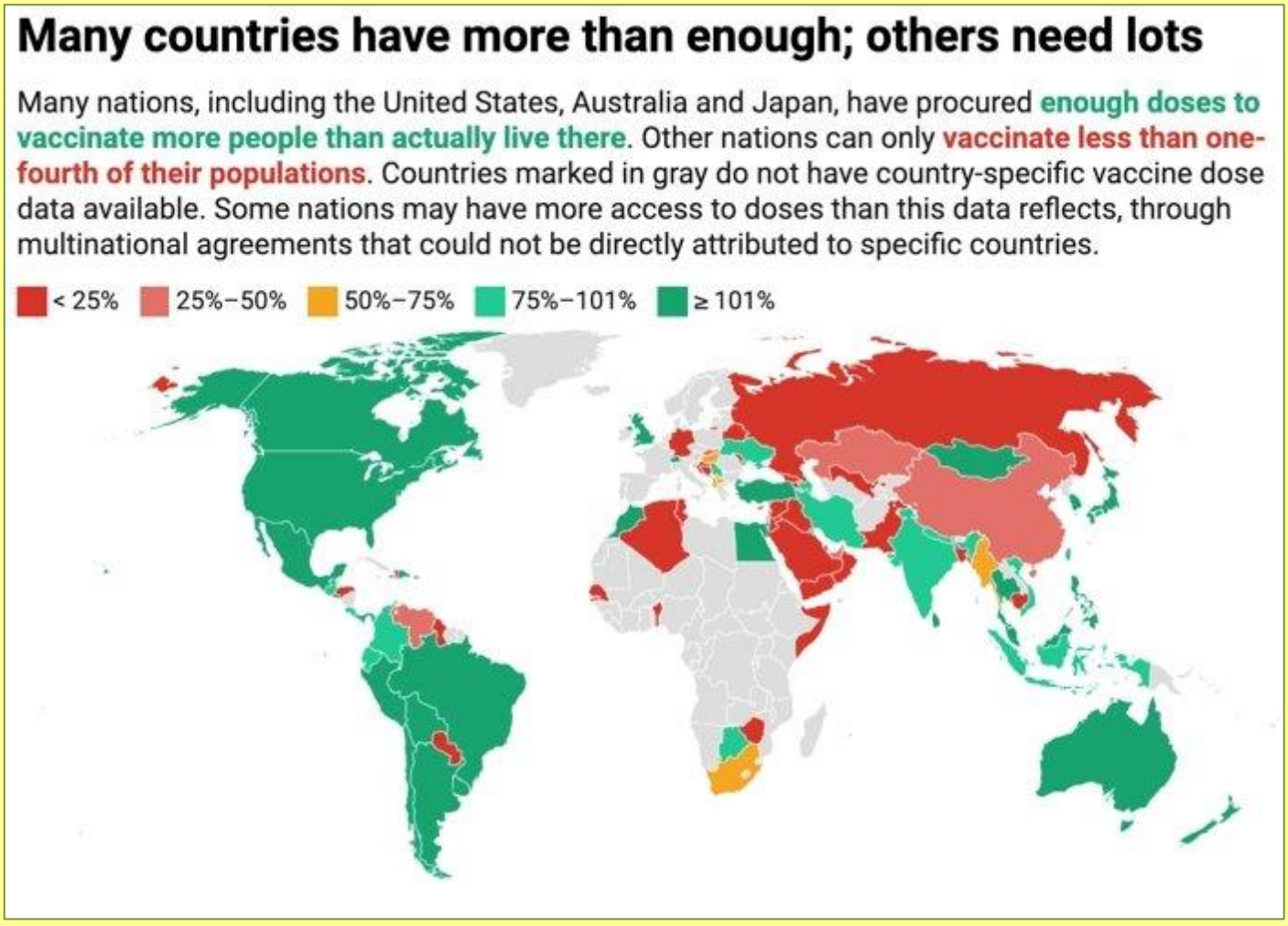
Source: https://www.sciencealert.com/99-1-percent-of-people-in-poor-countries-are-unvaccinated

June 23 – In the race between infection and injection, injection has lost.

Public health experts estimate that approximately 70 percent of the world's 7.9 billion people must be fully vaccinated to end the COVID-19 pandemic. As of June 21, 2021, 10.04 percent of the global population had been fully vaccinated, nearly all of them in rich countries.

Only 0.9 percent of people in low-income countries have received at least one dose.

I am a scholar of global health who specializes in health care inequities. Using a data set on vaccine distribution compiled by the Global Health Innovation Center's Launch and Scale Speedometer at Duke University in the United States, I analyzed what the global vaccine access gap means for the world.



(The Conversation/CC-BY-ND)

A global health crisis

Supply is not the main reason some countries are able to vaccinate their populations while others experience severe disease outbreaks – distribution is.

Many rich countries pursued a strategy of overbuying COVID-19 vaccine doses in advance. My analyses demonstrate that the US, for example, has procured 1.2 billion COVID-19 vaccine doses, or 3.7 doses per person. Canada has ordered 381 million doses; every Canadian could be vaccinated five times over with the two doses needed.

Overall, countries representing just one-seventh of the world's population had reserved more than half of all vaccines available by June 2021. That has made it very difficult for the remaining countries to procure doses, either directly or through COVAX, the global initiative created to enable low- to middle-income countries equitable access to COVID-19 vaccines.
Benin, for example, has obtained about 203,000 doses of China's Sinovac vaccine – enough to fully vaccinate 1 percent of its population. Honduras, relying mainly on AstraZeneca, has procured approximately 1.4 million doses. That will fully vaccinate 7 percent of its population. In these "vaccine deserts", even front-line health workers aren't yet inoculated.
Haiti has received about 461,500 COVID-19 vaccine doses by donations and is grappling with a serious outbreak.
Even COVAX's goal – for lower-income countries to "receive enough doses to vaccinate up to 20 percent of their population" – would not get COVID-19 transmission under control in those places.

The cost of not cooperating
Last year, researchers at Northeastern University modeled two vaccine rollout strategies. Their numerical simulations found that 61 percent of deaths worldwide would have been averted if countries cooperated to implement an equitable global vaccine distribution plan, compared with only 33 percent if high-income countries got the vaccines first.
Put briefly, when countries cooperate, COVID-19 deaths drop by approximately in half.
Vaccine access is inequitable within countries, too – especially in countries where severe inequality already exists.
In Latin America, for example, a disproportionate number of the tiny minority of people who've been vaccinated are elites: political leaders, business tycoons and those with the means to travel abroad to get vaccinated. This entrenches wider health and social inequities.
The result, for now, is two separate and unequal societies in which only the wealthy are protected from a devastating disease that continues to ravage those who are not able to access the vaccine.

A repeat of AIDS missteps?
This is a familiar story from the HIV era.
In the 1990s, the development of effective antiretroviral drugs for HIV/AIDS saved millions of lives in high-income countries. However, about 90 percent of the global poor who were living with HIV had no access to these lifesaving drugs.
Concerned about undercutting their markets in high-income countries, the pharmaceutical companies that produced antiretrovirals, such as Burroughs Wellcome, adopted internationally consistent prices. Azidothymidine, the first drug to fight HIV, cost about US$8,000 a year – over $19,000 in today's dollars.
That effectively placed effective HIV/AIDS drugs out of reach for people in poor nations – including countries in sub-Saharan Africa, the epidemic's epicenter. By the year 2000, 22 million people in sub-Saharan Africa were living with HIV, and AIDS was the region's leading cause of death.
The crisis over inequitable access to AIDS treatment began dominating international news headlines, and the rich world's obligation to respond became too great to ignore.
"History will surely judge us harshly if we do not respond with all the energy and resources that we can bring to bear in the fight against HIV/AIDS," said South African President Nelson Mandela in 2004.
Pharmaceutical companies began donating antiretrovirals to countries in need and allowing local businesses to manufacture generic versions, providing bulk, low-cost access for highly affected poor countries. New global institutions like the Global Fund to Fight AIDS, Tuberculosis, and Malaria were created to finance health programs in poor countries.
Pressured by grassroots activism, the United States and other high-income countries also spent billions of dollars to research, develop and distribute affordable HIV treatments worldwide.

A dose of global cooperation
It took over a decade after the development of antiretrovirals, and millions of unnecessary deaths, for rich countries to make those lifesaving medicines universally available.
Fifteen months into the current pandemic, wealthy, highly vaccinated countries are starting to assume some responsibility for boosting global vaccination rates.
Leaders of the United States, Canada, United Kingdom, European Union and Japan recently pledged to donate a total of 1 billion COVID-19 vaccine doses to poorer countries.
It is not yet clear how their plan to "vaccinate the world" by the end of 2022 will be implemented and whether recipient countries will receive enough doses to fully vaccinate

enough people to control viral spread. And the late 2022 goal will not save people in the developing world who are dying of COVID-19 in record numbers now, from Brazil to India.
The HIV/AIDS epidemic shows that ending the coronavirus pandemic will require, first, prioritizing access to COVID-19 vaccines on the global political agenda. Then wealthy nations will need to work with other countries to build their vaccine manufacturing infrastructure, scaling up production worldwide.
Finally, poorer countries need more money to fund their public health systems and purchase vaccines. Wealthy countries and groups like the G-7 can provide that funding.
These actions benefit rich countries, too. As long as the world has unvaccinated populations, COVID-19 will continue to spread and mutate. Additional variants will emerge.
As a May 2021 UNICEF statement put it: "In our interdependent world no one is safe until everyone is safe."

Maria De Jesus, *Associate Professor and Research Fellow at the Center on Health, Risk, and Society, American University School of International Service.*

Patients hospitalized for COVID-19 in 2021 could pay thousands of dollars, study suggests

Source: https://www.newswise.com/coronavirus/patients-hospitalized-for-covid-19-in-2021-could-pay-thousands-of-dollars-study-suggests

June 02 — Americans who get seriously ill from COVID-19 in 2021 might have to pay thousands of dollars in bills from their hospitals, doctors and ambulance companies, a new study suggests.
The new University of Michigan analysis has implications for both policymakers and people who haven't yet gotten vaccinated. The authors published their findings as a preprint because of their timeliness, and are submitting their analysis for peer review.
Most health insurance companies voluntarily waived co-pays, deductibles and other cost-sharing for hospitalized COVID-19 patients in 2020, but many major insurers lifted those waivers in early 2021.
Based on data from actual patients hospitalized for COVID-19 last year, the study suggests the lack of waivers could mean bills of about $3,800 for people with job-related or self-purchased insurance, and $1,500 for people with Medicare Advantage plans.
"It is premature for insurers to stop protecting patients from the costs of COVID-19 hospitalizations," says lead author Kao-Ping Chua, M.D., Ph.D., a health policy researcher and pediatrician at Michigan Medicine and the Susan B. Meister Child Health Evaluation Research Center. "Even though hospitalization levels are decreasing, more than 20,000 people are hospitalized for COVID-19 in the U.S. right now. The pandemic is not over."
The new study analyzes more than 4,000 COVID-related hospitalizations of people with private insurance and Medicare Advantage insurance between March and September 2020. The data come from the IQVIA PharMetrics Plus for Academics Database, which includes claims data from multiple insurers across the U.S.
The researchers found that the vast majority of patients didn't have to pay for hospital services such as room-and-board changes, suggesting their plans waived cost-sharing for bills sent by hospitals. However, among the few patients who did have to pay for hospital services - a sign that a waiver wasn't in place – out-of-pocket costs were in the thousands of dollars.
"Our findings illustrate the potential burden that patients now may face if they are covered by insurers that never implemented cost-sharing waivers or let their waivers expire," says Chua.

Waivers don't always cover bills from doctors

The study also suggests that insurer cost-sharing waivers for COVID-19 hospitalizations don't always cover all hospitalization-related care.
For example, patients in the study frequently received bills from the doctors who cared for patients in the hospital as well as from ambulance companies.
Overall, 71% of privately insured patients received a bill for any hospitalization-related service, with an average size of $788. Among those with Medicare Advantage coverage, 49% received a bill, with an average size of $277.
Chua notes that some insurers may only have waived cost-sharing for the hospital portion of the bill, but believes it is possible that some patients were mistakenly billed for services from doctors and ambulances because insurers implemented their waivers incorrectly or health care providers did not code all aspects of the care as being related to COVID-19.

For people who do receive a bill for COVID-19 hospitalization-related care, Chua recommends that they contact their insurer to ask whether the bill was sent in error.

Policy implications

To prevent other patients from getting the large bills sent to some patients in this study, Chua says federal policymakers could require insurers to waive costs of COVID-19 hospitalization-related care throughout the pandemic – just as they already do for COVID-19 testing and vaccination.

Hospitals that received special pandemic funding are already barred from billing patients directly for costs beyond what their insurance covers. Hospitals also get reimbursed by the federal government when they care for uninsured COVID-19 patients.

"Charging patients for COVID-19 hospitalizations makes little sense when the pandemic is still sending thousands of people to the hospital each week," Chua says. "The threat of high costs might cause some patients with COVID-19 to delay going to the hospital, increasing their risk of severe illness or death."

Chua and colleagues also recently published a paper looking at out-of-pocket costs for people over 65 in Medicare Advantage plans who were hospitalized for influenza, as a way to estimate potential out-of-pocket spending for COVID-19 hospitalizations. That paper found the average bill for influenza hospitalization was around $1,000.

In addition to Chua, the authors of the preprint are Nora Becker, M.D., Ph.D., a primary care physician and health economist from Michigan Medicine, and Rena Conti, Ph.D., an associate professor and health economist from Questrom Boston University School of Business.

Chua and Becker are members of the U-M Institute for Healthcare Policy and Innovation.

SARS-CoV-2 Variants May Succumb to Multivalent Nanobodies

Two sets of multivalent nanobodies have been generated that can overcome SARS-CoV-2 mutations. One set has enhanced avidity for the ACE2 binding domain; the other can recognize conserved epitopes largely inaccessible to human antibodies. Such nanobodies could help prevent COVID-19 mortality when vaccines are compromised. **+ MORE**

Efficacy of Proxalutamide in Hospitalized COVID-19 Patients: A Randomized, Double-Blind, Placebo-Controlled, Parallel-Design Clinical Trial

By Flavio A Cadegiani, Daniel N Fonseca, John McCoy, et al.

Source: https://www.medrxiv.org/content/10.1101/2021.06.22.21259318v1.full.pdf

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infectivity is mediated by the androgen-promoted protease, transmembrane protease, serine 2 (TMPRSS2). Previously, we have shown that treatment with proxalutamide, a non-steroidal androgen receptor antagonist, accelerates viral clearance and clinical remission in outpatients with coronavirus disease 2019 (COVID-19) compared to placebo. The effects in hospitalized COVID-19 patients were unknown.

Methods: Men and women hospitalized but not requiring mechanical ventilation were randomized (1:1 ratio) to receive 300 mg of proxalutamide per day or placebo for 14 days. The study was conducted at eight sites in the state of Amazonas, Brazil. The primary outcome measure was the clinical status (8-point ordinal scale) at 14-days post-randomization. The primary efficacy endpoint was the 14-day recovery ratio (alive hospital discharge [scores 1, 2]).

Findings: A total of 645 patients were randomized (317 received proxalutamide, 328 placebo) and underwent intention-to-treat analysis. The 14-day median ordinal scale score in the proxalutamide group was 1 (interquartile range [IQR]=1-2) versus 7 (IQR=2-8) for placebo, P<0.001. The 14-day recovery rate was 81.4% for proxalutamide and 35.7% for placebo (recovery ratio, 2.28; 95% CI 1.95-2.66 [P<0.001]). The 28-day all-cause mortality rate was 11.0% for proxalutamide versus 49.4% for placebo (hazard ratio, 0.16; 95% CI 0.11-0.24). The median post-randomization time to recovery was 5 days (IQR=3-8) for proxalutamide versus 10 days (IQR=6-15) for placebo.

Interpretation: Hospitalized COVID-19 patients not requiring mechanical ventilation receiving proxalutamide had a 128% higher recovery rate than those treated with placebo. All-cause mortality was reduced by 77.7% over 28 days. (ClinicalTrials.gov number, NCT04728802).

Proxalutamide is a second-generation nonsteroidal androgen receptor antagonist that is more potent than other antiandrogen compoundssuch as enzalutamide or bicalutamide.These compounds competitively inhibitandrogenbinding,block androgen receptor nuclear translocation,and prevent their binding to DNA.

New universal coronavirus vaccine could prevent future pandemics

Source: https://uncnews.unc.edu/2021/06/22/coronavirus-vaccine/

June 22 – Scientists at the University of North Carolina Gillings School of Global Public Health have developed a vaccine that could be effective against COVID-19, its variants — and a future coronavirus pandemic.

While no one knows which virus may cause the next outbreak, coronaviruses remain a threat after causing the SARS outbreak in 2003 and the global COVID-19 pandemic.

According to a study published June 22 in Science, the vaccine designed at UNC-Chapel Hill protected mice from the current SARS-CoV-2 coronavirus, plus a group of coronaviruses known to make the jump from animals to humans.

The lead study authors are David R. Martinez, a postdoctoral researcher at UNC Gillings School of Global Public Health and a Hanna H. Gray Fellow at the Howard Hughes Medical Institute, and Ralph Baric, an epidemiologist at UNC Gillings School of Global Public Health and professor of immunology and microbiology at the UNC School of Medicine, whose research has led to new therapies to fight emerging infectious diseases.

"Our findings look bright for the future because they suggest we can design more universal pan coronavirus vaccines to proactively guard against viruses we know are at risk for emerging in humans," Martinez said. "With this strategy, perhaps we can prevent a SARS-CoV-3."

Researchers at UNC-Chapel Hill are playing a key role in coronavirus vaccine development. After testing the effectiveness of the first generation of COVID-19 vaccines, they pivoted to look at a second-generation vaccine: one that targets sarbecoviruses, Baric said.

Sarbecoviruses, part of the large family of coronaviruses, are a priority for virologists after two caused devastating disease in the past two decades: SARS and COVID-19.

The team's approach started with mRNA, which is similar to the Pfizer and Moderna vaccines used today. But instead of including the mRNA code for only one virus, they welded together mRNA from multiple coronaviruses.

When given to mice, the hybrid vaccine effectively generated neutralizing antibodies against multiple spike proteins — which viruses use to latch onto healthy cells, including one associated with B.1.351, known as the South African variant.

"The vaccine has the potential to prevent outbreaks when used as a variant is detected," said Baric, a trailblazer in pandemic preparedness who advocates proactive, rather than reactive, tracking of emerging coronaviruses.

The paper includes data from mice infected with SARS-CoV and related coronaviruses and the vaccine prevented infection and lung damage in mice. Further studies could put the vaccine on track for human clinical trials next year.

The lead authors worked with a team of scientists from UNC-Chapel Hill, Duke University School of Medicine, and the University of Pennsylvania Perelman School of Medicine.

The National Institutes of Allergy and Infectious Disease at the National Institutes of Health and the North Carolina Policy Collaboratory, with funding from the North Carolina General Assembly, supported the study.

Covid-19: How Super-Powers Have Used 'Bio-Weapons' In The Past With China Being The Worst-Affected Nation

Source: https://eurasiantimes.com/how-super-powers-have-used-bio-weapons-in-the-past-with-china-being-the-worst-affected-nation/

June 23 – As the controversy surrounding the origin of the Covid-19 virus rages on, history shows how great powers have used "biological weapons" against their adversaries in the past.

Dr. Anthony Fauci, a top disease expert in the US, has come under increasing attacks for his "flip-flops" on Covid-19 guidance. Initially, he seemed to favor the Chinese version that the virus was natural but now he says that "it is essential as a scientist that you evolve your opinion and your recommendations based on the data as it evolves".

With his links with the Chinese laboratory in Wuhan, and his non-committal stand now on whether the virus is natural or man-made, apprehensions that the Covide-19 virus was meant to be a bio-weapon that got released accidentally have become stronger.
However, since China is not going to heed all international efforts or requests to come clean on the issue, the truth is unlikely to come in years to come.

Infectious Diseases Vs Bio-Weapons

As it is, there is an invisible line between infectious diseases and bio-weapons. Experts say that it is often very difficult for historians and microbiologists to differentiate natural epidemics from alleged biological attacks, "because: (i) little information is available for times before the advent of modern microbiology; (ii) truth may be manipulated for political reasons, especially for a hot topic such as a biological attack; and (iii) the passage of time may also have distorted the reality of the past".
Of course, infectious diseases are natural phenomena whereas bio-weapons are deliberately designed. But their impacts are the same.
There have been historical episodes of victims of infectious diseases becoming weapons themselves. In 1346, the attacking Tartar forces (ethnic group living mainly in Tatarstan and the wider Volga-Ural region) experienced an epidemic of plague, but they converted their misfortune into an opportunity by hurling the cadavers of their deceased into the city of Genoa (then an independent Republic on the north-western Italian coast), thus initiating a plague epidemic in the city. The outbreak of plague forced a retreat of the Genoese forces.
Bio-weapons have been used throughout the ages as far as one can remember. It is recorded that bio-war had already started 14 centuries before Christ when the Hittites sent infected rams to their enemies.
And, during the past century, of more than 500 million people who died of infectious diseases, several tens of thousands of these deaths were due to the deliberate release of pathogens or toxins.
Three aspects make biological weapons different from other weapons. First, these are extremely economical to manufacture, and hence can be easily employed by not only weaker nations but also non-state actors like terrorists.
Secondly, these are very difficult to be detected because the virus requires an incubation period before its effects can be seen on the victims. In fact, the incubation factor works to the advantage of the aggressor not being concealed; there are overwhelming chances of their impact or spread being considered as a natural outbreak.
Thirdly, biological weapons are highly infectious and can affect as much the affecting forces as those attacked. It has proven very difficult to create agents or bio-weapons which can discriminate between a friend and a foe, because their effects tend to persist longer than the operational conditions that justified their use, and they tend to spread beyond what the attacker has envisaged.
Of course, the attacker can use them if it is 100 percent certain that its political and economic system or the system of crisis-management is stronger and more capable than that of the attacked in weathering the pandemic.
However, given unpredictability in how resilient political systems will prove to resist an attack, launching a general pandemic in the hopes of suffering relatively less than a foe is incredibly risky.

How Japan Used Bio-Weapons

As a matter of fact, all the industrial powers have resorted to the use of biological weapons. The worst culprit in this regard has been Japan, the country that used these weapons intensely against China during the inter-war years.
It is said that the father of the Japanese biological weapons program was the radical nationalist Shiro Ishii who thought that such weapons would constitute formidable tools to further Japan's imperialistic plans.
He later became head of Japan's bio-weapon program during World War II, employing more than 5,000 people, and killing as many as 600 prisoners a year in human experiments in just one of its 26 centers.
The Japanese army poisoned more than 1,000 water wells in Chinese villages to study cholera and typhus outbreaks. Japanese planes dropped plague-infested fleas over Chinese cities or distributed them by means of saboteurs in rice fields and along roads. Some of the epidemics they caused persisted for years and continued to kill more than 30,000 people in 1947, long after the Japanese had surrendered.

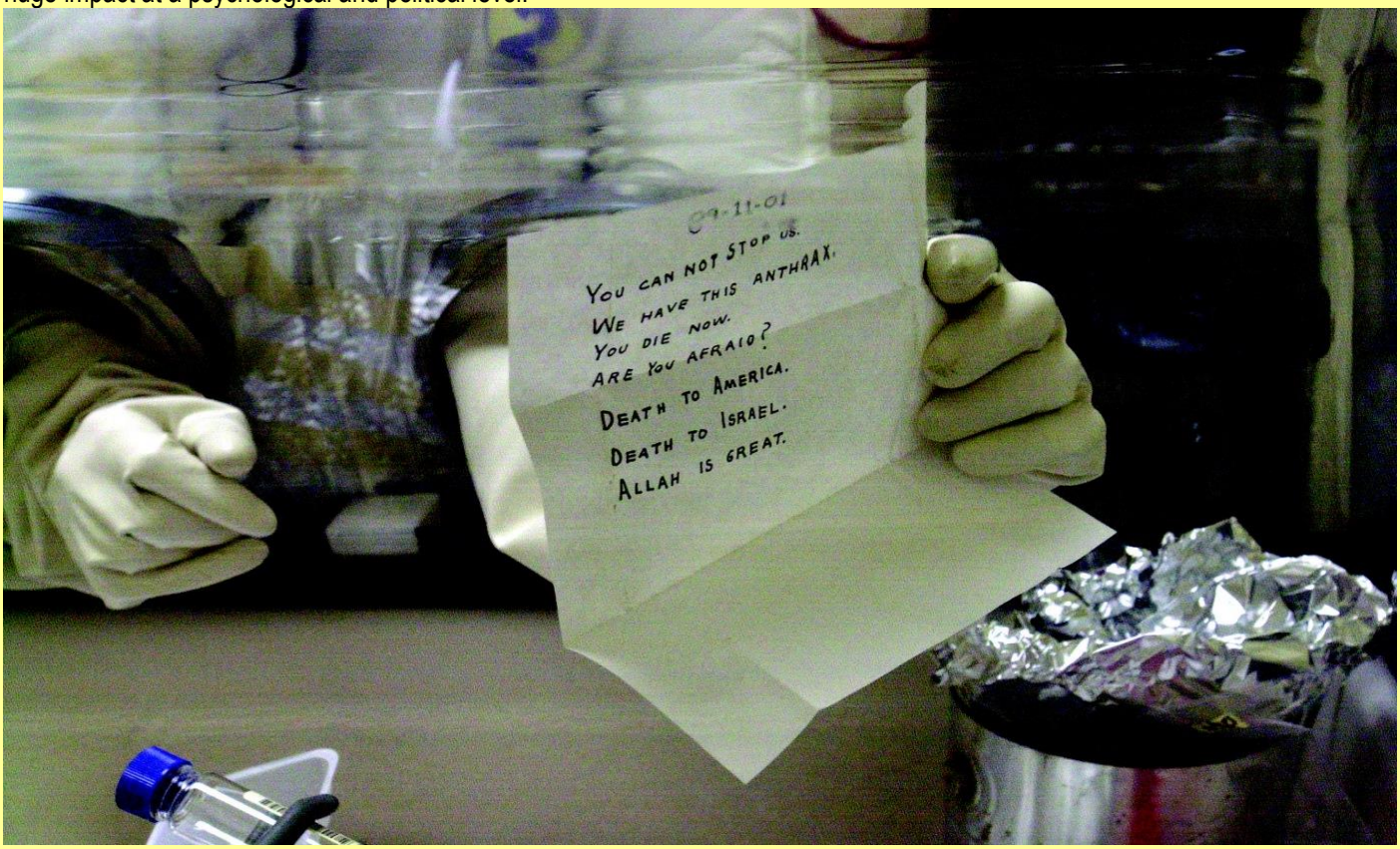
Cold War Rivalry

During the Cold War, the Soviet Union and the United States both established significant biological weapons programs, often building upon the work of their defeated foes. Both developed aerosol sprays capable of delivering bacterial and viral agents by plane or ballistic missile.

Both sides also stockpiled plenty of anthrax. In both countries, accidents and tests inflicted casualties on their civilian populations, although general outbreaks were prevented.
In fact, in cities like San Francisco and New York that were the testing grounds for these weapons, particularly for the study of the spread of the pathogen in a big city, resulted in a large number of infections. It caused such uproar that President Richard Nixon issued an executive order in 1969, unconditionally ending America's bio-weapons programs.
As regards the then Soviet Union, in 1979, 100 people and countless livestock died following the accidental release of anthrax spores from a bio-weapons plant in the city of Sverdlovsk — one of 40 such facilities that operated in the former Soviet Union.
Non-state actors and terrorists have also used bio-weapons in recent times. There is the notorious example of the 1995 sarin gas attack inside the Tokyo subway by the Japanese apocalyptic cult Aum Shinrikyo.
The widely publicized assault, which killed 13 people and hospitalized thousands, had been preceded by a series of failed botulism and anthrax assaults near the Imperial Palace, a Tokyo airport, and two US military bases.

The Anthrax Scare

And then there was the case of the "anthrax letters" in the aftermath of the World Trade Center attack of September 9, 2001, in New York. Several letters were sent during the autumn to government officials or journalists. Overall, 22 people were infected with anthrax, and five of them died from anthrax or complications resulting from it. This bio-terrorist attack might not have killed many, but it had a huge impact at a psychological and political level.



A lab technician holding the anthrax-laced letter addressed to a US senator after safely opening it at the US Army's Fort Detrick research laboratory, in November 2001. (Image: FBI)

Of course, recognizing the dangers of the bio-weapons, there have been international efforts to deal with them. There were two international declarations — in 1874 in Brussels and in 1899 in The Hague that prohibited the use of "poisoned weapons".
However, although these, as well as later treaties, were all made in good faith, they contained no means of control, and so failed to prevent interested parties from developing and using biological weapons.

Reining In Bio-Terror

In 1925, the *Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare* was ratified, prohibiting the use of biological weapons, but not their research and production.
Thus, States that had ratified the Geneva Protocol, such as France, the UK, Italy, Canada, Belgium, Poland, and the Soviet Union, began research on biological weapons; so did the US, which did not ratify the Geneva Protocol until 1975.
The last major attempt in regulating biological weapons prohibition of biological weapons resulted in the conclusion in 1972 of the Biological and Toxin Weapons Convention (BTWC or BWC) that entered into force in 1975 after 22 governments ratified it.
The BWC currently has 182 States as parties and five signatory states. It was the first multilateral disarmament treaty banning an entire category of weapons of mass destruction.
The Convention bans the development, production, stockpiling, and acquisition of biological agents or toxins of any type or quantity that do not have protective, medical, or other peaceful purposes, or any weapons or means of delivery for such agents or toxins.
Under the treaty, all such materials are to be destroyed within nine months of the Treaty's entry into force.
However, like the 1925 Geneva Protocol, the BWC does not provide firm guidelines for inspections and control of disarmament and adherence to the protocol.
There are unresolved controversies about the definition of "defensive research" and the quantities of pathogens necessary for benevolent or peaceful research.
As a result, what is to be banned and what is to be exempted in the name of scientific and technological advances continue to remain ambiguous.
Secondly, there are no guidelines on enforcement and how to deal with violations. Alleged violations of the BWC are to be reported to the UN Security Council, which may in turn initiate inspections of accused parties, as well as modalities of correction.
The right of permanent members of the Security Council to veto proposed inspections, however, undermines this provision.
With the objective of strengthening the BWC many "review conferences" have been held since 1981. The last and 8th Review Conference of the BWC was held in November 2016. But the results have not been very helpful.
And in the absence of a consensus on the scope and enforcement among major member countries, it is doubtful that the next Review Conference, scheduled for this year, will be of much help either.

Brain Inflammation From COVID-19 Looks Eerily Similar to That From Alzheimer's

Source: https://www.sciencealert.com/brain-changes-from-covid-19-look-eerily-similar-to-alzheimers-and-parkinsons-disease

June 24 – The SARS-CoV-2 virus doesn't just cause enduring damage to the lungs and the heart. A large number of patients who contract COVID-19 also report long-lasting neurological issues, including brain fog, memory loss, difficulty concentrating, hallucinations, headaches, and loss of smell or taste.
More than a year into the pandemic, scientists are still trying to figure out why. While some initial autopsies have found small signs of the virus within our brains, other autopsies have turned up nothing of significance.
Even if the SARS-CoV-2 virus doesn't directly infiltrate our noggins, or does so rarely, some scientists think its presence in the body can still trigger serious changes upstairs.
The most comprehensive molecular investigation to date has now uncovered extensive inflammation and degeneration in the brains of those who have died from COVID-19 - even when they didn't report any neurological symptoms in life.

The signs are eerily similar to what we see in Alzheimer's and Parkinson's disease, and yet no matter how hard the authors looked, they couldn't find any trace of the actual virus in the brain tissue.

It's possible the viral matter had already been cleared when these patients died, or it could be that SARS-CoV-2 is fanning the neurological flames from elsewhere in the body.
"The brains of patients who died from severe COVID-19 showed profound molecular markers of inflammation, even though those patients didn't have any reported clinical signs of neurological impairment," says neurologist Tony Wyss-Coray from Stanford University.
The study is small, but it suggests neurological damage may be common in severe cases of COVID-19, even when patients do not show any cognitive symptoms.
The study compared the brain tissue of 8 people who had died from COVID-19 with the brain tissue of 14 people who had died from other causes, including influenza.
Using single-cell RNA sequencing, the authors analyzed more than 65,000 frontal cortex and barrier cells, and their respective genes in each layer of the cortex. In every single type

of brain cell examined, the team found certain genes were uniquely activated in COVID-19 patients, and many of these genes are involved in neuroinflammation.
"Together," the authors conclude, "these data reveal significant brain barrier inflammation in COVID-19."
The blood-brain barrier is a semipermeable border that separates select materials in the bloodstream from fluids that come into contact with brain tissues. This protects the brain from infection while still allowing certain nutrients and immune cells in.
But while the blood-brain barrier might be keeping the actual SARS-CoV-2 virus out, the inflammatory effects of COVID-19 could still be slipping through.
Certain immune cells, called T-cells, for instance, were far more abundant in the brains of those who had died from COVID-19. In fact, T-cell infiltration in the brain was apparent in all but one COVID-19 patient, while those in the control group showed none of these immune cells in their brain tissue.
An abundance of T-cells passing through the blood-brain barrier can promote neuroinflammation and impair tissue repair in mice, which means something similar could be happening in humans.
In the frontal cortex, which is responsible for decision-making, memory, and mathematical reasoning, those who died from COVID-19 showed serious signs of neuronal distress.
The outermost layer in this part of the brain displayed different molecular changes compared to the control group, including heightened neuronal suppression and limited neuronal activation.
This is similar to what is seen in Alzheimer's disease, and it could be part of what's causing the neurological symptoms associated with COVID-19.
"Viral infection appears to trigger inflammatory responses throughout the body that may cause inflammatory signaling across the blood-brain barrier, which in turn could trip off neuroinflammation in the brain," explains Wyss-Coray.
"It's likely that many COVID-19 patients, especially those reporting or exhibiting neurological problems or those who are hospitalized, have these neuroinflammatory markers we saw in the people we looked at who had died from the disease."
Whether or not those who actually report neurological symptoms in life show greater neuroinflammation upon death is still unclear. But the findings suggest even if SARS-CoV-2 doesn't slip past the blood-brain barrier and even if no neurological symptoms are reported, the virus can still have a lasting effect on cognitive function.
When the authors compared the genes that were expressed differently in the brains of COVID-19 patients to other neurological disease and central nervous system disorders, they found several overlaps with Alzheimer's disease, multiple sclerosis, Huntington's disease, Parkinson's disease, autism spectrum disorder, depression, and schizophrenia.
Other recent autopsy studies have also shown surprisingly widespread brain damage, usually associated with strokes and neuroinflammatory diseases in those who have died of COVID-19.
Given how widespread this virus has become, it is crucial we figure out how it might impact our neurological health in the long run.

▶▶ **The study was published in *Nature*.**

Genome study discovers ancient coronavirus epidemic 20,000 years ago

Source: https://newatlas.com/science/genome-study-ancient-coronavirus-epidemic/

June 24 – An incredible new study, published in the journal *Current Biology*, is presenting evidence to suggest a major coronavirus outbreak struck humans in East Asia around 20,000 years ago. The international team of scientists found distinctive genomic marks indicating local populations faced a long viral epidemic that only finally dissipated a few thousand years ago.
"The modern human genome contains evolutionary information tracing back tens of thousands of years, like studying the rings of a tree gives us insight into the conditions it experienced as it grew," explains Kirill Alexandrov, co-author on the new research.
The researchers set out to investigate whether they could detect any genomic signs of ancient encounters with coronaviruses. To do this they homed in on gene variants known to code for virus-interacting proteins (VIPs) that interact with coronaviruses.
Using data from the 1000 Genomes Project, the researchers scanned genomes from 26 different populations around the world. The findings revealed the presence of these particular VIP genetic markers in several East Asian populations. The populations span areas known today as China, Japan, Mongolia, North Korea, South Korea, and Taiwan.
The genetic signals seemed to appear about 25,000 years ago, and the researchers say the evolutionary pressure on the genomes lasted for 20,000 years, until around 3,000 BCE, give or take a thousand years. Yassine Souilmi, a co-author on the study, says its unclear if it

was just one specific coronavirus exerting this evolutionary pressure for so many years, or whether it was a series of different viruses. "We really can't tell if this was a periodic thing that occurred every winter like the flu, or slightly different viruses that jumped from animals to humans every five to 10 years like what happened in the past 20 years with SARS, MERS, and SARS-CoV-2," says Souilmi.

At this stage the researchers can't say for sure these genetic signs are definitely due to coronavirus exposure but they are confident these are indications this ancient human population faced some kind of long-standing viral infection.

Besides offering a fascinating glimpse into the battles our ancestors may have fought with viruses, battles that we still face today, the research helps modern scientists get a handle on the ways our genomes have adapted to coronaviruses in the past. Alexandrov says these kinds of studies can help researchers understand what gene variants potentially lead to milder disease.

"Another important offshoot of this research is the ability to identify viruses that have caused epidemic in the distant past and may do so in the future," says Alexandrov. "This, in principle, enables us to compile a list of potentially dangerous viruses and then develop diagnostics, vaccines and drugs for the event of their return."

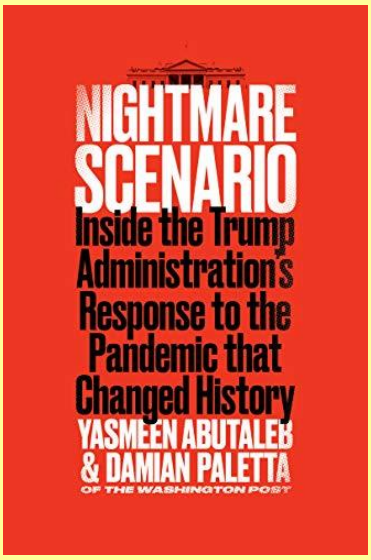
▶▶ **The new study was published in the journal** *Current Biology*.

When white powder blew up in his face, Fauci thought he might die; new book tells story of possible poisoning

Source: https://thehill.com/changing-america/well-being/560156-when-white-powder-blew-up-in-his-face-fauci-thought-he-might-die

June 24 – The nation's top infectious disease s expert thought he could have been a "dead duck" last summer when he received an envelope of powder from an unknown source that blew up in his face, according to Politico.

The news outlet got a preview of the new book "Nightmare Scenario: Inside the Trump Administration's Response to the Pandemic That Changed History," authored by Washington Post journalists Yasmeen Abutaleb and Damian Paletta.



The book details an Aug. 27, 2020 incident in which National Institutes of Allergy and Infectious Diseases Director Anthony Fauci was opening his mail and a mysterious white powder blew onto his face and chest.

Fauci said he believed at the time the substance could have been one of three things: **a prank to scare him, anthrax or ricin**. He said anthrax would make him seriously ill, but he'd likely survive, while ricin would be deadly.

His team then reportedly hosed him down in a chemical lab and he was required to stand naked in what looked like a kiddy pool while awaiting the results of what the substance was.

Luckily, the white substance was tested and found to be nothing dangerous. Fauci first revealed the jarring incident in January in an interview with The New York Times. The new book is set to be released Tuesday.

Tens of Thousands of Viruses Found in Human Poop Are Previously Unknown to Science

By Philip Hugenholtz and Soo Jen Low

Source: https://www.sciencealert.com/over-90-of-54-00-viruses-just-found-in-people-s-poo-were-previously-unknown-to-science

June 25 – Research published today in *Nature Microbiology* has identified 54,118 species of virus living in the human gut - 92 percent of which were previously unknown.

But as we and our colleagues from the Joint Genome Institute and Stanford University in California found, the great majority of these were bacteriophages, or "phages" for short. These viruses "eat" bacteria and can't attack human cells.

When most of us think of viruses, we think of organisms that infect our cells with diseases such as mumps, measles or, more recently, COVID-19. However, there are a vast number of these microscopic parasites in our bodies - mostly in our gut - that target the microbes that live there.

Everybody poops (but not all poop is the same)

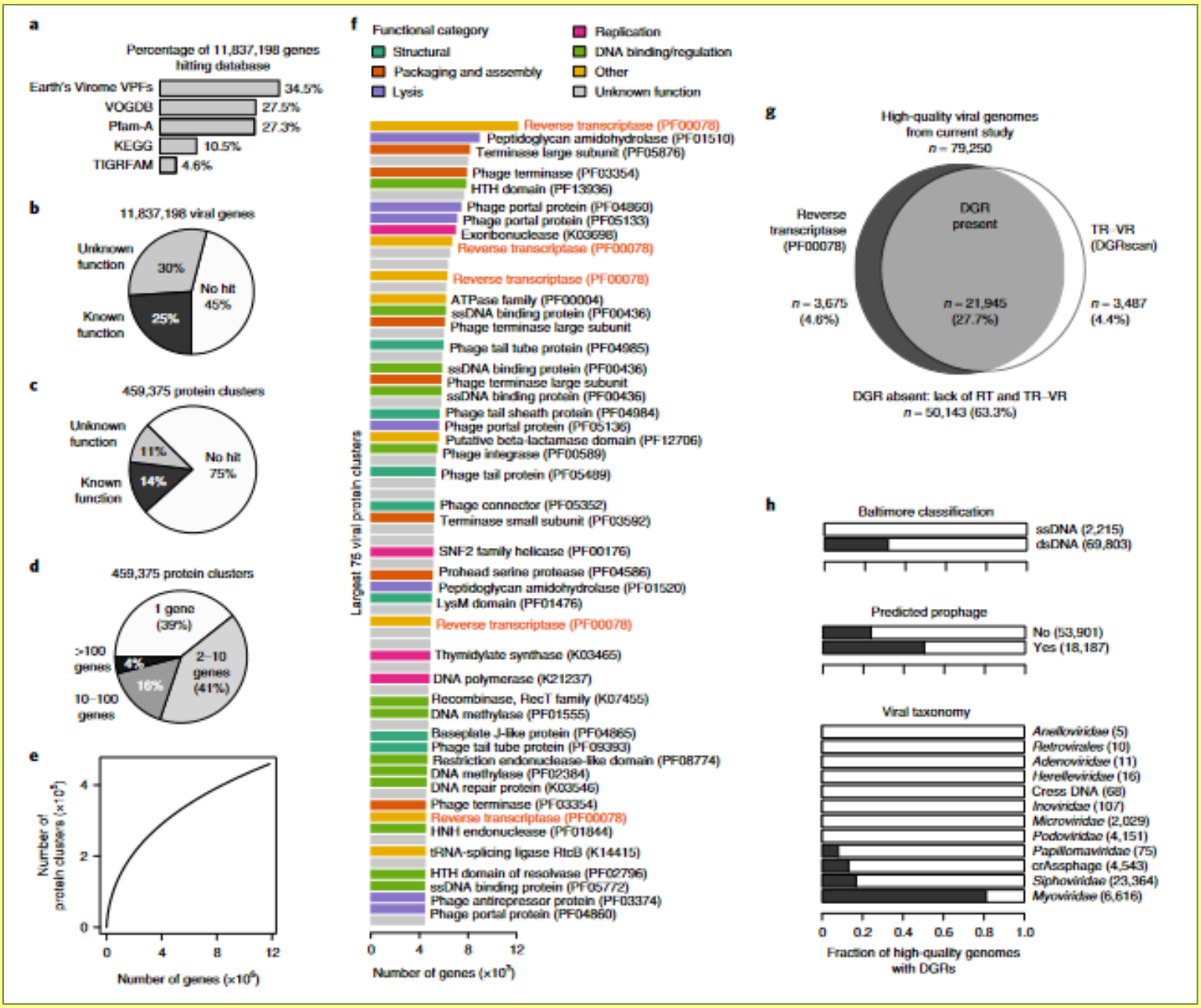
There has recently been much interest in the human gut microbiome: the collection of microorganisms that live in our gut.
Besides helping us digest our food, these microbes have many other important roles. They protect us against pathogenic bacteria, modulate our mental well-being, prime our immune system when we are children, and have an ongoing role in immune regulation into adulthood.
It's fair to say the human gut is now the most well-studied microbial ecosystem on the planet. Yet more than 70 percent of the microbial species that live there have yet to be grown in the laboratory.
We know this because we can access the genetic blueprints of the gut microbiome via an approach known as metagenomics. This is a powerful technique whereby DNA is directly extracted from an environment and randomly sequenced, giving us a snapshot of what is present within and what it might be doing.
Metagenomic studies have revealed how far we still have to go to catalog and isolate all the microbial species in the human gut - and even further to go when it comes to viruses.

11,810 samples of poo

In our new research, we and our colleagues computationally mined viral sequences from 11,810 publicly available fecal metagenomes, taken from people in 24 different countries. We wanted to get an idea of the extent to which viruses have taken up residence in the human gut.
This effort resulted in the Metagenomic Gut Virus catalog, the largest such resource to date. This catalog comprises 189,680 viral genomes which represent more than 50,000 distinct viral species.
Remarkably (but perhaps predictably), more than 90 percent of these viral species are new to science. They collectively encode more than 450,000 distinct proteins - a huge reservoir of functional potential that may either be beneficial or detrimental to their microbial, and in turn human, hosts.
We also drilled down into subspecies of different viruses and found some showed striking geographical patterns across the 24 countries surveyed.
For example, a subspecies of the recently described and enigmatic crAssphage was prevalent in Asia, but was rare or absent in samples from Europe and North America. This may be due to localized expansion of this virus in specific human populations.
One of the most common functions we discovered in our molecular field trip were diversity-generating retroelements (DGRs). These are a class of genetic elements that mutate specific target genes in order to generate variation that can be beneficial to the host. In the case of DGRs in viruses, this may help in the ongoing evolutionary arms race with their bacterial hosts.
Intriguingly, we found one-third of the most common virally-encoded proteins have unknown functions, including more than 11,000 genes distantly related to "beta-lactamases", which enable resistance to antibiotics such as penicillin.

Linking gut viruses to their microbial hosts

Having identified the phages, our next task was to link them to their microbial hosts. CRISPRs, best known for their many applications in gene editing, are bacterial immune systems that "remember" past viral infections and prevent them from happening again.
They do this by copying and storing fragments of the invading virus into their own genomes, which can then be used to specifically target and destroy the virus in future encounters.
We used this record of past attacks to link many of the viral sequences to their hosts in the gut ecosystem. Unsurprisingly, highly abundant viral species were linked to highly abundant bacterial species in the gut, mostly belonging to the bacterial phyla Firmicutes and Bacteroidota.
So what can we do with all of this new information? One promising application of an inventory of gut viruses and their hosts is phage therapy. Phage therapy is an old concept predating antibiotics, in which viruses are used to selectively target bacterial pathogens in order to treat infections.
There has been discussion of potentially customizing people's gut microbiomes using dietary interventions, probiotics, prebiotics or even "transpoosions" (fecal microbiota transplants), to improve an individual's health.



Functional landscape of intestinal phages.a, Protein-coding viral genes were identified across all MGVs and compared with profile HMMs from five databases. b, Forty-five per cent of genes fail to match any HMM, 30% match an HMM of unknown function and 25% match an HMM of known function. c, The 11,837,198 genes were clustered at 30% AAI using MMseqs2 into 459,375 protein clusters. d, Size distribution of protein clusters. e, An accumulation curve of protein clusters has not reached an asymptote. f, Functional annotations for the largest 75 protein clusters. Reverse transcriptases are highlighted in red. g, Prediction of DGRs based on the combination of the reverse transcriptase gene (PF00078) and TR–VR pair identified using DGRscan. A large fraction of MGVs contain the DGR system. h, DGR prevalence across different categories of viruses. DGRs are most common in lysogenic, dsDNA viruses from the Myoviridae family.

Phage therapy may be a useful addition to this objective, by adding species or even subspecies-level precision to microbiome manipulation. For example, the bacterial pathogen *Clostridioides difficile* (or Cdiff for short) is a leading cause of hospital-acquired diarrhea that could be specifically targeted by phages.

More subtle manipulation of non-pathogenic bacterial populations in the gut may be achievable through phage therapy. A complete compendium of gut viruses is a useful first step for such applied goals.
It's worth noting, however, that projections from our data suggest we've only investigated a fraction of the total gut viral diversity. So we've still got a long way to go.

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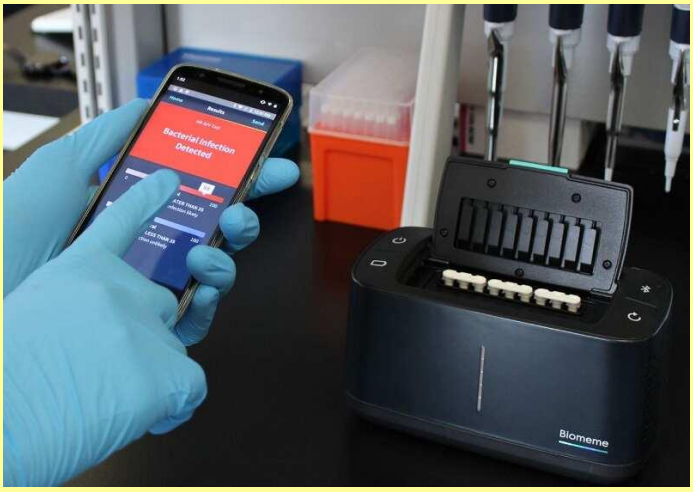
Soo Jen Low *is Postdoctoral Research Fellow @ The University of Queensland.*

Is it a Virus or Bacteria? New Tech Rapidly Tests for Pathogens

Source: http://www.homelandsecuritynewswire.com/dr20210625-is-it-a-virus-or-bacteria-new-tech-rapidly-tests-for-pathogens

June 25 – Tools that can quickly detect the presence or absence of previously unknown pathogens are critical in an effective defense against future pandemics.
As a first step towards using such tools, the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) is investing in a new technology that can discriminate between bacterial and viral infections using only a single drop of blood per patient. The hope is that by the time another major biological event—be it intentional, accidental or natural—comes knocking on our door, the United States will be able to quickly triage people for their next step of medical care. With this technology, front line medical personnel could use it to quickly determine the presence of either viral or bacterial infections in people and thereby best protect themselves, triage patients, and clear mass transport passengers for travel.



To make this a reality, S&T is working with the Cross-Border Threat Screening and Supply Chain Defense (CBTS) Center of Excellence and two leading biotechnology companies to develop a virus-versus-bacteria detection/diagnostic platform called the **Host Response Test System (HRTS).** It comprises a ruggedized portable device that can differentiate between bacterial and viral infections within an hour, even in pre-symptomatic patients. S&T's main interests in funding the HRTS effort are to help accelerate the development of pathogen-agnostic detection technology and to support interagency partners that have medical authority.
"Long before COVID-19 was on anyone's radar, S&T saw the importance of conducting better biological surveillance," said CBTS Director Dr. Gregory Pompelli. "S&T wanted to make sure we had this tool for DHS and others, recognizing that we need better surveillance for biothreats."
CBTS partnered with two companies: Predigen Inc., which developed the biomarkers that indicate the presence of viruses or bacteria, and Biomeme, Inc., which developed the Franklin™ thermocycler testing instrument to measure those biomarkers.
"Identifying potentially ill passengers and DHS staff sooner means they are less likely to spread infectious diseases and can get treatment earlier," added CBTS Executive Director Dr. Heather Manley Lillibridge. "The Food and Drug Administration has granted Emergency Use Authorization for the detection of SARS-CoV-2 on the Biomeme instrument. In work performed at Duke University and supported by the National Institutes of Health and the Antibacterial Resistance Leadership Group, the Predigen bacterial/viral tests have been evaluated in 1,200 patients across the U.S. with acute respiratory illness."
HRTS will help DHS mitigate biological events that impact national security, including those that can negatively impact the national economy, critical infrastructure, or could overwhelm state and local response capabilities. Moreover, HRTS will mitigate the impacts of communicable disease upon the DHS workforce, interagency partners and the public.
"DHS is investing in further development of the Predigen/Biomeme HRTS that can be used in both biodetection systems and medical diagnostics related to homeland security," said Dr. Lloyd Hough, who leads S&T's Hazard Awareness and Characterization Technology Center (HAC-TC). "Our civilian population and our economy would benefit greatly if HRTS

units were brought closer to where they are needed most. And if the system is widely available, it may help to mitigate a future outbreak and even prevent a pandemic."

HRTS Will Quickly Identify Viral/Bacterial Infections

When another contagious disease outbreak occurs, medical first responders will again be on the frontlines. HRTS could help first responders screen the population for signs of infection, even if the people being screened are asymptomatic.

"The portability of the technology allows you to use it anywhere," said Dr. Ephraim Tsalik, chief investigator at Predigen and associate professor of medicine at Duke University. "It serves as a tool to identify people who may be sick and don't even realize it."

When someone is exposed to a pathogen, distinct changes in the genes of the immune cells are triggered—changes specific for viral or bacterial infections. HRTS takes advantage of this phenomenon. Specifically, HRTS uses quantitative polymerase chain reaction (PCR) technology to measure the extent to which specific immune-related genes (biomarkers) are turned on or off (gene expression), and these gene expression signatures indicate whether viruses or bacteria are causing an infection. Predigen scientists at Duke University initially identified these biomarkers to detect and distinguish bacterial from viral infections in as little as a single drop of blood. HRTS could also identify someone exposed to a virus but not yet symptomatic. A critical window exists between the time of virus exposure and when someone becomes sick due to the infection, which can be many days. And since a patient's immune response to the virus is measured and not the virus itself, HRTS is perfectly suited to identify emerging viral infections before tests for that new virus are widely available.

"Since the immune system responds to pathogens within hours of exposure, these biomarkers could be detected days before symptoms appear. This is a far superior screening tool than taking temperatures or other routinely measured symptoms," said Tsalik. "For the S&T project, we are adapting Biomeme's thermocycler technology to measure gene expression signatures."

The Biomeme thermocycler was initially created in 2007 for environmental and veterinary pathogen testing in the field. Over the past decade, it evolved into pre-symptomatic testing. Biomeme and Predigen started working together on HRTS in 2018, and S&T started funding them in April 2020. According to Biomeme, no technology modifications were needed to embark on this HRTS effort.

Biomeme's thermocycler can simultaneously detect and quantify 27 biomarkers. Predigen's host response tests requires 24 of these, leaving space for up to three additional targets, including SARS-CoV-2 or the influenza virus. Biomeme and Predigen are currently working on two host response tests for S&T. One, called PreViral, can identify pre-symptomatic viral infection. The second test, called Bacterial/Viral, can discriminate between bacterial and viral infections.

"Although DHS is not involved in human diagnostic development per se, we do have a mission to advance technologies that can be used for biodetection and support the resilience of the U.S. homeland," said HAC-TC's Hough. "HRTS advances the technology paradigm for pathogen-agnostic biodetection and diagnosis that might someday be used to support DHS needs in deployed locations."

"DHS is concerned about the next unknown pathogen that threatens our national health security," added Hough. "That is why we are supporting the integrated development of the Predigen tests, which can discriminate between viral and bacterial diseases and use reagents suitable for austere environment, and Biomeme's ruggedized machine, on which these tests are run. In the future, we may be able to push the capabilities of HRTS and its reagents to serve other DHS biodetection needs or even as a screening solution for border security."

A Functional HRTS Prototype Could Be Ready within a Year

S&T is now halfway through this effort, and researchers are currently optimizing the bacterial and viral signatures and verifying that all the Predigen tests are compatible with the Biomeme instrument, which together comprises the integrated HRTS. Next, CBTS will validate the extent to which the tests distinguish between viral and bacterial infections, as well as identify people who are pre-symptomatic. S&T is also working to ensure an affordable price of HRTS, so it can be widely adopted for screening prior to prescribing antibiotics.

"The partnership with S&T has been very valuable to us," said Pompelli. "This project is a testament to the value of the S&T policy of investing in good research."

HRTS could also be useful for other federal agencies. For instance, the Department of Defense could use it to screen troops before deployment, and the National Aeronautics and Space Administration could screen astronauts prior to space shuttle missions. Moreover, Tsalik adds "Once these host response tests have undergone rigorous analytical and clinical validation, they will finally give clinicians the information they need to confidently know when to use antibiotics."

"The DHS COEs' focus on basic research is pushing the edge of science and technology to support the homeland security mission," said Hough. "And this project is a perfect example of that."

CDC Whistleblowers Tell Top Doctor Vaccine Injections Already Killed 50,000 Americans

Source: https://www.christianitydaily.com/articles/12386/20210625/cdc-whistleblowers-tell-top-doctor-vaccine-injections-already-killed-50-000-americans.htm

June 25 – Dr. Peter McCullough, Professor of Medicine at Texas A & M College of Medicine in Dallas, TX, referred to the COVID vaccine jabs as "propagandized bioterrorism by injection" which resulted in the deaths of more than 50,000 people in the United States.

In a recorded interview mentioned in a report from World View Weekend (WVW), Dr. McCullough was quoted as saying that "every single thing that was done in public health in response to the pandemic made it worse."

He claimed that COVID was a bioweapon, and that the vaccinations were "phase two" of that bioweapon's development.

He asserted that a "multi-drug treatment administered in the early to mid-point" of the virus might have averted 85 % of the more than 600,000 deaths that hit the United States.

"We have now a whistleblower inside the CMS, and we have two whistleblowers in the CDC. We think we have 50,000 dead Americans. Fifty thousand deaths. So we actually have more deaths due to the vaccine per day than certainly the viral illness by far. It's basically propagandized bioterrorism by injection," he said.

McCullough went on to claim that the prohibition of potential medicines against the COVID virus, such as hydroxychloroquine and, in particular, ivermectin, "was tightly linked to the development of a vaccine."

If this had been done, it was believed that the government would not have lawfully authorized the emergency use of three vaccines, Moderna, Pfizer and Johnson & Johnson.

WVW noted that the U.S. government is a "co-patent holder" of the Moderna vaccine "through the National Institutes of Health."

Previous reports on the growing body of evidence that mandates for vaccines is not necessary share in the network's conclusion about the US government's needless push for them by blocking previously accessible and efficient medicines. In addition to that, it claims that the FDA and CDC are concealing up a "tragic numbers of deaths caused by their experimental mRNA injections."

COVID is curable

Back in March, Dr. McCullough spoke before the Texas Senate Health and Human Services Committee.

In about the same manner, he addressed the hyped-up push for vaccinations as the overall solution for COVID, stating that there is no scientific rationale for such a claim.

"There is a low degree, if any, of asymptomatic spread. Sick person gives it to sick person," he argued.

"So my testimony," he said back then, "is COVID-19 has always been a treatable illness. A very large study from McKinney Texas, another one from New York City show that when doctors treat patients early who are over age 50 with a sequence multi-drug approach with the available drugs...there's an 85 percent reduction in hospitalizations and death. I want you to remember that number. 85 percent. We have over 500 000 deaths in the United States. The preventable fraction could have been as high as 85 percent if our pandemic response would have been laser focused on the problem, the sick patient."

"We're focused over here, and focused over there, and focused on masks, and what have you, laser focused sick patient. Treat them. We lost focus on the most fundamental factor."

He also emphasized the need of a panel of doctors deliberating on a pandemic response, not simply one who talks about it on media.

On his colleagues who have joined on the bandwagon in response to the virus, he said, "we have a crisis of compassion in our country in the medical field... I'm telling you we have a real self-check to do uh in the house of medicine."


PANDEMIC?
What pandemic?


UEFA
EURO2020

The beginning of the age of bioterrorism

By Safa Mariyam

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

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

From hegemonic power politics between US-China rivalry to bickering over the production and distribution of the vaccine has just divided the allies, shelved UN, and discarded WHO instantly. It is not eccentric if one would think of the 'novel' coronavirus as a bioweapon, keeping in mind the nefarious economic and political vying for unipolar status between the United States and China.

Leaving guns to the primitive men, world order, on a geo-political podium has experienced a drastic transformation from uni-polarity to multi-polarity due to unprecedented developments triggered simply by a 'biological agent'.

Since the Human Genome Project has deciphered the script of life whereby providing the human genetic blueprint, enormous entries in genomic databases have made it sinecure for a bioweaponeer to design highly infectious cryptic viruses. Such viruses could clandestinely infect a population and later become activated.

As the realm of genetic engineering has advanced, tailored development of lethal and contagious pathogens is feasible, rendering biodefense a challenging phenomenon. The dark side of biotechnology or 'black biology' has made it attainable to create 'designer genes' that can be exploited as lethal bioweapons.

Defining bioweapons

The current imbroglio ensued by 'novel' coronavirus has shifted the world's attention towards biological warfare like never before. Coronavirus pandemic went through the globe like a hot knife through butter, nevertheless, such infectious diseases were renowned as a potential tool in warfare as early as 600 BC. Petrifying events like Black Death (plague), anthrax, and smallpox all show a grief-stricken picture of melancholy humanity has endured.

Bio-warfare refers to the deliberate spread of disease to plants, livestock, and humans by using a biologically hazardous agent or a bioweapon. A bioweapon may sound like another kind of giant bazooka, but it is merely a few micrometers in size, not even visible to the human eye.

According to WHO, bioweapon is a harmful micro-organism like bacteria, toxin, or virus, used as agents to spread infectious disease. Bio-weapons are extremely cheap when compared to the cost of a nuclear weapon program. As an example, a neuro-toxin 'botulinum' infamously known as 'miracle bio-poison', secreted by bacteria *Clostridium botulinum*, is known for its extreme lethality and potency. According to research, 1 gram of crystalline toxin, if evenly circulated and inhaled, can kill more than one million people (Dhaked & Singh, 2010). A purified form of botulinum toxin from bacteria *Clostridium botulinum* is nearly 3 million times more intoxicating than sarin, a chemical nerve agent.

Dr. Piers Millett, an expert on science policy and international security whose work centers on biotechnology and biowarfare articulates, ''Imagine aerosolizing a lovely genome editor that knocks out a specifically nasty gene in your population. It's a passive thing. You breathe it in and it retroactively alters the population's DNA.''

Countries waging wars through bioweapons

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

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

Large-scale production and weaponization of many organisms such as those causing brucellosis, tularemia, and anthrax subsequently took place in many countries including the USSR, the USA, and the UK during the 1950s and 1960s.In 2001, *Bacillus anthracis* spores were sent anonymously in the US postal system that caused 22 cases of anthrax and 5 deaths. In the

'Anthrax anxiety' over 50,000 people took broad-spectrum antibiotics and deluged the medical care centers.
Despite signing the Biological and Toxin Weapons Convention (BWC) in 1972, the Former Soviet Union carried a clandestine bioweapon program 'Biopreparat' until the 1990s. The massive military program to weaponize biological agents expended hundreds of US dollars on the research and sought out the most deadly and transmissible bacteria (plague) and virus (smallpox) to humans.
A Japanese biowarfare program employed more than 3000 scientists and 150 buildings in Pingfan for its research and development. The center known as "Unit 731" worked on the pathogenic microorganisms and diseases of interest such *as B.anthracis, Neisseria meningitis, Vibrio cholera, Shigella spp. and Yersinia pestis.* An estimate of more than 10,000 war prisoners had died due to infection spread during experimentation of the Japanese program between 1932 and 1945.

Advanced gene editing technologies

Due to new-fangled DNA editing techniques in the genetic engineering domain, constructive or destructive modifications in a biological cell are now a duck soup for scientists. Such genome editing tools or 'cut and paste tools' are rather cheap, displaying immense potential for good use in the medical field when used to fix genetic disorders such as cystic fibrosis or deadly types of cancer. However, its horrendous use could be made by designing killer mosquitoes, anti-biotic resistant superbugs, and contagious viruses.
Advanced gene editing technologies include CRISPR (Cas9), TALENs, zinc-finger nucleases (ZFNs), and homing endonucleases or meganucleases. These scientific breakthroughs have the capacity to kick out a selective gene and insert the desired gene instead, or even design a gene from a scratch.
This technological revolution has accelerated myriad discoveries in the field of human gene therapy, drug modification, precision genetic medicine, disease modeling, and medical pathology studies. Furthermore, advances in synthetic biology have empowered us to control pathogen's innate programming language and install genetic logic gates to generate microbes with desirable functions. Forcing biology to behave like electronics, microbes equipped with reliable genetic logic gates can have an entire genome 'boot up'. Re-programming and genetic mixing of different living cells have paved a smooth road for the development of binary biological weapons and highly infectious micro-organism.
In a study, a strain of *Yersinia pseudotuberculosis* was re-programmed to combat malignant cells (Anderson, et. al, 2006). In an engineered bacterial cell, OR logic gates were synthesized which stimulated the production of the drug in the presence of some disease marker (Brophy & Voigt, 2014). Thus, it is not difficult for a non-state actor to develop bio or binary weaponry and achieve his bellicose missions against other states.

Categorizing bioterrorism agents

Whilst breakthrough advances in the realm of microbial biotechnology and comparative genomics, it is imperative to envisage proliferation and the use of new biological weapons for war contingencies and terrorist events. Pugnacious nationalist leaders and imperialistic warheads may persevere in seeking them for hegemonic motives.
For such a risk, the Centers for Disease Control has grouped over 30 potential bioterrorism agents (micro-organisms and toxins) into three threat categories on the basis of lethality and transmissibility.
First priority group includes agents like *Bacillus anthracis, Ebola, Lassa, Clostridium botulinum* toxin. The second list includes pathogens with less morbidity rate i-e Staphylococcal enterotoxin B, *Brucella s*pecies, Epsilon toxin of *Clostridium perfringens*, *E.coli O157:H7, Salmonella* species.
Whereas, list C focuses on the emerging pathogens which could be engineered for mass dissemination due to their availability, easy production, and high mortality rates. It includes the *Nipah virus* and *hantavirus*.
A group of elite scientists in the United States, JASON group, had categorized futuristic techniques that could design lethal genetically modified organisms. These included; binary biological weapons; designer genes; gene therapy as a weapon; stealth viruses; host-swapping diseases and designer diseases.

Russian experiments

Next-generation bioweapons developed by integrating genetic engineering and computational biology is the weaponry par excellence. Dr. Kanatjan Alibekov, an infectious disease physician and the highest-ranking detector of the Biopreparat program (Russia), published *Biohazard*, a detailed account of his experience.
He disclosed that along with Soviet biologists, he had prepared Biopreparat's first vaccine-resistant tularemia bomblet as a bioweapon. His team had also boosted the potency of the anthrax strain 836 and called it the 'battle strain'. Dr. Alibek confided that Russian scientists

had improved many of these deadly strains to evade the immune system and existing treatments.
In May 1998, Alibek testified before the U.S. Congress that in Soviet's opinion, the best biological agents were those which had no antidote. And those agents for which vaccines or treatment existed, antibiotic-resistant or immunosuppressive resistant variants were designed.
In the early 1990s, chimeras of VEE (Venezuelan equine encephalitis), Ebola, and Marburg genes inserted into the smallpox virus were developed by Russian biologists. Chimeras are man-made viruses, engineered by injecting genes from one virus to another, to make even a virulent viral strain.
In 1997, Russian scientists had published research in a British journal *Vaccine*, in which they had transferred the genome of the bacteria *Bacillus cereus* into *Bacillus anthracis* cultures, rendering the anthrax bacteria strain resistant to the Russian anthrax vaccine.

Arming against biological weapons
Exponential discoveries in the biotechnology domain have rendered biological weapons exceptional in their invisibility, transmissibility as well as potency. Engineering of these agents targets at creating encumbrance to military responses, crippling the socio-economic stability and pulverize the government on the global podium, leaving the healthcare system naked and dilapidated.
Also, Geneva Protocol signed in 1925 has proved itself to be a 'toothless' treaty as it does not ensure any verification or compliance even after banning the bacteriological methods of warfare. However, the amalgamation of microbial biotechnology with immuno-informatics can put forward significant countermeasures against these infectious war agents.
These include elucidating on the human genome, boosting the human immune system, understanding viral and bacterial genomes, and how the human body responds to an infection. Rapid detection of the bio-agent by highly sensitive and advanced diagnostics can be done by the latest technologies such as CRISPR SHERLOCK and DETECTR which may take even less than an hour.
Researchers are also focusing on the commercialization of nano-theranostics and micro-chips for the fast and accurate detection of infectious agents. Also, there is a huge demand of the time for the development of new vaccines, antibiotics, and antiviral drugs which is now a lot easier after the advent of techniques like reverse vaccinology and subtractive genomics.

Third world war to be biological?
Moreover, in view of the great misfortune we face today in the form of pandemics, it is evident that economic expansion has outperformed ethical scientific development. Incessant US-China squabbling over the origin of the virus at the extreme time of crisis has made covid-19 become rather a political football.
All of the 'politicking' on, when multitudes of infected humans are out of ventilators, pummeled by poverty, and grieved by the sickness. Seams that were loosening long before the sudden eruption of the virus are now ripping apart even quicker. The 'Chi-merica' imbroglio has not only stymied the trade agreements in times of severe crisis but has also augmented a deeper world divide in terms of sanctions and vaccine monopoly.
What is more worrisome about living in this 'Biological Century' is the intensity of threat one feels by the clandestine acts of bioterrorism. Keeping in mind the heightened capabilities of the scientists to manipulate DNA segment, it raises the question of the creation of such vaccine-resistant strains which could mutate resulting in a species for which no antidote could be developed in the future, putting forth dreadful consequences.
This leaves us with some serious queries. Is the covid-19 pandemic just a start towards a new world order? Have humans really equipped themselves to fight bio-warfare? Will black biotechnology consider the bio-security challenges before the next global humanitarian crisis?
Winston Churchill had once lamented, "Blight to destroy crops, Anthrax to slay horses and cattle, plague to poison, not armies but whole districts- such line along which science is remorselessly advancing". There are those who say 'The First World War was chemical; the Second War was nuclear, and that the Third World War-God forbid-will be biological.

Safa Mariyam *is an MPhil scholar and a researcher in Industrial Biotechnology, NUST, Islamabad, Pakistan. She is also a member of the American Society for Microbiology, ASM, and is the author of 'Nanotheranostics', an international book publication for Springer Nature, Germany.*

"A traitor
is not only the one who reveals
the secrets of the homeland to
the enemies,
but he is also the one who,
while holding a public office,
knowingly
does not take
the necessary steps
to improve the living standards
of the people
on whom he reigns!"

Thucydides

Athenian historian and general

These countries are making their own Covid-19 vaccines from scratch

Source: https://www.thenationalnews.com/uae/health/these-countries-are-making-their-own-covid-19-vaccines-from-scratch-1.1249156

June 27 – Just as Russia made a statement by calling its Covid-19 vaccine Sputnik V, so Cuba sent a message by naming some of the coronavirus vaccines it is developing "Soberana" – Spanish for sovereign.

Cuba's self-reliance is born of necessity.

Relatively poor, especially after a year in which its tourist industry has been battered by the pandemic, and heavily isolated by US sanctions, the country would have struggled to secure supplies of the Pfizer and Moderna coronavirus vaccines in particular.

Rather than join Covax – the global programme to provide vaccines to poor countries – Cuba has used its decades-long expertise in biotechnology to develop and produce its own.

By the end of this year, there's no doubt the population [of Cuba] will be vaccinated – the first in Latin America and the Caribbean

Dr Helen Yaffe, University of Glasgow

"It's partly or largely the result of a strategic development policy to invest in science and technology for social development," said Dr Helen Yaffe, a lecturer in economic and social history at the University of Glasgow in the UK and author of *We Are Cuba!: How a Revolutionary People Have Survived in a Post-Soviet World.*

"In the case of Cuba developing its vaccines, it's the necessity – most global south countries have that – combined with the capability."

That capability, in the form of multiple research institutes that co-operate closely with universities and hospitals, has been channelled into the development of vaccines employing tried-and-tested technology.

Initial clinical trials began last year, and Iran has become involved in recent months.

Among Cuba's vaccines are several named Soberana developed by Havana's Finlay Institute of Vaccines.

These include Soberana 02, a "conjugate" vaccine consisting of part of the coronavirus spike protein linked or conjugated to a

harmless form of the tetanus toxin, which is used to stimulate a stronger immune response.

Soberana 02 has 62 per cent efficacy after two of its three doses, according to Cuban officials.

Official data indicates that another Cuban vaccine, Abdala, made from SARS-CoV-2 proteins and produced by Cuba's Centre for Genetic Engineering and Biotechnology, had 92.28 per cent efficacy in clinical trials.
Using its own vaccines, Cuba has administered 5.11m doses, and 21 per cent of the population of more than 11m have had at least one jab, according to the University of Oxford's Ourworldindata website.
"By the end of this year, there's no doubt the population will be vaccinated – the first in Latin America and the Caribbean," Dr Yaffe said.
"How many countries will be able to say they vaccinated their entire population with their own vaccine?"
Cuba's vaccine programme will have more than domestic significance: the country is likely to export vaccines widely and at low cost, with Venezuela and Ukraine among likely recipients.
"They will charge cost price plus a little bit more to plough into their healthcare system," Dr Yaffe said.
"It's important politically for Cuba … They won't make a massive amount of money. But the economic situation is so bad that anything will help."
Unlike Cuba, Brazil has secured access to multiple foreign Covid-19 vaccines, helped by hosting clinical trials. But is also working on its own, including ButanVac, which officials say could be produced without having to import materials.
It uses a viral vector to stimulate an immune response against coronavirus spike proteins and, crucially, is likely to be inexpensive, making it attractive to Brazil itself and other developing nations.
This month, Brazil's health regulatory agency, Anvisa, gave the go ahead for clinical trials, and tens of millions of doses could reportedly be available later this year.
While there are existing Covid-19 vaccines with very high efficacy, Prof Eskild Petersen, of the University of Aarhus in Denmark, and chairman of the emerging infections taskforce at the European Society of Clinical Microbiology and Infectious Diseases, says it is good that "competing technologies" are being worked on.
"If you develop a vaccine in Brazil or Cuba and can prove the efficacy and profile of side effects are as good as the best we have – AstraZeneca and Pfizer – then they can probably produce it cheaper," he said.
Among the other Covid-19 vaccines emerging from developing nations is Corbevax from Biological E, a company based in Hyderabad in India.
Developed in partnership with two US institutions, this two-dose vaccine uses components of the coronavirus's spike protein to stimulate an immune response and is said to have performed well in early clinical trials.
Described as costing about half as much as the next-most-expensive jab used in India, it has attracted interest from the Indian government, which this month reserved 300m doses.
Also in June, emergency approval was given for Iran's domestically developed vaccine, CovIran Barekat, which is made using inactivated coronavirus particles. Iran's supreme leader, Ayatollah Ali Khamenei, was among the recipients.
Iran, which has also imported Covid-19 vaccines, is set to start late-stage clinical trials of another vaccine, Razi Cov Pars, based on coronavirus spike proteins, in August.
While some developing nations work on their own shots, Covid-19 vaccine supply globally remains highly uneven, with, for example, fewer than one per cent of Africa's population fully inoculated.
Those working in the field recognise that poorer regions need to develop, if not vaccines, then at least manufacturing capacity.
"Vaccine nationalism disappears once we all have the ability to make vaccines," Dr Adam Ritchie, a senior project manager in vaccine development at the University of Oxford, wrote earlier this year.
"The more we rely on sharing between countries with their own interest, the harder it is to get the vaccine to everyone."
This was demonstrated recently when India, home to the world's biggest vaccine maker, the Serum Institute of India, shut down exports in order to maximise domestic vaccination rates amid its second wave.
Prof David Taylor, emeritus professor of pharmaceutical and public health policy at University College London, says "the real challenge is in production", as manufacturing capacity may be more critical than access to the intellectual property of a vaccine.
"My own feeling is that the IP issues have been exaggerated," he said.
"The real challenge is getting enough big-scale capital investment into the production of vaccines wherever you're doing it."
Reports indicate that Egypt's state-supported Vacsera facility is set to soon start production of a Covid-19 shot from China's Sinovac, making it the second nation in Africa – after South Africa – to manufacture coronavirus vaccines.
As well as catering to local need – less than three per cent of Egypt's population has had at least one jab – Egyptian-made vaccines are likely to also be exported.
Elsewhere on the continent, the Pasteur Institute of Dakar in Senegal is scheduled to begin packaging and distributing vaccines produced by Belgian's Univercells by early next year, and will subsequently start actual manufacturing.

It was also recently announced that the World Health Organisation would work with South African companies, universities and the Africa Centres for Disease Control and Prevention to set up an mRNA Covid vaccine technology transfer hub to train manufacturers from poorer countries.
While there are constraints on supply now, Prof Taylor is confident these will ease.
"It don't think there's any doubt we will have enough capability in two or three years' time," he said.
"[But] it's terribly difficult for the people facing a big challenge to say there's no adequate vaccine supply now."

Lost Your Sense of Smell Due to COVID? New Study Explains When It Could Return

Source: https://www.sciencealert.com/it-could-take-up-to-a-year-for-your-sense-of-smell-to-come-back-after-covid-19

June 26 – A new study says it might take up to a year for the ability to smell to return after COVID-19.
Anosmia – the partial or total loss of smell – has been one of the defining symptoms of COVID-19.
The study, published in the *JAMA* medical journal, says anosmia could last up to a year. For the study, a team of medical researchers analyzed 97 patients with acute smell loss lasting more than seven days after a positive COVID-19 diagnosis.
Of the 97 participants, 51 underwent both subjective and objective olfactory tests, the study says, meaning they were surveyed about their sense of smell and tested to corroborate their responses.
These 51 patients took surveys every four months over the course of a year asking about their ability to smell.
The participants rated their sense of smell according to how strong they believed it to be at each four-month interval.
At the four-month mark, about 45 percent of the 51 patients reported having their full sense of smell back, according to the study.
A majority, about 53 percent, said they only regained their sense of smell partially. The remaining 2 percent indicated they felt no change in olfactory strength.
At the eight-month interval, about 96 percent of the 51 patients reported full recovery.
Two patients, or about 4 percent, continued to report a decreased sense of smell at the one-year mark.
About 28 percent of the 46 patients who underwent only the subjective test – the surveys – reported "satisfactory recovery" at the four-month mark, the study says.
The remaining participants reported the same by the year mark.
"Persistent COVID-19–related anosmia has an excellent prognosis with nearly complete recovery at 1 year," the medical researchers said.
"As clinicians manage an increasing number of people with post-COVID syndrome, data on long-term outcomes are needed for informed prognostication and counseling."

The great deception

Source: https://www.conservativewoman.co.uk/the-great-deception/

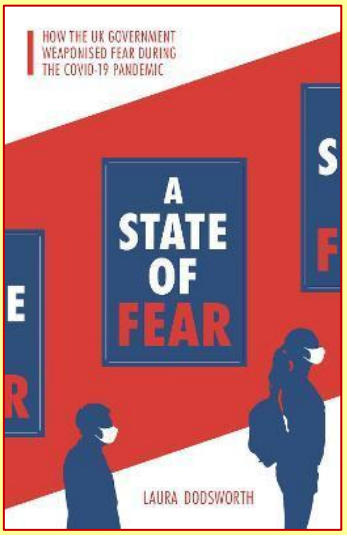
June 27 – Dr. Peter McCullough is one of the most eminent physicians and scientists in the US, and reputed to be the most published cardiologist in history. With a number of others, he devised a treatment protocol for Covid-19, which was shown to be effective in preventing up to 85 per cent of deaths. Having spent the best part of a year seeing all discussion of these treatments suppressed, resisted and censored by the authorities, media and Big Tech, he has come to a shocking conclusion:
'I believe that we're under the application of a form of bioterrorism that's worldwide, that appears to have been many years in the planning. The first wave of the bioterrorism was a respiratory virus that spread across the world and affected relatively few people, but generated great fear . . . The entire programme as this bioterrorism Phase 1 was rolled out was really all about keeping the population in fear and in isolation and preparing them to accept the vaccine, which appears to be Phase 2 of a bioterrorism operation.'
At the end of his interview with the German lawyer Reiner Fuellmich, he poses the following question:
'To me what was masterful is the psychological part of it. How did they pull this off from a mass psychology perspective?'
Of course, the response from those who have spent 15 months letting the Government and media do their thinking will be to dismiss his claims as that of a conspiracy theorist. But those dismissing his words should consider this: by definition, a conspiracy theory is a theory about something that someone believes is going to happen or which has happened.
Dr. McCullough is not talking about that. He is talking about something that is happening in real time, in plain sight, right in front of your eyes.

Almost everything we have been told about this virus and the response to it has been a lie. Not a mistake, not an accident, not a misunderstanding. Dr. Mike Yeadon, one of the few heroes of the moment, lists these falsehoods as follows:

1. That the virus is novel, so there is no immunity to it.
2. That the virus is very much more lethal than anything else we've encountered.
3. That there are no treatments.
4. That the PCR is a reliable test of clinically important infection.
5. That the virus can be spread by infected people without symptoms.
6. That masks protect against transmission.
7. That Lockdowns slow transmission through the community.
8. That variants formed during virus replication are more dangerous and some will escape immunity.
9. That it's uncertain if you can be infected twice.
10. That the vaccines are safe and effective.

Each of these points is, he says, provably untrue. Yet despite this, even if most people were offered irrefutable evidence that they are untrue, they still cannot bring themselves to come to any other conclusion than to question the official narrative is a 'Conspiracy Theory'. Part of the reason for this reluctance is that people demand to know every jot and tittle about how such an audacious plan might work. This is a strange way of thinking. If you knew with certainty that Smith lies repeatedly, you would not need to understand his motives and aims to know that he must have motives and aims. And so it is with what is going on right now. It is enough to ask whether Dr. Yeadon's assertions hold or not, and if they do, it matters not one whit whether we understand everything. We know enough to see that something's up, and that it cannot bode well.

We are faced with a double-edged sword. Not only are the authorities demonstrably deceiving the people; but the people are allowing the authorities to deceive them without question. Make no mistake, what we are living through is a Great Deception: a period of immense deception with unimaginable consequences.



Although we cannot know all, it is worth pondering Dr. McCullough's question on how this was pulled off from a mass psychology perspective. Those responsible have not simply pulled it out of the hat in a 'Let's see what happens if we do such-and-such' kind of way. They have been monitoring human behaviour for decades. They have seen how easy it has been for Governments to convince people of things which are demonstrably untrue. They have seen how easy it was to persuade whole populations to give up freedoms in the name of safety. They have seen how easy it was to manipulate people by the use of powerful media messaging. They have seen how easy it has been to control the media into toeing the line. They have seen the power of groupthink. They have seen how social media and algorithms can shape, alter, and condition behaviour. They have set up their behavioural science units in the heart of Government and – as Laura Dodsworth shows in her fantastic book *State of Fear* – they have been more than willing to reach for the levers of fear and panic as a means of controlling masses of people. And so when the time came, they knew which buttons to press, which nerves to touch, which emotions to play upon, although they are no doubt astonished at the ease with which it has been done.

However, ultimately this Great Deception can have no purely human explanation. Behavioural science alone cannot explain it. I have been struck by the number of atheists who have – along with those Christians who have seen through it – commented that it has been as if some kind of spell has been cast on people, and that there is a mysterious, spiritual dimension to all this. Something like this?

'For we do not wrestle against flesh and blood, but against the rulers, against the authorities, against the cosmic powers over this present darkness, against the spiritual forces of evil in the heavenly places.' (Ephesians 6:12 – see also Revelation 20:7-8)

Many atheists will scoff at such a claim, of course. Yet the truly astonishing thing about this Great Deception is that more of them appear to be open and receptive to such an explanation than is generally true of the church. Imagine that!

AI Predicts 20,000 Unknown Associations between Viruses and Susceptible Mammalian Species

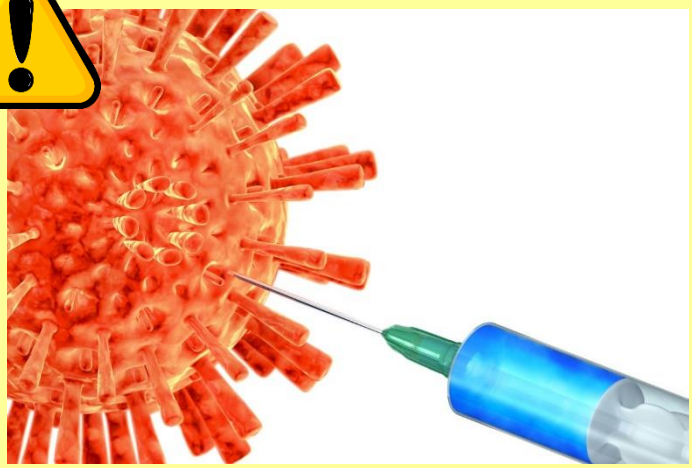
A University of Liverpool study could help scientists mitigate the future spread of zoonotic and livestock diseases caused by existing viruses. The researchers applied machine learning technology to predict more than 20,000 unknown associations between known viruses and susceptible mammalian species. They suggest the findings could be used to help target disease surveillance programs. **+ MORE**

Why COVID-19 vaccines can provide stronger immunity than natural infection

Source: https://newatlas.com/health-wellbeing/vaccine-immunity-stronger-than-natural-infection-covid/

June 27 – Eighteen months after the first officially reported SARS-CoV-2 cases appeared in Wuhan we can now begin to investigate questions that were impossible to answer early on in the pandemic, such as what kind of immunity is generated from a natural infection, how long could one be protected from re-infection, and does vaccination generate better immunity than natural exposure to the virus?

A recent preprint study, led by scientists from the University of Oxford, offers the most thorough account of immune responses in recovered COVID-19 patients to date. Nearly 80 healthcare worked were closely followed for six months post-infection and the researchers used a novel machine-learning approach to analyze immune biomarkers.



"We found that individuals showed very different immune responses from each other following COVID-19, with some people from both the symptomatic and asymptomatic groups showing no evidence of immune memory six months after infection or even sooner," explains study author Christina Dold.

In general, the research saw a correlation between disease severity and lasting immune response. Over 90 percent of asymptomatic cases showed no measurable immune response six months later. A quarter of symptomatic cases lacked lasting immunity six months after infection.

A little more worrying, however, was the finding that very few serum samples from infected subjects mounted antibody responses against newer variants of the virus. Dold says this seems to suggest **those infected with the original SARS-CoV-2 strain in 2020 may have little protection from some of the newer variants beginning to circulate**.

"Our concern is that these people may be at risk of contracting COVID-19 for a second time, especially with new variants circulating," says Dold. "This means that it is very important that we all get the COVID vaccine."

But why would immunity generated by a vaccine be any different from natural infection?

"The honest truth is, we don't know," says Sabra Klein, an expert in immunology from the Johns Hopkins Bloomberg School of Public Health. "The immune system of people who have been infected has been trained to target all these different parts of the virus called antigens. You'd think that would provide strongest immunity, but it doesn't."

Natural immunity is unpredictable

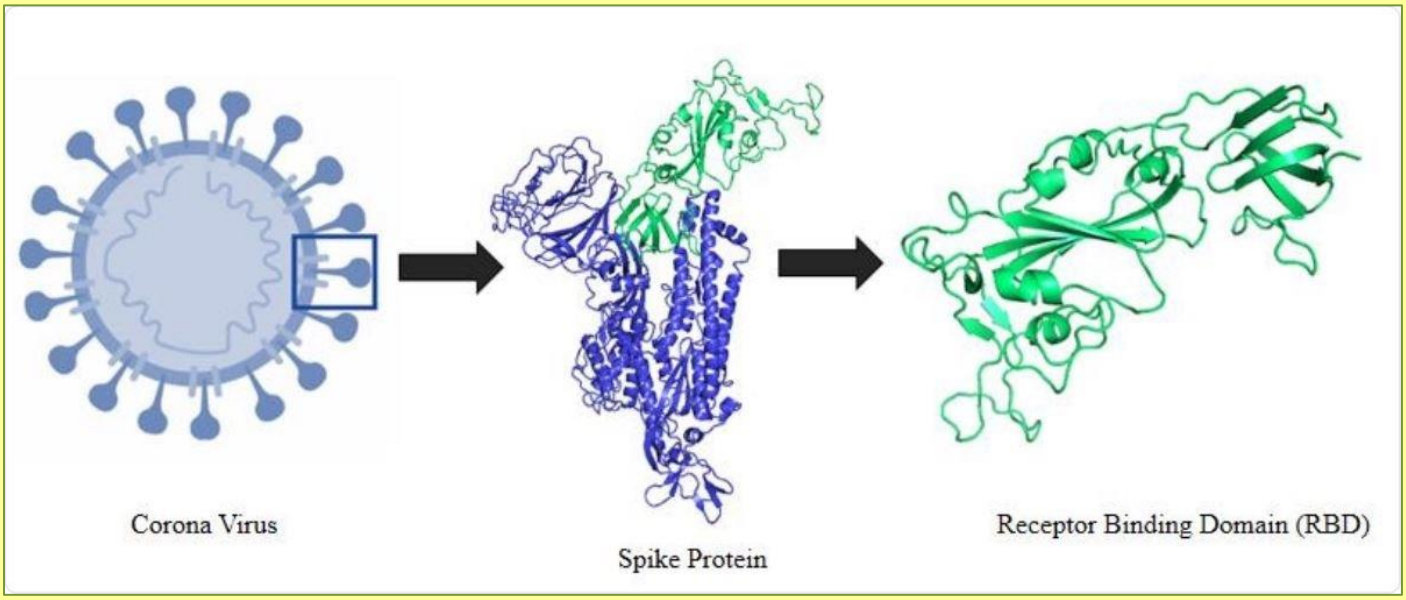
One of the biggest problems with natural immunity generated from a SARS-CoV-2 infection is just how variable and unpredictable it can be. A striking study published earlier this year found a stunning spectrum of natural immune responses in recovered COVID-19 patients. Although comfortingly, the paper saw immune responses from a natural infection lasting at least eight months, it also indicated some recovered patients displayed immunity levels 100 times higher than other patients.

"So if you were playing a basketball game and one person scored one point and the other person scored 100 points, you would not consider those equivalent performances," explains corresponding author Shane Crotty to USA Today. "And so that's the way we think about the immune responses as well. They're there, but not everybody's equal."

A more recent study, yet to be peer-reviewed and published, compared long-term antibody responses between naturally infected subjects and those immunized with a mRNA vaccine. It found after two vaccine doses antibody levels were up to 10 times higher than plasma from those following natural infection.

The RBD clue

A clue as to why vaccine-induced immunity could be stronger than natural infection comes in a robust new study published in the journal *Science Translational Medicine*. This research, from a team at the Fred Hutchinson Cancer Research Center, focused on a specific part of the SARS-CoV-2 virus called the **receptor binding domain (RBD)**.



Everyone has probably heard of SARS-CoV-2's infamous spike protein. It is this novel protein that allows the virus to infect humans by attaching to a receptor called ACE2, present in some of our cells.

Acting as a kind of interface between the viral spike protein and ACE2 receptors in human cells are RBD fragments. These are like anchors, helping the virus fuse with ACE2 receptors and ultimately infect human cells.

The new research analyzed thousands of possible RBD variants. The goal was to compare how well vaccine-elicited antibodies targeted RBDs compared to antibodies generated by natural infection.

"By closely examining the results, the researchers uncovered important differences between acquired immunity in people who'd been vaccinated and unvaccinated people who'd been previously infected with SARS-CoV-2," writes Francis Collins, director of the National Institutes of Health, in a statement explaining why vaccination is important, even for those previously infected.

"Specifically, antibodies elicited by the mRNA vaccine were more focused to the RBD compared to antibodies elicited by an infection, which more often targeted other portions of the spike protein. Importantly, the vaccine-elicited antibodies targeted a broader range of places on the RBD than those elicited by natural infection."

This new research finding offers insight into how vaccination could be more protective against newer SARS-CoV-2 variants. But, it still is unclear exactly why vaccination acts so specifically on RBD in this way.

Klein hypothesizes the reason behind strong vaccine immunity could be the way vaccines present the immune system solely with a large volume of spike proteins. This extreme focus on just one part of the virus could heighten our ability in developing effective antibodies.

"It's like a big red button sitting on the surface of the virus. It's really sticking out there, and it's what our immune system sees most easily," says Klein. "By focusing on this one big antigen, it's like you're making our immune system put blinders on and only be able to see that one piece of the virus."

Another hypothesis raised by the research team behind the new RBD study is that vaccines, mRNA vaccines in particular, present antigens to the immune system in a way that is very different to natural infection. This includes the fact that vaccines expose different parts of the body to antigens, which does not occur through natural viral infection.

"… natural infection only exposes the body to the virus in the respiratory tract (unless the illness is very severe), while the vaccine is delivered to muscle, where the immune system may have an even better chance of seeing it and responding vigorously," explains Collins.

Hybrid Immunity

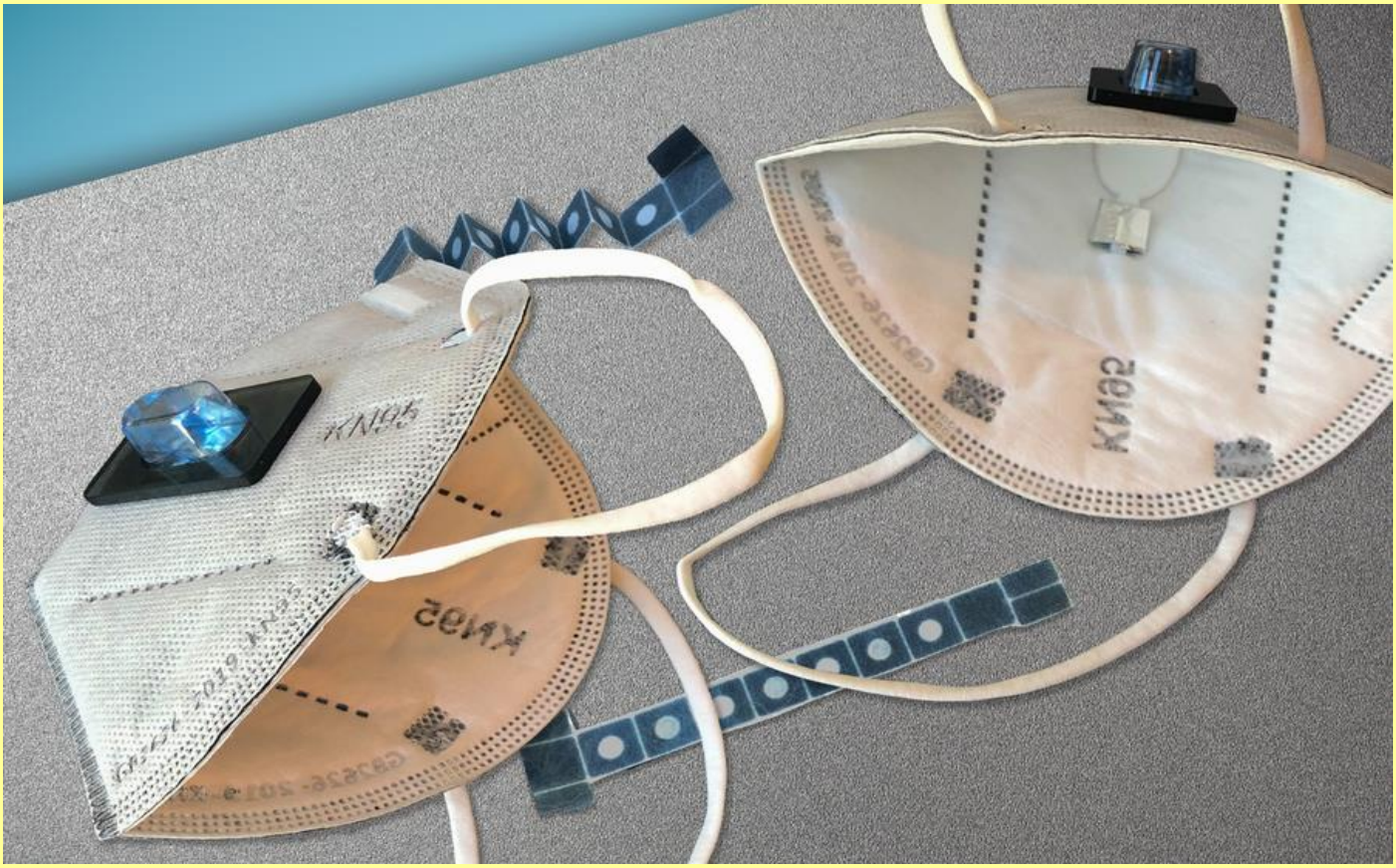
A growing body of research is finding one dose of a vaccine in previously infected subjects can produce a larger immune response than two doses given to uninfected individuals. Most recently a study led by UCLA affirmed previously infected COVID-19 subjects only required one mRNA vaccine dose to produce a strong antibody response.

"Our data suggest that a person who previously had COVID-19 has a huge response after the first mRNA vaccination and has little or no benefit from the second dose," says Otto

Yang, senior author on the study. "It is worth considering changing public health policy to take this into account, both to maximize vaccine usage and avoid unnecessary side effects."
Crotty, a vaccine scientist from La Jolla Institute for Immunology, explains how combining natural immunity and vaccine-generated immunity can synergize to produce a kind of "hybrid vigor immunity." This means those previously infected with SARS-CoV-2 will be better protected against newer variants after a vaccine shot compared to just relying on protection from natural infection.
"… neutralizing antibodies against B.1.351[the beta variant] after vaccination of individuals previously infected with non-B.1.351 SARS-CoV-2 were - 100 times higher than infection alone and 25 times higher than after vaccination alone - even though neither the vaccine nor infection involved the B.1.351 spike," Crotty writes in a recent perspective article.
With the rapid rise of the delta variant, which seems set to become the predominant SARS-CoV-2 variant, these new findings serve as a reminder of the importance of vaccinations, regardless of whether one has been previously infected.
All current vaccines have been found to offer good protection from new SARS-CoV-2 variants. And, as Francis Collins stresses, acquired immunity from vaccines offers our best hope at getting this pandemic under control.
"Our best hope of winning this contest with the virus is to get as many people immunized now as possible," writes Collins. "That will save lives, and reduce the likelihood of even more variants appearing that might evade protection from the current vaccines."

New face mask prototype can detect Covid-19 infection

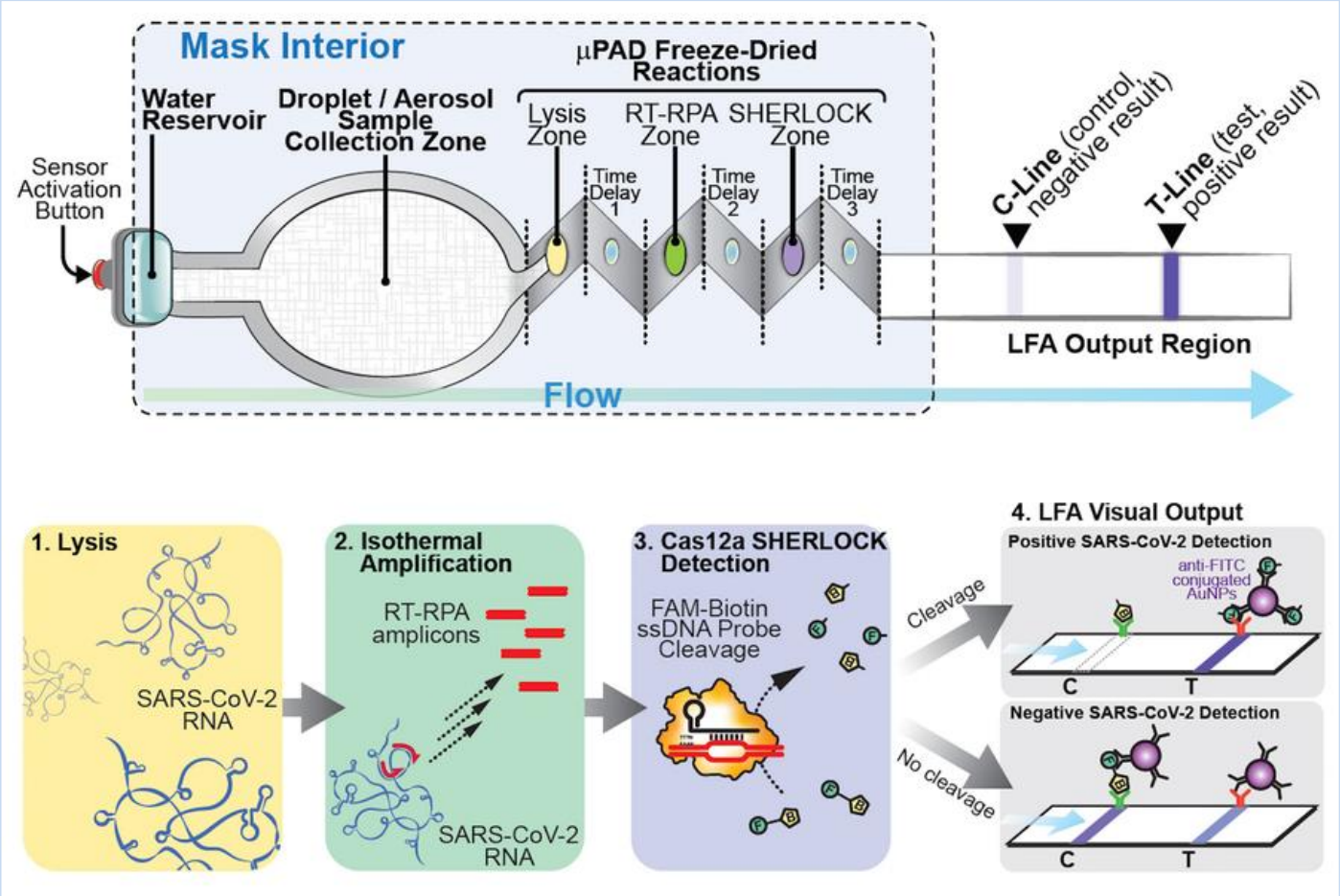
Source: https://news.mit.edu/2021/face-mask-covid-19-detection-0628



Caption: Engineers at MIT and Harvard have designed a prototype face mask that can diagnose the person wearing the mask with Covid-19 within about 90 minutes. The technology can also be used to design wearable sensors for a variety of other pathogens or toxic chemicals. (Credits: Image: Felice Frankel and MIT News Office)

June 28 - Engineers at MIT and Harvard University have designed a novel face mask that can diagnose the wearer with Covid-19 within about 90 minutes. The masks are embedded with tiny, disposable sensors that can be fitted into other face masks and could also be adapted to detect other viruses.

The sensors are based on freeze-dried cellular machinery that the research team has previously developed for use in paper diagnostics for viruses such as Ebola and Zika. In a new study, the researchers showed that the sensors could be incorporated into not only face masks but also clothing such as lab coats, potentially offering a new way to monitor health care workers' exposure to a variety of pathogens or other threats.



Caption: Researchers embedded sensors on the inside of the mask to detect viral particles in the breath of the person wearing the mask. The mask also includes a small reservoir of water that is released at the push of a button when the wearer is ready to perform the test. (Credits: Courtesy of the researchers)

"We've demonstrated that we can freeze-dry a broad range of synthetic biology sensors to detect viral or bacterial nucleic acids, as well as toxic chemicals, including nerve toxins. We envision that this platform could enable next-generation wearable biosensors for first responders, health care personnel, and military personnel," says James Collins, the Termeer Professor of Medical Engineering and Science in MIT's Institute for Medical Engineering and Science (IMES) and Department of Biological Engineering and the senior author of the study.

The face mask sensors are designed so that they can be activated by the wearer when they're ready to perform the test, and the results are only displayed on the inside of the mask, for user privacy.

Peter Nguyen, a research scientist at Harvard University's Wyss Institute for Biologically Inspired Engineering, and Luis Soenksen, a Venture Builder at MIT's Abdul Latif Jameel Clinic for Machine Learning in Health and a former postdoc at the Wyss Institute, are the lead authors of the paper, which appears today in *Nature Biotechnology*.

Wearable sensors

The new wearable sensors and diagnostic face mask are based on technology that Collins began developing several years ago. In 2014, he showed that proteins and nucleic acids needed to create synthetic gene networks that react to specific target molecules could be embedded into paper, and he used this approach to create paper diagnostics for the Ebola

and Zika viruses. In work with Feng Zhang's lab in 2017, Collins developed another cell-free sensor system, known as SHERLOCK, which is based on CRISPR enzymes and allows highly sensitive detection of nucleic acids.
These cell-free circuit components are freeze-dried and remain stable for many months, until they are rehydrated. When activated by water, they can interact with their target molecule, which can be any RNA or DNA sequence, as well as other types of molecules, and produce a signal such as a change in color.
More recently, Collins and his colleagues began working on incorporating these sensors into textiles, with the goal of creating a lab coat for health care workers or others with potential exposure to pathogens.
First, Soenksen performed a screen of hundreds of different types of fabric, from cotton and polyester to wool and silk, to find out which might be compatible with this kind of sensor. "We ended up identifying a couple that are very widely used in the fashion industry for making garments," he says. "The one that was the best was a combination of polyester and other synthetic fibers."
To make wearable sensors, the researchers embedded their freeze-dried components into a small section of this synthetic fabric, where they are surrounded by a ring of silicone elastomer. This compartmentalization prevents the sample from evaporating or diffusing away from the sensor. To demonstrate the technology, the researchers created a jacket embedded with about 30 of these sensors.
They showed that a small splash of liquid containing viral particles, mimicking exposure to an infected patient, can hydrate the freeze-dried cell components and activate the sensor. The sensors can be designed to produce different types of signals, including a color change that can be seen with the naked eye, or a fluorescent or luminescent signal, which can be read with a handheld spectrometer. The researchers also designed a wearable spectrometer that could be integrated into the fabric, where it can read the results and wirelessly transmit them to a mobile device.
"This gives you an information feedback cycle that can monitor your environmental exposure and alert you and others about the exposure and where it happened," Nguyen says.

A diagnostic face mask

As the researchers were finishing up their work on the wearable sensors early in 2020, Covid-19 began spreading around the globe, so they quickly decided to try using their technology to create a diagnostic for the SARS-CoV-2 virus.
To produce their diagnostic face mask, the researchers embedded freeze-dried SHERLOCK sensors into a paper mask. As with the wearable sensors, the freeze-dried components are surrounded by silicone elastomer. In this case, the sensors are placed on the inside of the mask, so they can detect viral particles in the breath of the person wearing the mask. The mask also includes a small reservoir of water that is released at the push of a button when the wearer is ready to perform the test. This hydrates the freeze-dried components of the SARS-CoV-2 sensor, which analyzes accumulated breath droplets on the inside of the mask and **produces a result within 90 minutes.**

"This test is as sensitive as the gold standard, highly sensitive PCR tests, but it's as fast as the antigen tests that are used for quick analysis of Covid-19," Nguyen says.
The prototypes developed in this study have sensors on the inside of the mask to detect a user's status, as well as sensors placed on the outside of garments, to detect exposure from the environment. The researchers can also swap in sensors for other pathogens, including influenza, Ebola, and Zika, or sensors they have developed to detect organophosphate nerve agents.
"Through these demonstrations we have essentially shrunk down the functionality of state-of-the-art molecular testing facilities into a format compatible with wearable scenarios across a variety of applications," Soenksen says.
The researchers have filed for a patent on the technology and they are now hoping to work with a company to further develop the sensors. The face mask is most likely the first application that could be made available, Collins says.
"I think the face mask is probably the most advanced and the closest to a product. We have already had a lot of interest from outside groups that would like to take the prototype efforts we have and advance them to an approved, marketed product," he says.

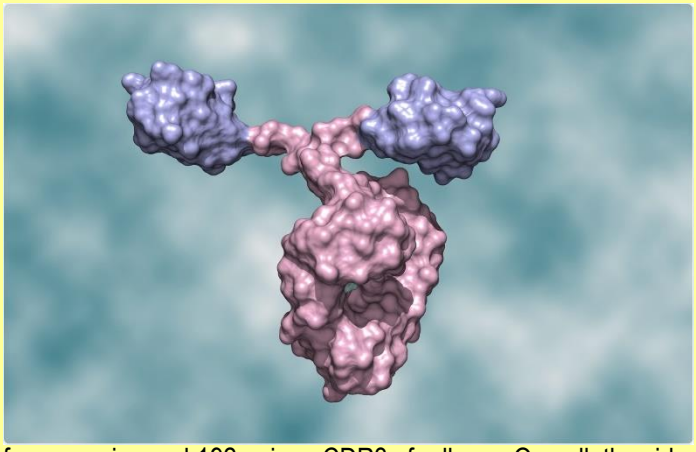
The research was funded by the Defense Threat Reduction Agency; the Paul G. Allen Frontiers Group; the Wyss Institute; Johnson and Johnson Innovation JLABS; the Ragon Institute of MGH, MIT and Harvard; and the Patrick J. McGovern Foundation.

Nanobodies from nanomice and llamas show potent neutralizing activity against SARS-CoV-2 variants

Source: https://www.news-medical.net/news/20210611/Nanobodies-from-nanomice-and-llamas-show-potent-neutralizing-activity-against-SARS-CoV-2-variants.aspx

June 11 – While several COVID-19 vaccines have been approved to date, the constant evolution of the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) receptor-binding domain (RBD) has challenged the efficacy of these vaccines.
The B.1.1.7 (UK), B.1.351 (South Africa), and P.1 (Brazil) variants, in particular, have negatively impacted convalescent sera and immunotherapies that were approved for emergency use.
A potential solution to viral immune escape is using camelid Variable Heavy chain domains of a Heavy chain (VHHs) or nanobodies, which are capable of recognizing epitopes that are often inaccessible to conventional antibodies.

Researchers isolate anti-RBD nanobodies from llamas and "nanomice" and produce SARS-CoV-2 neutralizing nanobodies
Researchers from the US isolated anti-RBD nanobodies from llamas and "nanomice" engineered by them to produce VHHs cloned from camels, dromedaries, and alpacas. In order to produce neutralizing nanobodies against SARS-CoV-2, the researchers immunized 3 nanomice and 1 llama with RBD and the stabilized prefusion spike. They isolated peripheral blood mononuclear cells post-immunization and amplified VHHs and cloned them into a phagemid vector. The research is published as an unedited manuscript in the journal *Nature*.



Study: *Nanobodies from camelid mice and llamas neutralize SARS-CoV-2 variants*. Image Credit: Huen Structure Bio / Shutterstock

Deep-sequencing analysis identified an average of 26,000 nanobody variants per library, with a total of 199 unique CDR3s for nanomice and 192 unique CDR3s for llama. Overall, they identified 2 sets of highly neutralizing nanobodies. Group 1 antibodies evade antigenic drift by recognizing a highly conserved RBD region in coronaviruses that is rarely targeted by traditional human antibodies. Group 2 antibodies exclusively focused on the RBD-ACE2 interface and did not neutralize variants with E484K or N501Y substitutions. Interestingly, group 2 nanobodies show full neutralization activity against the variants when expressed in the form of homotrimers, surpassing the activity of the most potent SARS-CoV-2 antibodies identified to date.
Based on these findings, the authors concluded that multivalent nanobodies overpower SARS-CoV-2 mutations using 2 separate mechanisms - 1. recognition of conserved regions inaccessible to human antibodies and 2. enhanced focus on the ACE2 binding domain. Thus, while new SARS-CoV-2 strains continue to emerge globally and compromise vaccines, nanobodies may be promising tools to help prevent COVID-19 mortality.

Study is proof of principle that engineered nanomice can produce highly potent anti-SARS-CoV-2 RBD nanobodies
According to the authors, a key contribution of their work is the creation of nanobody-producing mice. Although previous studies have explored the transgenic expression of 1 or 2 llama VHHs, this work replaces the entire VH domain with 30 VHHs. This leads to physiological recombination and selection during ontogeny.
Their nanomouse 1.0 can produce high-affinity nanobodies and can be further improved by increasing the number of VHHs available. This can be achieved by producing a second allele with VHHs from llamas, guanacos, and vicuñas, which are the 3 camelids not represented in this work.
The researchers hope that such improvements in animal models will help popularize the development of nanobodies against infectious diseases or other basic applications. The

authors used the engineered nanomice to produce highly potent and specific nanobodies against SARS-CoV-2 RBD, as a proof of principle.
Although several monoclonal antibodies isolated from humanized mice or COVID-19 patients have successfully blocked the RBD-ACE2 interface, immunotherapies with these antibodies are prone to escape variants with mutations around the ACE2-binding motif. The anti-RBD nanobodies isolated by the researchers were able to overcome this limitation in 2 ways. Although the llama nanobodies, Nb15 and Nb56 inhibit ACE2 binding to the original SARS-CoV-2 spike, they were not effective against variants with E484K or N501Y substitutions. However, these nanobodies show remarkable neutralization potency in multimeric form. The authors believe this is likely because of increased affinity for the trimeric spike or the simultaneous cross-linking of multiple spikes on the viral membrane.
The nanomice nanobodies, Nb12 and Nb30 recognize a highly conserved RBD region among Sarbecoviruses that is not accessible to most human antibodies. Since this region is outside the ACE2 binding motif, Nb-RBD contacts are not affected by E484K or N501Y substitutions.
Although the conserved domain does not overlap with the ACE2 binding motif, structural studies by the authors show that this class of nanobodies interferes sterically with ACE2-RBD associations.
Based on these features, the authors are hopeful that their nanobodies may offer valuable tools for passive immunotherapy or pulmonary delivery against both current and future SARS-CoV-2 variants of concern.

▶▶ **Journal reference:** Xu, J., Xu, K., Jung, S. *et al.* Nanobodies from camelid mice and llamas neutralize SARS-CoV-2 variants. *Nature* (2021). https://doi.org/10.1038/s41586-021-03676-z, https://www.nature.com/articles/s41586-021-03676-z

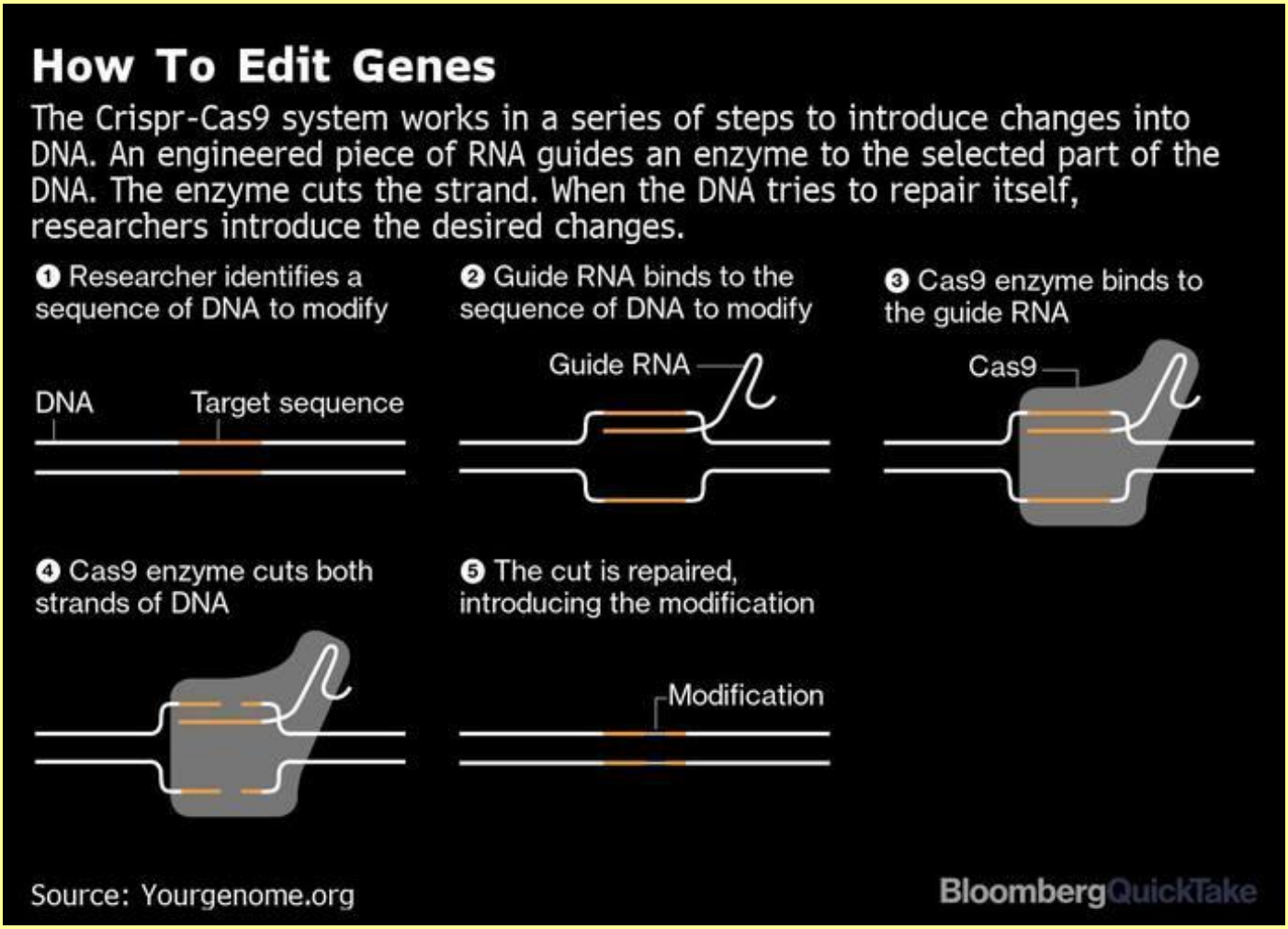
CRISPR

Source: https://www.washingtonpost.com/business/energy/crispr/2021/06/28/30151aaa-d853-11eb-8c87-ad6f27918c78_story.html

June 29 – Mankind has been manipulating genetics since early civilizations realized that certain traits of crops, animals and humans themselves were hereditary. The modern-day mapping of all human genes raised the prospects of learning precisely which genes control which traits and then directly altering their DNA codes. After years of hit-and-miss efforts, a gene-editing system called Crispr that's cheap, effective and easy to use promises to change our relationship with genetics — for better, worse or both. Its champions foresee using Crispr to control pests, increase food production and eliminate human diseases. They simultaneously worry that its use could unleash dangerous mutants, designer babies and new weapons of mass destruction. In the meantime, Crispr has given birth to a new biotechnology industry that is beginning to show promise in treating some intractable illnesses.

The Situation
Because of Crispr's ability to cut and paste individual genes, companies have been working to use the technology to rectify DNA flaws that lead to inherited disease. Those efforts gained a strong push in late June when drugmakers Intellia Therapeutics Inc. and Regeneron Pharmaceuticals Inc. reported results from the first clinical trial using Crispr technology to treat disease inside the human body. In the early-stage trial of just six people, researchers used Crispr to edit out a flawed gene that results in production of an abnormal liver protein that accumulates throughout the body, sometimes causing severe and even lethal symptoms. While the study doesn't prove the approach works, the patients who were treated saw significant reductions in levels of the harmful protein. In the past, gene editing had been used to alter human cells that were removed from the body and then replaced; the companies' trial showed that that step isn't always needed. Additional companies, such as Editas Medicine, are also working on similar projects. Other researchers have used Crispr inside the body, but not to treat disease. Chinese scientist He Jiankui announced in 2018 that he'd used the technology to alter the genes of a pair of twins while they were embryos with the aim of making them resistant to HIV. Using Crispr to make changes to embryos and germline cells — sperm, eggs and zygotes — is especially contentious because the modifications are passed to progeny. His announcement resulted in an ethical outcry and further restrictions on manipulating the DNA of healthy embryos.

The Background
Crispr technology is based on a rudimentary immune system that Japanese scientists first noticed in bacteria three decades ago and named Clustered Regularly Interspaced Short Palindromic Repeats. These sequences of genetic code destroy pathogens by cutting the DNA of the invader using enzymes called CAS nucleases, Cas9 being the most widely studied. Understanding of how the system can chop through and then replace segments of



DNA grew slowly until 2012, when researchers at the University of California, Berkeley published a paper on making molecular "guides" that allow Crispr to skim along DNA, targeting exactly the right spot to make a slice. Soon afterward, scientists at the Broad Institute in Cambridge, Massachusetts said they'd adapted Crispr for use in human cells. In 2020, pioneering scientists Jennifer Doudna and Emmanuelle Charpentier were awarded the Nobel Prize in Chemistry for their development of the gene-editing technology. A researcher with basic skills and just a few hundred dollars' worth of equipment can employ Crispr, creating enormous space for innovation, and abuse. The gene-editing system isn't perfect. It makes unintended cuts in DNA, with effects unknown. Scientists are working on minimizing these slip-ups. A newer method of gene revision, called prime editing, is thought to produce fewer unwanted alterations.

A Bloomberg video explores the transformative power of Crispr

The Argument

While Crispr offers enormous potential to improve human welfare, some of the risks are also immense. By improving so-called gene drives, experimental systems that increase the chance a certain gene is inherited, Crispr might one day, for instance, ensure that mosquitos can no longer host the Zika virus. Yet theoretically, the modifications could also allow the bugs to spread a more harmful pathogen. Germline editing raises similar issues. Potentially, a genetic disease could be eliminated from a family forever. But if something goes wrong, the consequences are potentially eternal, too, affecting future generations who would not have given their consent to the intervention. Some scientists worry that germline editing would invite enhancements of babies for non-medical reasons and could even lead to the division of humans into subspecies. Other commentators have argued that people bred to be supersmart could produce positive effects for society by generating innovations that would be used by everyone. Meanwhile, defense specialists fret over the possible military applications of Crispr. In its 2019 assessment of worldwide threats,

U.S. intelligence agencies warned of adversaries potentially using gene editing to "develop novel biological warfare agents, threaten food security, and enhance or degrade human performance."

Project Pandora: Interpol to assist Malaysia investigate illegal Darknet activities

Source: https://www.thestar.com.my/news/nation/2021/06/29/project-pandora-interpol-to-assist-malaysia-investigate-illegal-darknet-activities

June 29 – Interpol through its Project Pandora will be assisting five countries in South-East Asia including Malaysia in investigating bioterrorist-related activities using Darknet.

Interpol's Bioterrorism Prevention Unit coordinator, Adrien Sivignon said the other beneficiaries of Project Pandora were Indonesia, the Philippines, Thailand and Vietnam.

"We will be replicating the Project Pandora in the South-East Asia region by the first quarter of next year.

We hope for further support from the countries to investigate the dark web, in order to stop illegal activities," he said at a forum addressing 'Criminal Use of New Technologies, the Dark Web'.

He was one of the panellists at the Asean Cyber Security Forum at the Cyber Defence and Security Exhibition and Conference (CYDES) 2021, held virtually on Tuesday (June 29).

Interpol's Bioterrorism Prevention Unit introduced Project Pandora to increase the capability of police and intelligence analysts to investigate bioterrorist-related activities using Darknet.

This is following the increased use of Darknet to acquire, transfer or smuggle biological materials or weapons that have since become a major concern for the law enforcement community worldwide.

Sivignon said they recognised the threats posed by the potential use of biological materials by non-state actors, usage of the web as a platform for illicit trade of biological materials and dual-use equipment, as well as addressing the technical challenges in investigating the web through the project.

The inaugural CYDES 2021 themed, 'Embedding Resilience Within Our Cyberspace', is being organised by the National Security Council and National Cyber Security Agency from June 28 to 30.

Review of the Emerging Evidence Demonstrating the Efficacy of Ivermectin in the Prophylaxis and Treatment of COVID-19

By Kory Pierre Meduri, Gianfranco Umberto, Varon Joseph, Iglesias, et.

American Journal of Therapeutics: May/June 2021 - Volume 28 - Issue 3 - p e299-e318

Source:https://journals.lww.com/americantherapeutics/fulltext/2021/06000/review_of_the_emerging_evidence_demonstrating_the.4.aspx

After COVID-19 emerged on U.S shores, providers began reviewing the emerging basic science, translational, and clinical data to identify potentially effective treatment options. In addition, a multitude of both novel and repurposed therapeutic agents were used empirically and studied within clinical trials.

Areas of Uncertainty: The majority of trialed agents have failed to provide reproducible, definitive proof of efficacy in reducing the mortality of COVID-19 with the exception of corticosteroids in moderate to severe disease. Recently, evidence has emerged that the oral antiparasitic agent ivermectin exhibits numerous antiviral and anti-inflammatory mechanisms with trial results reporting significant outcome benefits. Given some have not passed peer review, several expert groups including Unitaid/World Health Organization have undertaken a systematic global effort to contact all active trial investigators to rapidly gather the data needed to grade and perform meta-analyses.

Therapeutic Advances: A large majority of randomized and observational controlled trials of ivermectin are reporting repeated, large magnitude improvements in clinical outcomes. Numerous prophylaxis trials demonstrate that regular ivermectin use leads to large reductions in transmission. Multiple, large "natural experiments" occurred in regions that initiated "ivermectin distribution" campaigns followed by tight, reproducible, temporally associated decreases in case counts and case fatality rates compared with nearby regions without such campaigns.

Conclusions: Meta-analyses based on 18 randomized controlled treatment trials of ivermectin in COVID-19 have found large, statistically significant reductions in mortality, time to clinical recovery, and time to viral clearance. Furthermore, results from numerous controlled prophylaxis trials report significantly reduced risks of contracting COVID-19 with the regular use of ivermectin. Finally, the many examples of ivermectin distribution campaigns leading to rapid population-wide decreases in morbidity and mortality indicate that an oral agent effective in all phases of COVID-19 has been identified.

How Protected Are You with Just One Dose of a COVID-19 Vaccine? Here Are Some Stats

Source: https://www.sciencealert.com/these-stats-show-you-why-you-really-should-get-both-shots-of-the-available-vaccines

June 29 – More than 179 million Americans and more than 44 million Britons have received their first dose of a two-shot COVID-19 vaccine.

The US has authorized vaccines from Moderna and Pfizer-BioNTech, while the UK has authorized Pfizer's shot as well as one made by AstraZeneca and Oxford University. Both countries have authorized Johnson & Johnson's vaccine, which is a single dose.

The UK is delaying the second dose of the vaccines for up to 12 weeks for most people to prioritize giving people their first shot because of an initial shortage of vaccines. In the US, the Centers for Disease Control and Prevention has recommended giving second doses of Pfizer's vaccine 21 days after the first, and 28 days after the first for Moderna, with an interval of up to six weeks in "unavoidable" situations.

The data for how well the vaccines work after one dose isn't clear cut – it depends on what you're measuring, and when you're measuring it. Stephen Evans, a professor of medical statistics at the London School of Hygiene & Tropical Medicine and a former drug-safety committee member at the European Medicines Agency, helped Insider break down the data.

Evans said the Food and Drug Administration presentation of the data from late-stage trials of each vaccine was generally the best data available. This is how much protection one shot of each vaccine gives you, based on that data.

Pfizer-BioNTech: at least 80 percent

Pfizer's shot was 52.4 percent effective at protecting against COVID-19 with symptoms between the first and second dose, according to the FDA documents. But the 52.4 percent figure includes the 11 days before protection kicks in after the first dose, so the real percentage could well be higher.

The true value lies between 29.5 percent and 84.5 percent, according to the FDA documents. There was a wide range because not many people caught COVID-19 in the trial during this time period.

Pfizer's shot was 100 percent effective at protecting against hospitalization and death. This was based on a small number though – only four people got severe COVID-19 in the trial after receiving placebo rather than the vaccine.

Evans said there was "pretty clear evidence" that you get at least 80 percent protection – and "probably" better than 90 percent – for Pfizer's vaccine against COVID-19 with symptoms after a single dose. He said you couldn't be absolutely sure what happens after 21 days because it hadn't been fully tested.

Evans said this was based on his overall reading of the trial data used by the FDA in their briefing document before authorization.

Moderna: at least 80 percent

Moderna's vaccine was 69.5 percent effective at preventing COVID-19 with symptoms between the first and second dose, with a true value between 43.5 percent and 84.5 percent. There was a fairly wide range because the number of people that caught COVID-19 in the trial during this time period was low.

The 69.5 percent figure includes the 13 days before protection starts, so the real percentage could be higher.

There were a small number of people in Moderna's trial – about 7 percent – that didn't get their second dose for unknown reasons. In this group, the shot was 50.8 percent effective at preventing COVID-19 with symptoms for up to 14 days after the first dose and 92.1 percent effective after 14 days.

It is unclear how well one shot of the vaccine protects against hospitalization and death because not many people got severe COVID-19 – two in the vaccine group and four in placebo.

Evans said that you get at least 80 percent protection – and probably better than 90 percent – for Moderna's vaccine against COVID-19 with symptoms after a single dose for 28 days. After 28 days it was unclear because it hadn't been tested. Again, this was based on his overall reading of the FDA data, he said.

AstraZeneca: more than 70 percent

Evans said it was harder to ascertain a figure for AstraZeneca's vaccine because late-stage trials used differing study designs, and a large US study was ongoing. The FDA also has not yet presented the data for the shot in the same way it has done for other vaccines.

A single dose of AstraZeneca's shot was 76 percent effective at protecting against COVID-19 with symptoms for at least 90 days, according to late-stage-trial data published in The Lancet on February 19. The study authors also reported that one dose provided 100 percent protection against hospitalization, but the numbers were small.

Based on his reading of existing studies, Evans said the single-dose efficacy for AstraZeneca's vaccine was probably at least 70 percent against COVID-19 with symptoms for the first 90 days. After this time period, it's unclear, he said.

Johnson & Johnson: 66 percent

J&J looked at protection against moderate to severe COVID-19 in trials, rather than symptomatic COVID-19, like Pfizer, Moderna, and AstraZeneca.

Protection kicked in at 14 days and was 66.1 percent effective at 28 days. The vaccine's efficacy varied depending on the country it was used in – it was 72 percent effective in the US but 64 percent and 68 percent effective in South Africa and Brazil, respectively. These countries both have coronavirus variants circulating that could partially evade antibodies.

What percentage efficacy means

Percentage efficacy for vaccines refers to the proportion of people that get full protection after a vaccine. With 80 percent efficacy, 80 percent of people have full protection, and 20 percent don't.

For those who get full protection the first time around, the second shot improves the quality of the immune response and its durability. For the people who don't get full protection with the first shot, some will get full protection after the second dose. Some people won't ever get full protection from a vaccine because their immune system doesn't respond at all.

The latest real-world data: One shot significantly reduces infections and transmission

- A UK study found Pfizer or AstraZeneca's vaccine cut COVID-19 infections with symptoms by 72 percent after one dose, and protection probably held up for 10 weeks. Protection from Pfizer's vaccine rose to 90 percent after two doses. The study hasn't been peer-reviewed.
- A US study of essential workers found that a single dose of Pfizer of Moderna's COVID-19 vaccines were 80 percent effective against all coronavirus infections from 14 days.
- A Scottish study found that a single dose of Pfizer's vaccine was 91 percent effective against hospitalization at 28 to 34 days following vaccination. One dose of AstraZeneca's vaccine was 88 percent effective against hospital admissions after the same time period.
- A UK study found that a single dose of either Pfizer or AstraZeneca's vaccine cut spread of symptomatic COVID-19 within a household by up to 50 percent.
- A South Korean study found one dose of Pfizer's vaccine was 89.7 percent effective at preventing COVID-19 in South Koreans aged over 60, at least two weeks after vaccination. AstraZeneca's vaccine was 86 percent effective at preventing COVID-19 after one dose. The severity of illness that the shots protected against was unclear – generally they're more effective at preventing COVID-19 infections that caused hospitalization or death.
- An English study found that a single dose of either Pfizer or AstraZeneca's vaccine was about 80 percent effective at preventing hospitalization in people over 70-years-old. Protection lasted for at least 6 weeks, including against the Alpha variant first identified in the UK.
- An Israel study showed that Pfizer's vaccine was 54 percent effective against symptomatic COVID-19, from 13 days to 24 days after vaccination, a figure comparable to the late stage trial data presented to the FDA.
- A UK study estimated that a single dose of either Pfizer or AstraZeneca's vaccine was between 56 percent and 62 percent effective at preventing COVID-19 infection caused by the Alpha variant in people over 75 years-old, four to seven weeks after the first dose. The severity of illness that the shots protected against was unclear, but probably included asymptomatic infections.

- A UK study estimated that one dose of Pfizer vaccine was 79.3 percent effective at reducing the risk of hospitalization from COVID-19 in people aged over 80. A single shot of AstraZeneca's was 80.4 percent effective, the researchers said.

Newest data suggests second shot provides better protection against variants

Real-word data from the UK posted May 23 by Public Health England showed that Pfizer's and AstraZeneca's COVID-19 vaccines worked better against the variants when two doses were given rather than just one. Both vaccines were 30 percent effective against COVID-19 with symptoms caused by the Delta variant, first identified in India, three weeks after the first dose.

This was boosted to between 60 percent and 88 percent effectiveness two weeks after the second dose. The two vaccines were 50 percent effective against COVID-19 with symptoms against the variant first found in the UK, Alpha, three weeks after the first dose. This increased to between 66 percent and 93 percent two weeks after the second dose.

Dr. Anthony Fauci, President Joe Biden's chief medical advisor, said on June 8 that getting two doses of COVID-19 vaccines would stop the Delta variant from spreading across the US.

In the UK, Professor Deborah Dunn-Walters, chair of the British Society for Immunology COVID-19 Taskforce, said in a statement on June 4 that two doses of Pfizer's vaccine were "critical for protection" against emerging strains of the virus.

EDITOR'S COMMENT: Looks like another mRNA propaganda article. And again, no reference to Sputnik V using two different adenoviruses in each of the two jabs. And if the efficacy of the RNA vaccines is at least 80% why having a second jab with more probabilities for adverse reactions?

COVID-19 Makes Lasting Changes to Blood Cells, Which Might Explain a Lot

Source: https://www.sciencealert.com/covid-19-is-making-lingering-changes-to-blood-cells-which-might-explain-a-lot

June 30 – Why does long COVID last for so long, leaving long-haulers with symptoms that persist for months after initial infection?

New evidence suggests the enduring imprint of COVID-19 could be due to the virus making significant alterations to people's blood – yielding lasting changes to blood cells that are still evident several months after infection is diagnosed.

"We were able to detect clear and long-lasting changes in the cells – both during an acute infection and even afterwards," explains biophysicist Jochen Guck from the Max Planck Institute for the Science of Light in Germany.

In a new study, Guck and fellow researchers analyzed patients' blood using a system developed in-house, called real-time deformability cytometry (RT-DC), which is capable of rapidly analyzing hundreds of blood cells per second, detecting if they exhibit abnormal changes in their size and structure.

The technology is relatively recent, but it could go a long way in exploring what remains a significant unknown in COVID-19 science: how the coronavirus may impact blood at the cellular level.

"While the pathology is not yet fully understood, hyper-inflammatory response and coagulation disorders leading to congestions of microvessels are considered to be key drivers of the still increasing death toll," the researchers, led by first author Markéta Kubánková, write in their paper.

"Until now, physical changes of blood cells have not been considered to play a role in COVID-19 related vascular occlusion and organ damage."

In the study, the researchers analyzed blood from 55 individuals: 17 patients with severe COVID-19 (half of whom later sadly died), 14 recovered patients, and 24 healthy volunteers who showed no sign of having had the disease.
In total, over 4 million blood cells taken from these people were run through the RT-DC system, being microscopically analyzed as they flowed through a narrow channel in the device.

The results showed that red blood cells (erythrocytes) in COVID-19 patients varied more in size than those from healthy people, and showed signs of stiffness in their physical structure, exhibiting less deformability, which could affect their ability to deliver oxygen through the body.

"The physical properties of erythrocytes are crucial for microcirculatory flow and as such, these changes could impair circulation and promote hypoxemia," the researchers explain.
"The effect could persist in COVID-19 patients long after the infection is not active anymore; we found that in recovered patients phenotype alterations were not as prominent, but still present."
In contrast, the researchers discovered that a form of white blood cells (leukocytes) called lymphocytes showed decreased stiffness in COVID-19 patients, while other white blood cells, known as monocytes, were significantly larger than in cells from the control group.
Meanwhile, neutrophils – another type of white blood cell – showed numerous changes in COVID-19 patients, seen in higher volume, with greater deformation.
Interestingly, neutrophils have a particularly short lifespan (of only about one day), but the neutrophil changes in COVID-19 patients could still be seen months after infection, a result Kubánková describes as "totally unexpected" – and yet more evidence of COVID-19 infection likely leaving a lasting influence on the immune system.
"While some of these changes recovered to normal values after hospitalization, others persisted for months after hospital discharge, evidencing the long-term imprint of COVID-19 on the body," the researchers write.
"We hypothesize that the observed changes could arise due to cytoskeletal alterations of immune cells. Mechanical properties of cells can be directly related to the cytoskeleton, an important supportive structure which also determines cellular function."
It remains to be seen how these blood cell changes may ultimately be triggered by viral infection, and it's not yet fully known how the cell alterations lead to COVID-19 symptoms, and sometimes to death.
For now, it's just more evidence for how deeply this virus invades our bodies – and why it sometimes won't let people go.
"The persistent alterations of erythrocytes and neutrophils could be connected with long term symptoms of the recovered patients, of which 70 percent described chronic headache or neurological symptoms, 54 percent had concentration disorders and 62 percent circulatory problems like cold sweat and tachycardia," the authors write.
"We hypothesize that the persisting changes of blood cell physical phenotypes could contribute to the long-term impairment of circulation and oxygen delivery linked with COVID-19."

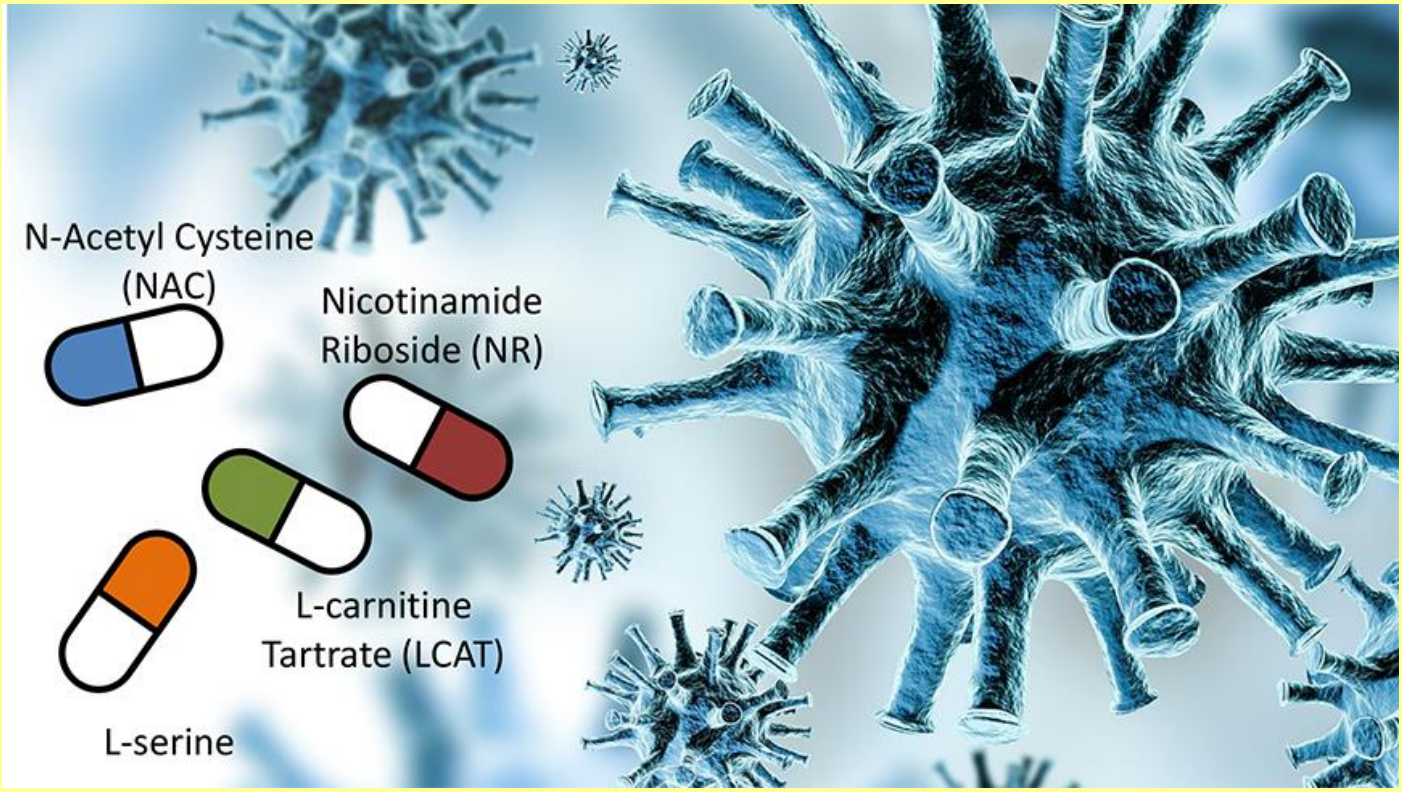
▶▶ **The findings are reported in *Biophysical Journal*.**

Covid-19 patients recover faster with metabolic activator treatment, study shows

Source: https://www.kth.se/en/aktuellt/nyheter/covid-19-patients-recover-faster-with-metabolic-activator-treatment-study-shows-1.1087654

June 28 – Metabolic activators can reduce recovery time by as many as 3.5 days in patients with mild-to-moderate Covid-19, according to a study published today in Advanced Science.
The researchers, from Science for Life Laboratory (SciLifeLab) at KTH Royal Institute of Technology, also found that treatment with the metabolic activators improved liver health and decreased the levels of inflammation, as shown by inflammatory markers.
Conducted in collaboration with the Sahlgrenska Academy in Gothenburg and King's College, London, the human phase three clinical study showed that patients with mild-to-moderate Covid-19—who were also receiving standard care—experienced a 3.5 day reduction in recovery time when receiving the combination of metabolic activators, nicotinamide riboside (NR), L-serine, N-acetyl-L-cysteine (NAC), and L-carnitine tartrate. All four activators are aimed at improving mitochondrial function. The results of the study build on findings from phase two clinical data.
Through a randomized, placebo controlled, double blind phase three clinical trial, 309 outpatients at Umraniye Teaching and Research Hospital, University of Health Sciences, Istanbul, Turkey were randomly assigned on a 3:1 basis to receive the metabolic activators or placebo. Patients received the combined activators or placebo twice a day for 14 days and clinical status was evaluated through daily telephone check-ins.

"Our phase three data shows that metabolic activators significantly improve the recovery, liver health, and markers of inflammation



of patients with COVID-19," says the study's lead author, Adil Mardinoglu, professor at KTH and Kings College and research fellow at SciLifeLab.

"Dysfunctional mitochondria have been implicated in worsened progression for Covid-19, and we are pleased to find that the combination of these metabolic activators helps to remedy the stress put on the body of an infected patient."

The study was conducted in partnership with Stockholm-based ScandiBio Therapeutics AB and California-based ChromaDex (NASDAQ:CDXC), which provided one of the four ingredients (nicotinamide riboside) through the ChromaDex External Research Program (CERP). Together with the strategic partner Viscoran (Turkey), a submission for drug approval has been submitted to the Ministry of Health in Turkey.

Funding for the research was provided by the Knut and Alice Wallenberg Foundation.

Greece: Inhaled EXO-CD24 for Covid-19

Israeli Professor of Medicine Nadir Arber, who developed the promising inhaled drug EXO-CD24 in the first 16 Greek patients with (medium to severe) Covid-19, described the results of the clinical trials as "extremely promising". "The clinical study in volunteer patients in Greece is going extremely well (one inhalation session for 5 min for 5 days). The results show the same success as Israel. We are continuing the effort by including other patients and we are optimistic for their recovery ", says Mr. Arber.

Overcoming Vaccine Hesitancy

Source:

June 29 – Vaccine hesitancy is the last hurdle we need to overcome to get more shots in arms. See the information provided below from the *New York Times*. Try the tactics out on people you know who still need to be vaccinated.

Convincing the hesitant

This week the last federally operated mass vaccination site in the U.S. closed, along with many state-run locations.

The shift away from high-volume vaccination centers is a major turning point in the country's vaccination effort — but also an acknowledgment of the hard road ahead. Health officials are pivoting to the so called "ground game": a targeted, labor-intensive mobilization effort to persuade vaccine-hesitant people to get their shots.

Convincing this group isn't easy. Dr. Anthony Fauci said he spent 90 minutes yesterday in Newark talking to people on their front porches, offering incentives and gift certificates if they would walk just the few blocks to get a shot. Many were hesitant and Fauci was able to persuade only about 10 people to get a dose.

If a celebrity doctor is struggling to change people's minds, what hope do the rest of us have? For tools, I turned to Dr. Arnaud Gagneur, a neonatologist who devised a successful prepandemic method of speaking with mothers who were hesitant about vaccinating their children.

For many people, it's sufficient when an authority — like a doctor — offers reassurances that vaccines are safe and essential. But for those who are vaccine hesitant, this approach can backfire because the patient may feel a lack of autonomy.

Gagneur suggests motivational interviewing, used frequently to treat addiction, to engage people "in the spirit of compassion, without judgment, and in partnership to find their own motivation to change."

Start with an open question. The goal here is to establish trust and determine the main reason for someone's hesitation. Examples include: What do you think about the Covid vaccine? What more do you want to know about the vaccine?

Listen, and remain open. It's important to show that you are in favor of vaccination, but also open to the idea that someone may not be open to immunization, Gagneur said. "Try not to give all of your arguments for immunization at the beginning because you are going to pick a fight and they will be thinking of all the counterpoints they have, and it's not going to be very constructive."

Introduce new information. That may include explaining how the vaccine was developed, or the science behind it, or the side effects. It is crucial, Gagneur said, to "ask for permission to give the new information. Because if people allow you to give new information, they are going to listen to you. But if you give unsolicited information, they are not going to listen to you."

EDITOR'S COMMENT: If I was a European or an American, I would like very much to know why my gov does not use the Sputnik V vaccine. Is public health below politics and profits?

Ask them about potential upsides. Maybe it's being able to travel, or protecting a grandparent, or going to school without a mask. Whatever it is, don't suggest reasons, Gagneur said. "It's more effective if people express it themselves."

Take it slow. "If you're faced with very hesitant people, you will not change their mind in five or 10 minutes," Gagneur said. "If you move too fast it could be counterproductive. So, you could say, 'Thank you very much for the discussion, and if you want, we could have another discussion tomorrow, or in two weeks, or whenever.' This is important. It's a seed we put in someone's mind that they can trust us, that we are going to listen to them, and that we are not going to make them change their mind too quickly. And you can continue the discussion later."

When the virus breaks through

Although the risk that vaccinated people will become infected with the coronavirus is low, it can still happen. Here's what you need to know about these breakthrough cases.

How common are they?

Quite rare — but the vast size of the immunized population means that there is a considerable number of cases, including the TV host Bill Maher and the Yankees two-time All-Star shortstop, Gleyber Torres.

As of April 30, out of about 101 million vaccinated people at the time, there were about 10,000 breakthrough infections reported in the U.S., according to the C.D.C. The agency has since stopped recording infections that do not involve severe symptoms.

How serious are breakthrough symptoms?

Because of the protection provided by the vaccines, experts say that most infected people who had been vaccinated are likely to have mild symptoms — nasal congestion and mild body aches — or no symptoms at all. That might be more severe for vaccinated people with weak immune systems, older adults and people with certain medical conditions.

What if it happens to me?

The guidelines are not much different than for unvaccinated people who get the vaccine, though the chances of severe Covid cases are much lower.

If you are fully vaccinated and experience symptoms consistent with Covid-19, the C.D.C. recommends that you self-isolate. If you test positive, experts suggest you participate in contact tracing efforts, inform your health care provider and, if you leave home, go to the doctor, wear a mask and practice social distancing.

Are breakthrough patients infectious?
A vaccinated infected person — even one without symptoms — could pass the virus on to someone else, including children under the age of 12, who currently don't qualify for a vaccine, and people who cannot get a vaccine because of immune-related or other health issues.
Experts say that the level of virus in the nose and aspirated droplets are not as contagious in a vaccinated person. Nevertheless, you should still wear a mask around others, disinfect surfaces, and turn on fans and open doors to increase ventilation.

Eric Holdeman *is a nationally known emergency manager. He has worked in emergency management at the federal, state and local government levels. Today he serves as the Director, Center for Regional Disaster Resilience (CRDR), which is part of the Pacific Northwest Economic Region (PNWER). The focus for his work there is engaging the public and private sectors to work collaboratively on issues of common interest, regionally and cross jurisdictionally.*

Analysis: Why We'll Likely Never Know Whether a Covid Lab Leak Happened in China

By Elisabeth Rosenthal
Source: https://khn.org/news/article/commentary-wuhan-china-lab-leak-covid-origins-hypothesis/

June 29 – Early in this century, post-SARS, and in a period when China started allowing more students and scientists to study abroad, collaboration and exchange between American and Chinese scientists blossomed.
Many of China's top scientists today were educated in the West. These include George Gao, the head of China's Center for Disease Control and Prevention, who trained and taught at Oxford and Harvard, and Shi Zhengli, who directs the Center for Emerging Infectious Diseases at the Wuhan Institute of Virology and received her Ph.D. in France.
Many, like Gao, spent more than a decade abroad before returning to China for top jobs and, often, prestigious positions and big salaries. They were great at their bench work, their science was well respected, and top American scientists got to know them well. They became friends with their American counterparts, as is clear from Anthony Fauci's email correspondence with Gao as the pandemic emerged, recently released through a Freedom of Information Act request.
But early on in what became a global crisis, when limited and reassuring information was coming out of China about the transmissibility of the novel coronavirus and the extent of its domestic outbreak, misplaced trust among America's top scientists led some to think the spread of the virus probably wouldn't be so bad.
Here's the problem: Chinese scientists are great scientists, but they work for an authoritarian government where politics, not facts, always comes first. If information they know or discover makes China look bad, it is dangerous to say it — especially to foreign colleagues, especially publicly, and, often, even to their friends or family.
That may sound familiar after the presidency of Donald Trump, during which he often mocked and sidelined experts like Fauci. But the risk for scientists in China is far worse: loss of your job and your kids' career prospects, visits by the police, false accusations, even prison.
As the country's leader, Xi Jinping, reminded his scientists in a speech last year: "Science has no borders, but scientists have a motherland."
Every Chinese citizen knows how to interpret that statement, and I learned, too: When I was a reporter in Beijing, I got to know Dr. Gao Yaojie, who exposed an epidemic of HIV/AIDS in rural China that had resulted from unsanitary blood collection practices, some state-run.
She was a valued source for a series of articles I wrote on the unfolding tragedy, in which nearly the entire adult population of poor farming villages was dying, without any treatment and leaving AIDS orphans behind. Dr. Gao (no relation to George Gao) was feted by Bill and Hillary Clinton and won international human rights awards for saving perhaps tens of thousands of lives and ending dangerous practices. But in China, that very same work meant Gao spent her retirement under house arrest, often followed and threatened by local officials for embarrassing China. She fled China in 2009 and obtained political asylum in the U.S. And that was at a time when China was less autocratic and more open than it is today.
President Joe Biden had instructed security agencies to investigate the lab leak theory — to figure out whether SARS-CoV-2, the virus that causes covid-19, emerged from the Wuhan lab or from nature. But if international scientific sleuths are hoping to see a lab log or find a whistleblower, that very likely won't happen. That kind of information won't be revealed, even

to Chinese scientists' many American friends and scientific partners, which include the U.S. The Wuhan lab has received more than half a million dollars of funding that originated from the National Institutes of Health and has worked with many American scientists.
Mistakes happen in science. Pathogens leak out of good containment labs, and not because people are evil. It's because, for example, the technician performing the bench work forgets an important step or, in a rush to go home, gets sloppy — it takes only a second. Or, for example, if scientists gathering bat samples in remote caves get a bit too comfortable in a dangerous environment — because they've been there dozens of times before with no problem and the biohazard suits and masks are suffocating. So, they pull off the face mask a bit too early as they exit.
When that happens, you have to acknowledge the error right away to contain the damage. But Chinese scientists can't do that, at least publicly. When, in late December 2019, Dr. Li Wenliang, an ophthalmologist working at one of Wuhan's major hospitals, raised his concerns to colleagues about patients dying from a strange new virus, he was punished and told by police to "stop making false comments" and investigated for "spreading rumours." He died of covid just a few weeks later.
In China today, it is dangerous to say what you know if it challenges the official government narrative. People who participated in the protests on June 4, 1989, in Tiananmen Square, which were violently put down by the Chinese army, don't even tell their children about that bloody day when many hundreds, and possibly thousands, were killed.
Kai Strittmatter, a longtime China correspondent for one of Germany's largest newspapers, told NPR's Terry Gross: "Of course, this generation, they all know, but they were afraid to tell their children. Because, you know, what do you do when your child in school suddenly tells the teacher and asks the teacher about Tiananmen massacre?"
We may never know if the novel coronavirus leaked from a lab or from animal-to-human transmission from a wild animal at one of Wuhan's live animal markets, as the Chinese first suggested. And that's exactly the knowledge we desperately need to prevent the next pandemic, because the solutions are so different.
If the former hypothesis proved true, U.S. scientists would need to ensure that collaborations with their Chinese partners involve full transparency — access to log books, internal reports, and all. If the latter, China must fully enforce its ban on the sale of exotic animals (the "intermediate hosts" that carry the virus) at its wet markets, a ban it promised after the original SARS virus emerged there from a civet cat nearly two decades ago. But the Chinese government's control over its scientists makes it unlikely we will learn the truth now — or ever.

Elisabeth Rosenthal, *Editor-in-Chief, joined KHN in September 2016 after 22 years as a correspondent with The New York Times, where she covered a variety of beats from health care to environment and did a stint in the Beijing bureau. While in China, she covered SARS, bird flu and the emergence of HIV/AIDS in rural areas. Libby's 2013-14 series, "Paying Till It Hurts," won many prizes for both health reporting and its creative use of digital tools. Her book, "An American Sickness: How Healthcare Became Big Business and How You Can Take It Back" (Penguin Random House, 2017), was a New York Times best-seller and a Washington Post notable book of the year. She is a graduate of Stanford University and Harvard Medical School and briefly practiced medicine in a New York City emergency room before converting to journalism.*

Once-promising mRNA COVID-19 vaccine disappoints with final trial data

Behind Pfizer and Moderna, **CureVac**'s mRNA COVID-19 vaccine was long-anticipated, with hundreds of millions of doses already pre-ordered. But its final large trial data has disappointed with only 48 percent efficacy at preventing symptomatic disease. **Read more**

Seven Up-and-Coming COVID-19 Drugs

Source: https://www.genengnews.com/a-lists/seven-up-and-coming-covid-19-drugs/

June 30 – Thanks to unprecedented development speed and mostly strong safety and efficacy data, vaccines have dominated the response to COVID-19. But ending the pandemic will also require development of numerous therapeutics.
Seven COVID-19 drugs have shown promise recently. Positive signs include the accumulation of encouraging data, participation in the Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) trials, and/or progress toward regulatory authorizations.

1. BRII-196/BRII-198

With operations in China and the United States, Brii Biosciences (Durham, NC, and Beijing) jumped into fighting COVID-19 shortly after SARS-CoV-2 emerged. Brii partnered with Tsinghua University and Third People's Hospital of Shenzhen to discover, develop, manufacture, and commercialize fully human neutralizing monoclonal antibodies against SARS-CoV-2 in March 2020.

Soon after, as cases declined in China, Brii pivoted to the United States, reaching out to the National Institute of Allergy and Infectious Diseases (NIAID). A combination therapy consisting of Brii's BRII-196 and BRII-198 was initially studied in the NIAID's ACTIV-3 trial (NCT04501978) in hospitalized patients, but failed to meet prespecified efficacy criteria needed to enter Phase III.

However, in April 2021, the NIAID advanced BRII-196 and BRII-198 into Phase III of another of its platform trials, ACTIV-2 (NCT04518410) in ambulatory COVID-19 patients at high risk for disease progression, after the antibodies showed safety and efficacy in Phase II.

"We are a smaller company and lack the bandwidth to just go out and set up global clinical trials ourselves," said Zhi Hong, PhD, Brii's CEO. "[But] this is a great public-private partnership where we are focused on public health."

2. CERC-002

Cerecor (Rockville, MD) was given Fast Track status from the Food and Drug Administration (FDA) in May for CERC-002, a biologic designed to treat hospitalized SARS-CoV-2 patients. CERC-002 is a first-in-class fully human monoclonal antibody that targets tumor necrosis factor superfamily member 14 (TNFSF14), a cytokine that is also known as lymphotoxin-like inducible protein that competes with glycoprotein D for binding herpesvirus entry mediator on T cells (LIGHT).

In final efficacy data from a Phase II trial (NCT04412057), Cerecor showed that more COVID-19 patients with acute respiratory distress syndrome who received a single dose of CERC-002 instead of a placebo were alive and free of respiratory failure over the 28-day study period. Efficacy was highest in patients over age 60, who often have other underlying inflammatory conditions.

"We think it's that underlying baseline information and then the resultant increase in cytokines with COVID-19 infection that really leads to this immunological dysregulation," H. Jeffrey Wilkins, MD, Cerecor's chief medical officer, told *GEN*. He said Cerecor tests for LIGHT through a validated, high-sensitivity serum/plasma-free assay developed with Myriad RBD.

Cerecor licenses CERC-002 from Kyowa Kirin through an agreement of undisclosed value. The agreement was expanded in March, giving Cerecor exclusive worldwide rights to develop, manufacture, and commercialize CERC-002 for all indications.

3. Lenzilumab

Humanigen (Burlingame, CA) applied in May for FDA emergency use authorization (EUA) for lenzilumab to treat patients hospitalized with COVID-19. Lenzilumab is an engineered (or, as the company says, "Humaneered") anti-human granulocyte-macrophage colony-stimulating factor (GM-CSF) monoclonal antibody designed to prevent and treat cytokine release syndrome preceding lung dysfunction and acute respiratory distress syndrome in serious SARS-CoV-2 infection cases.

Lenzilumab aced the Phase III LIVE-AIR trial (NCT04351152) by meeting its primary endpoint with a 54% relative improvement in the likelihood of survival without ventilation (SWOV) vs. placebo. SWOV likelihood improved 92% in participants receiving both corticosteroids and Gilead Sciences' remdesivir (Veklury); and three-fold in patients who had a C-reactive protein level of <150 mg/L and were under 85 years of age.

Lenzilumab is under study to prevent and treat cytokine storm in the NIAID-sponsored, placebo-controlled Phase II ACTIV-5 Big Effect Trial (NCT04583969), alone and with Veklury. Lenzilumab is also under study for numerous additional indications.

"We saw the pandemic wreaking havoc, and felt that we had a potentially valuable therapeutic, which appears to be proving out based on the Phase III data," said Cameron Durrant, MD, Humanigen's CEO.

4. Zofin

Organicell Regenerative Medicine (Miami, FL) showed positive results in April for an initial COVID-19 trial in India to evaluate Zofin, an acellular biologic therapeutic that is derived from perinatal sources and that is manufactured to retain naturally occurring microRNAs. The results pertain to the first 10 patients in the trial, all of whom had moderate to severe COVID-19. They were treated in hospitals in Bangalore, Kozhikode, and Chennai, and they all recovered. Recently, 65 additional patients with moderate-to-severe COVID-19 enrolled in the trial, which Organicell is conducting in partnership with CWI India.

In May, Pakistan's Drug Regulatory Authority approved a request to use Zofin on compassionate grounds to treat a COVID-19 patient, a physician who had been admitted to an intensive care unit. "Healthcare providers are the ones that have been hit the most all over the world, so we're very excited that we are able to participate and collaborate," said Mari Mitrani, MD, PhD, Organicell's co-founder and chief science officer.

Instances of compassionate use of Zofin have also been documented for COVID-19 patients in the United States, where Organicell recently completed enrollment in a U.S. trial offering expanded access to Zofin for patients showing mild-to-moderate COVID-19 or deemed at high risk of progression to moderate COVID-19. At the Landmark Hospital of Athens, in Athens, GA, emergency, compassionate use IND requests to administer Zofin were granted in three cases of severe COVID-19.
"The patients showed improvements in ICU clinical status and experienced respiratory improvements," a case report in *Frontiers in Medicine* indicated. "Acute delirium experienced by patients completely resolved and inflammatory biomarkers improved." The report also noted that the administration of Zofin was associated with decreased levels of inflammatory biomarkers, such as C-reactive protein and interleukin-6.

5. SAB-185

SAb Biotherapeutics (Sioux Falls, SD) has demonstrated early clinical success in the development of SAB-185, a fully human polyclonal antibody candidate that has been designed to offer passive immunity. In April, the first patient was dosed with SAB-185 in the NIAID-sponsored Phase II/III ACTIV-2 study (NCT04518410), after earlier trials showed the antibody to be safe, with a half-life of 25–28 days.
SAb has received $143 million from the Biomedical Advanced Research and Development Authority (BARDA) and the U.S. Department of Defense toward SAB-185's development, which is being carried out through SAb's DiversitAb Rapid Response Antibody Program. The company develops genetically engineered cows, turns off the genes that produce bovine antibodies, and replaces the bovine genes with human antibody genes transferred into the animals. Cattle are injected with an antigen to generate an immune response, while human polyclonal antibodies are collected in the cow's plasma. Human antibodies are then isolated through purification, after which a custom, high-potency immunotherapy is produced.
Cows produce more antibodies than humans and other monogastric animals, and they have more robust immune systems.
"One of the other reasons for choosing a large animal is that you can collect a lot of plasma," says Eddie J. Sullivan, PhD, SAb's co-founder, president, and CEO. "We can collect between 30 and 45 L of plasma from each animal every month."

6. SNG001

Synairgen (Southampton, United Kingdom) recently reported positive data from early studies of its SNG001 (inhaled nebulized interferon-beta-1a) for direct delivery to patients' lungs.
Combined data from hospital and home cohorts totaling 221 patients in the Phase II SG016 trial (NCT04385095) showed 33 markedly or severely breathless patients treated with SNG001 were 3.41 times likelier to recover than placebo patients. Synairgen said the results reinforced confidence in its ongoing Phase III SG018 trial (NCT04732949) in hospitalized patients. The trial is expected to release data in the second half of 2021.
In May, SNG001 announced in vitro results in which SNG001 showed antiviral activity against two COVID-19 variants, B.1.1.7 (Alpha/United Kingdom) and B.1.351 (Beta/South Africa).
"Most people are going for early or very late treatment," noted Richard Marsden, Synairgen's CEO. "We're kind of in the middle—with very strong effect sizes. We're not interested in treating everybody in the home environment. What we want to do is find the breathless people at home, which is probably only about 10% of the non-hospitalized population."

7. Sotrovimab

The FDA has granted EUA to Vir Biotechnology (San Francisco, CA) and GlaxoSmithKline (London, United Kingdom) for sotrovimab (VIR-7831) to treat mild-to-moderate COVID-19 in patients who are 12 years of age or older, weigh at least 40 kg (88 lb), have positive SARS-CoV-2 viral testing results, and are at high risk for progression to severe COVID-19.
The EUA followed an early halt in March to the COMET-ICE trial (NCT04545060) in high-risk adult outpatients, after data from 583 randomized patients showed an 85% reduction in hospitalization over 24 hours or deaths in those receiving sotrovimab vs. placebo. Sotrovimab has also shown efficacy against variant lineages B.1.1.7 (Alpha/United Kingdom), B.1.351 (Beta/South Africa), P.1 (Gamma/Brazil), B.1.617 (Delta/India), B.1.427/B.1.429 (Epsilon/California), and B.1.526 (Iota/New York).
"We are still analyzing data for some additional secondary endpoints like virology sequencing resistance, as well as secondary clinical endpoints such as patient reported outcomes and also severity of hospitalization," Phil Pang, MD, PhD, Vir's chief medical officer, told *GEN*.
Preclinical data suggest it could both block viral entry into healthy cells and clear infected cells by binding to an epitope on SARS-CoV-2 that is shared with SARS-CoV-1. A biologics license application is expected to be submitted to the FDA in the second half of 2021.

Support Services Help Developers Conquer COVID-19

Developing treatments against COVID-19 wouldn't be possible without the wide range of services provided by companies that support the work of drug developers.

To support COVID research, Charles River Laboratories (Wilmington, MA) has expertise in running in vitro antiviral assays and in vivo animal models of disease, said Sarah Gould, PhD, the contract development and manufacturing organization's senior principal scientific advisor. These include an acute respiratory disease model, which can help identify future drugs against acute respiratory distress syndrome.

"Critically, this and other models are also translatable to other respiratory infections and may serve as a useful tool for future pandemics," Gould said. "For the development process, Charles River's Safety Assessment team provides toxicology, safety pharmacology, and pharmacokinetic expertise and conducts all the study types required by the regulatory health authorities to start a first-in-human Phase I trial."

Serimmune (Goleta, CA) works with companies in early development stages to identify epitopes associated with monoclonal antibodies known to bind to the spike protein. These epitopes, linear or nonlinear, can help with further development of the antibody, optimization of cocktails, or assistance in identifying additional antibodies with a similar epitope, said Noah Nasser, the company's CEO.

"Serimmune is further interested in using its technology to identify response to these antibody interventions," he added. "We have a preliminary panel for COVID disease severity that could be used as exploratory biomarkers in trials."

The panel is composed of 15 motifs with nonzero coefficients that together can be used to classify disease severity. Some motifs map to SARS-CoV-2 genes such as spike and nucleocapsid, but many do not and may represent linear mimics of conformational epitopes.

Codex DNA (San Diego, CA) said its recombinant SARS-CoV-2 genomes serve as quality-assured source material used by industry and academic researchers to study mechanisms of viral infection, transmission, and pathogenesis.

"Our ability to rationally design and build synthetic genomes from scratch allows us to add features, such as reporter genes or heterologous promoters, while simultaneously modifying basic features of the genome to match emerging SARS-CoV-2 variants found in nature," said Dustin Ernst, PhD, scientist–genome engineer, Codex DNA.

In December 2020, through its BioXp 3250 system, Codex DNA released seven new synthetic SARS-CoV-2 genomes for use in development of COVID-19 drugs, vaccines, and diagnostics. In March, the company released the world's first synthetic genomes of the United Kingdom and South Africa variants of SARS-CoV-2. The company's BioXp and industry-standard Gibson Assembly technologies facilitate rapid de novo synthesis and assembly of emerging variants.

How Long Are COVID-19 Antibody Levels Sustained in Dialysis Patients?

By Nancy A. Melville and Charles P. Vega

Medscape Education Clinical Briefs | July 01, 2021

Source: https://www.medscape.org/viewarticle/953776

Valneva, the next-gen Covid-19 vaccine you may not have heard about

Source: https://www.thenationalnews.com/uae/2021/07/03/valneva-the-next-gen-covid-19-vaccine-you-may-not-have-heard-about/

July 03 – A next-generation Covid-19 vaccine is primed to join the global fight against the pandemic.

With several highly effective jabs already widely rolled out, the chances for other vaccines to play a major role in combating the pandemic may be narrowing.

However, of the more than 250 shots being worked but not yet approved, some have a better chance of making an impact than others.

Among the most promising is an inactivated whole virus vaccine from Valneva, a French biotechnology company. The UK government has ordered 100 million doses, production has begun at a factory in Scotland and the first doses should be delivered later this year, if the jab gets the green light from regulators.

David Lawrence, the company's chief financial officer, said the technological approach taken meant the jab "has an important role to play".

"The world needs multiple vaccines as well as booster options, and our vaccine would help diversify the overall portfolio", he said.

Efficacy of vaccines compared in trials

Called VLA2001, it consists of coronavirus particles treated so they cannot cause disease, and also contains an adjuvant, a substance to strengthen the immune response, produced by Californian company Dynavax.

It is the only Covid-19 vaccine taking this approach to be in clinical trials in Europe and is involved in two studies due to report results in September.

Cov-Compare, a UK study involving 4,000 participants, pitches the vaccine against the Oxford-AstraZeneca shot, with the immune response to each vaccine compared two weeks after the second shot.

At this stage of the pandemic, a clinical trial comparing the vaccine against a placebo would have been "infeasible and ethically highly questionable", Mr Lawrence said. The shot, which could be used as a booster or as a main vaccine, is also part of Cov-Boost, a clinical trial of seven vaccines to measure their effectiveness at improving the immunity of already vaccinated people.

"It is the first trial in the world to provide vital data on how effective a booster of each vaccine is in protecting individuals from the virus", said Mr Lawrence. Data reported in April from earlier-stage trials showed the vaccine "was well tolerated, with no safety concerns identified, and highly immunogenic".

New approach to a time-honored method

Later trial data will determine whether final regulatory approval is forthcoming. Inactivated vaccines are longer established than the mRNA vaccines, such as the Moderna and Pfizer-BioNTech shots, and viral vector vaccines such as the Sputnik V and Oxford-AstraZeneca shots, that are proving effective against the pandemic.

The first were made in the late 19th century in the US and France, and they have been used against influenza, hepatitis A, polio and rabies. The pathogen is grown in culture and inactivated or killed by, for example, heat or chemical treatment, so that while the vaccine stimulates an immune response that protects against disease, the shot itself does not cause illness.

Prof Paul Hunter, a professor in medicine at the University of East Anglia in the UK and specialist in infectious diseases, described inactivated vaccines as "established technology". "I was quite surprised the West didn't put a lot of effort into inactivated vaccines early on because you could pretty much guarantee they would work, but we went for the more technologically exciting vaccines", he said. Given the high efficacy of the likes of the Moderna, Pfizer-BioNTech and Oxford-AstraZeneca jabs, that approach appears to have been vindicated.

Vaccine market continues to grow

However, Valneva's Mr Lawrence said inactivated whole virus vaccines had multiple benefits, including their ability to be modified to cope with new variants, and their effectiveness as repeat booster vaccinations. Valneva has "viral seed banks" that include the Alpha (UK) and Beta (South Africa) forms, so variant-based vaccines could be produced.

"[Inactivated vaccines] can be used in people with weakened immune systems – for example those who are at greatest risk from Covid-19 – and routinely conform to standard cold chain requirements, which makes them easier to store and distribute", said Mr Lawrence.

Sinovac, Sinopharm and India's Bharat Biotech have produced inactivated Covid-19 vaccines, although the efficacy of the Chinese vaccines in particular has been questioned.

Headquartered in Saint-Herblain, a suburb of the city of Nantes in western France, Valneva was founded in 2013 following the merger of a French and an Austrian company.

Vaccine producer with invaluable experience

A vaccine specialist, it has two approved shots, against cholera and Japanese encephalitis, and aside from the Covid-19 vaccine, two under development, to combat Lyme Disease, a bacterial condition spread by ticks, and chikungunya, a viral disease mosquitoes carry. Mr Lawrence said Valneva began producing VLA2001 at its site in Livingston, Scotland, in January, and additional capacity will come on stream in the second half of this year with financial help from the British authorities.

"Alongside this, we are investing in our site in Solna, Sweden, to expand capacity for our inactivated Covid-19 vaccine", he said. Delivery of the first 60 million of the 100 million doses ordered by the British government is scheduled to continue into the first quarter of next year, with the rest also due for delivery in 2022.

The UK authorities have options for a further 90 million doses to be delivered between 2023 and 2025, which, if exercised, would bring the total value of the order up to €1.4 billion (Dh6.1bn).

"The question is, who's it for, because we've ordered more than enough Pfizer vaccine to vaccinate everyone [in the UK] in the autumn. I suspect we've done it so we can get it up and running and donate it or sell it to other countries down the line", said Prof Hunter.

The vaccine's stability means it could, experts have said, be useful for Western governments looking to stockpile supplies. Equity research analysts Jefferies has suggested the vaccine could bring in $1.1bn (Dh4.0bn) for Valneva next year and a further $500m (Dh1.84bn) in 2023, *Fierce Pharma* reported.

These are significant sums, but a fraction of those set to be earned by, for example, the Moderna and Pfizer-BioNTech shots. Valneva is hoping to strike new deals in addition to those it has with the UK. Reports have suggested France, Germany and Sweden are possible buyers after an EU-wide deal was not completed. "We are speaking with various governments", said Mr Lawrence. "We believe that our inactivated vaccine can make a major contribution to the ongoing fight against the pandemic and remain committed to bringing it to market."

UAE Explained: How Abu Dhabi's new Covid-19 scanners work

Source: https://www.thenationalnews.com/uae/2021/07/01/uae-explained-how-abu-dhabis-new-covid-19-scanners-work/

July 01 – Abu Dhabi recently introduced a new Covid-19 screening method in shopping malls, some residential areas and at all land and air entry points.

The devices measure electromagnetic waves. But what are they? And how do the scanners detect Covid-19? *The National* explains.

What are electromagnetic waves?

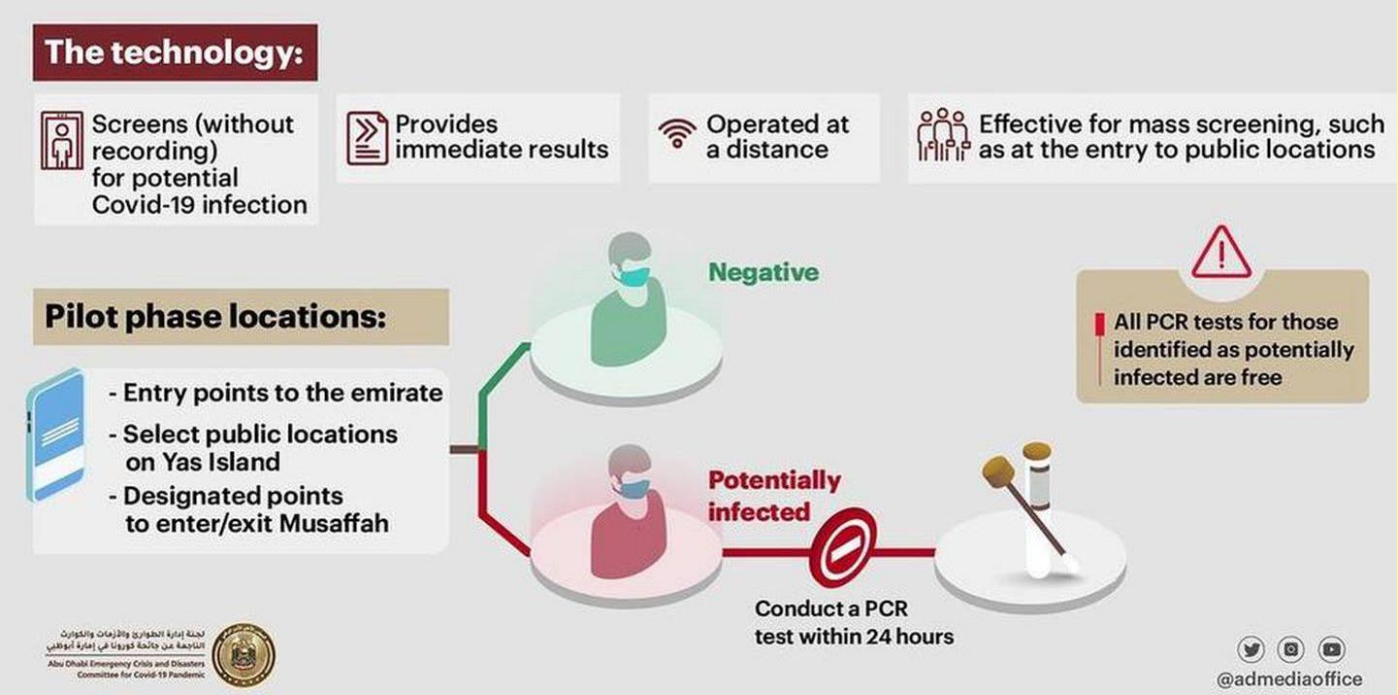
They are waves created by vibrations between an electric field and a magnetic field.

All objects emit electromagnetic radiation, which is measured in waves – including people.

Most of the radiation emitted by the human body is infrared.

Ear and forehead thermometers check body temperatures by detecting infrared radiation emitted by human bodies, as warmer objects emit more thermal radiation than cooler ones.
Infrared cameras detect body temperatures in the same way.
According to Nasa, electromagnetic waves have crests and troughs similar to those of ocean waves.
"The distance between crests is the wavelength. The shortest wavelengths are just fractions of the size of an atom, while the longest wavelengths scientists currently study can be larger than the diameter of our planet."

How do the scanners work?
According to Abu Dhabi Media Office, the device uses an electromagnetic detector, which measures waves within a 5-metre radius.
When a person enters the area, they alter the electromagnetic waves present.
The scanner measures these waves, "which change when the [ribonucleic acid RNA] particles of the virus are present in the person's body", the media office said.
RNA typically acts as a messenger carrying instructions from DNA.
A machine learning algorithm compares the information against the Covid-19 RNA molecule.



Abu Dhabi EDE facial scanner instructions. Courtesy: Abu Dhabi Media Office

What does it mean if a person is positive?
They may have Covid-19 and must report for a PCR test within 24 hours.
They will also be refused entry to locations such as malls.
The scanners are now used at shopping malls, some residential areas, and all land and air entry points.

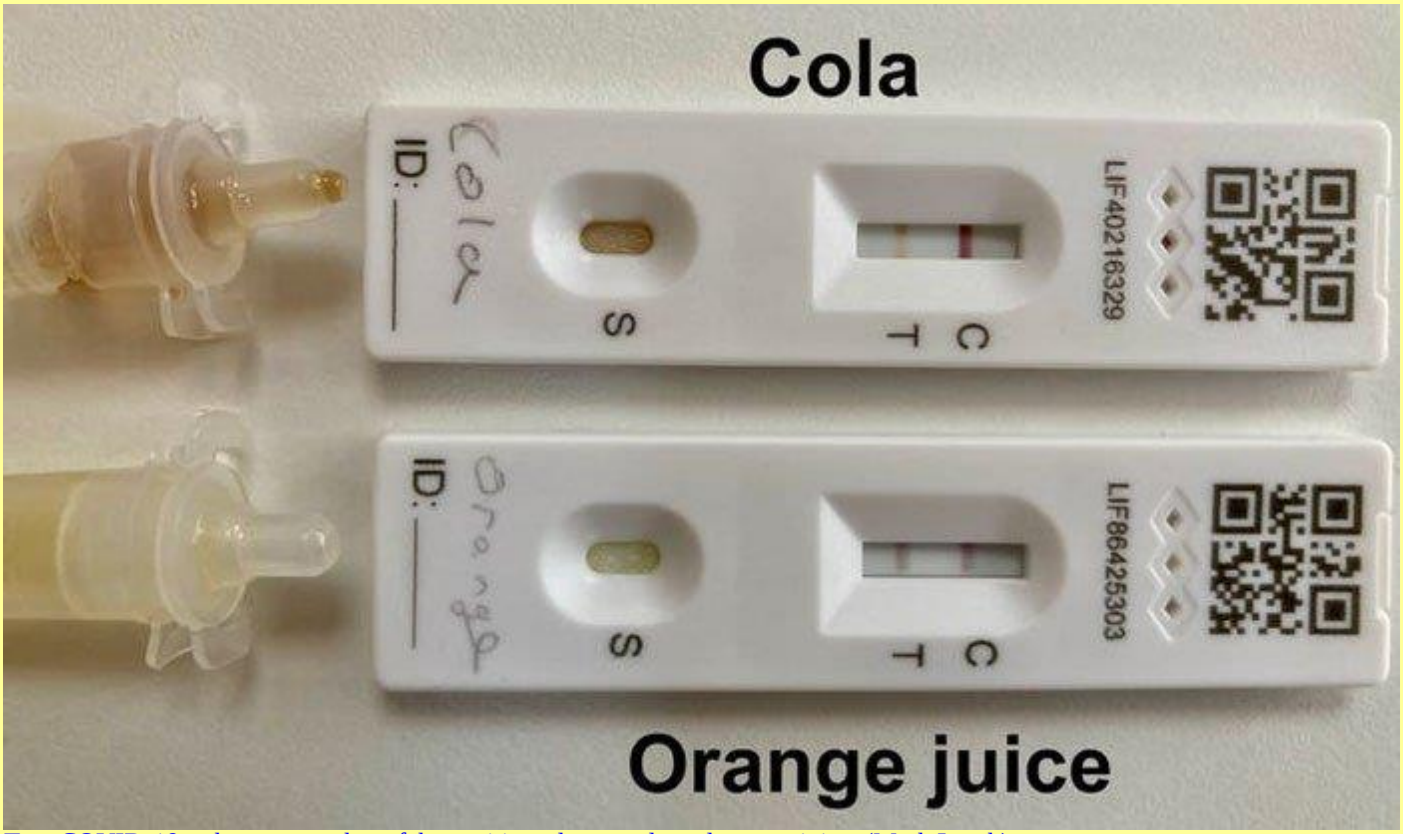
How accurate are the scanners?
Very, according to a trial involving 20,000 people, which showed "a high degree of effectiveness."
The devices were trialled in Ghantoot, Yas Island and Mussaffah.
Jamal Al Kaabi, undersecretary at the Department of Health in Abu Dhabi, said the use of the scanners underlined the emirate's commitment to protecting public health.
"Abu Dhabi has adopted an integrated strategy to combat the Covid-19 pandemic, based on increased testing to ensure safe entry into the emirate, vaccination and the continued implementation of precautionary measures," he said.

Dr Al Kaabi added the scanners would be used alongside other screening methods such as PCR testing.
The system was developed by the EDE Research Institute Abu Dhabi.

Here's How Kids Are Using Soft Drinks to Fake Positive Results on COVID-19 Tests

By Mark Lorch
Source: https://www.sciencealert.com/here-s-how-kids-are-using-soft-drinks-to-create-fake-positives-on-covid-19-tests

July 02 – Children are always going to find cunning ways to bunk off school, and the latest trick is to fake a positive COVID-19 lateral flow test (LFT) using soft drinks.
So how are fruit juices, cola, and devious kids fooling the tests, and is there a way to tell a fake positive result from a real one? I've tried to find out.
First, I thought it best to check the claims, so I cracked open bottles of cola and orange juice, then deposited a few drops directly onto LFTs. Sure enough, a few minutes later, two lines appeared on each test, supposedly indicating the presence of the virus that causes COVID-19.
It's worth understanding how the tests work. If you open up an LFT device, you'll find a strip of paper-like material, called nitrocellulose, and a small red pad, hidden under the plastic casing below the T-line.
Absorbed to the red pad are antibodies that bind to the COVID-19 virus. They are also attached to gold nanoparticles (tiny particles of gold actually appear red), which allow us to see where the antibodies are on the device.
When you do a test, you mix your sample with a liquid buffer solution, ensuring the sample stays at an optimum pH, before dripping it on the strip.



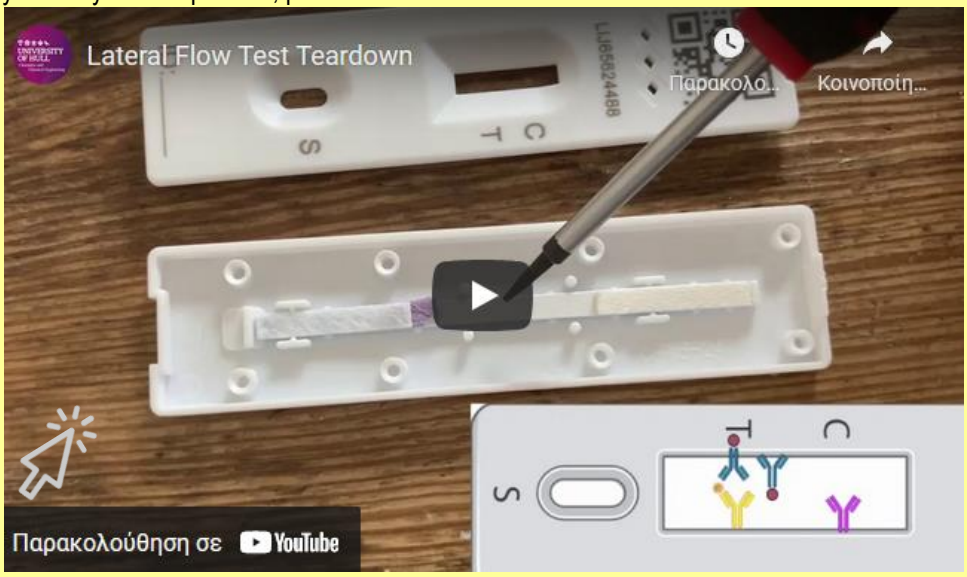
Two COVID-19 at-home tests show fake positives due to cola and orange juice. (Mark Lorch)

The fluid wicks up the nitrocellulose strip and picks up the gold and antibodies. The latter also bind to the virus, if present. Further up the strip, next to the T (for test), are more antibodies that bind the virus.

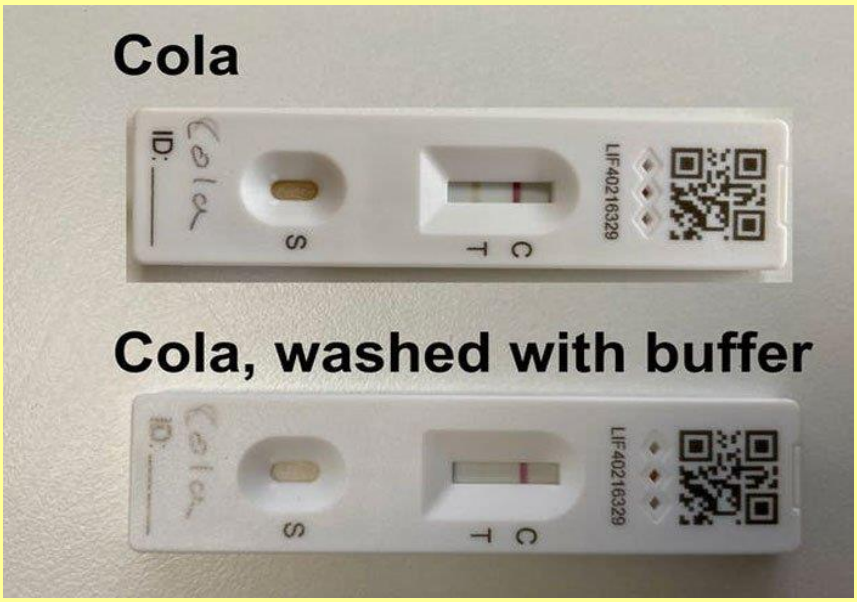
But these antibodies are not free to move – they are stuck to the nitrocellulose. As the red smear of gold-labeled antibodies passes this second set of antibodies, these also grab hold of the virus.
The virus is then bound to both sets of antibodies – leaving everything, including the gold, immobilized on a line next to the T on the device, indicating a positive test.
Gold antibodies that haven't bound to the virus carry on up the strip where they meet a third set of antibodies, not designed to pick up COVID-19, stuck at the C (for control) line. These trap the remaining gold particles, without having to do so via the virus.
This final line is used to indicate the test has worked.

Acid test

So how can a soft drink cause the appearance of a red T line?
One possibility is that the drinks contain something that the antibodies recognize and bind to, just as they do to the virus. But this is rather unlikely. The reason antibodies are used in tests like these is that they are incredibly fussy about what they bind to.
There's all sorts of stuff in the snot and saliva collected by the swabs you take from the nose and mouth, and the antibodies totally ignore this mess of protein, other viruses, and remains of your breakfast. So they aren't going to react to the ingredients of a soft drink.
A much more likely explanation is that something in the drinks is affecting the function of the antibodies. A range of fluids, from fruit juice to cola, have been used to fool the tests, but they all have one thing in common – they are highly acidic.
The citric acid in orange juice, phosphoric acid in cola and malic acid in apple juice give these beverages a pH between 2.5 and 4.
These are pretty harsh conditions for antibodies, which have evolved to work largely within the bloodstream, with its almost neutral pH of about 7.4.
Maintaining an ideal pH for the antibodies is key to the correct function of the test, and that's the job of the liquid buffer solution that you mix your sample with, provided with the test.



The critical role of the buffer is highlighted by the fact that if you mix cola with the buffer – as shown in this debunking of an Austrian politician's claim that mass testing is worthless – then the LFTs behave exactly as you'd expect: negative for COVID-19.
So without the buffer, the antibodies in the test are fully exposed to the acidic pH of the beverages. And this has a dramatic effect on their structure and function.
Antibodies are proteins, which are comprised of amino acid building blocks, attached together to form long, linear chains. These chains fold up into very specific structures. Even a small change to the chains can dramatically impact a protein's function.
These structures are maintained by a network of many thousands of interactions between the various parts of the protein. For example, negatively charged parts of a protein will be attracted to positively charged areas.
But in acidic conditions, the protein becomes increasingly positively charged. As a result, many of the interactions that hold the protein together are disrupted, the delicate structure of the protein is affected and it no longer functions correctly. In this case, the antibodies' sensitivity to the virus is lost.
Given this, you might expect that the acidic drinks would result in completely blank tests. But denatured proteins are sticky beasts. All of those perfectly evolved interactions that would normally hold the protein together are now orphaned and looking for something to bind to.
So, a likely explanation is that the immobilized antibodies at the T-line stick directly to the gold particles as they pass by, producing the notorious cola-induced false-positive result.



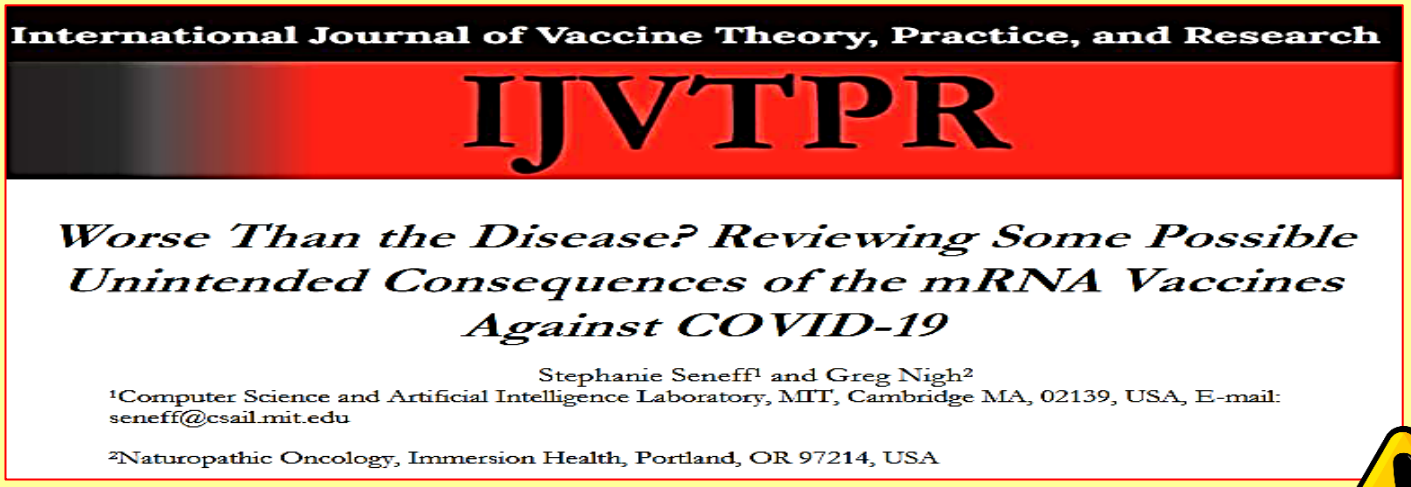
Is there then a way to spot a fake positive test? The antibodies (like most proteins) are capable of refolding and regaining their function when they are returned to more favorable conditions.

*A COVID-19 test with a fake positive caused by cola and a COVID-19 test that used cola after it was washed with a buffer. (*Mark Lorch)

So I tried washing a test that had been dripped with cola with buffer solution, and sure enough, the immobilized antibodies at the T-line regained normal function and released the gold particles, revealing the true negative result on the test.

Children, I applaud your ingenuity, but now that I've found a way to uncover your trickery I suggest you use your cunning to devise a set of experiments and test my hypothesis. Then we can publish your results in a peer-reviewed journal.

***Mark Lorch** is a Professor of Science Communication and Chemistry @ University of Hull.*


International Journal of Vaccine Theory, Practice, and Research

IJVTPR

Worse Than the Disease? Reviewing Some Possible Unintended Consequences of the mRNA Vaccines Against COVID-19

Stephanie Seneff[1] and Greg Nigh[2]

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Source: https://ijvtpr.com/index.php/IJVTPR/article/view/23/51

May 10 – Operation Warp Speed brought to market in the United States two mRNA vaccines, produced by Pfizer and Moderna. Interim data suggested high efficacy for both of these vaccines, which helped legitimize Emergency Use Authorization (EUA) by the FDA. However, the exceptionally rapid movement of these vaccines through controlled trials and into mass deployment raises multiple safety concerns. In this review we first describe the technology underlying these vaccines in detail. We then review both components of and the intended biological response to these vaccines, including production of the spike protein itself, and their potential relationship to a wide range of both acute and long-term induced pathologies, such as blood disorders, neurodegenerative diseases and autoimmune diseases. Among these potential induced pathologies, we discuss the relevance of prion-protein-related amino acid sequences within the spike protein. We also present a brief review of studies supporting the potential for spike protein "shedding", transmission of the protein from a vaccinated to an unvaccinated person, resulting in symptoms induced in the latter. We finish by addressing a common point of debate, namely, whether or not these vaccines could modify the DNA of those receiving the vaccination. While there are no studies demonstrating definitively that this is happening, we provide a plausible scenario, supported by previously established pathways for transformation and transport of genetic material, whereby injected mRNA could ultimately be incorporated into germ cell DNA for transgenerational

transmission. We conclude with our recommendations regarding surveillance that will help to clarify the long-term effects of these experimental drugs and allow us to better assess the true risk/benefit ratio of these novel technologies.

Probability and estimated risk of SARS-CoV-2 transmission in the air travel system

By Jenna K. Pang, Stephen P. Jones, Lindsay L. Waite,
Travel Medicine and Infectious Disease 43 (2021) 102133
Source: https://www.medrxiv.org/content/10.1101/2021.04.08.21255171v1.full

As an emerging virus, SARS-CoV-2 and the risk of transmission during air travel is of high interest. This paper is a retrospective estimate of the probability of an infectious passenger in the air travel system transmitting the SARS-CoV-2 virus to a fellow passenger. *Methods:* Literature was reviewed from May–September 2020 to identify COVID-19 cases related to air travel. The studies were limited to publicly available literature for passengers; studies of flight crews were not reviewed. A novel quantitative approach was developed to estimate air travel transmission risk that considers secondary cases, the overall passenger population, and correction factors for asymptomatic transmission and underreporting.

Results: There were at least 2866 index infectious passengers documented to have passed through the air travel system in a 1.4 billion passenger population. Using correction factors, the global risk of transmission during air travel is estimated at 1:1.7 million; acknowledging that assumptions exist around case detection rate and mass screenings. Uncertainty in the correction factors and a 95% credible interval indicate risk ranges from 1 case for every 712,000 travelers to 1 case for every 8 million travelers.

Conclusion: The risk of COVID-19 transmission on an aircraft is low, even with infectious persons onboard.

SARS-CoV-2 variants of concern as of 1 July 2021

Source: https://www.ecdc.europa.eu/en/covid-19/variants-concern

Variants of concern (VOC)

For these variants, clear evidence is available indicating a significant impact on transmissibility, severity and/or immunity that is likely to have an impact on the epidemiological situation in the EU/EEA. The combined genomic, epidemiological, and in-vitro evidence for these properties invokes at least moderate confidence. In addition, all the criteria for variants of interest and under monitoring outlined below apply.

WHO label	Lineage + additional mutations	Country first detected (community)	Spike mutations of interest	Year and month first detected	Evidence for impact on transmissibility	Evidence for impact on immunity	Evidence for impact on severity	Transmission in EU/EEA
Alpha	**B.1.1.7**	United Kingdom	N501Y, D614G, P681H	September 2020	Yes (v) (1)	No	Yes (v) (2, 3)	Dominant
	B.1.1.7+E484K	United Kingdom	E484K, N501Y, D614G, P681H	December 2020	Yes (v) (1)	Neutralisation (v) (4, 5)	Yes (v) (2)	Outbreaks
Beta	**B.1.351**	South Africa	K417N, E484K,	September 2020	Yes (v) (6)	Escape (v) (6, 7)	Yes (v) (3, 8)	Community

WHO label	Lineage + additional mutations	Country first detected (community)	Spike mutations of interest	Year and month first detected	Evidence for impact on transmissibility	Evidence for impact on immunity	Evidence for impact on severity	Transmission in EU/EEA
			N501Y, D614G, A701V					
Gamma	**P.1**	Brazil	K417T, E484K, N501Y, D614G, H655Y	December 2020	Yes (v) (9)	Neutralisation (v) (10)	Yes (v) (3)	Community
Delta	**B.1.617.2**	India	L452R, T478K, D614G, P681R	December 2020	Yes (v) (11)	Escape (v) (12-14)	Yes (v) (13, 15)	Community

Variants of interest (VOI)

For these variants, evidence is available on genomic properties, epidemiological evidence or in-vitro evidence that could imply a significant impact on transmissibility, severity and/or immunity, realistically having an impact on the epidemiological situation in the EU/EEA. However, the evidence is still preliminary or is associated with major uncertainty. In addition, all the criteria for variants under monitoring outlined below apply.

WHO label	Lineage + additional mutations	Country first detected (community)	Spike mutations of interest	Year and month first detected	Evidence for impact on transmissibility	Evidence for impact on immunity	Evidence for impact on severity	Transmission in EU/EEA
Eta	**B.1.525**	Nigeria	E484K, D614G, Q677H	December 2020		Neutralisation (m) (4)		Community
Epsilon	**B.1.427/B.1.429**	USA	L452R, D614G	September 2020	Unclear (16)	Neutralisation (v) (16)		Sporadic/Travel
Theta	**P.3**	The Philippines	E484K, N501Y, D614G, P681H	January 2021	Yes (m) (1)	Neutralisation (m) (4)		Sporadic/Travel
	B.1.616	France	V483A, D614G, H655Y, G669S	February 2021	Detection (c) (17)			Single outbreak
Kappa	**B.1.617.1**	India	L452R, E484Q, D614G, P681R	December 2020	Yes (v) (18)	Neutralisation (v) (19-22)		Outbreaks

WHO label	Lineage + additional mutations	Country first detected (community)	Spike mutations of interest	Year and month first detected	Evidence for impact on transmissibility	Evidence for impact on immunity	Evidence for impact on severity	Transmission in EU/EEA
	B.1.620	Unclear (b)	S477N, E484K, D614G, P681H	February 2021		Neutralisation (m) (4, 23)		Outbreaks
	B.1.621	Colombia	R346K, E484K, N501Y, D614G, P681H	January 2021	Yes (m) (1)	Neutralisation (m) (4)		Sporadic/Travel

Variants under monitoring

These additional variants of SARS-CoV-2 have been detected as signals through epidemic intelligence, rules-based genomic variant screening, or preliminary scientific evidence. There is some indication that they could have properties similar to those of a VOC, but the evidence is weak or has not yet been assessed by ECDC. Variants listed here must be present in at least one outbreak, detected in a community within the EU/EEA, or there must be evidence that there is community transmission of the variant elsewhere in the world.

WHO label	Lineage + additional mutations	Country first detected (community)	Spike mutations of interest	Year and month first detected	Evidence for impact on transmissibility	Evidence for impact on immunity	Evidence for impact on severity	Transmission in EU/EEA
	B.1.617.3	India	L452R, E484Q, D614G, P681R	February 2021	Yes (m) [1]	Neutralisation (m) (4, 16)		Not detected
	B.1.214.2	Unclear2	Q414K, N450K, ins214TDR, D614G	December 2020				Detected (a)
	A.23.1+E484K	United Kingdom	V367F, E484K, Q613H	December 2020		Neutralisation (m) (4)		Detected (a)
	A.27	Unclear (b)	L452R, N501Y, A653V, H655Y	December 2020	Yes (m) (1)	Neutralisation (m) (16)		Detected (a)
	A.28	Unclear (b)	E484K, N501T, H655Y	December 2020		Neutralisation (m) (4)		Detected (a)

WHO label	Lineage + additional mutations	Country first detected (community)	Spike mutations of interest	Year and month first detected	Evidence for impact on transmissibility	Evidence for impact on immunity	Evidence for impact on severity	Transmission in EU/EEA
	C.16	Unclear (b)	L452R, D614G	October 2020		Neutralisation (m) (4)		Detected (a)
Lambda	**C.37**	Peru	L452Q, F490S, D614G	December 2020				Detected (a)
	B.1.351+P384L	South Africa	P384L, K417N, E484K, N501Y, D614G, A701V	December 2020	Yes (v) (6)	Escape (v) (6, 7)	Unclear (8)	Detected (a)
	B.1.351+E516Q	Unclear (b)	K417N, E484K, N501Y, E516Q, D614G, A701V	January 2021	Yes (v) (6)	Escape (v) (6, 7)	Unclear (8)	Detected (a)
	B.1.1.7+L452R	United Kingdom	L452R, N501Y, D614G, P681H	January 2021	Yes (v) (1)	Neutralisation (m) (16)	Yes (v) (2)	Detected (a)
	B.1.1.7+S494P	United Kingdom	S494P, N501Y, D614G, P681H	January 2021	Yes (v) (1)	Neutralisation (m) (24)	Yes (v) (2)	Detected (a)
	C.36+L452R	Egypt	L452R, D614G, Q677H	December 2020		Neutralisation (m) (16)		Detected (a)
	AT.1	Russia	E484K, D614G, N679K, ins679GIAL	January 2021		Neutralisation (m) (4)		Detected (a)
Iota	**B.1.526**	USA	E484K, D614G, A701V	December 2020		Neutralisation (m) (4)		Detected (a)
	B.1.526.1	USA	L452R, D614G	October 2020		Neutralisation (m) (16)		Detected (a)
	B.1.526.2	USA	S477N, D614G	December 2020				Detected (a)

WHO label	Lineage + additional mutations	Country first detected (community)	Spike mutations of interest	Year and month first detected	Evidence for impact on transmissibility	Evidence for impact on immunity	Evidence for impact on severity	Transmission in EU/EEA
	B.1.1.318	Unclear (b)	E484K, D614G, P681H	January 2021		Neutralisation (m) (4)		Detected (a)
Zeta	**P.2**	Brazil	E484K, D614G	January 2021		Neutralisation (m) (4)		Detected (a)
	B.1.1.519	Mexico	T478K, D614G	November 2020		Neutralisation (m) (16)		Detected (a)
	AV.1	United Kingdom	N439K, E484K, D614G, P681H	March 2021		Neutralisation (m) (4)		Detected (a)
	P.1+P681H	Italy	D614G, E484K, H655Y, K417T, N501Y, P681H	February 2021		Unclear (25, 26)		
	B.1.671.2 + K417N	United Kingdom	L452R, T478K, D614G, P681R, K417N	June 2021				Detected (a)

(a) No assessment of transmission is given for variants in the monitoring category, only detected/not detected.
(b) The earliest detections from several different countries are close in time and there is no clearly demonstrated travel link to a specific country that explains the detections.
(c) The property of concern for this variant is the fact that there are reports of difficulties associated with detecting it in upper respiratory tract samples. These difficulties are not caused by primer-template mismatch but rather by the virus not being present in sufficient quantities in the upper respiratory tract.

Covid-19 Anosmia

In June, researchers published a small study that followed nearly 100 people with anosmia (loss of smell) for a year after their infection. They found out that by eight months, 96% had regained their ability to smell.

U.S. OKs EUA for Genentech's Actemra vs. COVID-19; Halts Distribution of Lilly's Antibody Combo

The U.S. Food and Drug Administration has granted Genentech a member of the Roche Group, EUA for its marketed interleukin-6 (IL-6) receptor antagonist Actemra® (tocilizumab) as a treatment for COVID-19. A day later, the FDA joined with another agency within the U.S. Department of Health and Human Services to immediately pause all nationwide distribution of Eli Lilly and

Company's antibody combination of bamlanivimab and etesevimab. Lilly's antibody combination showed itself "not active" against two of the COVID-19 variants that have increasingly accounted for new cases of the disease + MORE

New COVID-19 Vaccines May Reach Out to T Cells, Not Just B Cells

"Red flags" that prompt T cells to attack host cells infected by SARS-CoV-2 infection have been identified in studies with human cells. These red flags, which correspond to previously uncharacterized peptides derived from the internal proteins making up the SARS-CoV-2 virus, could enable a more precise selection of peptides for COVID-19 immune monitoring and vaccine development. + MORE

Universal Vaccine Protects Mice against Five Coronaviruses, Neutralizes Variants

Scientists at UNC have developed a universal vaccine that protected mice not just against SARS-CoV-2, but also other coronaviruses, and triggered the immune system to fight off a dangerous variant. Using a chimeric spike design, the mRNA-based vaccine demonstrates protection against challenge from five coronaviruses in mice. This universal, pan-coronavirus vaccine may proactively guard against viruses that are at risk for emerging in humans. + MORE

Top 8 Best-Selling COVID-19 Vaccines and Drugs of Q1 2021

Source: https://www.genengnews.com/a-lists/top-8-best-selling-covid-19-vaccines-and-drugs-of-q1-2021/

May 24 – By the end of this week, the world should cross two small but significant milestones on the road to overcoming COVID-19—getting at least 5% of the global population fully vaccinated against SARS-CoV-2, with at least 10% receiving one dose of vaccines that require two.

According to Our World in Data, a collaboration of the Oxford Martin Programme on Global Development at the University of Oxford and the nonprofit Global Change Data Lab, 376,173,766 people were fully vaccinated as of May 20 (4.8% of global population), while 739,208,299 people had received one dose (9.5%).

The worldwide march toward vaccination explains why this year is expected to be as good as it gets when it comes to the size of the market for COVID-19 vaccines and drugs.

The vaccine market alone will peak this year at $67 billion, buoyed by the rollout of recently approved jabs that have now protected millions from SARS-CoV-2, according to a report issued last month by Morningstar. The first authorized drugs and vaccines indicated for the virus have already generated 16% of that forecast for their developers, more than a combined $10.91 billion in sales—more than double the $4.23 billion generated all of last year, according to *GEN's* Top 7 Best-Selling COVID-19 Vaccines and Drugs of 2020.

Morningstar added that the COVID-19 market will shrink to $61 billion in 2022. For both this year and next, the majority of sales is expected to come from just two vaccines.

"Together, Pfizer/BioNTech and Moderna account for more than 60% of our total COVID-19 vaccine market sales estimate in 2021 and 2022," Karen Andersen, Morningstar senior strategist, biotechnology, commented May 3. "We see their first-to-market status, manufacturing success, and leading efficacy and safety securing them dominant positions with relatively strong pricing power in the near term, although we're watching for additional data from antigen-based vaccines and other mRNA vaccines that could alter the post-pandemic market dynamics."

Morningstar recently initiated coverage of Moderna, but assigned the company its "very high uncertainty" and "no-moat" ratings, concluding that Moderna is still building its "moat," or sustainable, competitive advantage, and faces numerous challenges in coming years.

"The key is with the virus. We're not really sure how much more it will mutate, and how many more shots people will need. Is this going to be something where everyone needs an annual booster for COVID-19," Andersen told *GEN* recently about Moderna's biggest challenges.

Morningstar has estimated the size of the COVID-19 market sinking to $8 billion annually starting in 2023 in the best of three scenarios or "bull case" laid out by the firm, but dropping further to $2 billion in the middle or "base case," and to $500 million in the worst or "bear

case." The number will depend on how frequently, and in how widespread of a population, will booster shots be needed.
GEN lists eight of the best-selling COVID-19 vaccines and drugs for which sales figures have been disclosed (or in the case of one company, suggested in a regulatory filing). Each drug or vaccine is listed by its name(s), sponsor(s), first-quarter 2021 sales as disclosed by sponsor(s), and the sponsors' 2021 sales guidance to investors, with a comparison to forecasts earlier this year.
This list does not include numerous additional COVID-19 vaccines and drugs that are well into clinical development but have yet to win any approvals or emergency authorizations from regulators.

Top 8 Best-Selling COVID-19 Vaccines and Drugs of Q1 2021

8. Johnson & Johnson Single-Shot COVID-19 Vaccine
Sponsor: Johnson & Johnson (Janssen)
Q1 2021 Sales (Worldwide): $100 million
U.S. Sales: $100 million (100%)
Company Guidance: N/A

7. CoronaVac
Sponsor: Sinovac Biotech
Q1 2021 Sales (Worldwide): $264.5 million[1]
U.S. Sales: $0 (0%)[2]
Company Guidance: N/A

6. COVID-19 Vaccine AstraZeneca (AZD1222; sold as Vaxzevria in Europe)
Sponsor: AstraZeneca
Q1 2021 Sales (Worldwide): $275 million
U.S. Sales: $0 (0%)[3]
Guidance (Change from Q4 2020): N/A[4]

5. REGEN-COV (casirivimab and imdevimab)
Sponsor: Regeneron Pharmaceuticals
Q1 2021 Sales (Worldwide): $438.8 million
U.S. Sales: $262.2 million (60%)
Guidance (Change from Q4 2020): Approximately $2.9 billion, unchanged

4. Bamlanivimab and etesevimab[5]
Sponsor: Eli Lilly
Q1 2021 Sales: $810.1 million
U.S. Sales: $650.6 million (80%)
Guidance (Change from Q4 2020): $1 billion to $1.5 billion, down from $1 billion to $2 billion, reflecting what Lilly said were "lower expected revenue from COVID-19 antibody sales due to lower expected demand and higher expected research and development expenses."

3. Veklury® (remdesivir)
Sponsor: Gilead Sciences
Q1 2021 Sales (Worldwide): $1.456 billion
U.S. Sales: $820 million (56%)
Guidance (Change from Q4 2020): Between $2 billion and $3 billion, unchanged

2. Moderna COVID-19 Vaccine (mRNA-1273)
Sponsor: Moderna
Q1 2021 Sales (Worldwide): $1.733 billion

U.S. Sales: $1.358 billion (78%)
Guidance (Change from Q4 2020): $19.2 billion, up from $18.4 billion

1. BNT162b2 (sold as Comirnaty® in EU and Switzerland)
Sponsors: Pfizer and BioNTech
Q1 2021 Sales (Worldwide): $5.833 billion[6]
U.S. Sales: $2.038 billion (35%)[7]
Guidance (Change from Q4 2020): Approximately $41 billion consisting of $26 billion (Pfizer), up from "approximately $15 billion;" and ~€12.4 billion ($15.1 billion; BioNTech), up from about €10 billion ($12.2 billion).

Coronavirus (COVID-19) Update: FDA Authorizes Drug for Treatment of COVID-19

Source: https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-authorizes-drug-treatment-covid-19

June 24 – Today, the U.S. Food and Drug Administration issued an emergency use authorization (EUA) for the drug Actemra (tocilizumab) for the treatment of hospitalized adults and pediatric patients (2 years of age and older) who are receiving systemic corticosteroids and require supplemental oxygen, non-invasive or invasive mechanical ventilation, or extracorporeal membrane oxygenation (ECMO). Actemra is not authorized for use in outpatients with COVID-19.

In clinical trials of hospitalized patients with COVID-19, Actemra in addition to the routine care patients receive for treatment of COVID-19, which included corticosteroid therapy, was shown to reduce the risk of death through 28 days of follow-up and decrease the amount of time patients remained hospitalized. The risk of patients being placed on ventilators or death through 28 days of follow-up was also decreased.

"Today's action demonstrates the FDA's commitment to making new therapies available through every stage of the global COVID-19 pandemic," said Patrizia Cavazzoni, M.D., director of the FDA's Center for Drug Evaluation and Research. "Although vaccines have been successful in decreasing the number of patients with COVID-19 who require hospitalization, providing additional therapies for those who do become hospitalized is an important step in combating this pandemic."

Actemra is a monoclonal antibody that reduces inflammation by blocking the interleukin-6 receptor. In the case of COVID-19 infection, the immune system can become hyperactive, which may result in worsening of disease. Actemra does not directly target SARS-COV-2. Actemra is a prescription medication given by intravenous infusion that is FDA-approved for multiple inflammatory diseases, including rheumatoid arthritis. Under today's EUA, the FDA is authorizing the emergency use of Actemra for the treatment of certain hospitalized patients with COVID-19. Actemra is not approved as a treatment for COVID-19.

The issuance of an EUA is different than an FDA approval. In determining whether to issue an EUA, the FDA evaluates the totality of available scientific evidence and carefully balances any known or potential risks with any known or potential benefits of the product for use during an emergency. Based on the FDA's review of the totality of the scientific evidence available, the agency has determined that it is reasonable to believe that Actemra may be effective in treating COVID-19 for the authorized population. And, when used to treat COVID-19 for the authorized population, the known and potential benefits of Actemra outweigh the known and potential risks for the drug. There are no adequate, approved and available alternative treatments to Actemra for the treatment of COVID-19 in hospitalized adults and pediatric patients (2 years of age or older) who are receiving systemic corticosteroids and require supplemental oxygen, non-invasive or invasive mechanical ventilation, or ECMO.

The data supporting this EUA for Actemra are based on four clinical trials. These included one randomized, controlled, open-label, platform trial [Randomised Evaluation of COVID-19 Therapy (RECOVERY)] and three randomized, double-blind, placebo-controlled trials (EMPACTA, COVACTA and REMDACTA). While all four clinical trials contribute to the FDA's understanding of Actemra for the treatment of COVID-19, the most important scientific evidence on the potential benefit of Actemra for its authorized use came from the RECOVERY and EMPACTA trials.

In the RECOVERY trial, 4,116 hospitalized patients with severe COVID-19 pneumonia were randomized to receive either Actemra in addition to usual care (2,022 patients) or usual care alone (2,094 patients). The primary endpoint evaluated death through 28 days of follow-up, and the results of the primary analysis were statistically significant. The probabilities of death by day 28 were estimated to be 30.7% for patients receiving Actemra and 34.9% for patients receiving usual care alone. The median time to hospital discharge was 19 days for patients receiving Actemra and more than 28 days for patients receiving usual care alone.

In the EMPACTA trial, 389 hospitalized patients with COVID-19 pneumonia were randomized to receive Actemra (249 patients) or placebo (128 patients). The primary

endpoint evaluated the need for mechanical ventilation or death through 28 days of follow-up. For patients receiving Actemra, there was an observed reduction in progression to mechanical ventilation or death compared to patients who received placebo, with the primary analysis results being statistically significant. The proportion of patients who required mechanical ventilation or died by day 28 was estimated to be 12.0% for patients receiving Actemra and 19.3% for patients receiving placebo.
In the COVACTA trial, 452 hospitalized patients with severe COVID-19 pneumonia were randomized to receive Actemra (294 patients) or placebo (144 patients). The primary endpoint was clinical status through 28 days of follow-up assessed on a 7-category ordinal scale. While there was no statistically significant difference observed in clinical status on the 7-category ordinal scale at day 28 between treatment groups, the COVACTA trial contributed to the assessment of the safety for Actemra when used for the treatment of COVID-19.
In the REMDACTA trial, 649 hospitalized patients with severe COVID-19 pneumonia were randomized to receive Actemra in combination with remdesivir (430 patients) or placebo in combination with remdesivir (210 patients). The primary endpoint was time to hospital discharge or "ready for discharge" through 28 days of follow-up. Additionally, while there were no statistically significant differences observed between treatment groups with respect to time to hospital discharge or "ready for discharge" through 28 days of follow-up, the REMDACTA trial contributed to the assessment of the safety for Actemra when used for the treatment of COVID-19.
Under the EUA, fact sheets that provide important information about using Actemra in treating COVID-19 as authorized must be made available to health care providers and to patients, parents, and caregivers. These fact sheets include dosing instructions, potential side effects and drug interactions. Common side effects of Actemra observed in the COVID-19 trials include constipation, anxiety, diarrhea, insomnia, hypertension and nausea.
The EUA was issued to Genentech Inc.

Milder COVID-19 Symptoms Linked to T Cells from Previous Coronavirus Infections

A new study suggests that CD8+ T cells specific for conserved coronavirus epitopes correlate with milder symptoms in COVID-19 patients. In addition, the study showed that killer T cells taken from the sickest COVID-19 patients exhibit fewer signs of having had previous run-ins with common-cold-causing coronaviruses. These findings may start to explain why some people have milder symptoms after an infection with SARS-CoV-2 than others. **+ MORE**

Poop Transplants Have Been Linked to Improved COVID-19 in Two Patients in Poland

Source: https://www.sciencealert.com/two-people-in-poland-had-poo-transplants-and-somehow-their-covid-symptoms-got-better

July 07 – Scientists will soon begin proper clinical trials to see if poop transplants really can help people recover from COVID-19.
The decision was spurred on by curious results from two recent hospital patients in Poland - an 80-year-old man with pneumonia, and an immunosuppressed 19-year-old man - who both received fecal transplants for severe *C. difficile* infections.

Unbeknownst at the time, these patients also had COVID-19. Its symptoms began to show up shortly after the two received their poop transplant, and yet even though both individuals were particularly vulnerable to SARS-CoV-2, their cases were only mild and their fevers cleared up within just a couple days.
There's no way to know how either would have coped without the poop transplant, so it's hard to pin down their fast recovery to any one source. That said, the coincidence is intriguing enough for scientists to investigate further.
After all, this isn't the first time experts have proposed using poop transplants to treat COVID-19. A person's gut microbiota is closely linked to their immune system, and COVID-19 can cause distinct disturbances in the gastrointestinal tract.

Some other initial reports suggest poop transplants can somewhat restore the balance of gut bacteria after COVID-19, but nobody has yet done any hard investigations on whether the treatment is useful clinically or even safe.
Poop transplants are carefully screened for infections when used as treatment, but there's always the chance some dangerous pathogen sneaks through, and in a global pandemic that prospect is even riskier.
Nevertheless, researchers think the two rapid recoveries in Poland are promising enough to merit further exploration. Most patients who develop COVID-19 show evidence of the virus in their feces for roughly 28 days, but in these two recent cases, the viral matter disappeared from stool samples much faster.
The 19-year-old, despite having a compromised immune system, wasn't even treated for the SARS-CoV-2 infection; he simply got better on his own within a day.
Meanwhile, the 80-year-old patient was given a cutting-edge treatment that usually takes about 10 days to kick in. Two days after receiving a poop transplant, his fever broke and never recurred again.
"Our main conclusion from these cases is that a fecal microbiota transplant appears safe and of comparable efficacy in treating recurrent *C. difficile* infection in patients with coexisting COVID-19," the researchers write in a letter describing the case.
"A further more speculative question is whether a fecal microbiota transplant may impact the clinical course of COVID-19."
It's possible, for instance, that poop transplants could boost the immune system in those with COVID-19, triggering a cascade of molecular changes from the presence of certain bacteria.
Some research even suggests the gut's microbiome can impact the respiratory system; in turn, this could boost the lungs' resistance to COVID-19.
We still know surprisingly little about how the gut impacts the immune system, or how poop transplants ultimately may contribute to the process, but it's worth investigating if this treatment really can help us clear severe viral infections. The authors of the current letter intend to begin recruiting for their clinical trials shortly.

▶▶ **The case study was published in *Gut*.**

The most recent country or territory to report its first confirmed case was the Cook Islands (W. Pacific, close to Australia/New Zealand) on 4 June 2021.

The mRNA flu vaccine race heats up with two human trials commencing

Source: https://newatlas.com/medical/mrna-flu-vaccine-human-trials-moderna-sanofi-translatebio/

July 07 – Biotech firm Moderna has commenced human trials testing an mRNA influenza vaccine targeting four separate viral strains. Building on its profoundly successful mRNA COVID-19 vaccine, the company is ultimately planning to develop a single vaccine against multiple respiratory viruses.
It is impossible to understate the incredible success of mRNA vaccines over the past year. The stunning efficacy of this vaccine technology against SARS-CoV-2 is offering the world a path out of this global pandemic. And the technology is now rapidly moving forward on another problematic viral disease, influenza.
Moderna's influenza vaccine candidate is currently dubbed mRNA-1010. It's the company's first flu vaccine to move to human trials and it targets four separate strains of the virus: influenza A H1N1, H3N2, influenza B Yamagata and Victoria.
The Phase 1/2 trial is taking place in the United States and is designed to primarily evaluate the vaccine's safety and ability to generate an immune response, or immunogenicity. The plan is to ultimately recruit around 180 subjects over the coming months.
Currently available flu vaccines are only around 50 percent effective and they are reformulated every year to target the three or four influenza strains predicted most likely to spread. However, these formulations are decided up to nine months in advance because the mode of production takes time. One of the strengths of mRNA vaccines is how quickly they can be developed once a problematic viral strain has been detected.
Stéphane Bancel, CEO of Moderna, says the plan is to not only develop an effective multi-strain influenza vaccine but to incorporate other viral antigens into the one shot to generate a combination vaccine protecting against a number of respiratory viruses.
"We believe that the advantages of mRNA vaccines include the ability to combine different antigens to protect against multiple viruses and the ability to rapidly respond to the evolution of respiratory viruses, such as influenza, SARS-CoV-2 and RSV," says Bancel. "Our vision is to develop an mRNA combination vaccine so that people can get one shot each fall for high efficacy protection against the most problematic respiratory viruses."

The beginning of Moderna's trial follows the recent commencement of another Phase 1 mRNA influenza vaccine trial. Developed by mRNA therapeutic company Translate Bio, and accelerated by pharma giant Sanofi, this vaccine focuses solely on the H3N2 strain of influenza.
The Translate Bio/Sanofi trial will evaluate the safety and immunogenicity of two different mRNA formulations. Several dose levels will also be explored as the trial looks to ultimately recruit up to 280 subjects over the coming months and hopefully deliver interim data by the end of 2021.
"We believe that mRNA technology could have several advantages for a seasonal flu application including the potential ability to demonstrate robust immune responses based on preclinical data to date, enable antigen specificity within a short time-frame from seasonal virus strain selection, and deploy agile manufacturing capacity," says Translate Bio's CEO Ronald Renaud.

Study Uncovers How Some COVID-19 Vaccines Cause Blood Clots

Source: https://www.genengnews.com/news/study-uncovers-how-some-covid-19-vaccines-cause-blood-clots/

July 08 – A team of researchers has uncovered how COVID-19 vaccines that use adenovirus vectors trigger a rare, but sometimes fatal, blood clotting reaction called vaccine-induced immune thrombotic thrombocytopenia (VITT). The findings will likely have both diagnostic and therapeutic implications.
The research is published in *Nature* in the article, "Antibody epitopes in vaccine-induced immune thrombotic thrombocytopenia."
"The intention of our study was to better understand how the severe clots which characterize VITT develop," said Donald Arnold, MD, chair in translational research and co-medical director of the McMaster Platelet Immunology Laboratory. "A basic principle of medical care is to understand how the disorder happens and, in doing so, develop better treatments."
[James Smith/McMaster University] Some COVID-19 vaccines, such as those from AstraZeneca and Johnson and Johnson that use adenoviral vectors, are associated with the VITT clotting disorder. VITT is characterized by both a drop in the platelet count (thrombocytopenia) and clotting (thrombosis). VITT is similar to a syndrome called heparin-induced thrombocytopenia (HIT), which occurs after heparin exposure.

The group first determined how platelets became activated by antibodies from patients who had VITT. They could show that VITT is caused by highly unusual antibodies to blood platelets that are triggered by the vaccine that stick to components from blood platelets causing them to trigger clot formation.

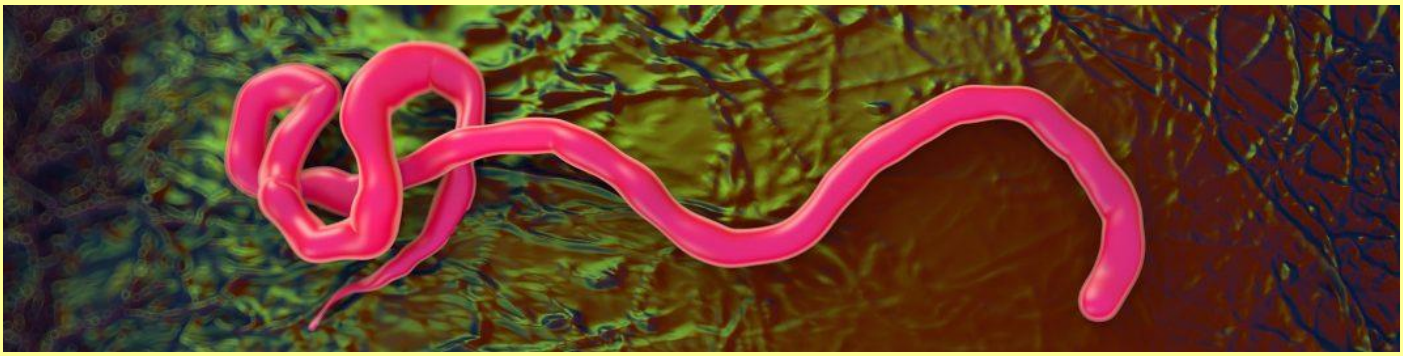
The group found that antibodies can bind tightly to a specific site on the naturally occurring platelet factor 4 (PF4) protein. Using alanine scanning mutagenesis, they studied the amino acids involved in the interaction between the VITT antibodies and PF4 protein. More specifically, they determined the binding of VITT anti-PF4 antibodies was restricted to eight surface amino acids, "all of which were located within the heparin binding site on PF4, and the binding was inhibited by heparin."
They then used biolayer interferometry (BLI) to determine how tightly the VITT antibodies bound to the target on PF4. The authors noted that the location of binding and the strength of binding "allow the antibodies to cluster PF4 proteins together forming immune complexes that can activate platelets and trigger an intense clotting reaction throughout the body." "The antibodies stick to the platelet protein called platelet factor 4 (PF4) in a very unique and specific orientation, which allows them to align with other antibodies and platelets in the precise formation that leads to a self-perpetuating vicious cycle of clotting events," said Ishac Nazy, PhD, associate professor of medicine for the Michael G. DeGroote School of Medicine at McMaster University in Ontario, Canada. "These disease-causing aggregates quickly activate platelets, creating a highly intense clotting environment in patients," he said.
This work, Nazy added, "answers important questions about the connection between antibodies and clotting."
John Kelton, MD, co-investigator of the study and professor of pathology and molecular medicine at McMaster, added: "We believe that this study is important because it clarifies how the clotting ensues, and because we have been able to identify the molecules involved. The next step is to develop a rapid diagnostic and accurate test to diagnose VITT. Our major interest is now to move upstream from how the clots happen to preventing them from occurring."

Mechanisms behind Ebola Virus Spread Revealed

Source: https://www.genengnews.com/news/mechanisms-behind-ebola-virus-spread-revealed/

July 08 – The Ebola Virus Disease (EVD) is a rare and deadly disease in people and nonhuman primates. The viruses that cause EVD are located mainly in sub-Saharan Africa. People can get EVD through direct contact with an infected animal (bat or nonhuman primate) or a sick or dead person infected with Ebola virus. The virus is extremely skilled at

escaping the immune system's defenses. However, new hope comes from a study by Mount Sinai researchers, who report they have uncovered the complex cellular mechanisms of Ebola virus. Their research may help to identify potential pathways to treatment and prevention.



"Ebola virus (EBOV) **VP24 protein** is a nucleocapsid-associated protein that inhibits interferon (IFN) gene expression and counteracts the IFN-mediated antiviral response, preventing nuclear import of signal transducer and activator of transcription 1 (STAT1)," wrote the researchers. "Proteomic studies to identify additional EBOV VP24 partners have pointed to the nuclear membrane component emerin as a potential element of the VP24 cellular interactome. Here, we have further studied this interaction and its impact on cell biology. **We demonstrate that VP24 interacts with emerin but also with other components of the inner nuclear membrane, such as lamin A/C and lamin B."** The team reported "how a protein of the Ebola virus, VP24, interacts with the double-layered membrane of the cell nucleus (known as the nuclear envelope), leading to significant damage to cells along with virus replication and the propagation of disease."

"The Ebola virus is extremely skilled at dodging the body's immune defenses, and in our study we characterize an important way in which that evasion occurs through disruption of the nuclear envelope, mediated by the VP24 protein," said co-senior author Adolfo García-Sastre, PhD, professor of microbiology, and director of the Global Health and Emerging Pathogens Institute of the Icahn School of Medicine at Mount Sinai. "That disruption is quite dramatic and replicates rare, genetic diseases known as laminopathies, which can result in severe muscular, cardiovascular, and neuronal complications."

The researchers collaborated with research partners from CIMUS at the Universidad de Santiago de Compostela in Spain, and the Bernhard Nocht Institute for Tropical Medicine in Hamburg, Germany. Together, they identified the cellular membrane components that interact with VP24 to prompt nuclear membrane disruption.

The researchers demonstrated that VP24 disrupts signaling pathways that are meant to activate the immune system's defenses against viruses.

"We believe our discovery of the novel activities of the Ebola VP24 protein and the severe damage it causes to infected cells will help to promote further research into effective ways to treat and prevent the spread of deadly viruses, perhaps through a new inhibitor," added García-Sastre. "Indeed, that research will hopefully identify even more precisely the molecular mechanisms by which viruses like Ebola invade the body and find ways to cleverly avoid its immune defenses."

▶▶ **The findings are published in the journal *mBio*,** "Expression of the Ebola Virus VP24 Protein Compromises the Integrity of the Nuclear Envelope and Induces a Laminopathy-Like Cellular Phenotype."

What is a variant? An expert explains

Source: https://wellcome.org/news/what-variant-expert-explains

May 11 – What are variants? We asked Divya Shah, Epidemics Research Lead, Wellcome, to explain how variants happen, what they mean for treatments and vaccines – including for Covid-19 – and how we can prevent them.

Must Read

What are mutations, variants and strains?

Although the terms viral mutants, variants and strains are often used interchangeably, they generally hold different meanings.

To spread, a virus needs to infect a host, replicate and produce lots of copies of itself.

When a virus replicates, it doesn't always manage to produce an exact copy of itself. This means that, over time, the virus may start to differ slightly in terms of its genetic sequence. Any changes to the viral genetic sequence during this process is known as a **mutation** and viruses with new mutations are sometimes called **variants**. Variants can differ by one or multiple mutations.
When a new variant has different functional properties to the original virus and becomes established in a population, it is sometimes referred to as a new **strain** of the virus. In short, all strains are variants, but not all variants are strains.

Are variants more dangerous than the original virus?

All viruses mutate. Most mutations are harmless and do not affect the properties of the virus. However, some mutations give the virus a selective advantage, increasing the likelihood that it will go on to infect another person.
Mutations which have a selective advantage could be ones which result in greater viral shedding – the release of infectious virus particles into the environment, for example when we talk, cough or sneeze – or they enable the virus to evade the body's immune responses.
Potential consequences of new variants include:

- change in transmissibility
- difference in disease severity
- ability to evade detection by viral diagnostic tests
- reduced susceptibility to treatments
- ability to evade natural or vaccine-induced immunity.

Do variants affect current treatments and vaccines?

Variants have the potential to make current treatments and vaccines less effective.
The influenza virus, which causes flu, is known to be a frequently mutating virus. Every flu season, we see several different influenza variants in circulation, which means that existing vaccines need to be updated so they are effective against the new variants.
Some individual mutations may reduce the virus' sensitivity and vulnerability to human antibodies (part of the immune response) and could therefore make a vaccine or treatment less effective.

So, should we be worried about Covid-19 variants?

There have been many mutations (e.g., A, B, Γ, Δ, Λ) of the virus (SARS-CoV-2) that causes Covid-19 since it was first identified in Wuhan.

Are the variants impacting the effectiveness of existing Covid-19 vaccines and treatments?

Many Covid-19 vaccines target the spike protein. A virus that accumulates numerous mutations in the spike protein may be able to evade natural or vaccine-induced immunity.
There is ongoing research being conducted to test the efficacy of existing vaccine candidates against a range of variants. Vaccine developers may be able to update their candidates(opens in a new tab)
to make them more effective against new variants.
Early lab data suggests that the new variants – especially those first identified in South Africa and Brazil – may not respond to the first Covid-19 monoclonal antibodies (mAbs). Designed to bind to the spike protein of the virus, like a key in a lock, the mutations found in the variants mean that the key (mAbs) no longer fits the lock (spike protein). While this would be a disappointing setback, this class of treatments still holds great promise for Covid-19 and work is underway to develop combination and second-generation antibody treatments.
There are suggestions that the variants of concern are more prevalent in peoples' noses and throats. This results in a higher viral load, making it easier for the virus to spread between hosts, continue to replicate, and potentially produce new mutations.
This is why it is important to continue to invest in development of a variety of vaccines and treatments to increase the chance of having tools that are effective against new variants.

How are variants tracked?

Due to the potential for a mutation to change the properties of a virus, we need to monitor variants closely to determine if they pose a greater risk of transmission, severe disease or evasion of current interventions.
Since the 1980s we've been monitoring and sequencing influenza (flu) virus strains through global networks, to enable adaptation of the flu vaccine every year.

This is done through genetic sequencing of a virus, and the collection of epidemiological and clinical data. Scientists monitor any changes to a virus' genome. Any concerning changes are reported and shared broadly so that public health interventions and policies can be adapted to limit the spread of a new variant nationally and worldwide.

What are countries doing to track the spread of the Covid-19 variants?

Genomic surveillance – the way in which we track and monitor viruses – varies internationally (opens in a new tab). This is a concerning because we know that viruses – such as SARS-CoV-2 – do not respect geographical borders and new variants spread across countries. Lack of international genomic surveillance also leads to gaps in data and poses the risk of new harmful variants emerging and spreading undetected.

The GISAID Initiative (opens in a new tab) promotes global rapid sharing of genetic sequencing and relevant epidemiological data associated with the Covid-19 pandemic. This data enables researchers and health authorities to determine if the new variant poses a greater risk of transmission, severe disease or evasion of current interventions. Collection of this data will also help target vaccines and therapeutics development and help monitor their impact when they are introduced.

On the flip side, if an increase in cases is noticed somewhere that cannot be explained or linked to a super-spreader event (for example, a workplace outbreak), health authorities may review the genetic surveillance data to look for mutations that could have caused the increase.

Can we prevent variants emerging?

The more virus that is in circulation, the more opportunity it has to replicate and mutate, potentially producing new variants of concern. Suppression of the spread of the virus will reduce the number of new variants from emerging, while also protecting populations from spreading existing variants of a virus.

To limit spread, we should:

- follow public health interventions, such as social distancing and handwashing
- increase global capacity to monitor and sequence the virus to track and flag any significant changes
- prioritize equitable distribution of vaccines and treatments worldwide. If only a few countries have access to these, the virus will remain active, continue to spread and increase the risk of new variants emerging that evade current treatments and vaccines.

There's a New Review of Potential SARS-CoV-2 Origins. Here's What Experts Think

Source: https://www.sciencealert.com/new-analysis-makes-strong-case-that-covid-19-sprung-from-animals

July 09 – As the world passes the harrowing milestone of 4 million COVID-19 deaths, and new virus variants wreak chaos in unvaccinated communities, debate continues to rage over the question whether SARS-CoV-2 leaked from a research facility.

Now a group of scientists – including world-leading virologists and a Nobel Laureate – have risen to the challenge with a critical review of the scientific evidence to date, concluding there is currently no proof the virus that causes COVID-19 sprung from a lab.

"Our careful and critical analysis of the currently available data provided no evidence for the idea that SARS-CoV-2 originated in a laboratory," says virologist and lead author Edward Holmes, who before this pandemic, worked on the viruses which caused Ebola outbreaks and influenza epidemics.

Knowing a lab breach cannot be ruled out completely, the group summarizes the evidence for the natural origins of SARS-CoV-2 and argues that human activities, such as deforestation and wildlife trade, "have repeatedly put us on a collision course with novel viruses."

They also warn that the focus on a highly improbable lab origin is distracting from more urgent scientific tasks, such as investigating animal sources of SARS-CoV-2, or preparing for the next pandemic – like we should have done for this one.

"The current preprint provides a refreshingly clear and reasoned description of the virological events that have taken place during the emergence of the pandemic virus," says virologist Jonathan Stoye from the Francis Crick Institute, who was not involved in the review.

Evidence in favor of the animal origins of SARS-CoV-2 is found in closely related viruses detected in bats and pangolins, and via people interacting with those animals.

The review, which is available as a preprint and undergoing peer-review, also cites other evidence which is inconsistent with the lab leak theory: SARS-CoV-2 is unable to infect lab mice, a go-to animal model of choice for studying viral infections.

And if someone artificially engineered the virus in a lab, there would be genetic markers of that process in the SARS-CoV-2 sequence – which cannot be found.
"[The review] makes a strong case for the natural origin of the virus followed by on-going adaptation in humans," Stoye says.
While several early documented cases of COVID-19 were linked to the now-closed Wuhan wet market, in the end it "was more of an amplifying event rather than necessarily a true ground zero. So we need to look elsewhere for the viral origins," public health researcher Dominic Dwyer, who was part of the WHO investigation in Wuhan, wrote back in February.
However, as the new review outlines, there is still no epidemiological evidence connecting SARS-CoV-2 – or possible precursors – to the Wuhan Institute of Virology, where researchers do study bat-borne coronaviruses.
"The key source would be an infected worker that may have taken it home after being infected in the lab," says Stuart Turville, a virologist at the Kirby Institute in Sydney, Australia. "Yet this is not documented in any early index cases."
As comprehensive as the latest review is, the 'lab leak' scenario can't be ruled out conclusively, which leaves room for doubts to creep in. Even the WHO investigation was not conclusive.
"No single research trip can provide all the answers," WHO Director-General Tedros Adhanom Ghebreyesus said in March this year, when the WHO released its first report detailing its extensive investigation into the origins of SARS-CoV-2.
By and large, experts currently agree that the most probable scenario is that the virus was circulating in wild animals, spilled over into human contacts, and then naturally evolved to adapt to its newest host.
However, immunologist Nikolai Petrovsky from Flinders University in Australia is less certain, saying the new analysis provides "minimal hard evidence" and no solid conclusions.
"The actual origins of the virus remains a completely open verdict split between a natural spillover event from a still unidentified animal vector, or a laboratory accident," says Petrovsky.
"Based on actual knowledge to date, neither possibility can be either proven or definitely refuted."
Other experts are more supportive of the review and its findings. Infectious disease epidemiologist James Wood at the University of Cambridge says:
"They considered the uncertainties that invariably persist around retrospective investigations of this nature and also noted that a laboratory accident could not be entirely ruled out, but that this was highly unlikely relative to an origin involving human and animal contact."
The historical record of other so-called zoonotic viruses which have jumped from animals into humans, is further evidence supporting the animal origins of SARS-CoV-2, the group argues.
"All previous human coronaviruses have zoonotic origins, as have the vast majority of human viruses," they write before acknowledging that the exact animal source of the coronavirus may never be found, which probably gave wind to the lab leak theory in the first place.
"Indeed, the animal origins of many well-known human pathogens, including Ebola virus, Hepatitis C virus, poliovirus, and [other] coronaviruses … are yet to be identified," the group writes.
A few things are more certain, though: Conspiracy theories and rumors are downright dangerous, even deadly, and we must learn from this pandemic, to protect ourselves for the next.

▶▶ **The review is available on the preprint server** Zenodo.

Cuba approves emergency use of own Abdala vaccine

Source: https://www.dw.com/en/covid-cuba-approves-emergency-use-of-own-abdala-vaccine/a-58222105

July 09 – **The Abdala vaccine is said to be highly effective after three doses**
Cuba on Friday approved its homemade Abdala coronavirus vaccine for emergency use.
The communist country is the first country in Latin America and the Caribbean to successfully develop a coronavirus vaccine.
The Cuban health regulator, CECMED, approved the shot after the manufacturers announced last month that their vaccine was more than 92% effective against COVID-19 infections when three doses were given.

What are the Cuban vaccines?

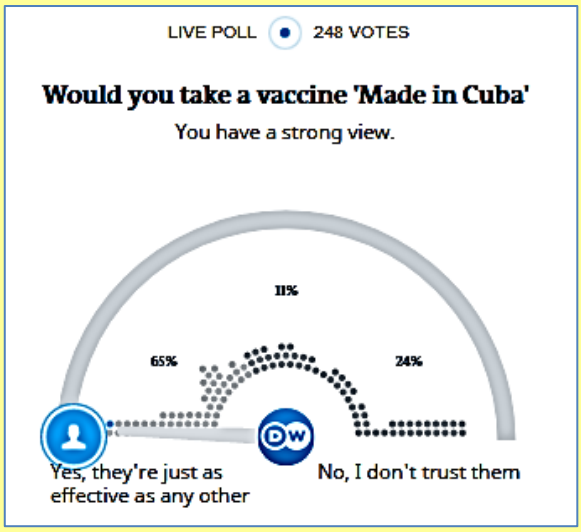
The Abdala vaccine is one out of five candidate vaccines in Cuba, according to authorities there. Another, the two-dose Soberana 2, is also expected to be soon authorized for emergency use by CECMED.

Both vaccines are then to be sent up for approval to the World Health Organization.

Abdala and Soberana 2 both employ a traditional approach by using a part of the virus's spike protein to build up the immune reaction. Such vaccines do not require extremely low storage temperatures as mRNA vaccines generally do, making them easier to deploy. They are also cheaper to develop.

Cuba already produces 80% of vaccines used in the country and exports some of them.

Iran, Argentina, and Vietnam have expressed an interest in producing the Cuban vaccines. Jamaica and Mexico are two of the countries that plan to probably purchase them.



What is the pandemic situation in Cuba?

Cases of COVID-19 in Cuba have jumped to a new record high amid a surge driven by both the beta and delta variants.

On Friday, it registered 6,422 cases, nearly double the number the day before.

However, mortality has remained relatively low, with a death toll below 1,500.

About 1.5 million of the country's 11.2 million residents have been fully vaccinated to date. Cuba began vaccinating with both Abdala and Soberana 2 back in May while the two vaccines were still undergoing clinical trials.

Gap between Sputnik V COVID-19 vaccine doses can extend to 180 days: Russia's RDIF

Source: https://www.businesstoday.in/industry/pharma/story/gap-between-sputnik-v-covid-19-vaccine-doses-can-extend-to-180-days-russias-rdif-300937-2021-07-09

July 09 – **The gap between the two shots of the Sputnik V coronavirus vaccine can be extended up to 180 days and it will remain effective, the Russian Direct Investment Fund (RDIF) said on Friday.**

An official at the RDIF, which markets the vaccine abroad, made the comments in a statement after some countries decided to widen the gap between the first and second doses of the vaccine developed in Russia.

Kazakhstan has said a longer interval between shots provides a stronger immune response.

Argentina has increased the gap to prioritise ensuring that as many people as possible receive at least a single dose.

Alexander Gintsburg, director of the Gamaleya Institute which developed the vaccine, said in April that the gap between the shots could be increased to 90 days.

The RDIF official quoted Gamaleya trials as showing longer gaps had secured a better immune response, but provided no further details of the trials. The official issued the statement after a Reuters request for comment, and denied it was related in any way to Russian deliveries of Sputnik V.

RDIF has notified all foreign partners and vaccine buyers that prolonging the gap between doses to 90 days helps to slightly increase the immune response, the official said.

Russia's vaccine roll-out involves giving people the second dose of Sputnik V after 21 days.

The Philippines Food and Drug Administration said this week it would allow a 42-day interval between doses, after Russia proposed widening the time interval to 90 days.

The Russian health ministry and the Gamaleya Institute did not immediately reply to requests for a comment.

Global COVID-19 Death Toll Surpasses 4 million

Source: https://www.medscape.com/viewarticle/954454

July 08 – More than 4 million COVID-19 deaths have been reported worldwide during the pandemic, according to *USA Today*.
The tally is equal to the number of people killed in battle during all of the world's wars since 1982, the newspaper reported, as well as three times the number of people killed in traffic accidents around the world each year.
Even still, public health officials believe the total is an undercount in many countries due to unidentified COVID-19 cases or deliberate concealment, *USA Today* reported.
"The numbers may not tell the complete story, and yet they're still really staggering numbers globally," Jennifer Nuzzo, an epidemiologist at Johns Hopkins Bloomberg School of Public Health, told *The New York Times*.
The pace of COVID-19 deaths has increased over time. The initial 1 million deaths were logged in 9 months, the newspaper reported. The death toll then hit 2 million in 3.5 months, followed by 3 million in 3 months and 4 million in 2.5 months. The number of daily deaths has declined in recent weeks.
The U.S. leads the world in reported COVID-19 deaths, with more than 606,000 as of Thursday morning, according to data from Johns Hopkins University. Brazil follows close behind with 528,500 deaths, and India has reported 405,000 deaths.
The global milestone comes as countries race to get more people vaccinated against COVID-19 in the face of contagious coronavirus variants. In particular, officials are closely watching the delta variant, which now makes up 52% of new COVID-19 cases in the U.S., *The New York Times* reported.
The delta variant is also the dominant strain in Germany as of Wednesday, *USA Today* reported, and has led to a jump in new cases in France and the U.K.
COVID-19 cases and deaths continue to surge in low-income countries in Africa, Asia and South America, the WHO said on Wednesday.
"Compounded by fast-moving variants and shocking inequity in vaccination, far too many countries in every region of the world are seeing sharp spikes in cases and hospitalizations," Tedros Adhanom Ghebreyesus, the director-general of the WHO, said during a news conference.
This week, 7 of the 10 countries with the highest death rates relative to their populations were in South America, *The New York Times* reported. Brazil reported the highest number of new cases and deaths of any country during the past week, and Paraguay had the highest number of deaths per capita.
More than two dozen countries have "epidemic curves that are almost vertical right now," Maria Van Kerkhove, the COVID-19 technical lead for the WHO, said during Wednesday's news conference.
"The virus is showing us right now that it's thriving," she said.

Variants, Misinformation, and "Brain Drain": The COVID-19 Vaccine Experience in Brazil, India, and Africa

By Stephanie Miceli

Source: http://www.homelandsecuritynewswire.com/dr20210708-variants-misinformation-and-brain-drain-the-covid19-vaccine-experience-in-brazil-india-and-africa

July 08 – COVID-19 is likely to be with us for some time, despite the rollout of effective vaccines. The Delta variant is outpacing global vaccination efforts, and several countries — even those with ample vaccine supply — could be grappling with surges this summer. While life may be returning to so-called "normalcy" for those fully vaccinated in the U.S., the outlook is different elsewhere. "When it comes to vaccines, there's access and there's supply. Then there's the question 'Will people take it?'" said Chicago Trust CEO Helene Gayle during a recent National Academy of Medicine (NAM) *COVID-19 Conversations* event, held in partnership with the American Public Health Association. Gayle, who also chaired a recent NAM study on equitable COVID-19 vaccine allocation, moderated the discussion with experts from Brazil, Africa, and India. They examined the social consequences of COVID-19 and the persistent public health challenges in their respective countries, and compared their experience to the U.S. experience.
One common theme they all agreed on: Rampant misinformation and fake news are not issues unique to the U.S.

"The first vaccine was given in 1796 … and the first anti-vaccine group likely formed in 1796," said panelist Bill Foege, professor emeritus at Emory University's Rollins School of Public Health and co-chair of the NAM report. "It's just the way people are. And you have to find the people that they trust in order to change that."

What's most alarming is that often, doctored videos and fake interviews feature seemingly credible scientists, added panelist Gagandeep 'Cherry' Kang, clinician scientist and professor at Christian Medical College in India. Many of them hawk "miracle cures" or spread misinformation about the vaccine and fertility.

"We cannot ignore vaccine misinformation in lower- and middle-income countries, because we're a global community," she said. "The messages spreading in our communities are many of the same messages you see in the U.S. They circulate on WhatsApp and YouTube, and as soon as YouTube takes them down, they appear on other sites and are dubbed in other languages," said Kang.

Even among those who are trying to get vaccinated, there's a digital divide, said Kang.

"You had people in urban areas registering in rural areas and returning to the city … when rural residents didn't even know there was a vaccine drive going on in the first place."

In Brazil, the pandemic — and an anti-science environment — has accelerated "brain drain," an exodus of the country's scientists and intellectuals, said Beatriz Grinsztejn, infectious disease physician at the Evandro Chagas National Institute of Infectious Diseases-Oswaldo Cruz Foundation.

"The pandemic has implications for Brazil's educational future," said Grinsztejn. "Even before COVID-19, we saw dramatic cuts in research funding, and the dismantling of scientific institutions. We're at risk of losing a generation of Brazilians who are contributing to our scientific, social, and economic development."

Grinsztejn added that the prolonged pandemic in Brazil has set back poverty reduction goals by 13 years, and a food insecurity crisis is unfolding as well.

"If the vaccine rollout doesn't scale up in Brazil, the disease will continue to proliferate. And the populations that experience poverty and social inequality will suffer the most."

Salim Abdool Karim, director of the Centre for the AIDS Programme of Research in South Africa (CAPRISA), expressed concern that Africa is at "the back of the queue" when it comes to vaccine access and coverage.

While some African countries have secured enough doses of the vaccine, they can't administer them in a timely manner. In South Africa, just 2.4 doses are available for every 100 people — while Canada has 10 doses for every one of its citizens, Abdool Karim said.

"Some countries are vaccinating children, who are low risk, when Africa has not even completed health care worker vaccinations," he added.

Variants have also complicated matters, since vaccines that would otherwise be efficacious are not in certain countries. Access to whole-genome sequencing is also limited, which makes it difficult to understand the genomic landscape as new variants emerge.

"When you have low vaccine coverage and high transmission, that leads to new variants. So low vaccination coverage in Africa requires global solutions."

Although panelists stressed the need for a shared mission and global solidarity to fight COVID-19 — similar to the HIV/AIDS movement — they warned against the notion of "vaccine diplomacy."

"The term 'vaccine diplomacy' is one that's driven by politics, versus the proper public health planning that we need to achieve vaccine equity," said Abdool Karim.

Rather than promoting a return to "normalcy," said Foege of Emory University, the global community should use this tragedy to fight against racism, gender inequity, and other social factors that make life unfair for so many. Echoing other panelists, he emphasized that we can't live with vaccine stock concentrated in countries that already have control of the pandemic.

"Global solidarity needs to be in place so that all of us become safe," he said. "It's not enough for countries to control their situation if all of us don't get the opportunity to do it together."

***Stephanie Miceli** is a media relations officer at the National Academies of Science, Engineering, and Medicine.*

What do you think?

True or hoax? Conspiracy or reality?

Endless Corona madness?

Watch: https://www.servustv.com/aktuelles/v/aa-23zjmvcz51w12/

Several inhalable COVID-19 vaccines move to human trials

Source: https://newatlas.com/science/inhalable-covid19-vaccines-nasal-spray-human-trials/

July 11 – A new study in the journal *Science Advances* presents the latest research demonstrating the potential effectiveness of an inhalable COVID-19 vaccine. The vaccine is one of several in development designed to be administered through a nasal spray.

"The currently available vaccines against COVID-19 are very successful, but the majority of the world's population is still unvaccinated and there is a critical need for more vaccines that are easy to use and effective at stopping disease and transmission," explains Paul McCray, a researcher from the University of Iowa working on an inhalable COVID-19 vaccine.

McCray is working alongside colleagues from the University of Georgia on a single-dose COVID-19 vaccine delivered via a nasal spray. Their particular vaccine utilizes a virus called **parainfluenza virus 5 (PIV5)**, optimized to express the spike protein from SARS-CoV-2.

PIV5 is harmless in humans and previous experiments with the virus as a vaccine delivery system have been effective in animal studies against MERS, another coronavirus. The new data demonstrates the experimental COVID-19 vaccine is effective in mice and ferrets.

"We have been developing this vaccine platform for more than 20 years, and we began working on new vaccine formulations to combat COVID-19 during the early days of the pandemic," says co-lead on the study, Biao He, from the University of Georgia. "Our preclinical data show that this vaccine not only protects against infection, but also significantly reduces the chances of transmission."

Traditional vaccines are usually administered by an intramuscular injection. But injections come with a whole load of hurdles making widespread vaccination campaigns complicated and costly. Injected vaccines often need cold storage and must be administered by medical professionals. Syringes are also a finite resource and supply problems have caused major issues with the COVID-19 vaccine roll-out.

One nasal spray vaccine is currently in the market. Called **FluMist** the vaccine targets influenza and, despite being approved for around a decade, its effectiveness has varied from year to year. For several years both the American Academy of Pediatrics and the Centers of Disease Control and Prevention recommended the injectable flu vaccine over this inhalable version, but recently changed that advice after a new formulation showed improved efficacy in the 2019-20 flu season.

Alongside the ease of administration of a nasal spray vaccine there is a strong hypothesis suggesting delivering vaccines directly to mucosal tissue in the upper respiratory tract could offer better localized protection from infection. Darrell Irvine, a bioengineer from MIT, has been working on developing inhalable vaccines for several years.

“In some cases, vaccines given in muscle can elicit immunity at mucosal surfaces, but there is a general principle that if you vaccinate through the mucosal surface, you tend to elicit a stronger protection at that site,” says Irvine.

“Unfortunately, we don’t have great technologies yet for mounting immune responses that specifically protect those mucosal surfaces.”

A study from Irvine's MIT team published earlier this year demonstrated great efficacy with a novel method attaching peptide vaccines to albumin proteins. Mouse studies showed the inhalable vaccine generated a 25-fold increase in immune T cells compared to the same vaccine injected into muscle.

A small number of inhalable COVID-19 vaccines are now in early-stage human trials. Early in 2021 researchers from Oxford University commenced Phase 1 human trials for a nasal spray version of its ChAdOx1 nCoV-19 vaccine (now more familiar as the AstraZeneca COVID-19 vaccine).

Sandy Douglas, chief investigator on the trial, says they are initially studying the nasal spray's safety profile in young, healthy volunteers. It is hoped delivering the COVID-19 vaccine through upper respiratory tissue could offer better protection against mild disease and onward transmission, but Douglas also notes inhalable administration should increase vaccine uptake as well.

"There are a variety of people who will find an intranasal delivery system more appealing, which may mean vaccine uptake is higher in those groups," says Douglas. "It might also have practical advantages – nasal sprays have been used successfully for other vaccines, for example the flu vaccine used in UK schools."

Overall there are around seven intranasal COVID-19 vaccines currently in early human trial stages but it is still unclear whether this route of administration will work effectively for SARS-CoV-2. Most recently, pharma company Altimmune discontinued work on its inhalable vaccine candidate after Phase 1 human trials showed weak immune responses.

Richard Kennedy, an immune researcher at the Mayo Clinic, says it seems increasingly clear inhalable vaccines will not work for all pathogens. Several research dead-ends over the past decade indicate developing a nasal spray COVID-19 vaccine may not be a simple task, but hopefully with research moving at a rapid pace we will have some answers over the next year.

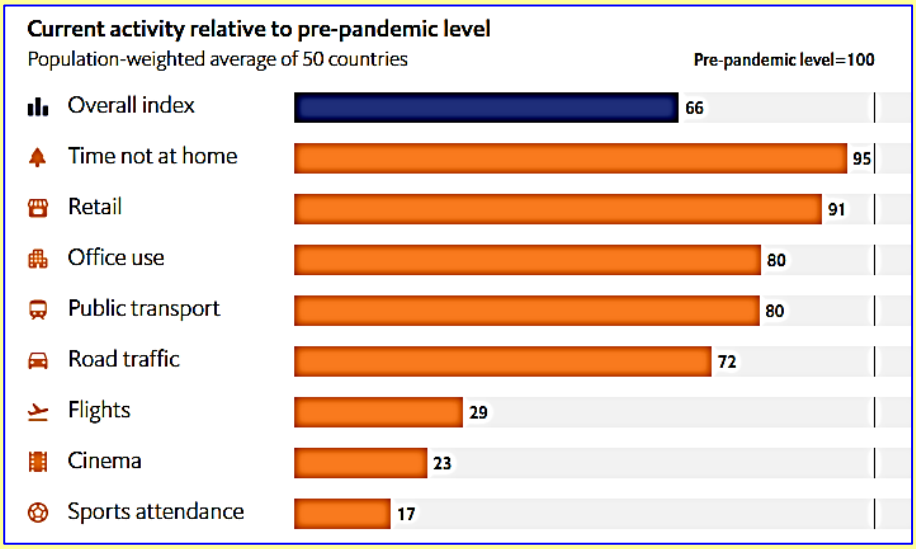
"There are not many licensed mucosal vaccines," Kennedy said recently to MedPage Today. "These vaccines are effective for certain pathogens, but this may or may not be true for SARS-CoV-2."

▶▶ **The new study was published in the journal** *Science Advances*.

The long farewell to covid-19

Source: https://www.fr24news.com/a/2021/07/the-long-farewell-to-covid-19.html

July 03 – When will it end? For a year and a half, covid-19 has gripped one country after another. Just when you think the virus is defeated, a new variant is back in full force, more contagious than the previous one. And yet, as the number of vaccinations surpasses 3 billion, glimpses of post-covid life are emerging. Already, two things are clear: that the last phase of the pandemic will be long and painful; and that covid-19 will leave a different world.



This week ***The Economist*** **publishes a normality index**, which reflects these two realities. Taking the pre-pandemic average to 100, it tracks things like theft, trafficking and retailing in 50 countries representing 76% of Earth's population. Today it stands at 66, almost double the April 2020 level.

Yet the ravages of covid-19 are still apparent in many countries. Take the example of Malaysia, the worst performer on our index, which suffers a wave of infections six times as deadly as the January wave and only scores 27. The main reason is that vaccination remains incomplete.

In sub-Saharan Africa, the victim of a deadly epidemic, only 2.4% of the population over the age of 12 received a single dose. Even in America, where vaccines are plentiful, only about 30% of Mississippians and Alabamans are fully protected. Although the world is set to produce around 11 billion doses of vaccine this year, it will be months before all those jabs find weapons, and longer if rich countries monopolize doses in case, they could have them. need.

The lack of vaccination is aggravated by new variants. Delta, first spotted in India, is two to three times more contagious than the virus that came out of Wuhan. Cases spread so quickly that hospitals can quickly run out of beds and medical staff (and sometimes oxygen), even in places where 30% of people have had injections. Today's variants are spreading even among the vaccinated. No mutation has yet reduced the ability of vaccines to prevent almost all serious illnesses and deaths. But the next one might.
None of these changes the fact that the pandemic will eventually subside, even though the virus itself is likely to survive. For those lucky enough to have been fully vaccinated and have access to new treatments, covid-19 is already rapidly becoming a non-fatal disease. In Britain, where Delta is dominant, the death rate if you're infected is now around 0.1%, similar to seasonal flu: a danger, but manageable. If a variant required a reformulated vaccine, its creation wouldn't take long.
However, as vaccines and treatments become more abundant in rich countries, the anger that people in poor countries die for lack of supplies will also increase. This will cause friction between the rich countries and the others. Travel bans will separate the two worlds.
Eventually, the flights will resume, but other behavioral changes will last. Some will be deep. Take America, where the booming economy surpassed its pre-pandemic level in March, but still only scores 73 on our index, in part because big cities are quieter and more people work from home. So far, it looks like the legacy of covid-19 will follow the pattern set by past pandemics. Nicholas Christakis of Yale University identifies three changes: the collective threat causes growth in state power; the upheaval of everyday life leads to a search for meaning; and the proximity of death which brings caution while disease rages, stimulates daring when it is over. Everyone will mark society in their own way.
When people in rich countries retreated to their homes during the closures, the state barricaded itself with them. During the pandemic, governments were the primary channel for information, policy makers, a source of money and, ultimately, vaccine providers. Roughly speaking, the governments of the rich countries paid 90 cents for every dollar of production lost. Much to their own amazement, the politicians who curtailed civil liberties found that most of their citizens applauded.
There is a vigorous academic debate on whether the lockdowns were worth it. But the great government's legacy of the pandemic is already visible. Just look at the Biden administration's spending plans. Whatever the problem – inequality, sluggish economic growth, security of supply chains – a bigger, more militant government seems to be the preferred solution.
There is also evidence of a renewed search for meaning. This reinforces the shift towards an identity policy on the right as well as on the left, but it goes further than that. About one in five people in Italy and the Netherlands told Pew, a pollster, that the pandemic had made their countries more religious. In Spain and Canada, around two in five people say family ties have strengthened.
Leisure has also been affected. People say they had 15% more free time. In Britain, young women spent 50% more time with their noses in a book. Literary agents were overwhelmed by the early novels. Part of that will fade: Media companies fear a "recession in attention." But some changes will remain. For example, people may decide they want to escape pre-pandemic chores at work, and tight labor markets may help. In Britain, applications for medical schools increased 21% in 2020. In the United States, business start-ups are at their highest level since record breaking in 2004. One in three Americans who can work at home wants to do it five days a week, according to surveys. Some bosses order people to enter the office; others try to attract them.

Those who don't die roll the dice

It is still unclear whether the appetite for risk is about to rebound. Basically, if you survive a deadly disease, you can consider yourself one of the lucky ones and the devil can care. In the years since the Spanish Flu a century ago, a thirst for arousal erupted in everything from sexual license to the arts to the speed craze. This time around, the new frontiers could range from space travel to genetic engineering, artificial intelligence and augmented reality. Even before the arrival of the coronavirus, the digital revolution, climate change and the rise of China seemed to put an end to the Western order ruled by the West after World War II. The pandemic will accelerate the transformation.

SARS-CoV-2 variants

Alpha variant (B.1.1.7) Beta variant (B.1.351)	Gamma variant (P.1) Delta variant (B.1.617.2)	Eta variant (B.1.525) Iota variant (B.1.526)	Kappa variant (B.1.617.1) Lambda variant (C.37)

▶▶ **Read also:** https://www.livescience.com/coronavirus-variants.html

Varenicline blocks SARS-CoV-2 infection in cells and animal models

Source: https://www.news-medical.net/news/20210705/Varenicline-blocks-SARS-CoV-2-infection-in-cells-and-animal-models.aspx

July 05 – As the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)-induced coronavirus disease 2019 (COVID-19) pandemic continues to spread in the face of vaccination roll-outs, albeit at a reduced rate, the realization that global vaccination will not be achieved for another year or two has led to continued attempts to find a suitable antiviral therapy.

A new paper released on the *bioRxiv* preprint server suggests that the nicotinic acetylcholine receptor (nACHR) agonist, varenicline tartrate, has antiviral activity against the virus.

Background

The need for protective immunity against the virus is heightened not only by the inevitable delay in universal immunization against COVID-19, but by the rapid emergence of newer variants of concern (VOCs) that are resistant to neutralization by therapeutic antibodies and convalescent serum.

This includes the alpha variant, which rapidly rose to a dominant position, before being itself overtaken by the delta variant. These are both much more transmissible than the original Wuhan variant. The alpha variant also has a 63% higher mortality within 28 days.

The SARS-CoV-2 pathogen enters host cells via the angiotensin-converting enzyme-2 (ACE2), while the host transmembrane serine protease 2 (TMPRSS2) enzyme also plays a major role in priming the virus spike protein. Since the nasal mucosa expresses both these proteins on the epithelium, it could be the most vulnerable to infection within the airway.

Involvement of nicotinic cholinergic system

Since early studies have shown that a low prevalence of smoking is associated with reduced hospitalization rates for COVID-19, some scientists have postulated that the nicotinic cholinergic system is implicated in the spread of this virus.

The virus spike protein is predicted to be able to bind to nAChR, according to binding simulations, and one study has shown a putative sequence within the receptor binding domain (RBD) of the spike glycoprotein of SARS-CoV-2 that acts similarly to nAChR-binding snake venom.

Such interactions could account for immunologic pathology in COVID-19, including the disease flares or acute myasthenia-like findings in patients with autoimmune disease on contracting SARS-CoV-2 infection or after receiving mRNA vaccines against this virus.

Varenicline as antiviral

In this scenario, the researchers explored the potential role of the selective small-molecule nAChR agonist varenicline tartrate. This compound mimics the activity of nACh at the α7 receptor and is a partial agonist at the α3β4, α3α5β4, α4β2, and α6β2 receptors.

Its clinical approval at present is as an oral tablet meant to help quit smoking, though it is being studied for its use in treating dry eye syndromes. The current study is based on computational modeling, showing that it may bind at high affinity to the spike protein of SARS-CoV-2 at the hinge site.

In vitro efficacy

The study showed that varenicline indeed reduced viral titers in two different cell cultures to half the expected level at concentrations of 0.3 μM to 0.5 μM – the half-maximal inhibitory concentration (IC50). When tested against the alpha variant, the IC50 was even lower, at 0.13 μM, while for the beta VOC, it was 4μM.

In neither of these conditions did the cells show any toxicity effects.

In vivo efficacy

A second phase of the study explored the efficacy of the drug in rhesus macaques exposed to SARS-CoV-2. This animal model has shown consistent mild to moderate disease following infection with this virus, with high viral loads in the respiratory tract and several patches of lung inflammation.

Varenicline inhibited SARS-CoV-2 in monkeys, with no changes in the rapidity of breathing, respiratory trouble, or fecal consistency. There were only small changes in body weight and temperature.

When treated with varenicline OC-01 nasal spray, viral loads were dramatically reduced as judged by reverse transcriptase-polymerase chain reaction (RT PCR) measuring genomic ribonucleic acid (RNA), as well as sub-genomic (sg) RNA. These are expected to be at high levels when the virus is actively replicating.

Both genomic and sub-genomic RNA levels went down approximately 100-fold and 200-fold, compared to control cells. At 4 days from exposure, sgRNA levels had fallen below detectable levels.

What are the implications?

The researchers have presented the results of a pioneering study showing the antiviral activity of a nAChR agonist against SARS-CoV-2. The growth of the virus in cell cultures, following treatment with varenicline over a range of dosages and using wild-type, alpha and beta variants, was severely suppressed, while leaving the cell viability intact.

In vivo studies using a rhesus monkey model showed that varenicline applied as a nasal spray, at an estimated dose of 1 mM, successfully prevented infection with the virus, and its replication in the nasal cavity, within 24 hours of administration.

"*The results suggest a sound rationale for the use of OC-01 (varenicline) nasal spray as a therapeutic for pre-exposure/post-exposure prophylaxis to prevent infection, to decrease viral load, and/or to lessen severity and transmission of SARS-CoV-2.*"

Since varenicline can be used topically as an aqueous nasal spray, it can achieve high local concentrations in the nasal mucosa. Moreover, this averts potential side effects due to systemic administration. In addition, it tackles the virus at the site of the first entry. And finally, it retains efficacy against alpha and beta variants as with the wild-type virus.

This confirms earlier in silico studies that indicate the ability of varenicline to bind directly to the SARS-CoV-2 RBD, at the hinge site, showing high affinity. This is thought to block the change of the spike protein into the 'up' conformation, which is necessary for binding to the ACE2 receptor or the nAChR and subsequent infection of the host cell.

The spike also binds to the nAChR directly, though not via the RBD, but at the Y674-R685 region. In fact, this part of the protein may actually take on distinct conformations after binding to the α4β2 and α7 nAChR subtypes, which are observed to have high binding affinity for this agent.

This second action suggests that varenicline will continue to show efficacy against new VOCs since its affinity for the Y674-R685 region of the spike or for nAChRs does not depend on the RBD conformation.

Finally, the nicotinic cholinergic system is thought to prevent severe COVID-19, which is due in part to the induction of a hyperactive immune-inflammatory response, triggering a cytokine storm, which results in multi-organ dysfunction.

What is the conclusion?

"Given the in vitro and in vivo effectiveness seen in the studies, varenicline nasal spray warrants further investigation as an antiviral agent for pre-exposure/post-exposure prophylaxis, and/or prevention of transmission of SARS-CoV-2 wild-type and variants," write the researchers.

Imiquimod – A toll like receptor 7 agonist - Is an ideal option for management of COVID 19

By Athina Angelopoulou, Nikos Alexandris, Evangelia Konstantinou, et al.

Environ Res. 2020 Sep; 188: 109858.

Laboratory of Molecular Biology and Immunology, Department of Pharmacy, University of Patras, 26500, Greece

Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7309930/

According to numerous recent publications, the COVID-19 patients have lymphopenia, higher infection-related biomarkers and several elevated inflammatory cytokines (i.e., tumor necrosis factor (TNF)-α, interleukin IL-2R and IL-6). The total number of B cells, T cells and

NK cells are significantly decreased. RNA viruses, SARS-CoV-2 included, hit the innate immune system in order to cause infection, through TLRs 3, 7 and 8. Imiquimod is an immune-stimulator that activates TLR 7 and can be used to enhance the innate and adaptive immunity. Preclinical and clinical trials are proposed.

▶▶ Read also: https://nemertes.lis.upatras.gr/jspui/bitstream/10889/13412/1/Imiquimod_Repository.pdf

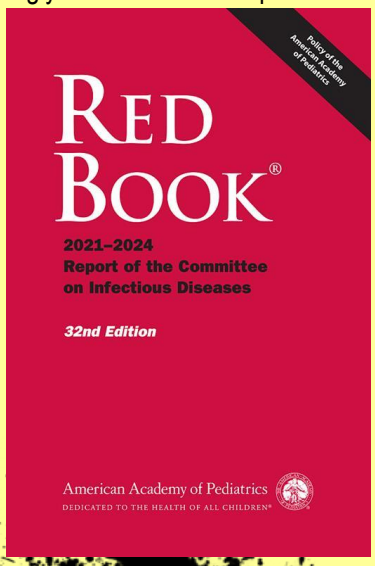
Neonates, breastfeeding infants included in new CDC guidance on plague

American Academy of Pediatrics
Source: https://www.aappublications.org/news/2021/07/15/cdc-plague-treatment-071521

July 15 – A new report offers recommendations on the antimicrobial treatment and prophylaxis of plague, both naturally occurring and in a bioterror attack, including guidance related to neonates and breastfeeding infants.
The evidence-based guidance published today in *Morbidity and Mortality Weekly Report* (MMWR) from the Centers for Disease Control and Prevention (CDC) is aimed at clinicians, public health professionals and first responders. Organizations, hospitals and communities can use the information for treating patients and in a mass casualty.
Yersina pestis, the agent that causes plague, is in the highest risk category of biologic agents and toxins. An attack would require rapid and informed decision-making by clinicians and public health agencies, according to the report *Antimicrobial Treatment and Prophylaxis of Plague: Recommendations for Naturally Acquired Infections and Bioterrorism Response*.
New data have become available and the Food and Drug Administration has approved additional countermeasures since plague guidelines were published in 2000. AAP experts were among those in clinical medicine, bioterrorism preparedness and public health who took part in forums beginning in 2018 and contributed to the updated publication.

Transmission, types

Y. pestis transmitted to humans through the bite of an infected vector (often a rodent flea), through direct contact with infected tissues or fluids, or via inhalation of infected droplets. The route of transmission determines the primary clinical form of plague, such as bubonic, pneumonic, septicemic (fever and sepsis without localizing signs), meningeal and pharyngeal (with or without cervical lymphadenopathy).
Pneumatic is the only clinical form that can be transmitted from person to person, but bubonic plague is the most common clinical presentation in humans.
Naturally-occurring plague frequently affects children, although they don't appear to be at greater risk for death or serious complications compared with adults, the report stated.
Despite its high case-fatality rate, plague is treatable with antimicrobials and supportive care. Aminoglycosides and fluoroquinolones are the mainstays of treatment, and early recognition is critical.



Neonates
Plague in neonates has not been documented often. Treatment should be initiated as soon as possible for those who are symptomatic and infected with *Y. pestis* before, during or after birth. Tables in the report outline first-line and alternative treatments. Postexposure prophylaxis should be given to all neonates exposed postnatally. Consult the report for more detail.
When selecting antimicrobials for treatment and prophylaxis of plague among neonates, consider the following factors:

- Many medications must be administered intravenously to ensure the full dose is taken. Some neonates have gastroesophageal reflux, which makes it difficult for them to get a full dose of medication orally. Breast milk or formula contains substantial amounts of calcium and other minerals that can inhibit the absorption of some antimicrobials.
- Many antimicrobials have not been evaluated or approved for use in neonates.
- Some antimicrobials carry risks for this age group, such as bilirubin displacement and the potential for kernicterus associated with sulfonamides. General adverse reactions can include disruption of the gut microbiome.

Breastfeeding infants
While studies have not assessed the presence of *Y. pestis* in the breast milk of infected mothers, suspected transmission from mother to child has not been reported and risk is considered to be low. Mothers with the *pneumatic* form can continue breastfeeding if they are receiving antimicrobial treatment and their infant is receiving microbial or postexposure prophylaxis.
The report also discusses the selection of antimicrobials for lactating mothers and concentrations of the medications that are detected in breast milk. With the exception of chloramphenicol, most of the antimicrobials recommended for *Y. pestis* treatment or prophylaxis produce low concentrations in breast milk and have an acceptable safety profile.

▶▶ **Resource:** Information from the AAP Red Book on plague

The COVID-19 Pandemic: Catalyst or Complication for Bioterrorism?

By Gregory D. Koblentz and Stevie Kiesel
Studies on Conflict and Terrorism
Source: https://www.tandfonline.com/doi/abs/10.1080/1057610X.2021.1944023?journalCode=uter20&

The COVID-19 pandemic demonstrates how an infectious disease can cause massive casualties, destabilize governments, and garner intense media attention as countries struggle to respond effectively. Will the pandemic inspire terrorist groups to consider biological weapons, hoping to replicate these effects? This question is the latest iteration of the debate over the risk posed by bioterrorism, which is characterized by three camps: optimists, pessimists, and pragmatists. This article revisits these schools of thought in light of COVID-19 and analyzes recent developments among extremists to assess the new risk of bioterrorism. The article concludes with recommendations for policymakers to mitigate this risk.

Chinese Company's Global Genetic Data Collection Poses Economic, Security Threats: Experts

By Adrianna Zhang
Source: http://www.homelandsecuritynewswire.com/dr20210716-chinese-company-s-global-genetic-data-collection-poses-economic-security-threats-experts

July 16 – A Chinese gene company is collecting genetic data through prenatal tests from women in more than 50 countries for research on the traits of populations, raising concern that such a large DNA database could give China a technological advantage and the strategic edge to dominate global pharmaceuticals, according to a recent news report.
Analysts expressed unease with the developments exclusively reported by Reuters at BGI Group, the Chinese gene company, which is collecting genetic data via its NiPT prenatal test with the brand name NIFTY (Non-Invasive Fetal TrisomY).
The tests, sold in more than 50 countries, can detect abnormalities such as Down syndrome in the fetus by capturing DNA from the placenta in the bloodstream about 10 weeks into a pregnancy.
The tests are sold in 52 countries, including Germany, Spain and Denmark, as well as in Britain, Canada, Australia, Thailand, India and Pakistan, according to Reuters. They are not sold in the United States, where "government advisers warned in March that the genomic data BGI is amassing and analyzing with artificial intelligence could give China a path to economic and military advantage," Reuters reported.
Collecting the biggest and most diverse set of human genomes could propel China to dominate global pharmaceuticals, and also potentially lead to genetically enhanced soldiers, or engineered pathogens to target the U.S. population or food supply, the U.S. advisers said, according to Reuters.
Reggie Littlejohn, founder and president of the rights group Women's Rights Without Frontiers, said that due to China's strategy of fusing military and civilian interests, "any Chinese company can be forced by the government to supply its information to the military."
China sells the prenatal tests "a good product at a lower cost because they're able to do that," Littlejohn said. "But what people don't realize is that when they get these lower cost genetic tests," the collected information goes to the Chinese military," she told VOA via a video interview using Microsoft Teams.
The Reuters report said the company has "worked with the Chinese military to improve 'population quality' and on genetic research to combat hearing loss and altitude sickness in soldiers."

China's Ministry of Foreign Affairs dismissed the report, telling Reuters it was "a groundless accusation and smear campaign."
Dan Harris, an international lawyer and author at the *China Law Blog*, told VOA Mandarin that he believes democratic entities, such as the United States, Japan, Korea, Australia and the European Union, are going to realize they "need to enact special laws to deal with China and China's hoovering of data."
Crystal Grant, a data scientist and molecular biologist with a Ph.D. in genetics who is a technology fellow in the Speech, Privacy and Technology Project at the American Civil Liberties Union, told VOA Mandarin via Teams video interview that this accumulation of DNA will challenge genomic policy worldwide.
By using what she described as "this massive amount of information" and supercomputers "to crack those codes is going to be a threat to genomic policy everywhere," she told VOA in a video interview.
Huang Yanzhong, a senior fellow for global health at the Council of Foreign Relations, told VOA Mandarin in a TV interview in February that rapid advances in genetics and biotechnology have highlighted the need for the international community to step up regulations to prevent data abuse.
"It is not just China. The progress in the legal framework in this area is lagging behind," Huang said. "It's vital for the international community to sit down and work out a framework."

Genetic Engineering

Yet researchers worldwide in the academic, private and government sectors, are refining genetic engineering techniques and knowledge.
China's interest in the field is not new. In 2018, researcher He Jiankui announced that he had produced twins genetically altered to resist HIV using a relatively new, accurate and very fast American-developed genetic editing technique known by its acronym, CRISPR.
In 2019, a Chinese court found He guilty of using "illegal medical practices" and sentenced He to three years in prison.

Prenatal Privacy

Reuters found no evidence BGI violated patient privacy agreements or regulations. "However, the privacy policy on the NIFTY test's website says data collected can be shared when it is 'directly relevant to national security or national defense security' in China," the report stated.
BGI dismissed the Reuters report, saying that the company's research has met national and international requirements.
"All NIPT data collected overseas are stored in BGI's laboratory in Hong Kong and are destroyed after five years, as stipulated by General Data Protection Regulation (GDPR)," the company said in a statement released on July 9.
BGI emphasized that it developed the NIPT test alone, not in a partnership with China's military.
Reuters interviewed four women who have used the BGI's prenatal tests in Poland, Spain and Thailand. They all signed consent forms stating that their genetic data would be stored and used for research, yet they are not aware that their genetic information could end up in China.
Harris, the lawyer, told VOA that most of the time, people didn't know what they were signing.
"Maybe the sign off says that it will be limited to BGI and BGI access, though XYZ, a Chinese military company, might be one of BGI's subsidiaries," which would mean that the consent form allowed BGI to transfer a woman's genetic information to the Chinese military, he told VOA via Microsoft Teams.
One of the women, a 32-year-old office administrator from Poland, told Reuters that she would have chosen a different test had she known that her data might end up in China being used for research involving military applications.
U.S. federal authorities have been watching BGI's record on data collection. Bill Evanina, former director of the United States National Counterintelligence and Security Center, told the CBS-TV newsmagazine *60 Minutes* in January that he was extremely concerned when BGI offered to provide COVID-19 testing kits to several U.S. states last year.
"Knowing that BGI is a Chinese company, do we understand where that data's going?" Evanina asked. They are the ultimate company that shows connectivity to both the communist state as well as the military apparatus."
Edward You, supervisory special agent with the FBI and a former biochemist, told *60 Minutes* in the same January episode that Beijing authorities are betting that accumulating large amounts of human DNA will prove to be a successful strategy.
"They are building out a huge domestic database," You said. "And if they are now able to supplement that with data from all around the world, it's all about who gets the largest, most diverse data set. And so, the ticking time bomb is that once they're able to achieve true artificial intelligence, then they're off to the races in what they can do with that data."
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Cannes film festival shaken by mid-air bio-terrorist attack flick Emergency Declaration

Source: https://www.geo.tv/latest/360450-cannes-film-festival-shaken-by-mid-air-bio-terrorist-attack-flick-emergency-declaration

July 17 – Cannes was shaken Friday by a South Korean virus flick about a bio-terrorist attack on a passenger plane.

Eerily evocative of the ongoing Covid pandemic, "**Emergency Declaration**" by director Han Jae-rim tells the story of a **vengeful biochemist spreading a deadly mutant corona-like virus on an aircraft**.

As passengers start dying messily, police on the ground scramble for solutions.

Critics at the thriller´s first screening instinctively adjusted their masks -- which are mandatory during Cannes screenings -- as they watched the fictional, airborne virus spread death through the plane.

But while the actual coronavirus pandemic loomed large during the filming of "Emergency Declaration", it was never meant to be its theme. "It´s not ´Covid, The Movie,´" director Han insisted.

"When we prepared for the movie, there was no Covid-19. We knew SARS, but nobody was talking about coronavirus," he told AFP.

"At one level, it´s an action movie, I wanted to make it entertaining," he said. "But I also wanted to show how people react when they are confronted with a catastrophe."

Fast-paced action sequences and a tight storyline make the movie´s 147 minutes fly by, with Han saying he aimed to make sure that "the situation is shown in a very realistic way" without sliding into panic-inducing "cliches".

For cabin scenes with the aircraft in tailspin, the crew built a rotating cylinder, with camera operators filming inside, strapped tight into rigs.

"That is something that even Hollywood doesn´t often do," Han said.

Many scenes are filmed with handheld cameras so "viewers get the full experience inside the plane, and are not just distant spectators," he added.

Humanity makes progress

Han goes further, exploring fear, cowardice and selfishness sparked by the virus crisis, but also bravery, solidarity and self-sacrifice.

"Some are cowards, some run away, but you can also see that, despite everything, humanity makes progress because there are always people with courage," Han said.

Filming, which took place entirely during the pandemic, was briefly interrupted in the summer of 2020 when there was a virus scare over one of the actors who was in contact with a positive case, but eventually tested negative.

"In the beginning I thought Covid might help viewers to really immerse themselves in the film," lead actor Lee Byung-hun told AFP. But as the pandemic spread, he began to worry.

"When reality gets more powerful than fiction, the film´s force can be diminished. But now I realise that any viewer with experience of Covid can plunge into the movie even more intensely," Lee said.

Apart from Lee, a superstar in Korea but also in Hollywood thanks to "G.I. Joe: The Rise of Cobra" and "The Magnificent Seven", the film also features Jeon Do-yeon, who won the best actress award at Cannes in 2007.

Song Kang-ho, another famous Korean actor who sits on the festival´s main jury this year, plays a police chief.

South Korea -- which won the last Palme d´Or in 2019 with Bong Joon-ho´s "Parasite" -- has a booming film industry notorious for its hard-hitting thrillers and often gore-filled horror flicks.

"Emergency Declaration" premiered out of competition at Cannes, which closes on Saturday.

AlphaFold, AlphaGo, and RoseTTaFold – remember these words in the near future!

Fauci Says Smallpox Eradication Would've Been Unlikely With Today's Vaccine Misinformation

Source: https://www.newsweek.com/fauci-says-smallpox-eradication-wouldve-been-unlikely-todays-vaccine-misinformation-1610770

July 17 – Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, on Saturday said that smallpox and polio eradication would have been unlikely in the U.S. with today's vaccine misinformation.

"If we had had the pushback for vaccines that we're seeing in certain media ... we probably would still have smallpox and we'd probably still have polio in this country if we had the false information that's being spread now," Fauci told CNN's Jim Acosta in an interview.

"If we had that back decades ago, I would be certain that we'd still have polio in this country."

Fauci's remarks came as the White House strengthened its rhetoric against false information on social media about the coronavirus vaccine.

U.S. Surgeon General on Thursday warned that misinformation had become a "serious threat to public health," calling out Facebook for failing to adequately prevent the spread of COVID-19 falsehoods.

President Joe Biden said Friday that social media platforms like Facebook are "killing people" by hosting the spread of vaccine misinformation. "They're killing people—I mean they're really, look, the only pandemic we have is among the unvaccinated," the president told reporters.

White House press secretary Jen Psaki also criticized social media platforms for not doing enough to address misinformation. "Why don't we all participate in a process that will help provide accurate information out there?" she said.

Facebook rebuffed the Biden administration's allegations in a statement on Saturday. "President Biden's goal was for 70% of Americans to be vaccinated by July 4. Facebook is not the reason this goal was missed," Guy Rose, the company's vice president of integrity, wrote in a blog post.

He also noted that data suggests vaccine hesitancy has decreased by 50 percent among U.S. users of Facebook, with 85 percent saying they have been vaccinated or want to get vaccinated against COVID-19. "These and other facts tell a very different story to the one promoted by the administration in recent days," said Rose.

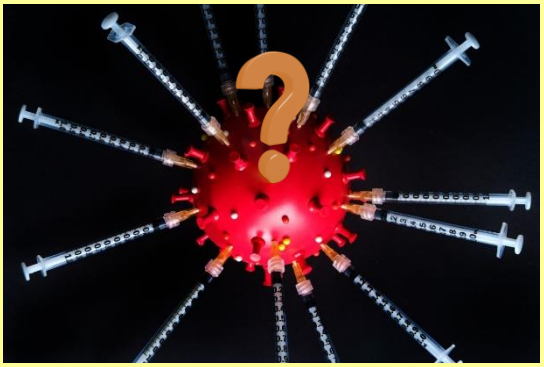
The more-virulent Delta variant of the coronavirus has caused cases and deaths to rise again after six months of steady decline. The Centers for Disease Control and Prevention (CDC) on Friday reported a nearly 70 percent surge in new cases and 36 percent increase in hospitalizations over the past week.

Health officials have ramped up efforts to encourage vaccinations as surges appear worse in areas with low vaccination rates. However, new cases have also increased in New York and Los Angeles, two states that reportedly met Biden's Fourth of July goal of vaccinating 70 percent or more of adults with at least one shot of the vaccine.

"This is becoming a pandemic of the unvaccinated," said CDC Director Dr. Rochelle Walensky Friday. "If you remain unvaccinated, you are at risk."

To boost or not to boost? The big COVID-19 vaccine question

Source: https://newatlas.com/health-wellbeing/are-boosters-needed-coronavirus-vaccine-mrna-cdc-pfizer/



July 13 – **When will COVID-19 vaccine booster shots be necessary?** Pfizer has recently claimed a third booster dose of its vaccine may be needed six to 12 months after full vaccination but not everyone is convinced, with new research finding mRNA vaccines could offer years of protection.

A recent press release from Pfizer and BioNTech offered an update on their ongoing clinical trial testing the effect of a third booster shot of their current mRNA vaccine delivered six months after a second dose. No specific data was outlined in

the statement, instead the companies simply noted a booster shot delivered six months after initial vaccination elicited high levels of protection.

"… we have said, and we continue to believe that it is likely, based on the totality of the data we have to date, that a third dose may be needed within 6 to 12 months after full vaccination," the companies stated in the press release. "While protection against severe disease remained high across the full 6 months, a decline in efficacy against symptomatic disease over time and the continued emergence of variants are expected."

In a rare move the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA) released a joint statement pushing back on the booster claims by Pfizer and BioNTech. Noting virtually all recent COVID-19 deaths and hospitalizations were among unvaccinated individuals, the federal agencies indicated there is currently no evidence to indicate the need for a booster shot.

"Americans who have been fully vaccinated do not need a booster shot at this time," the joint statement noted. "We continue to review any new data as it becomes available and will keep the public informed. We are prepared for booster doses if and when the science demonstrates that they are needed."

Earlier this week Pfizer and BioNTech representatives met behind closed doors with senior US health officials to present their data arguing for third booster shots. Described by Anthony Fauci, the White House's chief medical advisor, as a "courtesy meeting", US officials came out of the discussion unconvinced of a current need for booster shots. However, Fauci did stress this could change at any point in the future even though right now, there is no evidence a third boost is necessary.

"The discussion about boosters is really an appropriate preparation on the part of the [drug] companies together with the NIH and the CDC and others in being prepared in the eventuality that you might need a boost," Fauci said in a CNBC interview following the meeting.

Pfizer and BioNTech plan to submit their booster trial data in full to regulatory bodies within weeks. Plus, a write-up of data the companies are using to push the third booster should appear soon in a peer-reviewed journal.

A blog post from National Institutes of Health director Francis Collins has called Pfizer and BioNTech's booster shot suggestion premature. He says vaccine protection looks strong so far, including new data on emerging variants such as Delta.

Collins particularly cites a study recently published in *Nature* offering promising signs mRNA vaccines generate long-lasting protection. The unique research followed 14 participants for 15 weeks after Pfizer vaccination. Lymph node biopsies were conducted at several points over the study, with the researchers investigating germinal center activity in those tissue samples.

"The lymph nodes are where the human immune system establishes so-called germinal centers, which function as 'training camps' that teach immature immune cells to recognize new disease threats and attack them with acquired efficiency," Collins explains. "In this case, the 'threat' is the spike protein of SARS-COV-2 encoded by the vaccine."

Ali Ellebedy, senior author on the new study, says these germinal centers were effectively producing spike-protein-targeting B cells for the entire 15 weeks of the study. And, following the conclusion of the study, the researchers continued to detect persistent germinal center activity, suggesting vaccine-induced immunity could be long-lasting.

"We found that germinal centers were still going strong 15 weeks after the vaccine's first dose," says Ellebedy. "We're still monitoring the germinal centers, and they're not declining; in some people, they're still ongoing. This is truly remarkable."

Collins notes these kinds of memory B cells can survive for years, or even decades. And although this study does offer clues to potential long-lasting immunity from SARS-CoV-2 mRNA vaccination, it also raises lots of questions that need answers if we're going to think about future vaccine booster scenarios.

"What is the most reliable correlate of immunity from COVID-19 vaccines?" Collins asks. "Are circulating spike protein antibodies (the easiest to measure) the best indicator? Do we need to know what's happening in the lymph nodes? What about the T cells that are responsible for cell-mediated immunity?"

It's perhaps inevitable that booster shots will be necessary at some point, either to enhance waning immunity or to battle new vaccine-evading variants. But right now, according to Jay Butler from the CDC, there is no sign those vaccinated back in December are displaying a need for booster shots, implying it is unlikely a booster shot is needed at least within the first six to 12 months after initial mRNA vaccination.

"We're not seeing evidence at this point in time that waning immunity is occurring among people who were vaccinated back last December or January and that they are at higher risk of breakthrough infections," says Butler.

The World Health Organization (WHO) has come out and explicitly criticized both Pfizer and those countries already ordering booster shots. With billions of people in low and middle-income countries still struggling for initial vaccine supplies the disparity between rich and poor countries is stark. And the WHO says it is unethical to shift supply to countries with high vaccination rates when so many are still suffering.

"Right now, we are condemning hundreds of millions of people to having no protection," says Mike Ryan, head of the WHO's Health Emergencies program. "We will look back in anger, and we will look back in shame if countries use precious doses on booster shots, at a time when vulnerable people are still dying without vaccines elsewhere. These are people who want to have their cake and eat it, and then they want to make some more cake and eat it too."

Inside the UAE's largest freezer farm that stores millions of Covid-19 vaccines

Video: https://www.thenationalnews.com/uae/2021/07/18/inside-the-uaes-largest-freezer-farm-that-stores-millions-of-covid-19-vaccines/

A site in Abu Dhabi's port district is being used as a vital centre to send millions of coronavirus vaccine doses across the globe, especially to the developing world.

EDITOR'S COMMENT: Although the video is very informative, I think it is not a good idea to provide so detailed info on the Internet. Freezer farms might become the new target for terrorists – the unexpected always happens!

New long COVID studies warn we're still in "uncharted territory"

Source: https://newatlas.com/health-wellbeing/new-study-long-covid-symptoms-coronavirus/

July 18 – With successful vaccines helping prevent hospitalizations and deaths from COVID-19 scientists are racing to understand the long-term effects of this novel disease. Dubbed "long COVID", a handful of new studies are beginning to shed light on this unusual chronic condition, highlight who is more susceptible and what kind of symptoms are most common.

A new study led by researchers at University College London is presenting the largest investigation into the symptoms of long COVID conducted to date. **The research surveyed nearly 4,000 long COVID subjects spanning 56 countries.**

"While there has been a lot of public discussion around long COVID, there are few systematic studies investigating this population; hence relatively little is known about its range of symptoms, and their progression over time, the severity, and expected clinical course (longevity), its impact on daily functioning, and expected return to baseline health," says senior author Athena Akrami.

The research focused on those initial COVID-19 cases, diagnosed early in 2020. All participants were over the age of 18 and suffered from symptoms lasting at least 28 days.

A striking 203 different symptoms were identified in the study, the most common matching prior long COVID studies – fatigue, brain fog and reductions in exercise capacity. But a huge array of diverse symptoms were also reported, including sexual dysfunction, shingles and bladder issues.

"Headaches, insomnia, vertigo, neuralgia, neuropsychiatric changes, tremors, sensitivity to noise and light, hallucinations (olfactory and other), tinnitus, and other sensorimotor symptoms were also all common, and may point to larger neurological issues involving both the central and peripheral nervous system," notes Akrami.

Only 6.8 percent of the entire cohort had completely recovered and were symptom-free by the time the study was completed.

The vast majority of long COVID patients surveyed (89.1 percent) reported exercise or stress as the primary trigger for symptom relapses, and almost half of the cohort were working less than they were pre-illness.

Although this new study offers a comprehensive insight into the characteristics of long COVID, it doesn't investigate how common the condition is. However, its prevalence seems to be closely connected to the severity of the first few weeks of infection.

University of Birmingham researchers have suggested those COVID-19 patients suffering from five or more symptoms in their first week of infection are the cohort most likely to suffer from long COVID. This finding is irrespective of age or gender.

An early long COVID study looking at more than 1,700 hospitalized subjects from Wuhan found 76 percent of that cohort reported at least one ongoing symptom six months later. More recent research is backing up those early findings, affirming around 70 percent of COVID-19 cases severe enough to need hospitalization result in some kind of persistent symptoms up to six months after the acute illness.

For those suffering more mild disease the research so far suggests between 10 and 30 percent will experience some kind of lingering symptoms. One calculation from researchers at Imperial College London estimates there currently could be more than two million people in England suffering from long COVID symptoms.

Danny Altmann, from Imperial College London, is part of the front line of long COVID research. He says one of the only things that is clear right now is that long COVID is certainly a real phenomenon.

"… I'm very impressed when I look around the world, at different cohorts of people in different countries who've been infected, that they're all describing the same kind of thing," says Altmann. "They're saying that they may have had quite mild COVID-19 infection, or severe infection, or even asymptomatic infection, and yet for several weeks, or months, or now years afterwards, many of them are describing the same kind of pattern of symptoms."

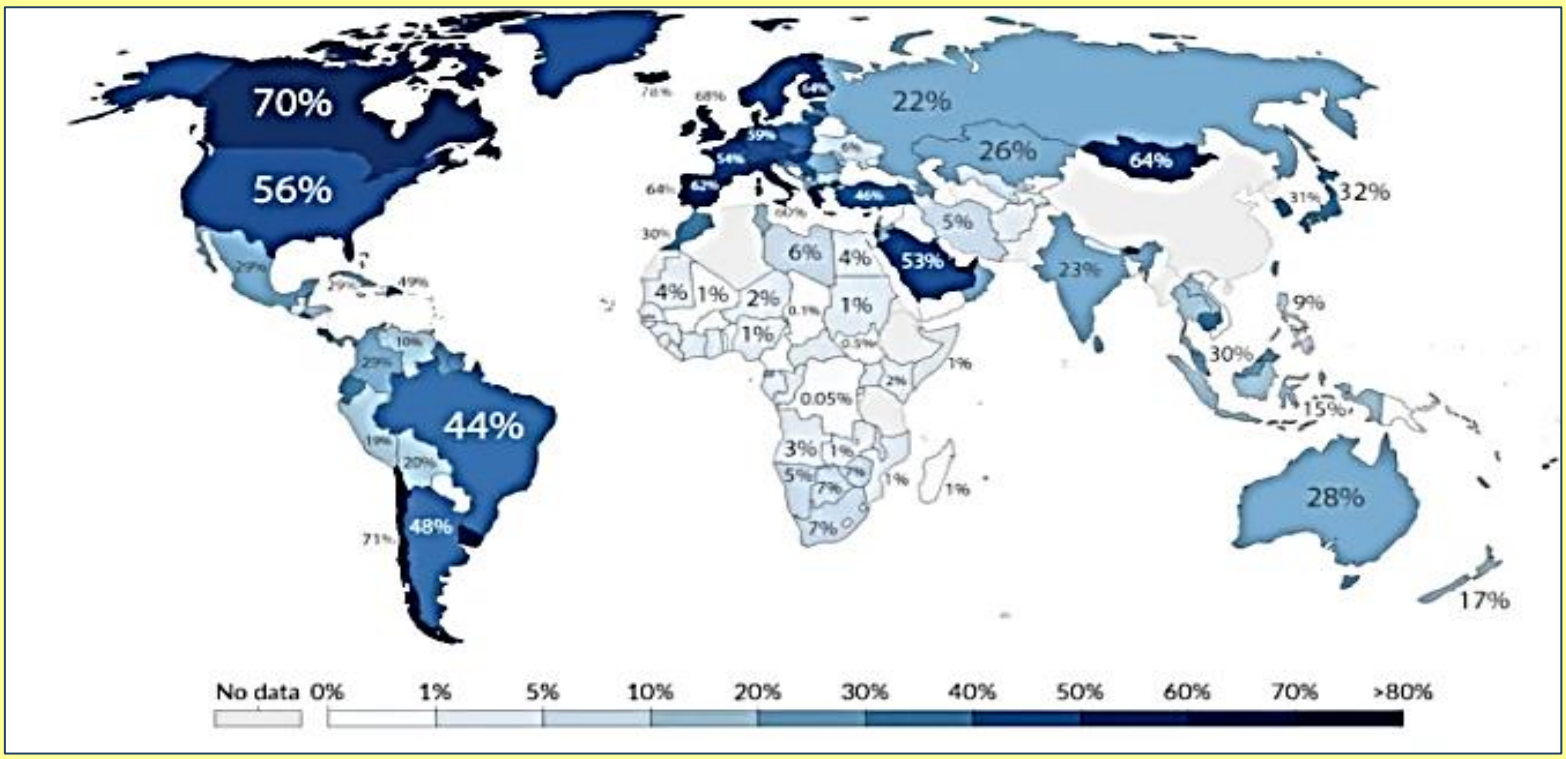
Beyond that, however, is a huge array of questions that will take time to answer. Is long COVID a passing condition that will dissipate after a year or two? Does long COVID predispose a person to other illnesses? What exactly is causing long COVID, and how can we treat it?

Altmann says it is precisely this "uncharted territory" we are entering that is so worrying. There is precedent for viral infections triggering long-term health issues – glandular fever, Epstein Barr virus and Ebola are just a few examples of long-term immune disruptions following an acute infection.

"And without straying into politics, it's one of the reasons why I do worry," says Altmann, "when I see people being laissez faire, saying 'Well, if we've got the stage where people aren't dying, and aren't filling up the intensive care units, do we need to care?'. And the answer is, I think, until we've got more data, we don't know how much we need to care."

Striking map shows the vaccination divide between a few rich countries and the rest of the world

Source: https://news.yahoo.com/striking-map-shows-vaccination-divide-085108443.html



July 19 – A map shows the huge difference in vaccination rights between some rich countries and the rest of the world.

The graph, produced by Max Roser of the site Our World in Data, shows the proportion of each country to receive at least one dose of a coronavirus vaccine:

It shows European countries, North America, and some in South America with high rates, with especially low rates across Africa.

Tedros Adhanom Ghebreyesus, the head of the World Health Organization, blamed "greed" for the disparity last week, and said rich countries should donate their excess vaccines instead of using them as boosters.

"We are making conscious choices right now not to protect those in need," he said.

Experts have warned that the unequal vaccine rates means some countries will end up being more heavily affected by the pandemic. They also warn that it will likely prolong the pandemic, even for those richer countries, as the virus keeps mutating and circulating.

Roser said on Twitter that he supported the WHO scheme for distributing vaccines to poorer countries, called COVAX.
"I think rich countries should support COVAX and finance the production of more vaccines to end the global pandemic."

China reports its first death of a human from rare Monkey B virus

Source: https://news.yahoo.com/china-reports-first-death-human-110330191.html

July 19 – A man in China has died after contracting a rare infectious disease from primates, known as the Monkey B virus, Chinese health officials revealed in a report Saturday. The victim, a 53-year-old veterinarian based in Beijing, was the first documented human case of the virus in China.

According to the Chinese Center for Disease Control and Prevention, the man worked in a research institute that specialized in nonhuman primate breeding and dissected two dead monkeys in March. He experienced nausea, vomiting and fever a month later, and died May 27. His blood and saliva samples were sent to the center in April, where researchers found evidence of the Monkey B virus. Two of his close contacts, a male doctor and a female nurse, tested negative for the virus, officials said.

The Monkey B virus, or herpes B virus, is prevalent among macaque monkeys, but extremely rare - and often deadly - when it spreads to humans. In humans, it tends to attack the central nervous system and cause inflammation to the brain, leading to a loss of consciousness, said Kentaro Iwata, an infectious disease expert at Kobe University in Tokyo. If untreated, there's about an 80 percent fatality rate.

There have been fewer than a hundred reported human infections of herpes B since the first case of primate-to-human transmission in 1932, many of them in North America, where scientists tend to be more aware of the disease, Iwata said. There are likely to be cases of the virus that have gone undetected, but experts still widely believe that it is an extremely rare condition among humans.

Victims have tended to be veterinarians, scientists or researchers who work directly with primates and could be exposed to their bodily fluids through scratches, bites or dissections. In 1997, a primate researcher in New York died six weeks after a caged monkey flung a drop of liquid at her face, hitting her eye. According to the U.S. Centers for Disease Control and Prevention, there has only been one documented case of an infected human spreading the virus to another person.

Both herpes B and the novel coronavirus are "the consequence of species jumps," said Nikolaus Osterrieder, dean of the Jockey Club College of Veterinary Medicine and Life Sciences in Hong Kong. "But the important difference is that in the case from herpes B, it's a dead end. It's not jumping from one human to another human," he added. "SARS-CoV-2, on the other hand, acquired the ability to spread to a new host."

Osterrieder said herpes B is very well-adapted to macaque monkeys and unlikely to mutate in a way that it will start to spread rapidly among humans. Nonetheless, both he and Iwata emphasized that they hope more people learn about the disease and take the right safety precautions, especially when interacting with monkeys in non-research settings, such as at a zoo or in nature. Officials in Florida debated last year what to do over a rapidly multiplying population of rhesus monkeys - an emerging tourist attraction - many of which carried the herpes B virus.

Chinese health authorities said discovery of the Monkey B virus in a human suggests that it might "pose a potential zoonotic threat to occupational workers," adding that it's necessary "to strengthen surveillance in laboratory macaques and occupational workers."

By Monday, news of the veterinarian's death had been viewed more than 110 million times on the Chinese social media platform Weibo.

"Apart from researchers, most people should stay away from wild animals," said one post with several thousand likes. "You may want to be close to nature, but nature doesn't want to be close to you."

Last week, Dallas County health officials in Texas reported the case of a man with a rare case of monkeypox, which can also be transmitted when people are bitten or scratched by an animal.

EDITOR'S COMMENT: China? Again? Give us a break! More than 200 people tracked for possible exposure to monkeypox

What are bioterrorist brokers?

Source: https://gruntstuff.com/what-are-bioterrorist-brokers/222463/

July 19 – The **Bioterrorism brokers are pathogenic organisms or organic toxins which have the potential to trigger illness and demise in people, animals, or vegetation.** Whereas these pathogens might not pose a risk to people as they are present in nature, they do might be intentionally uncovered to people, animals or vegetation with the intention of killing or inflicting concern in individuals.

As we've simply stated, bioterrorist brokers can be utilized as they are present in nature or might be modified to enhance their virulence, making them proof against at the moment out there antibiotics and vaccines. To this point, there have already been varied incidents of bioterrorism which have occurred world-wide and all through historical past.

Transient historical past of bioterrorism

Bioterrorist brokers are categorised as **huge destruction weapons** and though this phrase has turn out to be in style in recent times, the reality is that **bioterrorism has been a risk to society for hundreds of years**.

Documented circumstances of bioterrorism date again **to the sixth century B. C.,** when the Assyrians **used the ergot mushroom to poison enemy wells**. Throughout the fourteenth century, in accordance with historic accounts, **the Black Dying got here to Europe from the Crimea as a result of the corpses had been catapulted over the wall** of the town in the course of the siege of Caffa as a way of organic warfare.

These historic strategies of bioterrorism had been extensively investigated in the course of the **World Struggle II and the Chilly Struggle** to arrange for and counter potential bioterrorism assaults.

Extra just lately, America suffered its worst organic assault in historical past when **dispatched letters laced with anthrax in America mail**, shortly after the terrorist assaults of September 11. **5 individuals died and there have been 17 injured**.

The reality is that, as expertise advances, so does **its potential to extend the impression of bioterrorist assaults**. It's now potential to genetically alter organisms by modifying them to fulfill particular necessities.

Whereas this expertise has been developed for optimistic purposes, comparable to the event of latest most cancers therapies, there may be additionally the likelihood that this expertise shall be utilized by these planning bioterrorism assaults to **enhance the virulence of a pathogen and improve the impression of the hypothetical assault**.

Bioterrorist brokers at the moment recognized

For the time being, **greater than 65 potential brokers have been recognized** of various bioterrorism. Among the many finest recognized, together with the illness they trigger, is *Bacillus anthracis* (**anthrax**), *Yersinia pestis* (**pneumonic plague**), Variola main

(**smallpox**), influenza (**avian flu**), Brucella species (**Brucellosis**), arenavirus, bunyavirus, and filovirus (**viral hemorrhagic fevers**), **SARS-associated coronavirus**, amongst others.
The truth that a number of brokers have already been utilized in acts of bioterrorism has given scientists the likelihood to **predict how future acts of bioterrorism might unfold** with these brokers, permitting them to forestall and put together to regulate and decrease the impression of such assaults. Nevertheless, there may be nice concern concerning the risk that **new brokers are developed with using new expertise**.
Scientists concern the likelihood that **recognized pathogenic viruses are rebuilt with the results of bettering their virulence.** On this sense, they are additionally involved that using expertise serves to **develop new microorganisms**, with the potential to launch extremely poisonous chemical substances within the physique.
Along with elevated pathogens and new engineering, scientists are additionally involved about **future brokers of bioterrorism assaults**, which embody the highly effective new pressure of botulism, often called **botulism H**. For the time being, **there isn't any remedy for this pressure and it's deadly**. On this line, the **growth of antibiotic resistant brokers** it's also one other concern.
To complete, remark that, curiously, **coronaviruses** have been on the watch listing in recent times as **potential new brokers of bioterrorism**. With the numerous impressions of the Covid-19 pandemic, scientists will possibly keep watch over this group of viruses and **put together to isolate and deal with future outbreaks**.

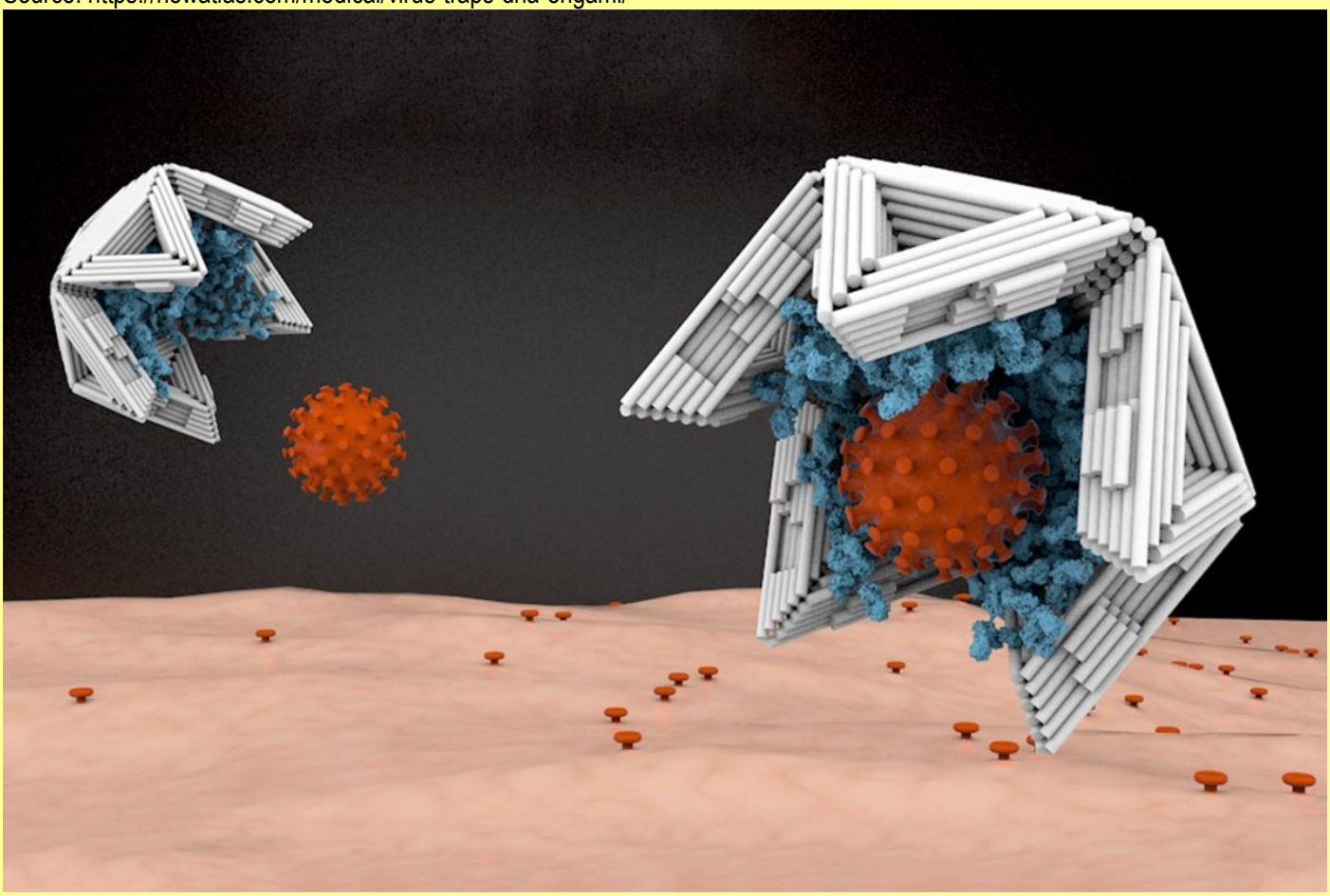
Researchers hunt for a long COVID diagnostic blood test

Source: https://newatlas.com/science/long-covid-diagnostic-blood-test-cambridge-cytokine/

July 19 – A big flush of funding from the National Institute for Health Research (NIHR) in the United Kingdom is pushing new research on ways to diagnose and treat long COVID. A University of Cambridge team receiving NIHR funding is now working on a blood test to objectively diagnose long COVID using immune biomarkers.
"Long COVID can have serious and debilitating long-term effects for thousands of people across the UK, which can make daily life extremely challenging," says Sajid Javid, the UK government's health and social care secretary. "This new research is absolutely essential to improve diagnosis and treatments and will be life-changing for those who are battling long-term symptoms of the virus."
A team from the University of Cambridge is investigating whether there are any blood-based biomarkers that can be used to easily diagnose long COVID. Nyarie Sithole, co-lead on the research, says there is a real need to find a way to objectively track this emerging chronic condition.
"Because we currently have no reliable way of diagnosing long COVID, the uncertainty can cause added stress to people who are experiencing potential symptoms," explains Sithole. "If we can say to them 'yes, you have a biomarker and so you have long COVID', we believe this will help allay some of their fears and anxieties."
The Cambridge researchers have been following a number of long COVID patients for several months. Collecting regular blood samples, the researchers are currently looking at a particular immune biomarker that may be a specific sign of long COVID.
Cytokines are small proteins released by immune cells, and the initial stages of the research homed in on a particular cytokine produced by immune T cells in response to SARS-CoV-2 infection. The cytokine is detectable for several months following viral infection, and the researchers suspect it could be an effective way to test whether a person has been previously infected with SARS-CoV-2.
That pilot research also revealed another type of cytokine that seemed to be persistently present in long COVID patients and not patients who have completely recovered from COVID-19. It is this particular biomarker the researchers suspect could be a useful way to objectively diagnose those with long COVID.
The new NIHR funding will allow the Cambridge team to scale up their study and include up to 500 long COVID patients in their ongoing work. Sithole says the link between long COVID and a specific immune biomarker offers clues to the role the immune system may be playing in this new chronic condition.
"One of the theories of what's driving long COVID is that it's a hyperactive immune response – in other words, the immune system switches on at the initial infection and for some reason never switches off or never goes back to the baseline," says Sithole. "As we'll be following our patients for many months post-infection, we hope to better understand whether this is indeed the case."
A trio of long COVID research projects at Oxford University also received NIHR funding boosts. These include an investigation into the effects of vaccination on long COVID and a detailed lung imaging study looking to understand the mechanisms behind persistent breathlessness in long COVID patients.

Scientists build tiny "virus traps" out of DNA origami

Source: https://newatlas.com/medical/virus-traps-dna-origami/



An artist's impression of the new virus traps constructed out of DNA origami (Elena-Marie Willner/DietzLab)

Ju;y 20 – Researchers at the Technical University of Munich (TUM) have developed a new method to treat viral infections by making traps. The team folded DNA into nano-capsules with specialized binding points inside them, which could grab hold of viruses and render them inert.

For the last few years the team has been experimenting with programming DNA to fold into “blocks” and plates which then assemble into shapes like origami. For the new work the researchers decided to see if they could use this technology to make hollow bodies that were about the size of a virus, which could then clamp over the bugs and prevent them from infecting cells.

To do so, the team started with a shape called an icosahedron, which is made up of 20 triangular surfaces. Using DNA origami they created a half-shell of 180 subunits, and lined the center with molecules that bind to viruses. The outer surfaces are then irradiated with UV light and treated with polyethylene glycol and oligolysine, to keep the traps from degrading in body fluids.

The team tested the traps in lab cell cultures, containing mouse serum, human cells and viruses. The structures remained stable in the serum for 24 hours, and successfully captured two different types of viruses – hepatitis B and adeno-associated viruses (AAVs). In both cases, the traps prevented the viruses from infecting human cells.

"Even a simple half-shell of the right size shows a measurable reduction in virus activity," says Hendrik Dietz, corresponding author of the study. "If we put five binding sites for the virus on the inside, for example suitable antibodies, we can already block the virus by 80 percent, if we incorporate more, we achieve complete blocking.”

The concept of a virus trap sounds a little familiar, but takes a different approach. Last year another team of German scientists designed bacteriophages that mimic structures in lung cells that the flu virus binds to, which reduces the number of viruses that go on to infect the real cells.

The researchers say that the next step is to test these traps in mice, and they expect that they should be well-tolerated by the human body. And the underlying tech of building nanostructures out of DNA origami could eventually have other applications as well.
"In addition to the proposed application as a virus trap, our programmable system also creates other opportunities," says Dietz. "It would also be conceivable to use it as a multivalent antigen carrier for vaccinations, as a DNA or RNA carrier for gene therapy or as a transport vehicle for drugs."

▶▶ **The research was published in the journal** *Nature Materials*.

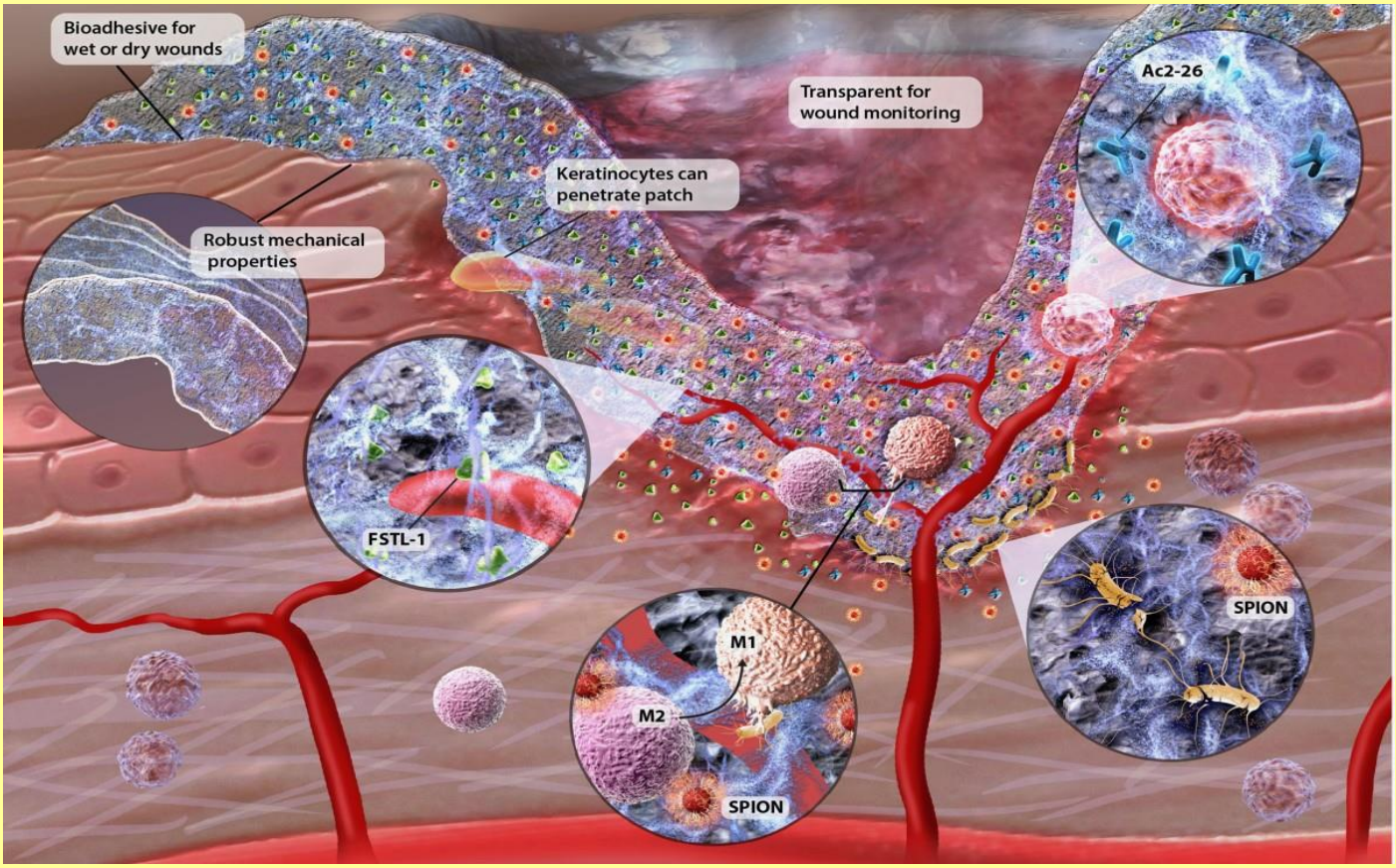
EDITOR'S COMMENT: Just another proof that human brain is made for divine innovations instead of evil actions!

Imperfect Vaccination Can Enhance the Transmission of Highly Virulent Pathogens

Source:https://journals.plos.org/plosbiology/article?id=10.1371%2Fjournal.pbio.1002198&fbclid=IwAR27qhCSAxNtAfGBRCD_9PVnqmN7R9RR_fPqnohbCAVkMlrsolrPXiOr-Ng

Inexpensive collagen-based dressing could help heal chronic wounds

By Ben Coxworth
Source: https://newatlas.com/medical/inexpensive-collagen-dressing-chronic-wounds/



A diagram of the dressing, which is not yet available for clinical use – The Journal of Molecular Pharmaceutics

Chronic wounds such as diabetic foot ulcers can be very difficult to treat, potentially leading to amputations or even death due to associated infections. A new dressing, however, may be able to heal such wounds while remaining much less expensive than other materials.

Currently, many chronic wound dressings incorporate harvested natural biological tissue. Obtaining those tissues from donors – and working them into the material – is typically a very complex process. According to Michigan State University (MSU), this means that such dressings may ultimately cost up to US$1,000 each.

Seeking a more affordable alternative, an international team led by MSU's Asst. Prof. Morteza Mahmoudi has instead looked to collagen, which is the main structural protein in the extracellular matrix of the body's connective tissues.

The dressing has a three-dimensional scaffolding-like microstructure, made up of interwoven nanofibers of collagen and other biopolymers. When applied to a wound, the scaffolding serves the same purpose as the skin's extracellular matrix, acting as a sort of "roost" for adjacent skin cells to migrate into and reproduce.

A sample of the dressing pictured against a neutral backdrop (top) and on a simulated wound (bottom) – Michigan State University

Added to the nanofibers are the protein FSTL-1, which prompts blood vessels to regenerate; iron oxide nanoparticles, which help prevent infections by stimulating immune cells and killing bacteria; and amino acids known as peptides, which keep the immune response from becoming too aggressive.

The dressing itself is transparent, so caregivers don't have to remove it in order to visually track the healing process. In fact, they don't need to remove it at all, as it dissolves and is harmlessly dissolved by the body over time.

So far, the material has been tested on 13 patients with chronic wounds, all of whom were cured. The technology is now being commercialized by UK firm PGWC, with hopes that the dressing may eventually be available for only about $20 a piece.

A paper on the research – which also involved scientists from Harvard Medical School, Emory University, Georgia Tech, Rutgers State University, Canada's McGill University, Germany's University of Siegen and Spain's University of Santiago de Compostela – was recently published in the journal *Molecular Pharmaceutics*.

*Based out of Edmonton, Canada, **Ben Coxworth** has been writing for New Atlas since 2009 and is presently Managing Editor for North America. An experienced freelance writer, he previously obtained an English BA from the University of Saskatchewan, then spent over 20 years working in various markets as a television reporter, producer and news videographer. Ben is particularly interested in scientific innovation, human-powered transportation, and the marine environment.*

Sanofi and GSK start Covid vaccine 'rolling review'

Source: https://www.thenationalnews.com/coronavirus/2021/07/20/sanofi-and-gsk-start-covid-vaccine-rolling-review/

July 20 – Europe's drug regulator said on Tuesday it had started a real-time review of **Vidprevtyn**, the Covid-19 vaccine developed by French drugmaker Sanofi and Britain's GlaxoSmithKline, which showed promising results in trials in May.

The decision to start the "rolling review" of the vaccine was based on preliminary results from lab studies and early stage clinical trials in adults, the European Medicines Agency (EMA) said. It is the fifth shot under such a review currently.

Late-stage global trials for the protein-based coronavirus vaccine candidate began in May.

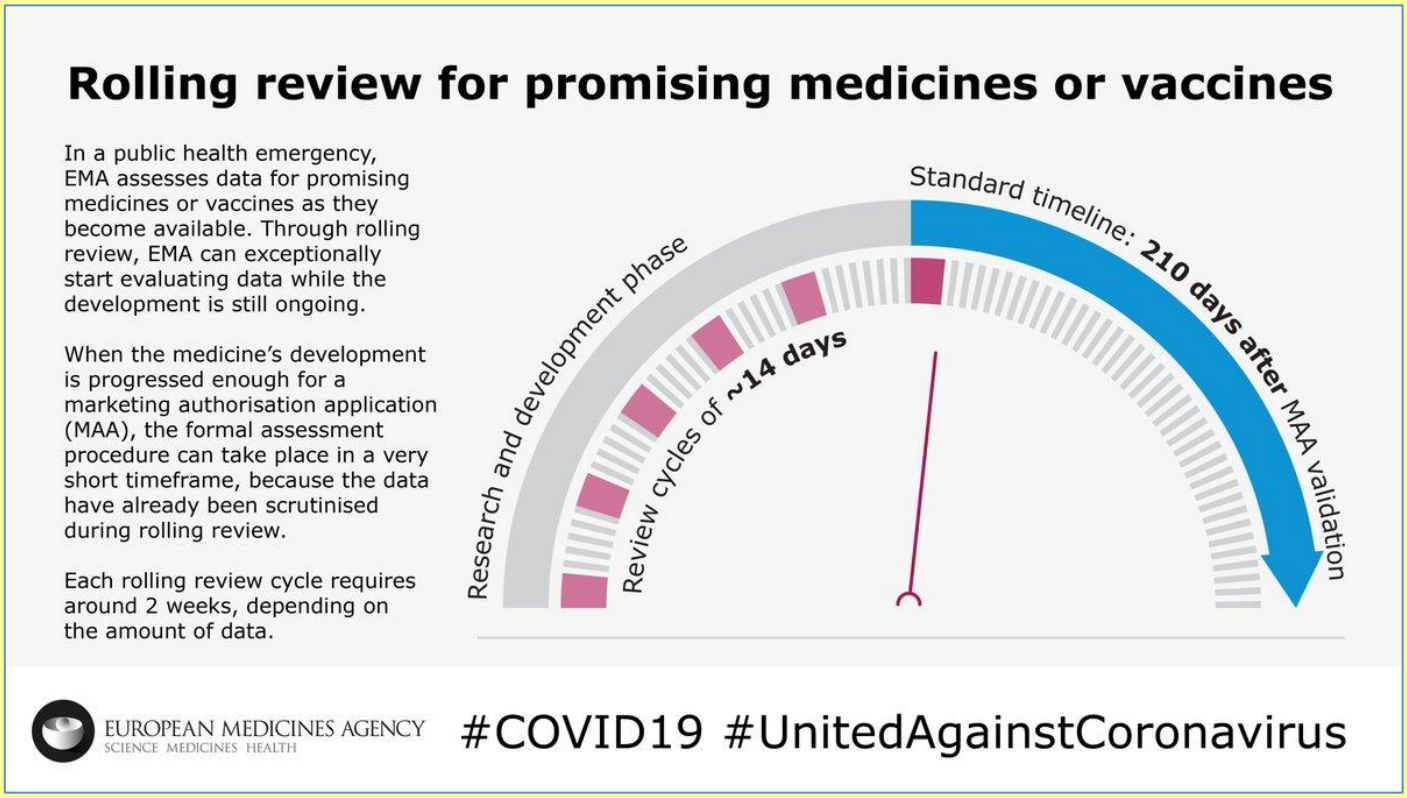
Sanofi and GSK hope to gain approvals by the end of 2021 after early stage results showed the vaccine produces a robust immune response.

"EMA will assess the compliance of Vidprevtyn with the usual EU standards for effectiveness, safety and quality," the regulator said.

It did not give details of data it had received so far or an expected timeline for approval.

EMA's rolling reviews are aimed at speeding up the approval process by allowing researchers to submit findings in real time before final trial data is available.

Vidprevtyn uses the same technology as one of Sanofi's seasonal influenza vaccines. It will be coupled with an adjuvant, a substance that acts as a booster to the shot, made by GSK.



The Covid-19 vaccine candidates in EU's rolling review

- Vidprevtyn
- CureVac
- Novavax
- Sinovac
- Sputnik V

Dozens of new viruses discovered in 15,000-year-old glacier ice

Source: https://newatlas.com/science/new-viruses-15000-year-old-glacier-ice/

July 20 – Scientists have collected viruses from almost-15,000-year-old ice samples, taken from glaciers on the Tibetan Plateau. **Dozens of species were found to be unknown to science,** which could provide an intriguing look back at the history of viral evolution.

Glaciers are fantastic at preserving deep history, as they trap particles of dust, traces of gas, microbes, and plant matter from different time periods. Since these layers build up over time, scientists can drill and study ice cores to learn a huge amount about ancient climates, what was in the atmosphere, and what kinds of life existed at various points of history.

In the new study, led by researchers from Ohio State University, ice cores were drilled from the Guliya ice cap on the Tibetan Plateau, which were dated as far back as 14,400 years old. The team then analyzed these cores for what kinds of viruses they contained, and the genetic

Figure 1: Map of Tibetan Plateau. *Source*: www.yowangdu.com

codes of 33 viruses were identified. Four of these were found to belong to known types of bacteriophage, viruses that prey on bacteria, but at least 28 of them didn't match any known type.
The team hypothesizes that the viruses probably originated in plants and soil, but they weren't necessarily thwarted by the cold – in fact, around half of them seemed to be well suited to life on the ice.
"These are viruses that would have thrived in extreme environments," says Matthew Sullivan, co-author of the study. "These viruses have signatures of genes that help them infect cells in cold environments – just surreal genetic signatures for how a virus is able to survive in extreme conditions."
Contamination by modern microbes is a serious problem for this kind of study, so the researchers developed a new method for sterilizing the ice cores. They removed half-centimeter (0.2-in) layers of the outer material with different techniques – first band saw scraping, then an ethanol wash, and finally a sterile water wash. The inner section of the core could then be examined free of contamination.
The team tested this sterilization process on their own artificial ice cores, which were coated in bacteria, viruses and DNA. After they conducted their three-step process, no traces of these mock contaminants were detected in the inner ice cores.
The researchers say that being able to better study ancient microbes can help scientists better understand the history of their evolution, as well as how they handled changing climates in the past – and how well they might in future. The sterilization method could also come in handy for finding traces of viral genetic sequences in samples taken on the Moon or Mars.

▶▶ **The research was published in the journal** *Microbiome*.

EDITOR'S COMMENT: Prepare for new adventures?

Israeli lab: Some existing drugs could stop COVID at almost 100%

Source: https://www.jpost.com/health-science/israeli-lab-some-existing-drugs-could-stop-covid-at-almost-100-percent-674426

July 21 – Scientists from the Hebrew University of Jerusalem say they have identified several drugs that could potentially help treat, if not "cure," people who develop COVID-19.
Prof. Shy Arkin, a biochemist in the Alexander Silberman Institute of Life Science, told *The Jerusalem Post* that in lab tests in which cells infected with SARS-CoV-2 were placed together with the drugs for two days, "almost 100% of the cells lived despite being infected with the virus."
In contrast, without the preexisting drug compounds, around 50% of the cells died after coming in contact with the virus.
Arkin and his team culled through a library of more than 2,800 approved-for-use compounds, identifying 18 drugs they felt could be effective. In unpublished work, the researchers were able to show that several of these compounds "exhibited remarkable potency against the whole virus in in vitro experiments."
Two of them are Darapladib, used for the treatment of atherosclerosis, and Flumatinib, used for the treatment of certain blood cancers. Arkin said he was hesitant to share the names of any of the drugs, adding that he could not recommend them until they underwent proper clinical trials.
The team focused on drug repurposing to potentially expedite any future regulatory steps. Since the drugs are already being used for other indications, their toxicity and side effects, for example, are known and approved.
The way the drugs work is by inhibiting two targets in the virus: the **E (envelope) protein and the 3a protein.**
The E protein is the most conserved of all virus proteins. For example, while the spike proteins of SARS-CoV-2 and SARS-CoV-1 (the 2003 virus) are only about 75% identical, their E proteins are roughly 95% alike. This means the drugs would likely remain effective even when the virus mutates, Arkin told the *Post*.
The Pfizer and Moderna vaccines target the spike protein.
In previous studies, E and 3a proteins were shown to be essential for viral infectivity. Arkin's team was among the first to study the E protein of the first SARS coronavirus in 2004.
As part of research that Arkin's team has been conducting for more than two decades, they identified that the **E protein is an ion channel, a type of protein family expressed by virtually all living cells that because of its structure has "served as excellent and frequent targets for pharmaceutical point interventions**," including for cystic fibrosis, epilepsy, arrhythmia, neurodegenerative diseases, hypertension, angina and more, the report said.
It is important that "a large arsenal" of drugs exist to fight SARS-CoV-2, Arkin said.

"We should never be in a situation where in our arsenal we only have one firearm," he said. "If we only have one and we rely solely on it, and then there comes a time that it fails, we will be in a very precarious situation."
Arkin believes his team is set for in vitro and in vivo studies, and he is looking for a pharmaceutical partner to help carry these trials through.
Citing the success of Gilead obtaining US Food and Drug Administration approval for Remdesivir in record time at the start of the pandemic, Arkin said he was optimistic that at least some of these compounds could be approved for use against COVID "very quickly with the right partner."

Should children get COVID vaccines? What the science says

Source: https://www.nature.com/articles/d41586-021-01898-9

July 20 – At a time when much of the world is still struggling to access COVID vaccines, the question of whether to vaccinate children can feel like a privilege. On 19 July, vaccine advisers in the United Kingdom recommended to delay vaccines for most young people under 16, citing the very low rates of serious disease in this age group. But several countries, including the United States and Israel, have forged ahead, and others are hoping to follow suit when supplies allow.
Nature looks at where the evidence stands on children and COVID vaccines.

Is it necessary?

Since the early days of the pandemic, parents have been taking some comfort from the fact that SARS-CoV-2 is far less likely to cause serious illness in children than it is in adults.
But some children do still become very ill, and the spectre of long COVID — a constellation of sometimes debilitating symptoms that can linger for months after even a mild bout of COVID-19 — is enough for many paediatricians to urge vaccination as quickly as possible. "I spent the pandemic taking care of kids in a children's hospital," says Adam Ratner, a paediatric infectious disease specialist at New York University. "We saw not as many as in the adult side, but plenty of children who were quite ill."
Vaccine advisers in the United Kingdom, however, have recommended that only adolescents who are clinically vulnerable, or who live with vulnerable adults, will be vaccinated for the time being. Severe illness, deaths and even long COVID are rare among healthy adolescents and children, and nearly all vulnerable adults will have soon received two vaccine doses, University of Bristol paediatrician Adam Finn told reporters at a media briefing.
But in some countries, still little is known about how COVID affects children. Some official tallies of hospitalizations and deaths due to COVID in sub-Saharan Africa, for example, do not break down the cases by age. As a result, paediatricians don't know which deaths were in children and young people, and how outcomes of COVID might be affected by conditions such as malnutrition, or concurrent tuberculosis or HIV infection. "We are feeling in the dark," says Nadia Sam-Agudu, a paediatrician with the University of Maryland School of Medicine in Baltimore who works in Nigeria.
In addition, some paediatricians are concerned about what will happen to children who are co-infected with SARS-CoV-2 and other common viruses, such as respiratory syncytial virus, which is one of the causes of the common cold but can sometimes cause more severe breathing illness in young children. Strict lockdowns have kept this problem at bay in some regions, but as social distancing measures are eased, there are already signs that respiratory syncytial virus infections in children are rising, says Danilo Buonsenso, a paediatrician at the Gemelli University Hospital in Rome. "We don't know yet what will be the burden of co-infections in children when we have a massive circulation of routine viruses and COVID," he says.

Is vaccinating children safe?

A handful of vaccines have been tested in young people over the age of 12, including mRNA vaccines made by Moderna and Pfizer–BioNTech, and two Chinese vaccines made by Sinovac and Sinopharm. And several countries, including the United States, Israel and China, are now offering vaccines to this age group. Other studies are expected to report results in young people over the age of 12 soon, including studies on the Zydus Cadila vaccine and the Covaxin inactivated coronavirus vaccine, both made in India.
Thus far, the vaccines seem to be safe in adolescents[1], and some companies have moved on to carrying out clinical trials in children as young as 6 months old. In the United States, vaccines for those under 12 might be available later this year, says paediatrician Andrea Shane at Emory University in Atlanta, Georgia.
A potential link between the Pfizer vaccine and heart inflammation — conditions called myocarditis and pericarditis — has emerged since Israel and the United States began vaccinating young people. However, researchers have yet to establish that the vaccine

caused the inflammation. Most of those affected have recovered, and the data suggest that the risk of these conditions is "extremely low", says paediatrician David Pace at the University of Malta in Msida — on the order of about 67 cases per million second doses in adolescent males aged 12–17, and 9 per million in adolescent females in the same age group.

How will vaccinating children and young people affect the pandemic?

Malta has fully vaccinated 80% of its population — one of the highest vaccination rates in the world — and is now also vaccinating adolescents over the age of 12. There, the decision to vaccinate young people was shaped, among other factors, by the close-knit family structures in a country where adolescents often have frequent contact with their grandparents, says Pace. "On a population level, vaccinated adolescents may result in a reduction in transmission to vulnerable older people," he says. Young people in Malta also often travel abroad for school, potentially importing coronavirus infections and variants from abroad, he adds.

Data show that children and particularly adolescents can play a significant part in coronavirus transmission, says Catherine Bennett, an epidemiologist at Deakin University in Melbourne, Australia. And concerns about transmission by children and adolescents are growing as new coronavirus variants emerge. It's possible that more-transmissible variants will develop a way to push through whatever it is in a young person's immune response that makes them more resistant to infection, says Bennett, making it all the more important that they are vaccinated.

Hopes of achieving herd immunity through immunization have waned, so countries need to do the best that they can to keep transmission low, she adds: "You only need one poorly vaccinated population to generate global variants."

Is vaccinating children fair?

Chile, another country with one of the highest COVID vaccination rates in the world, is also rolling out vaccines to those aged 12 and older.

But Miguel O'Ryan, a former member of two advisory committees to the government there who has pushed for aggressive vaccination campaigns, now finds himself wondering whether it's time to slow down. "Probably countries should not move forward with paediatric vaccinations so fast," says O'Ryan, who is a paediatric infectious disease specialist at the University of Chile in Santiago. "Other countries, even our neighbours, are struggling very hard to get enough vaccines for their high-risk groups."

O'Ryan is not the only one concerned about using valuable vaccines to inoculate children, when more vulnerable populations around the world are still struggling to secure supplies. In May, World Health Organization chief Tedros Adhanom Ghebreyesus said that wealthier countries that are vaccinating children are doing so at the expense of health-care workers and high-risk groups in other countries. But advocates for vaccinating children and young adults argue that it need not be a case of one or the other. "This is sort-of a false dichotomy," says Ratner. Sam-Agudu agrees, pointing out that some wealthy countries bought more than enough doses to fully vaccinate their populations. "The argument for sending vaccines outside the country should not preclude vaccinating children in higher-income countries," she says.

And there are other steps that could be taken to improve the supply of vaccines to needy countries, says Bennett. More could be done to better target donations, she notes. For example, rather than allocating donated vaccine doses to countries based solely on how many people live there, they could be distributed based on other factors, such as the need to preserve health-care services in the face of an oncoming malaria season, or ongoing measles outbreak. "We probably still haven't had the deep epidemiological war room that we need to map out the problem and the best way to address it," she says. "There's a whole range of ways you could look at this."

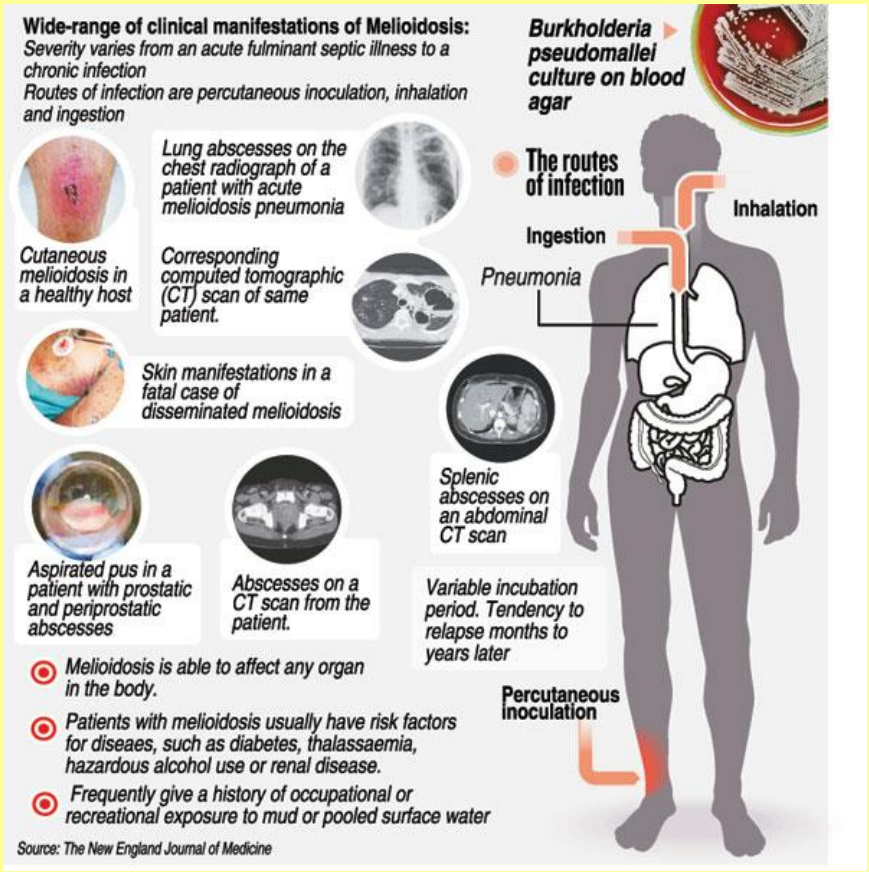
Hope for vaccine amid fears disease found in suburban gardens could be a biological weapon

Source: https://www.abc.net.au/news/2021-07-21/breakthrough-discovery-in-meliodosis-vaccine-search/100306988

July 21 – North Queensland scientists have made a major breakthrough in the hunt for a vaccine for a deadly disease linked to suburban gardens.

Melioidosis is prevalent in northern parts of Australia and is linked to direct contact with contaminated soil or water.

Each year about 20 people in northern parts of Australia are diagnosed with the disease and, of those, one in five cases are fatal. The disease has also been found in parts of southern Queensland.



In a major breakthrough, Townsville microbiologist Dr Robert Norton has found proteins that elicit an immune response to melioidosis.

"These may be useful for vaccine candidates and early diagnosis," he said.

The proteins have been harvested and sent to a research team in Hawaii that has been given $US3 million by the US Department of Defence to advance the study.

"There has been a lot of interest, worldwide, and particularly from the United States in developing a vaccine against melioidosis," Dr Norton said.

"The organism [***Burkholderia pseudomallei***] that causes the disease is of concern because it's a bioterrorism agent."

Bioterrorism is the use of an infectious agent or other substance — such as anthrax — as a weapon of terrorism.

Dr Norton said the mortality rate and serious illness caused by melioidosis made it a disease of particular concern.

"It kills one in five people in Australia and up to 70 percent of people in parts of South-East Asia," he said.

While the majority of melioidosis patients survive, the disease is debilitating, leaving many in intensive care.

Townsville man Barry Maxwell was diagnosed with melioidosis in January this year, days after he began struggling to go to the bathroom and suffering from fevers.

"I was in hospital for three weeks. I was on heavy antibiotics for months after that," Mr Maxwell said.

UAE scientists launch animal study in quest to help treat Covid in humans

Source: https://www.thenationalnews.com/coronavirus/2021/07/23/uae-scientists-launch-animal-study-in-quest-to-help-treat-covid-in-humans/

July 23 – A Covid-19 antibody test that detects if animals were exposed to the coronavirus has been developed by a team of scientists in the UAE. More than 500 samples of blood from different species of animals, stored at the Central Veterinary Research Laboratory in Dubai, were selected for testing.

The oldest sample, which was in a deep freeze, was taken from a camel 34 years ago, and the most recent on Wednesday.

Researchers hope the antibody test will help detect which species contracted Covid-19 and which later developed antibodies against the virus.

Dr Ulrich Wernery, a veterinary microbiologist at CVRL, said the findings could eventually lead to vital answers in helping doctors to treat infected patients.

“We have samples from about 18 different animal species including lions, tigers, gazelles, sheep, goats, camels, horses, cats and dogs,” he said.

"If we find antibodies in samples of the animals, then we know that, at one point, they would have been exposed to the virus.
"Interestingly, 34 years ago, we collected blood samples from 50 camels and tested them against the Mers virus.
"Mers was only discovered in the 2000s, but our samples showed that some camels had antibodies against the virus, which meant they had developed it decades before."
There is no solid evidence that animals play a significant role in spreading SARS-CoV-2, the virus that causes Covid-19, to people.
Based on available information, the risk of animals spreading the virus to people is considered low but possible with close contact.
As part of the research, Dr Wernery said he wanted to understand how Covid-19 spreads across both human and animal kingdoms as well as which animals can catch the virus.
All 500 samples were removed from frozen storage to be prepared for testing. The full process will start next week and will take 14 days to complete.
The "antibody ELISA test" will produce results from each sample on the same day. "For each sample we remove the cells and leave only the fluid, because cells can disturb the results," he said. "It is quite a complicated process but for this specific test we need to use traces of the Covid-19 virus, so we are using a dead version of it. "We then load the dead virus on to the ELISA plate and if an antibody shows up in the serum sample it will attach to the virus. "That is how we will measure the results and learn if an animal previously had Covid-19 or not. "I cannot hypothesise what the results will be but it is likely we might find some positive cases in cats, so we have a lot of cat serum. Some dog serum might be positive too, let's see." Dr Wernery said a "positive and negative control" was required for such tests to provide accurate results.
A positive control should confirm the target antigen is expressed on the relevant cells and tissues, while the negative control should consist of tissues or cells in which the target protein is known to be absent. "Recently, we immunised camels with the dead virus and they produced antibodies against Covid-19," he said. "We have taken samples from these camels and are incorporating them with this study as it is the positive control for our test. "Camels are the best antibody producer in the animal kingdom as they have best immunity, so they are the perfect candidate for this research."

Could test results help treat humans?
Dr Wernery said he hoped to develop small antibodies – or nanobodies – that could be used in therapy to cure severe Covid-19 infection in people. "I have 40 camels at the lab and if we immunise them four to six times, they develop high, or peak, antibodies," he said. "You can then take some blood from these animals and they can be used to help treat Covid-19 infection in people. The research requires about Dh1.5 million ($408,363) investment, ideally from pharmaceutical companies. "It's a long process and obviously you cannot take camel blood and give it to humans," he said. "You can extract the nanobodies, treat them so that they are pure and have nothing to do with camels anymore, then administer into the bloodstream through IV to neutralise Covid-19. We call it serum therapy."

LG's air purifying face mask now comes with built-in mic and speakers

Source: https://newatlas.com/wearables/lg-puricare-air-purifier-hepa-face-mask/

July 23 – LG has updated its PuriCare Wearable Air Purifier mask by incorporating a microphone and speaker to make it easier to talk. The new device will appear first in Thailand in August with other parts of the world to follow.
Last year LG was one of the first big electronics companies to jump into the face mask game. Carefully avoiding direct references to COVID-19, the mask essentially transferred its PuriCare air purifying technology into a portable device.
The first iteration was basically a HEPA air purifier you can strap to your face. The newest version of the device is smaller, lighter and brings in a couple of vital new features to solve a big problem found in the original.

That big problem the original device encountered was the great difficulty in having conversations through such an encompassing mask. Early reports suggested voices were substantially muffled and some users had to pull down the mask to talk.

To overcome this LG has now incorporated a microphone and speaker into the device, amplifying a person's voice when they are talking. A computerized system, dubbed VoiceON by the company, can detect when you are talking and amplify your voice while remaining switched off when you are just breathing normally. So hopefully there is no Darth Vader-style heavy breathing effect.

Other elements of the original device have also been optimized in this new version. The battery has been upgraded to 1,000mA while the overall weight of the device has dropped from 126 grams to just 94 grams.

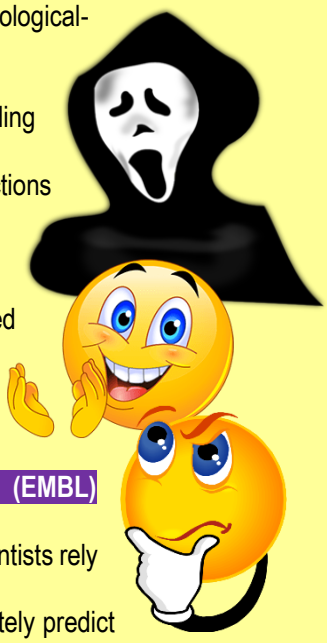
As previously mentioned, there is no direct claim or evidence this mask offers protection from SARS-CoV-2, the virus that causes COVID-19. The HEPA filters in the mask have been found to remove 99.7 percent of viral particles but this is very carefully marketed as an air purifier and nothing else.

LG's latest mask update isn't the first electronic face mask to toy with microphone and speaker integration. Laptop company Razer revealed a unique smart mask concept earlier in the year. Its mask also featured a mic and speaker, alongside a transparent design and superfluous LED lights, for that full cyberpunk effect.

Razer's mask certainly wins style points over LG but notably it has not hit the market yet, so if you are looking to actually buy one of these things the PuriCare Wearable Air Purifier mask is your best bet. This new iteration from LG will initially launch in August in Thailand with other regions around the world following later this year.

This New Database of Over 350,000 Proteins Will Change the Research of Life Itself

Source: https://www.sciencealert.com/google-s-ai-human-protein-database-will-fundamentally-change-biological-research



July 23 – Scientists on Thursday unveiled the most exhaustive database yet of the proteins that form the building blocks of life, in a breakthrough observers said would "fundamentally change biological research".
Every cell in every living organism is triggered to perform its function by proteins that deliver constant instructions to maintain health and ward off infection.
Unlike the genome – the complete sequence of human genes that encode cellular life – the human proteome is constantly changing in response to genetic instructions and environmental stimuli.
Understanding how proteins operate – the shape in which they end up, or "fold" into – within cells has fascinated scientists for decades.
But determining each protein's precise function through direct experimentation is painstaking.
Fifty years of research have until now yielded only 17 percent of the human proteome's amino acids, the subunits of proteins.
On Thursday, researchers at **Google's DeepMind and the European Molecular Biology Laboratory (EMBL)** unveiled a database of 20,000 proteins expressed by the human genome, freely and openly available online.
They also included more than 350,000 proteins from 20 organisms such as bacteria, yeast, and mice that scientists rely on for research.
To create the database, scientists used a state-of-the-art machine learning program that was able to accurately predict the shape of proteins based on their amino acid sequences.
Instead of spending months using multi-million dollar equipment, they trained their AlphaFold system on a database of 170,000 known protein structures.
The AI then used an algorithm to make accurate predictions of the shape of 58 percent of all proteins within the human proteome.
This more than doubled the number of high-accuracy human protein structures that researchers had identified during 50 years of direct experimentation, essentially overnight.
The potential applications are enormous, from researching genetic diseases and combating anti-microbial resistance to engineering more drought-resistant crops.

'Protein-folding problem'

Paul Nurse, winner of the 2001 Nobel Prize for Medicine and director of the Francis Crick Institute, said Thursday's release was "a great leap for biological innovation".
"With this resource freely and openly available, the scientific community will be able to draw on collective knowledge to accelerate discovery, ushering in a new era for AI-enabled biology," he said.
John McGeehan, director for the Centre for Enzyme Innovation at the University of Portsmouth, whose team is developing enzymes capable of consuming single-use plastic waste, said AlphaFold had revolutionized the field.
"What took us months and years to do, AlphaFold was able to do in a weekend. I feel like we have just jumped at least a year ahead of where we were yesterday," he said.
The ability to predict a protein's shape from its amino acid sequence using a computer rather than experimentation is already helping scientists in a number of research fields.
AlphaFold is already being used in research into cures for diseases that disproportionately affect poorer countries.
One US-based team is using the AI prediction to study ways of overcoming strains of drug-resistant bacteria.
Another group is using the database to better understand how SARS-CoV-2, the virus that causes COVID-19, bonds with human cells.
Venki Ramakrishnan, winner of the 2009 Nobel Prize for Chemistry, said Thursday's research, published in the journal *Nature*, was a "stunning advance" in biological research.
He said AlphaFold had essentially solved the so-called "protein-folding problem", which argued that the 3D structure of a given protein should be determinable from its amino acid sequence, and which had puzzled scientists for half a century.

Given that the number of shapes a protein could theoretically take is astronomically large, the protein-fold problem was partly one of processing power.
The task was so daunting that in 1969 US molecular biologist Cyril Levinthal famously theorized that it would take longer than the age of the known universe to enumerate all possible protein configurations using brute calculation.
But with AlphaFold capable of performing a mind-dizzying number of calculations every second, the problem stood no chance when faced with AI and algorithms.
"It has occurred long before many people in the field would have predicted," Ramakrishnan said.
"It will be exciting to see the many ways in which it will fundamentally change biological research."

EDITOR'S COMMENT: Good news or scary news?

How UNSCOM found and destroyed Iraq's biological weapons

By Filippa Lentzos
Source: https://thebulletin.org/2021/07/how-unscom-found-and-destroyed-iraqs-biological-weapons/

An UNSCOM inspector from the Netherlands measures the volume of nerve agent in a container on October 7, 1991. (UN Photo)

Editor's note (July 23): Kings College London and the UN's Office for Disarmament Affairs hosted a webinar in April to mark the 30th anniversary of the founding of the UN Special Commission (UNSCOM), which oversaw destruction of Iraq's weapons of mass destruction after the Persian Gulf War. What follows is an edited transcript of that event. The July issue of the Bulletin*'s bimonthly magazine features an array of essays and recollections from officials and inspectors involved in the disarmament of Iraq. It can be found here.*

Filippa Lentzos: Our aim with this event is to look back to recognise, and celebrate, UNSCOM's successes, particularly in terms of its biological weapons work, as well as to

understand how it achieved these. We also aim to look forwards, to reflect on ways in which UNSCOM's experiences can help understand and address contemporary security challenges.

We are delighted to be joined by so many people who worked with and for UNSCOM, and who are engaged with contemporary research, investigations and decision-making. Thank you all for coming, and particularly to our wonderful panel of speakers. One person, who is not on the program, but who was absolutely integral to UNSCOM, is Ambassador Rolf Ekéus. I am so very pleased he is here with us in the audience today. A very warm, and special, welcome to you Rolf. We have done our very best to get as many UNSCOM-people together for this occasion as we could, but we are by no means complete. I would also like to take the opportunity to recognise the many people involved with UNSCOM, including the Iraqis, who either couldn't be here today, or who have passed away.

A few words about what to expect today. In a few moments, we will hear some opening remarks from Ioan Tudor, of UNODA. We will then have a historical framer from Steve Black, and a contemporary framer from Henrietta Wilson. We then have seven sets of reflections. Charles Duelfer, Deputy Executive Chair of UNSCOM, will provide some big picture remarks. Dave Franz, Tim Trevan, Terry Taylor and Åke Sellström will provide some on-the-ground inspection experiences and perspectives from UNSCOM's efforts to verify that BW activities had ceased and were destroyed or rendered harmless. Gabriele Kraatz-Wadsack will focus on a second key part of UNSCOM's work: monitoring to continuously verify that proscribed activities were not being diverted to reconstitute new weapons programs. And Nikita Smidovitch will round up our presentations with some remarks on inspector training – an aspect that became of the key lessons learned from UNSCOM and which went on to have significant relevance for UNSCOM's successor, UNMOVIC, and which continues to be of contemporary relevance.

It now gives me great pleasure to introduce Ioan Tudor. Ioan is the current Chief of the WMD Branch at the UN Office for Disarmament Affairs. He has held several positions at the UN, including as Chief of Staff to the OPCW-UN Joint Investigative Mechanism for Syria. Before joining the UN, he worked at the OPCW and served as Head of the Government Relations and Political Affairs Branch. Ioan was also an Observer, on behalf of the OPCW, at the College of Commissioners of the United Nations Monitoring, Verification and Inspections Commission (UNMOVIC).

Ioan Tudor: Good morning, good afternoon, and good evening to all wherever you may be located.

It is my pleasure to welcome you all to this commemorative webinar marking the 30th anniversary of the foundation of the United Nations Special Commission (UNSCOM). I would like to congratulate King's College London on this initiative – today's event will allow a welcome reflection on UNSCOM's work and achievements, with a particular focus on its biological weapons work.

The establishment of UNSCOM 30 years ago was a major development in multilateral efforts to stop the proliferation of weapons of mass destruction. One of the lessons drawn over the years from the case of UNSCOM and its partner in the nuclear field, IAEA, is that international verification can work effectively even under the most challenging conditions. UNSCOM demonstrated that an international inspection regime can perform credibly: they were able to prepare themselves well, deploy quickly, organize efficiently, and produce reports of a high technical standard to the Security Council.

While the work of UNSCOM came to an end in December 1999 when the Security Council replaced it with the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC), it is important to note that UNSCOM's legacy and impact reached beyond just its successor UNMOVIC. The Special Commission's impact can be seen in further multilateral initiatives to strengthen the nonproliferation regime in the chemical and biological fields, including the UN Secretary-General's Mechanism for the investigation of allegations of chemical and/or biological weapons (UNSGM), as well as the OPCW-UN Joint Investigative Mechanism established by the Security Council in 2015 to identify the perpetrators of chemical weapons use in Syria.

The importance of such initiatives was also highlighted in the Secretary-General's Disarmament Agenda, *Securing Our Common Future*, launched in May 2018, in which the Secretary-General pledged, amongst other things, to work with UN member states to ensure respect for the norms against chemical and biological weapons use. To this end, UNODA was requested to undertake actions to strengthen the readiness of the UN Secretary General's Mechanism.

As also noted by the Secretary-General in his Agenda, "concerns regarding the increasing risk of biological weapons have continued to grow as developments in science and technology lower barriers for their acquisition, access and use, including by non-state actors. There is therefore a need to strengthen the Biological Weapons Convention (BWC), which acts as a forum for consideration of preventative measures, such as strong national health systems, robust response capacities and effective counter-measures."

One global development that must be mentioned here is the COVID-19 pandemic – the very reason why we meet virtually today, and which also signals the potential impact of biological incidents. The pandemic has demonstrated the global disruption which infectious diseases can cause and has highlighted the lack of preparedness at the national, regional and international level. The deliberate release of a pathogen that has been manipulated to be more virulent, for example, or that has been intentionally released in multiple locations at once, would lead to an even more

serious global crisis. In order to improve preparedness and response to future disease threats, serious attention needs to be devoted to preventing the deliberate use of diseases and biological toxins as weapons against humans, animals and plants.
The BWC has established a strong norm against the production, development and use of biological weapons since its entry into force in 1975. However, it lacks an oversight institution, contains no verification provisions and does not have an operationalized mechanism to provide and deliver assistance.
There is an expectation by BWC states parties that "the United Nations and other international organizations could also play an important role in coordinating, mobilizing and delivering assistance upon request of the concerned State Party." Therefore, respective capacities and experiences of UN and relevant international organizations should be identified and used, within their mandates, when required.
It is in this very context that experiences to be shared by today's panelists, some of whom I had the privilege to work with in recent years, can inform current efforts to strengthen arms control, disarmament, and non-proliferation regimes.
I look forward to what I am sure will be interesting and informative reflections on UNSCOM's unique work and achievements, as well as to discussions on how lessons from UNSCOM's experiences can inform current disarmament and arms control initiatives. Thank you very much for your attention.
Filippa Lentzos: Warm thanks, Ioan, for those welcoming words. I am now delighted to introduce you to Steve Black. Steve served as historian to UNSCOM from 1993 to 1999, and he has written several UNSCOM histories. He also served as Deputy Chief Inspector, as Inspector Mission Planner, Operations Officer and Report Coordinator on 15 UNSCOM chemical and biological weapons inspections in Iraq. Steve also served in the Iraq Survey Group, set up after the 2003 Iraq invasion to investigate the scope of Iraq's weapons of mass destruction. Steve, it gives me great pleasure to give you the floor.
Stephen Black: Good morning for me, for all the rest of you in Europe: good afternoon. Looking through the attendee list, I see a lot of people that I met when they were very early in their careers, and I'm really happy to see you're still in the game. I also saw a bunch of people that mentored me and that I learned a lot from early in my own career and I'm equally happy to see you're still in the game. What I want to try to do, for those of you that weren't up to your eyeballs in this whole process in the 1990s, is to give you a sense of what the world was like and where the basic mandate came from for UNSCOM in terms of diplomacy and its legal basis. And also to fill you in on some of the things that really led to that rapid ability of UNSCOM to spool up some of the precedents that existed in arms control before UNSCOM even came into existence.
So, as they say in the cartoon, you have to set the Wayback Machine for 1990. As you'll recall, the Cold War was at its end. You had this sort of sweet spot in international affairs, where many countries were willing to agree on things. If those same issues came up today, people would disagree just for the sake of disagreeing. But the sweet spot allowed the Security Council to actually become a functional instrument in international affairs, and the Security Council itself played a role in the entire Iraq disarmament issue in a way that I think, since then, it has struggled to achieve again.
The immediate foundation of this disarmament effort was Iraq's invasion of Kuwait in 1990. That kicked off the ball. There were all sorts of things that went on beforehand, and we'll come back around to that later, but for now we're with Iraq invading Kuwait in 1990. The international reaction to this was widespread and almost universally negative. You basically had the whole world agreeing that Iraq should not be allowed to invade its neighbour. A very large and diverse coalition of countries, principally led by the US but it was very international, then undertook military action with the blessing of the United Nations Security Council to push Iraq out of Kuwait. The ceasefire came pretty quickly, but the military ceasefire on the ground had to be followed with something that would provide a more lasting basis for peace in the region. Security Council Resolution 687 was the foundation for all of the things that were supposed to establish a more peaceful situation in that immediate region. The Resolution covers all manner of things like defining borders, repatriation of goods and people, addressing hostage issues, and so on, but one of the core components of it was this idea that Iraq had to give up its weapons of mass destruction and certain ballistic missile systems.
Iraq's WMD programs had been a major issue, principally all through the 1980s, largely as a result of widespread use of chemical weapons during the Iran-Iraq War. The world was horrified by this. There were scenes right out of World War One, with massive battlefield use of chemical weapons. There was international condemnation at the time, but there was not much that could be done directly to solve the problem. You add to this the fact that during the Gulf War in 1991, there was threat of use of chemical weapons, and, probably even more importantly, widespread fear by coalition members that chemical weapons or potentially biological weapons would also be used. We also saw significant use of ballistic missiles by Iraq against coalition partners, and earlier, in the 1980s, there was ballistic missile use between the cities of Tehran and Baghdad.
This all laid the ground for a thing that needed to be addressed, and that was largely folded into Resolution 687. The specific requirement was that Iraq give up all of its chemical and biological weapons, any efforts at a nuclear weapons programme, as well as ballistic missiles and launchers with a range greater than 150 kilometres. Iraq also had to give up its means

of production of those systems. In order to motivate Iraq to do this, you had two things going on in Resolution 687. One was the fact that it was a ceasefire agreement. In other words, if you break the agreement you return to the *status quo ante* as they say, which was a state of open hostility. So Iraq had that hanging over its head. The positive motivation was paragraph 22, which directly tied Iraq's compliance with the disarmament provisions to its ability to sell oil on the open market. So that was the carrot and the stick for Iraq's compliance.

In order to implement these requirements, the Security Council created a Special Commission. This was a unique thing. The Special Commission did not exist under the Secretary General's part of the United Nations system; it was a body directly tied to the Security Council. Now, Iraq was obliged under Resolution 687 to provide declarations of all of its WMD and missile holdings. The weapons that were in existence were to be notionally turned over to the Special Commission for eventual destruction, either under Special Commission supervision or by the Special Commission itself, and then the Special Commission could undertake on-site inspections for the purpose of verifying those declarations and those destruction activities. So that's what the Special Commission was tasked to do. It's painfully simple to describe but, as you'll hear later today, it was a hard thing to implement.

The Special Commission, when it started, seemed like a large task and when you look back on it, it seems like UNSCOM was cutting new ground in this regard. It was certainly unprecedented in having a single organisation responsible for so many things, but it's not like it was created from whole cloth. The notion of post-war disarmament goes all the way back to the Versailles Treaty. Obviously, there are big political and diplomatic differences, but the basic concept that the victor gets to take away weapons from the defeated country is already extant when UNSCOM is created. The Non-Proliferation Treaty on nuclear weapons obviously has declaration verification – that entire process is already part of international arms control practices. The Intermediate-Range Nuclear Forces Agreement set in place a wide spectrum of on-site inspection practices, many of which UNSCOM adopted, almost in whole cloth. Some of the support that went to UNSCOM from supporting governments followed exactly the same process as the briefings to inspection teams on their way in to do inspections in the then Soviet Union for the Intermediate-Range Nuclear Forces Agreement. There was ongoing debate and development of the Chemical Weapons Convention, with an enormous number of people—in fact, a bunch of them are at this webinar—doing research and development efforts to try to craft the verification provisions of the Chemical Weapons Convention, and most of that work was directly portable over to UNSCOM's initial inspections.

In fact, most of this goes for all of these different precedents which are forerunners to UNSCOM's verification efforts. The people moved, wholesale, from one of these other verification efforts either in development or in existence, over to support the UNSCOM practices. And probably one of the more interesting ones is the trilateral work between the Soviet Union, the UK and the US to look at biological weapons issues. It is a fascinating story, and a number of the UNSCOM participants in the biological weapons investigations cut their teeth on those trilateral processes on either side of the table. So either they were being inspected or they were doing the inspecting, but that brings an enormously valuable set of tools to the Iraq process, rather than having to create it, as I said, out of whole cloth.

UNSCOM's basic approach, and the work that it was trying to do, are not outliers in the world of arms control. It might have been a new step, a thing that had not quite been done before, but it was really on the continuum of the development of arms control verification practices. And just as UNSCOM made use of all of those earlier regimes (in development or existing) to get it started, I think there are future regimes and things that are being looked at right now that we'll be able to draw good ideas and practices from, as well as things to try to avoid from UNSCOM's experiences.

I chafe at the idea when people say 'UNSCOM was totally unprecedented', 'we'll never be able to do that again', and 'I don't want to hear about UNSCOM when we're talking about arms control regimes'. The reality is you can pick and choose good ideas from UNSCOM's practices, and there were a lot of very clever things that got done, and I'm delighted to have people that are involved in current development of verification regimes go back and look at UNSCOM because there's no need to reinvent the wheel, if somebody has already figured that out.

Henrietta Wilson: Thank you so much, Steve, for an amazing set of comments. You've captured the flavour of where UNSCOM came from, what it did, and how it fits within wider efforts going backwards and coming to the present time.

Before I hand over to the remaining weapons inspectors, I'm going to say a few words to bring things into what's happening now. Ioan and Steve have already outlined some ways in which UNSCOM gives really important lessons to people who are today engaged with weapons regulation and verification. What I'm going to focus on is thinking about how UNSCOM resonates with current open-source research—in other words, remote monitoring using digital technologies.

UNSCOM clearly involved a great deal of in-person, on-site activities. It also included some remote monitoring, and UNSCOM was really important in pioneering developing systems for doing that remote monitoring and incorporating it into other activities. Since UNSCOM, digital technologies have transformed possibilities for remote monitoring. The Internet gives a lot of people direct access to information from things like commercial satellites, or social media,

or transport flows, or publications about commercial enterprises. There's a lot of information available, and a lot of non-governmental groups and individuals are accessing this and using it to track weapons flows, to track weapons uses, and to track human rights abuses. Often called OSINT, open source intelligence, or open source research, it is basically a whole set of activity-tracking practices using publicly available information.

UNSCOM foreshadowed some of this OSINT activity. Both provide really interesting examples of international verification that's happening outside of a negotiated treaty framework. Usually, international verification is tied to what different states agree can be looked for and accessed. UNSCOM and OSINT kind of blur these boundaries. I'm not for a moment arguing they had unrestricted access to anything, but they can go beyond the categories of weapons that have been defined by treaty negotiators, they can go into places that the investigated party would rather they didn't go. So that's one link.

Some of their techniques look very similar too. In particular, the UNSCOM technique of material balances, where people were auditing the amount of material that was in Iraq and the amount of material that they knew had been supplied to Iraq. Looking at these could suggest the amounts of weapons and components that were unaccounted for in declarations. Some OSINT techniques look very similar to this. For instance, those of open source researchers who are looking at shipping routes going in and out of North Korea, looking at what's on those ships, looking at where the blind spots are. There are similarities there with UNSCOM's material balance techniques.

And really importantly, both OSINT and UNSCOM raise very significant questions about what happens next. When people find evidence of wrongdoing, what can they do with that evidence? This raises the classic arms control question *After detection, what?* I'm sure we'll hear all sorts of ways in which UNSCOM approached this question with new experiences and practices. Coming forward in time, the difficulties of *After detection: what?* are clearly illustrated in the range of current efforts, some falling under the remit of international organisations, some undertaken by OSINT researchers, trying to trace the perpetrators of chemical weapons use in Syria that has already been mentioned today, and which some people here have been involved in.

Finally, at the heart of both UNSCOM and OSINT are people. UNSCOM and OSINT both involve a certain type of person. They both rely on talented, inventive, meticulous people who are looking for and finding solutions to really difficult monitoring problems. And, as well as individuals, they are essentially collaborative. Both groups require really good team-working and team skills. So while the technologies have changed since UNSCOM, there are clear resonances in the techniques and personalities. And across both the OSINT and UNSCOM communities, there's this sense that politically verification is very, very difficult.

The overlaps that I've alluded to are represented in the people we have in our virtual room today. As Filippa said, we're really grateful to all the speakers for agreeing to share their experiences and insights. We're also absolutely bowled over by the calibre of the audience. We have some former weapons inspectors in our audience. We have some people doing OSINT in our audience, some of whom weren't born when UNSCOM was set up. But there are also some who were weapons inspectors previously and are now doing the new OSINT work. It is extremely exciting to have you all here. Thank you all very much for coming.

Now it's time for me to hand over to our next speaker: Charles Duelfer. Charles served as the Deputy Executive Chair of UNSCOM and as a Special Adviser to the Director of the CIA on Iraq's weapons of mass destruction. He also led the Iraq Survey Group. Thank you very much, Charles

Charles Duelfer: I have six points I will try to make.

It was in the Iraq Survey Group where we learned how well UNSCOM had succeeded in rooting out the extent of Iraq's WMD program. But I will focus on UNSCOM and its lessons learned over the ensuing 30 years. I should hasten to warn you that for 10 years I've been giving presentations inside the US government on lessons learned from Iraq and in particular, monitoring and what it means for intelligence. That presentation runs three hours. Here, I will try to be short, but if you push the wrong button, I may transmit much longer.

The first point is that there's something I would call the "truth-trust curve", which, almost from day one in the UNSCOM experience, went in the wrong opposing directions. It became, in my opinion, a negative feedback loop. As Steve Black was saying, the deal in Resolution 687 was that Iraq had to give up, accountably and verifiably, all of its WMDs or it wouldn't get out of sanctions or the oil embargo. Saddam's assumption at the start was that things would tend to revert to the norm. People would want to get on doing business again, buying and selling oil, and so on. And he wanted to make that process as short as possible. So, in meeting with his lieutenants to discuss what to do with inspectors when they arrived, he said, 'Okay guys, give them the obvious stuff, give them the missiles, give them the chemical stuff, everybody knows we've got that. UNSCOM will count that stuff up and then the sanctions will be lifted, and we'll be back to normal.' This (not illogical) initial decision explains the series of lies and the tortuous path to truth that ensued.

UNSCOM, under the direction of Rolf Ekéus—who was a great leader and all the innovations that UNSCOM had were a result of him saying yes to ideas which bubbled up—became much more fastidious in what we'd accept as truth than Iraq's leadership had expected. As

it turned out, Iraq gradually gave more and more information, and the amount of truth they provided went up over time. But because they had started with a big lie and only incrementally gave things up, the trust of the inspectors, and I dare say the intelligence communities and politicians around the world, diminished over time. Every time the Iraqis revealed something new, it also demonstrated the Iraqis had been lying again. So, the willingness of inspectors and intelligence analysts to give Saddam the benefit of the doubt, to cut him any slack, went down. Simply stated, as Iraqi truth went up over time, trust of Iraq went down. And that caused big problems.

The second point I'd like to make is that there's always a question of inspection regime adequacy: in our case, could we do what Resolution 687 said we had to do. As Steve mentioned, it was a ceasefire resolution. It was coercive disarmament. And while each inspection regime has its own terms that the inspectors are supposed to meet, ultimately it's always a political issue. And as time went on with UNSCOM, as we got closer to the point in time when we ultimately left Iraq, there were a lot of challenges—all related to whether we could actually do the mission or not. We've learned subsequently that judging the value of an inspection regime is not clear cut. But in the case of Iraq, it turned out to be much more valuable than we realised and I will come back to that. From the ground-level inspectors point of view, our task seemed nearly impossible. We could not account for every single little thing that was a component of Iraq's WMDs—the weapons and the infrastructure. By the same token, Iraq could not prove a negative. So, in a sense, what we were charged with, and I think every inspection regime is charged with, was at its base level impossible. There has to be an intersection of political science and physical science. And at some point, a political judgement has to be made, "Good enough, or not good enough."

Third. What if UNSCOM did feel that Iraq had verifiably accounted for its WMDs? The resolutions included, as Steve Black pointed out, with a carrot. That carrot was: if UNSCOM inspectors say Iraq has actually done what it was supposed to do, the Security Council would fulfil its end of the bargain and lift the sanctions and the embargo. But, who really believed that if all the restrictions and the embargo were lifted, and, recognising the reality that without another war, the odds of those 'sticks' being re-imposed were next to zero? And Saddam, not being an idiot by any stretch of imagination, would he really continue to comply with UNSCOM long-term monitoring and inspection in perpetuity? The preponderance of views, from cynics and non-cynics, was that that was probably not going to happen. At the same time, the Iraqis certainly did not fully believe that the Security Council (especially not the United States) would ever really agree to lifting the embargo. So that was an inherent issue.

The fourth point I'd make is that as a product of the truth-trust curve and the doubts about Saddam, UNSCOM reported in 1998 that we could not complete the job. We could not confidently verify the disposition of Iraq's WMD, as demanded by the Security Council resolutions) under the conditions that Iraq would permit us to operate.

In retrospect, we can look more critically at the point where a political judgement in a technical world comes in. When we left Iraq at the end of 1998, and reported that we could not complete the job, the consequence was that all of the data that had been fulfilling the need for information by the international community, stopped. And I can tell you from the American intelligence perspective, they went from having a lot of data, a lot of baseline information from people going all over Iraq, interviewing people, all the things that UNSCOM did, and providing detailed public reporting to the Security Council, to having nothing.

So the uncertainties that UNSCOM had—and they were important uncertainties about chemical weapons and ballistic missiles, etc.—that took on a different perspective, when you realise you will have no new inspection information. And yet, as time goes on, presidents and leaders of other countries are not going to stop asking the question, "What do you think Saddam has?" And the intelligence community will wonder, "Well do you think Saddam has gotten rid of his stuff, or is he going to reconstitute WMD?" Without on-the-ground data, the intelligence community ended up making assessments on the basis of increasingly flimsy information.

People worried that imperfect inspections can provide a false sense of security. But the alternative in the absence of inspectors was a potent and growing feeling of anxiety. The further we got in time from UNSCOM's departure, the less we knew about what Saddam was doing. Moreover, there's a tendency in the intelligence community, and not just in the United States, to be conservative in assessments. You tend to think the worst.

Then 9/11 happened. It was at the beginning of George Bush, the younger's, presidency. All of a sudden, he had to recalibrate his risk tolerance. He was a new president, and suddenly the United States had been attacked. The risk tolerance of the country which existed at the end of 1998 was far different than the risk tolerance after September 2001. Suddenly, the hypothesis that maybe Saddam did have some WMDs seemed more plausible. He certainly had the expertise to create WMDs. And maybe he could give that to somebody who's bad, and maybe that person could use them against the United States. Maybe that was a low risk, but the consequences would be very high. We all know how the Bush administration judged that.

But you can ask the question—and it's not a totally useless exercise—what if UNSCOM had continued its inspections? Suppose there had been this continuous reporting from having

inspectors on the ground, you could have bounded the uncertainty in a substantial way, even though those inspections were imperfect. In respect of the ensuing events, I think there's a greater appreciation of that value now that didn't exist in 1998.

Let me make a point about the Iraq Survey Group, which I had the privilege to lead. We had enormous resources, and we had a lot of people. Circumstances were very different from those during UNSCOM. We had people killed. We had a lot of people injured. It was different. But I think we conclusively came to an understanding about what Saddam had. And importantly, where he was going. One of the key things that I wanted to do with respect to all this effort was in some way address the equation in Saddam's head that he was solving when at some points he elected to have and use WMD, and at other points he elected not to have WMDs. What were the factors or variables that he was evaluating that led him to come to different conclusions at different points in time? What lessons does that provide us for the future?

There were a lot of other things that the Iraq Survey Group did, and we had extraordinary access to all of the people who were involved in the programs, in decision-making, to Saddam and everybody else. It was one of my personal goals to involve as many of our UNSCOM alumni in that process. We had Australians, Brits and Americans, and they were, frankly, the backbone of the knowledge. They got to speak with the Iraqis that they had spoken with before, and their background was extremely helpful.

Lastly, and others have mentioned this, but it is important to recognise the innovations which UNSCOM brought to bear and the creativity of the ideas—all of which Rolf Ekéus promoted. I am deeply jealous of what inspectors now have. The ability to have an iPhone, be able to take the measurements, to size things, to have a searchable database where you just plug in the data, that have open source imagery, open source RF emitters, all kinds of things. It's an amazingly different world that exists now, and while there are lessons to be learned from UNSCOM, the technological opportunities for inspectors have improved far beyond what UNSCOM had and further than I expected.

I want to end by putting things in perspective. We began today saying this event is about celebrating UNSCOM's successes. There were some things that didn't go so well. One key thing is that we did not know how successful we were. And there's a problem in that. We didn't know how much of the base material balance we had accounted for. And I'm not sure anybody else could have done better. But equally, at that point in time, on the trust-truth curve, we could not say that the residual didn't really matter. That's a problem. I'm not sure it's a solvable problem, but it gets to the political science part of this, and this is where Rolf Ekéus and Richard Butler and all such leaders step into this crucible in the Security Council. The Council is the ultimate political authority. Verification is not just a technical issue. You've got to feed these politicians the right data, but they often demand more flavoring. It was easy for me to be categorical as the American Deputy, and say the data isn't good enough. Rolf, and Richard, they had to manage the political environment, and that's always going to be a judgement and a place for political debate. I'll end there, thank you.

Filippa Lentzos: Thank you, Charles, for your many insightful points. I'll move straight to introduce my good friend Dave Franz. Dave served as Commander of the US Army Medical Research Institute of Infectious Diseases (USAMRIID), and as Deputy Commander of the US Army Medical Research and Material Command. He retired as Colonel after 27 years on active duty. Dave, go ahead.

David Franz: Thanks Steve and Charles for that helpful background. I'm going to take us now from that 30,000-foot view down to the ground level. I led biological weapons (BW) missions 3, 5 and 20. David Kelly led BW1, and my boss at USAMRIID, David Huxsoll, led BW2. We are all different and take different lessons from our experiences. For me, UNSCOM was the start of a 25-years career working with people in similar but slightly different settings, primarily in Russia, China and in Pakistan, but in other regions of the world as well. What I've been doing since those UNSCOM days, however, isn't really arms control, I prefer to call it making friends with science. It's opening lines of communication at the scientist level, which might also have helpful implications for national and global security.

For example, compare our interactions with someone in leadership, Hussein Kamal, and someone closer to the bench, Dr Taha, at the technical level. General Hussein, speaking to a journalist at the end of BW3, accused my team specifically, and me directly, of spying for the US. Dr Taha on the other hand was generally very cooperative, although not forthcoming during BW3.

As Steve and Charles have suggested, there was a lot going on globally during the period that I was involved with UNSCOM. The UNSCOM inspection regimes in Iraqmostly took place during the Bush-senior and Clinton Administrations. It was between the two Gulf Wars, and overlapped with the visits to Russia under the US-UK-Russia Trilateral Agreement which were mentioned earlier.

Three days into our first mission in March of 1993, our minders stopped us from entering the Baghdad College of Veterinary Medicine. They said our educational institutions are sacred; you can't go in. Even General Amir Mohammad Rashid al-Ubaidi, the former Iraqi oil minister and director of Iraq's Military Industrial Corporation, came out to reinforce that message, and my negotiations and arguments didn't sway them. No problem. I reached into my 'back pocket' for a handy satellite phone [He shows an image of himself using a suitcase-sized phone in the back of a UN vehicle] and called Mr Ekéus at home. He said, "Tell them

you will end your mission, depart Iraq, and they can deal with the Security Council." So I told my team to pack up, and as we started to drive away, the minders chased us. "No problem, you can enter", they said.

We did enter the campus and, it turns out, I had a wonderful experience visiting with the Dean of the Veterinary School. I was originally a veterinarian, and this was a fellow veterinarian, and we of course had a great time together. He said, "Have some tea with me while your inspectors go through and look around, anywhere they would like to go in my college. Just let me know if my faculty can't answer any of your questions." My observation at the time, which is so well known to me and most of us today, is that it's easier to work with scientists, who share common interests, than with political leaders. But I was new to that business at that time, and I thought well that's really interesting. So I put my satellite phone back in my 'pocket' and I didn't need it again for the rest of the BW3 mission.

We had a great team. We were well prepared by the leadership in New York. I was also blessed to have an outstanding operations officer from the Australian Special Forces who really supported me and compensated for many of my weaknesses as a leader. I also had four very competent and dedicated Russian members on this team. I would work with one of those gentlemen again on the opposite side of the table in the Russian Ministry of Foreign Affairs during the trilateral negotiations. Our report for BW3 stated our finding that Al Hakam was likely their key BW site, but we couldn't confirm this.d

Nine months later, in June of 1994, we were back, this time with actual biological weapons expertise. Going back through Al Hakam with Bill Patrick was like taking blinders off my eyes. On that trip, I learned the critical importance of actual biological weapons experience in this business. Those expertise requirements are probably slightly different today with the advances in technology. But at that time, it was critical, at least for me, to have an expert on the team; someone who had actually done it. We didn't have much available expertise in this regard, certainly not in the US and now we have even less. I would return with BW20 in February of 1995, only nine months later, but about 15 BW inspections later, so you can see that the pace of biological weapons inspections was certainly quickening.

Another example of human interaction comes from a visual memory I recall on our way to Mosul in a German helicopter. Our Iraqi minder, who had been a minder on a previous mission, and our US Army Arabic translator seemed very comfortable working together. They also spoke a common language, in this case Arabic, not science, and they established a rapport that really facilitated our work. Again, we're all human. I would go on, along with David Kelly and Terry Taylor, to watch human interactions in the trilateral process with Russia and the UK. It wasn't all deadly serious. Terry was seen speaking into a banana at breakfast one morning, as we staged at the main airbase in Frankfort on the way in. None of the rest of the team ever figured out why he carried a banana, but he was certainly a very successful and productive team member.

Finally, I'll close with this. What took me three trips to Iraq and numerous trips to Russia to figure out, Professor Lederberg—really our only US Nobel Laureate who cared about biodefence—knew all along. Just as I was retiring from the US Army in 1998, Richard Preston published a piece in *The New Yorker*, in which Josh Lederberg was quoted as saying, "There is no technical solution to this problem of biological weapons. It needs an ethical, human and moral solution if it's going to happen at all. Don't ask me what the odds are for an ethical solution, but there is no other solution." And then he paused and looked at Richard and said, "But what are the odds for an ethical solution? Would an ethical solution appeal to a sociopath?" And I think more than 20 years later, Josh' words may still ring true.

Henrietta Wilson: Dave, what a fantastic insight into what it felt like to be on the ground in some of those extraordinary situations. Thank you for that. I'm next going to introduce Tim Trevan, who served as Special Advisor to UNSCOM Executive Chair Rolf Ekéus and spokesperson for UNSCOM from 1992 to 1995. He has since worked on biorisk management and health security issues internationally. He is the author of *Saddam's Secrets: The Hunt for Iraq's Hidden Weapons* that I can really recommend. Thank you very much, Tim.

Tim Trevan: Thanks Henrietta. It is great to see so many former colleagues, and particularly Ambassador Rolf Ekéus, it is great to see you. Since my UNSCOM days, my particular focus has turned away from arms control issues to why people, teams and organisations do what they do, in the context of safety. I'm still very much involved in doing that for biological risks, but the lessons that I'm working with are really meta-lessons that go beyond the 30,000-feet level, to the 50,000-feet level, so that's where I'm going to occupy today. And I'd like to reference some of what Steve, Charles and Dave have just talked about in what I'm going to say.

Essentially, UNSCOM's work had three phases: to verify the holdings that Iraq had; to destroy the holdings that they were no longer permitted to have; and then to monitor their dual-use capabilities and industrial capabilities going forward to ensure they didn't re-acquire what they shouldn't have. I'm going to focus on that first one, verifying the holdings.

And as Steve said, the expectation was that Iraq would make honest declarations, which would put us in a situation of full knowledge, and that they would then fully cooperate with UNSCOM, so that we would report to the Security Council that they were in compliance and hence sanctions could be lifted. We did not expect them to create situations where the

possibility of the reversion to the *status quo ante*, as Steve referred to, would be on the table. So we had that sort of belief, because of the sanctions, because of the threat of resumed hostilities.

What we got instead of the full, final and complete disclosures is what we used to affectionately refer to as the full, final and complete fairy tales: version one, version two, version three, through version x. And so that gets to what Charles was talking about – the truth-trust curve. In essence, we moved from an environment of verifying honestly-made and fully cooperative efforts to confirm declarations—a situation of full knowledge—to one of hunting for things which had not been declared—a situation of uncertainty. And this had a lot of implications at an organisational level as to how you should organise to do that work.

From the field of occupational safety, Jens Rasmussen has described three different types of work.[1] There's skills-based work, which is, you have a task to do, you use these skills to do it, and they tend to be motor skills. There's rules-based work: If this, then that. And then there's knowledge-based work: innovation, creation, problem-solving, where you don't have certainty about what you're dealing with. When you're in a world of certainty, when you're simply dealing with things you know well, then you occupy the space of skills-based and rules-based work. When you move into the world of hunting for things in an uncertain environment, then you move very heavily into the knowledge-based environment. And that has huge implications for how you organise and for the types of people that you need in the process, and for culture.

At roughly the same time as UNSCOM was working, people in other fields were creating a new field of study called high reliability organisations. How do organisations that work in extremely dangerous and fast-changing environments do their work safely? This field started in around 1986, UNSCOM started in 1991, so not much overlap in terms of providing a background for UNSCOM's work. But in retrospect it's very interesting to see how much the current literature on high reliability organisations, 30 years on, shows that a lot of UNSCOM under Rolf's leadership, intuitively did right.

On an organisational level, if you're in a knowledge-based environment where you're having to problem solve and create and innovate, then you want flat organisational structures, and Rolf established that. Anyone could talk to Rolf about any crazy idea they had for how we could do the job. He created a culture in which crazy ideas are listened to respectfully. Over the last five years, a new and growing understanding about psychological safety has come into existence; and UNSCOM had a practice of psychological safety, that is, people were not punished for thinking differently, they were able to be fully honest about what they were thinking about, and they did not face any consequences for saying anything which ran against the orthodoxy. Knowledge-based work also needs decentralised decision-making. The only people with full knowledge of what's happening on the ground, are the people there—it's not the people in New York—and so giving delegated authority for people to make decisions on the fly is key. And within very tight bounds, that was given to inspectors. When you have a strong organisational culture, you can give that delegated authority to do things on the ground.

You need to have a reporting culture, a learning culture and flexibility. UNSCOM had all of those. Teams were briefed before they went in, they were briefed as soon as they came out, and people worked hard to learn from these as quickly as possible. Effort was put into shortening learning cycles so that as soon as we found things that didn't work, that was known, and as soon as we found things that did work, that was also known.

We did all of these things in terms of organisational culture, and attitudes, creating what I call the "*ITCH for Excellence*", having inspectors who had *Initiative*, *Trust* to speak their mind, *Curiosity* to think of new ways of doing things, and *Humility* to understand that they didn't have all the answers and to listen to other people. And we had people of the highest quality, who got supported in the job. Yes, there was a core group in UNSCOM in New York, but the teams were tailor-made for the task at hand. We brought in the world's top experts from multiple countries to fill the specific roles required for the teams, rather than relying on a standard set of inspectors, who may or may not have had the relevant expertise. Dave's reference to Bill there shows how important it was to have the absolutely right expertise on an inspection. Thank you.

Filippa Lentzos: Warm thanks Tim. Let's move on to Terry Taylor and his experiences. Terry served as Commissioner for UNSCOM from 1993 to 1995. He was Chief Inspector from 1993 to 1997. He has worked on international security and non-proliferation issues with UNODA and the 1540 Committee Group of Experts, as well as with the UK Ministry of Defence, IISS, NTI and the International Council for the Life Sciences. We're very pleased to have you with us and look forward to hearing what you've got to say.

Terence Taylor: Thank you so much Filippa.

So many wise words have already been said. It's a bit of a challenge to inject something new. And from Charles, I have a quotation from the Roman historian Tacitus, which is, I simply paraphrase, "the unknown is assumed to have great potential". I think that this is at the heart of some of the things that you were saying and certainly has a real point—a political point and a technical point—because we didn't know what the end state was.

Steve raised great points, talking about the history. In my own case, involvement with the Chemical Weapons Convention negotiations, other arms control negotiations, conventional

confidence-building measures in Europe and other parts of the world, were important precursors to UNSCOM. These were very influential to me.

I want to start with something that's not often talked about, and that is the challenge for any inspection organisation—the ones that exist now, and for us at the time—that comes from any adversarial relationship. Charles described so eloquently earlier on, the adversarial situation between the Iraqis and the inspections regime. The Iraqis conducted information attacks on UNSCOM, all the way from New York to the ground level in Iraq. This meant, for example, that it was almost impossible to have a surprise inspections. So we had to develop special measures to defeat that.

We found for inspections, in my case biological weapons inspections, where we needed to speak to, for example, Iraqi scientists at their place of work, we needed to take special measures to make sure the Iraqis didn't get advance warning. Because we were under threat of information attacks, the work done in New York and Iraq on desktop computers was vulnerable. The special measures included doing work off-site on laptops. It also involved keeping secrets and protecting what your ultimate inspection objective was, or who it was you wanted to interview. Planning, when you wanted to create surprise, had to be done off-site, but with full knowledge and support, of course, of Ambassador Rolf Ekéus. He always knew what we were up to and if we got into a problem on the ground, I could get on a satellite phone and he'd know what I was talking about. Rolf's leadership was so important in these contexts.

My next point is the challenge of having two separate organisations involved. At the high level, we had Rolf Ekéus as head of UNSCOM and Hans Blix as head of IAEA. This divided responsibility, and with two people reporting to the Security Council created problem. The lesson essentially was that a unified organisation is needed, so the inspection teams were not working in stovepipes. The Iraqis did try to play one organisation off against the other and it put pressure on the whole system. The effect of divided responsibility filtered all the way down. Another example is from the field, from Al Hakam. Our mission was to destroy the whole place. Nothing was going to remain, buildings, desks, chairs, everything had to go, because all of it was associated with the biological weapons programme. Now that's a bit tough, when you have a large site, I think it was a three by four-kilometre rectangular site, something like that. And remember, it was an Iraqi workforce that was doing the destruction; UNSCOM was overseeing it. Our Iraqi workforce turned up on the first day, and they were mostly teenagers aged between 13 and 16, with no protective equipment. So that was a time for the phone call to New York. And then I got the same message as Dave: "Tell them that you're leaving, that this is an unacceptable non-starter. So we drove off with them trying to stop us going. But, the next day they called us up and said, "Please come back." We got a more adult workforce when we returned.

We were going to start destroying a building, I can't remember what it was called, and the Iraqi team said that they hadn't got any explosives because all the RDX—an explosive not only used in demolitions but also as ammunition—was destroyed during the coalition attacks and there was none left. But I knew that inspectors looking at the nuclear programme had a store of HMX—a high grade explosive with a near instantaneous explosion capacity— from the Iraqi nuclear program stored under IAEA control. The magic phone call to Ekéus worked again. Not long after, probably the next day, a truck turned up with HMX explosives. This was double disarmament, destroying the explosives from the nuclear program by using them to blow up a biological weapons facility.

The two explosive ordnance disposal people from the UK I had with me had never handled HMX. It had never been used before in demolition. We didn't get it quite right the first time, when they kindly invited me—fortunately standing in a trench—to press the trigger. The first time, nothing much happened to the buildings. So the wonderful British warrant officer said: "Well we'll soon fix that, Sir". He adjusted the amount of explosive and the building went into tiny, tiny pieces. Thank God we were in a trench. We were all okay, but the building vanished into dust. I think windows were broken for several miles around with a few complaints.

This illustrates the challenge of stovepiping in conducting inspections, and the need to work across the different disciplines. This came out in other inspections too, for example in the discovery of the growth media. The media was identified by not quite an expert, by looking at videos taken by the chemical weapons team at al Adile, the medical store. And that's where we saw these big tubs of growth media. That was almost an accidental discovery: why would we as biological inspectors look at these chemical places that the chemical team was visiting? So stovepiping is a real challenge, and it is a lesson for the future in multiple disarmament processes, including nuclear, chemical, biological, missiles, fuel fabrication for missiles, aerial delivery means, trade tactics. Different efforts need to be under one head, with one person in charge, integrating all these things.

A point about information. I prefer to use the word information, not intelligence. Under the Resolution 687, UN member states were required to supply relevant information to UNSCOM, in most cases from their intelligence sources. Unfortunately, in some cases, because the information was classified, whatever the original source, it was assigned higher priority. It was deemed to be more important than information gathered from other sources, and in particular the information appearing from our inspections—and that was a challenge. It's a human problem about how you handle different sources of information and how you put it all together, and that's a really important issue.

A couple of technical points. One is that there is a risk of weapons expertise proliferating to others, so you have to think very carefully about who joins inspection teams, and what information you as the team leader disclose to other inspectors. Not many people know about biological weapons and the physical process of making them. Theoretical aspects are important too, but there really are not many people who know about making biological weapons, even taking into account new technologies. Although it is true to say that advances in science and technology makes proliferation easier across the board, nuclear and chemical as well as on the biological side. Generally, I think it true that to make an effective biological weapon, that is going to have a mass effect, as opposed to an individual assassination type, is actually very difficult. And that was the aspect the Iraqis, on the biological weapons side, had a real problem with: how to deliver a biological weapon. They hadn't quite mastered the engineering involved in that.

I liked Dave's and Tim's emphasis on people, how important they are. Another angle on that is the tacit knowledge in people's heads. The Iraqis were very careful and tried to conceal the level of technical knowledge they had, not just hide the weapons. Even if the materiel was being destroyed, they hoped to hide knowledge that would indicate how far they had got with the program. There's another illustration from my last inspection. My deputy chief inspector, a civil engineer, had all sorts of relevant skills. He was able, in this particular case, to look at the building and say: "Terry, there's something under the ground here." And sure enough, there was. It didn't turn out to be anything to do with biological weapons, but unfortunately for the other side it was actually a communications facility, which they were trying to keep secret. So, you have to be very flexible about the types of skills you need.

The single most important thing that I carry forward is my interactions with people, as Dave called it "the people thing", in the trilateral process. The reciprocal agreement for the trilateral agreement was, I think, essentially, a two and a half page document, and it didn't have any details of exactly what we were supposed to do on the ground. However, the less detail you have, the more flexibility you have. There is a danger of going too far in agreements or having too much detail because you don't know the direction you're going to go in. So I'll finish on a caution against detail.

Henrietta Wilson: Many thanks Terry. Next, we're lucky to have Åke Sellström with us. Åke served as Chief Weapons Inspector with UNSCOM and as a Special Adviser to Rolf Ekéus. He also served as Special Advisor to the Chair of UNMOVIC, Hans Blix, in 2000. Since then, he has contributed to international chemical weapons inspections processes, including for the UN and the OPCW in Syria.

Åke Sellström: Thank you for organising this and for the opportunity to talk to and to see old friends. I came into this as quite an ignorant professor of histology, and I've spent most of my career working on antidotes to chemical weapons. When Rolf Ekéus asked for Swedish assistance to build databases for equipment that was used in the chemical weapons programme, I signed up. I arrived on a very cold day in April 1994 as a latecomer to the other inspectors in New York, and took my place on the 31st floor. I knew very little about databases, and I knew next to nothing about the equipment, or the quality of the steel that was used for that equipment. But as other speakers have already mentioned, we had a fantastic Chair, who became an inspiring mentor to me. Being a Swede was another quality of his. We also had fantastic colleagues. Some of the key people that took care of me at the chemical desk were Horst Reeps, Igor Mitrokhin and Cees Wolterbeek.

I slowly became an inspector, or had the inspector mindset put on. I built the equipment database. At that time—and now I realise it much more—we were wrapping up the destruction, or 'the making Iraq harmless' part of UNSCOM's mission, and entering into the monitoring part. My second task was, accordingly, to write site folders for the chemical file—the factories, the laboratories, etc. that were to be inspected. I also went to Baghdad to start up the monitoring in chemistry with two Austrians. In Baghdad, I also became involved in setting up a simple chemical laboratory in the Canal Hotel.

As time went on, I was more and more coming into the big picture. This became fully true, following the release of the chicken farm documents. There were lots of documents, with research data and other data. Working with the material I got familiar with some of the key words the Iraqis used for key agents. We had tea. We had coffee. We had Debus (Date syrup). And there was sugar. Some of them were chemicals, like Debus, or VX, considered the Ferrari of chemical weapons. That was the most effective chemical you could have: a 10^{th} of a drop on your skin could kill you. The others—the tea and the coffee and the sugar—were code names for biological agents. Tea was a suspension of a protein. Coffee was a very rough mixture of anthrax spores, and sugar was to have these spores in a dried format.

Monitoring and 'making harmless' was a challenging development. Others have touched on this already. How do you assess what remains to be monitored? When was our job done? Was Iraq 'harmless' when it came to chemical and biological weapons? These judgements became my obsession. Many of you are aware that 200 litres or so of good quality anthrax spores will have the same effect as a 10kg nuclear weapon, and that 2000 litres of VX would have the same effect if dropped on unprotected people.

I first looked into Iraq's VX research to see how potent it was. How it was carried out, and what they achieved. I was nagging the chemical group for not pursuing this line before. And I was also telling Rolf Ekéus that we had to investigate this. We couldn't just rely on the old

stuff that we had destroyed, i.e. the old programme. It was obvious that they had restarted programmes again after the peace with Iran. They restarted programmes concerning VX as well as some of the bio agents.

Finally, they sent me to Baghdad. My first experience as Chief Inspector was interesting. I was used to working in flat groups. At the time, I was head of a research institute. For my first experience sitting down with the team, in Bahrain to prepare for Baghdad, I proceeded like a usually do with my research team. I defined the problem and I said, so how do you think we should attack this? And I had two British officers, leaning their heads forward and saying 'shit, this man doesn't know how to do it!' Flat hierarchies didn't translate so well on my first attempt.

For the most part of my field work with UNSCOM, I sat in a chair in Baghdad, communicating with General Amer Saadi, the Iraqi Minister of Armament. But, I had a fantastic tailor-made team. I had the best experts on VX in the world. I learned a lot from them. One of our key problems was finding out how the Iraqis were producing the VX. One French expert asked them [in a French accent]: 'Did you 'eat it?' They looked just as surprised as you do now. And, of course, what he meant was: 'Did you heat it?' It was apparently essential for the process, whether it was heated or not. The discussion went on and then we had a Russian expert that asked the primary leader of the VX development: 'Where did you go to school?' And he responded, 'I went to the Timochenko Academy in Moscow.' 'Aha, and who was your teacher?' When he mentioned a name that I don't remember, the Russian guy said: 'Ha, I know exactly how you made your VX!' And that was it. You know that was a prime example of how easily you penetrated a wall of silence. The Iraqis just blushed, and with a laugh sort of laid out what they had done. They had done very skilful work.

UNSCOM eventually had a new chair. The new chair had problems trusting the inspectors and their assessment on whether there remained weapons of military significance with the Iraqis. At this time, this question remained one of our core challenges. How much is military significant if you have VX or dry anthrax? Remember, 200 litres of anthrax could as effective against humans as a 10 kg nuclear device.

The new chair gathered an international panel, representing more than a dozen different nations. And these experts were to look into the biological weapons programme, as well as the Iraqi Declarations, to assess what remained to become harmless and left over for monitoring. I was asked to coordinate this exercise. We had a number of meetings where we met with the Iraqis. At these meetings, we pointed out what was lacking in the declarations, and most of the international experts agreed that key elements of the declarations were still missing. We eventually received updates on what we asked for, but we didn't ever come to a point where we could say, 'Iraq is now harmless when it comes to biological weapons', because the granular detail simply wasn't there. We didn't have the resolution to detect a garage type activity, or one or two or three scuds, filled with whatever they were filled with.

It was very satisfying to see afterwards, following the invasion of Iraq, and the extensive effort to look through what could have existed, that we had been done, that we had completed our task. Charles Duelfer mentioned this, but the trust, or rather the distrust we had in Iraq, didn't help us to be convinced that we actually had reached our goal. Again, the minute amounts that you needed to be of military significance, or of significance for the security effect of your neighbours, made it a very difficult task.

There are three main points I take away from UNSCOM experience. One is about the organisation: Executive Chairman Rolf Ekéus, Deputy Executive Chairman Charles Duelfer, and the staff. I appreciated how the organisation was driven, the flatness of it. I was sort of enjoying our morning meetings, and having a Swedish chairman doing as well as our chairman was doing. I valued the people that trained me into the task in the chemical file, and the collaborators that I worked together with in the biological file, Richard Spertzel and Gabriele Kraatz-Wadsack. They taught me a lot. There was a lot of proliferation going on there, especially from Dick to a Swede who doesn't know anything about making biological weapons. I appreciated the multitude of specialities that were there—the linguists, international lawyers, people into missiles, and whatever. Whatever expertise your needed was available or was made available.

The second point relates to what is happening now with Syria and OPCW. The declaration assessment at OPCW is not the same as what we were doing in Iraq, and they have a different endpoint than what we had, but they have similar problems to extract information from Syria, and, then, to define what may be their endpoint. Of course, completeness is the endpoint, but completeness is almost a theoretical thing.

The third point that I take away is that, although we did a very good job all in all, we also created a distrust in the possibility of verifying declarations in the biological area, since biological weapons could be quite significant, even in small volumes and at very low scales. UNSCOM's findings, and the confirmation in 2003, when the Iraq Survey Group also failed to find something, or prove that there was nothing, probably meant that the OPBW that was envisaged to as a copy of the OPCW for biological weapons never happened.

To compensate for how difficult it is to perform biological weapons inspection, we've ended up with a patchwork approach: 1) the Secretary-General's Mechanism that the Secretary-General could draw on to investigate allegations of biological weapons use; 2) the health sector and its laboratories, and the increased requirements for health sector laboratories to

declare what they have, and to look over the security; and 3) Resolution 1540 to control the spread of biological weapons to non-state actors. Thank you so much.

Filippa Lentzos: Thank you so much Åke, lots of wonderful anecdotes there and again emphasising that human side to verification work. We are now going to change gears slightly. We've looked at some of the ground level experience of inspectors, trying to identify a programme and render it harmless. We're now going to look at the monitoring aspect of what UNSCOM was doing. Clearly there is no better person to tell us about that than Gabriele Kraatz-Wadsack, who was chief of the team tasked with establishing and operating biological monitoring, and who herself also served as Chief Weapons Inspector on many biological weapons inspections. After Gabriele's time with UNSCOM from 1995 to 1999, when UNSCOM wound down, she went on to work with UNMOVIC until 2001. She has held several senior UN positions since, including Chief of the WMD Branch, Chief of the Regional Disarmament Branch of ODA, and most recently in the OPCW UN Joint Investigative Mechanism for Syria. Gabriele, we're so pleased to have you here, welcome.

Gabriele Kraatz-Wadsack: Thank you so much, and thank you for organising the event. It's great to see all my former colleagues, even on Zoom.

In UNSCOM I was given the task of implementing and putting into practice long-term monitoring in the biological weapons area. This task was unprecedented. For other types of weapons of mass destruction, there was at least some understanding about how monitoring non-proscribed activities could be done. But in the biological area we literally started from scratch, and even within our own group there were a lot of sceptics who doubted that biological monitoring could be effectively done, and there were widely divergent opinions on how to proceed on practically every issue.\

Finally, a system was developed, which incorporated a layer-by-layer approach, covering different aspects of the sites and activities to be monitored, and used many complementary and overlapping tools, including on-site inspections. UNSCOM also concluded that effective monitoring could not be done by short-term visiting teams, and instead decided to place resident monitoring teams of three to five experts in Iraq.

From the start, we ran into a huge complicating factor. Just as we were launching our monitoring activities, UNSCOM began to expose Iraq's concealed offensive biological weapons programme. On top of its regular duties, my monitoring team had in January 1995 been tasked with finding incontrovertible evidence of the proscribed biological weapons activities. In July 1995, Iraq finally had to admit that it had successfully mass-produced anthrax, botulinum toxin and aflatoxin, and weaponized and deployed operational missiles and aerial bombs filled with these agents. Iraq's acknowledgement of its secret biological weapons programme made UNSCOM realise more clearly that the long-term monitoring regime would be dealing with a more formidable opponent—one who had the necessary knowledge and capabilities to produce and weaponize biological agents, and who also had mastered concealment efforts over several years.

The UNSCOM biological long-term monitoring system was widely regarded as effective, including by our Iraqi counterparts themselves. Hussein Kamel, the head of the Military Industrialization Commission and the son-in-law of Saddam Hussein, reported to Saddam, "There are no doubts that their monitoring is working efficiently".[2] Expert post-factum assessment was also favourable. For example, Graham Pearson concluded that the ongoing monitoring and verification regimes devised by UNSCOM were effective in implementing the Security Council decision on Iraq.[3]

I have thought a lot about how UNSCOM's experiences, and the lessons learned, could benefit the Biological Weapons Convention. I advocate a new approach for strengthening the BWC, which leaves behind the tried but failed attempt to draft a legally binding verification protocol, and instead start working directly on ways and means to address and resolve non-compliance concerns.[4] Specifically, I suggest that states parties could launch a focused process to identify possible cases of non-compliance, and outline options to address each specific case. A menu of options for case-resolution might include various modes of consultative and clarification formats, such as familiarisation visits, presentations and demonstration of activities, roundtable discussions, expert panels, and peer reviews. Each of the options could be further elaborated as part of a specific toolbox.

Depending on each case, modalities and tools could relate to timing, speed, and scope of in-country and on-site access, as well as composition and expertise of teams, types of technical means to be used, sampling rules and interviews. During discussions about which option/s to use for each case, various situations and solutions could be suggested, thoroughly examined, and even tested through tabletop exercises. These activities could also involve other stakeholders such as industry and international organisations.

The suggested multi-layered and multi-tool procedures would not be legally binding—no protocol—but would instead be available for states parties to draw on and use once a suspected non-compliance case emerges. Most importantly the suggested approach would allow BWC states parties to be continuously, productively and cooperatively engaged in the work to strengthen the core of the Biological Weapons Convention.

Henrietta Wilson: Gabriele, a wonderful set of remarks, bringing us right up to today's challenges, and extremely interesting to hear your thoughts about the Biological Weapons Convention, thank you very much. I'm absolutely delighted to be handing over to Nikita Smidovich as our final speaker for today. Nikita is the longest serving staff member of UNSCOM and UNMOVIC. He was one of the first people recruited to UNSCOM, in June 1991, and he served as Deputy Director for Operations and Coordinator for missile and biological weapons issues at UNSCOM all the way through until it ended, and then he became Chief of Training for UNMOVIC so it'll be great to get his long-standing perspectives on all the things we've been talking about. Thank you very much Nikita.

Nikita Smidovich: First, I would like to express appreciation and gratitude to Ambassador Rolf Ekéus. Personally, I am grateful for his invitation to New York to work for the United Nations. Professionally, he taught me one of the basic lessons of diplomacy – that diplomacy should not pave the way to wars.

UNSCOM was given 'absolute' inspection and investigative rights. This was indeed very helpful in planning and implementing our tasks in Iraq. But there was a downside. It deprived us of convenient excuses which are often used by inspection agencies, that is, that their failures are the fault of their 'limited' mandate. Given the comprehensive terms of Security Council Resolution 687, UNSCOM could blame nothing but itself for its failures. Although today we are focussing on UNSCOM's successes, UNSCOM had its share of failures. The actual basis of these failures was not the mandate limitations but, in large part, the lack of proper inspection skills of personnel performing inspections. Every one of us who participated in UNSCOM can easily recall their own failures or the failures of fellow inspectors, including failures of epic proportions.

When UNSCOM started in 1991, the United Nations had no qualified personnel to carry out its designated activities. Governments were asked to send their military, diplomatic, intelligence, technical, and scientific experts to perform UNSCOM inspections. These people were among the best in their respective countries in their expert fields, but it turned out that they lacked the skills needed for conducting the new task of international on-site inspections, specifically those with absolute inspection rights. It soon became clear that simply modifying the pre-existing, multilateral or national procedures would not be sufficient. I will just point out two examples: one political and one technical.

First the political. It turned out that the most useful evidence was to get an admission from the host country about its illicit activities. Thus, international verification under the Security Council is not like a national court of law, or even scientific research. The best evidence of Iraq's biological weapons program was Iraq's own admission of such a program. The question then becomes, how can you make a government admit its illegal activities, which it had previously concealed and vocally denied.

A technical example from UNSCOM is related to information collection. UNSCOM was the first to undertake interviews as part of international inspections. This meant that new processes had to be worked out; whether they were effective or not is a different question.d

We realised that we needed specific inspection skills and so we launched a dedicated training program, covering biological, chemical and missile areas. It became a very extensive program, providing training for every inspector to be sent by UNMOVIC to Iraq. The training comprehensively addressed all aspects of inspection activities, from health and safety, through on-site investigation, to cultural sensitivity. For seven years since 2000, we conducted more than 40 training courses, five or six courses annually, and we trained more than 400 people, including 100 biological inspectors. The main task was to change the trainees' mindset, from what they had developed during their previous professional careers to that needed for being a skilled international inspector. This was a new and challenging profession for them. Later, we used the same approach in UNODA – Gabriele tasked me with launching a training activity for the Secretary General's Mechanism for investigating allegations of biological and chemical weapons use—again, the most difficult task was changing the mindset of people doing international inspections.

Unfortunately, there is no international inspectors' school even today. No one is educated specifically to become a professional international WMD inspector. Treaty-based organisations do train their staff, but only to perform their specifically-mandated tasks. I believe that efforts should be made to set up and sustain activities to train future personnel to conduct effective international WMD investigations.

Filippa Lentzos: Thank you so much Nikita. We're nearing the end of our time together, and I'll take a few moments to draw the webinar to a close. It has been a really wonderful experience to be here with all of you, and amazing to hear so many first-hand accounts of UNSCOM's successes, and how it achieved these, showing that verified elimination of weapons of mass destruction is technically possible despite difficult circumstances—although it does require extremely hard work and creative solutions. And sometimes, a very large phone.

This is all interesting in itself, but it is also very important for current work aiming to strengthen global weapons regulation regimes, including everyone now involved in monitoring illicit flows of weapons and weapons uses, such as the people who are in our audience with experience of online, open source investigations, and the people looking into Syrian chemical weapons use.

There is of course so much more we could say about all this but for now, it is really just time for me to say some very big thank-yous from myself, Henrietta and Ioan. Thank you to Isabel Lucio at King's CSSS for all her technical support making this happen, to our fantastic speakers, and to all of you for coming. Thank you all very much. Goodbye.

Notes

[1] http://www.humanreliability.com/downloads/Understanding-Human-Behaviour-and-Error.pdf
[2] "Meeting between Saddam and His Security Council Regarding Iraqi Biological and Nuclear Weapons Program," 05 Feb 1995, Conflict Records Research Center, Washington, D.C., https://conflictrecords.files.wordpress.com/2013/06/sh-shtp-a-001-0111.pdf; Original Audio for SH-SHTP-A-001-011
[3] The Search for Iraq's Weapons of Mass Destruction, Inspection, Verification and Non-Proliferation, Graham S. Pearson, Palgrave MacMillan, 2005
[4] https://www.tandfonline.com/doi/full/10.1080/10736700.2020.1865629

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