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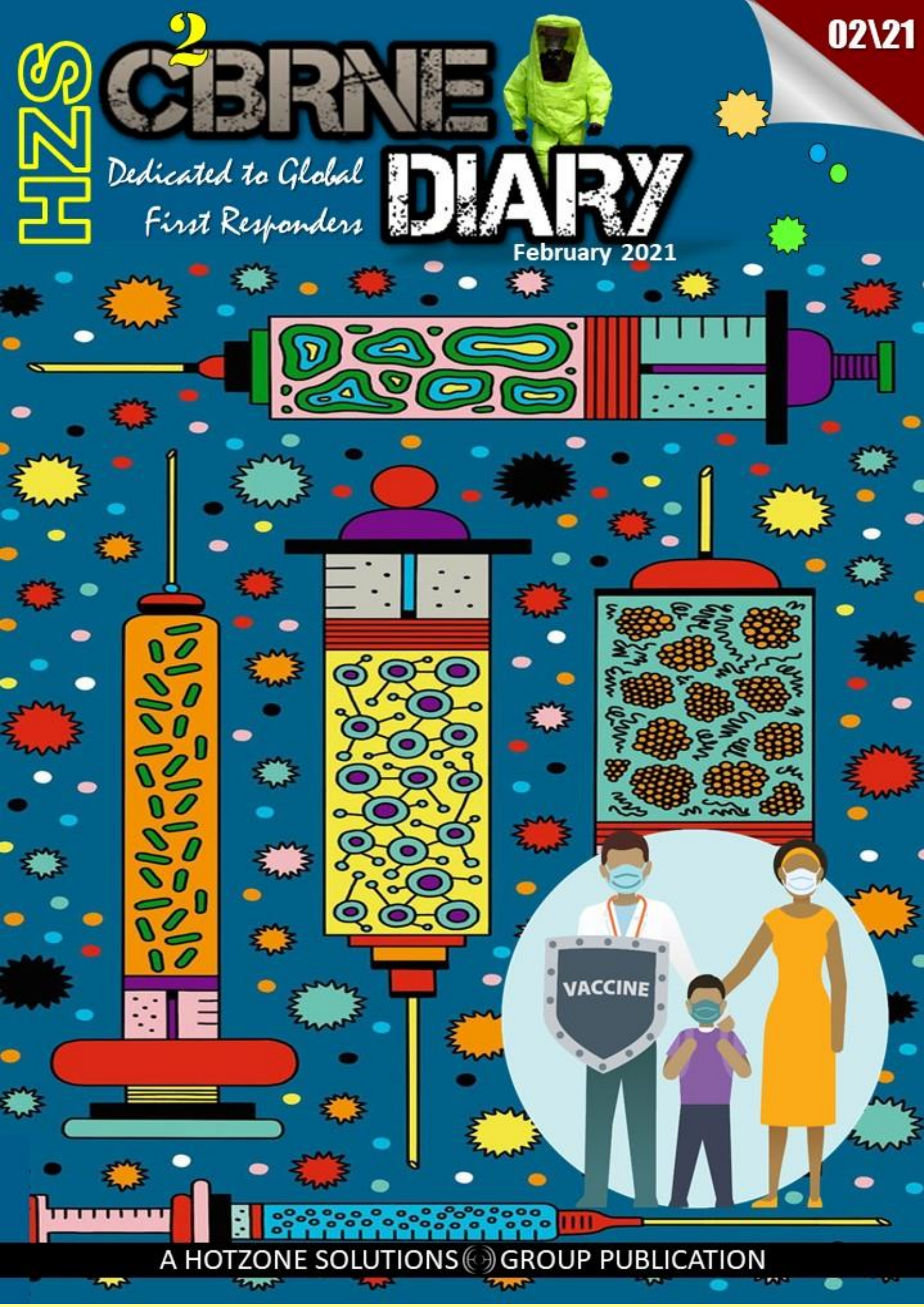
HZS C²BRNE DIARY

Dedicated to Global First Responders

February 2021



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February 2021

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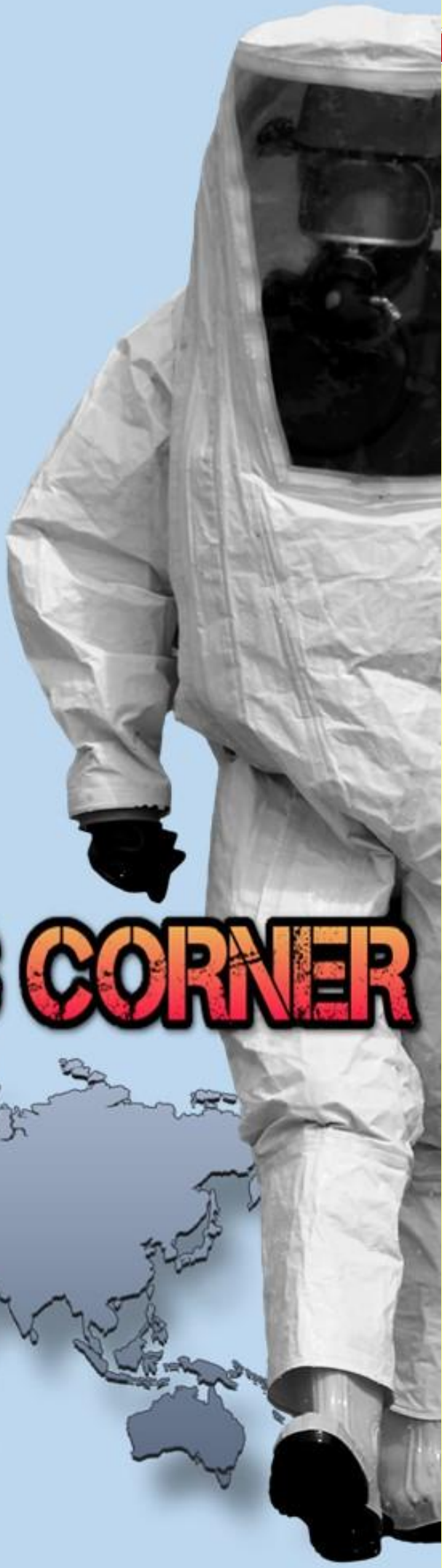

EDITOR'S CORNER

Editorial

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

Editor-in-Chief
HZS C²BRNE Diary

Dear Colleagues,

It might sound odd but nothing really important marked February. Of course, things happened but we need to know where nominate the "important" stamp. In that respect, it was nice that the United States of America managed to have a new President and avoided a theoretically possible civil war. The new administration remains to prove that is better than the previous one but reality have shown that in most cases new leadership is worse than the previous one. New administration does not mean that all problems over and under the carpet have been solved – e.g., the proposal for the independence of Texas (especially now that huge oil fields have been indentified).

In Europe, after the remarkable solidarity recorded during the first wave of the pandemic we now became witnesses of vaccine nationalism and many things happen under the table and behind closed doors about who is getting the vaccines first and in big numbers for their own people. The second issue is the uncertainty generated following the adverse reactions and death caused by the two mRNA vaccines available along with the ups and downs of the intervals between jabs. There was also a 360^0 turn and now the Russina vaccine is as good as the Western vaccines and many say it is more effective and safer. We eagerly expect to get the approval of the European Medicines Agency in order to be ordered by member states. Of interest is the Janssen/Johnson & Johnson single jab vaccine. Of course, vaccination alone does not mean that we are back in the normal. The precautions' triad should be followed at least until the end of 2021 that most of nations will reach the heard immunity percentage of 70% despite the fact that mutations cause additional problems.

What is important is that the current pandemic can serve as an initiative to review our plans and fill our gaps when comes to emergency response in similar disasters. I am sorry to say that only very few countries are looking ahead in the midst of an ongoing pandemic. And when the pandemic will be under control governors will focus on restoring the economy forgetting to heal the wounds in their systems. And then a new pandemic will come (some already call it "*Pandemic X*") or a bioterrorism attack will threaten the entire planet much worse that SARS-CoV-2 as Bill Gates recently warned. We as first responders are obliged to warn people in high places about what went wrong and how to fix it but we are not the people who can make drastic changes and reboot the system. But at least we can try and the unexpected might happen!

And as if the pandemic is not enough, we have the change of attitude of Iran that now seems dedicated to produce enough nuclear material to make a few bombs and Israelis are not happy about it and we all know what this means. In the same wavelength Turkey is systemically attached to Pakistan most probably staring its nuclear bomb technology for its own and this is something that certain nations in the area are not happy at all. In addition, it is almost certain that something unpleasant will happen between Greece and Turkey because even bullying has its limits and some times the victim reacts in asymmetric ways!

Be alert first responders! Keep in mind that the few and the brave are the shield of the nation!

The Editor-in-Chief

ISIS and Foreign Fighters: Assessing the Threat and Potential Repatriation, Rehabilitation, and Reintegration

By Antoine Andary, Amanda Garry, Allison McDowell-Smith, and Ardian Shajkovci

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/isis-and-foreign-fighters-assessing-the-threat-and-potential-repatriation-rehabilitation-and-reintegration/

Jan 25 – Concerns over ISIS returnees remain pressing for many western governments, as does apprehension over domestic actors potentially spreading violent extremist ideology or carrying out terrorist attacks under the banner of ISIS or other terrorist groups. Some argue the November 2020 Vienna attack, in which four people were killed, marked the relaunch of ISIS' "Europe campaign." [i] Debatably, al-Qaeda supporters and sympathizers back in the day exhibited more fortitude as sleeper cell agents, sometimes waiting up to two or three years for marching orders before taking action. ISIS' "flash to bang" indoctrination peddled vis-à-vis its follower base nowadays seems to have become rapid and has been tightening. Perhaps the case of the French middle-school teacher who was brutally murdered in October 2020 in Conflans-Sainte-Honorine, France, by a militant jihadi adherent serves to demonstrate the point and perhaps draw attention to newly emerging forms of violence and terrorism in Europe. This particular terrorist act has once again intensified the public debate over a "radical atmosphere" in Europe, interspersed with diverse opinions on subjects such as secularism, terrorism, endemic violence, immigration, and freedom of expression.

European media claimed that the suspect had contacts in Idlib in northwestern Syria, and that he was close to Hayat Tahrir Al-Cham (HTS),[ii] though the official investigation in France is ongoing. Abdoullakh Anzorov was shown to be very active on social media, and his tweets leave little doubt about his fundamentalist vision of religion.[iii] Nicolas Chapuis from Le Monde accessed Anzorov's Twitter accounts and found 3,000-plus tweets published between June and October 2020, all of them under various accounts. In the beginning, he exchanged jokes with his connections. Gradually, his conscientious exposition of the religion of Islam grew stronger. "He detailed his vision of the world in binary terms, namely what is considered *halal* [permitted] and *haram* [prohibited]," Chapuis explained.[iv] Anzorov seemed vigilant in concealing extremist compulsions, however, and on several occasions he had expressed his support to the Taliban in Afghanistan and to "Aqmi," a branch of al-Qaeda in the Islamic Maghreb. He retweeted a post referencing ISIS but was mindful not to immerse into discussing terrorism issues. Therefore, Anzorov managed to escape the radar of the French intelligence services.

Questions over whether returning foreign fighters will opt at all costs for violence once back in their home countries of origin will likely continue to linger. Hundreds of detainees and prisoners linked to terrorism and radicalization remain housed in European prisons, with approximately 220 of them located in Belgian prisons alone. This number includes "returnees, terrorist convicts, hate preachers, and so-called radicalized criminals."[v] Different countries have adopted their own varied solutions, ranging from forgiveness to punishment and punitive measures. Adding further to the complexity is the fact that thousands of children continue to remain in a limbo in Syria and Iraq,[vi] with the UN and other organizations stressing that governments have "the primary responsibility to address the plight of their nationals, including children trapped in conflict zones."[vii] The following testimonies from State Department and other domestic and international legal and psychological experts lay a groundwork on some important considerations as governments continue to address the issue of FTFs and their family members.

Historical, Conceptual Considerations

There is an overarching need to approach every issue with several factors in mind, one being history. History repeats itself and ensuring there is an adequate understanding of our past will allow us to be better prepared for the future and any challenges that may arise. [viii] As stated by John Giduck, "The question is not only how we combat terrorism, but how do we live with the people upon whom we have placed the brand of terrorists."[ix] Both the legal and humanistic perspective have to inform each other and work together. From the legal perspective, we need to define terms like FTF as well as the many threats that we strive to reduce. The United States government has at least 13 different definitions of terrorism, creating challenges within the legal realm. Giduck stated, "If the United States itself cannot agree on what exactly terrorism is and what a terrorist is, how does the world come together to arrive at a single, commonly accepted understanding and definition of terrorism?"[x]

Varying definitions create barriers to success and hinder our ability to indict and prosecute individuals at a consistent level, especially internationally. Practitioners need to consider what we do with the individuals who are involved in terrorism, whether that includes sheer incarceration or de-brainwashing or deradicalization. "We are never going to kill our way to peace in this situation… and we need to start thinking now about the long-term solution," Giduck explained.[xi] Countries need to give more consideration to individual circumstances and promote sustainable results. The

Guantanamo Bay experience, for example, allows us to recognize that the world has not come together to develop a definition or agree on U.S. conduct when dealing with detainees. Countries are not in agreement on which individuals they should take back. Giduck further explained, "We are facing a similar situation in Iraq and Syria, including the status of the individuals once they return and how will home nations react to them and what opportunities will they give them."[xii] Giduck also placed an emphasis on how repatriation is defined in varying countries along with the extent and degree to which foreign courts' rulings will be honored and possibly appealed. In terms of prosecution, Giduck posited, "The United States deserves a lot of scrutiny because the statutes are just an association law that says there has to be evidence of active membership and specific intent."[xiii]

Reintegration, Rehabilitation, and Repatriation Imperative

Many countries remain focused on successful reintegration and rehabilitation of FTFs. Those who have accompanied them in Iraq and Syria serve as a "cautionary tale for others in their home communities who may be considering following in their path."[xiv] The coronavirus is presenting challenges within this arena and we need to ensure it does not magnify grievances and lead to further recruitment. Some countries, such as the United States, place an emphasis on children who are swept up in conflict and view them as victims regardless of the roles in which they serve. Devoting attention to the impact of trauma and children is important to work through these circumstances and restore normalcy as soon as possible. Michael Duffin stressed, "Even if countries do not actively elect to repatriate their citizens, we have learned that many ISIS family members find their way back to their home communities on their own."[xv] Duffin argued that success is far more likely among those who are involved in the formal repatriation process rather than those who travel and reintegrate entirely on their own. The risks that they pose to society need to be addressed and alleviated to lower their overall level of threat. Duffin further explained, "If we don't develop effective rehabilitation and reintegration programs now, these children could become the next wave of terrorist fighters or supporters."[xvi]

The long-term health and well-being of children is critical as some of their issues may not present themselves immediately. To assist with this, governments need to leverage their resources and acquire the tools to help communities address vulnerabilities that push individuals toward extremism. The United States is known for sending specialists to many different countries to work toward successful repatriation. It is important to adjust our approach when meeting different individuals and to collaborate with each other. Psychologists, social workers, religious leaders, and those who have experience with traumatized children need to come together and calibrate their knowledge. Virtual programs now allow for longer-term engagement and strengthened trust among international partners. Creating long-term sustainable protection programs helps ensure that the government and community have the resources that they need for success. Duffin concluded, "We need to be concerned with the newer generation who hasn't heard the horror stories of ISIS and extremism."[xvii] Understanding how and if their rhetoric will be accepted in coming decades is key when developing counter messages and reducing the overall threat. Among those who wanted to fight for ISIS but did not, it is important to capture their voices that help dissuade others.

Children Repatriation, Psychological Needs Considered

The issue of repatriation is multidimensional and applies to a variety of different levels. In reflecting on the experiences of children who have lived under ISIS and how to help them achieve a sense of normalcy, Dr. Heidi Ellis explained, "Disruptions in any one layer of *social ecology* can have profound implications for a developing child at its core."[xviii] Under ISIS, every layer is disrupted within society. Education, family life, all are infused with violence. Practitioners need to leverage this information to create successful rehabilitation and reintegration plans. We also need to understand how the brain processes threats. "When we experience trauma there are shifts in our behavior, emotions, and how we perceive and process both ourselves and the world around us. But when a child lives in an environment of chronic or severe threat, the brain system that perceive and respond to a threat become potentiated," Dr. Ellis explained.[xix] Individuals will mistakenly respond to a safe situation and environment as if they are in danger because of how their cognition is impacted by their experiences. Even if children are removed from an unsafe situation, their mental trauma and affiliation with fear is not resolved. Dr. Ellis further elaborated, "We can reintegrate them into a safer context, but the brain will respond as if their survival is at stake, leading to developmental cascades that inhibit their ability to thrive in safe settings."[xx] One ought to understand the correlation between stressors and psychological adjustments.

Trauma needs to be approached from a multidisciplinary standpoint. Dr. Ellis clarified, "You need a multi-actor team that can come together to collaboratively assess and address these needs. No one sector can hold the solution."[xxi] Psychological, practical, legal, societal, and family factors need to be considered to form individual treatment plans that are based on positive intervention and individual growth. It is critical to have clarity around information flows. There needs to be "a clear line between info gathering of criminal justice separate from what we need to know about an individual to understand their strengths and

needs and how we can implement supportive services to give them the best chance at moving forward," Dr Ellis rationalized.[xxii] Distinct limitations should be set surrounding information sharing outside of when an imminent risk is present. Too much information sharing, especially for prosecution purposes, can "undermine trust in those services, and once you've done that you've lost every opportunity we have." Capacity building programs help identify barriers to healthy development. "Once you've strengthened social connection and removed barriers, you've positioned someone to have more options in terms of how they relate to society and where they see themselves," Dr. Ellis stated.[xxiii] Avenues of civic engagement are important, and we need to leverage what we have done in the past in order to learn live. Implementing rigorous monitoring and evaluation of these programs is critical to promote future success.[xxiv]

Legal Barriers, Political Impediments

Generally speaking, European countries remain reluctant to actively repatriate their citizens from Syria and Iraq. In France, specifically, for instance, Dominique Inchauspe explained that nearly 67 percent of the public are against the repatriation of children, which creates many concerns among how the government should respond to these individuals.[xxv] The French government does not want to accept responsibility or liability for the women and children housed in the camps in northern Syria. Additionally, courts do not agree on the decision-making processes and often promote varying convictions. The gathering of evidence allows sentences to be easily overturned because almost any piece of evidence that is found can be used. Inchauspe explained, "Evidence is free. France does not have an admissibility problem, and there is no assessment on whether evidence can or cannot be used."[xxvi] Regarding repatriation, Inchauspe suggested following in the footsteps of countries like Kosovo and "to incorporate specialist chambers into the justice system" when prosecuting FTFs. Assessment is a case-by-case basis that is often neglected as authorities do not want to deal with repatriation in the first place. Additionally, prosecuting FTFs in France is easy, but evidence gathering creates hinderances that law enforcement needs to work through.[xxvii]

Some countries have more actively engaged in repatriation of their respective citizens, albeit acknowledging practical, policy, and legal barriers to repatriation and successful rehabilitation and reintegration. Prosecutors often face difficulties from a technical standpoint and how to react best morally and legally. Atdhe Dema argued that women returnees, for example, are often placed on less harsh restrictions as their presence is viewed as being necessary for their children to thrive. House arrest is a common sentence to ensure the family can continue to function and grow. Even when a woman's presence in ISIS-controlled territory could be established, it is difficult to display whether or not a passive or active role was assumed. Additionally, varying elements must be established in order to convict the individual to avoid having any procedural issues. Women oftentimes provide material support to ISIS to appease their husbands and are able to receive lesser sentences, assuming they express remorse and are first-time offenders.[xxviii]

Dema also explained that "repatriation should be carried out when it comes to citizens of your country, they must bear the responsibility to treat them in accordance with the law."[xxix] From a legal standpoint, we have to respect the rule of law. While cooperation among various institutions and psychologists is beneficial in the repatriation process, a strict set of guidelines and policies has to be followed. Psychologists care about those individuals and their reintegration in a proper way and should be involved at every step, Dema pointed out, further noting, "A sentence itself isn't effective, and we need to work with them and reintegrate them."[xxx]

Conclusion

Foreign Terrorist Fighters (FTFs) who fought in Iraq and Syria are likely to remain a key security concern for many western countries for years to come. ISIS has also transformed into a covert network, both in Iraq and Syria, while it also remains a global threat with centralized leadership,[xxxi] which is equally problematic. Failure to recognize this danger and develop appropriate policies to combat it, along with the relatively low returnee rate, runs the risk of terrorist attacks in Europe and elsewhere. A peaceful reintegration into society seems possible. Indeed, some foreign fighters are far from continuing their radicalization once they return and, thus, as demonstrated by expert insights in the article, it is essential to further explore aforementioned considerations that can lead to effective repatriation, rehabilitation, and reintegration solutions of FTFs and their family members.

Antoine Andary *is a political communication and international affairs, counter-terrorism research fellow and intelligence analyst. Currently, he is the Vice-Chairman of the International Association for Political Science Students – IAPSS's Research Committee on Conflict, Security and Crime. Formerly, he served as a counter-terrorism intelligence analyst at the Counter-Terrorism Group – CTG within the crime unit. Antoine is a research fellow at the American Counterterrorism Targeting and Resilience Institute (ACTRI), where he researches crime-terror nexus in the context of both militant Jihadi, terrorist groups and*

violent extremist in the EU. His research focuses on developing counter-terrorism ingenuity and capability on understanding the inducement of terrorists individual and organizations worldwide. He leads different research and information collection on the role of law enforcement and prosecution strategies in combatting extreme ideologies, specifically, vis-a-vis the Middle East and the European Region.

***Amanda Garry** serves as a Cyber Defense Technologist within Raytheon Missiles and Defense, where she is responsible for maintaining security posture of information systems, auditing, ensuring compliance, and upholding key security practices to promote a secure and sustainable network from infiltration. She has previous experience in counterterrorism research and intelligence analysis. Amanda graduated from Nichols College in 2018 and 2019 with a Bachelor of Science in Business Administration and Master of Science in Counterterrorism degree, respectively. She has explored roles in criminal justice including security, fraud, and risk mitigation. Her interests include examining terrorist recruitment, radicalization, and rehabilitation, and she strives to counter terrorism on a global scale with primary research, actionable recommendations, and consistent program evaluation. At the American Counterterrorism Targeting and Resilience Institute (ACTRI), Amanda researches both far-right and militant jihadi radicalization, recruitment, rehabilitation, communication platforms, and technology. She also looks at structural, psychological, and social processes associated with domestic terrorism and targeted violence in the United States. She is currently leading data collection for the upcoming ACTRI database.*

***Allison McDowell-Smith, Ph.D.** is Deputy Director at American Counterterrorism Targeting and Resilience Institute (ACTRI). She is also the Director of the Graduate Counterterrorism Program, Chair of the Undergraduate Criminal Justice Program, and Assistant Professor of Criminal Justice at Nichols College. She has launched the Nichols Master of Science in Counterterrorism (MSC) Program, the first graduate program in the United States with a focus on Violent Extremism (VE) and leadership for those pursuing careers in the fields of security, intelligence, and public policy. She has spearheaded pioneering innovative approaches to shape understanding of violent extremism and terrorism globally while pursuing data-driven policy security solutions and tackling unique proficiencies needed to understand the field of the study at both private and public sector levels. As an interdisciplinary researcher and educator, she strives to identify and advance criminological approaches that may be relevant to violent extremist and terrorist thought and violence, offering unique perspectives on the often-overlooked relationship between the two. Beyond her teaching experience in the fields of violent extremism and terrorism and program management skills, she has a significant record of collaborating and liaising with law enforcement, military, and intelligence components on security related trends and events, focusing on a wide range of issues, from violent extremist and terrorist motivation to technology and cyber security threats. Prior to her academic life, she has worked in non-profit sector, most recently as a Senior Research Fellow for the International Center for the Study of Violent Extremism (ICSVE), where she conducted research on ISIS recruitment strategies, de-radicalization processes, and counter messaging. She obtained a Ph.D. from Northcentral University focused on Homeland Security, Leadership, and Policy; M.S. in Criminal Justice administration from Northcentral University; and B.S. in Criminal Justice from Rochester Institute of Technology.*

***Ardian Shajkovci, Ph.D.** is Director at American Counterterrorism Targeting and Resilience Institute (ACTRI). He is a counter-terrorism researcher, lecturer, and security analyst. He has conducted terrorism and violent extremism related research in in Syria, Somalia, Iraq, Jordan, Western Europe, the Balkans, Kenya, and Central Asia. Ardian serves as a visiting lecturer and adjunct faculty, including at Nichols College, where he is teaching CT and P/CVE courses in the MSC Counterterrorism Program. Past positions include Research Director and Senior Research Fellow at the International Center for the Study of Violent Extremism (ICSVE) and other positions and consultancies with domestic and international organizations. Ardian obtained his Ph.D. in Public Policy and Administration, with a focus on Homeland Security Policy, from Walden University. He obtained his M.A. in Public Policy and Administration, from Northwestern University, and a B.A. in International Relations and Diplomacy from Dominican University. Homeland security, disengagement from terrorism, violent extremist and terrorist group media communication strategy and information security, messaging and counter-messaging, and the legal, regulatory, and policy aspects of response strategies to threats and crisis related to terrorism and violent extremism represent some of the areas of research interest. Ardian has authored and co-authored numerous scientific and professional publications on the subject of violent extremism and terrorism. He has written for, and his work has been quoted by,* The Hill, Homeland Security Today, New York Post, Euronews, The Daily Beast, Le Figaro, Washington Examiner, AFP, Daily Caller, Fox News, *and others.*

This young lady saved a soldier who had been shot in the mouth. Whilst under fire she raced to his rescue and administered life saving support. If you think lockdown is tough then just think of her.

UK Royal Navy Medic Kate Nesbitt

Her citation (Military Cross) read: "Under fire and under pressure her commitment and courage were inspirational and made the difference between life and death."

THE WAR HEROINES WHO RISKED EVERYTHING

■Private Michelle Norris was the first woman to win the Military Cross after dodging sniper fire to save the life of a critically injured colleague in Iraq in 2006. Private Norris, from the Royal Army Medical Corps, was just 19.

■Lance Corporal Sally Clarke, 22, was hit by shrapnel from a Taliban grenade but refused to board a rescue helicopter so she could stay and treat seven wounded comrades in Helmand province in February.

■Nancy Wake worked as a saboteur and was helped sever German lines of Communication on D-Day. Now 97, she is one of several who inspired the film Charlotte Gray

and has been awarded medals including the George Cross.

■Pearl Cornioley was dropped into France from 300ft to join the resistance in the Second World War. When her leader was taken by the Gestapo she commanded 1,500 freedom fighters.

■Nurse Edith Cavell, pictured, helped about 200 Allied soldiers escape from occupied Belgium into the neutral Netherlands during the First World War. Later executed.

■Flora Sandes joined the Serbian Red Cross in the First World War and was later decorated for serving seven years as a soldier in arduous mountain campaigns.


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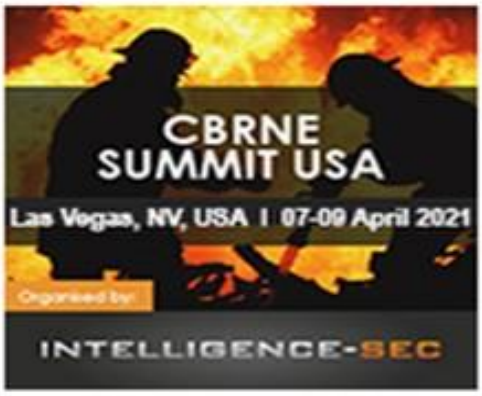
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Qatar rated among 'World's Best' in Health Care System: Numbeo Index 2021

Source: https://www.qatarday.com/news/local/qatar-rated-among-worlds-best-in-health-care-system-numbeo-index-2021/82804

Jan 26 – Qatar is consistently in the roster of the world's giants in providing the best health care services. Just recently, the country has been ranked among top 20 countries and the best in GCC, according to Numbeo Healthcare Index by Country 2021.
Scoring 73 points overall, Doha's points in different components of the survey are as follows:

- Skill and competency of medical staff - 68.18 (high)
- Speed in completing examination and reports - 70.00 (high)
- Equipment for modern diagnosis and treatment - 88.19 (very high)
- Accuracy and completeness in filling out reports - 69.49 (high)
- Friendliness and courtesy of the staff - 75.98 (high)
- Satisfaction with responsiveness (waiting) in medical institutions - 56.40 (moderate)
- Satisfaction with cost - 74.80 (high)
- Convenience of location - 78.65 (high)

Rank	Country	Health Care Index	Health Care Exp. Index
1	Taiwan	86.39	158.95
2	South Korea	82.34	150.68
3	France	80.99	148.63
4	Japan	80.68	147.35
5	Denmark	79.96	147.26
6	Spain	78.80	145.11
7	Austria	78.40	143.50
8	Thailand	78.08	142.37
9	Australia	77.71	141.60
10	Finland	76.40	139.22
11	Netherlands	75.76	138.16
12	Norway	75.50	137.92
13	Czech Republic	75.37	138.45
14	Belgium	75.20	136.55
15	United Kingdom	74.93	137.50
16	Switzerland	74.47	139.38
17	Germany	73.77	134.44
18	Israel	73.76	135.17
19	New Zealand	73.58	133.70
20	Qatar	73.00	132.65

Taiwan is at number one globally among 93 countries covered in the survey. Other countries in top 20 include South Korea, France, Japan, Denmark, Spain, Austria, Thailand, Australia, Finland, Netherlands, Norway, Czech Republic, Belgium, United Kingdom, Switzerland, Germany, Israel and New Zealand.
The Numbeo Healthcare Index is an estimation of the overall quality of the healthcare system, healthcare professionals, equipment, staff, doctors, cost, among others with the scale of (0, 100) for values.
In the recent survey, Doha has also emerged as first in the region scoring 72.94 on Numbeo Healthcare Index by City 2021.

Advanced Healthcare System

"Despite the global Coronavirus (COVID-19) pandemic, Qatar's investment in self-sufficiency in medicine and medical supplies has reinforced our efforts to safeguard the health and wellbeing of our citizens and residents," Qatar's Government Communications (GCO) office said in a statement.

Anchored by its advocacy to provide the best possible medical care to the community, it has been focused on intensifying the increase of its medical facilities and services. It has also been cultivating a culture of research across diverse specializations.

Best Army of Doctors

While the coronavirus pandemic is sweeping across the world, overwhelming already strained healthcare systems, Qatar has been in a fairly solid position to deal with the virus with its army of doctors.

The country has the best healthcare system in the world in terms of the doctors per capita, according to worldatlas.com.

Qatar has 77.4 physicians per 10,000 people (7.74 per 1,000 people) followed by Monaco (71.7), Cuba (67.2), Greece, San Marino (54, 51), Spain (49.5), and Austria (48.3).

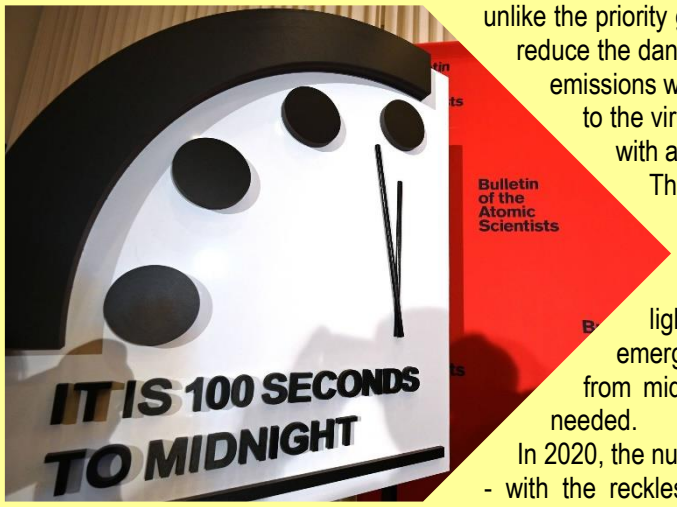
The most dangerous situation humanity has ever faced

By Edmund G. Brown Jr. and Robert Rosner

Source: https://edition.cnn.com/2021/01/27/opinions/doomsday-clock-dangerous-situation-brown-rosner/index.html

Jan 27 – For a year now, the world has been ravaged by the horrors of Covid-19. It has caused millions to lose their jobs, overwhelmed health care systems and dramatically changed how we live. The disease has killed more than 2 million people and infected 100 million around the globe.

Even so, we face fundamentally greater threats to humanity than this pandemic. We refer to the catastrophic dangers which nuclear weapons and climate change pose -- dangers that preceded this pandemic and will persist long after it ends. Unfortunately, and unlike the priority given to developing a vaccine against the virus, little progress was made to reduce the danger of the world's nuclear weapons arsenal or to effectively slow the carbon emissions warming our planet in 2020. The sudden appearance and confused response to the virus makes all too clear how ill-prepared the world can be when it has to deal with an unprecedented threat of global magnitude.



This is why the Bulletin of the Atomic Scientists announced Wednesday that the hands of the iconic Doomsday Clock remain at 100 seconds to midnight -- **as close to the end of humanity as the clock has ever been**. The temptation, of course, in a dark hour is to cling to even the faintest signs of light and hope. And the truth is that there are some encouraging signs now emerging. However, we continue to teeter at the brink and moving the Clock away from midnight would provide false hope at a time when urgent action is what is needed.

In 2020, the nuclear powers continued their blind and bellicose march toward catastrophe -- with the recklessness of spending to "modernize" weapons systems matched only by recklessness of world leaders' rhetoric. As we see it, the potential for the world to stumble into nuclear war increased last year. Despite this looming danger, there is little dialogue, but lots of accusation and blame shifting.

Governments also failed to sufficiently address climate change in 2020. While the pandemic-related economic slowdown temporarily reduced carbon emissions in 2020, atmospheric greenhouse gas concentrations hit a record high -- and it was one of the two warmest years on record.

At a time when fossil fuel use needs to decline rapidly to avoid the worst effects of climate change, oil and gas demand instead are projected to recover to pre-pandemic levels.

As we noted in the 2020 Doomsday Clock statement, the existential threats of nuclear weapons and climate change have intensified in recent years because of a threat multiplier: the continuing corruption of the information ecosphere on which democracy and public decision-making depend. This "infodemic" came into even greater focus as governments struggled to contain and confront the pandemic.

The now widespread and wanton disregard for science and the large-scale embrace of conspiratorial nonsense -- often driven by political figures and partisan media -- undermined the ability of responsible national and global leaders to protect the security of their constituents in 2020.

Nonetheless, we do see some positive developments that could turn back the hands of the Doomsday Clock next year. The election of a US President who respects science, acknowledges climate change as a profound threat and supports international cooperation

puts the world on a better footing to address global problems. And the new administration has already taken two meaningful steps: The US is rejoining the Paris climate accord and agreed to extend the New START arms control agreement with Russia for another five years. In the context of a post-pandemic return to relative stability, more action rooted in science and multilateral cooperation could create the basis for a safer and saner world.

We will be watching these developments closely in the year ahead, but this is no time for celebration. We remain perilously close to catastrophe. The pandemic laid bare our shared vulnerability. Now, the question is whether we choose to recognize that vulnerability with respect to the climate and nuclear threats. The imperative must be to rise above narrow nationalism and embrace planetary realism, recognizing that nations, no matter how different, share profoundly common interests.

Edmund G. (Jerry) Brown Jr. *is Executive Chair of the Bulletin of the Atomic Scientists. He completed his fourth term as the governor of California in 2019.*

Robert Rosner*, a former director of Argonne National Laboratory, is the William E. Wrather Distinguished Service Professor in the Departments of Astronomy & Astrophysics and Physics and the Harris School of Public Policy at the University of Chicago. He chairs the Bulletin of the Atomic Scientists' Science and Security Board.*

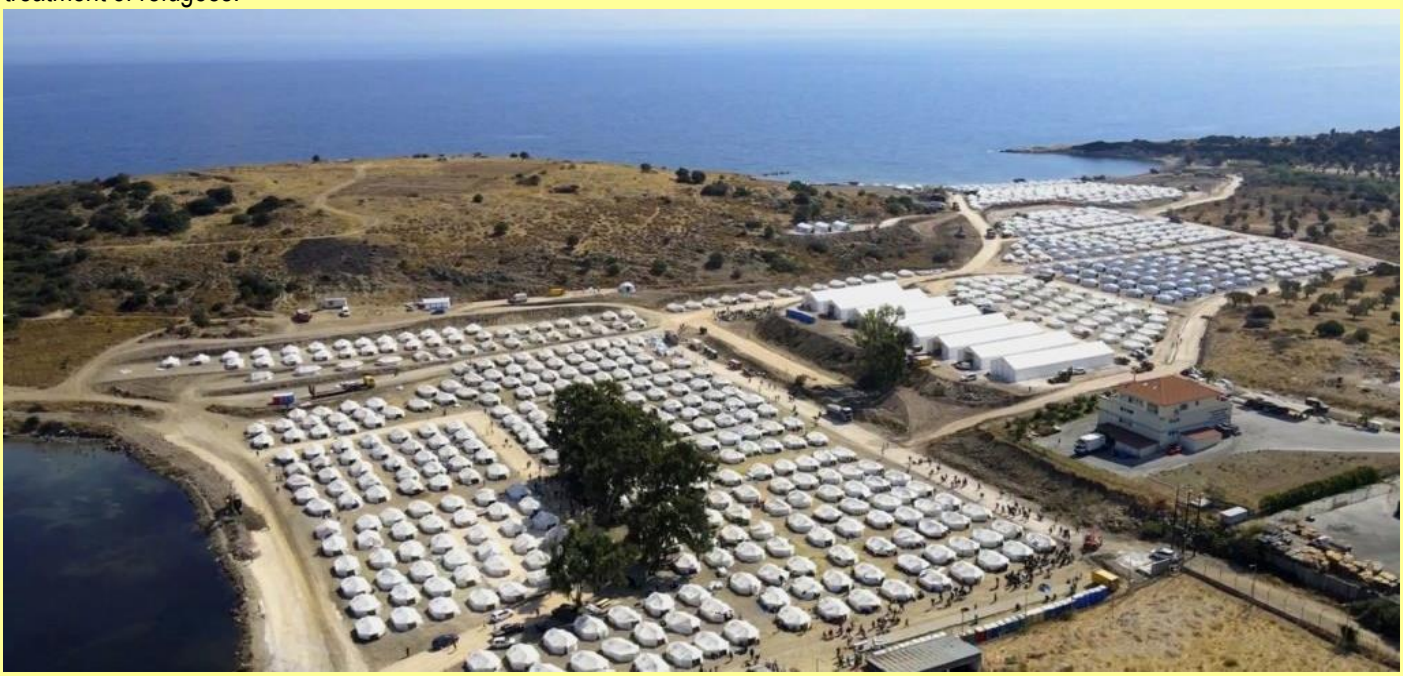
Syria group files for int'l probe of Greece migrant abuse

Soure: https://www.ekathimerini.com/261763/article/ekathimerini/news/syria-group-files-for-intl-probe-of-greece-migrant-abuse

Jan 28 – A Washington-based Syrian rights group filed a case with the International Criminal Court on Thursday, calling for an investigation into alleged crimes against humanity by Greece for its mistreatment of refugees.

The Syria Justice and Accountability Center said witness testimony and video evidence back its claims of mistreatment and abuse of refugees at Greece's borders and inside overcrowded camps. It cites instances of security guards using tear gas to disperse refugee protests, and shabby and unhealthy conditions at the sprawling camps.

Mohammad Al-Abdallah, the group's executive director, said this was the first legal challenge to the European Union over its treatment of refugees.



A general view shows the Kara Tepe camp for refugees and migrants on the island of Lesvos

Throngs of migrants, mostly from war-torn Syria, have crammed into small dinghies on dangerous journeys over the Mediterranean Sea to escape fighting and persecution, overwhelming the European asylum system, starting in 2015. Over 1 million migrants arrived, many of them Syrian refugees, entering the Greek islands via Turkey.

"If this case proceeds, it would send a clear message that yes, you have good policies in some countries, others [not] — but that you are actually governed by international law and by your refugee treaties, not by your individual member state's decision making," said Al-Abdallah.

Prosecutors at the ICC will review the case before deciding whether to open a full-scale investigation, which would likely take months to complete. The court receives hundreds of submissions each year from groups and individuals urging it to look into alleged crimes, but has so far mostly taken on cases referred to it by the UN Security Council and member states.

In the past, the court based in The Hague has faced criticism for looking into cases mainly in African countries, though it is currently probing cases world over.

The mistreatment documented since March 2016, the Syrian group argues, extends to Greece's territorial waters where it has documented sabotaging of migrant boats, leaving them to drift back to sea – even pushing them back into water.

Such "pushback" incidents are considered contrary to international refugee protection agreements, which say people shouldn't be expelled or returned to a country where their life and safety may be in danger.

The Syria Justice and Accountability Center said there is evidence that personnel from Frontex, the agency that monitors and polices migrant movements around Europe's borders, participated in or were complicit in these abuses, which it says could amount to crimes against humanity.

Frontex is already under fire after an October investigation by media outlets said evidence in video and other public data suggests its members were "actively involved in one pushback incident at the Greek-Turkish maritime border in the Aegean Sea."

Frontex maintains there is no evidence of its involvement in such actions, insisting that EU member countries have control over operations in their waters. But the allegations have been embarrassing for the European Commission, which in September unveiled new reforms to the EU's asylum system.

Nesma Bashi, a legal fellow with the Syria Justice and Accountability Center who conducted research on the Greek Islands, urged the ICC to investigate the allegations on Greece, and the "international community to recognize and provide support to end the plight of refugees, including Syrians, who continue to suffer in Greece."

The plight of refugees and poor conditions in camps took a dramatic turn last September when a fire broke out on the island of Lesbos in what used to be the most overcrowded camp on the Greek islands, where over 12,000 people lived in a facility designed for nearly 3,000.

Al-Abdallah said that by resorting to international law, he hopes the case would influence debate in individual EU member states.

"We are hoping this would also influence the policy and discourse on refugees within the EU, not only in Greece," Al-Abdallah said. "No EU country wants an accusation of crimes against humanity." [AP]

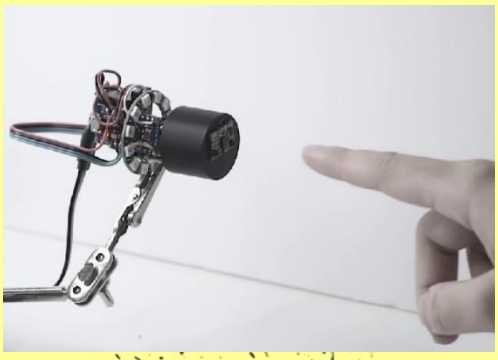
EDITOR'S COMMENT: Really? Why they accuse Greece the moment that internal borders to the rest of EU are closed for refugees/immigrants? And let us have things straight: A Syrian escaping to Turkey is a refugee. The same person entering Greek territories (land; sea) without proper documentation (but with expensive cell phones) is an illegal immigrant. End of story. The main problem are the NGOs' not the refugees.

COVID-19 Tech: Touchless Button Press

Source [+video]: https://i-hls.com/archives/106667

Jan 28 – The Covid-19 pandemic has forced all of us to maintain social distancing from each other and refrain from touching surfaces in public spaces. These surfaces include lift buttons, doorbells, cab doors, and more.

A Singapore-based innovation studio, Stuck Design, has come out with a new 'touchless' technology that can solve this problem.



This touchless technology impersonates the pressing of a button without actually pressing

it, helping people to minimize physical contact with any kind of surface. With the aid of motion sensors, this technology detects finger movements. No matter what the gesture is, pushing or pulling or sliding, this technology can mimic all in a physical manner. This new interaction for touchless lift buttons mirrors the finger movements to recreate the tactile response of pushing a button, as reported by technosports.co.in.

"Most touchless tech tends towards a static sensor with light or buzz to indicate an activated button, greatly diminishing the push-button interaction. By going beyond the expected feedback of light and sound, Kinetic Touchless provides a surprisingly delightful and yet newly familiar way to interact with contactless technology," the company said.

Governments Sign Secret Vaccine Deals: Here's What They Hide

By Matt Apuzzo and Selam Gebrekidan (The New York Times)

Source: https://news.yahoo.com/governments-sign-secret-vaccine-deals-130813221.html

Jan 29 — When members of the European Parliament sat down this month to read the first publicly available contract for purchasing coronavirus vaccines, they noticed something missing. Actually, a lot missing.

The price per dose? Redacted. The rollout schedule? Redacted. The amount of money being paid up front? Redacted.

And that contract, between German pharmaceutical company CureVac and the European Union, is considered one of the world's most transparent.

Governments have poured billions of dollars into helping drug companies develop vaccines and are spending billions more to buy doses. But the details of those deals largely remain secret, with governments and public health organizations acquiescing to drug company demands for secrecy.

Just weeks into the vaccination campaign, that secrecy is already making accountability difficult. Drug companies Pfizer and AstraZeneca recently announced that they would miss their European delivery targets, causing widespread concern as dangerous virus variants spread. But the terms of their contracts remain closely guarded secrets, making it difficult to question company or government officials about either blame or recourse.

Available documents, however, suggest that drug companies demanded and received flexible delivery schedules, patent protection and immunity from liability if anything goes wrong. In some instances, countries are prohibited from donating or reselling doses, a ban that could hamper efforts to get vaccines to poor countries.

Governments are cutting at least three types of vaccine deals: Some are buying directly from pharmaceutical companies. Others are buying through regional bodies like the European Union or the African Union. Many will turn to the nonprofit COVAX program, an alliance of more than 190 countries, which is buying from the drugmakers with an eye toward making vaccines available worldwide, especially to poor countries, free or at reduced cost. Some governments have signed deals with manufacturers and COVAX alike.

The United States has secured 400 million doses of the Pfizer-BioNTech and Moderna vaccines, enough for 200 million people, and is close to arranging 200 million additional

doses by summer, with options to buy up to 500 million more. It also has advance purchase agreements for more than 1 billion doses from four other companies whose inoculations do not yet have U.S. regulatory approval.
The European Commission, the European Union's executive branch negotiating on behalf of its 27 member states, has nearly 2.3 billion doses under contract and is negotiating for about 300 million more, according to data collected by UNICEF and Airfinity, a science analytics company.
COVAX says it has agreements for just over 2 billion vaccine doses, although it too is keeping its contracts secret. Only about a dozen of the 92 countries that qualify for vaccine subsidies under the alliance have managed to secure separate deals with individual companies, for a combined 500 million doses.
Despite the secrecy, government and regulatory documents, public statements, interviews and the occasional slip-up have revealed some key details about the vaccine deals. Here is what we learned.

Governments Helped Create Vaccines

Vaccine development is a risky venture. Companies rarely invest in manufacturing until they are sure their vaccines are effective and can win government approval. That is part of why it typically takes so long to develop and roll them out.
To speed up that process, governments — primarily the United States and Europe — and nonprofit groups like the Coalition for Epidemic Preparedness Innovations, or CEPI, absorbed some or all of that risk.
The United States, for example, committed up to $1.6 billion to help Maryland-based company Novavax develop its coronavirus vaccine, according to regulatory filings. CEPI kicked in up to about $400 million in grants and no interest loans.
Other companies have received even more help. Massachusetts biotech company Moderna not only used government-developed technology as the foundation of its vaccine; it also received about $1 billion in government grants to develop the drug. In August, the government then placed an initial order for the vaccine for $1.5 billion. The company has said that the project was paid for entirely by the federal government.
These types of arrangements were designed to help companies jump-start manufacturing and cover costs such as clinical testing.

But Companies Keep the Patents

Despite the tremendous taxpayer investments, typically the drug companies fully own the patents. That means that companies can decide how and where the vaccines get manufactured and how much they cost. As the CureVac contract explains it, the company "shall be entitled to exclusively exploit any such" property rights.
This has been a matter of contention for months. A coalition of countries, led by India and South Africa, have petitioned the World Trade Organization to waive intellectual property rights so generic drugmakers can begin producing the vaccines. The World Health Organization has endorsed the idea, but it is all but doomed by opposition from the United States and Europe, whose drugmakers say patents — and the profits that flow from them — are the lifeblood of innovation.
"Governments are creating artificial scarcity," said Zain Rizvi of the watchdog group Public Citizen. "When the public funds knowledge that is required to end a pandemic, it shouldn't be kept a secret."

Prices Will Vary

One of the key terms of the vaccine contracts — the price per dose — is frequently redacted in the public versions of government contracts. The companies consider this a trade secret. Some drug companies have included clauses in their supply contracts that allow them to suspend deliveries if countries reveal the price.
By insisting that their pricing remains confidential, the drugmakers have the upper hand over government negotiators who do not know what other countries are paying.
While governments accepted that provision, leaks and some official reports show some of the disparities. The European Commission paid $2.19 for every dose of the vaccine developed by the University of Oxford and AstraZeneca, while South Africa paid more than twice as much, $5.25, according to media reports.
Drug companies did not respond to requests to view their unredacted contracts or explain why secrecy was necessary. A spokesperson for Moderna pointed only to a regulatory document that said the contract "contains terms and conditions that are customary."
That is why it caused such a stir last month when a Belgian official mistakenly revealed a price list, which showed that United States taxpayers were paying $19.50 per dose for the Pfizer vaccine, while Europeans paid $14.70.
Dag Inge Ulstein, Norway's minister of international development, said countries and international organizations must do more to make contracts public. He also called on countries to share vaccine technology and said rich governments should donate vaccines to poor countries early — even while still vaccinating their own citizens, as Norway plans to do.

"There must be transparency related to the agreements on procurements," he said in an interview. To that end, he shared with The New York Times his country's purchase agreement with COVAX. That organization has refused to make public its deals — either with the drugmakers or with the countries it is selling to.
COVAX contracts with countries assume a cost of $10.55 per dose but warn that the final cost could be higher after including an "access/speed premium," which COVAX said is used to help companies rush their vaccines to market.

Donations and Resales Are Restricted
Public health advocates have called on wealthy countries — which have all but cornered the market on the early doses — to donate or sell vaccines to poor countries. But contracts may restrict buyers' ability to export doses, which could depress drug company sales.
The CureVac contract, for example, prohibits European countries from reselling, exporting or donating doses — including to COVAX — without permission from the company. Some contracts in the United States have similar restrictions.
A spokesperson for the European Commission has said the companies included that provision to guarantee that, wherever their drugs were used, they were covered by the same legal protections.
And governments are trying to find other ways to restrict exports.
On Tuesday, Germany lobbied the European Commission to allow its member states to block exports of vaccines to countries outside of the bloc after the stuttering start of vaccine distribution in Europe.

Vaccines Arrive When They Arrive
Delivery times are considered proprietary information, so there are no public bench marks to measure a company against.
Nowhere is that clearer than in the European Union's fight with AstraZeneca over the company's announcement that it would not deliver the expected number of doses in the first quarter of this year. European officials say they received specific contractual assurances for such deliveries. The company says it promised only to make its best efforts to hit those targets.
European officials, who initially agreed to keep the contract secret, have now asked the company to make it public. Unless that happens, there's no way to assess who is responsible.
But there is no question that the drugmakers have built themselves plenty of wiggle room for such an ambitious, complicated rollout.
The CureVac contract says the delivery dates (which are all redacted) should be considered estimates. "No product or only reduced volumes of the product may be available at the estimated delivery dates," the contract reads. Similar provisions exist in other contracts.
Nearly every vaccine-maker has similarly told investors that they might not hit their targets. "We may not be able to create or scale up manufacturing capacity on a timely basis," Pfizer warned in a corporate filing last August.
That uncertainty has frustrated health officials. When Pfizer recently told Italy that it was temporarily cutting deliveries by 29%, the government said it was considering taking the company to court. That lawsuit, if it materializes, could make public some details of the European Union's contract with Pfizer, which remains entirely secret.
"At one point they promised more vaccines or faster vaccines," said Steven Van Gucht, the Belgian government's top virus expert. "And in the end they couldn't deliver."

Some Governments Are Profiting
Early in the pandemic, the European Investment Bank, the lending arm of the European Union, provided a $100 million loan to German company BioNTech, which partnered with Pfizer in producing a vaccine.
In addition to the interest on the loan, the European bank will receive up to $25 million in vaccine profits, according to a redacted version of the contract that BioNTech filed with securities regulators.
The bank said profit-sharing arrangements reflect the risk involved in early financing. Rizvi, of Public Citizen, argued that it puts governments on the same side as the drugmakers and reduces any incentive to make drugs cheap and widely available.

Companies Get Liability Protection
In the United States, drug companies are shielded from nearly all liability if their vaccines don't work or cause serious side effects. The government covered COVID-19 drugmakers under the PREP Act, a 2005 law intended to speed up access to medicine during health emergencies.
That means that people cannot sue the companies, even in cases of negligence or recklessness. The only exceptions are cases of proven, "willful misconduct."

Drug companies are seeking similar liability waivers in negotiations with other countries. European negotiators have balked at such requests. COVAX also insists that countries accept all liability as part of its contracts.
The CureVac-EU contract does shield the company from significant liability, but with exceptions. Those exceptions are redacted.

How to redesign COVID vaccines so they protect against variants

Source: https://www.nature.com/articles/d41586-021-00241-6

Jan 29 – As evidence grows that new variants of the SARS-CoV-2 coronavirus can evade immunity produced by vaccines or previous infections, scientists are exploring the idea of redesigning the vaccines currently being rolled out worldwide.
Researchers are still debating whether the new variants could undercut the effectiveness of these first-generation COVID-19 vaccines. But some vaccine developers are charging forward with plans to update their shots so that they could better target the emerging variants, such as those identified in South Africa and Brazil. These lineages carry mutations that seem to dampen the effects of antibodies crucial to fending off infection. Researchers are also considering the possibility that vaccines against the coronavirus might have to be updated periodically, as they are for influenza.
The best and most immediate way to combat the threat of emerging variants is still probably to quickly vaccinate as many people as possible with current shots, says Mani Foroohar, a biotechnology analyst at the investment bank SVB Leerink in Boston, Massachusetts: "We need to get vaccines in arms and to smother this virus before it blows up in our face again."
But Foroohar and others expect that, in the future, a bevy of new vaccines will emerge to take the COVID variants head on. *Nature* explores the open questions about updating the world's coronavirus vaccines.

People await coronavirus vaccines at a hospital in Glasgow, UK.Credit: Jeff J Mitchell/Getty

Will we need updated COVID-19 vaccines?

"I think it's starting to look that way," says Kanta Subbarao, a virologist at the Peter Doherty Institute for Infection and Immunity in Melbourne, Australia.

Labs worldwide are racing to understand the threat that emerging coronavirus variants pose for vaccines. But early insights from these studies are mixed and incomplete. A variant identified in late 2020 in South Africa, called 501Y.V2 (also known as variant B.1.351), is among the most worrying. Lab assays have found that it carries mutations that sap the potency of virus-inactivating 'neutralizing antibodies' that were made by people who received either the Pfizer or Moderna RNA vaccines.

Whether these changes are enough to lower the effectiveness of those vaccines is not clear, says Subbarao. "That is the million-dollar question, because we don't know how much antibody you need." Other immune responses that vaccines prompt might help to protect against the effects of variants.

But on 28 January, biotech firm Novavax released data from clinical trials showing that its experimental vaccine, designed to combat the original virus, was about 85% effective against a variant identified in the United Kingdom — but less than 50% effective against 501Y.V2. That drop is concerning, say researchers, because it indicates that 501Y.V2 and other variants like it can cause a significant drop in vaccines' effectiveness.

"I think it's inevitable for the vaccines to maintain tip-top efficacy, they will need to be updated. The only question is how often and when," says Paul Bieniasz, a virologist at the Rockefeller University in New York City who co-led one of the neutralizing-antibody studies.

How should we decide when to update vaccines?

Scientists, health officials and vaccine makers are starting to hash this out. Researchers are only beginning to learn how different mutations alter vaccine responses and how evolutionary forces can cause mutations to spread. "I certainly wouldn't update them now," says Bieniasz.

One model that COVID vaccine updates could follow is that of seasonal flu vaccines, says Subbarao, who directs the World Health Organization Collaborating Centre for Reference and Research on Influenza in Melbourne. Centres including hers monitor emerging flu strains for genetic changes that might influence vaccines' effectiveness. Researchers use studies with ferret and human antibodies to determine whether a new flu strain is likely to evade a previous season's vaccine, and therefore necessitate an update. These reviews are conducted annually for each hemisphere's flu season, and changes are made only when a vaccine-evading strain is widespread, says Subbarao. "If it's localized to one region, one country, we wouldn't change the vaccine for the whole hemisphere."

Generally, the threshold for updating flu vaccines is similar in magnitude to the threshold for changes in neutralizing-antibody responses that researchers have linked to the 501Y.V2 variant. But it is not yet clear how these shifts — and the geographical distribution of different variants and mutations — will inform COVID-19 vaccine updates. "Those discussions are just beginning," says Subbarao. "We can't be chasing every variant that emerges."

How will the vaccines be updated?

That's another open question. Some COVID vaccines, including the major ones made by Moderna, Pfizer and AstraZeneca, instruct cells to produce the virus's spike protein — the immune system's key target for coronaviruses. Variants including 501Y.V2 carry spike mutations that alter regions targeted by neutralizing antibodies.

One possibility is to swap vaccines' old versions of the spike protein — based largely on the virus that was first identified in Wuhan, China — for an updated molecule that has the specific amino-acid changes that hinder antibody responses. But researchers will first need to determine whether any such changes have knock-on effects that alter how the immune system reacts to the vaccine. Another possibility is to include both new and old forms of the spike protein in a single jab — scientists call this a multivalent vaccine.

Moderna has started work on updating its mRNA vaccine to match spike mutations in 501Y.V2. The biotech company, based in Cambridge, Massachusetts, says it also intends to test the effectiveness of a third dose of its original coronavirus vaccine, and is looking into the possibility of a multivalent vaccine, said Tal Zaks, Moderna's chief scientific officer, in a 25 January call with investors.

But before deciding on any path, researchers will need to study how animals, and probably humans, respond to any potential vaccine update, says Subbarao. "It's not going to be as simple as [altering] an amino acid site and saying 'okay we got it'."

How will vaccines be trialled and approved?

Vaccine developers tested the currently available COVID vaccines in 'phase III' trials involving tens of thousands of participants before regulators authorized their use. But that kind of testing for a revamped vaccine would be slow and difficult now that the first-

generation vaccines are being deployed worldwide, says immunologist Drew Weissman at the University of Pennsylvania in Philadelphia: "I can't imagine how they could do a phase III trial for a variant."
It's unclear how much clinical data would be needed to approve a COVID vaccine update. New seasonal flu vaccines typically do not require fresh trials. But regulators do not have the assurance of decades of experience and clinical data with COVID vaccines. "They might say, 'It's a brand-new vaccine, let's do a couple of clinical trials,'" says Weissman.
The size and duration of those trials could depend on whether researchers can find 'correlates of protection': measurable features of an immune response, such as a particular level of neutralizing antibodies, that can provide a marker for protection against COVID-19. With such markers, researchers would not need to wait for trial participants to become infected with coronavirus to know whether the vaccines are working — they could simply measure immune responses after each dose.
There is no guarantee that a robust correlate will emerge, says Paul Offit, a vaccine researcher at the Children's Hospital of Philadelphia in Pennsylvania. But even without a definitive correlate, researchers might still be able to demonstrate that their new vaccine produces antibody levels similar to the first-generation vaccines. Moderna has said that it expects to be able to rely on clinical trials involving hundreds, rather than thousands, of participants to push forward with its vaccine against the 501Y.V2 variant. Foroohar expects that it will take the company about five months to go from producing the new vaccine to submitting data from its trials to regulators.

How will people respond to updated vaccines if they've already been immunized?
Researchers don't yet know how a person who has been fully vaccinated with a first-generation COVID vaccine will respond to a fresh vaccine against a new variant. Immunologists have long observed that people tend to mount more robust immune responses to the first variant of a pathogen that they encounter than subsequent variants. This phenomenon could mean that updated vaccines might trigger more muted immune responses than those to a first vaccine. "The fear is that boosting somebody with a variant won't make a new response against that variant," says Weissman. "It'll just boost the old response."
But Weissman argues that there is some evidence that RNA vaccines may not fall prey to this trend. For reasons that are not clear, some RNA vaccines trigger surprisingly complex immune responses, yielding antibodies that target regions of viral proteins that are often undetected by responses to other kinds of vaccines. This could mean that RNA vaccines will also be better able to target the changes present in a variant, Weissman says.
And Offit notes that a variant-specific response may not be necessary: even if an updated vaccine mainly boosts the response to an earlier coronavirus vaccine, that may still be enough to fend off the variants, he says.

What are vaccine makers doing?
Like Moderna, other coronavirus vaccine makers have said that they are looking into updating their vaccines. They include Johnson & Johnson of New Brunswick, New Jersey, which is developing a single-shot coronavirus vaccine.
Some aspiring vaccine makers have had their eye on the threat that escape variants might pose from the start. A team at Gritstone Oncology decided to focus on this potential problem by designing a vaccine that targets multiple sites on several viral proteins, in contrast to first-generation shots that target only the spike protein, says Andrew Allen, president of the company in Emeryville, California. The hope is that the vaccine, which should soon start clinical trials, will make it difficult for the virus to evade immunity because many genetic changes would be necessary for it to do so. "You can either play whack-a-mole and chase the variants, or you can try to get ahead of them," Allen says.
Because updating the construction of exisiting vaccines is relatively simple, a new RNA vaccine could be designed and manufactured for clinical testing within six weeks, Weissman estimates.
But that is only the beginning. "Mass-producing a vaccine is hard. To start all over again will be hard," says Offit.
Some researchers are expecting periodic updates to coronavirus vaccines, as with flu, to become a way of life. "This is not unusual," says Stanley Plotkin, a consultant who advises companies on vaccines. But it could mean that worries over supply chains and logistics will continue for some time.

Did Congress Rename Their French Fries to 'Freedom Fries' Before the Iraq War?

An evaluation of Islamist violencein the world (1979-2019)

By Dominique Reynié (Executive Director of the Fondation pour l'innovation politique)
Source: https://www.academia.edu/41097392/Islamist_Terrorist_Attacks_In_The_World_1979_?email_work_card=view-paper

Conspiracies, Contagion, and Convergence: Troubling Trends and COVID-19

By Stevie Kiesel
Source: http://www.homelandsecuritynewswire.com/dr20210205-conspiracies-contagion-and-convergence-troubling-trends-and-covid19

Feb 05 – For hundreds (if not thousands) of years, disease outbreaks have been accompanied by exaggerated or downright false claims of origin, spread, and treatment. Some of these claims are **misinformation**—incorrect information spread without an intent to mislead. For example, shortly after COVID-19 was declared a pandemic, claims that garlic could cure COVID-19 spread across social media. The majority of posters did not appear to have malicious intent in sharing this content, making these claims misinformation. On the other hand, disinformation is deliberately misleading or biased information. Far-right Telegram users planned to weaponize disinformation when they urged followers to spread inaccurate information about COVID-19 safety precautions via flyers in certain neighborhoods. While misinformation and disinformation are both dangerous, disinformation is more

insidious. Throughout history, both mis- and dis-information have spread prolifically during pandemics. This article provides a brief history of conspiracy theories during pandemics, discusses some popular COVID-19 conspiracies, and examines a potential convergence of various communities spreading similar conspiracy theories.

Fear of disease occupies a special place in the human psyche—an invisible threat that can cause physical deterioration and possibly death. Though science has come a long way in understanding pathogens and the human body, even today "much remains unknown in medicine, creating fertile ground for **fear**." While this is certainly true of the novel coronavirus SARS-CoV-2, conspiracy theories have accompanied disease outbreaks for millennia. Susceptibility to conspiracism is present in every country and can gain traction at any time, though it is more common around unprecedented events. Disease outbreaks are certainly one example, but the attacks of September 11th and the 2010 Deepwater Horizon industrial accident show that conspiracies often accompany newsworthy events. The influenza pandemic of 1918 saw its fair share of myths, often aimed at rival countries. For **example**, the United States and United Kingdom initially linked the outbreak to intentionally adulterated aspirin from Bayer, a German company. These accusations reflected a post-World War I mistrust of Germany. Similarly, a rumor circulated throughout Brazil that the 1918 influenza virus was intentionally spread around the world by German submarines in an act of biological warfare.

Though Americans often call this pandemic the Spanish flu, many countries had other regional names for it based on their particular prejudices. Conspiracy theories commonly lay blame on specific groups in an attempt to turn public opinion, even going so far as to claim that an outbreak is the result of biological warfare. For instance, a pernicious rumor in 14th century France claimed that a Muslim prince enlisted help from France's Jewish population to bribe lepers to contaminate public water sources and kill Christians. A few hundred years later, conspiracy theories around yellow fever eventually led to the genre American Gothic. The father of American Gothic, Charles Brockden Brown, caught the disease himself, and though he recovered, others in his life did not survive it. His writings often used disease as a "conventional vehicle of terror." His style was also deeply paranoid, including "hidden voices, secret societies…[and] fears of the Illuminati." These themes, as well as a fearful fascination with the Illuminati, reverberated in American popular culture and religious life as yellow fever continued to spread.

Conspiracies accompany nearly every significant outbreak of disease. Some believed that the SARS outbreak of 2002 was caused by a virus created in a Chinese weapons lab (sound familiar?). During the H1N1 (swine flu) outbreak of 2009, rumors circulated that the World Health Organization and pharmaceutical companies conspired to manufacture the outbreak so that they could profit from vaccine distribution (a theme that appears with many outbreaks). And the current outbreak of novel coronavirus is a case study in how the internet and political tensions can exacerbate conspiracism in the United States.

Because SARS-CoV-2 is a novel virus, misinformation and disinformation have provided many people with answers where science could not yet do so. The World Health Organization labeled this phenomenon an "infodemic," where technology and social media are used on a massive scale. While technology provides new mechanisms for keeping people safe and informed, it can also result in an overabundance of information, as well as the proliferation of incorrect and potentially harmful narratives. The pandemic has spawned countless conspiracy theories, but the most widespread can be generally grouped into four buckets:

- **Virus origins and spread**. There is a great deal of theories about how the virus came into existence and how it is spread. Members of the Trump administration, as well as the former POTUS himself, have claimed that the Wuhan Institute of Virology is responsible for bioengineering SARS-CoV-2. Some adherents of this theory claim the virus was then intentionally released, while others say it escaped the lab accidentally. Another popular theory is that 5G networks are acting as super-spreaders for the virus. This theory has been linked to several acts of vandalism against 5G towers and an increased propensity for violence.
- **Preventative measures.** Claims that preventative measures like mask wearing and social distancing are ineffective got a lot of traction on social media and were amplified by the Trump administration's words and actions. This is not a uniquely American phenomenon: for example, Moldova's former President was routinely photographed violating social distancing and mask mandates in his country. And in the US as well as Germany, the United Kingdom, and other countries, these preventative measures were met with angry protests by those who believe the lockdowns were a pretense for increased government control. And unfortunately, recent studies have proven that belief in COVID-19 conspiracy theories reduces willingness to engage in these preventative measures and protect communities.
- **Vaccines.** No other preventative measure has spurred quite as many conspiracy theories as the COVID-19 vaccine. The theories range from mundane (the vaccine actually gives you COVID-19) to bizarre (the vaccine will alter your DNA) to absolutely wild (the vaccine contains a microchip that will allow Bill Gates to track your every movement and implement a New World Order). Others are simply concerned about the safety and effectiveness of the vaccine because they perceive the approval process as rushed and/or they mistrust the government and pharmaceutical companies. As of December 2020, only 60% of Americans surveyed said they intended to get the vaccine, while 20% said they were fairly certain they would under no circumstances get the vaccine.
- **Treatments.** At the start of the pandemic, home remedies for COVID-19 were extremely popular on social media. Other bad information about COVID-19 cures came and went throughout 2020. Some of the most popular "cures" include garlic, saline nasal wash, exposure to high temperatures or sunlight, antibiotics, and hydroxychloroquine. None of these are effective against COVID-19.

Bad actors often encourage and amplify the spread of these narratives, twisting them for their own purposes. Extremists have latched onto many of these conspiracy theories and used them to recruit and radicalize followers. Social distancing, lockdowns, and online school and work have moved many people indoors, online, and looking for answers. When scientists, doctors, and public officials cannot provide the answers people are looking for, they become incredibly susceptible to messengers that claim to have a simple answer.

Conspiracism ebbs and flows, and though it is not a uniquely American phenomenon, we are currently living through a peak in what Richard Hofstadter has called the "paranoid style in American politics." Understanding all the factors that have led to this crescendo is beyond the scope of this article, but political turmoil, increasing inequality, and a global pandemic play a significant role, exacerbated by the rapid spread of information and a waning trust in

institutions. While much of the focus is on the political right, particularly given the recent siege of the Capitol, there is evidence of a convergence of conspiratorial thinking among those on both ends of the political spectrum, as well as those with few political beliefs who find answers in these ways of thinking. COVID-19 misinformation has been rampant on the right as well as within wellness and spirituality communities that are traditionally uninterested in politics or lean left. Liberal and leftist activists have also spread similar misinformation rooted in suspicion of pharmaceutical companies, the "medical industrial complex," and the government.

The QAnon conspiracy is another recent example of this convergence. Declared a domestic terrorism threat by the FBI in 2019, adherents of the theory have been linked to at least a dozen alleged crimes. This statistic does not take into account any crimes committed during the Capitol siege, but QAnon adherents had a sizeable presence there. While many Q followers approve of Donald Trump because they believe that he has been trying to dismantle the deep state cabal of pedophiles and Satanists that run the US government, QAnon has appealed to people across the political spectrum. Though at its core, the QAnon conspiracy is based on an old antisemitic trope of the Blood Libel, the core belief has been laundered through movements such as #SaveOurChildren (claiming to be fighting child sex trafficking) and by social media influencers that put a gentle exterior on an extreme ideology. Much like multi-level marketing schemes, these rebranding targets potential marks by constructing a façade to hide the ugly reality and consequences. The subreddit QAnonCasualties is full of stories from former Q adherents as well as their friends and family. These stories show how conspiracism can consume someone's life, leading them down a path to extremism that often ends in ostracism and sometimes even violence against their loved ones. The subreddit also shows the many different communities that can lead to Q, from churches to the wellness community to other conspiracy communities to right-wing politics and in countries outside the US.

Conspiracy theories and extremism will remain a potent threat for years to come, and currently disparate communities may converge in ways predictable or surprising. Conspiratorial thinking is often black and white, an "us versus them" mentality that can erode a person's aversion to violence. Terrorist groups can (and have) taken advantage of this shift in mindset and used conspiracy theories as an opening to eventually introduce more extreme ideas. The Capitol siege and subsequent crackdown on inflammatory rhetoric on the major social media platforms may be pushing people toward sources such as Gab, Telegram, and Bitchute where extreme ideas flourish. The Biden administration has suggested several actions to combat the threat of domestic extremism, including a threat assessment and capacity-building to disrupt extremist networks. These are positive steps that must include experts outside of government and from a variety of disciplines, including those experienced in successful cult deprogramming and deradicalization. While promoters of and participants in extremist violence should be held fully accountable under the law for their actions, we should not lose sight of the structural and systematic failures that have made these conspiracy theories so appealing today.

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

Greece – Lockdown for local citizens only

Legal and illegan members of the Pakistani community in Greece demonstrating outside the Embassy of India in Athens in the middle of a strict lockdown while Greek citizens are locked in their homes. Are aliens above the law? (wide coverage by the Pakistani media)

It Looks Like the UAE Is About to Win The 'Race to Mars'

Source: https://www.sciencealert.com/the-uae-s-hope-probe-expected-to-win-the-2020-race-to-mars

Feb 07 – The first Arab space mission, the UAE's "Hope" probe, is expected to reach Mars' orbit on 9 February, making it the first of three spacecraft to arrive at the Red Planet this month.

The United Arab Emirates, China, and the United States all launched projects to Mars last July, taking advantage of a period when the Earth and Mars are nearest.

If successful, the wealthy Gulf state will become the fifth nation to ever reach Mars – a venture timed to mark the 50th anniversary of the unification of the UAE – with the China mission due to become the sixth the following day.

Landmarks across the UAE have been lit up in red at night, government accounts emblazoned with the #ArabstoMars hashtag, and on the big day Dubai's Burj Khalifa, the world's tallest tower, will be at the centre of a celebratory show.

Hope, known as "Al-Amal" in Arabic, will orbit the planet for at least one Martian year, or 687 days, while the Tianwen-1 from China and the Mars 2020 Perseverance rover from the US will both land on Mars' surface.

Only the US, India, the former Soviet Union, and the European Space Agency have successfully reached the Red Planet in the past.

Risky manoeuvre

After blasting off from Japan last July, the Hope mission now faces its "most critical and complex" manoeuvre, according to Emirati officials, with a 50-50 chance of successfully entering a Mars orbit.

The spacecraft must slow significantly to be captured by Martian gravity, rotating and firing all six of its Delta-V thrusters for 27 minutes to reduce its cruising speed of 121,000 kilometres (about 75,000 miles) per hour to about 18,000 km/h (11,200 mph).

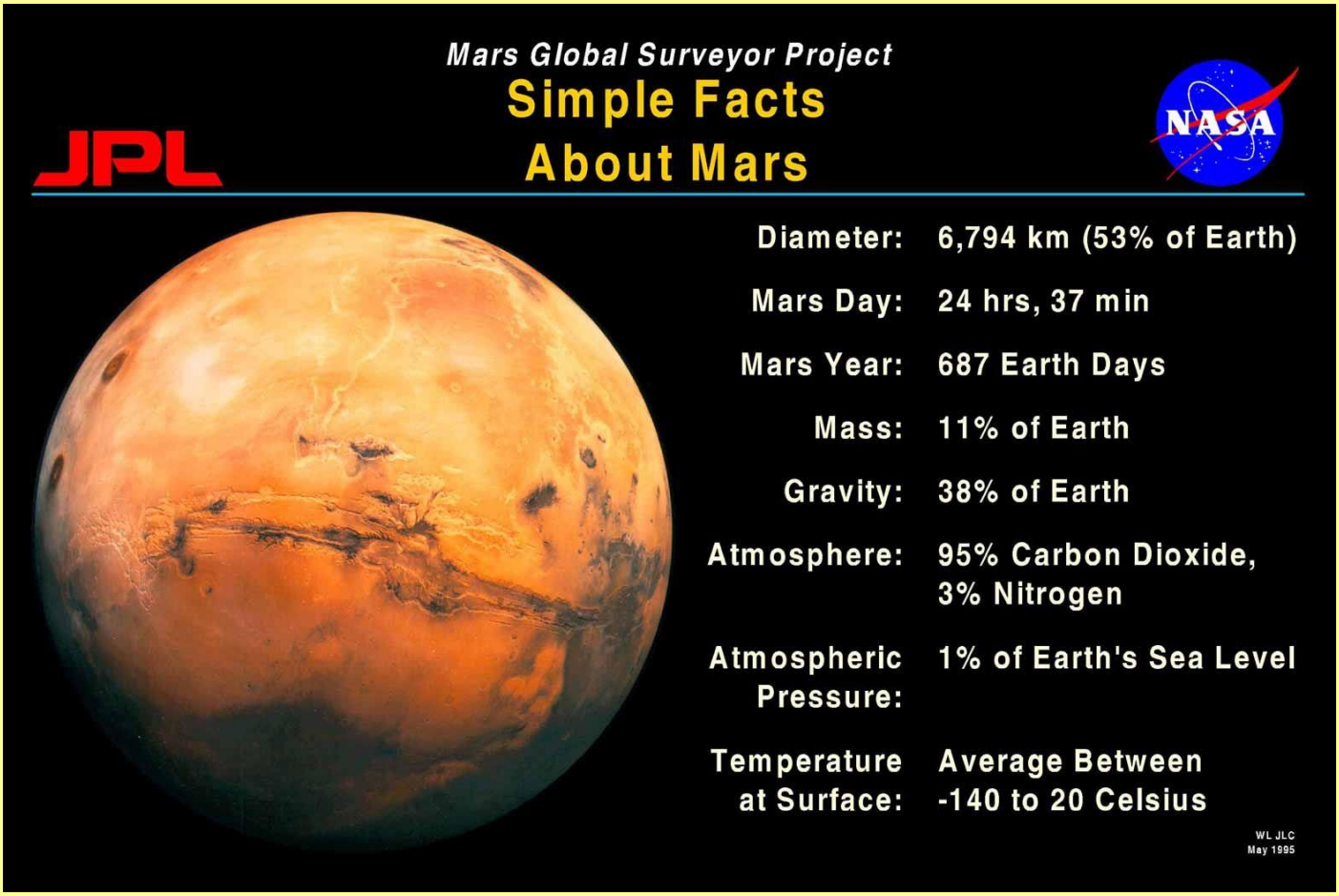
The process, which will consume half of its fuel, will begin on Tuesday, Feb. 9, at 15:30 GMT (15:30 UTC) and it will take 11 minutes for a signal on its progress to reach ground control.

Omran Sharaf, the UAE mission's project manager, said it was a "huge honour" to be the first of this year's missions to reach Mars. "It is humbling to be in such auspicious and skilled company as we all embark on our missions," he said. "It was never a race for us. We approach space as a collaborative and inclusive effort."

While the Hope probe is designed to provide a comprehensive image of the planet's weather dynamics, it is also a step toward a much more ambitious goal – building a human settlement on Mars within 100 years.

While cementing its status as a key regional player, the UAE also wants the project to serve as a source of inspiration for Arab youth, in a region too often wracked by sectarian conflicts and economic crises.

Hope will use three scientific instruments to monitor the Martian atmosphere, and is expected to begin transmitting information back to Earth in September 2021, with the data available for scientists around the world to study.



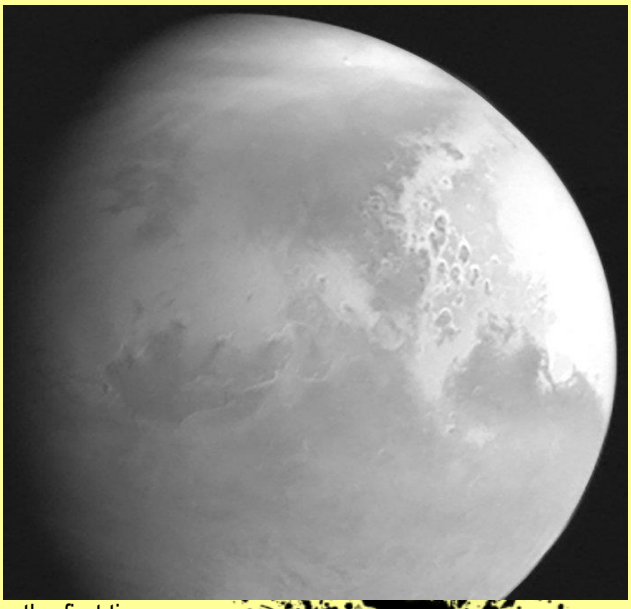
Close behind

China's Tianwen-1, or "Questions to Heaven", has already sent back its first image of Mars – a black-and-white photo that showed geological features including the Schiaparelli crater and the Valles Marineris, a vast stretch of canyons on the Martian surface.

The five-tonne Tianwen-1 includes a Mars orbiter, a lander and a solar-powered rover that will for three months study the planet's soil and atmosphere, take photos, chart maps and look for signs of past life.

China hopes to land the 240-kilogramme (529-pound) rover in May in Utopia, a massive impact basin on Mars. Its orbiter will last for a Martian year.

Tianwen-1 is not China's first attempt to reach Mars. A previous mission with Russia in 2011 ended prematurely when the launch failed.



Tianwen-1's first photo of Mars. (China National Space Administration/AFP)

NASA's Perseverance, which is set to touch down on the Red Planet on February 18, will become the fifth rover to complete the voyage since 1997 – and all so far have been American.

It is on an astrobiology mission to look for signs of ancient microbial life and will attempt to fly a 1.8-kilogram helicopter-drone on another world for the first time.

Perseverance, capable of autonomously navigating 200 meters (650 feet) per day, will collect rock samples that could provide invaluable clues about whether there was ever past life on Mars.
About the size of a small SUV, it weighs a metric tonne, has 19 cameras and two microphones – which scientists hope will be the first to record sound on Mars.
The mission is set to last at least two years.

First Responders: Work hard to keep him safe …

Canadian 26-year-old Canadian pop megastar Justin Bieber with his new $330,000 Rolls Royce Wraith

U.K. Reduces Terrorism Threat Level

By Kylie Bielby
Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/u-k-reduces-terrorism-threat-level/

Feb 09 – The U.K. has reduced its terrorism threat level **from 'severe' to 'substantial'.** Substantial is the third highest tier and indicates that an attack is deemed to be likely as opposed to highly likely or even highly likely in the near future as is the definition for the highest level – 'critical'. Two lower tiers – 'moderate' and 'low' mean that an attack is possible but unlikely, and highly unlikely respectively.
The U.K. had been on a severe terrorism threat level since November following attacks in Europe. This threat level is set by the Joint Terrorism Analysis Centre and refers to the threat from international terrorism. MI5 is responsible for setting the threat level for domestic terrorism which includes Northern Ireland terrorism.
The threat level for international terrorism has never been lower than 'substantial' since the levels were introduced in 2006. It reached critical level four times – in 2006, 2007 and twice in 2017.
The pandemic has slowed terrorist activity somewhat, both on U.K. soil as well as in Europe. However, the number of potential suspects on MI5's radar remains largely unchanged at

around 3,000 individuals and it is highly conceivable that bad actors are using the national lockdown (which currently has no end date) to focus on regrouping and recruiting. There is also a concern that right-wing extremism and other forms of domestic extremism are increasing.

Kylie Bielby has more than 20 years' experience in reporting and editing a wide range of security topics, covering geopolitical and policy analysis to international and country-specific trends and events. Before joining GTSC's Homeland Security Today staff, she was an editor and contributor for Jane's, and a columnist and managing editor for security and counter-terror publications.

EDITOR'S COMMENT: As I wrote when the threat level rose to severe, what is the meaning of "threat levels" to the lay people. Do they know what to do and what to expect in each and every level? Most probably, not! This is something we have to change. The most important player in disasters and terrorism incidents is left out of emergency planning and response because we think that first responders will take care everything. Just think the numbers and change wrong assumptions.

QUIZ – Guess where this placard is and why?

Placards in 6 languages set next to Evros River (Greek-Turkish border) show the pathways that illegal immigrants can use to invade Greece in their effort to go to EU via closed borders.

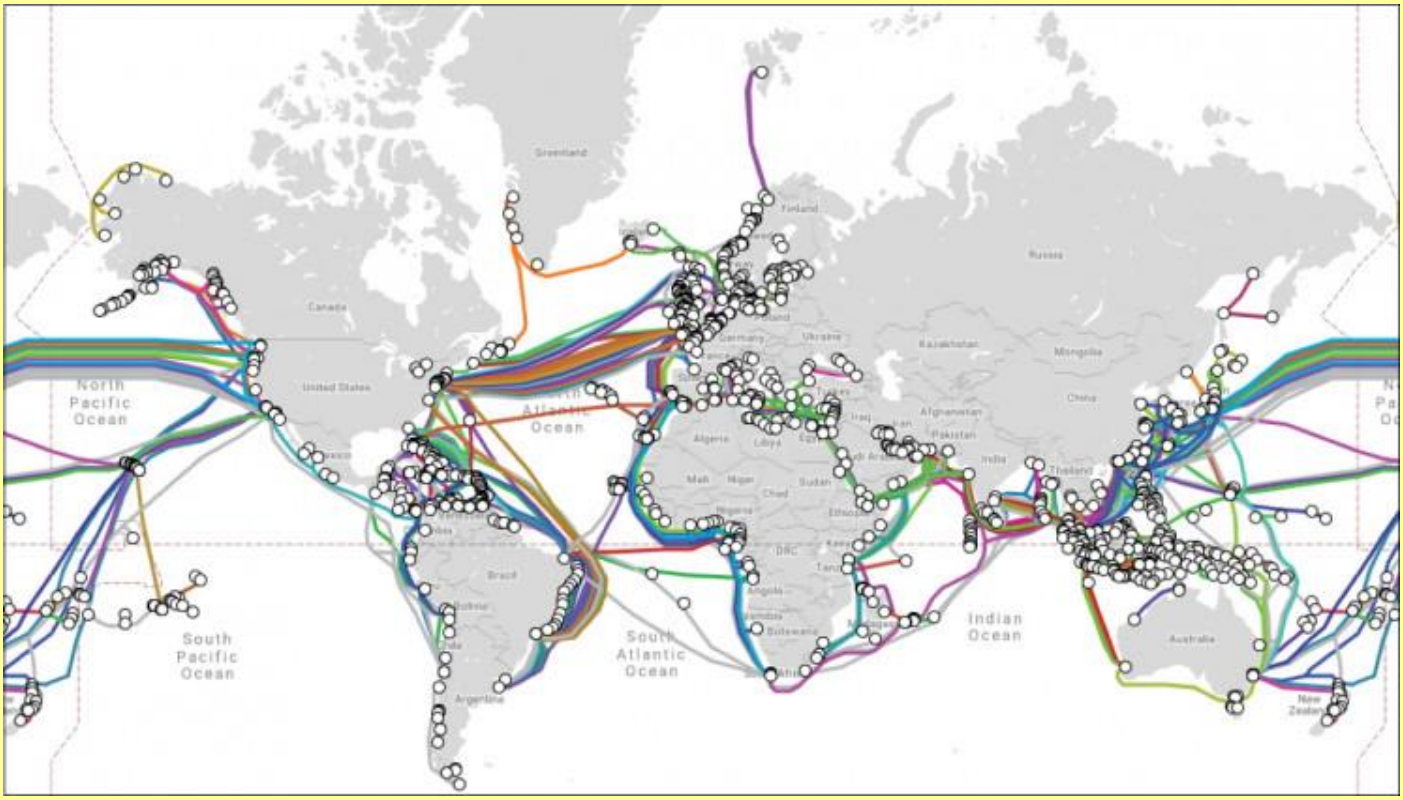
When plan
think
as a terrorist.

When implement
think
as a victim!

Partnerships, Presence 'Absolutely Critical' to Protect Shipping, Undersea Cables from Evolving Threats

By Bridget Johnson

Source: https://www.hstoday.us/subject-matter-areas/maritime-security/partnerships-presence-absolutely-critical-to-protect-shipping-undersea-cables-from-evolving-threats/



Feb 05 – Evolving threats in the maritime domain underscore the importance of security forces being eyes and ears to ensure the safety of merchant shipping and safe supply chain routes, and "partnerships are absolutely critical" to maintain free seas, naval leaders from the U.S. and Sweden said.

While 90 percent of the world's trade travels on the ocean, "closer to 100 percent of the world's information flows on the seabed in conjunction with satellites and that is something that is a gray zone area" vulnerable to "hybrid activity where it is difficult to point fingers," U.S. Second Fleet Commander Vice Adm. Andrew Lewis said at an American Enterprise Institute webinar last week on maritime gray zone threats.

"Then the activity on the sea and above the sea, the classic activity: There is a maritime code in which you operate in international waters," he added. "At times other nation-states will not adhere to that code, and along hybrid lines will not adhere to that code. The Russians, the Chinese, terrorist groups, little green men on the surface of the ocean if you like, but that is where we are really focusing, and it is getting busier and busier with strategic lines of communication."

Royal Swedish Navy Chief Ewa Skoog Haslum stressed that it is an "international security concern" to protect shipping as it's easy for bad actors "to hamper or harass" merchant vessels without surveillance.

Presence is critical, Lewis agreed, and partners "have to work together to maintain freedom of the seas, to be able to maintain those trade routes over the global surface."

"In spite of what we're going through right now it's a much healthier environment globally than we've ever lived in, and that is because of partnerships that stem from the alliance in maintaining that safety," he said. "… The most powerful part of any command starts with the trust and the relationships that you build with your partners."

Skoog Haslum said "high readiness" is also critical "and always thinking about 'what if'" in the physical and cyber realms — "so we will have to start thinking different scenarios, which are maybe not normal scenarios for us military organizations" and partner civilian agencies.

Lewis said one thing the U.S. can learn from partners such as Sweden and Norway is the value of operating in the spirit of a seagoing nation. By Sweden embracing its maritime culture the country "has continued to not only survive, but to get better and better all the time and become more and more relevant on the world stage — there's a lot to be learned from that."

"They are very much maritime nations and still singing sea shanties all of the time… when we lose global positioning or we lose exquisite communications or satellite communications, whereas we see in higher latitudes that is very difficult to maintain, even when we lose line of sight electronic communications or digital capability it goes back to a visual world, a world in which we need to rely upon our senses of our eyes and our ears and our five senses," he said.

"And more and more as the electromagnetic spectrum is infringed upon and manipulated by nefarious actors the more we have to be able to rely upon those what I would call mission orders — the way to operate tactically, operationally, and strategically on intent where you have very young operators, young civilians who understand what they are seeing and know how to report it and know how to defend themselves, if you like," the admiral continued. "That is something that I think we all could educate our entire societies on the threat that exists, an existential threat to our way of life."

"That is what I think we owe to our entire societies is understanding what all of this means and what it means to the threat of our way of life, our families, and our livelihood that is more at risk than we care to admit. Cyber attacks, for example… it is very scary how little is known about that. It is scary how little people know about what they are seeing on the horizon."

Skoog Haslum said embracing greater interdependence and cooperation between government and industry can help drive home how dependent nations are on secure sea lines.

"We need to cooperate even more and we need to train," she said. "We don't have that much Swedish merchant vessels any longer. It's about 100 of them. So, the most vessels trafficking the Baltic Sea is international ones and we need to cooperate together with those companies as well."

Lewis said that while the Russians are "certainly within their international rights" to operate in the Arctic, "reinvigorating their military capability in the Arctic… to try to make it a militarily contested zone" is "not in the common interest of the other Arctic nations and what we cannot allow to happen."

"In order to maintain a free and open Arctic and high North, we've got to be able — we have to be present there," he said. "We have to be operating professionally and we have to do so with our partners, which fortunately, our partners, the Arctic nations — all but one are true partners, and we know who that one is."

Bridget Johnson *is the Managing Editor for Homeland Security Today. A veteran journalist whose news articles and analyses have run in dozens of news outlets across the globe, Bridget first came to Washington to be online editor and a foreign policy writer at The Hill.*

Biden govt supports repatriating jihadists: US diplomat

Source: https://www.france24.com/en/live-news/20210210-biden-govt-supports-repatriating-jihadists-us-diplomat

Feb 10 – **President Joe Biden's administration believes countries should repatriate jihadists and their families to counter the threat from the Islamic State group,** an American diplomat told the United Nations on Wednesday.

"The global threat from Isis will grow if the international community does not repatriate their citizens," said Jeffrey DeLaurentis, the acting US ambassador for special political affairs.

Former president Donald Trump's government also supported the repatriation of fighters who went to fight abroad, mainly in Syria and Iraq.

Several European countries -- including France -- refuse to repatriate adults, believing they should be tried in countries where they are accused of committing crimes. They only accept the return of their children on a case-by-case basis.

"Beyond being the best option from a security standpoint, repatriation is also simply the right thing to do," said DeLaurentis during a Security Council video conference dedicated to the threat of terrorism.

"It is estimated that 90 percent of children in the camps are under 12 and 50 percent under five."

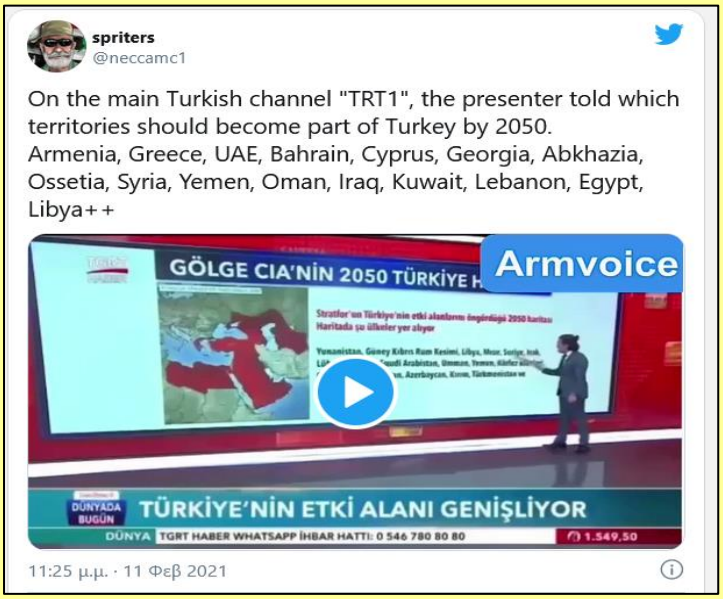
"We watch with concern as women and children languish in camps in dire conditions, with little access to education, increasing the potential for the radicalization," he added.

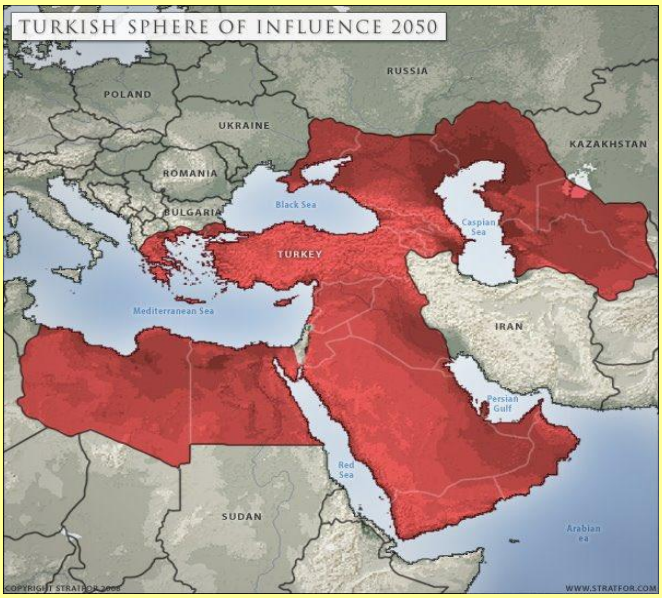
DeLaurentis warned that the IS group "remains a serious threat."

The group exploits instability in Iraq and Syria, demonstrates intentions to "execute attacks abroad and continues to inspire terrorist attacks from sub-saharan Africa to the Asia-Pacific theater," he told diplomats.
He said there were tens of thousands of suspected foreign terrorist fighters in conflict zones.
Beyond those areas "there is a surge in the threat posed by Isis affiliates around the world, especially on the African continent," DeLaurentis said.
"It is alarming but not unexpected to see these affiliates across Africa, working together. This poses a danger to us all," he explained.

EDITOR'S COMMENT: Dear American Diplomat please remember your statement the next time that a returnee will be involved in a terrorism incident in your country or in another country with similar "humanitarian" attitudes. Return of their children? Surely not! Imagine children grown in an environment where all relatives will speak about how he/she was separated from mom and dad that might be imprisoned by bad people or die away from them. Do you expect them to grow up like ordinary normal people? Ask a psychoanalyst to tell you what is his/her professional opinion.

Do we need troublemakers?





PERSPECTIVE: Prioritize Public Health Officers to Increase Preparedness for Future Threats

By Katie Klatt and Richard Serino
Source: https://www.hstoday.us/subject-matter-areas/emergency-preparedness/perspective-prioritize-public-health-officers-to-increase-preparedness-for-future-threats/

Feb 11 – Last year, we were faced with one of the biggest threats to our homeland: the COVID-19 pandemic. And there is the potential for even bigger crises than this. While some may consider this disease to have changed the threat landscape, we would argue that in fact this threat has existed all along – for any point on the spectrum from governments, to businesses, to individuals. Public health is now, and has always been, an underlying and vital component of any crisis, big or small. If we are to find any positive aspects of COVID-19, it is that it has shed new light on the importance of public health – public health has finally entered the much-needed spotlight.
The current state of the world – with climate change, social injustice, widespread mistrust, and reliance on social media rather than experts – means that crises will be exacerbated, and so too will the public health impact of these crises. Leaders now must immediately incorporate public health thinking into all of their activities. COVID-19 has touched every aspect of life – and this is how deep public health thinking must go. In 2020 we experienced

firsthand the importance of a healthy workforce, of personal health, of solid health policy, of consistent health messaging. Accomplishing these goals requires intentional thought and work toward public health.
With that in mind, for leaders both in government and business to incorporate public health measures into their future planning and operations, public health experts must be consulted. The idea of a Public Health Officer or advisor is a new and exciting way to realize these ambitions. Public health experts, with experience and knowledge in areas such as infection control, social determinants of health, health initiatives, and policy, are primed for these positions. A Public Health Officer would require a voice at the highest management levels to provide insight and guidance for how to ensure a healthy workforce and population. They can step into many different industries and scenarios and provide the much-needed expertise to help people regain control of their health.
Economic hardships will admittedly present a challenge in the hiring of a new executive. But think about what might happen if you don't. Ongoing COVID-19 could leave your workforce susceptible to extended time out of work. Without advisors on health and safety measures, returning to in-person work could be drawn out and expensive. Uncoordinated vaccine administration could leave part of the workforce still vulnerable to communicable diseases. Wary individuals could stop frequenting your business if they perceive inadequate health measures. Sedentary lifestyles could leave your company paying for more chronic illnesses through employer-sponsored insurance. These pressing problems, and many more, could be easily managed through Public Health Officers or advisors. They will ensure that your organization, and the people you care about, are prepared for any unexpected event and can remain healthy for whatever may be on the horizon.

***Katie Klatt** is a COVID-19 infection-control nurse at Boston EMS. She is currently a Master of Public Health in Health Management student at the Harvard T.H. Chan School of Public Health. Katie received her bachelor's degree in nursing from the University of Virginia. She worked as a pediatric intensive care unit nurse in California and Australia before beginning her MPH studies.*
*The **Honorable Richard Serino** is currently a "Distinguished Visiting Fellow" at Harvard University, National Preparedness Leadership Initiative. Mr. Serino was appointed by President Obama and confirmed by the Senate as the Federal Emergency Management Agency's 8th Deputy Administrator in October 2009 and served until 2014. Prior to his appointment as Deputy Administrator, he served as Chief of Boston EMS and Assistant Director of the Boston Public Health Commission. As Chief of Boston EMS, Mr. Serino served as Incident Commander for over 35 mass casualty incidents and for all of Boston's major planned events. During his time at FEMA, he oversaw 60 disasters from flooding in the Midwest, tornado devastation in Missouri, tsunami destruction, and numerous hurricanes. Mr. Serino was on scene at the Boston Marathon bombings in 2013 as the highest-ranking official of DHS. Under Mr. Serino's leadership, FEMA has started the following initiatives such as FEMA Corps, FEMA Stat, the FEMA Think Tank, a detailed budgetary process, and a Disaster Workforce and Workplace Transformation.*

Homeland Security Experts on the Biggest Threats and Challenges the U.S. Faces in 2021

Source: https://www.hstoday.us/subject-matter-areas/airport-aviation-security/homeland-security-experts-on-the-biggest-threats-and-challenges-the-u-s-faces-in-the-year-ahead/

Feb 11 – Homeland Security Today asked top experts in various sectors of the homeland mission to discuss what they see as the greatest threats and challenges facing our country in the year ahead.

Greg Touhill
First Federal Chief Information Security Officer of the United States

As we enter 2021, the COVID-19 pandemic looms large as the most significant threat to national security and prosperity. Despite the encouraging progress in developing vaccines with astounding initial efficacy reports, widespread distribution and application of the vaccine to the American population should be the top priority. In conjunction with the distribution and application of the vaccine(s), the accurate and complete collection of data associated with the application of the vaccine and empirical measurements of the vaccine(s) efficacy are essential. This will present special challenges to policy makers as they address long-deferred issues such as identity and privacy

security in the midst of the massive collection of essential data collection as part of the public health initiatives.
Disinformation remains a huge threat to the United States and is likely to grow in magnitude and impact during 2021. I define disinformation as the knowing and deliberate creation of false information purposely designed to invoke sharp responses and influence target audiences to take actions shaped by the creators of the disinformation. Disinformation always is crafted around nuggets of truth to lure in their intended audience. Misinformation is the unwitting sharing of disinformation, often by those consumers of social media who share the disinformation without checking the source of the disinformation nor the veracity of the reports. Disinformation was used to attack the integrity of the U.S. election system in 2020 as well as key societal institutions. I suspect we will continue to see malicious actors using disinformation campaigns to shatter our societal fabric and undermine confidence in our constitutional government. Policy makers will be challenged to understand the nature of the issue and act wisely to counteract this threat vector without compromising our treasured constitutionally guaranteed right of free speech. The first step to understanding a problem is acknowledging that you have a problem.
Americans have traditionally thought of threats as external to the United States. We typically think of nation-state actors based in foreign capitals as threats. However, as illustrated during the widespread disinformation campaigns over the last five years, we are experiencing a wholly new threat landscape. Disinformation campaigns have encouraged and promoted a sharp polarization of American societal fabric. Pundits have posited that, left unchecked, disinformation campaigns magnified by widespread misinformation attacking the American people and our institutions could rip apart our republic. Some even forecast we are "headed toward a civil war" (which may even be deliberately crafted disinformation designed to incite violence!). Policy makers and leaders at all levels must take action to combat disinformation. We should launch a counter-offensive to disinformation. The counter-offensive campaign can include elements such as:
1) Inform the public they are under attack: Policy makers ought to join together in a bipartisan manner to inform the public that we are under attack by disinformation campaigns targeting the American people and our societal institutions. If this is not addressed in a bipartisan manner, we will fail and the attackers will win.
2) Give the American public the tools to defeat the threat: We already have the tools; we just need to point them out to the American people. Sadly, online platforms deliberately analyze your browsing histories and serve up content they believe you will be interested in. They track where you like to get your information from and prioritize those sources. The result is that many Americans are caught in what some call an information "echo chamber," where all they see is information curated and tailored to conform with the reader's preconceived favored opinions. Malicious actors understand this and feed those engines to steer sentiment and opinions to meet their strategic objectives. We can change the public discourse by encouraging the public to "change the channel" and seek out other information sources, including those that don't espouse opinions or conclusions we'd naturally share. When we only seek out information that conforms to our opinions, we don't get all the facts and make bad decisions. When that happens, our adversaries win. From a policy standpoint, policy makers can work with online platforms and social media companies to retire the algorithms that censor alternate views from the consumers and create the "echo chamber," thereby restoring a more open and civil public discourse of ideas.
3) Hold those who create disinformation accountable: Where clear evidence can be presented that a person or organization has willingly and deliberately created disinformation for malicious intent, those persons and organizations ought to be held accountable under our rule of laws. This is easier said than done. Preservation of our constitutional rights is paramount and under no circumstances should we abrogate them. However, identification of the root source of information is a powerful method of incentivizing the source to ensure that the information is verified and true.

Sandra L. Stosz

Retired Vice Admiral, U.S. Coast Guard, former Deputy Commandant for Mission Support

I don't know about everyone else, but I've been coping with the coronavirus constraints and consequences by hoping for a brighter 2021. I'm excited for the new year, because I do believe we have much to be grateful for and much to hope for with vaccines and new treatments coming more quickly than anyone could have expected. Hope for the future will shine through today's hurts if we focus on the promise and possibilities that await.
As powerful as hope is, it's a state of mind that must be backed by active leadership to achieve positive results. What our nation needs now, more than ever, is leaders of character who can inspire others to hope, and motivate them to achieve success. We need insightful leaders who understand the balance between hope and reality, and who seek value for their organizations in that murky space.

Leaders of character must understand that the coronavirus pandemic has impacted employees and business partners in different ways. In many cases, leadership and middle management have successfully transitioned to working from home, thanks to enabling technology. At the other end of the spectrum, front-line and service-sector employees may be invisibly struggling to support themselves and their families. There is no better time for leaders to set aside time to personally check in with all echelons of their workforces, and the workforces of the organizations on whom their business depends.

The best long-term antidote to the coronavirus may not be a vaccine, but resilience. Now is the time for leaders to examine their organizations to assess strengths, weaknesses, opportunities, and threats. They need to think about where they fell short in meeting the pandemic challenges, and where they can make permanent changes and improvements to be prepared to take advantage of the opportunities that will arise when our hope becomes the reality of a brighter 2021.

Now is the time for leaders of character to focus on their most important resource: their people. They need to ensure that their employees all have an equal chance to achieve personal and professional resilience so they can share in the organization's success. As the economy adjusts to the pandemic, as lockdowns are eased, leaders must be prepared to meet unforeseen threats and challenges. They must encourage and reward innovation, challenging people to think differently and not be afraid to "fail with purpose" as they stretch for a goal. Leading with character means trusting one's employees, and those who do so will build the resilience necessary to weather any storm.

Matthew Albence

Former Acting Director, U.S. Immigration and Customs Enforcement

I think one of the major issues for 2021 will be immigration/border security. It has been largely placed on the back burner due to the pandemic, but once things in that regard begin to normalize, the border is going to explode, and the increases we have seen at the end of 2020 are clearly ominous. The incoming administration realizes this, as does the mainstream media, as both have addressed it recently, with the Biden administration already seeking to temper expectations with regard to its campaign promises, and the *Washington Post* doing some extensive reporting on the challenges and intricacies of canceling both the Title 42 order as well as other Trump administration initiatives/regulations that have significantly curtailed the flow but are expected to be rolled back.

I fully expect that the terrible conditions and humanitarian crisis that we saw in 2019 will reappear in 2021, and there have been no changes to the infrastructure (and now reduced funding in the FY 21 budget in critical areas, such as detention and transportation) that will enable the responsible agencies (CBP/ICE/HHS) to be in a better position to respond and/or manage.

Brian Harrell

Former Assistant Director for Infrastructure Security, Cybersecurity and Infrastructure Security Agency (CISA)

When companies think about security, they most often think of securing their networks, infrastructure, and critical assets against

cyber and physical attacks. But supply chains, comprising traditional manufacturers or third-party service providers, are also vulnerable to security risks. We have seen this in 2020 with a litany of major data breaches via third parties and 2021 will be no different. Security practitioners should strongly consider diversifying their supply chain. Don't rely on one source for materials or products as that source may become compromised or unable to ensure confidentiality, integrity, or availability of their products or services. Establish reliable secondary suppliers in different regions to minimize this risk.

From the extreme right to the extreme left, we are also seeing an uptick in extreme political activism, often resulting in violence or harm to infrastructure. The fear and panic that accompanies the current pandemic response environment, intensified by the isolation many are experiencing, is exploited by malicious nation-state and domestic actors that seek to advance their own agendas and undermine political, healthcare, and other response systems and operations. In 2021, we will continue to see this exploitation through active disinformation campaigns from groups such as QAnon, and other right- and left-wing media sites. Remember, disinformation stops with you.

Stephanie Yanta

Supervisory Special Agent, FBI

The FBI's Behavioral Threat Assessment Center (BAU-1/BTAC) remains concerned about threats and acts of targeted violence. Targeted violence may result from a personal grievance, may be ideologically motivated, or can often be an amalgamation of the two.

Acts of targeted violence can be perpetrated by an individual/lone actor or, as we have recently witnessed, groups of individuals sharing the same grievance(s)/ideologies. Importantly, extensive research and operational experience have shown there is no "profile" of an individual intent on engaging in a violent act. Violent offenders cross genders, ages, socio-economic status, ethnicities, etc.

Significantly, acts of targeted violence are rarely impulsive, emotion-driven or spontaneous. People just don't "snap." Instead, perpetrators of targeted violence consider, plan and prepare. These behaviors are often observable thereby providing an opportunity for early engagement and disruption prior to a violent act occurring.

Notably, in recent months and as recently as a few weeks ago, groups of individuals have engaged in violence within our communities largely as a result of the tumultuous, fluid and volatile social and political climates facing our nation. Herein, it is important to recognize and differentiate between targeted violence, general criminality and the impact of group think – the idea that otherwise well-intentioned individuals ultimately make poor decisions in order to conform to the group and/or feel they are unable to oppose the group's actions.

Prevention of acts of targeted violence may be achieved through properly implemented threat assessment and threat management (TATM) principles. Effective threat management relies heavily upon thorough, accurate, and holistic threat assessment. The FBI's BTAC is a national-level, multi-agency, multi-disciplinary Task Force focused on the prevention targeted violence through the application of behaviorally-based operational support, training and research. TATM assistance from the FBI's BTAC can be obtained through your local FBI office's designated BAU Threat Management Coordinator or one of the BAU Coordinators.

Greg Marshall

Former Chief Security Officer, Department of Homeland Security

Internally, I believe the United States faces very real threats from domestic violent extremists who have taken sides on both the left and the right.

Many conservatives believe the presidential election was "unfair" and "stolen," and those government institutions designed to review and remedy citizen grievances (courts and state governors, and state legislatures) largely ignored their pleas of redress and what conservatives believe was "evidence" of election fraud and criminality. These facts, I believe, have caused a rise in political activity and concern among ordinary citizens on the right across America.

Most liberals never accepted the last presidential administration. The Mueller investigation, impeachment, Kavanaugh hearings, and General Flynn conviction, among others, were examples of what most conservatives believe were liberal overreach. These actions, combined with the Nov. 3 election outcome, have exacerbated the divide between the left and right and have emboldened people and organized groups on both sides.

"Defunding the police" efforts continuing in some jurisdictions will cause rises in violent crimes; specifically shootings, aggravated assaults, and murders. We are already seeing these crime spikes in major U.S. cities. This is a threat to our quality of life. Antifa, BLM, and similar groups, I believe, will continue their efforts in some American cities and certainly pose a risk to U.S. citizens in each of those cities.

COVID-19 obviously remains a very serious threat in the U.S. As the virus mutates this winter and spring, and the vaccine rollout continues, the federal government will need to continue their close coordination with all states and territories to meet the threat head-on, and quickly make any adjustments as necessary.

I see the potential for the COVID-19 pandemic to be further exacerbated in the U.S. if entry from Central and South America is relaxed or not enforced on the southwest border. The pandemic is widespread within countries in those regions.

Worldwide debt from emergency COVID-19 spending is erupting. I see a serious risk, potentially, to the U.S. economy. Federal and state leaders will face tough decisions balancing public health concerns and local budgets with regional and national economic stability.

Cyber threats (internally and externally) to the U.S. will likely continue and grow, especially when you consider the internal climate of unrest we face here.
Externally, I see China, Russia, and Iran remaining as our most preeminent adversaries, especially on the cyber front.
I also view Iran to be a larger threat to the U.S. Iran has extensive anger at the U.S. for the killing of Soleimani, and has threatened retaliation against the U.S. Combine this fact with their renewed actions to produce a nuclear weapon, it appears we (and our allies) are headed toward a confrontation down the road.

Steve Karoly
Former TSA Acting Assistant Administrator for the Office of Requirements and Capabilities Analysis

1). Implementation of REAL ID: The REAL ID Act established the mandate of minimum security standards for license issuance and prohibits federal agencies from accepting non-REAL ID compliant forms of identification at federal facilities and boarding federally regulated commercial aircraft. This means that every U.S. air traveler will be required to present a REAL ID-compliant license or another acceptable form of identification, such as a U.S. passport, to board a domestic flight. The COVID-19 pandemic delayed the implementation of REAL ID by one year, now planned for October 2021, giving states, through their Department of Motor Vehicle (DMV) offices, an additional year to issue these forms of identification. However, in October 2020 it was reported that only 110 million REAL ID-compliant driver's licenses and identification cards have been issued (approximately 40 percent of all driver's license holders). This means that an additional 165 million REAL ID-compliant driver's licenses and identification cards still need to be issued to have 100 percent compliance by October 2021. Given the normal challenges that accompany any new process change along with challenges of issuing IDs during a pandemic, I think it is fair to say that in October 2021 there will be air travelers who are at the airport who do not have the proper documentation to board their plane. That number of travelers could be in the thousands to hundreds of thousands. TSA needs to be prepared to handle this foreseeable situation from both an operational perspective in terms of developing nationwide doctrine and procedures and a personnel perspective in terms of ensuring the thousands of Transportation Security Officers are trained to execute those operational procedures.
2). Cybersecurity concerns within the contactless experience: Reducing touchpoints within the airport passenger screening process has been a focus area for several years now but the COVID-19 pandemic changed the timeline. The deployment and use of automation and self-service technologies through biometrics, electronic IDs, or mobile applications have accelerated in 2020 with expectations they will continue to accelerate in 2021 (and beyond). Although these new 'conveniences' give passengers a more seamless passenger experience, they also provide cyberterrorists additional opportunities to locate and attack system vulnerabilities. Although policies, processes, and technologies are normally put in place by companies to help prevent or limit security incidents and data breaches, we need to be sure their products that are being deployed in airport environments, along with the associated airport's IT infrastructure, have similar policies, processes, and technologies in place to prevent or limit cyber incidents.
3). Insider threats: With the growing polarization of political views within the United States, the threat of domestic violent extremists becomes even more real from day-to-day and week-to-week. The aviation sector remains a clear target. With the aviation sector being so integrated across the aviation enterprise, mitigating the insider threat challenge has to be through a coordinated effort between the Transportation Security Administration (TSA) and other governmental regulators, airport operators, and air carriers — thus the significant challenge facing the aviation sector. In May 2020, TSA released their Insider Threat Roadmap 2020 to guide TSA and the transportation community in mitigating the insider threat. The success in executing the details within the Roadmap depends upon the relationships TSA has with the airport operators and air carriers and their willingness to contribute to this effort. The next step is to mutually develop implementation plans that define the who, what, where, when and how for each insider threat focus area.

But more importantly, the TSA/airport operator/air carrier team must agree that without each of their assistance, from a planning to execution perspective, the mitigation of the insider threat will not be accomplished nor will there be raising of the bar in terms of the security baseline.

Tom Essig
Former Chief Procurement Officer, Department of Homeland Security

America continues to be well-positioned to win traditional wars and defend against traditional threats. But the events of the past year have provided tremendous information to

nations and groups, both foreign and domestic, that wish to harm the United States or destroy American democracy. And it's not only with traditional methods or weapons. In fact, some of our greatest threats may be via non-traditional means, in areas where we have not yet developed strong and effective defensive measures. These include:

1. Disinformation: This has definitely been the year for it. Disinformation on social networks, in the news media, and even from elected officials has made it difficult to really know what the truth is. And polarized the nation to the point where many people don't even seem to recognize or even care what the truth is, since they're fully committed to their beliefs. It's also proven to be an effective, while inexpensive and low- risk, weapon in the hands of those who would want to weaken America and/or our democracy.

Centuries ago, Sun Tzu advised in *The Art of War* to "divide and conquer" an enemy that is much stronger than you. America is probably still the most powerful nation in the world. But we arguably are more of a house divided today than at any other time since our Civil War. And that provides a huge opportunity for adversaries to exploit. Apparently, they have been doing so for some time, but we have yet to come up with an effective countermeasure and the very openness of our society provides a means for exploitation by adversaries. That makes it difficult to come together as a nation and provides great opportunities for our adversaries to divide and conquer.

But why is this disinformation so effective and why do so many people believe and act on it? Some of the reasons are psychological in nature such as:

- ✓ Tendencies to see things in a way that fits our preconceptions, or to read and accept as true only those things that we already believe.
- ✓ Widespread distrust of science and heavy reliance on anecdotal information – such as "the cold winter we're having proves that global warming isn't real."
- ✓ Consequences of the pandemic. This has caused emotional and mental challenges for many of us and limited our ability to obtain reliable information. It has also caused severe economic difficulties for many, which may make them less likely to be receptive to truths that are difficult to accept.

Of particular concern is disinformation that is intended to further polarize the nation into camps that are unable or unwilling to work with each other, thereby dividing America and reducing our ability to act as one nation and significantly weakening our global influence; to erode or even destroy American democracy to the point that it no longer serves as a model for other nations; to inspire and coordinate actions of hate groups; or even just to win some votes. The specific goals of those who spread disinformation may vary, but they all seem to recognize that, for whatever reason, America today seems to be tremendously susceptible to disinformation and, as a result, creates the ability to use disinformation as a weapon – with very little cost or risk to the person, group, or nation using it. And that makes it a threat that must be dealt with.

Fortunately, many social networks have already started efforts to remove disinformation. It's a step in the right direction but too much disinformation still gets through – at least for long enough to be viewed and spread by significant numbers of people.

Almost all of us use social media and are free to post pretty much whatever we want, within certain limits. For the most part, they're wonderful fun and help us keep touch with friends and family and allow us to share our lives with them. But they're also used by some with very different goals. Many of us freely provide extensive information about our background, likes, dislikes, and a lot more personal information. And many of us have also completed numerous surveys and trivia exercises on social networks. They're fun – but all of that information creates an enormous database that can be used for reasons we might never dream of. In fact, it may be the largest intelligence gathering operation in history – certainly one of the cheapest. In unscrupulous hands, it can and is being used to advance goals that are detrimental to us and our nation. And further polarize us. For a very entertaining example of how this information might be used at the national level, take some time to view the HBO movie *Brexit*. While it is a fictionalized account of a real-life event, it does show how data in social networks can be used to change the direction of a nation.

2. Biological Attacks: Yes, I know there are international conventions that, at least in part, prohibit this. But our experience with COVID-19 shows how free societies may experience significantly greater health, economic and even military impacts from biological agents than closed societies that easily limit people's freedoms. Most of us have also heard the debate regarding whether COVID-19 occurred naturally or in a lab, with most scientists concluding it had occurred naturally. But even if it had been created in a lab, it would be difficult to determine whether its release was accidental or intentional.

And, even though there are even stronger international agreements prohibiting the use of chemical weapons, there have been isolated cases where even those have been used. But what might happen if someone could use a banned weapon without anyone being able to determine who attacked them, or even that they had been attacked? No nation goes to war without the expectation of some casualties. But if you could control your casualties much better than your enemy and also have the opportunity for plausible deniability, would that increase the likelihood that such weapons would be used? I believe that the risk is too great to assume that the answer is no.

While there are a number of international agreements that cover bans on biological weapons, there are also a number of holes in them. A good first step then would be the elimination of those holes. This would also make all nations understand that we are aware of the risk and want to work with the rest of the world to eliminate that risk. Beyond that, our planning would be just as helpful against future naturally occurring pandemics. So, while it may have been 100 years since the last great pandemic to hit America, we cannot afford to assume that it will be that long before we need effective plans to counter the next.

Ajit Maan

HSToday Narrative & National Security Columnist, Founder and CEO of the Think-and-Do Tank Narrative Strategies

Hybrid strains of Domestic Radicalization. Some threat-casters might say foreign influence is a major threat. I agree but those threats, wherever they originated, have become domesticated and have taken on regional mutations. These are hybrid strains of domestic extremism and they will be engaged in all domain warfare.

We are seeing in the homeland the same techniques used in conflict zones to manipulate and recruit civilians to engage in terroristic acts.

The steps to radicalization include: convincing the target audience that they are victims and scapegoating groups or individuals as perpetrators of their victimization, pathologizing the targets' stories, and then encouraging them to take violent action as a way to stop or reverse what has been described as the inevitable existential destruction of their identities. Watch for this pattern. We are seeing it already and it will come to full fruition in the next year.

Paul Cobaugh

Vice President, Narrative Strategies

I would argue that our most serious domestic threat for 2021 revolves around the ineffectiveness of the national security community to operate on the primary modern battlefield: influence. At the heart of this problem is a critically low national level of resilience regarding all types of malign influence via domestic and foreign bad actors. Although there are several serious threats on our plate, we are unable to address any of them successfully without the ability to settle on facts, common sense and truth. There is no limit to what our nation can achieve when unified, focused and observant of knowledge, data and wisdom.

5 Terrorism Trends to Watch in 2021

By Bridget Johnson

Source: https://www.hstoday.us/subject-matter-areas/infrastructure-security/5-terrorism-trends-to-watch-in-2021/

Jan 05 – Among many critical national security lessons, 2020 emphasized the importance of staying nimble as multiple threats simultaneously unfold. A pandemic was coupled with the most active Atlantic hurricane season in history, political tension and protests kept law enforcement on its toes, and entities from critical infrastructure operators to local governments and houses of worship were forced to assess and adjust security postures based on an overlapping – and often overwhelming – saturation of threats.

Even the response to COVID-19 gave the homeland community fresh insight on confronting this shifting threat landscape in 2021. With all of the other challenges vying for the attention of security professionals, entities must resolve to wisely shape counterterrorism strategies and not let this focus take a backseat. Today's threats underscore the need to adapt as concerns arise with new or evolved groups, movements, and tactics.

Conspiracy theory extremism

"The biggest threat to humanities [sic] survival in 2021. ChemTrails x 5G x COVID Vax = EXTERMINATION event," declared a Jan. 2 tweet from a self-declared QAnon account, mishmashing some of the conspiracy theories that could propel people convinced they must combat a perceived threat into taking potentially violent action.

As we repeatedly saw in 2020, conspiracy theories jump into the void created by upheaval and continue to be stoked by grassroots movements and authority figures. Coronavirus

conspiracy theories have had devastating public health consequences by encouraging people to not take the threat seriously, compounded by vaccination opponents claiming Bill Gates wants to microchip people or asserting other claims about the goals of inoculation programs. Conspiracy theories that have warranted the attention of homeland security also include those pushed by QAnon supporters alleging "deep state" conspiracies and more, the 5G conspiracy theories that allege the technology is used to track people and/or spread COVID, and the white supremacist "great replacement" theory that claims there is an organized plot against whites and has been cited by mass shooters in Christchurch and El Paso.

Conspiracy theories have at times driven people to violence, including the 2016 "Pizzagate" believer who fired shots inside a restaurant in D.C. and the 2019 arsonist there, the 2018 California wildfire arson and Hoover Dam standoff by QAnon adherents, this spring's disrupted plot against a Missouri hospital in which the suspect wanted to "attack high value targets if the government issued martial law and quarantine orders as a result of COVID-19," and the March derailment by a train engineer who shared conspiracy theories about the intent of USNS Mercy in the Port of Los Angeles. In the coming year these movements are poised to evolve with perhaps more intense expressive actions and potential violence in response to political and policy changes in the country along with the continuing pandemic response.

Expressive actions in response to COVID conspiracy theories have ranged from maskless flash-mob-style protests potentially exposing store workers and patrons to the deadly virus, increased incidents of people deliberately coughing or spitting on emergency workers and law enforcement, threats of violence against public health officials including National Institute of Allergy and Infectious Diseases Director Dr. Anthony Fauci, and even the alleged militia plot to kidnap the Michigan governor because of COVID mitigation measures. In Wisconsin, a pharmacist was arrested last week and charged with intentionally spoiling 570 doses of COVID-19 vaccine because, according to prosecutors, he is an admitted conspiracy theorist who believed the vaccine altered DNA. In addition to insider threats that could inflict harm, there is the risk of anti-vaccination individuals or groups attacking soft-target inoculation sites such as drugstores, government offices seen as instrumental in COVID policy, or even healthcare facilities.

Violence against faith-based institutions

"Hey motherf*ckers, I'm going to burn that f*cking church, I'm going to bomb it, b*tch! I'm going to f*cking kill you guys. I'm going to send my f*cking soldiers, motherf*ckers," Sonia Tabizada of San Jacinto, Calif., said on the voicemail of Georgetown Visitation Preparatory School in Washington, D.C., the oldest Catholic girls school in the country, after the school decided to allow same-sex wedding announcements in its alumni magazine. A minute later, Tabizada, who pleaded guilty in federal court this week, called back and vowed, "I'm gonna f*cking blow up the school and call it a mission from God. You guys are going to get terrorism."

Among white supremacist, Islamist, and other politically and religiously motivated extremists, attacks against religious institutions have achieved a sort of exalted status: They are often soft targets with a welcoming environment, they have great symbolic meaning to would-be attackers, and the nature of the attacks achieves a terrorist's shock-and-awe aims. Attacks such as the 2015 Charleston church shooting, the Pittsburgh synagogue shooting in 2018, the Sri Lanka Easter attacks in 2019 and the Christchurch mosque attacks just a few weeks before that, and the 2019 Poway synagogue shooting still feature prominently in extremist propaganda and recruitment.

And even when COVID-19 kept many pews empty in 2020, house of worship still have been targeted in different ways. Just hours after three people were killed Oct. 29 in a knife attack at the Notre Dame Basilica in Nice, France, ISIS published a full-page article in its regularly scheduled weekly newsletter featuring a photo from the attack scene and a call to threaten France to the extent that the country would feel driven to ban depictions of Muhammad. After a mid-December rally in D.C., police said attacks on four historically black churches were being investigated; this week, the leader of the Proud Boys was arrested in connection with video (the circulation of which serves as propaganda and recruitment) showing a group tearing down and burning a Black Lives Matter banner from one of the churches, and he was also charged with possession of two high-capacity firearm magazines. Threats to religious institutions are also emanating from conspiracy theory extremism, as anti-Semitic claims that Jews spread COVID and orchestrate vaccinations as part of a global domination plot circulate among both white supremacist and coronavirus conspiracy forums.

Threats against houses of worship and faith-based institutions in 2021 will be heavily influenced by extremist groups' desires to boost relevance and recruitment, and thus attacks could increasingly feature multiple perpetrators instead of lone terrorists. These institutions also need to keep in mind as they tailor limited COVID openings and pandemic prevention measures that extremists have openly discussed using the coronavirus as a bioweapon to infect crowds.

Domestic extremism

Anti-Semitic and white supremacist terrorism is increasingly becoming a transnational threat that helps put the United States "at the doorstep of another 9/11," DHS and FBI

officials told Congress early in 2020. FBI Director Christopher Wray told Congress in September that domestic violent extremists of concern "include everything from racially motivated violent extremists… all the way to antigovernment, anti-authority violent extremists."
The FBI director said the Bureau usually has about 1,000 domestic terrorism investigations open each year, but that was higher in 2020 – "a good bit north of 1,000." Arrests last year included "everything from racially motivated violent extremists to violent anarchist extremists, militia types, sovereign citizens, you name it," Wray said.
"Within the domestic terrorism bucket category as a whole, racially motivated violent extremism is, I think, the biggest bucket within that larger group," Wray said. "And within the racially motivated violent extremist bucket, people ascribing to some kind of white supremacist type ideology is certainly the biggest chunk of that… I would also add to that that racially motivated violent extremists over recent years have been responsible for the most lethal activity in the U.S."
Accelerationist movements, which can include white supremacists, neo-Nazis and other movements and seek to collapse society through violence and start anew, have been growing with increasingly global reach. Two professed members of the extremist Boogaloo Bois who claimed membership in a sub-group called the "Boojahideen" allegedly offered themselves as mercenaries to Hamas and delivered gun accessories to an undercover FBI employee they believed was a senior member of the terror group. The accused gunman in the slaying of a Federal Protective Service officer in Oakland in June is linked to the Boogaloo and was an active-duty staff sergeant stationed at Travis Air Force Base.
Propaganda and recruitment efforts are also up, as seen when a neo-Nazi group claiming their recent actions were spurred by "violent left-wing" protests posted flyers across the Arizona State University campus declaring "Hitler was right," among other anti-Semitic messages. In a February update tracking white supremacist propaganda, the ADL said there were 2,713 cases of racist, anti-Semitic and anti-LGBTQ fliers, stickers, banners and posters distributed or posted on or off campuses in 2019 — double the number of incidents in 2018 and the highest level of activity recorded by the organization. Islamist extremist propaganda and white supremacist propaganda also reflect similar themes and memes in the ways they recruit and incite, contributing to the internet's ample open-source library of D.I.Y. extremist training and incitement – from posters to videos, from social media to magazines – that bridges group allegiances and ideologies. At times they mimic each other's memes, promote ideological dominion, urge copycats to emulate infamous attacks, threaten the social media companies that try to rein in their propaganda, praise and promote attacks that have recently occurred, circulate machismo-saturated training camp videos, and heavily traffic in anti-Semitism.
One key shared characteristic of recruitment is how Islamist extremists and white supremacists both try to appeal to grievances, hoping that potential recruits who might not otherwise join their movements could be pushed over the edge with targeted psychological messaging. Similarly, both groups seize on current events to promote core anti-government and retribution themes, trying to appeal to would-be recruits as if they're soldiers in a cultural or kinetic war – as one recruitment propaganda poster from the neo-Nazi Feuerkrieg Division put it, "Turn your sadness into rage." Islamist extremists and white supremacists hope to seize on the energy of current events whether it's white supremacists using debates over Confederate monuments or Islamist terror groups using Western military operations – and both ideological movements trying to use the coronavirus pandemic to their advantage – to steer some of that fury into their movements to stoke anger and gain new recruits.
In the coming year we may see more reactionary violence from domestic extremists, either by multiple members of a group or movement or lone attacks with manifestos like the 2019 El Paso Walmart shooting, in response to real or perceived policy shifts that naturally come with a new administration — or even in reaction to how a newly led Justice Department may address and confront domestic extremist movements. Political and social tensions will also likely influence recruitment and growth in some domestic extremist movements.

Complex coordinated attacks

Wray told lawmakers in September that the greatest threat to the homeland "is not one organization, certainly not one ideology, but rather lone actors, largely self-radicalized online, who pursue soft targets using readily accessible weapons."
2021 could see shifts, though, not in just who is committing attacks but how they are committing attacks. The more that extremist movements encourage "revolutionary"-caliber attacks, the more likely they are going to try to show strength through numbers. And the more attacks with multiple co-conspirators, the more we could see multi-faceted operations intended to throw off the intended targets and law enforcement, strike multiple locations, or deploy multiple tactics against targets. The alleged Michigan plot of the "Wolverine Watchmen" was felled by an informant in their militia midst, leading to a criminal complaint that richly detailed the construction of the plot including a diversionary IED to distract law enforcement in order to kidnap the governor. One suspect allegedly discussed how their plot could snowball into other operations hatched by self-styled militias: "I can see several states takin' their f*ckin' tyrants. Everybody takes their tyrants."

Among Islamist extremists, the complex coordinated attacks in Paris, Mumbai and Sri Lanka are recycled in propaganda and recruitment materials as the gold standard of attacks. Individual operations have been encouraged by ISIS and al-Qaeda as they have acknowledged that their homegrown loyalists in the West and other target regions aren't always the brightest bulbs and may be less likely to catch the attention of law enforcement in the planning stages by working alone. Encouragement of lone operations can also lead to more opportunistic attacks and can give freedom to low-skilled terrorists to use simple weapons and tactics to the best of their abilities. But these groups are also aching for a fresh complex coordinated attack as an ideal recruitment and propaganda boost as they evolve and grasp at new opportunities.

ISIS and al-Qaeda moving forward

ISIS is still evolving, and the group's tentacles are their strongest part: the network of supporters and recruiters and propaganda artists deeply ingrained online, ultimately posing a greater threat in the long term than a physical caliphate straddling Syria and Iraq as they recruit, inspire, and teach homegrown violent extremists anywhere in the world. The terror group still publishes their weekly newsletter *al-Naba*, but some of the most consistent media reaching out to an English-language audience in 2020 came from ISIS supporters in India, underscoring how the terror group is reliant on its geographical diversity for recruitment and distance learning. ISIS has not been defeated but has evolved out of necessity toward its original goal of being a global, far-flung, and insidious terror outfit. ISIS provinces are still active, particularly through attacks in West Africa and Afghanistan. More importantly, they've laid down a framework of borderless jihad and a blueprint for growing a terror movement both on the dark web and the open internet that is impossible to rein in. And while COVID-19 hasn't left their own ranks untouched, the virus has had the group thinking more about bioweapons and unconventional attacks as we look ahead.

Afghan officials have reported that the relationship between the Taliban and al-Qaeda seems as cozy as ever since the Taliban inked a deal with the United States in a Doha ceremony on Feb. 29 – as First Vice President Amrullah Saleh said last week, trying to separate the deeply intertwined groups "is harder than desalination." Yet, as the Taliban self-identified as a jihad-centered political entity, they traded a promise for U.S. withdrawal for a promise to behave. Taliban propaganda has long boasted that they would eventually bring "to their knees" American "crusaders," and as their headlines scream that they essentially accomplished their goal it can serve as a shot in the arm to other terror groups operating with the same aims. Terrorists no longer live, communicate, or recruit in silos: a victory against a common enemy is viewed at its core a victory for all, and that is feeding the ever-growing and accessible ideological marketplace of terrorist ideas, methods and inspiration – in addition to the physical assistance the Taliban and their terror allies share.

Al-Qaeda and al-Shabaab also have been using current events to recruit and inspire attacks, as the latter group watches the 11th-hour pullout of U.S. forces that had been training Somali forces to battle the terror group. In response to recent terror attacks in France, al-Qaeda in the Islamic Maghreb and al-Shabaab subsequently issued statements telling followers that they should emulate the assaults, with the latter declaring that the terrorists were "gallant knights" who "have treaded the path of the noble companions in dealing with those who malign our religion." The terror group then advised others to follow in those footsteps as well in a "war" against secularism, naming recent attackers in France "and the other unknown soldiers of Allah." Al-Qaeda had previously issued a statement declaring France to be a target and inciting attacks after French President Emmanuel Macron said in an Oct. 2 address that "Islam is a religion which is experiencing a crisis today, all over the world," and said there is a need to build an "Islam des Lumières," or Islam of Enlightenment. These groups will be using perceived gains in the year ahead to recruit, inspire, and move into their next era.

***Bridget Johnson** is the Managing Editor for Homeland Security Today. A veteran journalist whose news articles and analyses have run in dozens of news outlets across the globe, Bridget first came to Washington to be online editor and a foreign policy writer at The Hill.*

Effective Security Options for Healthcare Facilities

By Peter Jackson (Managing Director, Jacksons Fencing)
Source: https://cip-association.org/effective-security-options-for-healthcare-facilities/

The police recorded a 4% decrease in crimes across England and Wales in the 12 months ending June 2020, attributed to the ongoing Coronavirus pandemic. Crimes such as general theft have reportedly dropped overall by 15%, with the most significant change year on year seen in April to June 2020, when there were 43% fewer theft offences.

However, sadly the effects of the pandemic mean that healthcare facilities have become even more vulnerable to attack. Restricted visitor guidelines, and increased demand for critical PPE items such as masks and gloves, meant these institutions were exposed to opportunistic criminals. Staff cars and bikes have been stolen, ambulance tyres slashed, hand gel dispensers ripped from walls, and defibrillators and oxygen canisters were key targets for burglars. Given the constant, essential work carried out by health services, the security of staff and physical assets must be fully considered to protect them from opportunistic criminals.
The ongoing COVID-19 pandemic has placed enormous pressure on our essential healthcare services, adding additional risks and complexity. Facilities managers and specifiers now need to consider these factors to provide adequate protection for patients, visitors, property and assets.
One new issue involves securing additional sites. Additional, temporary areas, built specifically for Coronavirus patients are now common across many hospitals to enable them to cope with the excess demand on their services. Often entirely disconnected from the main hospital, these sites require their own physical security measures to ensure they are adequately protected.
Facilities managers are seeing the benefit of combining fencing, gates, storage enclosures and access control as part of a complete solution to secure such buildings. With the right combination of security measures in place, it's possible to operate effectively 365 days a year, through the pandemic and beyond.

Robust Access Control
Hospitals are fast-paced environments where life and death outcomes are often time-critical. The promptness of patient admittance and staff movement around the site is hugely important. As such, efficient, seamless access is vital. All gates and access points around the perimeter need to be assessed and considered, and each of the access points should be installed and controlled centrally, or regularly monitored.
Another principal consideration is the diverse range of vehicles that require access, including ambulances entering and exiting at speed, lorries carrying crucial medical supplies, and staff and visitor vehicles. The appropriate solution should ensure that all visitors, including site staff, should have access to secure parking, while also allowing emergency vehicles to get in and out of the site unhindered, and without ever compromising the safety of pedestrians.
When designing pedestrian and vehicular access: gates should be DDA (Disability Discrimination Act) compliant. It is important to note that the design of fencing and gates specified needs to accommodate rapid evacuation and access for emergency services.

Secure Parking Solutions
Multi-storey car parks provide an effective way of parking cars, using far less ground area than conventional parking solutions. Commonly used alongside healthcare facilities, they provide low building costs per vehicle space and a greater degree of flexibility, which ensures faster parking and retrieval times.
These structures need specialist fencing to secure them effectively. Jacksons has worked on several multi-storey car park sites, including one at Lister Hospital, Hertfordshire. Over 1,000 metres of steel welded mesh panels were specified for this development. They created an ultra-secure barrier to stop members of the public from falling through open gaps in the car park's steel structural framework, yet also delivering an aesthetically pleasing solution which did not impede surveillance.
The security in hospital car parks can be strengthened via rising arm barriers or bollards. These solutions control access and actively separate pedestrians from vehicle traffic once inside the multi-storey structure, thus reducing the risk of accidents.

Promoting Wellness through Aesthetics
Creating a welcoming environment is extremely important when specifying security options for hospitals. Razor or barbed wire may be effective deterrents to potential trespassers, but they create an intimidating and harsh aesthetic, far removed from the sense of wellbeing these developments should promote.
Vertical bar security fencing or welded mesh panels both offer visual appeal and a high level of security. These options deliver strong boundary protection and, crucially, excellent visibility for surveillance, surpassing any alternatives.
For recreational or recovery areas requiring a delicate appearance, such as gardens, timber fencing is a good option. Timber has a natural, welcoming appearance and promotes a sense of wellbeing and privacy. Wood, in the form of acoustic fencing, can also provide a high level of noise protection, transforming gardens or terraced areas into little oases of calm, ideal for recovery and relaxation.

Outdoor Storage Areas
Hospitals and other medical facilities produce a large amount of hazardous medical waste which requires secure storage on-site before it's taken away. Hospitals have a responsibility

to ensure these areas are secured using risk-appropriate fencing to avoid potentially dangerous materials getting into the wrong hands.
Risk assessments are also vital to ensuring an appropriate solution is installed effectively. For facilities at risk of criminal activity, products accredited by standards including Secured by Design or the Loss Prevention Certification Board's LPS 1175 have been shown to reduce the likelihood of crime. It's also best practice to assess any climbing aids such as lamp posts or trees located near the storage areas. The surrounding fence should also be high enough to deter any attempts at climbing.
The market is brimming with a wide variety of robust, and easy-to-install security options, suitable for healthcare facilities. The most crucial factor is to ensure each institution is considered on a case-by-case basis, as a unique project, as each site is different and will require a tailored plan to keep everyone safe.

How History Predicts COVID-19's Impact on Maritime Piracy, and What America Can do to Help

Source: https://www.hstoday.us/subject-matter-areas/transportation/how-history-predicts-covid-19s-impact-on-maritime-piracy-and-what-america-can-do-to-help/

Feb 13 – 2020 was a bad year for maritime piracy. The global number of sea-piracy incidents rose by over 20% from 2019 and West Africa experienced the highest number of attacks and attempted attacks since data collection began in the early 1990s at the the International Maritime Bureau's Piracy Reporting Center (*see Figure 1*).
But the Gulf of Guinea was not the only piracy hotspot in 2020. In fact, attacks increased in Southeast Asia and the Americas, as land-based crime appeared to spill over into the ports and anchorages of Dumai, Taboneo, Callao, and Macapa. Kidnappings jumped sharply in 2020 and the illegal boarding of steaming ships reached its highest level in five years. Some recent headlines appear to minimize the threat of sea-piracy and fail to appreciate the harmful economic effects of the COVID-19 pandemic. Yet, previous financial crises have been followed by significant surges in maritime crime. The novel Coronavirus will likely produce similar conditions that have fueled ship targeting in the past.

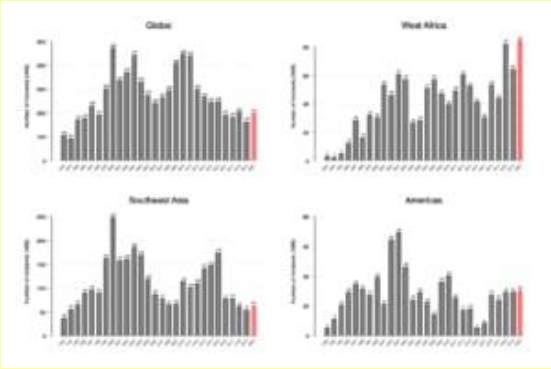


Figure 1: Piracy Counts by Region and Global, 1993-2020 (IMB Data)

The 1997-98 Asian financial crisis sharply reduced incomes, increased regional unemployment, and drove up food prices, all of which amplified poverty levels in many Southeast Asian countries. Pirate attacks in the region subsequently jumped by 80% from 1998 to 1999 and another 50% from 1999 to 2000, going from 89 incidents recorded by the IMB in 1998 to 247 incidents only two years later. Sea-piracy did not return to its pre-Asian financial crisis levels until 2006, and then the region was buffeted by a global recession that began in the United States only a year later. Incidents of sea-piracy and armed robbery on ships nearly quadrupled over the next five years in Indonesian waters and Somali pirates dramatically escalated their seizure of commercial vessels beginning in 2008 (*see Figure 2*).
The economic effects of the COVID-19 pandemic have been similarly devastating: job losses, negative growth rates, and increased poverty. Indeed, according to the International Monetary Fund (IMF), China is the only major economy projected to have a positive growth rate in 2020. The economies of most other countries contracted, some by more than 9%. Overall, the global economy likely shrunk by at least 4% in 2020 and the World Bank expects an additional 150 million people have been pushed into poverty. The economic costs of the pandemic have been particularly challenging for many piracy-prone countries. The IMF expects sizable unemployment increases in Indonesia, Uruguay, Brazil, Mexico, and the Philippines. Grim, and longer lasting, economic conditions are anticipated for many countries in West Africa. It is true that the IMF expects an economic rebound in 2021 and some countries, like China, may experience a V-shaped recovery. But, pre-COVID economic malaise in many places almost certainly spells a slower recovery process for most countries.
Underlying economic conditions remain important for understanding why individuals engage in illicit maritime activities. Multiple studies point to the absence of legal opportunities in the local economy, particularly the local fishing industry, as a motivating factor that drives maritime crime and violence. The Coronavirus pandemic is currently hitting the global fishing industry hard. COVID-19 mitigation efforts have led to downturns in the Fish Price Index as

well as expected future declines in supply, production, consumption, and trade revenues. The FAO anticipates global fish production fell by 1.7% in 2020, which would equate to a 1.4% decline in aquaculture output, a devastating downturn not seen in 60 years. COVID-19 restrictions have especially hit workers hard in developing countries as demand for seafood has dropped in many wealthy countries.

The IMB is not the only organization to note an increase in maritime crime in 2020. Other piracy reporting centers also reported sizable increases, as well (*see Figure 2*). The International Maritime Organization, an arm of the United Nations, and ReCAAP, the Regional Cooperation Agreement on Combatting Piracy and Armed Robbery against Ships in Asia, both registered sharp jumps in attacks in 2020. And, the U.S. Office of Naval Intelligence, through its Anti-ship Activity Messaging System, recorded 264 incidents in 2020, an increase of over 70% from 2019. All of these organizations also show striking surges in piracy incidents following the two most recent financial crises.

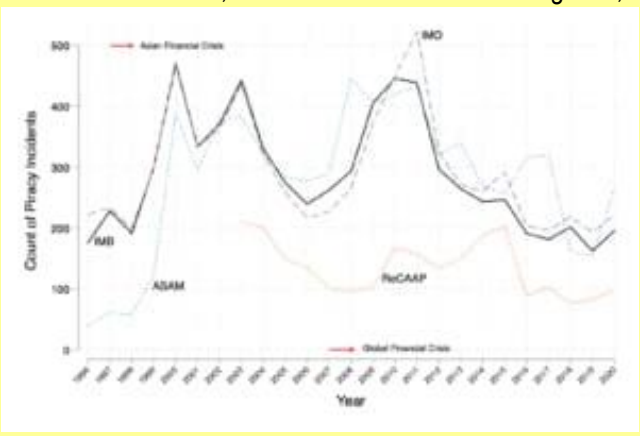


Figure 2: Piracy and Armed Robbery on Ships, Various Reporting Organizations

To be sure, global piracy counts currently remain far lower than previous surges and there are notable successes in counter-piracy operations. In 2020, for example, no incidents were reported by the IMB in the greater Gulf of Aden and reports from Southeast Asia mostly noted simple armed robberies on ships rather than more serious hijackings or crew abductions. Only one category 1 incident (the most serious type of attack) was reported by Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) in 2020, a significant drop from only a few years ago. Further, port security in Malaysia appears to have improved and security enhancements at the Chittagong Port in Bangladesh continue to keep robberies on anchored ships well below their numbers from only a few years ago. Enhancements included the installation of additional CCTV cameras to monitor port activity and restrictions on movement.

Still, the Singapore Straits remains an area of particular concern (mostly the eastern sector). Over 100,000 vessels transit the narrow, 105 km passage every year, carrying critical supplies, such as oil, iron ore, food, and palm oil. In 2020, the IMB recorded 23 attacks in the Straits (*see Figure 3*), nearly doubling the number of incidents from 2019 and reaching the highest level of sea-piracy activity recorded by the IMB in the Singapore Straits since data collection began. ReCAAP shows higher pirate activity in the Straits during 2014 and 2015, but both organizations report significant increases in ship attacks over the past three years.

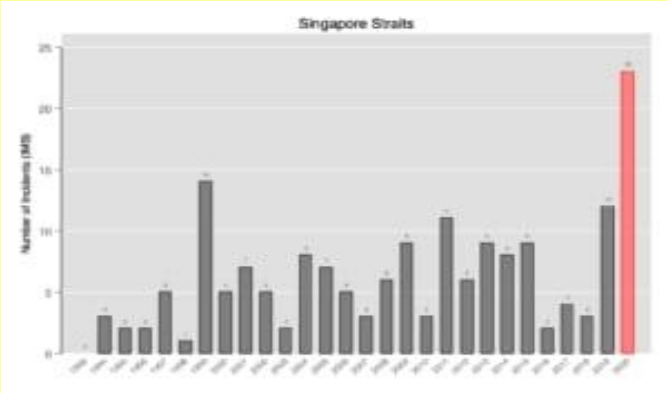


Figure 3: Number of Piracy Incidents in Singapore Straits, 1993-2020 (IMB data)

Despite increased pirate activity in the Singapore Straits, the Gulf of Guinea remains the most dangerous maritime zone in the world today. Over 40% of all pirate attacks and attempted attacks occur in the waters of West Africa, which is the highest percentage since IMB data collection began. The incidents in West Africa continue to be more violent than other regions and nearly all crew abductions recorded globally occur in the greater Gulf of Guinea. At least 130 crew members were taken hostage by West African pirates in 2020, nearly double from just two years before, and sailor kidnappings do not appear to be slowing so far in 2021.

On January 23rd, 15 crew members from a Turkish-operated but Liberian flagged ship 98 nautical miles northwest of Sao Tome and Principe in the Gulf of Guinea were abducted by pirates. The M/V Mozart was en route from Lagos to Cape Town when it was attacked. Along with the 15 kidnapped sailors, one Azerbaijani crew member was killed in the encounter. The pirates are demanding a ransom from the shipping company for the release of the kidnapped crew. Only a few days later, another large cargo ship was boarded by pirates in the Gulf of Guinea. This time, however, they failed to break into the ship's citadel and were forced to quit the vessel.

While piracy and armed robbery on ships increased in 2020, the pandemic has also affected maritime crime more generally, sometimes favorably. The first half of 2020 in the Indo-Pacific saw an increase in Illegal, Unreported, and Unregulated (IUU) fishing compared to 2018, but actually a decrease from the same period in 2019. Most reports of IUU fishing from January to June 2020 occurred in the territorial waters of the Philippines, and then in Sri Lanka, Indonesia, Malaysia, and Thailand. In the Philippines, the COVID-19 lockdown from March 17 to May 15 occurred during the country's primary fishing season. IUU fishing appears to have spiked during this period. Maritime contraband smuggling, however, saw a decrease from 2019 perhaps owing to COVID-19 restrictions. The largest types of contraband smuggled were drugs first, then tobacco, domestic products, and fuel.

Meeting the challenges of maritime security in the shadow of a global pandemic requires an inclusive and comprehensive response. Our research, funded by the Office of Naval Research through the Minerva Initiative, builds a framework to understand how pirates and other criminal actors inhabit maritime spaces where weak institutions, and a lack of naval power and cooperation among states, persists. In order to meet these complex maritime challenges head on, governments must strengthen regional cooperation, enhance maritime law enforcement, improve local governance, and address underlying economic conditions. States must further decouple maritime security from other larger sources of inter-state contention. Local capacity building ought to be at the center of any effort to combat maritime piracy and crime. In its annual report, for example, ReCAAP commended Filipino authorities for their intensified patrols in Manila and Batangas, which have improved security.

The United States must also continue its commitment to maritime security by deepening its relationship with allies and partners alike, especially in the Indo-Pacific. Through the FY16 National Defense Authorization Act, Section 1263, the Indo-Pacific Maritime Security Initiative (MSI) provides Indonesia, Malaysia, the Philippines, Thailand, Vietnam, Sri Lanka, and Bangladesh with maritime security assistance and training. In Indonesia, the U.S. Department of State says this has meant "human capital improvements for strategic planning, budgeting, sustainment, and maritime security".

In August 2020, the United States Navy once again hosted the Rim of the Pacific (RIMPAC) multinational maritime exercise. Ten countries engaged in antisubmarine warfare, maritime intercept operations, live-fire training events, and other activities all designed to build cooperative relationships to better tackle maritime insecurity.

Finally, the international community needs to aggressively combat the economic fallout from the COVID-19 pandemic. A focus on long-term inequities to better prepare for future shocks may help alter an individual's calculus regarding the benefits of illicit activity, especially if secure employment and an adequate social safety net were available. Perhaps the best place to start is to encourage countries to fully implement the Sustainable Small-Scale Fisheries (SSF) guidelines outlined by the Food and Agriculture Organization. Many workers in the global fishing industry lack adequate legal and other protections. Interventions to shore up aquaculture production must give workers the tools to demand the necessary safety equipment, working conditions, and access to social services while the pandemic continues.

▶▶ **NOTE:** Click on source's URL for a clearer view of the figures shown.

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Turkey, Pakistan: Inside the Ankara-Islamabad Axis

Britain: A Sanctuary for Deadly Islamic Terrorists

By Raymond Ibrahim
Source: https://www.meforum.org/62034/britain-sanctuary-for-deadly-islamic-terrorists

Feb 18 – Once again, the UK shows itself to be a safe haven for Islamic terrorists. According to a Feb. 14, 2021 report,
A terrorist who claimed asylum in Britain after he was sentenced to death in Egypt for a failed assassination plot is set to win the right

to stay in this country. Yasser Al-Sirri, 58, first claimed asylum in 1994 but was turned down and has taken the issue to court more than eight times at great cost to British taxpayers.

The UK is more eager to grant asylum to violent Islamists like Yasser Al-Sirri (left) than to their victims, such as Asia Bibi (right).

Al-Sirri, who was also charged in the US with assisting someone involved in the 1993 World Trade Centre bombing, has appeared in several tribunals since. And last week a tribunal decided he was entitled to **remain in the U.K. as a refugee.**

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

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

Qatar Airways to become first global airline to offer 100% touch-free in-flight entertainment

Source: https://www.qatarday.com/news/travel/qatar-airways-to-become-first-global-airline-to-offer-100-touch-free-in-flight-entertainment/84120

Feb 19 – Qatar Airways will soon become the first global airline to offer passengers 100 percent ZeroTouch technology for its award-winning Oryx One in-flight entertainment system across the A350 fleet as part of the airline's latest COVID-19 safety measures. The Zero-Touch technology, introduced in partnership with the Thales AVANT IFE system, will enable A350 passengers to pair their electronic devices (PEDs) with their seat-back IFE screen by connecting to 'Oryxcomms' Wi-Fi and simply scanning a QR code displayed on the screen.

They can use their PEDs to navigate and enjoy more than 4,000 options on offer through the airline's award-winning Oryx One inflight entertainment system, limiting the frequency of onboard surface contact and providing greater peace of mind throughout their journey.

Qatar Airways is also set to become the first airline in Europe and the Middle East and North Africa region to offer passengers in Business and Economy the option to pair their personal Bluetooth headphones with the on-board seat-back IFE system in all cabins on the Boeing 787-9 fleet. Qatar Airways Group Chief Executive, H E Akbar Al Baker, said: "As an industry

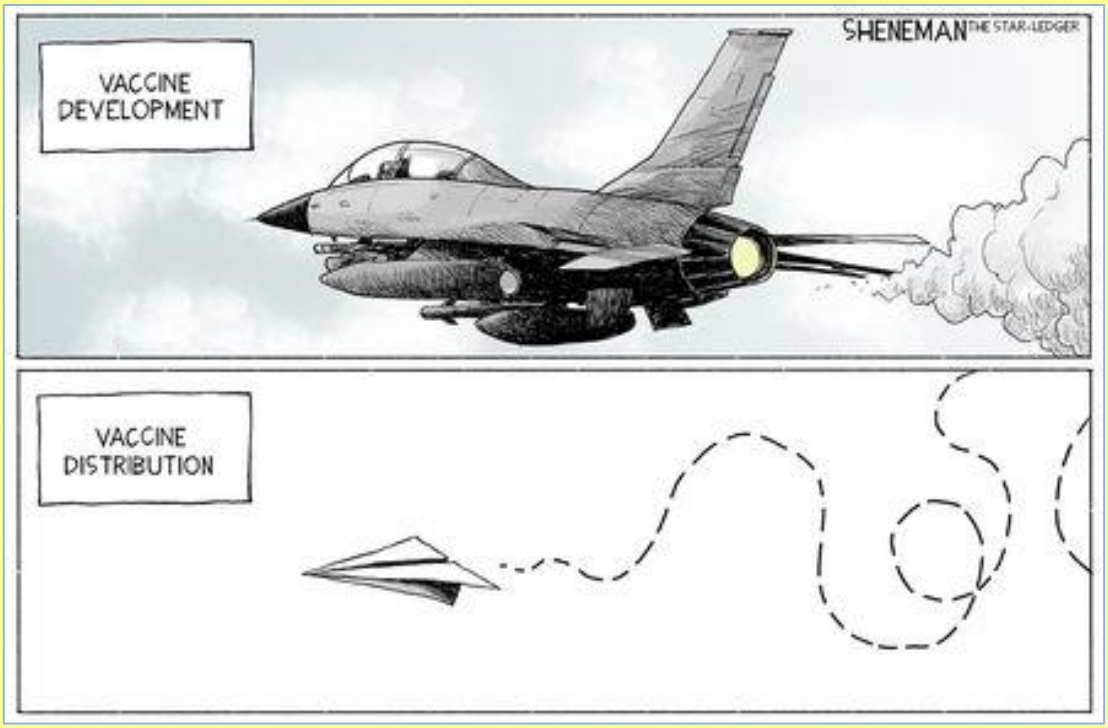
leader in the fight against COVID-19 and the first global airline to recently achieve a 5-Star rating in the coveted Skytrax Airline Safety Rating,
Qatar Airways is committed to ensuring the highest standards of safety and hygiene on-board its aircraft at all times. The introduction of the state-of-the-art Zero-Touch technology and enabling passengers to use their Bluetooth headset on board is an important step in taking our already rigorous and stringent COVID-19 precautions to another level, limiting passenger surface contact and preventing any possible spread of infection on board
"We hope it provides yet further assurance of the safety of air travel, as well as offering passengers on board increased confidence that they are enjoying the most consistently advanced customer experience available in the sky." Qatar Airways recently became the first global airline to achieve the prestigious 5-Star COVID-19 Airline Safety Rating by international air transport rating organisation, Skytrax. This follows HIA's recent success as the first airport in the Middle East and Asia to be awarded a Skytrax 5-Star COVID-19 Airport Safety Rating.
These recognitions assure passengers worldwide that airline health and safety standards are subject to the highest possible standards of professional, independent scrutiny and assessment. The national carrier of the State of Qatar continues to rebuild its network, which currently stands at over 130 destinations. With more frequencies being added to key hubs, Qatar Airways offers unrivalled connectivity to passengers, making it easy for them to change their travel dates or destination if they need to.

Perspectives on Terrorism

Volume XV, Issue 1 | February 2021
Source: https://www.universiteitleiden.nl/binaries/content/assets/customsites/perspectives-on-terrorism/2021/issue-1/vol-15-issue-1.pdf

The current issue features five **Articles**. The opening article by Lorne Dawson critically examines whether religious motivations have been misrepresented in relation to religious terrorism. The second article by Atal Ahmadzai examines the written and audio-visual materials used by the Taliban to motivate and operationalize suicide bombings in spite of social and cultural resistance in Afghan society. Next Carlos Igualada and Javier Yagüe explain how the practice of declaring bay'ah (taking an oath of allegiance) has helped al-Qaeda and Islamic State pursue global expansion by establishing allegiance relationships with dozens of groups around the world. In the fourth article, Ronald Mendoza, Rommel Jude Ong and Dion Lorenz Romano review some key legal issues regarding counterterrorism efforts in the Philippines. And in the final article of this issue, Stephane Baele, Lewys Brace, and Travis Coan compare the content and discussion of six different /pol boards of "chan" forums, identifying how popularity and extreme content can distinguish one from another amid a fragmented subculture.
These articles are followed by two **Research Notes**. In the first, Jeremiah Asaka examines relationships and patterns of interaction between climate change and terrorism. And the second is an extensive inventory of institutions and centers in the field of terrorism research, compiled by Reinier Bergema and Editorial Assistant Olivia Kearney,
Our **Resources** section open with the *CT-Bookshelf* wherein our Book Reviews Editor Joshua Sinai provides abbreviated reviews of 8 new publications. This is followed by an extensive bibliography on terrorism in Southeast Asia by Information Resources Editor Judith Tinnes, and an equally extensive bibliography on civilian casualties of terrorism and counterterrorism, by Assistant Information Resources Editor David Teiner. Then Assistant Editor Brody McDonald provides a bibliography of academic theses on preparedness for, and resilience to, terrorism. The reader will also find in this issue a list of new web-based resources on terrorism and related subjects by Associate Editor Berto Jongman and a Conference Calendar compiled by Olivia Kearney.
Finally, the February issue concludes with some words of appreciation to all the peer reviewers and members of the Editorial Board who have contributed their time and effort towards the continued success of this open-source journal, and a reminder that submissions for the TRI Best Thesis Award competition for the Best Doctoral Dissertation on Terrorism and Counter-Terrorism must be received by 31 March, 2021. The articles and other texts of the current issue of *Perspectives on Terrorism* have been edited by Alex Schmid and James Forest, the journal's principal editors. Editorial Assistant Jodi Moore handled proof-reading, while the technical online launch of the February 2021 issue of our journal has been in the hands of Associate Editor for IT Christine Boelema Robertus.

UK: "Chestfeeding" instead of "breast feeding" = "pure stupidity"

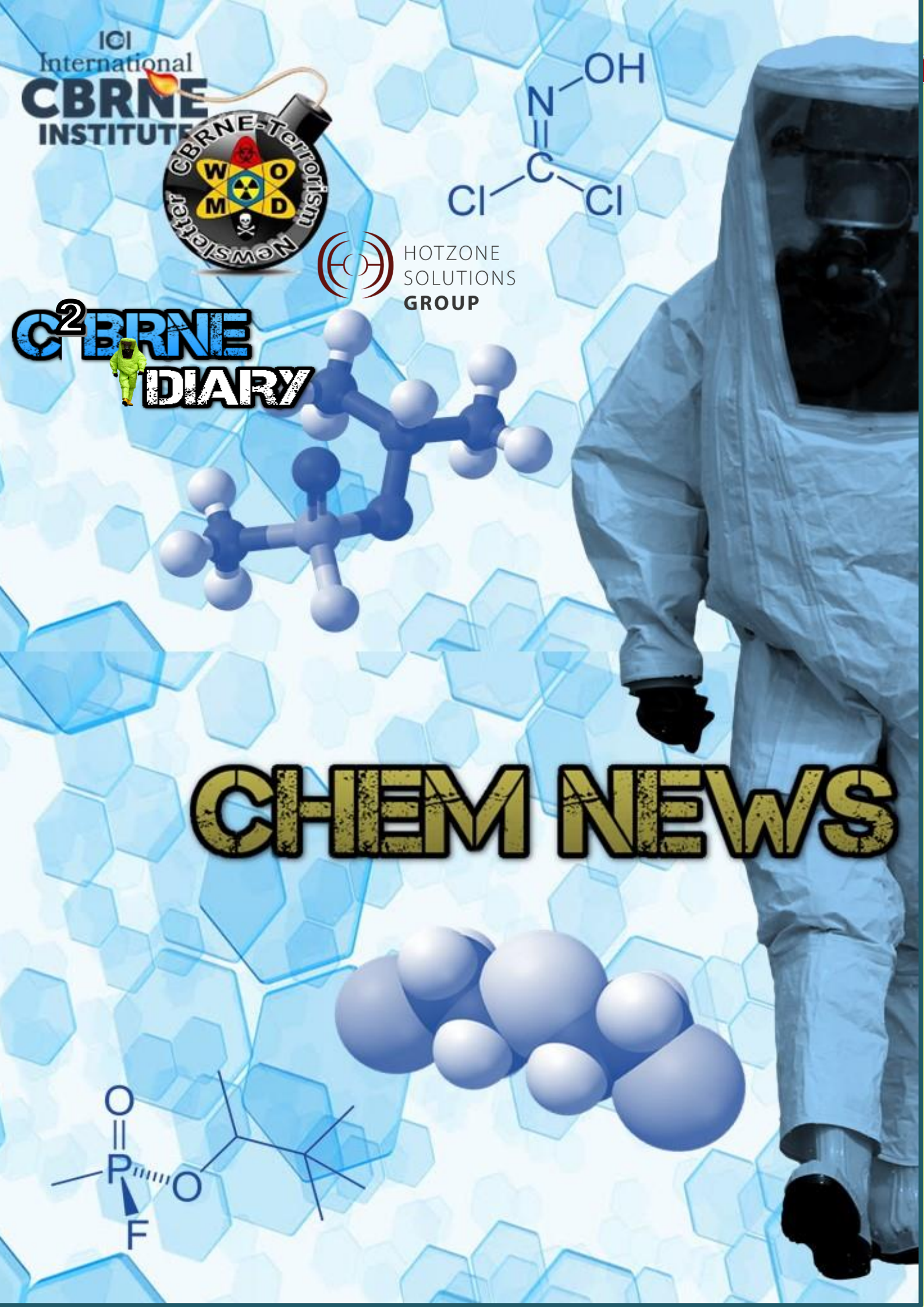

SHENEMAN THE STAR-LEDGER
VACCINE DEVELOPMENT
VACCINE DISTRIBUTION

ICI International CBRNE INSTITUTE

CBRNE-Terrorism Newsletter

HOTZONE SOLUTIONS GROUP

C²BRNE DIARY



CHEM NEWS

Price of the Rubber Glove

By Ms. Pinja Mann

NCT Magazine | January 2021

Source: https://nct-magazine.com/nct-magazine-january-2021/price-of-the-rubber-glove/

As the world keeps struggling with COVID-19 and the delayed and poorly planned vaccine rollouts, the rubber glove market keeps being the hottest pandemic trade by revenue. The market is expected to grow at a compound annual growth rate (CAGR) of over 13 percent during the period 2021-2026, according to the Rubber Gloves Market – Global Outlook and Forecast 2021-2026. The healthcare workers administrating the shots will keep the demand for medical gloves afloat, albeit not in such high demand as during the early months of the pandemic in 2020. The manufacturers will also be able to supply enough products to the buyers, monetizing the higher-than-average prices companies could charge for their products when supply-and-demand cycles did not meet. Moreover, South East Asian medical gloves market is projected to reach USD 373.7 million at 10.5 percent by 2027, exhibiting a CAGR of 10.5 percent during the forecast period, according to Fortune Business Insights.

Key glove manufacturers in South East Asia, e.g., Top Glove and Hartalega, are focusing on strengthening their regional brand presence to gain a stronghold in South East Asia. There has also been a clear trend of a more aggressive elevation of these key players' production capabilities in the region. This is mostly to ensure their dominance in the global medical gloves industry. Increased production capacities enable these companies to bolster their regional presence, widen their offerings and their international sales horizons. In contrast, North America is the major consumer of rubber gloves in the western hemisphere, with the US dominating and leading the market. According to PR Newswire, a distributor of press releases headquartered in New York City, North America has some of the most rigorous safety practices that drive demand from several industries and sectors. The market is poised for continued growth and opportunities. The number of players operating in the market has the potential to surge, which could also see the rise of domestic players with mergers and acquisitions through global brands. Moreover, the innovations in synthetic rubber categories, e.g., neoprene, polyisoprene, and thermoplastic elastomer, could stand out from the competition because the North American market is open to new product launches.

Manufacturers were facing problems with attaining enough raw materials for making the gloves as well as keeping factories open, since the workers were also getting infected with COVID-19. As many Western nations had stopped manufacturing all PPE and sanitizers a long time ago, they had to rely on foreign products at first, before re-starting local, domestic production. As the Eastern world kept manufacturing and supplying the gloves, it became apparent that whoever would bid the highest amount would get the gloves first.

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

➲ **Read also: Norway Country CBRN Profile**

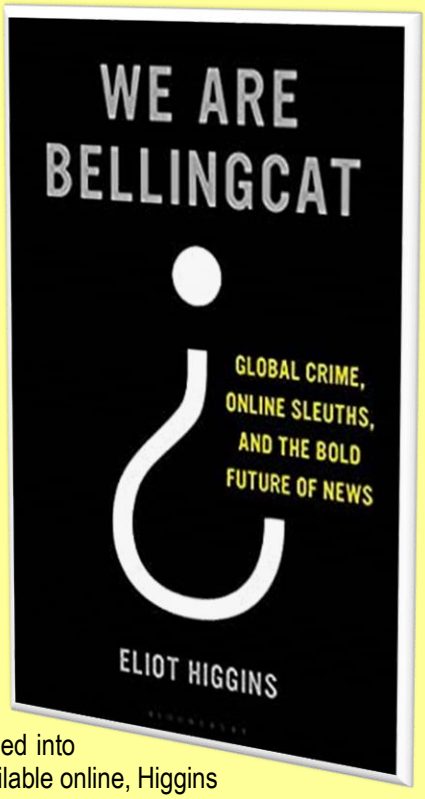
Pinja Mann *is currently studying MSc Security and Crisis Management - Governance of Crisis at Leiden University. She joined IB Consultancy in November 2020.*

A bored business administrator in Leicester puts the intelligence services to shame

Source: https://www.spectator.co.uk/article/a-bored-business-administrator-in-leicester-puts-the-intelligence-services-to-shame

Jan 30 – In the summer of 2012, a man was walking near Jabal Shashabo, a Syrian rebel enclave, when he spotted a group of turquoise canisters with what appeared to be tail fins attached. He picked up one of the objects and filmed it. Later he uploaded his video to YouTube.

What were those strange turquoise cans? The answer was provided not by a UN investigator, war correspondent or military expert, but by a bored business administrator at his desk in Leicester. He had never been to Syria, spoke no Arabic and by his own admission knew nothing about weaponry. But Eliot Higgins had become fascinated by the war in Syria, and was following the social media feeds of people in the thick of it. He saw the YouTube clip and noticed the serial number 'A-IX-2'.



Working with other online amateur weapons-spotters, Higgins figured out that the man in the video was holding a Russian-made cluster bomb. These devices detonate at high altitude, sending out a shower of smaller bombs that often land without exploding. Children are especially likely to pick them up and be killed by cluster munitions, and for that reason they are illegal in many countries. By interrogating the contents of a single YouTube clip, Higgins had established that the Syrian government was using illegal, Russian-supplied cluster bombs against its own people. He published his findings online.

Then came the chemical weapons attack on Ghouta, the rebel-held suburb of Damascus, in which up to 1,700 people died. Higgins found images of the rocket on social media, and a detail caught his eye: the screw cap on the warhead suggested that it had contained liquid. After more online sleuthing, he concluded that the device was a Soviet-made artillery rocket and that the warhead had contained the nerve agent sarin.

This time Higgins went further. Using a combination of Google maps and extreme perseverance he was able to 'geolocate' the spot where the rocket had landed. From its angle of arrival, he deduced the rocket's trajectory and therefore its launch site — a Syrian army installation. Higgins had shown that Assad's army was using chemical weapons of Russian origin, in violation of international law. His investigations started attracting followers and he set up a blog, which he called 'Brown Moses'.

It was the tragedy of flight MH17 from Amsterdam to Kuala Lumpur that brought his work to international attention. On 17 July 2014, during the Russian invasion of Ukraine, MH17 crossed into Ukrainian airspace. It was shot down, killing all on board. Using information that was openly available online, Higgins established that the plane had been hit by a Russian Buk missile. He also identified the serial number of the missile-launcher and even uncovered the identity of the shooters, in this case a unit of the Russian 53rd Brigade. In his report on the incident, he and his team concluded: 'The Russian government bears responsibility for the tragedy.'

By this time Higgins's blog had turned into an online research group, part-funded by Google, which he named Bellingcat. The name derives from the children's story of the mice who decide to put a bell round the cat's neck. By 'belling the cat', they take away its ability to act unseen.

Higgins and his team have been very effective at 'belling the cat'. In 2018, they uncovered the identity of the men who poisoned Sergei and Yulia Skripal in Salisbury. In an absurd interview on Russian state TV, the two suspects claimed to have been tourists, visiting Salisbury to view the cathedral. Bellingcat established that they were GRU operatives, a kill team working for Russian military intelligence. Higgins's work evidently touched a nerve. Sergey Lavrov, the Russian foreign minister, told an interviewer: 'Bellingcat is closely connected with the intelligence services, which use it to channel information intended to influence public opinion.'

Higgins, whom I have met and interviewed, denies this. What's more, he is completely unfazed by having made such powerful enemies. In a further investigation published after this book's completion, Bellingcat identified the men who tried to assassinate Alexei Navalny, the Russian opposition leader. The culprits this time were operatives from the FSB, the Russian security service.

This determination to reveal awkward facts has led Bellingcat to focus on what Higgins calls 'the counterfactual community', the radical, conspiracy-obsessed online culture that has begun seeping out into the real world, with hideous consequences. As Higgins explains, the

man who carried out the Pittsburg synagogue massacre in 2018 was radicalised by websites featuring anti-Semitic conspiracy theories, Nazi memes and 'ironic' white supremacist language. A mass murder at a Texas synagogue that same year was also announced on an extremist website, as was the 2019 Christchurch massacre at a New Zealand mosque.

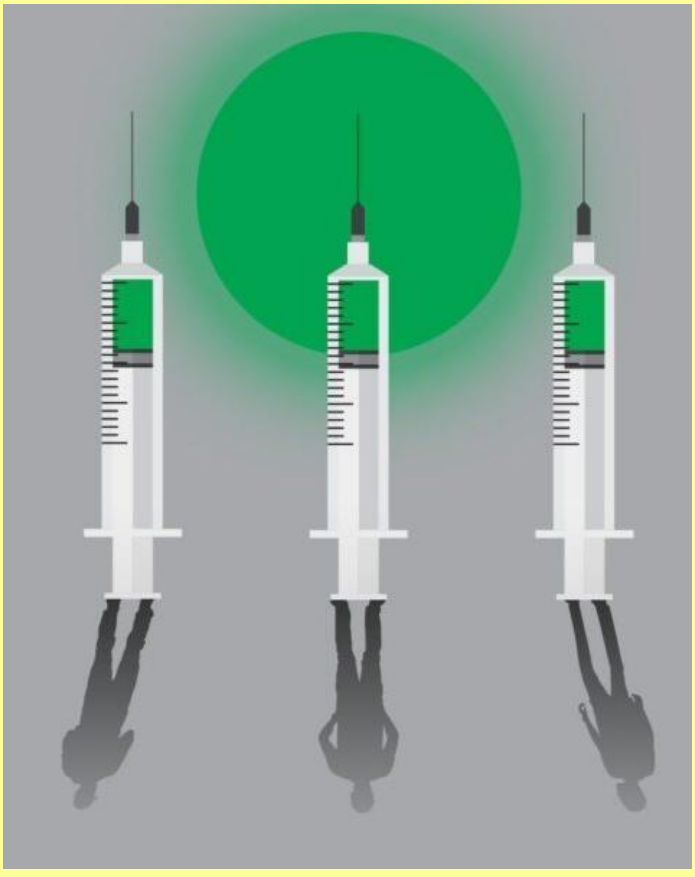
The websites that radicalised these killers gave rise to conspiracy theories such as QAnon, popular among the Trump supporters who stormed the Capitol. QAnon's followers believe that a cabal of child abusers, made up of senior Democrats and liberals, is trying to take over the world, and only Trump can defeat them. It's absurd — but look at the social media images of the crowd that stormed Congress. Look at the QAnon flags and clothing emblazoned with the capital 'Q'. A ridiculous theory, if widely believed, can threaten national security.

This is a fascinating, bewildering book. Remarkably, the world's media failed to spot a gold mine of online information and it took a bored guy working in his spare time to show them the way. In doing so, he created an entirely new way of investigating events. Organisations including the BBC and the *New York Times* now have open source investigation units modelled on Bellingcat. In some cases, including the downing of MH17, Bellingcat's findings have proved more revealing than investigations by governments and official bodies. Is its methodology more powerful than that of government agencies?

The distinction between the truth and the lie is often muddled, sometimes purposefully. Higgins worries that it will become even more blurred now that AI can generate 'deepfake' images of events that never happened. But the lesson of this deeply impressive book is that, despite the noise, the propaganda and the lies, the truth is everywhere. You just have to know how to look for it.

Navalny Poison Squad Implicated in Murders of Three Russian Activists

Source: https://www.bellingcat.com/news/uk-and-europe/2021/01/27/navalny-poison-squad-implicated-in-murders-of-three-russian-activists/



Jan 27 - In **our previous investigation**, we disclosed the existence of a clandestine unit within the FSB's Criminalistics Institute, members of which had shadowed opposition leader Alexey Navalny for nearly five years. Members of the unit with medical and chemical-weapons background, travelling in groups of two or three, had followed Navalny on more than 30 flights during his 2017 presidential election campaign. Three members of this squad had been near him during a suspected poisoning of his wife in July 2020, and during his near-fatal poisoning in August 2020.

We also disclosed that this unit was supervised by Col. Stanislav Makshakov, deputy director of the Criminalistics Institute and a scientist involved with Russia's military chemical weapons program, which according to public sources had developed over 20 highly toxic materials including organophosphates of the Novichok type. Before Navalny's poisoning with Novichok, Col. Makshakov was in frequent communication with scientists from the Signal Institute, which a previous **joint investigation** linked to Russia's surreptitiously renewed chemical weapons program.

A follow-up **report** presented additional validation of the role of the FSB's Criminalistic Institute in the poisoning of Alexey Navalny obtained through an inadvertent admission by one of the unit's chemical weapons specialists – Konstantin Kudryavtsev – who had been dispatched to Omsk following the poisoning to dispose of any traces of the toxic substance on Alexey Navalny's personal items.

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

India warns against terrorists getting chemical weapons of mass destruction

By Arul Louis

Source: https://sambadenglish.com/india-warns-against-terrorists-getting-chemical-weapons-of-mass-destruction/

Feb 04 – India has warned against chemical weapons of mass destruction falling into the hands of terrorists noting the reports of the resurgence of the Islamic State (IS) terror group in Syria.

"India remains concerned about the possibility of such dangerous weapons of mass destruction falling into the hands of terrorist organisation and individuals," R. Ravindra, a Deputy Permanent Representative of India, told the Security Council on Wednesday.

"Terrorist groups have taken advantage of the decade-long conflict in Syria to entrench themselves posing a threat to the entire region. Reports of the resurgence of the IS in the region are being heard with increasing frequency," he said after the Council heard a briefing on the implementation of its resolution against chemical weapons in that country.

That Resolution adopted in 2013 expressly demanded that "non-State actors" or terror groups "not develop, acquire, manufacture, possess, transport, transfer, or use nuclear, chemical or biological weapons and their means of delivery".

Ravindra said: "The world cannot afford to give these terrorists any sanctuary or dilute its fights against these terrorist groups."

The UN's High Representative for Disarmament Affairs Izumi Nakamitsu, who briefed the Council on the implementation of its resolution, alleged that Syria was not fully in compliance with it.

"At this stage, due to the identified gaps, inconsistencies, and discrepancies that remain unresolved, the declaration submitted by the Syrian Arab Republic cannot be considered accurate and complete in accordance with the Chemical Weapons Convention (CWC)," she said.

She said that there were 19 outstanding issues and one of them was about a chemical weapons production facility that a team from the Organization for the Prohibition of Chemical Weapons (OPCW) determined had been used to manufacture such weapons although Damascus has denied such use.

The issue of chemical weapons in Syria has pitted Russia, with some backing from China, against the Western nations which are vehemently opposed to the government of Bashar al-Assad.

With New Delhi in the middle, Ravindra said: "India has consistently underlined the need for impartial and objective investigation into any alleged use of chemical weapons, scrupulously following the procedures and provisions laid down in the (Chemical Weapons) Convention."

New Delhi also has close ties with Syria.

"India has consistently called for a comprehensive and peaceful resolution of the Syrian conflict through a Syrian-led dialogue," Ravindra said.

India has "contributed to the return of normalcy and rebuilding of Syria through humanitarian assistance and human resource development" and was now ready to provide it with Covid-19 vaccines, he said.

As for the CWC, Ravindra said India attaches high importance to it.

He said it "is a unique, non-discriminatory disarmament instrument and serves as a model for the elimination of an entire category of weapons of mass destruction".

He added that India was the first country to be declared the first signatory to the CWC to be declared a chemical weapon-free state.

German Firm to Clear Beirut Port of Dangerous Containers

Source: http://www.naharnet.com/stories/en/279232-german-firm-to-clear-beirut-port-of-dangerous-containers

Feb 06 – A German firm has treated 52 containers of hazardous material at Beirut port and will ship them out of Lebanon, the German ambassador said Saturday, months after a monster port blast.

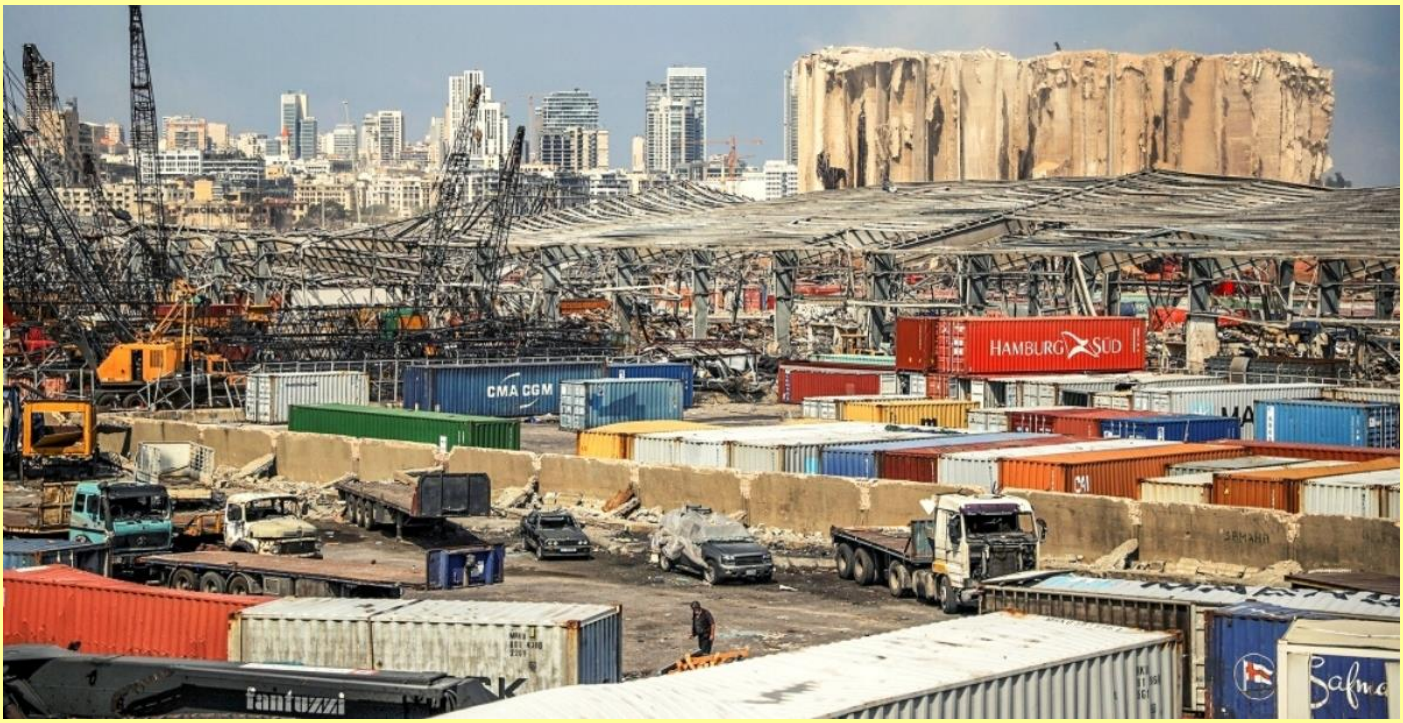
Andreas Kindl said on Twitter that the heavy lift transport company Combi Lift "has treated 52 containers of hazardous and dangerous chemical material that had been accumulated over decades and were a threat to the people in Beirut".

"They stand ready to be shipped to" Germany, he added.

The August 4 explosion of a stockpile of ammonium nitrate fertiliser that had been left to languish haphazardly at the Beirut port for years killed more than 200 people, wounded at least 6,500 others and ravaged swaths of the capital.

Lebanon's worst peace-time disaster sparked concerns over remaining shipments of hazardous chemicals still stored at the blast site.

In November, Lebanon signed a contract with Combi Lift, which was already working at the port, to clear containers carrying hazardous chemicals.



The containers, which include corrosive acids, had been stored in an open-air cargo zone for over a decade under the supervision of Lebanon's customs authority, officials said at the time.

If they catch fire "Beirut will be wiped out", interim port chief Bassem al-Kaisi said in November.

Kindl on Saturday published pictures on Twitter showing fraying containers at the port and what appears to be chemicals leaking from some of them.

Lebanese authorities have said Combi Lift will ship the chemicals in special containers as part of a $3.6 million deal, with the port authority reportedly to pay $2 million of that.

Lebanon's army and port authority have said they do not have the expertise to handle such a process.

Lebanon has launched an investigation into the August blast amid public anger against a political class widely blamed for the tragedy.

At least 25 people have been arrested, including the port chief and the head of the customs authority, but no politician has been held to account.

First-of-a-kind sweat sensor tracks stress levels around the clock

Source: https://newatlas.com/wearables/first-sweat-sensor-stress-cortisol-circadian-rhythm/

Feb 07 – Human sweat contains all kinds of valuable biomarkers that can be used to track different aspects of human health, such as glucose levels in diabetics or metabolic conditions during exercise, and a new breed of wearable sensors promise to make this a rather simple

undertaking. Scientists at Switzerland's École polytechnique fédérale de Lausanne (EPFL) have just developed the first of these designed to continuously monitor stress levels over the course of the day, which they hope will make it easier to spot signs of stress-related disease caused by disruptions to natural hormonal cycles.

The research focuses on the hormone cortisol, which can spike in response to stressful events but is also secreted naturally throughout the day in line with our circadian rhythm. Levels peak between 6 am and 8 am and gradually decrease over the course of the day, playing an important role in regulating things like blood sugar, blood pressure and metabolism.

"But in people who suffer from stress-related diseases, this circadian rhythm is completely thrown off," says Adrian Ionescu, who led the research team. "And if the body makes too much or not enough cortisol, that can seriously damage an individual's health, potentially leading to obesity, cardiovascular disease, depression or burnout."

Back in 2018, we looked at research from Stanford University that resulted in **the first wearable skin sensor that could measure a person's cortisol levels through their sweat.** Where this patch was designed to be applied momentarily to the subject when they are glistening in sweat to gather the sample for analysis, the EPFL team sought a solution that could be worn around the clock.

At the heart of the breakthrough is the high sensitivity and very low detection limits of the patch, owing to an electrode made from graphene that can bind to and capture cortisol, working with a transistor to measure its concentration in the wearer's perspiration. This is the first system developed to continuously track cortisol concentrations across the circadian cycle, opening up some very useful possibilities.

"That's the key advantage and innovative feature of our device," says Ionescu. "Because it can be worn, scientists can collect quantitative, objective data on certain stress-related diseases. And they can do so in a non-invasive, precise and instantaneous manner over the full range of cortisol concentrations in human sweat."

The patch has been put through its paces in the lab and the team is now planning on testing it out at a local hospital on patients suffering from stress-related conditions, such as Cushing's syndrome, Addison's disease and obesity. Furthermore, they believe the technology can play a role in diagnosing and treating psychological diseases brought on by stress.

"For now, they are assessed based only on patients' perceptions and states of mind, which are often subjective," says Ionescu. "So having a reliable, wearable system can help doctors objectively quantify whether a patient is suffering from depression or burnout, for example, and whether their treatment is effective. What's more, doctors would have that information in real time. That would mark a major step forward in the understanding of these diseases."

▶▶ **The research was published in the journal** *Communications Materials*.

Robot Seeks Out Chemical Agents

Source: http://www.homelandsecuritynewswire.com/dr20210208-robot-seeks-out-chemical-agents

Feb 08 – DSTL, the science inside U.K. defense and security, has developed a prototype robot so that humans and machines can now share the burden of detecting and report dangerous chemicals over large areas.

The **Merlin Robot**, developed by industry partner HORIBA-MIRA with funding from the MOD and the Home Office, autonomously carried out simulated chemical reconnaissance tasks over test areas covering up to 10,000 square meters. Currently a single prototype, the Merlin robot operated continuously on tasks for several hours with ease, allowing personnel to monitor and manage the test incident scene from a safe distance, away from potential harm.

Chemical reconnaissance (recce) on foot and in specially modified vehicles is currently carried out by specialist personnel in the event of suspected or confirmed use of chemical agents,

both in military battlefield and homeland security scenarios. It is a dangerous and laborious task requiring high levels of specialist training. In the future, however, autonomous systems could enable the task with significantly less burden on personnel and at lower risk to the deployed teams.

The trial, run under DSTL's Project Servitus, was a follow-on to successful previous work conducted under Project Minerva, which investigated the use of ground-based and airborne autonomous systems to tackle hazardous scene assessment in areas contaminated with chemical agents, on behalf of the MOD and the Home Office.

Initially developed as part of Project Minerva, under Servitus the Merlin robot had an off-the-shelf chemical vapor sensor mounted so that it can be accurately positioned close to the ground. The robot's AI-based object recognition and search and detection techniques were also further developed, including drawing on other DSTL-funded work on MIRA's Viking re-supply and recce unmanned ground vehicle (UGV), enhancing the system's autonomous behaviors and capability.

The Servitus trial tested different autonomous behaviors for search and mapping operations in exploring an area, obstacle avoidance and chemical mapping. The operationally realistic trial was undertaken with support from specialist C-CBRN operators from 27 Squadron RAF Regiment RAF Honington. Non-toxic chemical simulants were sprayed onto the ground within a simulated operational activity, and both the military recce teams and the robot undertook the task of searching the areas to find and map the chemicals and plot clean routes.

27 Squadron RAF Regiment operators were provided with basic training on the Merlin and its tablet-based human machine interface, and given the opportunity to operate the robot, setup Merlin missions, monitor progress and re-task the robot as required. The users were quickly able to absorb the training and become proficient in commanding the robot, relishing the chance to work with the system. Commenting on working with DSTL and MIRA, a spokesperson from 27 Squadron RAF Regiment said: "It was a hugely interesting project to be part of within the early development stages, and it was a pleasure to work alongside the MIRA and DSTL personnel who were very engaged, approachable and keen to listen to our observations and experience. The system has a lot of potential and testing our personnel against the AI of the robot was a good benchmark."

By the end of the trial, Merlin had successfully demonstrated autonomous operation in area recce tasks that were both clean and contaminated, and had performed tasks to find clean routes through contaminated areas. Throughout the trial the embedded AI was pushed to the limits of object and obstacle recognition and successfully demonstrated its utility within a cluttered environment.

DSTL's project technical lead, Andy Martin said: "Project Servitus has demonstrated the clear potential to make the job of military and emergency services users safer, more effective and future looking. The technology has significant potential in a number of fields, and work to explore the exploitation pathways within CBR and elsewhere is well underway. Building on Project Minerva, Servitus is another exemplar of cross-department and industry collaboration, with close working between government technical experts, industry and the military user community. It has been highly successful because of that."

Almost 200 academics from more than a dozen British universities could face jail amid probe over fears they inadvertently helped China develop weapons of mass destruction

February 08

Source: https://www.dailymail.co.uk/news/article-9236123/Almost-200-academics-British-universities-face-jail-sending-information-China.html

- **Academics, from 20 universities, suspected of breaching Export Control Order**
- **Law is designed to prevent sensitive intellectual property going to hostile states**
- **The law carries a maximum 10-year prison sentence for those who breach it**

Terrifying missiles so high-tech it's almost impossible to stop them

HYPERSONICS

China is spending huge sums to create hypersonic missiles that will go so fast (up to twenty times the speed of sound) that military chiefs believe they will be invulnerable to any form of defence.

Indeed, some analysts fear that human capability to respond to such lethal weapons will be inadequate and that the only way to protect against them would be to rely on artificial intelligence and computer systems.

Travelling several miles a second as they deliver surprise attacks within minutes of being launched, they have been described as a 'game-changer' for warfare.

Although America, too, has such Star Wars-style weapons in development, General John E. Hyten, commander of US Strategic Command, told a Senate committee three years ago: 'We don't have any defence that could deny the employment of such a weapon against us.'

Such missiles, capable of carrying nuclear warheads, would deliver precision attacks on people, vehicles and buildings.

To test such weapons, the Beijing government said three years ago it was building a wind tunnel that simulated conditions up to 25 times the speed of sound. And a contractor has said it has carried out a six-minute test flight for a hypersonic missile.

The complexities of developing hypersonics – using sophisticated sensors, guidance systems and innovative propulsion methods – have been compared to building the atomic bomb.

GRAPHENE

This is a revolutionary material with enormous defence and manufacturing potential. One atom thick and the thinnest and lightest material known to man, it conducts heat, absorbs light, stretches and is 200 times stronger than steel.

It was invented by researchers in 2004 at Manchester University – with China's President Xi Jinping having made an official visit to their lab.

Among its military applications are as coatings on ballistic missiles, wiring in hypersonic vehicles exposed to high temperatures, camouflage of vehicles and body armour for troops.

Chinese reports suggest that the Z-10 attack helicopter – a rival to Boeing's Apache – has been equipped with graphene armour developed at the Beijing Institute of Aeronautical Materials. The institute has ties to three universities in Britain, where it collaborates on two centres specialising in research into the use of graphene in the aerospace industry.

Chinese media have reported plans to use graphene coatings on military installations on artificial islands built in the South China Sea, an area where Beijing has controversially deployed Jin-class ballistic missile submarines armed with nuclear missiles.

SPY TECHNOLOGY

One of the most sinister recent trends in China has been the creation of a surveillance state that seeks to control 1.4 billion citizens through a constant watch over their movements, thoughts and words.

People are tracked via a massive network of street cameras, facial recognition technologies, biometric data, official records, artificial intelligence and monitoring of online activities as mundane as things like shopping and takeaway food ordering habits.

The most extreme example is in the Western province of Xinjiang, where Uighurs and other Muslim minorities are under 24/7 surveillance.

Much of the network was developed by the state-owned China Electronics Technology Group Corporation, which supports work at four Chinese universities with ties to seven British universities.

CHINESE UNIVERSITIES

As part of President Xi's bid for China's global supremacy, he has employed a so-called 'military-civil fusion' strategy that involves universities playing a central role in maximising the country's military power.

China's constitution also stipulates that all new technologies, even if developed by the private sector, must, by law, be shared with the People's Liberation Army.

A key research institution is the National University of Defense Technology, in Hunan, which is controlled by the military and specialises in hypersonics, drones, supercomputers, radar and navigation systems.

It has links with eight British universities, including a formal collaboration with one world-renowned seat of learning.

Eight other UK universities have ties with the Beijing University of Aeronautics and Astronautics, which spends 60 per cent of its research budget on defence activities.

Another important centre is the Harbin Institute of Technology. It has a joint research lab with the nation's leading ballistic missile manufacturer and has links with three British universities.

DRONE SWARMS

The Beijing government is developing swarms of 'suicide' drones to hover in the sky as they locate their target – while communicating with each other and co-ordinating their movements without any human input.

This marks the next era of robotic warfare, with autonomous weapons replacing current drones that have to be pre-programmed or are remote-controlled. The United States and Israel are also working on such technology, while Britain, too, tested a swarm of 20 drones last month with sorties from RAF Spadeadam in Cumbria.

The advanced technology uses computer algorithms – often modelled on biological studies of insects and fish – to create self-navigating drone squadrons.

NUCLEAR WEAPONS

In total, China is estimated to have 350 nuclear warheads, including 204 on operational long-range missiles fired from landbased launchers, 48 on submarines and 20 'gravity bombs' to be dropped from aircraft. A recent Pentagon report warned that, in its bid to catch up with Russia and the US, Beijing plans to double its nuclear arsenal over the next decade as part of President Xi's drive towards global dominance.

Many of these weapons are being developed by China Aerospace Science and Technology Corporation, a massive state-owned conglomerate that has links with at least five UK universities.

Missing: Legal Frameworks for Chemical Security

Source: https://www.stimson.org/2020/missing-legal-frameworks-for-chemical-security/

Dec 2020 – In recent years, state and non-state actors have broken the taboo against the use of chemical weapons. Yet evidence suggests that the national legal frameworks for chemical security, as required of all UN member states by United Nations Security Council Resolution 1540 (2004), remain persistently underdeveloped. Worse, the international community has yet to generate a widely accepted set of international standards for chemical security. To provide a baseline on national implementation of the chemical security obligations under Resolution 1540, the authors led a research team that first identified key practices for chemical security laws and regulations from a review of more than 30 national, regional, and industry codes of conduct and guidance. They then extracted more than 600 laws and regulations identified by the 1540 Committee for analysis. After comparing these measures against key practices derived from the codes and guidance, the authors generated a composite index score for each UN member state and created a choropleth map to provide new insights into the status of 1540 implementation, from geographic clusters to unexpected outliers. Finally, they offer several potential determinants for further research.

In the aftermath of the widespread use of chemical weapons during the First World War, many countries committed to not use such weapons again in the 1925 Geneva Protocol.[1] In the following decades, despite their use by a few governments and non-state actors against domestic and foreign targets, a strong international norm against chemical weapons emerged.[2] With the end of the Cold War, the international community further formalized this norm into a robust regime against chemical weapons by establishing the 1993 Chemical Weapons Convention (CWC), which now has 193 state parties and created the Organisation for the Prohibition of Chemical Weapons (OPCW). More recently, however, state and non-state actors' use of chemical weapons threatens to undermine the chemical weapons nonproliferation regime at its foundation. The chemical weapons attacks during the Syrian civil war brought opportuni- ties for international cooperation, resulting in Syria acceding to the CWC and destroying much of its chemical warfare agents. At the same time, the attacks brought moments of division, such as grappling with the Syrian government's role in continued attacks and a contested Security Council vote on the OCPW's responsibility to determine attribution.

Furthermore, perpetrators of chemical weapon attacks are employing new agents and tactics, from sophisticated chemical weapons for assassinations in Malaysia and the United Kingdom to attacks, virtual and physical, on chemical facilities.[3] The use of novel agents in these most re- cent attacks have even prompted CWC state parties to add new chemicals, the families of novichocks and carbamates, to the schedules of chemicals controlled under the CWC for the very first time.[4]

Unfortunately, these challenges to the nonproliferation regime and the norms that underpin it are not isolated or infrequent. Of the 517 events involving chemical, biological, radiological, or nuclear terrorism from 1990 to 2017 in the Profiles of Incidents Involving CBRN and Non-State Actors (POICN) database, more than 400 involve chemical terrorism occurring in at

least 59 countries on six continents.[5] Thus, the international community has much more to do to secure and prevent the illicit use of these chemicals.
The global community knows little about how national systems are implemented and enforced, beyond evidence that illicit actors can and have exploited them.[6] However, with funding from Global Affairs Canada, the Henry L. Stimson Center began a project to explore the national legal frameworks for chemical security in all 193 UN member states with the intention to develop a compendium of laws, regulations, or their equivalent that include specific obligations to secure toxic chemicals of proliferation concern.[7] The project also sought to identify a set of emerging chemical security standards by reviewing open source literature and then evaluating national legal measures against key elements of those standards. All UN member states are required to have effective legal measures and other controls in place for chemical security under legally binding obligations of United Nations Security Council Resolution (UNSCR) 1540 (2004). However, the OPCW has not yet developed an international code of conduct or guidance on chemical security. Without OPCW guidance, countries determine on their own how they should implement their chemical security obligations. In contrast, the International Atomic Energy Agency (IAEA) has produced a code of conduct and guidance for nuclear and radiological security.[8] The lack of internationally accepted chemical security standards and practices has contributed to a global dis- array of national systems to secure toxic chemicals, their precursors, and related facilities. This article first identifies key practices and standards of chemical security applicable to UNSCR 1540. It then generates a composite index score to evaluate each UN member state and provides insight into each state's implementation. Finally, the article recommends areas for more research into compliance with UNSCR 1540.

▶▶ **Read full academic article published by** Strategic Studies Quarterly (SSQ) **in Winter 2020**.

2020/2021 Hazardous Materials, Substances & Wastes Compliance Guide

Source: https://www.hazmat-tsp.com/shop/hazardous-materials-substances-wastes-compliance-guide-exeaf-be8yr-3kgjg

The 2020/2021 Compliance guide with the Emergency Response Guidebook contains the most up-to- date mandatory regulations covering the activities of all HAZMAT/WASTE Employees and Employers engaged in any activity, taking place in any location involving hazardous materials, chemicals, substances or wastes.
This is the only available Compliance Guide that provides all the critical interfacing DOT/EPA/OSHA Hazard Communication and Compliance requirements for Hazardous Materials, Chemicals, Substances and Wastes.
THIS YEAR'S GUIDE, HAS BEEN IMPROVED WITH A MORE DETAILED INDEX, EASIER TO FIND REFERENCES, OVER 40 PAGES OF TRAINING AND COMPLIANCE EXAMPLES ILLUSTRATING VARIOUS REGULATORY REQUIREMENTS, AND EVEN COMES WITH A DOT TEST AND CERTIFICATE OF COMPLETION.
The Compliance Guide contains the 49 CFR Department of Transportation Hazardous Material Regulations and the 2016 Emergency Response Guide Book, the 40 CFR Environmental Protection Agency Hazardous Waste Management and Disposal Regulations and the 29 CFR Occupational Safety and Health Administration Worker Protection Regulations, and provides the all-important interface between these confusing and often conflicting requirements.

Weapons of Mass Destruction and Modern Terrorism: Implications for Global Security

By Oluka Nduka Lucas (University Lecturer and private researcher)
2019, Canadian Center of Science and Education
Source:https://www.academia.edu/42059541/Weapons_of_Mass_Destruction_and_Modern_Terrorism_Implications_for_Global_Security

The hazard of biological, chemical and nuclear materials, regarded as Weapons of Mass Destruction (WMD), intercalating the arsenal of terrorists is the biggest crime and challenge against humanity. Every such crime and challenge ought to be named appropriately; and state actors experiencing such owe it to their citizens to act speedily and with certainty

against terrorists. Even with the ongoing war on terrorism, there has been a surge in terrorist activities in some parts of the world. Terrorists in our contemporary age have also embraced startling trends in their operational mode since the 11 September 2001 fanatic attacks in New York and Washington D. C. The devastating effect of these twin attacks has raised global concern about the potential use of WMD by Al-Qaeda, the Islamic State of Iran and Syria (ISIS), and their affiliate groups. One major issue of great concern in recent times, apart from the propensity of the terrorist organizations to acquire WMD, is the involvement of state actors that secretly acquire or claim to have acquired them for the purposes of electricity generation. Notably, too, is the trend in modern scientific and technological improvement which has increased the nature of, and access to, WMD. This research, therefore, attempts to access the implication and impact of WMD as terrorists put them to use. The study also examines the concept of terrorism and WMD. Also examined is the general implication of the use of WMD and the challenges this might pose to the international community, considering the current trends in their acquisition by some states and non-state actors. The investigation suggests appropriate countermeasures to thwart terrorists' effort to acquire WMD. The study also adopted the qualitative approach of research to analyse the sophistication adopted by new terrorist groups particularly by the ISIS terrorist network; the al-Qaeda group and other splinter groups. Thus, historical research is most appropriate for this study, and secondary source of data was adopted as its methodology.

India: Mock drills to be held in all districts by 2023 to combat chemical, biological, radiological and nuclear disasters

Source: https://www.thehindu.com/news/national/mock-drills-to-be-held-in-alldistricts-by-2023-to-combat-cbrn-disasters/article33486657.ece

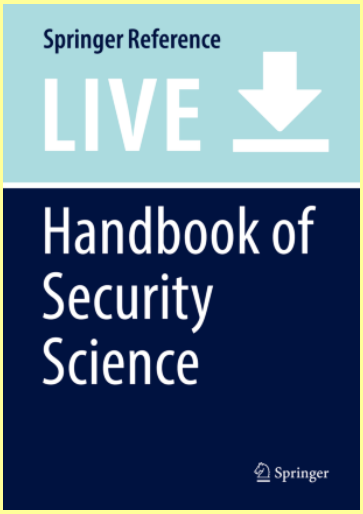
Jan 03 – India is undertaking a wide exercise programme to conduct preparatory drills in each of its 740 districts by 2023 to combat various man-made and natural disasters with a special attention on tackling chemical, biological, radiological and nuclear (CBRN) attacks or accidents, the country's disaster response force chief said.

Disaster Management of a Major CBRN Accident

By Marco Carbonelli, Alba Iannotti and Andrea Malizia

First Online: 06 February 2021

Source: https://link.springer.com/referenceworkentry/10.1007%2F978-3-319-51761-2_36-1



Abstract

In this work, the NATO vision, US DHS, and CIA positions on terrorism and CBRNe events are analyzed and compared, taking into account even the United Nations and EU definitions. Furthermore, to focalize the Italian viewpoint, an analysis of the Italian Penal Code regarding Terrorism is presented. The aim of this analysis is to identify the main elements defining the contemporary concept of terrorism. Furthermore, the concept of subversion is discussed, and initial analysis of two important databases on terroristic events (RAND and GTD) is carried out.
In the second part of the work, two evolution theories on terrorism are illustrated, introducing the WMD and CBRNe most important definitions and international use together with an analysis of the action taken in Italy in case of CBRNe emergencies and CBRNe crisis.
The purpose of this work is to indicate, at international and national levels, the main concepts and actions to be taken during terroristic and CBRNe events.

Biosecurity: Is It Time for The World to Be Ready?

By Hamish De Bretton-Gordon OBE

Source: https://www.forces.net/news/comment/biosecurity-now-time-world-be-ready

Feb 05 – Over the last few weeks, we have learned from the French open-source investigation site Openfacto that Russia most likely has a biological weapons programme, alongside their chemical weapons programme.
China is just allowing WHO investigators to the Wuhan Level 4 containment laboratory, where some American politicians claimed last month that COVID emanated from, but long after the 'COVID' horse has bolted.

Notwithstanding this, China has many questions to answer and the many high-level biosecure labs around the world, storing pathogens like COVID are a key vulnerability.
If this is not the global wake-up call to get biosecurity sorted, an awful lot of people may have died from COVID, amid little advancement in this area.
Biosecurity is the poor relation of the 'other' securities, especially cyber, for good reasons.
A pandemic or biological terror appeared an unlikely threat especially on a global scale, until COVID struck.
The US and the UK must now prepare for the next pandemic or biological terror event to ensure physical and economic resilience.
Like any threat, with the appropriate mitigation in place, upfront, respective governments can provide the required resilience to their people and economies.
In the future, we should think of weaponised biology as no less of an existential threat to the planet in the 21st Century than weaponised atomic science to the 20th.
From a biosecurity perspective, the impact of a 'not very toxic' pathogen has blind-sided us all, possibly more than a very toxic one, due to its rapid global transmission.
Advances in technology have meant that many civilian research projects in medicine have the potential to be used in military applications and biosecurity protocols are used to prevent dangerous biological materials from falling into the hands of malevolent parties.

Controversial experiments in synthetic biology, including the synthesis of poliovirus from its genetic sequence, and the modification of H5N1, a highly infectious flu variant, for airborne transmission in mammals, led to calls for tighter controls on the materials and information used to perform similar feats.
Ideas include better enforcement by national governments and private entities concerning shipments and downloads of such materials, and registration or background check requirements for anyone handling such materials.
The economic impact alone requires us to mitigate this threat, which hitherto the risk was 'likelihood low but impact massive' and with these odds, most thought a risk worth taking.
Not now; future likelihood is at least medium or likely and warrants our undivided attention.
The Salisbury nerve agent attack in 2018 is a massive neo advert to every dictator, despot, rogue state and terrorist of the huge impact to be gained from a chemical attack; COVID has, no doubt, done the same for biological attack.
It is very difficult for governments to take risk in such situations.
There are the challenges we must address to develop resilience to the next pandemic or a bioterror attack, around policy, medicines and equipment.
When it comes to policy and legislation, there is the Biological and Toxic Weapons Convention (BTWC), ratified in 1975, though a poor cousin to the Chemical Weapons Convention, it is designed to prevent the development and proliferation of Biological Weapons.
However, it is poorly funded and supported and does not have a body like the Organisation for the Prohibition of Chemical Weapons (OPCW) to police it.
A quick and effective win could be to properly fund the BTWC and create an Organisation for the Prohibition of Biological Weapons to police it – perhaps an extension of the OPCW's remit would be the most effective mechanism?
Allied to a biological early warning system to track pandemics or bio terror, like a weather map, showing its progress around the globe and mostly likely run by the World Health Organisation; these two measures alone would put us well on the road to mitigating and suppressing these threats in future.
If we are not to suffer a COVID-type pandemic every five years or so, and the ultimate terror of a biological weapons attack, we must get our Bio Security plans up to speed in short order.
Biosecurity has been the poor relation of the other securities, especially cyber and it now requires our undivided attention.
Brexit and COVID-19 will fade into next year, but future pandemics and bioterror require active measures, currently missing, to make us all resilient to them. In the future, we should think of weaponised biology as no less of an existential threat in the 21st century to the planet, than weaponized atomic science in the 20th century.

Hamish de Bretton-Gordon OBE, *is a former British Army officer and former commanding officer of the UK's Joint Chemical, Biological, Radiological and Nuclear Regiment and NATO's Rapid Reaction CBRN Battalion.*

What Assad's chemical weapons really accomplished

By Graeme Wood

Source: https://www.washingtonpost.com/outlook/what-assads-chemical-weapons-really-accomplished/2021/02/18/ad6f818c-68ac-11eb-8468-21bc48f07fe5_story.html

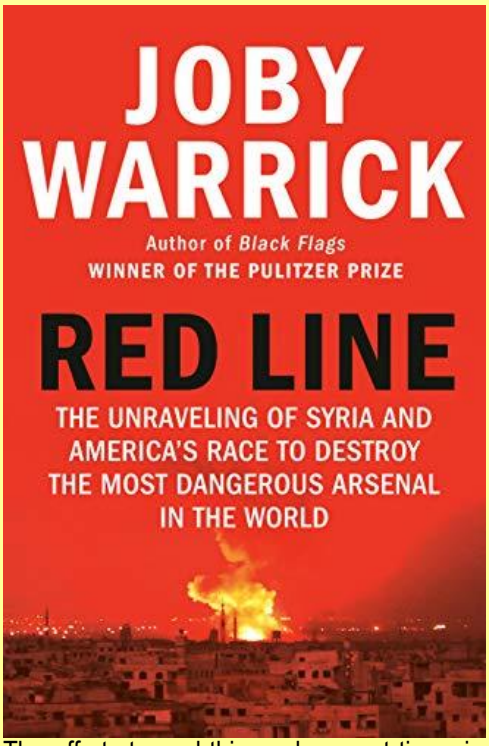
Inside a fortified bunker in central Syria in 2013, an inspector examines metal tanks containing thousands of gallons of a liquid sarin precursor. About half a million Syrians have died in the country's civil war, but only a few thousand have been killed by chemical weapons. (Courtesy of Joby Warrick)

Feb 19 – The smell of pure sarin gas is the smell of nothing at all, and also the smell of death. Sarin is a nerve agent, and just a whiff will disturb virtually every bodily function. The nose begins to run uncontrollably. Pupils constrict, vision clouds over, and the mouth froths. Chemical warfare expert Tim Blades, who was accidentally exposed to sarin as a U.S. government employee, likens the feeling to having "something big and rotten stuck inside [the] abdomen." Blades survived the exposure only because he received expert medical attention. If he had been exposed in a war zone, far from modern hospitals, he might have ended up like hundreds of Syrians — dead within hours.

In his new book, "Red Line: The Unraveling of Syria and America's Race to Destroy the Most Dangerous Arsenal in the World," The Washington Post's Joby Warrick tells the story of President Bashar al-Assad's chemical weapons program, from the dormant period when it was holstered in vats in facilities scattered around the country, to its use against civilians, to its supposed dismantling. Pressured by his ally Russia, Assad pledged to surrender his sarin and did in fact let the United States neutralize tens of thousands of gallons of it — enough to kill every Syrian many times over. But he kept a secret stash somewhere, and he probably still has it.

Stories about chemical and biological weapons are often oversold, for the same reason stories of cannibalistic serial killers are: Peculiar forms of murder repulse and excite us, and old-fashioned forms do not. (Most of Assad's victims have died from conventional weapons,

such as barrel bombs.) Chemical weapons are an extremely impractical and roundabout way to commit mass murder. A surprise gust of wind can render them harmless (or blow them back toward you); careless chemists tend to poison themselves in the production process. In World War I it took about a ton of mustard gas to kill a single enemy soldier. Iraq gassed 27,000 Iranian soldiers in the Iran-Iraq War but killed only 262 of them. By contrast a bullet to the brain works almost every time.



The Syrian civil war has killed about half a million people, and only a few thousand of them with chemical weapons. More than 1,000 died in a single sarin attack in Eastern Ghouta, near Damascus, in August 2013, and nearly 100 died in another sarin attack in Khan Sheikhun in April 2017. An undetermined number died from attacks using chlorine gas, which is much less toxic than sarin. The perpetrator of all these attacks, according to every reputable source, was the armed forces of Syria, loyal to Assad.

Warrick maintains a sense of proportion. He devotes short sections to efforts by the Islamic State to develop chemical weapons. But the Islamic State didn't need these weapons to be fearsome; its militants could just run over people with trucks. The group's chemical weapons program was never more than primitive and probably wasted its resources.

Overwhelmingly, Warrick's emphasis is where it should be, on Assad, for whom chemical weapons were a highly developed and strategic program of terror. "Syrians died every day from bullets, blast wounds, and shrapnel injuries," Warrick writes, "but to exterminate human beings with chemicals, as though they were fleas and cockroaches" — this was "a different order of savagery." Lacking any legitimate military purpose, Assad's chemical weapons existed to terrorize civilian populations by killing as indiscriminately as possible. Eliminating his arsenal was therefore a top international priority.

The efforts toward this goal were at times ingenious, even heroic. The unlikely protagonist of the first section is Ake Sellström, a Swedish chemical weapons researcher who led an international investigation of the Eastern Ghouta massacre and proved the Syrian government's culpability. Surviving Syrians on the receiving end of the chemical attacks, such as a young doctor named Houssam Alnahhas, act with no less bravery by sharing advice with one another, even while being hunted by the government, on how to treat the victims and preserve evidence of their causes of death.

Blades, the American who survived sarin exposure, is another hero. Assad's sarin is what is known as a binary chemical weapon — separated into two stable chemicals that become sarin when mixed. (Think of peanut butter and jelly, each kept in its own jar until ready to be commingled on sandwich bread.) Blades was tasked with destroying these chemicals after Assad surrendered them. He invented a portable contraption (known as the "Margarita Machine") that converts burbling sarin precursors into a "broth the color of watery blue Kool-Aid," roughly as harmful as the cleaning products under my kitchen sink. For weeks, Blades's team operated these machines aboard a ship in the Mediterranean, rendering inert enough Syrian sarin to kill tens of millions of people (or fish, had the ship capsized). Toxic-waste disposal is not, on its surface, the most promising subject matter for a nonfiction thriller, but Warrick presents it sharply and compellingly.

Nonetheless it appears in the end that these efforts, however heroic, achieved almost nothing. Warrick rightly blames the Russians for guaranteeing Assad's survival. They claimed to want a chemical-weapon-free Syria, but they slow-rolled every eradication effort and ultimately intervened on Assad's side militarily, even as he continued to gas civilians. Warrick shies away from stating what his evidence strongly suggests: Assad's chemical weapons program worked very well indeed, not by killing people but by giving Assad a bargaining chip and giving the Russians one more issue over which to burn time and energy negotiating. President Barack Obama's famous comment about Assad's chemical weapons — that using them would mean crossing a "red line" and triggering an American response — turned out to be nearly the opposite of true. Using chemical weapons did not end Assad's ability to negotiate. It strengthened his position.

Did Assad want Sellström to tell the world that Syria had sarin and had used it? A secret chemical weapons capability would not have done Assad much good. But a known one could distract the international community while the Syrian civil war was won by conventional means. That is what appears to have happened. Warrick quotes then-Secretary of State John Kerry in conversation with a Russian counterpart: "If [the Syrian rebels] are truly bad guys, I don't care how you kill them," he says. "Just don't use chemical weapons!"

Assad gassed just enough people to confirm to the world that he had no scruples — and that in exchange for being allowed to survive, he might refrain from doing so again. This is a diabolical way to run a country but a very effective way to stay in power.

Graeme Wood *is author of "The Way of the Strangers: Encounters with the Islamic State."*

Russia: Terrorists plotting chemical attack in Idlib to blame Syrian government

Source: https://www.presstv.com/Detail/2021/02/21/645718/Russia-Syria-Idlib-chemical-attack

Members of the al-Qaeda-affiliated Hay'at Tahrir al-Sham terrorist group

Feb 21 – The Russian Center for Reconciliation of Warring Parties in Syria says it has received information that Hay'at Tahrir al-Sham terrorists are planning a provocation with the use of toxic agents northeast of the de-escalation zone in Syria's Idlib Province. Rear Admiral Vyacheslav Sytnik, deputy chief of the Russian center, said on Saturday that the al-Qaeda-affiliated militants had already delivered truck containers with toxic agents, presumably chlorine, to the settlement of Tarmanin.

"According to our information, militants plan to simulate a chemical attack entailing casualties among local residents in order to accuse the Syrian government forces of the use of chemical weapons against civilians," he added.

White Helmets plotting false flag operation to incriminate Damascus: Russia

Russia says the so-called aid group White Helmets is planning to stage a false- flag operation in Syria in order to implicate the government.

Russia has repeatedly criticized the Organization for the Prohibition of Chemical Weapons (OPCW) for ignoring the information about toxic provocations in Syria, saying the body is biased against the Damascus government.

Recently, Russia's UN Ambassador Vasily Nebenzya said the OPCW is being used as a political tool by the Western countries to put pressure on the states they deem as "undesirable".
Moscow and Damascus have on many occasions accused the White Helmets of staging gas attacks in a bid to falsely incriminate Syrian government forces and fabricate pretexts for military strikes by the US-led military coalition.
The group claims to be a humanitarian NGO but has long been accused of collaborating with anti-Damascus militants.
Elsewhere in his remarks, Sytnik reported 37 shelling attacks from terrorist positions in the Idlib de-escalation zone.
"The Russian reconciliation center calls on commanders of illegal armed groups to stop armed provocations and embark on a path of peaceful settlement of the situation on territories they control," he said.
Syria has been gripped by foreign-backed militancy since March 2011. Damascus says the Western governments and their regional allies are aiding the Takfiri terrorist groups that are wreaking havoc in the Arab country.
Russia has been providing Syrian forces with crucial military assistance in the ongoing counter-terrorism battles.

Re-engineering Botox

By Pål Stenmark (*Department of Biochemistry and Biophysics, Stockholm University, Stockholm; Department of Experimental Medical Science, Lund University, Lund, Sweden)*
Science 19 *Feb 2021: Vol. 371, Issue 6531, pp. 782*
Source: https://science.sciencemag.org/content/371/6531/782.full

Some of the most toxic substances known are the botulinum neurotoxins. The most well-known member of this toxin family is Botulinum neurotoxin A1, famously known as Botox. Botulinum neurotoxins are large proteins that target neurons and block the release of synaptic vesicles at nerve terminals, causing paralysis (1, 2). Yet despite their extreme toxicity, botulinum neurotoxins are used therapeutically and cosmetically. Expanding their potential beyond their natural substrates has been limited by the lack of tools to master the complex substrate specificity of the protease domains of these toxins. On page 803 of this issue, Blum *et al.* (3) describe a phage-assisted evolution approach to control the substrate specificities of the toxin's protease domains. This may lead to new therapeutics, targeting diseases that previously have been inaccessible to treatment.
Botulinum neurotoxins can cause the deadly disease botulism, which is often associated with the consumption of incorrectly canned food. The disease is also caused by toxin released from the bacteria *Clostridium botulinum* that have colonized the intestine of infants. The toxins are also possible bioterrorism agents (4). Despite being one of the most toxic compounds known, with median lethal dose values of only a few nanograms per kilo, botulinum neurotoxins are used therapeutically, mainly to dampen or inactivate specific muscles. The number of applications for the neurotoxins is rapidly increasing, and there are now more than 100 medical conditions for which the toxins are applied (5–7).
The toxins have an exquisite design, containing three domains with different tasks each. The binding domain directs the toxin to the correct cells (binding receptors on neurons), and the translocation domain moves the protease domain across the membrane into the cell (1, 2, 8, 9). The spearheads of the botulinum neurotoxins are the light-chain protease domains, which cleave distinct SNARE [soluble NSF attachment protein (SNAP) receptor] proteins within the neuron (1, 2, 10, 11). The protease domain recognizes its SNARE substrate through extensive interactions and several exosites (secondary substrate-binding sites on the toxin), elegantly explaining the high substrate specificity (9, 12).
The SNARE proteins are key players in membrane vesicle fusion (13). Cleavage of the SNARE proteins stops the vesicle fusion events needed for the release of synaptic vesicles that contain the neurotransmitter acetylcholine at the neuromuscular junction, severing the connection between the nerve and the muscle.
Progress is being made in the ability to engineer the receptor interactions and cell specificity of the toxins (14). To master the substrate specificity of the protease domain of the toxins, Blum *et al.* developed a variant of phage-assisted continuous evolution that facilitates simultaneous negative and positive selection for specific protease activities.
Briefly, the technique relies on coupling the desired properties of the protease domain to the infectivity of a bacteriophage and allowing it to rapidly evolve over many generations.
Decreasing the specificity and thereby widening the substrate specificity of proteases has been demonstrated previously. However, the beauty of the method described by Blum *et al.*

is the possibility to select for a certain substrate at the same time as selecting against another. The authors demonstrate this by evolving botulinum neurotoxin serotype X, a recently discovered botulinum neurotoxin that naturally has multiple substrates (15). Blum *et al.* engineered the toxin to cleave one of its substrates efficiently while having no activity toward others. Another of the key advances by Blum *et al.* is the ability to evolve activity toward completely new substrates, as they show by evolving botulinum neurotoxin E toward a non-SNARE target.

The possibilities that are opened up by the method developed by Blum *et al.* have enormous potential in many fields. The protease domains of the toxins could be evolved to cleave specific proteins involved in the sensation of pain. Or, one could envision evolving activity specifically toward a mutated oncogene while sparing the proto-oncogene, targeting cancer cells while sparing other cells.

There are many other proteases for which the redirection of substrate specificities could have great potential. For example, the technique from Blum *et al.* could be used to refine and alter the specificities of other proteases that are being developed for treating cardiovascular disease, digestive disorders, inflammation, cystic fibrosis, retinal disorders, and other medical conditions. The method could also be used to develop highly specific proteases for use as research tools, similar to how botulinum neurotoxins are used to study vesicle fusion.

Many challenges remain before we can access the full potential of the botulinum neurotoxins and other proteases. However, the findings of Blum *et al.* open up new fields of research with the potential to develop therapeutics and target diseases that previously have been inaccessible.

▶▶ References and Notes are available at source's URL.

Conotoxins: Potential Weapons from the Sea

By Peter D. Anderson and Gyula Bokor

J Bioterr Biodef (2012); 3:120

Source: https://www.omicsonline.org/conotoxins-potential-weapons-from-the-sea-2157-2526.1000120.php

The cone snail is a marine predatory snail that uses powerful venom to kill its prey [1]. Conotoxins are a group of cysteine-rich peptide-based toxins in the venom of cone snails [2]. Most conotoxins contain multiple disulfide bridges. Secondary uses of conotoxins by the snails are protection against predators and competitors. Conotoxins are considered by the United States Centers for Disease Control and Prevention to be a potential agent in bioterrorism [3]. Most venomous animals (e.g. snakes and arthropods) only produce one or a few poisons. A single cone snail produces over 100 individual toxins [4]. Not all conotoxins are considered high risk for bioterrorism [5].

Cone snails belong to the phylum Mollusca, the class Gastropoda, the order Sorbeoconcha, and the family Conidae, and the genus *Conus* [6]. The shells of the cone snails are spiral and conic, hence their name. Cone snails are found in warm seas and oceans throughout the world but are mostly in the Indo-West Pacific region [7]. There are approximately 700 species of cone snails and all are carnivores. Most cone snails are nocturnal hunters. Different species specialize in eating fish, worms (e.g. polychaete), or other mollusks. The cone snails that eat fish are piscivores. Molluscivores eat other snails. Worm-eating cone snails are vermivores.

The siphon is the "nose" of the cone snail. The siphon is used for detecting prey and for respiration. The proboscis is the hunting tool used by the snail. The proboscis is a long tubular muscular elongation of the mouth. In the proboscis are harpoons containing the toxins. The synthesis of the conotoxins takes place in the epithelial cells of the venom duct and then secreted into the lumen of the venom duct. Attached to the venom duct is the venom bulb. The function of the venom bulb is to contract and push venom into the harpoon.

There are two types of piscivorous hunters: hook-and-line hunters and net hunters. The hook and line hunters use a proboscis with a harpoon containing toxins to paralyze their prey. The net hunters open their mouth to catch several fish at a time. Once inside the mouth a deadly harpoon kills the fish [8]. Each harpoon is discarded after use. The snails have approximately 20 harpoons at various stages of development.

Human Exposures

A sting by certain species of cone snails are poisonous to humans including *Conus geographus, Conus catus, Conus aulicus, Conus gloriamaris, Conus omaria, Conus magus, Conus striatus, Conus tulipa,* and *Conus textile* [9]. Conus geographus is the most lethal to humans [9]. Piscivores are more dangerous to humans than other cone snails [10,11]. From an evolutionary point of view the toxins must be stronger for piscivores than molluscivores or

vermivores. Fish move much more rapidly than snails or worms. In order for a cone snail to be an effective predator of fish the toxins need to act instantly. Hunting a mollusk or a worm requires less speed. Fish are also zoologically more related to people than worms or mollusks.

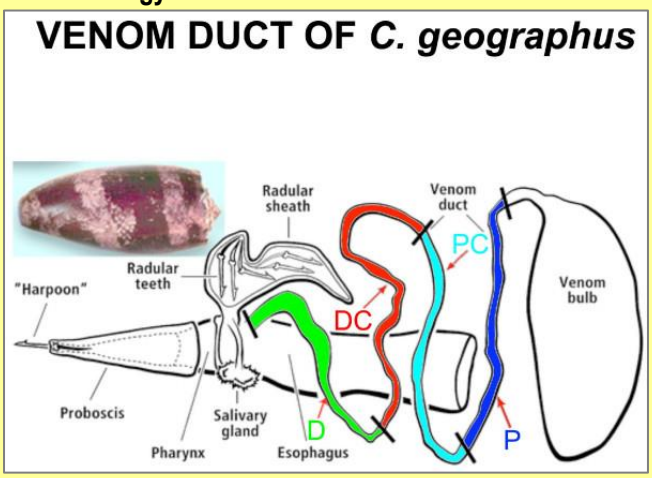
Conus aulicus

Signs and symptoms of exposure include faintness, ptosis (drooping eyelids), poor coordination, absent gag reflex, areflexia, paresthesias (abnormal sensations such as burning or tingling), urinary retention, diplopia (double vision), blurred vision, speech difficulties, dysphagia (difficulty swallowing), weakness, nausea, generalized numbness, and respiratory arrest [9-13]. Autopsy findings may include blanching and swelling at the site of injection, petechial hemorrhages, cardiac dilation, and cerebral edema [12]. No specific antidotes are available. The heterogeneity in structure and the diverse pharmacology of the toxins are barriers to making an effective antidote. The treatment for a cone snail sting is respiratory support and intubation [13]. Vital signs, blood gases, and cardiac function need to be monitored. Death has been reported to occur within one to five hours [10,13]. The above toxidrome results from the interaction of a number of conotoxins rather than a single conotoxin.

Conus gloriamaris

Milder toxicity has been reported with molluscivorous and vermivorous cone snails. This is not to say that molluscivorous and vermivorous cone snails are harmless to humans. *Conus regius,* a molluscivorous snail, has been reported to cause paresthesias, numbness, and movement difficulty in the affected limb [14]. *Conus textile* is also a mollusk eater but considered hazardous to humans [9].

Pharmacology of the Conotoxins



Early laboratory studies found venom from *Conus geographus* to cause convulsions and respiratory suppression (without immediate concurrent cardiac arrest) in mice. In isolated muscles venom from *Conus geographus* produced muscle paralysis [15,16]. Conotoxins work on a variety of neurotransmitters in the body including glutamate, adrenergic, serotonin, and cholinergic and ion channels of sodium, potassium and calcium [17].

The conotoxins are classified by ***Conoserver*, a database on conotoxins maintained by the University of Queensland**, by gene superfamily, cysteine framework, or by pharmacological effects [18]. There are 18 gene superfamilies used by Conoserver [18] Classifying conotoxins by cysteines involves consideration of the number of cysteines in the peptide, their pattern, and their connectivity within the peptide. Pharmacological categories include alpha (α), gamma (γ), delta (δ), epsilon (ε), iota (ι), kappa (κ), mu (μ), rho (ρ), sigma

(σ), chi (χ), and omega (ω) [18]. Refer to **Table 1** for the pharmacological characteristics of each class. Not included in the above classification system are the conantokins, which act on the N-methyl-D-aspartate receptors [19]. Conotoxins that modulate vasopressin/oxytocin receptors are also not included in the Conoserver classification system.

Family	Physiological Effects
Alpha (α)	Blocks nicotinic receptors. Produces muscle paralysis
delta (δ)	Inhibits the fast inactivation of voltage gated sodium channels.
epsilon (ε)	Affects presynaptic calcium channels needed for action potential activity.
iota (ι)	Agonist at sodium gated channels with no delayed inactivation.
kappa (κ)	Antagonist of potassium gated channels. Interferes with repolarization.
mu (μ)	Antagonist of sodium gated channels.
rho (ρ)	Impacts alpha-adrenal receptors affecting blood pressure and smooth muscle.
sigma (σ)	Affects serotonin activity. Impacts mood, appetite and stress control
chi (χ)	Affects neuronal adrenergic transporter.
omega (ω)	Works on voltage gated calcium channels.
Conantokins	Antagonize glutamate, the main excitatory neurotransmitter in the brain, at N-methyl- D-aspartate receptors.
Conopressins	Modulate vasopressin/oxytocin receptors. Increases blood pressure.

Conotoxins are a pharmacological diverse group of toxins. Each group is selective for a specific neurotransmitter or cation channel.

Table 1: Pharmacological Classes of Conotoxins.

One of the key components to the venom of *Conus geographus* are the α-conotoxins [20]. The α-conotoxins are antagonists of nicotinic receptors. Nicotinic receptors serve a variety of functions in the body. Nicotinic receptors are needed for the contraction of skeletal muscle. Acetylcholine is released by a motor neuron. The acetylcholine then attaches to the nicotinic receptors on the muscle. This starts a physiological cascade causing the muscle to contract. Physically blocking the nicotinic receptor with a drug or toxin would stop the contraction and cause paralysis. The diaphragm is a muscle located below the lungs and divides the abdomen from the chest cavity. The diaphragm is the primary muscle that causes the lungs to inflate and deflate. Paralysis of the diaphragm results in the cessation of breathing. The diplopia reported from human exposures probably results from paralysis of the extraocular muscles.

Nicotinic receptors are the main receptors at ganglia synapses. Nicotinic receptors are also found in the brain. The first isolated α-conotoxins were GI, GIA, and GII and found in *Conus geographus* [20]. These α-conotoxins do not affect the central nervous system. Other alpha-conotoxins were isolated different species including *Conus magus, Conus striatus, Conus consors, Conus achatinus,* and *Conus spurious* [21]. A number of α-conotoxins were found to have activity on the nicotinic receptors in the brain. The first centrally acting α-conotoxin was α-conotoxin CTx IMI isolated from *Conus imperialis*, a worm-eater [21].

Inhibiting the nicotinic receptor is not the only mechanism to cause muscle paralysis. Muscle paralyzing effects can be obtained by blocking the ion channels in the neurons supplying the muscles or by blocking the ion channels in the muscles. *Conus purpurascens*, is piscivore that causes both a flaccid paralysis and a "sudden tetanus on its prey" [22]. *Conus purpurascens* uses α-conotoxin PIVA and a μ-conotoxin PIIIA to paralyze its fish prey [22]. The α-conotoxin targets the nicotinic receptors in the muscles. The μ-conotoxin targets the sodium channels in the skeletal muscles [22]. This species also uses κ-conotoxin PVIIA and δ-conotoxin PVIA to cause the "sudden tetanus of prey" thus immobilizing the prey quickly [22]. All of the muscles of the victim fish are contracted at the same time. The fish experiences the pharmacological equivalent of an electrical shock. The κ-conotoxin PVIIA blocks potassium channels. Potassium is needed by the cells to reverse the action potential. Blocking the potassium channels prolongs the contraction. The δ-conotoxin PVIA delays sodium inactivation thereby prolonging the action potential. The δ-conotoxins from molluscivorous cone snails, with the exception, of Am2766, do not have active receptors in mammals [23]. The δ-conotoxins of piscivorous cone snails inhibit the inactivation of Na_v channel in mammals [23]. Neurons, muscle cells, and cardiomyocytes require Na_v channels for normal electrical functioning [24].

Scientific and Medical Applications of Conotoxins

Conotoxins are employed in both basic science investigations and for therapeutic explorations. Conotoxins are used as tools of research including determining how specific receptors and ion channels work. Conotoxins have potential roles in the direct treatment of disease. The ω-conotoxins are used in neuroscience research to study calcium channel subtypes [25]. A variety of conotoxins are used to understand specific sodium channels. A number of potential pharmaceuticals are being derived from conotoxins. Ziconitide is derived from *Conus magus* ω-conotoxin MVIIA. It has been approved by the United States Food and Drug Administration for treating intractable pain under the brand name Prialt®. K-conotoxin PVIIA may have cardioprotective effects [23]. Analogs of α-CTx MII, a centrally acting nicotinic blocker derived from *Conus geographus*, may have a role in treating Parkinson's disease [21]. Other centrally acting α-conotoxins in theory could be useful in treating Alzheimer's disease, nicotine addiction, and in pain management [21]. Prospective therapeutic or research uses of conantokins include pain, epilepsy, stroke, and Parkinson's disease. The chi family inhibits norepinephrine transport and thus is potential treatments for attention-deficit/hyperactivity disorder or depression [26]. Conotoxins that block $Na_v1.6$ and $Na_v1.2$ channels may mitigate the inflammatory process in multiple sclerosis [26]. Other conotoxins may have applications for studying schizophrenia [26]. There are an estimated 50,000 to 100,000 conotoxins and approximately 0.1% have been characterized pharmacologically [23].

Use as Terrorist Weapon

Conotoxins have potential as biological weapons [2,27]. The direct chemical synthesis would more likely be found in clandestine laboratory than the farming of cone snails. Collecting a large enough supply directly from cone snails to use in aerosol dispersal would be a cumbersome process. Most conotoxins are small peptides with 10 to 30 amino acids which make them relatively easy to manufacture using direct chemical synthesis [17]. Difficulties occur with the folding conotoxins producing discrepancies between *in vitro* and *in vivo* synthesis [28]. As discussed above, much research is being done with conotoxins. The supplies in laboratories could be diverted to terrorists. **The United States Department of Health and Human Services requires registration, background checks, biosafety and security procedures for handling α-conotoxins at amounts exceeding 100 mg** [29].

Potential methods of using of conotoxins in terrorism include contamination of food sources or aerial dispersal in a concentrated population area. The most likely method of dispersal would be as an aerosol [27]. Information on the inhalation effects of conotoxins is not available in the public domain. The onset of effects from inhaling conotoxins would probably be much faster than from cone snail stings assuming adequate absorption of the toxin in the lungs. Conotoxins are not volatile and need to be aerosolized. **One barrier is creating the conotoxins as an aerosol is the developing the optimal particle size of 1 to 3 µm** [30].

The mu family, the omega family, and NMDA antagonists are low risk for a bioterrorism incident [5]. Serotonin acting conotoxins are poor candidates for weaponization because obtaining lethal toxicity with serotonergic agents is difficult. The main predicted effect of adrenergic acting conotoxins based on the receptor activity would be a rapid increase in blood pressure. In theory, terrorists could also use certain conotoxins to disrupt agriculture by poisoning farm animals. However, conotoxins are not a "select agent" of the Animal and Plant Health Inspection Service of the United States Department of Agriculture and considered a low-risk for agricultural terrorism [3].

Botulinum *vs.* α-Conotoxins

From a pharmacological or toxicological point of view, the α-conotoxins are a high risk because of the muscle paralysis. The paralysis of the diaphragm results in respiratory arrest. The LD_{50} for α-conotoxins is 10 to 100 µg/kg in laboratory mice [31]. The LD_{50} for hydrogen cyanide is 1-3 mg/kg with oral ingestion [32]. Inhalation of certain α-conotoxins would be expected to produce a clinical presentation similar to the inhalation of botulism toxin. The clinical presentation of botulism poisoning from natural causes has many differences from a cone snail sting. Refer to **Table 2** for comparison of naturally occurring cone snail stings to natural botulism [33,34]. In addition to the clinical manifestations α-conotoxins have a different mechanism of toxicity from botulism toxin. Botulinum disables the terminals on the motor neuron [34]. The α-conotoxins work directly on the muscle. Regeneration of the nerve terminal by is required from botulism but not from α-conotoxins. That is why the recovery from botulism can take months.

Naturally occurring Botulism	Naturally occurring Cone Snail
Frequently from ingesting improperly canned foods.	Handling or touching a cone snail and feeling a sting.
No numbness.	Numbness at site of sting.
Descending paralysis.	Descending paralysis not described.
Widespread muscle paralysis	Widespread muscle paralysis
No paresthesias or generalized numbness.	Paresthesias and generalized numbness.
Speech difficulties, urinary retention and double vision.	Speech difficulties, urinary retention and double vision
Death is often from respiratory arrest secondary to diaphragm paralysis.	Death is from diaphragm paralysis or cardiovascular collapse.
Onset is a matter of days.	Onset is a matter of hours.
Recovery takes months (without antitoxin). Recovery from botulinum F is a shorter duration.	Recovery takes days.

Table 2: Chart compares naturally occurring botulism (especially types A, B and E) to a cone snail envenomation. This comparison includes cone snails that produce α-conotoxins. Not all cases of botulism result from improperly canned food. The toxicity with cone snails will vary with species.

The clinical onset of inhalational absorbed botulism or α-conotoxins would most likely be much faster than natural acquired intoxication. An early clinical differentiation of aerosol borne botulism from inhalational α-conotoxins may be difficult. Natural envenomations of cone snails involve a mixture of toxins whereas a terrorism situation may involve a single toxin. The cardiac manifestations associated with cone snail stings are probably not due to α-conotoxins. The numbness is not expected to occur with an exclusive exposure to α-conotoxins. Identification of the toxins in biological fluids would confirm the diagnosis. Most clinical laboratories lack the capabilities to analyze samples of conotoxins or botulinum toxin. Correct differential diagnosis between botulism and α-conotoxins is crucial. No specific antidote for α-conotoxins exists. An immunoglobulin-based antitoxin is available to treat botulinum poisoning [2]. First responders probably would not be able to clinically distinguish inhaled α-conotoxins from inhaled botulinum. However, the prehospital treatment is the same i.e., maintaining an adequate airway and respiration. Again, the comparisons with botulism only apply to α-conotoxins with nicotinic activity in the muscle cells.

Other High-Risk Agents

The δ-conotoxins are also high risk because of the excitotoxicity and prolonged muscle contractions. κ-conotoxin PVIIA could cause cardiac toxicity by blocking the potassium channels in the heart.

Conclusions

The conotoxins are a vast range of poisonous substances produced by the predatory cone snails. Most conotoxins are not a bioterrorism risk. **The α-conotoxins, κ-conotoxins and δ-conotoxins pose the greatest risk as terrorist threat.** The most dangerous scenario is the clandestine manufacture of the toxins and delivering the toxins as an aerosol over a concentrated population area. Potential effects include muscle paralysis, muscle contractions, or other effects from altering ion channels in cardiac, nerve, or muscle cells. **Numerous technical hurdles need to be overcome to weaponize the conotoxins.**

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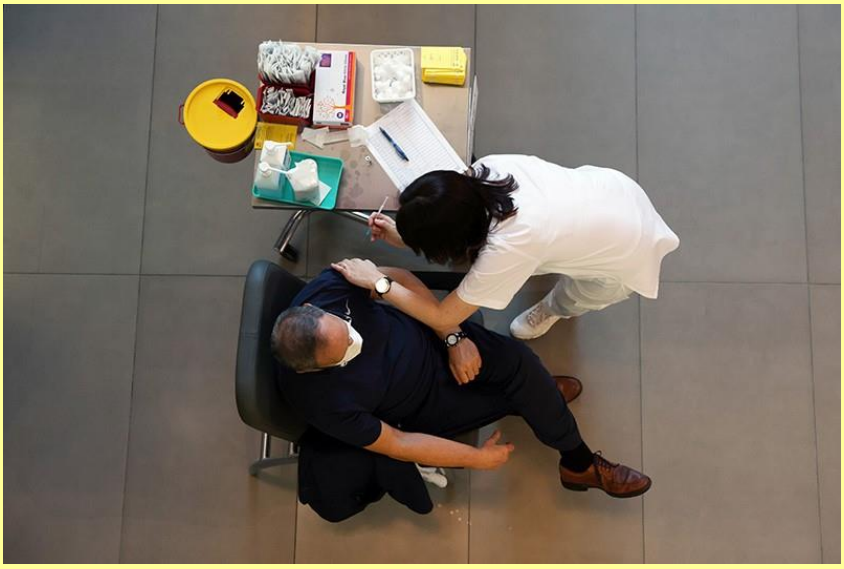
Are COVID vaccination programmes working? Scientists seek first clues

By Smriti Mallapaty

Source: https://www.nature.com/articles/d41586-021-00140-w

Jan 22 – As countries worldwide roll out COVID-19 vaccines, researchers are eagerly watching for early signs that they are having an impact on the pandemic. Last week, researchers in Israel reported preliminary figures suggesting that people vaccinated there were about one-third less likely to test positive for SARS-CoV-2 than people who had not received a shot. But scientists say that population-wide effects of immunization will take time to become clear.



Credit: Ronen Zvulun/Reuters

Many factors will determine how soon scientists can detect the impact of vaccines on the pandemic. Among them are the extent of vaccine coverage, the effectiveness of shots at preventing disease and infection, and the rate of viral transmission.

Israel and the United Arab Emirates are leading the world in vaccine coverage. The two nations have vaccinated roughly one-quarter of their populations — more than two million people each. Other nations, such as the United Kingdom and Norway, have targeted their vaccination programmes at high-risk groups. Britain has vaccinated more than 4 million people, mostly health-care workers and older people, including those living in care homes; Norway has immunized all residents living in nursing homes, some 40,000 people.

First signs

The results from Israel are among the first to report the impact of vaccines administered to people outside clinical trials. They provide an early indication that the two-dose RNA-based vaccine developed by Pfizer–BioNTech can prevent infection or limit its duration in some vaccinated people.

In a preliminary analysis of 200,000 people older than 60 who received the vaccine, compared with a matched group of 200,000 who did not, researchers found that the chances of testing positive for the virus were 33% lower two weeks after the first injection.

“We were happy to see this preliminary result that suggests a real-world impact in the approximate timing and direction we would have expected,” says Ran Balicer, an epidemiologist at Israel’s largest health-care provider, Clalit Health Services, in Tel Aviv. He expects to get more conclusive results several weeks after people receive their second shot.

Another analysis, by Maccabi Healthcare Services, found a similar trend, although neither study has been peer-reviewed.

Clinical trials of the Pfizer–BioNTech vaccine show it to be around 90% effective at preventing COVID-19, and the preliminary data suggest it can also provide some protection from infection. But it will take longer to establish whether vaccinated people no longer spread the virus to unvaccinated people, says Balicer.

As more than 75% of older people in Israel have been vaccinated, Balicer says he expects to see a drop in hospitalizations among vaccinated older people over the coming weeks.

Most countries are prioritizing COVID-19 vaccinations for people who have a high risk of getting severe disease and dying. So, the first evidence that shots are working in those countries will probably be reductions in hospitalizations, and then in deaths, says Alexandra Hogan, an infectious-disease modeller at Imperial College London.

Indirect effects

If vaccines are effective at preventing infections, then their indirect benefit — protecting unvaccinated people — will be visible only once enough people have been immunized, says Natalie Dean, a biostatistician at the University of Florida in Gainesville.

Israel will probably be the first country to see this kind of population-wide impact, say researchers. This is because it is using a high-efficacy vaccine and aiming for wide coverage with the explicit goal of achieving herd immunity, when enough people are immune to a virus for its spread to be controlled.
In some places, the first signs of indirect protection might emerge in specific groups who have been widely vaccinated, such as health-care and long-term-care workers and their families, says Dean.
But teasing apart the population-level effects of vaccines on a drop in COVID-19 cases from the impacts of other public-health interventions, such as social distancing and lockdowns, will be tricky. "Infectious diseases are very unpredictable — so you end up needing a lot of data to smooth out a lot of unpredictability," says Dean.

Challenges ahead
The effect of vaccines on reducing overall COVID-19 infections will be more difficult to ascertain in regions such as Norway, which have largely brought the virus under control, says Hogan.
Yet rampant transmission also complicates such investigations, until countries reach high vaccine coverage, adds Dean. Vaccinated health-care workers, for example, might be able to protect their families from infection, but when the virus is everywhere, there will be lots of opportunities for it to enter a household, she says.
Israel aside, vaccines will not have an impact on viral spread any time soon, says Raina MacIntyre, an epidemiologist at the University of New South Wales in Sydney, Australia. "Many other countries are using much lower-efficacy vaccines, which are unlikely to control infection," she says.
Modelling work by Hogan shows that vaccines that are less effective at preventing infection will have a smaller impact on transmission in the population. "But even with an imperfect vaccine, that population-level impact on deaths could still be quite substantial," she says.

EDITOR'S COMMENT: I do not know if vaccination programs work or not. What I know is what I see in the picture accompanying this article: A nurse without gloves! When I was in service, everytime I was on duty at the hospital (off-working hours) I gather the shift personnel and warn them about only one thing: "I do not want to see somebody handling a patient without gloves!" It was the only thing that could make me violent – it happened twice in 30 yrs.

VACCINES: Side by side comparison

PFIZER

Sinopharm

	PFIZER	Sinopharm
COMPANY	Germany's BioNTech and America's Pfizer	Sinopharm CNBG
THE VACCINE	Messenger RNA	Inactivated virus
STORAGE	Must be shipped and stored at -75C	Refrigerated at 2°C to 8°C
PRODUCTION	**2 billion** in 2021	Several countries have already signed deals with Sinopharm for tens of millions of doses of its vaccine.
DOSAGE	Two shots. The interval between doses is 21 days	Two shots, second shot between 21 and 28 days after the first
EFFICACY	**95%** success rate from seven days after the second dose	**86%** (UAE, 31,000 trial volunteers): 79.34% as per Sinopharm announcement on December 30, 2020
REGULATORY STATUS	Approved in the UAE, UK, US, the EU, Canada, Bahrain, Saudi Arabia and more than 40 other countries	Approved in Bahrain, Brazil, China, Egypt, Jordan, Morocco, Pakistan, Peru and the UAE

Sputnik V

MODERNA

	Sputnik V	MODERNA
COMPANY	Gamaleya	Moderna, US
THE VACCINE	Inactivated virus	Messenger RNA
STORAGE	From 2°C to 8°C. Liquid form must be stored at -18°C or below to maintain its stated 92% efficacy.	Can be stored a regular refrigerator freezer. Must be shipped at -20C
PRODUCTION	More than 50 countries have made requests for >1.2 billion doses of the Sputnik V vaccine.	Between 600 million and 1 billion doses in 2021
DOSAGE	2 doses, 20 days apart	Two doses given 28 days apart
EFFICACY	**73-92%** efficacy, according to Russia (Moscow Times)	**94.1%** effective from 14 days after the second dose
REGULATORY STATUS	12 countries now using Sputnik V: approved in Argentina (including people over 60), Belarus, Hungary, India, Russia, Serbia, the UAE, Venezuela; Philippines (pending)	Approved for use in the UK, US, EU and Israel. Data is reviewed in Canada, Singapore and Switzerland

COVISHIELD

COVAXIN

	COVISHIELD	COVAXIN
COMPANY	Manufactured in India by the Pune-based Serum Institute of India (SII). Developed by Oxford University in partnership with Astra-Zeneca	Bharat Biotech in collaboration with Indian Council of Medical Research and the National Institute of Virology
THE VACCINE	Made from weakened version of a common cold virus (adenovirus)	Inactivated virus
STORAGE	Refrigerated at 2°C to 8°C	Refrigerated at 2°C to 8°C
PRODUCTION	**100** million doses SII will provide 100 million doses of the vaccine in India, and to other developing countries after India's requirements are met.	**300** million doses in 2021 with the potential to increase to 500m doses
DOSAGE	Two doses, with a gap of 4 to 6 weeks	Two doses, four to six weeks apart
EFFICACY	**70%** Average protection	Phase 3 results expected after March, 2021
REGULATORY STATUS	Approved for emergency use in India on January 3	Approved for emergency use in India on January 3

OXFORD

CoronaVac

	OXFORD	CoronaVac
COMPANY	AstraZeneca, Anglo-Swedish company, and Oxford University	Sinovac Biotech
THE VACCINE	Adenovirus	Inactivated virus
STORAGE	Refrigerated between 2C and 8C	From 2°C to 8°C.
PRODUCTION	**3 billion** doses in 2021	**300 million** per year. Sinovac has capacity to produce millions of vials in 46 days, from cell culture to packaging. Several countries have already struck deals with Sinovac for millions of doses.
DOSAGE	Two doses, up to 12 weeks apart	Two doses, 21 to 28 days apart
EFFICACY	**62-90%** 62% effective or 90% effective, depending on the dosage	**78%** effective in preventing mild cases, 100% effective in preventing severe/moderate infections (as per Instituto Butantan report); 91.25% efficacy in a Turkey study; between 50.38% and 90% effective in Brazil trials.
REGULATORY STATUS	Approved in the UK, Thailand, EU, Mexico, Argentina. Data under US review. Approved and manufactured in India under the name of Covishield	Approved in Brazil, China, Chile, Indonesia, Turkey, Philippines

Immune system mounts a lasting defense after recovery from COVID-19, researchers find

Rockefeller University
Source: https://www.sciencedaily.com/releases/2021/01/210121131909.htm

Jan 21 – As the number of people who have fought off SARS-CoV-2 climbs ever higher, a critical question has grown in importance: How long will their immunity to the novel coronavirus last? A new Rockefeller study offers an encouraging answer, suggesting that those who recover from COVID-19 are protected against the virus for at least six months, and likely much longer.
The findings, published in *Nature*, provide the strongest evidence yet that the immune system "remembers" the virus and, remarkably, continues to improve the quality of antibodies even after the infection has waned. Antibodies produced months after the infection showed increased ability to block SARS-CoV-2, as well as its mutated versions such as the South African variant.
The researchers found that these improved antibodies are produced by immune cells that have kept evolving, apparently due to a continued exposure to the remnants of the virus hidden in the gut tissue.
Based on these findings, researchers suspect that when the recovered patient next encounters the virus, the response would be both faster and more effective, preventing re-infection.
"This is really exciting news. The type of immune response we see here could potentially provide protection for quite some time, by enabling the body to mount a rapid and effective response to the virus upon re-exposure," says Michel C. Nussenzweig, the Zanvil A. Cohn and Ralph M. Steinman Professor and head of the Laboratory of Molecular Immunology, whose team has been tracking and characterizing antibody response in Covid-19 patients since the early days of the pandemic in New York.

Long-lasting memory
Antibodies, which the body creates in response to infection, linger in the blood plasma for several weeks or months, but their levels significantly drop with time. The immune system has a more efficient way of dealing with pathogens: instead of producing antibodies all the time, it creates memory B cells that recognize the pathogen, and can quickly unleash a new round of antibodies when they encounter it a second time.
But how well this memory works depends on the pathogen. To understand the case with SARS-CoV-2, Nussenzweig and his colleagues studied the antibody responses of 87 individuals at two timepoints: one month after infection, and then again six months later. As expected, they found that although antibodies were still detectable by the six-month point, their numbers had markedly decreased. Lab experiments showed that the ability of the participants' plasma samples to neutralize the virus was reduced by five-fold.
In contrast, the patients' memory B cells, specifically those that produce antibodies against SARS-CoV-2, did not decline in number, and even slightly increased in some cases. "The overall numbers of memory B cells that produced antibodies attacking the Achilles' heel of the virus, known as the receptor-binding domain, stayed the same," says Christian Gaebler, a physician and immunologist in Nussenzweig's lab. "That's good news because those are the ones that you need if you encounter the virus again."

Viral stowaways
A closer look at the memory B cells revealed something surprising: these cells had gone through numerous rounds of mutation even after the infection resolved, and as a result the antibodies they produced were much more effective than the originals. Subsequent lab experiments showed this new set of antibodies were better able to latch on tightly to the virus and could recognize even mutated versions of it.
"We were surprised to see the memory B cells had kept evolving during this time," Nussenzweig says. "That often happens in chronic infections, like HIV or herpes, where the virus lingers in the body. But we weren't expecting to see it with SARS-CoV-2, which is thought to leave the body after infection has resolved."
SARS-CoV-2 replicates in certain cells in the lungs, upper throat, and small intestine, and residual viral particles hiding within these tissues could be driving the evolution of memory cells. To look into this hypothesis, the researchers have teamed up with Saurabh Mehandru, a former Rockefeller scientist and currently a physician at Mount Sinai Hospital, who has been examining biopsies of intestinal tissue from people who had recovered from COVID-19 on average three months earlier.
In seven of the 14 individuals studied, tests showed the presence of SARS-CoV-2's genetic material and its proteins in the cells that line the intestines. The researchers don't know whether these viral left-overs are still infectious or are simply the remains of dead viruses.

The team plans to study more people to better understand what role the viral stowaways may play in both the progression of the disease and in immunity.

The Proportion of SARS-CoV-2 Infections That Are Asymptomatic

By Daniel P. Oran and Eric J. Topol
Source: https://www.acpjournals.org/doi/10.7326/M20-6976

Jan 22 – Available data suggest that at least one third of SARS-CoV-2 infections are asymptomatic. Longitudinal studies suggest that nearly three quarters of persons who receive a positive PCR test result but have no symptoms at the time of testing will remain asymptomatic. Control strategies for COVID-19 should be altered, taking into account the prevalence and transmission risk of asymptomatic SARS-CoV-2 infection.

ColCORONA: Colchicine Reduces Complications in Outpatient COVID-19

Source: https://www.medscape.com/viewarticle/944593

Jan 24 – The oral, anti-inflammatory drug colchicine can prevent complications and hospitalizations in nonhospitalized patients newly diagnosed with COVID-19, according to a press release from the ColCORONA trial investigators.
After 1 month of therapy, there was a 21% risk reduction in the primary composite endpoint of death or hospitalizations that missed statistical significance, compared with placebo among 4488 outpatients enrolled in the global, phase 3 trial.

After excluding 329 patients without a confirmatory PCR test, however, the use of colchicine was reported to significantly reduce hospitalizations by 25%, the need for mechanical ventilation by 50%, and deaths by 44%.

"We believe that this is a medical breakthrough. There's no approved therapy to prevent complications of COVID-19 in outpatients, to prevent them from reaching the hospital," lead investigator Jean-Claude Tardif, MD, from the Montreal Heart Institute in Quebec, Canada, told *theheart.org | Medscape Cardiology*.
"I know that several countries will be reviewing the data very rapidly and that Greece approved it today," he said. "So this is providing hope for patients."
Having been burned by hydroxychloroquine and other treatments brought forth without peer review, the response to the announcement was tempered by a desire for more details.
Asked for comment, Steven E. Nissen, MD, Cleveland Clinic Foundation, Cleveland, Ohio, was cautious. "The press release about the trial is vague and lacks details such as hazard ratios, confidence intervals, and *P* values," he told *theheart.org | Medscape Cardiology*.
"It is impossible to evaluate the results of this trial without these details. It is also uncertain how rigorously data were collected," he added. "We'll need to see the manuscript to adequately interpret the results."
The evidence in the press release is hard to interpret, but early intervention with anti-inflammatory therapy has considerable biologic appeal in COVID, said Paul Ridker, MD, MPH, who led the pivotal CANTOS trial of the anti-inflammatory drug canakinumab in the post-MI setting, and is also chair of the ACTIV-4B trial currently investigating anticoagulants and antithrombotics in outpatient COVID.
"Colchicine is both inexpensive and generally well tolerated, and the apparent benefits so far reported are substantial," Ridker, from Brigham and Women's Hospital in Boston, Massachusetts, told *theheart.org | Medscape Cardiology*. "We are eager to see the full data as rapidly as possible."
The commonly used gout and rheumatic disease agent costs **about 26 cents in Canada and between $4 and $6 in the United States. As previously reported, it reduced the time to clinical deterioration and hospital stay but not mortality in the 105-patient Greek Study in the Effects of Colchicine in COVID-19 Complications Prevention (GRECCO-19) study.**
Tardif said he's looking forward to having the data in the public domain and that they acted swiftly because the evidence was "clinically persuasive" and "the health system is congested now."
"We received the results Friday, January 22 at 5 p.m., an hour later we were in meetings with our data safety monitoring board [DSMB], 2 hours later we issued a press release, and a day later we're submitting a full manuscript to a major scientific journal, so I don't know if anyone has done this at this speed," he said. "So, we are actually very proud of what we did."
ColCORONA was designed to enroll 6000 outpatients, at least 40 years of age, who were diagnosed with COVID-19 infection within the previous 24 hours, and had a least one high-risk criterion, including age at least 70 years, body mass index ≥ 30 kg/m², diabetes mellitus,

uncontrolled hypertension, known respiratory disease, heart failure or coronary disease, fever of ≥ 38.4°C within the last 48 hours, dyspnea at presentation, bicytopenia, pancytopenia, or the combination of high neutrophil count and low lymphocyte count.

Participants were randomly assigned to receive either placebo or colchicine 0.5 mg twice daily for 3 days and then once daily for another 27 days.

The number needed to prevent one COVID-19 complication is about 60 patients, Tardif said.

Colchicine was well-tolerated and resulted in fewer serious adverse events than with placebo, he said. Diarrhea occurred more often with colchicine, but there was no increase in pneumonia. Caution should be used, however, in treating patients with severe renal disease.

Tardif said he would not prescribe colchicine to an 18-year-old COVID outpatient who doesn't have any concomitant diseases, but would for those meeting the study protocol.

"As long as a patient appears to me to be at risk of a complication, I would prescribe it, without a doubt," he said. "I can tell you that when we held the meeting with the DSMB Friday evening, I actually put each member on the spot and asked them, 'If it were you — not even treating a patient, but if you had COVID today, would you take it based on the data you've seen?' and all of the DSMB members said they would.

"So, we'll have that debate in the public domain when the paper is out, but I believe most physicians will use it to treat their patients."

Sweden gives 1,000 people Covid-19 shots kept at wrong temperature

Source: https://www.hindustantimes.com/world-news/sweden-gives-1-000-people-covid-19-shots-kept-at-wrong-temperature-101611325167704.html

Jan 22 – Around 1,000 people in Sweden have been given doses of Moderna's Covid-19 vaccine that were kept at the wrong temperature during transportation, the pharmacy company delivering the shots said on Friday.

In total 2,100 vaccine doses - around 20% of what Sweden has so far received from Moderna - were kept at too low a temperature, and the shots not yet administered have been set aside pending clarity on whether they will have been spoiled as a result, Apoteket said.

All of the people given doses from the faulty delivery are healthcare professionals, it said.

"According to the Swedish health authority's preliminary assessment, there is no indication that the doses transported in too low a temperature entail any health risk," Apoteket said in an emailed statement.

However, Sweden's health authority and pharmaceutical watchdog are investigating the matter further, Magnus Frisk, a spokesman for Apoteket said, adding: "One other thing we need to know is whether the vaccine doses already given will work."

Frisk said the agencies had contacted Moderna for further information about the effect of doses being kept at too low a temperature and whether the people given those doses needed another shot of the vaccine. The affected doses which have not been administered are accounted for and will not be used, he said. As of Jan. 17, Sweden had vaccinated 146,000 people, most of whom were given the Pfizer-BioNTech shot.

Nasal spray developed in Turkey kills coronavirus in 1 minute

Source: https://www.qatarday.com/news/health/nasal-spray-developed-in-turkey-kills-coronavirus-in-1-minute/82771

Jan 26 – The outbreak of COVID-19, which has now affected the whole world, put many microbiologists to work finding solutions. While health care professionals labor intensely in

laboratories to develop tests, vaccines and treatments, a nasal spray has been developed at Bursa's Uludağ University that can kill the coronavirus in just one minute.

The solution named Genoxyn, which completely kills the virus, was developed by associate professor Dr. Şehime Gülsün Temel, operator Dr. Ahmet Ümit Sabancı and Dr. Cüneyt Özakın, a faculty member of Uludağ University's Medical Microbiology Department. The researchers collaborated with academics from Uludağ and Çukurova universities to test the developed solution's antimicrobial and antiviral effects. The study found that the solution prevented the reproduction of bacteria and viruses.

Sabancı said he had been carrying out his studies on protection from disease before the coronavirus pandemic started. "With Cüneyt Özakın, we showed that the solution has antibacterial activity, and after the pandemic began, we thought about whether we could develop this solution to contribute to (the fight against) COVID-19. So, we refined a new oral and nasal spray and sent it to biocompatibility tests," he said.

"It was already known that the transmission points of the virus are the mouth and nose, and our studies determined that the solution both killed and cured the virus on the mouth and nose tissue. The death of the virus in a short time means preventing its entry into the cells and reducing the virus's number. If the solution can prevent contamination, it will be a good protector for us," Sabancı explained.

Temel, meanwhile, said they proved the solution kills the virus within a minute and, most importantly, showed that the solution does not damage people's epithelial cells in their mucous membranes. "We have even shown that it has a healing effect on these cells. Therefore, this means that it is safe to use as it does not harm human cells," she said.

Özakın, on the other hand, said that Sabancı came up with this solution two years ago for it to be tested for its antimicrobial activities. "Based on international methods, we found out that the solution was a product that could be used with some effects such as tissue healing and the prevention of inflation. The primary ingredient of the developed product was known for years; however, there were problems in its use for human health. It did not have a permanent effect, and its structure was deteriorating rapidly," he explained.

"After new developments were made on the product, the product's effects became more permanent with the latest technological applications. With the nanotechnological applications, it began to show a long-lasting impact through the particular molecules it binds. Also, the fact that it has biocompatibility, which means it acts without damaging human tissues and cells, has enabled us to make it usable for human health," Özakın said.

Özakın said they had initially tested the solution's antiviral effectiveness against common viruses, but when the coronavirus pandemic began, their focus switched to the SARS-CoV-2 virus. After conducting the necessary tests, the three researchers demonstrated that the solution has a direct effect on the novel coronavirus.

"We have demonstrated that it has a lethal effect against bacteria, fungi and especially SARS-CoV-2," Özakın said.

R&D for COVID-19 has increased, yet other pandemic risks go unaddressed

Source: https://accesstomedicinefoundation.org/access-to-medicine-index/results/r-d-for-covid-19-has-increased-yet-other-pandemic-risks-go-unaddressed

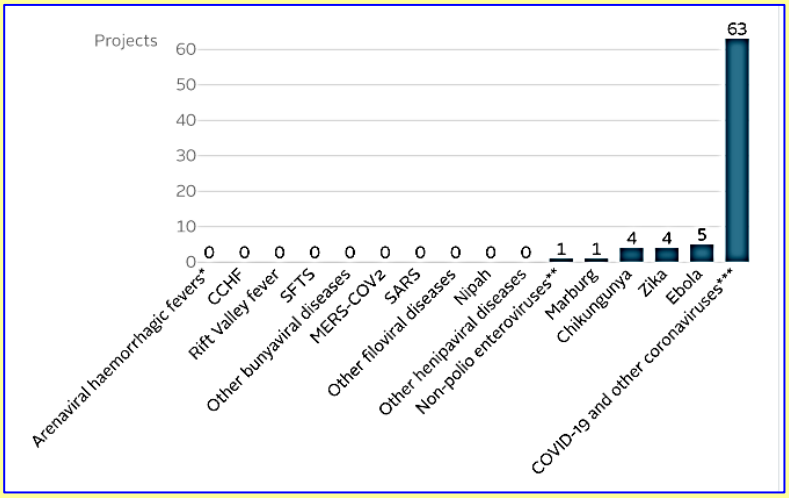
Despite years of warnings that novel coronaviruses were among the pathogens most likely to cause a global health emergency, the pharmaceutical industry, as well as society at large, was ill-prepared for the COVID-19 pandemic.

In the period before the start of the pandemic, R&D pipelines targeting pathogens most likely to cause a pandemic were largely empty. However, after the pandemic hit, the portfolio of experimental drugs and vaccines to treat coronavirus filled up – while the R&D effort by 20 of the world's largest pharmaceutical companies into other priority emerging infectious diseases (EIDs) remains alarmingly low.

Research activity is at an extremely low level even for the few cases where there is work being done, such as the mosquito-borne chikungunya virus that has spread rapidly in recent years, including across the Americas, Africa and in India. From the companies in scope, there are just 13 R&D projects across five non-coronavirus diseases and zero for the remaining ten. Those ten diseases also had empty pipelines in 2018.

Pharmaceutical companies are not targeting priority pathogens with epidemic potential through R&D

Excluding coronaviruses, pathogens with pandemic potential where pharma companies are active in R&D show very small pipelines in 2020. Out of 16 pathogens, 10 have empty pipelines.



Concerning low level of R&D for EIDs

Research activity against EIDs is concentrated among a few companies. In 2020, 17 companies are targeting coronavirus. Nine companies are targeting other EIDs: Bayer, Eisai, Gilead, Johnson & Johnson, MSD,† Merck,‡ Roche and Takeda. These diseases could be the next ones to cause death rates to spike and to stall the global economy. They matter more than ever in today's inter-connected world that presents viruses with heightened opportunities to spread at the speed of a jet plane, increasing the risk of future pandemics.

	R&D projects		Active companies	
Disease flagged as an epidemic/pandemic risk	2018	2020	2018	2020
Arenaviral haemorrhagic fevers (incl. Lassa fever)	0	0	0	0
Chikungunya	3	4	3	4
Crimean-Congo haemorrhagic fever	0	0	0	0
Ebola	7	5	5	4
Emergent non-polio enteroviruses (including EV71, D68)	1	1	1	1
Marburg	1	1	1	1
Middle East resp. syndrome coronavirus (MERS-CoV)	0	0	0	0
Nipah	0	0	0	0
Other bunyaviral diseases	0	0	0	0
Other filoviral diseases	0	0	0	0
Other henipaviral diseases	0	0	0	0
Other highly pathogenic coronaviral dis. (incl. COVID-19)	0	63	0	17
Rift Valley fever	0	0	0	0
Severe acute respiratory syndrome (SARS)	0	0	0	0
Severe fever with thrombocytopenia syndr. (SFTS)	0	0	0	0
Zika	3	4	3	4

Are companies preparing for a future pandemic?

This figure shows the number of R&D projects and companies targeting diseases identified by WHO and Policy Cures as emerging infectious diseases, and how this has changed since 2018.

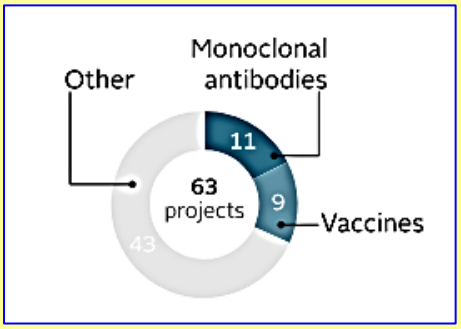
Large pharma companies' respond to COVID-19

Large research-based pharmaceutical companies have a critical role to play in preparing for the next pandemic. While academic groups and small biotechs can pioneer new research ideas, big companies are essential in ensuring rapid development and access to vaccines, therapeutics and diagnostics, including providing the capacity for scaled-up manufacturing and global distribution without disrupting supply chains leading to shortages and stockouts.

Many large companies have moved to fulfil this role in response to COVID-19, helping to facilitate the development and deployment of vaccines in record time. However and to a large extent, this industry only mobilised against COVID-19 once it became clear that the outbreak affected rich as well as poor countries, thereby opening up the possibility of substantial recurring pharmaceutical revenues. Yet, not all pandemics lead to the creation of such a substantial market for new products. Without sustained commitment by large pharmaceutical companies to pandemic preparedness, the world will remain worryingly vulnerable to pandemics and epidemics, particularly those that mainly affect low-income countries.

Few projects suitable for resource-limited settings

The COVID-19 pandemic has seen a range of responses by pharmaceutical companies. Apart from for projects developed within the COVID-19 Tools Accelerator (ACT-A), there was little evidence in the first months of the pandemic response of structures for ensuring



access to COVID-19 vaccines and treatments in poorer countries. By June 2020, only seven out of 24 late-stage coronavirus projects analysed (Phase II or III) were covered by an access plan, such as a licensing agreement or pricing commitment.

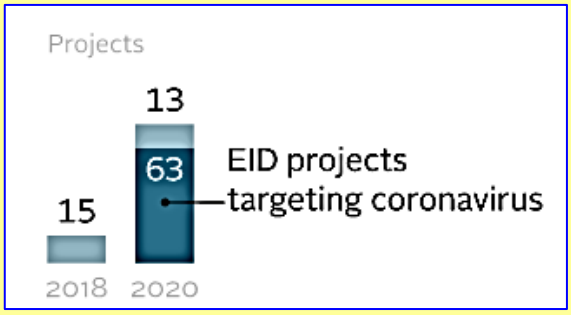
9 vaccines for COVID-19 in the pipeline

Out of 63 projects for COVID-19, five are antivirals, with nine vaccines and 11 antibody-based treatments. The rest aim to repurpose existing medicines for COVID-19 patients.

Out of 63 projects, only five are antivirals, nine are vaccines, and 11 are antibody-based treatments. Amongst the projects, there are several existing medicines that are repurposed for COVID-19 patients. Unfortunately, many of the non-vaccine products in development will be challenging for low- and middle-income countries to get to patients, either due to their comparatively high cost or because of technical requirements – for example, monoclonal antibodies that need to be administered by sterile infusion, may need monitoring and require highly specialized health workers and sophisticated diagnostics Some vaccines, too, are less suitable for resource-poor settings because of their high cost and the need for ultra-cold storage.

What next? Prepare for the next pandemic through EID R&D and broader use of IP-sharing and other tools

Arrangements for preparing for and preventing future pandemics exist but are precariously positioned, due in part to weak engagement by the research-based pharmaceutical industry. The lesson of COVID-19 is that pandemic preparedness requires a robust and diverse range of private and public sector entities to engage in research against EIDs. This must include companies that can accelerate the passage of products through clinical development and approval, and manufacture and supply at global scale without disrupting existing activities. Vaccines take at least a year to develop, even at an accelerated pace. R&D targeting EIDs must begin before epidemics break out, for example to develop platform technologies or to share IP to accelerate discovery-stage R&D.



Increase in R&D for emerging infectious diseases (EIDs) concentrates on coronaviruses

With the vast majority of projects for EIDs targeting coronaviruses, increased engagement in EID R&D is needed to prepare for the next pandemic.

The Index shows that, before COVID-19 struck, there was very little engagement in EID research by large pharmaceutical companies, despite clear prioritisation by WHO and others. Incentives for pharmaceutical companies to engage were limited, as many EIDs offered little in terms of commercial prospects, such as Ebola, Zika, dengue fever and malaria. To counter this in-built reluctance to engage, there are organisations such as the Coalition for Epidemic Preparedness Innovations (CEPI) focused on developing vaccines, Gavi, the Vaccine Alliance, to enable sustainable vaccine markets, and the Access to COVID-19 Tools (ACT) Accelerator, which includes IP-sharing, launched by WHO and partners. Ending a pandemic requires suitable products to be developed and fairly distributed so that people in low- and middle-income countries (LMICs) are not last in line or left behind altogether. The lag in access planning, despite hefty public funding for much R&D, suggests that pharmaceutical companies must do more: demonstrate a sustained commitment to invest more in EID R&D; embed equitable distribution into their strategies; and show greater flexibility on sharing intellectual property.

† Merck & Co, Inc (Kenilworth, NJ USA)
‡ Merck KGaA (Darmstadt, Germany)
** Including Lassa Fever*
*** Including EV71, D68*
**** Other highly pathogenic coronaviral diseases (incl. COVID-19). Includes products that are being repurposed to improve patient outcomes.*
CCHF: Crimean-Congo haemorrhagic fever
SFTS: Severe fever with thrombocytopenia syndrome
MERS-COV2: Middle East respiratory syndrome coronavirus
SARS: Severe acute respiratory syndrome

'Will the Vaccine Alter My Genes?' – and Other Patient FAQs

By Jan E. Patterson, MD, MS; Rukevwe I. Ehwarieme, MD
Source: https://www.medscape.com/viewarticle/944213

Jan 21 – The bleak winter surge of COVID-19 across the country has been punctuated by hope in the form of effective and safe vaccines. States are receiving shipments of the Pfizer/BioNTech and Moderna mRNA vaccines, and as of this writing, about 15 million doses have been distributed and almost 5 million first doses received. Although vaccine enthusiasm is evident in some areas, especially with the current shortages of vaccine, there remain pockets of vaccine hesitancy that need to be addressed.
About one quarter of the public continues to be hesitant, though it varies by demographics. The highest rate of hesitancy is among Republicans (42%), persons aged 30-49 years old (36%), and rural residents (35%). And despite bearing more adversity in the pandemic, 35%-40% of Black adults would decline the vaccine or are reluctant, as are approximately a third of essential workers and even a third of those who work in healthcare delivery.
Fortunately, 85% of people trust their own doctor or healthcare provider to give them the best information. Thus, it is especially important for us to be prepared to answer our patients' questions. The most common reason for reluctance is concern about side effects. Other common reasons are concern that it is too new and the role of politics in vaccine development. Emergency authorization was associated with lower acceptance, but vaccine efficacy and safety were important factors for higher acceptance.
Here are some questions that patients may ask about the vaccine, as well as issues that are important to address in guiding them to vaccine acceptance.

Symptoms	Younger group (16 – 55 years of age)		Older group (> 55 years of age)	
	Dose 1	Dose 2	Dose 1	Dose 2
Fatigue	47.4%	59.4%	34.1%	50.5%
Headache	41.9%	51.7%	25.2%	39.0%
Muscle Pain	21.3%	37.3%	13.9%	28.7%
Chills	14.0%	35.1%	6.3%	22.7%
Joint Pain	11.0%	21.9%	8.6%	18.9%
Fever	3.7%	15.8%	1.4%	10.9%
Vomiting	Reported less frequently in the older group and was similar after either dose			
Diarrhea	Reported less frequently in the older group and was similar after each dose			

Is the vaccine safe? What side effects can I expect?

Yes, the vaccine is safe. Short-term side effects are common and may include soreness in the arm, fatigue, headache, and muscle aches, and pain within 2-3 days of getting the vaccine. These are more common after the second dose and in younger people (Table).
Some rare allergic reactions (increased heart rate, lowered blood pressure, swollen lips, hives) have occurred in people with a history of allergic reactions. The reactions were detected during the monitoring period after administration and treated successfully. Sites that give the vaccine should be equipped to treat this type of rare reaction. If a severe allergic reaction occurs after the first shot, a second shot is not recommended.
If you have a known allergy to a component of the vaccine, you should not take the vaccine. For instance, polyethylene glycol (PEG) is in the vaccine. This is a compound found in some foods, beverages, toothpastes, shampoos, and medications, and some people have a known allergy to it.
Participants rarely developed Bell's palsy, a temporary facial nerve paralysis. The rate at which this occurred, however, was not higher than expected in the general population, so it is not clear that this is due to the vaccine.

What should I do if I experience side effects?

Most side effects are short-lived and relieved with acetaminophen or ibuprofen. If a patient experiences a severe side effect after getting vaccinated, they and/or their vaccine provider should send a report to the national Vaccine Adverse Event Reporting System (VAERS), which tracks and monitors adverse effects.

Are there any long-term effects from the vaccine?

Monitoring of long-term safety data is still ongoing. Typically, vaccines only have short-term side effects. We do know that COVID-19 can have long-term effects — fatigue, shortness of

breath, prolonged cough, joint pain, difficulty with concentration, depression, and more — so the disease is worth preventing by receiving the vaccine.

Is the vaccine effective?

Both of the recently authorized COVID-19 vaccines are effective. The Pfizer/BioNTech vaccine trial had 43,000 participants and 95% efficacy, and the Moderna vaccine trial had 30,000 participants and 94.1% efficacy. Vaccine effectiveness was comparable across subgroups by age, gender, race, ethnicity, and underlying conditions. Severe cases requiring hospitalization were avoided in vaccine recipients of both trials.

Effectiveness in the 95% range for a vaccine is exceptional. We don't have many vaccines with this kind of efficacy, so it is worth getting the shot.

How were these vaccines made so quickly? I don't trust them.

The SARS-CoV-2 genome was sequenced by early January 2020. This allowed characterization of the spike protein, the immunogenic protein on the coronavirus that allows for cell entry. Because of novel mRNA technology, the coronavirus did not have to be grown in eggs or cell culture to develop the vaccine. Also, the partnership with the federal government has allowed companies to develop the vaccine faster than they normally would. The committee that reviews the efficacy and safety data for the FDA (the Vaccines and Related Biological Products Advisory Committee) is served by respected experts from around the country, and they recommended authorization of these vaccines.

Will this new technology alter my genes?

This mRNA technology has been studied for decades. The mRNA sends a genetic message to cells to make spike protein, the protein that coronavirus uses to enter cells. The mRNA is very unstable and has to be encapsulated in lipids to make it to the cell and deliver the message. Once it is in the cell, the mRNA is rapidly destroyed by enzymes, so it does not stay around. When the cell makes spike protein, the body produces antibody to it.

The mRNA technology is safe, but vaccines with other technologies are being developed. Two vaccines that are currently undergoing phase 3 trials use virus that cannot replicate as a vector to carry the message to the cells. These are the Oxford/AstraZeneca and the Johnson & Johnson vaccines. The Novavax vaccine uses another technology that has previously been used in vaccines — a recombinant spike protein along with an adjuvant to stimulate the immune system.

What about the new variants I have heard about?

Viruses typically have mutations over time, and this virus is not an exception. There have been two significant variants documented recently — one in the United Kingdom and the other in South Africa. Though each of these has a number of mutations, the vaccine was designed to neutralize the entire spike protein, so the vaccine will probably still be effective. Studies are being done to specifically evaluate the efficacy of the vaccines against these variants.

Can I get compensation for a severe adverse reaction?

Vaccine companies are not liable if something unintentionally goes wrong with their vaccine. For a severe adverse effect, there is a process to apply for compensation through the National Vaccine Injury Compensation Program. It requires filing a petition with the US Court of Federal Claims and a review by the US Department of Health and Human Services medical staff, who will determine whether the claim meets criteria for compensation. *[Editor's note: After the submission of this commentary, the authors have noted that under the Department of Health and Human Services public health emergency declaration, claims for COVID-19 vaccine injuries are brought under the Countermeasures Injury Compensation Program rather than the Vaccine Injury Compensation Program. The authors of* The New England Journal of Medicine *article point out that this program is more limited in compensation and qualifications, and call for Congress to rectify.]*

In summary, the outstanding efficacy of the vaccines and their acceptance by millions of persons, including healthcare workers and leaders, have helped to decrease vaccine hesitancy, but reluctance remains in some groups. National and regional public health agencies and community leaders must continue to inform and educate the public, but the role of the healthcare provider in talking to individual patients will be a powerful and critical influence in increasing acceptance.

***Jan E. Patterson, MD, MS**, is a professor of medicine/infectious diseases and associate dean of quality & lifelong learning at the Joe R. and Teresa Lozano Long School of Medicine, UT Health San Antonio. She has had many publications and*

presentations on infectious diseases and healthcare epidemiology over a period of three decades. Her areas of expertise include clinical infectious diseases, infection prevention, antimicrobial resistance and stewardship, and integrative medicine. She has served in leadership positions regionally and nationally, including the boards of national professional organizations.

***Rukevwe I. Ehwarieme, MD,** is an infectious diseases fellow at the University of Texas Health San Antonio Long School of Medicine, where he is also a member of the COVID-19 Vaccine Task Force.*

Controversy Flares Over Ivermectin for COVID-19

By Marcia Frellick

Source: https://www.medscape.com/viewarticle/944440

Jan 20 – The National Institutes of Health (NIH) has dropped its recommendation against the inexpensive antiparasitic drug ivermectin for treatment of COVID-19, and the agency now advises it can't recommend for or against its use, leaving the decision to physicians and their patients.

"Results from adequately powered, well-designed, and well-conducted clinical trials are needed to provide more specific, evidence-based guidance on the role of ivermectin for the treatment of COVID-19," according to new NIH guidance released last week.

Passionate arguments have been waged for and against the drug's use.

The NIH update disappointed members of the Front Line COVID-19 Critical Care Alliance (FLCCC), which outlined its case for endorsing ivermectin in a public statement on Monday. Point-by-point, the group of 10 physicians argued against each limitation that drove the NIH's ruling.

The group's members said that although grateful the recommendation *against* the drug was dropped, a neutral approach is not acceptable as total US deaths surpassed 400,000 since last spring — and currently approach 4000 a day. Results from research are enough to support its use, and the drug will immediately save lives, they say.

"Patients do not have time to wait," they write, "and we as healthcare providers in society do not have that time either."

NIH, which in August had recommended against ivermectin's use, invited the group to present evidence to its treatment guidance panel on January 6 to detail the emerging science surrounding ivermectin. The group cited rapidly growing evidence of the drug's effectiveness.

Pierre Kory, MD, president/cofounder of FLCCC and a pulmonary and critical care specialist at Aurora St. Luke's Medical Center in Milwaukee, also spoke before a Senate panel on December 8 in a widely shared impassioned video, touting ivermectin as a COVID-19 "miracle" drug, a term he said he doesn't use lightly.

Kory pleaded with the NIH to consider the emerging data. "Please, I'm just asking that they review our manuscript," he told the senators.

"We have immense amounts of data to show that ivermectin must be implemented and implemented now," he said.

Some Draw Parallels to Hydroxychloroquine

Critics have said there's not enough data to institute a protocol, and some draw parallels to another repurposed drug — hydroxychloroquine (HCQ) — which was once considered a promising treatment for COVID-19, based on flawed and incomplete evidence, and now is not recommended.

Paul Sax, MD, a professor of medicine at Harvard and clinical director of the HIV Program and Division of Infectious Diseases at Brigham and Women's Hospital in Boston, wrote in a blog post earlier this month in the *New England Journal of Medicine Journal Watch* that ivermectin has more robust evidence for it than HCQ ever did.

"[B]ut we're not quite yet at the 'practice changing' level," he writes. "Results from at least 5 randomized clinical trials are expected soon that might further inform the decision."
He said the best argument for the drug is seen in this explanation of a meta-analysis of studies of between 100 and 500 patients by Andrew Hill, MD, with the Department of Pharmacology, University of Liverpool, United Kingdom.
Sax advises against two biases in considering ivermectin. One is assuming that because HCQ failed, other antiparasitic drugs will too.
The second bias to avoid, he says, is discounting studies done in low- and middle-income countries because "they weren't done in the right places."
"That's not just bias," he says. "It's also snobbery."
Ivermectin has been approved by the US Food and Drug Administration (FDA) for treatment of onchocerciasis (river blindness) and strongyloidiasis, but is not FDA-approved for the treatment of any viral infection. It also is sometimes used to treat animals.
In dropping the recommendation against ivermectin, the NIH gave it the same neutral declaration as monoclonal antibodies and convalescent plasma.

Some Physicians Say They Won't Prescribe It

Some physicians say they won't be recommending it to their COVID-19 patients.
Amesh Adalja, MD, an infectious disease expert and senior scholar at the Johns Hopkins University Center for Health Security in Baltimore, Maryland, told *Medscape Medical News* that the NIH update hasn't changed his mind and he isn't prescribing it for his patients.
He said although "there's enough of a signal" that he would like to see more data, "we haven't seen anything in terms of a really robust study."
He noted that the Infectious Diseases Society of America (IDSA) has 15 recommendations for COVID-19 treatment "and not one of them has to do with ivermectin."
He added, "It's not enough to see *if* it works, but we need to see *who* it works in and *when* it works in them."
He also acknowledged that "some prominent physicians" are recommending it.
Among them is Paul Marik, MD, endowed professor of medicine and chief of pulmonary and critical care medicine at Eastern Virginia Medical School in Norfolk. A cofounder of FLCCC, Marik has championed ivermectin and developed a protocol for its use to prevent and treat COVID-19.
The data surrounding ivermectin have met with hope, criticism, and warnings.
Australian researchers published a study ahead of print in *Antiviral Research* that found ivermectin inhibited the replication of SARS-CoV-2 in a laboratory setting.
The study concluded that the drug resulted post-infection in a 5000-fold reduction in viral RNA at 48 hours. After that study, however, the FDA in April warned consumers not to self-medicate with ivermectin products intended for animals.
The NIH acknowledged that several randomized trials and retrospective studies of ivermectin use in patients with COVID-19 have now been published in peer-reviewed journals or on preprint servers.
"Some clinical studies showed no benefits or worsening of disease after ivermectin use, whereas others reported shorter time to resolution of disease manifestations attributed to COVID-19, greater reduction in inflammatory markers, shorter time to viral clearance, or lower mortality rates in patients who received ivermectin than in patients who received comparator drugs or placebo," the NIH guidance reads.
The NIH acknowledges limitations: the studies have been small; doses of ivermectin have varied; some patients were taking other medications at the same time (including doxycycline, hydroxychloroquine, azithromycin, zinc, and corticosteroids, which may be potential confounders); and patients' severity of COVID was not always clearly described in the studies.
Nasia Safdar, MD, medical director of infection prevention at the University of Wisconsin Hospital in Madison, told *Medscape Medical News* she agrees more research is needed before ivermectin is recommended by regulatory bodies for COVID-19.
That said, Safdar added, "in individual circumstances if a physician is confronted with a patient in dire straits and you're not sure what to do, might you consider it? I think after a discussion with the patient, perhaps, but the level of evidence certainly doesn't rise to the level of a policy."
A downside of recommending a treatment without conclusive data, even if harm isn't the primary concern, she said, is that supplies could dwindle for its intended use in other diseases. Also, premature approval can limit the robust research needed to see not only whether it works better for prevention or treatment, but also if it's effective depending on patient populations and the severity of COVID-19.

Marcia Frellick is a freelance journalist based in Chicago. She has previously written for the Chicago Tribune, Science News and Nurse.com and was an editor at the Chicago Sun-Times, the Cincinnati Enquirer, and the St. Cloud (Minnesota) Times.

How Likely Are Malpractice Lawsuits from Treating COVID?

Source: https://www.medscape.com/viewarticle/944616

Jan 25 – Last May, Emily Reardon, a 19-year-old college freshman and former high school varsity swimmer, was brought by her parents to the Riverside Methodist Hospital emergency department (ED) in Columbus, Ohio, with severe respiratory distress and low pulse-oximetry readings. She was treated by an emergency physician.

It looked like a case of COVID-19. But after testing negative three times for the virus, Reardon was sent home with her parents with a diagnosis of pneumonia and prescriptions for an antibiotic and acetaminophen. She returned 2 days later in respiratory distress with a dangerously low pulse-oximetry reading of 70%. She died 8 hours later.

Her death certificate listed the cause as acute respiratory distress syndrome, according to a medical malpractice lawsuit filed last June against the hospital, the emergency physician, and other ED staff in state court in Franklin County. The suit alleged failure to properly diagnose and treat Reardon's symptoms and failure to adequately monitor her serious and rapidly declining condition, calling the care "negligent and/or reckless."

The facts suggest that this is the kind of coronavirus-related negligence case that has physicians, hospitals, liability insurers, and malpractice defense attorneys on high alert.

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

Coronavirus Vaccine Tracker

What We Know and Don't Know About Virus Variants and Vaccines

Source: https://www.medscape.com/viewarticle/944508

Jan 21 – About 20 states across the country have detected the more transmissible B.1.1.7 SARS-CoV-2 variant to date. Given the unknowns of the emerging situation, experts with the Infectious Diseases Society of America (IDSA) addressed vaccine effectiveness, how well equipped the United States is to track new mutations, and shared their impressions of President Joe Biden's COVID-19 executive orders.

One of the major concerns remains the ability of COVID-19 vaccines to work on new strains. "All of our vaccines target the spike protein and try to elicit neutralizing antibodies that bind to that protein," Mirella Salvatore, MD, assistant professor of medicine and population health sciences at Weill Cornell Medicine in New York City, said during an IDSA press briefing on Thursday.

The B.1.1.7 mutation occurs in the "very important" spike protein, a component of the SARS-CoV-2 virus necessary for binding, which allows the virus to enter cells, added Salvatore, an IDSA fellow.

The evidence suggests that SARS-CoV-2 should be capable of producing one or two mutations per month. However, the B.1.1.7 variant surprised investigators in the United Kingdom when they first discovered the strain had 17 mutations, Salvatore said.

It's still unknown why this particular strain is more transmissible, but Salvatore speculated that the mutation gives the virus an advantage and increases binding, allowing it to enter cells more easily. She added that the mutations might have arisen among immunocompromised people infected with SARS-CoV-2, but "that is just a hypothesis."

On a positive note, Kathryn M. Edwards, MD, another IDSA fellow, explained at the briefing that the existing vaccines target more than one location on the virus' spike protein. Therefore, "if there is a mutation that changes one structure of the spike protein, there will be other areas where the binding can occur."

This polyclonal response "is why the vaccine can still be effective against this virus," added Edwards, scientific director of the Vanderbilt Vaccine Research Program and professor of pediatrics at the Vanderbilt University School of Medicine in Nashville, Tennessee.

Salvatore emphasized that although the new variant is more transmissible, it doesn't appear to be more lethal. "This might affect overall mortality but not for the individual who gets the infection."

Staying One Step Ahead

When asked for assurance that COVID-19 vaccines will work against emerging variants, Edwards said, "It maybe we will have to change the vaccine so it is more responsive to new variants, but at this point that does not seem to be the case."

Should the vaccines require an update, the mRNA vaccines have an advantage — researchers can rapidly revise them. "All you need to do is put all the little nucleotides together," Edwards said.

"A number of us are looking at how this will work, and we look to influenza," she added. Edwards drew an analogy to choosing — and sometimes updating — the influenza strains each year for the annual flu vaccine. With appropriate funding, the same system could be replicated to address any evolving changes to SARS-CoV-2, she said.

On funding, Salvatore said more money would be required to optimize the surveillance system for emerging strains in the United States.

"We actually have this system — there is a wonderful network that sequences the influenza strains," she said. "The structure exists, we just need the funding."

"The CDC is getting the system tooled up to get more viruses to be sequenced," Edwards said.

Both experts praised the CDC for its website with up-to-date surveillance information on emerging strains of SARS-CoV-2.

Biden's Backing of Science

A reporter asked each infectious disease expert to share their impression of Biden's newly signed COVID-19 executive orders.

"The biggest takeaway is the role of science and the lessons we've learned from masks, handwashing, and distancing," Edwards said. "We need to heed the advice...[especially] with a variant that is more contagious.

"It is encouraging that science will be listened to — that is the overall message," she added.

Salvatore agreed, saying that the orders give "the feeling that we can now act by following science."

"We have plenty of papers that show the effectiveness of masking," for example, she said. Salvatore acknowledged that there are "a lot of contrasting ideas about masking" across the United States but stressed their importance.

"We should follow measures that we know work," she said.

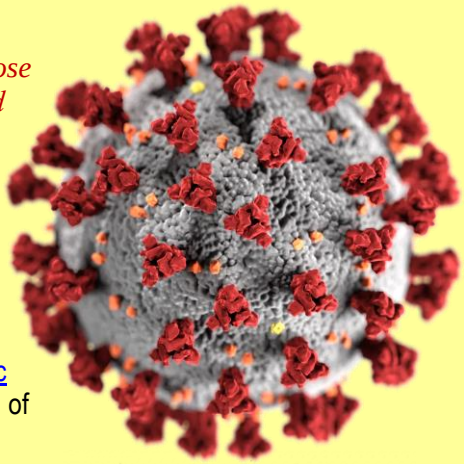
Both experts said more research is needed to stay ahead of this evolving scenario. "We still need a lot of basic science showing how this virus replicates in the cell," Salvatore said. "We need to really characterize all these mutations and their functions."

"We need to be concerned, do follow-up studies," she added, "but we don't need to panic."

The Virus of Mass Destruction

By Duni Dalmar

Source: https://www.globalresearch.ca/virus-mass-destruction/5735452



When fear of covid-19 was at its peak, we were told it was killing 3.4% of those who got the disease, similar to the famous "Spanish flu" of 1918, which killed 60 million people worldwide. The New York Times editorial board said this was a world war 2 level problem that deserves an equal level of national commitment, they claimed that in the worst-case scenario over 1.7 million Americans would die from the virus.

Jan 21 – On cable news stations on the right and the left there was a constant ticker on the bottom of the screen showing how many cases and deaths there were, something we'd never seen until this pandemic. There were videos of people "panic buying" necessities at the start of the lockdowns or stay at home orders, & later videos of filled hospitals or body bags being carried out of hospitals.

First it was China locking down, then Italy, then eventually the rest of the world (no longer a handful of countries). We were told we had no other choice. Many have forgotten now, but even right wingers were down with the program this spring, 42 states including the majority of the ones with Republican governors, had "stay at home" orders. These states made up

95% of the us population. Tucker Carlson was on Fox News telling his viewers to be terrified of the new coronavirus, and apparently he even personally drove to go see President Trump and tell him how serious this was. Soon after, Trump himself was talking about how deadly the virus was and how serious of a problem it was, he also supported stay at home orders. There was non stop talk about a "new normal".

Certain terms have become ubiquitous, like **"social distancing"**, and **"flattening the curve"**. How scared is the public? A recent vox poll showed 52% of Americans support a 1 month national lockdown. Back in April, at peak level of panic, an AP poll showed 87% of Americans supported stay at home orders, including 78% of republicans! America wasn't so polarized then, was it? And obviously it's not just America, the rest of the world is frightened to and has been since last February. Many people across the world think covid has already killed off a decent chunk of humanity.

A survey taken in July asked 1 thousand people in several different countries what percentage of their country they thought was killed off by covid, answers ranged from 3% in the us to 9% in Germany, this is several times the actual percentage and something you'd see in a scifi movie. Even after the public was told in some reports maybe this virus really didn't kill 3.4%, and that we were missing a lot of asymptomatic cases, we were still told to be terrified (and most media outlets kept using the higher death rates when discussing COVID-19 anyway).

It was still considered "at least 10 times deadlier than the flu" (1 % vs .1%) and anyone who compared it to the flu was ridiculed, despite the similarity in symptoms. We were told that the experts overwhelmingly supported the stay at home orders, that anyone who was against them was akin to a climate change denier who did not respect science, or, just a psychopath.

There was also the question of the origin of the virus, while technically a mystery, it was said that the virus having come from a lab was highly unlikely. The virus was first noticed in Wuhan, China, which happens to also have a high level bio research lab, this obviously had many thinking of the possibility the virus snuck out. The most commonly accepted theory is this virus somehow jumped from a bat or some other closely related animal, but we don't know for sure. This mysterious element of the story almost certainly added to peoples fear and paranoia. The thing is, this was all a farce, we were and are not dealing with anything comparable to the 1918 flu. We were dealing with something more like a normal bad flu season in some parts of the first world, and a very light one in most of the world.

Most experts and peer reviewed papers were not calling for mass quarantines or "stay at home" orders. Most places were not "following the science". The most logical conclusion that can be made is that the virus has been exaggerated so big business can swallow as much of small business as possible and so the ruling class can move forward with its fourth industrial revolution or "great reset" at a rapid pace. This involves things like the increased use of automation, artificial intelligence, 3d printing, increased online shopping & working from home, the move toward ending paper money, & increased big tech censorship. This has all happened when it's happened most likely because the super rich were going to end up needing another giant bailout, and they knew people weren't going to accept that under normal circumstances. Here's what Michael Parenti would call a "conspiracy analysis" of this crazy situation.

Let's start with the lies about the lethality of the virus.

At this point it's settled science that covid mainly kills the old and the frail (this doesn't mean it can't kill young people, just that it's extremely rare). An unusually high percentage of covid deaths are in nursing homes where studies show the average person only lives 6 months after entry anyway. In the us nursing home patients make up less than 1% of the population but are 39% of covid deaths.

A recent peer reviewed study published by the WHO showed that when you look at antibody studies done worldwide, which is the best way to see who has and hasn't been infected, **the virus actually only kills about .2 to .3% of those who get it.** In the third world the number was much lower, and for people under 70 worldwide it was .05%. That's a 1 in 2000 chance of dying after catching covid if you're under the age of 70. To put this in perspective, that's the **infection fatality rate** for about 90% of the world and about 80 to 85% of the richest countries.

So, how is it that this virus I just described has scared people so much? How have they been convinced this virus kills at several times the actual rate?

Well, as already mentioned, there was mass media hysteria, the constant case/death numbers on the screen, the constant anecdotal evidence, but propaganda by omission has also been huge. Many people either aren't aware or seem to have forgotten death is a daily thing, it's always sad when it's a loved one but it happens, about 150,000 people die every day on average. This is the type of context that was never given to the covid case and death numbers on local and cable news.

Reports of full hospitals in covid hot spots like NYC and cities in northern Italy weren't given context either, those are places that constantly have full hospitals during the winter. Another big factor is the under estimation and misunderstanding of influenza or "the flu". For starters, there isn't just one flu, there's a bunch strains of influenza, some more deadly than others.

Us regular folks outside the medical community just call all of them the flu. Many influenza strains are also more deadly than .1% according to many experts. The German network for evidence based medicine and the German health ministry says 2017/2018 flu season was .4 to .5% infection fatality ratio.
According to the CDC covid would only be a level 2 out of their 5 level pandemic severity index, showing that influenza strains clearly get higher than 0.1% . The WHO says up to 650k per year die of influenza like viruses and a bad year can obviously be much worse.
Another thing the average person probably doesn't understand, because of the mainstream media, is that there are many coronaviruses too.
The "common cold" is usually either a coronavirus or a rhinovirus (usually the latter). Yet at the beginning of the pandemic and to a lesser extent now, people have referred to this virus as THE coronavirus. This is extremely deceptive and makes Covid-19 seem more unique and deadly than it is, which causes panic.
Not only is it not very unique but it's not even the most deadly coronavirus. SARS and MERS, both of which are coronaviruses that have been dealt with in the last 20 years are far more deadly than Covid-19. Why would it be referred to as THE coronavirus if it's not the most deadly? Of course deaths aren't the only measure of lethality, there's been tons of stories of people getting sick for longer periods of time with covid, but this can happen with different kinds of influenza as well, it's called post viral syndrome. There are also things like myocarditis, and the even more rare instance where something crazy can happen like becoming paralyzed. These headlines about covid causing these things in rare instances frighten people but once again, influenza can do these things too. Since they're rare, people don't fear monger about them.
As far as the full hospitals, since covid is more of a nursing home problem than most influenza strains and hits kids a lot less hard, it actually has caused less hospitalizations than a normal bad winter season in several places. According to CDC numbers more people were hospitalized during the 2017 /2018 flu season in the United States than during the worst stretch of covid (an estimated 800k hospitalizations in 6 months that season), there were less hospitalizations the first 6 months of covid (hospitalization rate doesn't equal 800k here).
Stanford professor **John Ionniadis,** one of the most cited infectious disease experts on earth, called this a "once in a century evidence fiasco" back in March. As I said earlier, politicians around the world were not "following the science" as we were told in the mainstream media, how do we know? Simple. As former NY Times reporter Alex Berenson has pointed out in his book unreported truths, before COVID-19, the WHO had prepared for the possibility of pandemics of airborne viruses deadlier than this. What did they recommend? Nothing close to a lockdown/stay at home order, in fact they weren't even confident in basic things like mask wearing or hand washing. They changed their tune radically in early 2020 without scientific justification.
In the US the CDC had pandemic guidelines too, and again, they prepared for airborne viruses more deadly than this, and did not recommend lockdowns even in the worst imaginable scenario. Similar things happened in other countries, many of them first world countries with even better health care systems than the United States. It's leaked out in the media that Norway, Denmark, Italy, Russia, all ignored their health ministers and went with lockdowns that were not recommended, in the case of Denmark, because not locking down would be "politically undesirable". The UK downgraded the status of covid, taking it off the "high consequence infectious disease" list the day before it locked down on March 19. Who downgrades a viruses lethality while upgrading the measures taken against it? Another country with an elite health care system, Singapore, went far beyond what was recommended too. Their health ministry didn't recommend anything close to what Europeans were doing at the very beginning of the pandemic, and even commissioned a study that ended up in the lancet medical journal that didn't call for anything close to the harsh lockdown they ended up doing.
In late March right before most of the world shut down the WHO expert group on mass gatherings said in the lancet medical journal that there wasn't enough evidence to shut down mass gatherings like concerts or sporting events and warned of the possible negative effects of stopping these events. All over the world there are plenty of examples of political leaders not following their own rules, which is extremely shady to say the least . It's as if they know the truth, that we aren't really in as much danger as they tell us we are. To make matters worse, we have dealt with much more damaging airborne viruses in recent history. The '57 and '68 pandemics are not really known outside the medical community but both of those pandemics killed much more than what Covid-19 has on a global scale adjusted for population growth.
In the United States, which has the most total covid deaths, the number of deaths is slightly higher than in '57. But this was a year life went on as normal, and seniors old enough to remember the year don't discuss it as a pandemic year. Furthermore those older pandemics were much more deadly for kids and working age people which technically makes it worse for society. All these restrictions are outrageous, even if you accept their death count, which many experts don't since you can die of other causes while having the virus.
As I mentioned earlier, the experts who are calling for lockdown are in a minority, and many prominent ones who publicly call for them have gone back and forth or are clearly politically

or financially motivated. Take for example the "John snow memo" which calls for harsher restrictions and was made in response to "the great barrington declaration" which was signed by thousands of experts and calls for allowing life to continue as normal outside nursing homes. This was obviously political. Not because they responded, but because while listing examples of countries that "did it right" they listed japan, which has the least restrictions of any first world country including Sweden.

They listed it next to New Zealand which had an extremely harsh lockdown, Japan didn't do any of the mass testing they wanted and kept almost its entire economy open. It looks like they just chose a random country with a low death count and said "hey, do it this way!". So far the great barrington declaration has gotten more signatures than the John snow memo. The same exact mistake regarding Japan was recently made by **Dr. Michael T Osterholm**, an infectious disease expert from the university of Minnesota and member of Joe Biden's new covid task force. He's one of the top experts in the country and one of those peculiar cases I was talking about. On March 10 he went on the Joe Rogan podcast and it was viewed by millions of people. In this interview he basically said there was nothing we can do about the virus, that cloth masks were useless, and that it was going to kill 450k Americans before we know it. About 2 weeks later, he wrote an op Ed in the Washington post saying lockdowns would cause way too much damage and weren't worth it. Months later he was calling for a lockdown himself.

The man who many say is the top infectious disease expert in the country, **Dr. Anthony Fauci**, is also in the same boat. In late March the New England journal of medicine published a paper by Dr. Fauci where he only recommends possible school closures, working from home *when possible*, and *voluntary isolation*. Compare this with his comments months later, where he's praised New York's harsh stay at home order and told people not to have a normal thanksgiving. What's causing all these doctors to do this? Aside from political or personal reasons, like the fact that panic sells and some people just like being on tv. There could be big conflicts of interest, for example with pharmaceutical companies. This was recently brought up by the editor in chief of the British medical journal. He said "Science is being suppressed for political and financial gain.

Covid-19 has unleashed state corruption on a grand scale, and it is harmful to public health". What kind of damage have covid restrictions done? Globally, there will be more extra deaths from other diseases being neglected than from covid itself. Many more malaria, hiv, and tuberculosis deaths. The increase in starvation deaths worldwide will also single handedly outnumber covid deaths. In the first world there will be many preventable deaths coming from things like missed cancer screenings and a huge drop in blood donations. There have already been plenty of deaths from people being too scared to seek care because of Covid-19 and dying of a stroke or a heart attack. Aside from all the death these restrictions have caused, there is also the long term effects of unprecedented economic collapse worldwide.

Quality of life is very important and there are multiple studies that have shown the huge gap in life expectancy between the top and bottom one percent in places like the United States, so many people who weren't poor before the pandemic who lost their job because of it are almost certainly going to have years taken off their life as they stay unemployed for an extended period of time. There's about 3 million people in the United States in that category, along with another 17 million who have become "food insecure" during the pandemic. An additional 135 million have become food insecure globally, too.

Depression is also on the rise all over the world, and also lowers quality of life as well as life expectancy, a recent CDC survey showed that 1/4th of young Americans aged 18 to 24 contemplated suicide recently. The closing of many schools and universities for a long period of time will have incalculable effects on children, young adults, and society as a whole. Elective surgeries are way down since the pandemic started as well. These aren't surgeries which you may not need to survive but skipping them can have a terrible effect on your quality of life and maybe even keep you from working.

On rare occasions the the truth can be found about this pandemic in mainstream media but it's outnumbered by the craziness, on top of flooding the zone, there has also been some crazy censorship (Both mentioned in event 201 here from about 9:20 to 9:55). YouTube at one point censored one of the ten most cited scientists on earth, Stanford epidemiology professor John Ioannidis, before having to put the video back up after a large amount of complaints. He was presumably censored because he said covid was similar to seasonal influenza, but who has YouTube hired that's more qualified than him? YouTube also recently censored the former chief scientific advisor for Pfizer, again, presumably because he said covid wasn't that deadly.

Facebook censored **Dr. Carl Hennegan,** a professor of evidence based medicine at Oxford university. What did he do? Say the earth is flat? No, he attempted to post his article from the website the spectator where he cites and discusses peer reviewed studies. With all this censorship of expert opinion, and cherry picking by mainstream media, most people think covid restrictions have saved lives. The truth is, if you look at deaths per capita by country on the widely used "worldometer" website, you have to go down pretty far to reach a non lockdown country. If these harsh restrictions worked, there would be some correlation between them and deaths per capita but there isn't.

A study in the Lancet medical journal by researchers from the university of Toronto found "Rapid border closures, full lockdowns, and wide-spread testing were not associated with COVID-19 mortality per million people" on a global scale, which again we could see just from

looking at the worldometer site, it's been obvious for awhile. Even in the United States, there is no correlation between restrictions and deaths. South Dakota basically did nothing and they rank 9th in deaths per capita while New York and New Jersey are 1 and 2, with a per capita death rate that is much much higher. All of this clever deception, lying, suppression of scientific debate, and over the top fear mongering has been going on for economic reasons. The biggest corporations and financial institutions were headed for another huge crash similar to '08 before this virus arrived. People all over the world would would not have accepted another giant bailout of the biggest financial institutions and corporations again under normal circumstances, political crisis would emerge. There was likely to be a left populist backlash from this (pink tide, or Corbyn style movements).

Now, after the scam has got rolling, a total restructuring of the global economy that has been in the works for years can get fast tracked. All those stats about the economy doing terrible, people starving, they don't tell us how the ruling class is doing. Wall Street profits are up over 80% this past year, big tech companies are doing better than ever, the biggest corporations either didn't stop running during the pandemic or got paid as a part of a federal reserve program that gave the biggest companies in the country 500 billion dollars. They weren't even required to preserve jobs to get this money. Similar bailouts are taking place all over the world. Furthermore, small business has been destroyed, which opens up more opportunities for the biggest companies in the world as their competition shrinks and their market share grows.

As of June, 3 million American small businesses were closed, 40% of jobs lost during the pandemic are gone for good, similar patterns can be seen in other countries. Billionaire wealth has increased this year even after a gigantic stock market crash in the end of winter/early spring. As well as the ruling class is doing now, there was a huge crisis in 2019. In order to understand how this crisis was going to go global and how there could be global coordination in the exaggeration of COVID-19 one must understand how the world is run on a macro level. For starters, there's 3 main global powers (us and its "ally democracies", China, Russia), each with a sphere of influence, the United States & it's minions having by far the largest one. This is who runs the world sans a handful of places. This isn't controversial, it's mainstream political science. And who runs these countries? Big money, simple, the biggest companies, financial institutions and asset managers are who runs the show, and they get help from their puppet governments/national security states when ever necessary. Their number one goal? Make more money. In China, they may call themselves communist, but the reality is there are plenty billionaire in the Chinese "communist party", and there are giant companies like alibaba with huge influence. The inequality there is now approaching us levels according to economist Thomas piketty, it's been on the rise for the last 40 years, working conditions are terrible as well. How about Russia? Inequality there is also terrible and in the west we even ironically make fun of them for "oligarchs". The US, the biggest global power, is also ran by big giant corporations and billionaires.

A Princeton study in 2014 came to the conclusion that the US isn't a democracy but an oligarchy ran by a small group of rich powerful people. **Senator Bernie Sanders,** and even at times **Donald Trump** would constantly complain about the power of "political donors". The US allies have some big multinational corporations but they're tied at the hip with the US security state and the US elite are invested heavily in these companies too. Like Samsung, or BP. Even though these powerful countries like us and China are technically enemies, there is still plenty trade between them (especially the us and China), us/China financial systems are also intertwined in many ways. In this financialized/globalized economy if one of them crashes it could domino effect to the entire world as happened in 08. Most of the big central banks are intertwined in someway, and the federal reserve is the most powerful of them all. Now, to the crisis. Instead of public debt or "the trade war" causing a crisis, it's once again corporate debt, private banking, and lack of regulation that caused the crisis.

There was a repo loan crisis, caused mainly by the big 6 us banks who were no longer confident in lending to each other or to other financial institutions. Once the system reaches this point in the United States, a global meltdown isn't far off. Pam and Russ martens at Wall Street on parade have been covering this more than anyone in their ongoing series on the financial crisis. They describe in detail the conspiracy, how the mainstream media is complicit with their silence from September 2019 to February 2020 when the fed opened up emergency programs it hadn't opened since the last crisis and spent trillions before the cares act or any covid related shut downs.

According to CNBC 2019 also set a record for most ceo departures, even more than 08 which was second, they referred to it as a ceo exodus. The repeal of glass steagall made this possible, as the biggest commercial banks are allowed to make risky investments with deposit money. The federal reserve is a private institution collectively owned by the biggest banks, and has bailed out private financial institutions with trillions of dollars the public will have to pay back in the long run. All this without a vote, before the cares act, and to make matters worse they put the biggest asset manager on earth (blackrock) in charge of choosing who gets bailed out. The federal reserve is buying corporate debt and junk bonds at their direction.

Congresswoman Katie porter has called out some of this corruption but not all of it. She referred to the fed as corrupt for their relationship with Blackrock. I don't think she mentioned

Blackrock had been overseeing 25 million of fed chairman Powell's money & 7 trillion in assets under management overall before getting control of the feds huge corporate bailout program. They also wrote the bailout program that ended up getting rolled out before anyone knew there was even a crisis in August of last year, the people at blackrock who authored the bailout were former central bankers from some of the most powerful countries.

Much like the last crisis it looks like the big banks and the super rich kept a coming collapse secret. Blackrock is incredibly powerful owning a portion of big media companies, and now having several former employees in important positions in the new Biden administration. An analysis by political scientists from the university of Amsterdam 3 years ago showed how the big 3 asset managers, of which black rock is the biggest, own a big portion of corporate America and coordinate their investments. They've only grown bigger in influence since. They also look after assets from rich people not just in the us but all over the world and even have influence with some us enemies like China. The asset managers and billionaires are also the biggest shareholders of big pharma stocks and have made a killing on the vaccines.

Vaccines, that's a topic I've not touched on yet, many big corporations are planning on requiring vaccinations for people to come in their place of business, odds are you'll need to be vaccinated to do a lot of things. There's been some talk of attempting to vaccinate everyone on earth. I don't believe there's some evil plot to kill billions of people or anything, but i do believe vaccine profits play a role in this. I think it's just simply about the money, in 2010 the WHO was called out by the British medical journal and an official eu medical organization for their advisors having big pharma ties which led to overproduction of vaccines for the swine flu**. Bill Gates**, his foundation and other billionaires and their foundations are big investors in big pharma and are set to profit off this as well.

One of the worlds richest men Warren Buffet is also a big investor in big pharma, as is **Jeff Bezos**. Bezos Washington post has posted some good stuff about covid but for the most part they've fear mongered heavily, and he's profiting big in multiple ways from covid panic likely including the vaccine. Even the nation magazine and the Colombia journalism review have talked about Bill Gates big influence over media/public health and his cashing in on the pandemic (not just "conspiracy theorists"). Odds are, there won't be many deaths from the vaccine, but the thing is with something that kills only .05% of people under 70 and hospitalizes less than one percent of those who get it worldwide.

Is mass vaccination even necessary? Is it worth the risk for kids even with an extremely small chance of injury? For kids, it's probably more likely they develop a fever from the vaccine than from covid based on trial results. The old and the weak taking it is fine but everyone taking it seems like a money grab. This constant advertising, the demonization of people worried about the safety of this rushed new vaccine as "anti vax" is meant to protect a 40 billion dollar profit for big pharma. Worrying about their safety is perfectly normal, VP Kamala Harris has worried about it, so have many medical experts like Pfizer's former head of respiratory research Dr. Yeadon, or Dr. Sucharit Bhkadi, or Professor Caumes. All of this global coordination is possible through organizations like the world economic forum, most of the worlds elite meets and discusses the future right in front of our faces in lavish places in davos. Also through big asset management firms who are connected to the rich all over the world.

The old saying goes "never let a good crisis go to waste" and it appears that's what the world's richest have done. They flipped a crisis to their advantage, and now they have a good amount of public approval for their new fourth industrial revolution or "great reset" of capitalism where the 0.1% will have an even greater strangle hold on the world. This is something they've had in the works and have talked about publicly, but with the financial crisis the process was sped up. They make talk a good game about climate change, but some of the biggest oil companies are a part of the club. They may talk a good game about inequality, pretend to care about it, make up feel good phrases like "stakeholder capitalism instead of shareholder capitalism", but at the end of the day the mega multi national corporations (and the puppet governments that work for them) only care about maximizing profit.

Marx's predictions about competition and capitalism inevitably leading to monopoly have turned out to be right, even before covid in 2017 Nobel Prize winning economist Joseph Stiglitz was talking about the big monopoly problem in the us.

He said "There has been an increase in the market power and concentration of a few firms in industry after industry". A Washington post article from may headlined "the end of small business" put it nicely, "Since the late 1970s, the income share of the top 1 percent of earners has risen from 11 percent to more than 20 percent of national income. Those gains have been almost exactly balanced by losses among the bottom 50 percent. There are many reasons for this trend, including corporate concentration, the private-equity boom and technology, which both displaces lower-skilled workers and enriches a highly skilled elite. But the coronavirus amplifies the importance of all of them. The pandemic could compress decades of economic change into a matter of years."

International institutions like the IMF and World Bank will be giving out loans to both poorer and richer countries to help with the "recovery" from the economic crash and of course there will be loans given out to help distribute the vaccine as well. This will seem friendly and benign but it will almost certainly require what's called a structural adjustment. These international programs impose austerity on countries according to many economic experts. The EU and some other first world

countries have already been known to be deficit hawks before the pandemic and this will most likely be a perfect excuse to switch to an even harsher version.
Former Labor leader Jeremy Corbyn recently said he expects all these first world countries to turn to "harsh austerity" after running these deficits up, and that the third world was headed for "brutal restructuring" and should expect another attack on their public sector. (10:45 here) The President of Belarus, a country that did not lockdown, said that the IMF told them they'd only give them assistance if they locked down. The head of the IMF didn't really deny this, he said he told them that they had to follow WHO orders, but the WHO changed to a lockdown policy in the spring. So, this is basically blackmail, in today's globalized economy even just China alone locking down would've caused a recession that would require a stimulus for most countries.
Surveillance is another thing many have become paranoid over, and rightfully so, but even then this is just an ongoing process being turbo charged. This is the next step in the evolution of surveillance which the empire has been using since the beginning, historian Alfred McCoy has written a lot about this process that has been going on over one hundred years. Of course, there's also the Snowden leaks which exposed the gigantic modern surveillance state. Liberals and leftists who usually cry all day about the "far right" don't at all find it strange that orban in Hungary, bibi in Israel, modi in India, the Saudi and gulf dictators, and duterte in the Philippines all went along and supported harsh lockdowns in the name of public health at one point or another? Gop governors in the us who didn't support simple Medicaid expansion in Obamacare all of a sudden care about public health and lock their residents inside because of it? This is absurd, of course they don't, they're just helping chase more profit for their big corporate donors and billionaire friends.
In fact Bolsonaro in Brazil was probably the only far right leader to not be pro lockdown and even in Brazil local areas were still shutting down anyways. In many places people were forced to wear masks, even though it used to be considered a debatable issue. In some East Asian countries masks were recommended during flu season, in most other places they weren't, the WHO wasn't recommending them for everyone during flu season either. Oxford evidenced based medicine professors said there wasn't enough evidence to say either way and the issue had been politicized. Well, why was debating the effectiveness of masks made a kin to saying the earth is flat? Some seem to think it's some type of psychological tactic by people in power, and maybe that's possible. I can't help but I think of the money though, the disposable mask market went from under 1 billion dollars to start 2020 to over 166 billion by the end of 2020, there are definitely groups of wealthy people who have cashed in on the mask mania.
Dr. Fauci and Dr. Osterholm, whom I mentioned earlier, both separately said masks were useless in March, and switched up months later.
Fauci even admitted he lied in March allegedly to stop a mask shortage.
Many other doctors around the world did similar things. Even if this virus wasn't engineered and let out of a lab on purpose or on accident, both of which are very possible as Sam Husseini has written about in Salon, this is the mother of all of conspiracies. Even in the most benign scenario where the virus jumped into humans through nature naturally, this global scam is still a crime against humanity that makes the weapons of mass destruction scam look light in comparison. We should start calling it "the virus of mass destruction". I can't remember exactly where I first heard the phrase, but it's a fitting name for this. Now the difference is instead of pretending to fight terrorism we have leaders all over the world pretending to care about public health. This is class warfare kicked up a notch, it's gone from conventional to nuclear.
Many people have figured out they're being lied to, the problem is they can't put their finger on exactly why so we end up with crazy conspiracism. Everything that has happened isn't so the most powerful people can have more power just for the sake of it, and of course most people aren't going to accept that theory, it's ridiculous.
The lack of economic analysis in covid conspiracy circles probably comes from the fact that in the west most people against covid restrictions are libertarians, and obviously they aren't going to blame capitalism or even understand that's what caused all this. That's why you have idiots calling the covid lockdowns "communism", because for many libertarians anything they don't like is communist, even if it's being done by multi billion dollar corporations.
With that being said, I think the person who believes in 5g conspiracies or is obsessed with Bill Gates (he's obviously extremely powerful, but he did not start this craziness on his own) is more reasonable than the perfectly healthy person who's locked themselves inside their home and is scared to death of covid. At least they can see something isn't right, and are willing to fight for their basic rights.
To me, the saddest thing I see is Leftists taking it as axiomatic that lockdowns work even though they don't, and that they hurt the rich when in fact they do the opposite. Or how about race obsessed people saying things like covid kills black people more often than white people, as if a respiratory virus can be racist, and as if there are only blacks and whites in the US (black Africans have been dying less per capita than white Europeans). There is more of a correlation between obesity

and covid deaths than race, and globally richer countries like the US have more obesity, but at the country level its the poor American who is more likely to be obese and black Americans are disproportionately poor.

COVID Vaccine Dosing FAQs

By Sandra Adamson Fryhofer, MD
Source: https://www.medscape.com/viewarticle/944321

Jan 25 – On December 11, 2020, Pfizer-BioNTech's mRNA COVID vaccine received FDA emergency use authorization for those aged 16 years and older. Two 30 µg (0.3 mL) doses of Pfizer's vaccine, given 21 days apart, are 95% effective in preventing COVID. On December 18, 2020, FDA authorized emergency use of a second COVID vaccine, Moderna's mRNA vaccine, for those 18 and older. Two 100 µg (0.5 mL) doses of Moderna's vaccine, given 28 days apart, are 94.1% effective at preventing COVID.
Both are more than 90% effective. Vaccine efficacy after a two-dose series is 94%-95%. The second dose is not a booster; it's the second dose in the series. Patients need both doses for optimal protection. That's what's been studied.
You may have seen some recent articles and news reports suggesting ways to stretch vaccine supply and immunize more people. Proposals include reducing the number of doses, extending the time between doses, and using half a dose rather than a whole dose. In fact, on January 5, 2021, three articles in the *Annals of Internal Medicine* (Tuite and colleagues, Paltiel and colleagues, Barnabas and colleagues) proposed different dosing schedules. On January 4, the FDA released a statement basically saying to stick with the science and what's been studied. Making these changes would be premature. "Using a single dose regimen or administering less than the doses studied in the clinical trials could affect duration of protection." And duration of protection, even with two full doses, is still unknown. More study is needed.
Acceptable dosing intervals have been a little confusing. CDC initially specified "a 4-day grace period" for giving doses, which created some confusion and misinterpretation. On January 6, CDC clarified and explained that the 4-day grace period is for giving the second dose early. There's no maximum interval between the doses for either vaccine. But for optimum protection, try to adhere to the respective 21-day (Pfizer) and 28-day (Moderna) dosing intervals.
New updates from CDC posted January 21 address guidance for real-life situations. With interruptions in vaccine supply due to erratic distribution, vaccinators need guidance on what to do when vaccine is not available when it's time to administer a second dose. In this less-than-ideal situation, CDC says the second dose of the Pfizer or Moderna vaccine can be given up to 6 weeks (42 days) after the first dose. However, the 28- and 21-day dosing intervals are still recommended.

What if the same vaccine product isn't available when it's time for the second dose?
mRNA COVID vaccine products are not interchangeable. Their ingredients are different. Every effort should be made to determine which vaccine product a patient received for the first dose, and the same product should be used for both doses.
On January 21, CDC clarified that in exceptional circumstances, when the first-dose vaccine product is not known, or the same product is not available, any available mRNA vaccine may be used for the second dose a minimum of 28 days and up to 42 days (6 weeks) after the first dose was administered. At present, if a patient has already received two doses using different mRNA vaccine products, no additional doses of either vaccine product should be administered.
CDC guidance on these issues may be updated as other vaccine products (protein subunit or viral vector vaccines) are authorized in the United States.

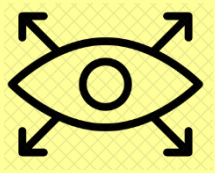
Can patients who have already had COVID get the vaccine?
Yes; it's safe and likely efficacious after COVID, but current evidence does suggest that reinfection is uncommon in the 90 days after initial infection. Patients don't need any testing before getting vaccinated.

Should patients who currently have COVID be vaccinated?
It is best to wait until they have recovered and are out of quarantine. Patients who received COVID monoclonal antibody or convalescent serum should wait at least 90 days so that this COVID treatment won't interfere with vaccine immune response.

When should patients who have had a known exposure to COVID and are still in quarantine be vaccinated?
These patients should wait until their quarantine is over before getting vaccinated.

Can COVID vaccine be given in combination with other vaccines?
CDC says try to allow a minimum 2-week window from other vaccine doses if you can.
When patients are vaccinated, they should be given a card with the date and type of vaccine product they received, and told to save this card. It is their proof of receipt of the vaccine. Also, they should make an appointment for their second dose as soon as possible.
Whoever administers a COVID vaccine should record the patient's vaccination in the appropriate immunization information system within 24 hours of vaccination. This is included in the CDC's COVID 19 Vaccination Program Provider Agreement that you have to sign in order to administer COVID vaccine.
One more important reminder: For now, even after vaccination, all vaccinated persons should still continue to wear masks and follow other recommendations to prevent COVID. We're still not sure how much — or if — mRNA vaccines reduce transmission or just how long protection lasts. Only time and more study will tell.
Vaccines are here. Now we have to get them into arms.

Pandemic, Lockdown, Economic Disaster: Are We at War?



Based on a Zoom presentation to the Coalition of Progressive Organizations and Universities Seoul, South Korea

By Peter Koenig

Source: https://www.globalresearch.ca/pandemic-lockdown-economic-disaster-are-we-war/5735433

Are we at War? *This has become a legitimate question over the last 12 months in the western world. And we are not talking of war by the west against Russia or China, or the east in general. It's a war of the people against ever-more tyrannical governments around the world, that under the guise of health security against an invisible enemy, called Covid-19 – are repressing people of the entire planet.*

Jan 26 – When I mention the West, that includes every country that follows the neoliberal economic concept of the west, still led to this date by the United States of America and her subservient allied governments in Europe and Latin America and even in Asia and Oceania. Yes, that also includes Japan, Australia, New Zealand – and to some extent also South Korea.
It's a people's war against a nefarious and rapidly all destructive ideology – an ideology that has nothing to do with humanity, that in fact has so far – and way before covid – economically destroyed and debt-enslaved many countries of the Global South by internationally imposed trade policies (by the western created World Trade Organization – WTO) and fiscal policies that serve the western dollar-based fiat economy – imposed out by the IMF and the World Bank.
Now, this Covid-19 "pandemic", in fact a Plandemic – because it has been planned for decades – has destroyed much more. It destroyed the livelihoods of billions of people, has killed more people from famine, misery, extreme poverty despair and suicide. Yes, there is a rapidly rising curve of suicides, worldwide. And this is only the beginning. – Because there is a different much more gigantic agenda behind covid: It is a crime of epic proportions that is being implemented in front of our eyes.

March 11, 2020
On March 11, 2020, WHO declared covid-19 a pandemic. And that when worldwide cases were only 5095 and deaths 293 (WHO statistics). That is hardly a case for a pandemic. Its rather a *Plandemic* – a purposefully planned pandemic that subsequently is to justify global lockdowns and the devastating destruction of the world economy, with disastrous human and social consequences – uncountable bankruptcies, hundreds of millions of unemployed – no income, famine, despair – and hopelessness, a vision of no future.
In fact, on or around March 16, 2020, less than a week after WHO's infamous declaration of Covid-19 as a pandemic, the entire world, all 193 UN member countries plus 3 territories went into total lockdown. There is nowhere to escape.
A coincidence? – Hardly. It is absolutely impossible that a virus strikes the entire world at the same time.
This already indicates that the virus is man-made, most-likely in a US bio-war lab. Other possibilities of the virus's origins mentioned are the UK and France. There are patents registered for this and other viruses preceding SARS-CoV-2, alias Covid-19.
This is a manufactured crisis that a world authority on health – like the World Health Organization (WHO) has been ordered to help implement, by declaring Covid-19, or SARS-CoV-2, as a pandemic, upon which all country governments have the right to take

precautionary measures. The strange thing is that literally every government in the world, except for Sweden and Belarus, and perhaps one or two others have followed strictly the "official narrative".
Why is that so? – Were they under pressure? – What kind of pressure?
Who are the masters behind WHO, behind the Plandemic?
Are they a few super-rich multi-billionaires – no names shall be mentioned – who have spun a network of collaborators throughout the world's nations' governments to make them obedient servants, and if they are not obedient, these governments, there are means to make them obedient?

China

China is also an exception, a different type of exception. China was struck first – not that the virus originated in China – no, in the most likelihood not – but the west may have been interested in observing with what efficiency China will master this maliciously manufactured crisis.
Well, the west had plenty of opportunities to learn from China on how to master this virus with a minimum of casualties and a minimum of economic losses.
But the west didn't learn anything; or did not want to learn how to deal with this false epidemic efficiently and effectively? – Possibly, because there was and still is a different agenda behind this virus? – Instead of approaching the "crisis" with China-style efficiency, the west predominantly Europe and the US, create wanton confusion, chaos, issue non-sensical rules that change almost by the day – lockdowns, half-lockdowns, curfews – and all the time, or most of the times mask-wearing, always socials distancing, different rules for people's assemblies – and lots of exceptions.
Then there are allegedly ever-so-often new strains discovered, like in the UK, some say they are highly infectious and deadlier than the original version of covid-19 – and the origin is South Africa – or maybe not. In any case, this new-type corona virus gives good reason for countries to continue locking down and closing borders, to keep their people ever more on a tight rope, ever less freedom – and ever more frustration.
And this, when scientist know and some have revealed, that since the beginning of the covid-19 Plandemic, there have been at least between 10 and 15 mutations. The corona virus mutates as does the flu virus. But these mutations are all more or less equally infectious, or dangerous, the same as with the flu virus.

The Big Picture

Let's backtrack a bit to understand what was in the making for more than a decade – possibly several decades. But it may be sufficient to go back to 2010 to get a view of the Big Picture – on the basis of which we will understand the diabolical plan that has thrown the world into a chaos, never seen in the current civilization, vastly worse than the 1928 / 29 – 1933 world crisis.
It is important to understand the background and the plan behind this invisible enemy. It breaks every human right, every civil right – and nobody dares to object – because of FEAR, FEAR and FEAR. Fear has become weaponized. Fear is an instrument of war.
FEAR is also the instrument to subdue the world to the begging of a small elite – let's call them, this commanding elite, the Globalist Cabal, those who aim at creating a One World Order (OWO) – and eventually to control every inch of Mother Earth and of humankind, by total digitization of everything – including the human brain…
That's why the question: **Are we at war? We should be, because we cannot let this happen.** We have to resist this monster enslavement of the human population for the benefit of a few inhuman elitists.
Here is a brief summary of key precursors to Covid-19. In 2010 the Rockefeller Foundation issued a Report, simply called the "2010 Rockefeller Report" – May 2010 (until recently this report was available on internet). This report outlines in remarkable details what is happening today and has been happening since the beginning of 2020. It includes several scenarios that are supposed to follow each other.
The first one is called the "***Lockstep Scenario***". Exactly. That's what is happening now. A hapless and clueless world population is thrown from one day to another into a pandemic from which there is no escaping – as all 193 UN members have subscribed to it, or were coerced or bribed into it.
And ***this shocked world population is behaving in lockstep*** as they are told to do – by their government masters – isolate, wear masks, separate, live in quarantine – a series of well-thought out anti-social conditions, meant to break society, families and friends apart, and to condition the brain that this will be the new normal. Remember, a society in fear can be easier manipulated.
These measures have nothing to do with protecting peoples' health. Their purpose is entirely different, as we will see. In fact, science – real science – not bought science – has proven in multiple ways that these measures are more destructive, more harmful than the virus Covid-

19 itself – which has a mortality rate similar to that of the annual influenza. See Anthony S. Fauci, Director the National Institute of Allergies and Infectious Diseases (NIAID / NIH – USA), in *"Covid-19 – Navigating the Uncharted"*, New England Journal of Medicine – NEJM (28 February, 2020).

If one assumes that the number of asymptomatic or minimally symptomatic cases is several times as high as the number of reported cases, the case fatality rate may be considerably less than 1%. This suggests that the overall clinical consequences of Covid-19 may ultimately be more akin to those of a severe seasonal influenza (which has a case fatality rate of approximately 0.1%)…

All of this is happening, I can only repeat – while the world economy is practically coming to a stand still. With uncountable losses – worst off are the people living in the Global South, where up to 70% of labor is informal – no contract, no social safety nets, no social health services – no shelter no food – no hope – and no education for children – no future.

This is the kind of misery this Globalist Cabal has planned and planted upon the world. And, mind you, we are only at the beginning. The ***Lockstep*** is just the first of four mind-dumbing scenarios to be implemented over the coming ten years. – If we, the People, humankind – do not stop it. NOW!

The 2010 Rockefeller Report is not all. There were numerous intermediary reports prepared by WHO's Control Board.

But just a couple of months before the outbreak of the PLANDEMIC, on 18 October 2020, ***Event 201*** took place in NYC. This event was sponsored by the Johns Hopkins Bloomberg School of Public Health (funded by the Rockefeller Foundation), by the World Economic Forum (WEF), and by the Bill and Melinda Gates Foundation.

What is the WEF? ***The WEF*** was created in 1971 by the German economics Professor Klaus Schwab, as a simple NGO in a suburb of Geneva, Switzerland, to develop rapidly into an international forum for the ***crème of the crop of Big Busines, Big Finance and Big Fame***. Ever since then – with one exception – the WEF's elite membership met usually in the last week of January in Davos Switzerland – to decide over the *"fate of the globe – and over humanity".*

The 2021 WEF meeting, is however, planned for May 2021 in Singapore. – They claim Covid is the reason for the change of venue. There is an intimidating arrogance with which the WEF make decisions behind closed doors. And the world population never knows what is planned for them – and as we – the people – have been programmed to obey authorities, we go along. Only few of us are questioning ever more grotesque events and occurrences. All of them infringing on our human and civil rights.

When the day comes that we discover that the salami is completely sliced off – I mean, sliced off of human and civil rights – that there is nothing left – it is too late. And that moment is now visible. In other words, it is High Noon to act.

Event 201

Back to ***Event 201***. The key purpose of ***Event 201*** was to computer simulate a pandemic patterned according to the 2002 / 2004 SARS outbreak. They called the new virus SARS-CoV-2. According to computer simulations this pandemic produced 65 million deaths in 18 months, created worldwide economic and social chaos, leaving behind uncountable bankruptcies, billions of people without work, and creating a deadly famine, a massive shortfall of goods and services, including food – and social misery beyond control.

On this website you may find several videos depicting ***Event 201***, as well as some of the discussions that took place during the event.

The ***Event 201*** Conference was attended by everybody who has a name in international public health – FDA, CDC, National Institute of Allergy and Infectious Diseases (NIAID / NIH); in international finance, led by the IMF and the World Bank, key Wall Street bankers, as well as in Big Pharma, for example pharma-industry interest groups, and of course WHO, also UNICEF and other UN agencies – and more.

The original SARS (meaning – Severe Acute Respiratory Syndrome) broke out also in China, in 2002, in the Guangzhou, *Province, from where it spread to 26 other countries and according to WHO (2004) produced worldwide* 8,096 cases and 774 deaths, more than 90% of which in China. It is speculated that the first SARS outbreak was a trial for what was to follow 20 years later. There were also other, what we may call, dry-runs for covid-19, not least the "failed" H1N1 Swine Flu which failed to break out as was expected by the organizers.

Isn't it amazing that just a few weeks after ***Event 201*** the first SARS-CoV-2 case was discovered and reported from Wuhan, China, in late 2019, and in early January 2020? China, prepared and alarmed, recalling the 2002 SARS outbreak, reacted fast, and with systematically organized severe lockdowns mastered the disease within a few months.

After WHO's declaration of Covid-19 as a pandemic – the entire world went into a lockdown, every country destroying its own socioeconomy, creating economic chaos, bankruptcies, unemployment, poverty and misery – deadly famine, especially in the Global South. How can that happen? What powers must be in play – what rewards or threats issued, so that ***every country of the planet basically self-destructs in lockstep?***

The economic cost of this destruction – destruction of the real economy, can hardly be estimated. The devastation gets worse with every new lockdown, with every new measure of human segregation from society, from the workplace – with new and repeated closings of vital businesses – possible recovery of the economy is ever more difficult. Most small businesses will be gone forever. According to some estimates up to a third of the World's GDP has already been wiped out.

And a good portion of these losses has been monetized and syphoned off and up into the pockets of a few billionaires, wo increased their riches in the 3 months from March to May 2020 by 20%. Imagine! Wile at the same time the International Labor Office estimates unemployment reaching close to 50% of the worlds 'entire labor force, most of it in the Global South.

When one sees the precursors to this covid-19 – which has in the meantime many strains, several mutations – one cannot but understand that there are "superior forces" behind it. There is an agenda way beyond Covid-19. This virus, invisible enemy, is just a convenient – and a truly clever – instrument to carry out worldwide restructuring of society, of our civilization of values that we have created over the years – good ones and bad ones.

Here is when the ***Great Reset*** sets in. That's what the WEF calls it. The IMF, working in unison with the WEF, calls it the ***Great Restructuring***.

"Covid-19 – The Great Reset" *(July 2020), was written by* **Klaus Schwab***, founder and CEO of the WEF, and his associate* **Thierry Malleret***. Schwab calls the pandemic* ***"a rare but narrow window of opportunity to reflect, reimagine, and reset our world."*** *– at the outset, it sounds like a good idea – bringing more equality, justice, a cleaner environment and finally peace to our world. Sounds like a dream.*

But when you read the book, and read between the lines, it shows that the Reset means more power to the elite – a GLOBALIST and ever richer elite, that is steering the world's nations – still to some extent sovereign nations – towards a global One World Order (OWO), to be managed through one gigantic global government.

Capitalism, now with a "black" economy – because of our primordial use of hydrocarbons (90+% of all energy), is to be turned into a Green capitalism. Meaning: The capitalist model will be maintained, even enhanced; hydrocarbons will be used to make so-called "green" energy – wind, solar, tidal power. These machineries and mechanisms are created with hydrocarbons.

As an example, we have today electric cars. Where do you think Tesla and consortia get their electric energy from? – It is at least 80% hydrocarbon or nuclear-generated electricity.

So, when you compare energy efficiency of an electric car and a conventional car, on average, the electric car is about 35% energy efficient, while the conventional car about 75%. This does not even account for the environmental and social damage that takes place to mine lithium, the base raw material for the batteries, as well as the rare earths metals used for the cars sophisticated electronics – and being mined largely in Central Africa under the most inhuman work conditions, including with massive child labor. This socio-environmental cost is simply shoved off as an economic "externality".

That's what Green Capitalism is all about. Pushing the so-called New Green Deal – basically painting capitalism green – is an important objective of the Great Reset – and, by the way, of the new Globalist Jo Biden US Administration.

An alternative would be for countries joining together, investing massively into research for new renewable energies, for example, more efficient solar energy – i.e., through photo synthesis.

Another objective of the Great Reset is outright digitization of everything. Algorithms and robots will control our lives. Money – cash – as we know it, will disappear – is already in the process of disappearing. By digitizing the money that we earn and hold in (bank) accounts, we are vulnerable. Depending on our "behavior" – whether we are obedient and submissive to the going dictatorial narrative – we may be allowed to use our earned monetary resources – or not.

It gets better. – In October 2020, the WEF issued a so-called ***White Paper entitled "Resetting the Future of Work Agenda – in a Post-Covid World".***

This 31-page document reads like a blueprint on how to "execute" – or implement – ***"The Great Reset"****. The "White Paper" means it's a draft, like a trial balloon to measure people's reactions.*

It reads indeed like an executioner's tale. Many people may not read it – have no awareness of its existence. If they did, they would go up in arms and fight this latest totalitarian blueprint, offered to the world by the WEF.

It **promises a horrifying future to some 80%-plus of the (surviving) population.**

The Great Reset is to be executed according to the UN Agenda 21-30, meaning in ten years. The WEF outlines some 8 basic predictions, most of them linked to digitization and global control. But the last one is hilarious – "You own nothing and are happy."

Now, contrary to what Klaus Schwab pretends – namely that the pandemic is a window of opportunity for **the Great Reset** – it is the other way around – the covid epidemic had to be invented, planned and implanted to allow The Great Reset to become a plan. We can only hope and act against it – hopefully not to come to fruition.

In addition to robotizing and electronically enslaving humanity, without most of humanity noticing, the Plandemic is also stealing our health, making it one of the most profitable commodities this civilization has ever known.
Just imagine – the idea is to vaccinate the world's 7 billion-plus people within less than ten years. Only then can we move "freely" again. That's the idea, already being floated around by many governments, especially in the west.
That's the kind of policies the Global Cabal orders government leaders to implement, pretending that only when we are all vaccinated, freedom will return. Except that by then we are totally controlled and freedom is just a lame word from a defunct dictionary. In the meantime, Big Pharma makes trillions and trillions of dollars with Our Health – by stealing and commoditizing it.
Who would have thought, less than 12 months ago, that less than a year later we are literally living in a world tyranny? – And that we seem to be subdued and powerless against these also invisible Global Cabalists?
Will we let it happen?
Do we want to live in a New Technological World, a technocracy – to be terrorized, tyrannized and digitized?
Earlier I said – no names shall be mentioned. Yet, I would like to mention one name: Bill Gates.
Beware!
Why is BILL GATES Buying ALL the Farmland?
Our war is about:
Are we letting ourselves be pulled into this subversive World of Tyranny *or do we opt for an open and t****ransparent World of Freedom?***

Peter Koenig *is a geopolitical analyst and a former Senior Economist at the World Bank and the World Health Organization (WHO), where he has worked for over 30 years on water and environment around the world. He lectures at universities in the US, Europe and South America. He writes regularly for online journals and is the author of Implosion – An Economic Thriller about War, Environmental Destruction and Corporate Greed; and co-author of Cynthia McKinney's book "When China Sneezes: From the Coronavirus Lockdown to the Global Politico-Economic Crisis" (Clarity Press – November 1, 2020). Peter Koenig is a Research Associate of the Centre for Research on Globalization.*

The "Smoking Gun" is the PCR Cycle Threshold (Ct): Your Coronavirus Test Is Positive – You Still Might Not Have COVID-19

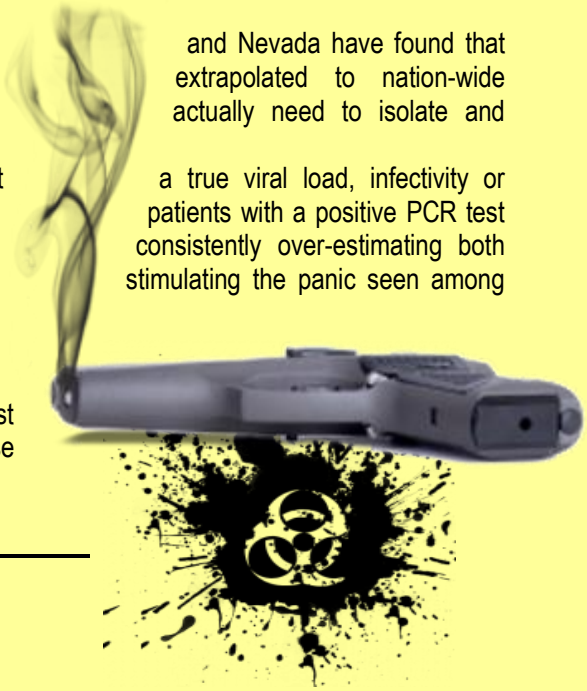
By Dr. Gary G. Kohls
Source: https://www.globalresearch.ca/your-coronavirus-pcr-test-positive-you-still-might-not-have-covid-19/5735461

New York's state lab has access to the ***Cycle Threshold (Ct)*** *values from the PCR tests they process. Last July, the lab identified 872 positive tests based on a threshold of 40 cycles.*

Jan 26 – If the lab has used a cutoff of 35 cycles, 43 percent of those tests would have been considered negative. **What's more, if the cycles had been limited to 30, 63 % of the PCR-positive patients would have been justifiably been regarded as negative.**

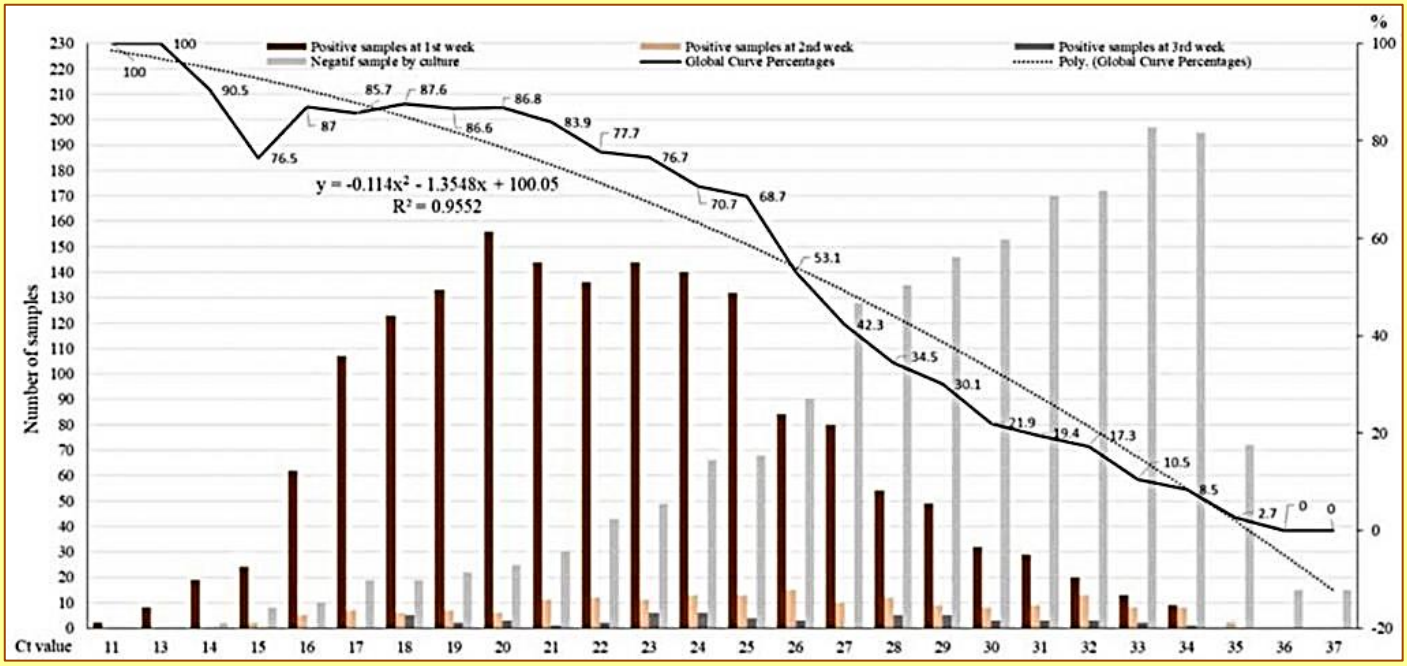
In testing data that include cycle thresholds, officials in Massachusetts, New York and Nevada have found that up to 90 percent of people testing positive carried barely any virus. If that data was extrapolated to nation-wide statistics, the 45,000 new "cases" reported last week perhaps only 4,500 would actually need to isolate and submit to contact tracing

It is obvious that PCR tests need to be interpreted with caution as they do not reflect a true viral load, infectivity or even contagiousness. In fact, many times no viable viruses can be cultured in patients with a positive PCR test result. False positive PCR tests abound, resulting in CDC statistics that have been consistently over-estimating both the incidence rates and mortality rates related to the current epidemic, thus falsely stimulating the panic seen among the many people demanding their vaccinations NOW.



Studies in France, Canada and Singapore, as reported in the August 25, 2020 issue of *Clinical Infectious Diseases*, have tried to culture the Covid-19 virus in patients that had positive PCR test results when the number of "cycles" used in the test exceeded 30. The scientists doing the studies were unable to culture any virus in those

patients. Since many PCR test kits in the United States use cycle thresholds that are actually greater than 35, there is a serious problem with the PCR test, which is considered the "gold standard" for diagnosing SARS CoV-2.
In view of the general consensus (including recent acknowledgements from both the WHO and CDC) that PCR cycle thresholds (Ct) above 30 results in increasingly large false positive test rates that approach 100%. (Note that 30 cycles represents a ***million*** replications of the RNA particles and 40 cycles represents a ***trillion*** replications.)
If it takes a trillion multiplications of a test before any viral RNA fragments (much less viable viruses) can be identified, you can be sure there are not enough viral particles to cause a disease.
Below is some information that should help people understand why mRNA vaccine hesitancy makes total sense.



PCR cycle threshold (11-37) and positive cell culture (black line, 100% to 0%). The colored bars indicate the number of positive cell cultures per Ct per week after infection (1 to 3 weeks). (Jafaar/Raoult)

The above chart is from a French research group that has recently shown that at a cycle threshold (Ct) of **25**, about 70% of nasopharyngeal samples were viral culture positive (i.e. were infectious). At a Ct of **30**, only 20% of the samples were culture positive. And at a Ct of **35**, a miniscule 3% of samples remained culture positive. A**bove 35**, all samples were negative.
This means that if a person gets a "positive" PCR test result at a cycle threshold of 35 or higher (as applied in most US labs and many European labs), the chance that the person is infectious is **less than 3%**. The chance that the person received a "false positive" result is 97% or higher.
The chart above correlates PCR test positivity (black line) with culture results for the tested-for virus (colored bars). If more than 30 cycles are required to get a PCR-positive test result, the cultures will be consistently negative/sterile, meaning that any positive PCR test that only becomes positive after 30 cycles can be called a false positive.
Many PCR test kits on the market use a PCR Ct that is actually above a useless 35! Those kits will naturally result in large numbers of false positives that have already corrupting the CDC's and Department of Health's Covid-19 statistics – and also the CDC's drive to get people inoculated as rapidly as possible with the experimental – and untested for long-term safety and efficacy – the two mRNA vaccines. It is therefore imperative for patients who take a PCR test to know what test kit brands are being used (see partial list below) in your hospital or Public Health Dept laboratory.
Here is a helpful quote:
"…if a person gets a 'positive' PCR test result at a cycle threshold (Ct) of 35 or higher (as applied in most US labs and many European labs), the chance that the person is infectious is less than 3%. The chance that the person received a "false positive" result is 97% or higher." **– Swiss Policy Research**
So, if someone has typical flu symptoms or an influenza-like-illness (ILI) and a positive PCR test that might be a false positive (ie, one that only turns positive at a cycle threshold over

30), perhaps your disease is something other than Covid-19 and shouldn't be reported to the CDC as Covid-19. Something to think about.

And here are some examples of PCR cycle thresholds for five of the PCR test kit brands that are used in the United States:

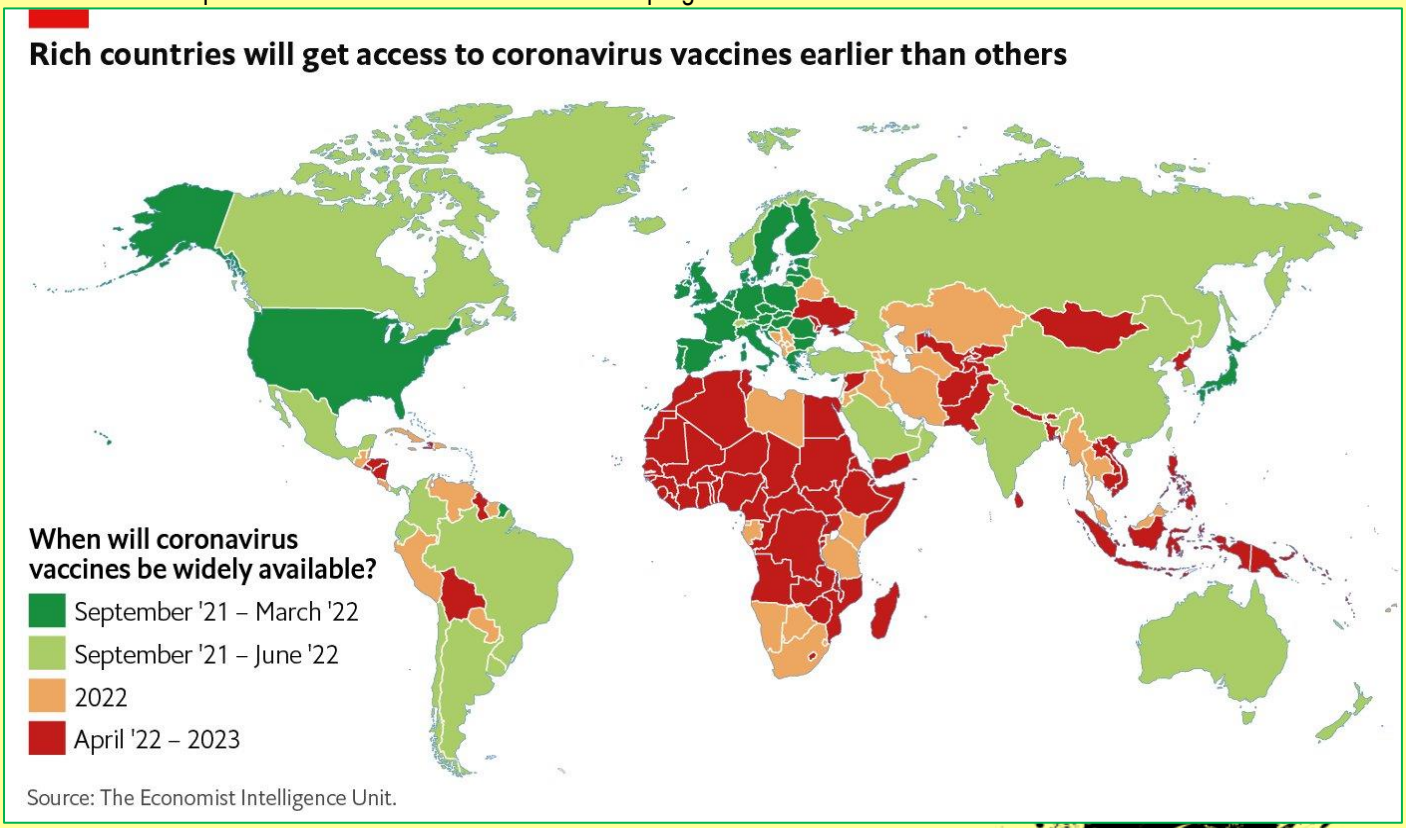
- Quest: 50 cycles
- Inbios: 45 cycles
- Luminex: 45 cycles
- Gnomegen: 39 cycles
- ThermoFisher: 37 cycles

Dr Gary G. Kohls *lives in the USA and writes a weekly column, entitled Duty to Warn, for the Duluth Reader, Duluth, Minnesota's alternative newsweekly magazine. His columns deal with the dangers of American Friendly Fascism, corporatism, Oligarchy, militarism, racism, malnutrition, and Big Pharma's over-drugging and over-vaccinating agendas as well as other movements that threaten the environment, democracy, civility, health and the sustainability and livability of the planet and the future of the children. Dr. Kohls is a past member of Mind Freedom International, the International Center for the Study of Psychiatry and Psychology and the International Society for Traumatic Stress Studies and is a signatory to and/or an advocate of the principles of the Great Barrington Declaration, the World Doctors Alliance and Americas Front Line Doctors. His practice of holistic medicine mainly involved helping the survivors of psychiatry that had often been mis-diagnosed, over-diagnosed and always over-medicated with un-approved and un-tested-for-safety cocktails of neurotoxic psychiatric drugs that not only had sickened them but to which they had also become addicted.*

Rich countries will get access to coronavirus vaccines earlier than others

Source: https://www.eiu.com/n/rich-countries-will-get-access-to-coronavirus-vaccines-earlier-than-others/

Dec 18 – Recent announcements that several coronavirus vaccines are effective have not altered The Economist Intelligence Unit's economic and political forecasts for 2021 onwards. Although positive, these announcements represent only first, limited steps towards the development of safe and effective immunisation programmes.



The vaccines will not be available in quantities large enough in the coming months to be game-changing. Logistics and shipping will also be difficult. We, therefore, maintain our view that a vaccine will not start to be rolled out widely in developed economies before mid-2021. Access to the vaccine will be difficult initially as all developed countries race to acquire sufficient quantities and poorer countries struggle to secure funding. As a result, the rollout in middle-income and emerging countries will take much longer; we do not expect it to take place at a game-changing scale before 2022. The picture appears even bleaker for low-income countries; we do not expect most of these states to have wide access to a vaccine before 2022-23.
The map depicts our current assumptions for the global rollout of coronavirus vaccines, showing when we expect the shots to be widely available for the general population in each country (after priority or special groups have been vaccinated).

EDITOR'S COMMENT: EIU should recolor the map regarding Gulf states – they got the money and their populations are small enough to achieve herd immunity by summer 2021 or the latest, Dec 2021. UAE is already heading to over 20%.

Bipartisan Commission on Biodefense Says Bold Action Can End Era of Pandemic Threats by 2030

Source: https://biodefensecommission.org/reports/the-apollo-program-for-biodefense-winning-the-race-against-biological-threats/

Jan 26 – The Bipartisan Commission on Biodefense is calling on the federal government to urgently implement the recommendations specified in its new report, *The Apollo Program for Biodefense: Winning the Race Against Biological Threats*, as COVID-19 continues to wreak havoc in the United States and all over the world. Released widely today, the report details an ambitious program to develop and deploy the technologies needed to defend against all biological threats, empower public health, and prevent pandemics. **The Commission argues if the United States acts now, this Apollo Program could effectively end the era of pandemic threats by 2030.**

"While the outsized effects of COVID-19 demonstrate how vulnerable the United States is to biological threats, our response to COVID-19 also illuminates the country's astounding potential in terms of resources, manpower, and creativity," said Commission Co-Chair, former Senator Joe Lieberman. "The rapid creation of multiple COVID-19 vaccines speaks to that limitless potential."
"It is our belief that with the right encouragement and policies, groundbreaking and lifesaving technologies could be American reality before the end of this decade, creating a layered and effective defense against future biological threats," said Commission Co-Chair, former Homeland Security Secretary Tom Ridge. "Now is the time for an Apollo Program for Biodefense – with the same ambition and ingenuity that put the first human on the Moon in 1969."
To achieve the results sought in this new report, the Commission urges the Administration and Congress to include funds for The Apollo Program for Biodefense as part of a unified biodefense budget and in the President's Budget Request; appropriate long-term, multi-year funding for the Program; and fully implement the remaining recommendations laid out in the Commission's 2015 National Blueprint for Biodefense.
With ambitious technology goals in mind, the Commission's recommended Program would ideally deploy medical countermeasures within days or in advance of a biological event, detect a novel biological threat at the first human cluster, and enable the public to gather in spaces built to defend against pathogen transmission. The United States must invest in innovation, achieve goals quickly, and engage and motivate America's entrepreneurial spirit.

▶▶ **The full report may be accessed here.**

China deploys anal swabs to test for Covid-19

Source: https://www.france24.com/en/live-news/20210127-china-deploys-anal-swabs-to-test-for-covid-19

Jan 27 – China has begun using anal swabs to test those it considers at high risk of contracting Covid-19, state TV reported, with social media users and travellers squirming over the invasive procedure which doctors say can be more effective in detecting the virus.

Officials took anal swabs from residents of neighbourhoods with confirmed Covid-19 cases in Beijing last week, broadcaster CCTV said, while those in designated quarantine facilities have also undergone the test.

Small, localized outbreaks in recent weeks have seen multiple cities in northern China sealed off from the rest of the country and prompted mass testing campaigns -- which up until now have mostly been conducted using throat and nose swabs.

But the anal swabs method "can increase the detection rate of infected people" as traces of the virus linger longer in the anus than in the respiratory tract, Li Tongzeng, a senior doctor from Beijing's You'an Hospital, told CCTV.

Users of China's popular Twitter-like Weibo social media platform reacted to the method with a mix of mirth and horror.

"So lucky I returned to China earlier," one user wrote.

"Low harm, but extreme humiliation," another said, using a laughing emoticon.

Others who had undergone the procedure chimed in with dark humour.

"I've done two anal swabs, every time I did one, I had to do a throat swab afterwards -- I was so scared the nurse would forget to use a new swab," one Weibo user joked.

CCTV said on Sunday anal swabs would not be used as widely as other methods, as the technique was "not convenient."

As cases rise around the world, China has imposed stricter requirements on international arrivals in an effort to keep domestic transmission close to zero.

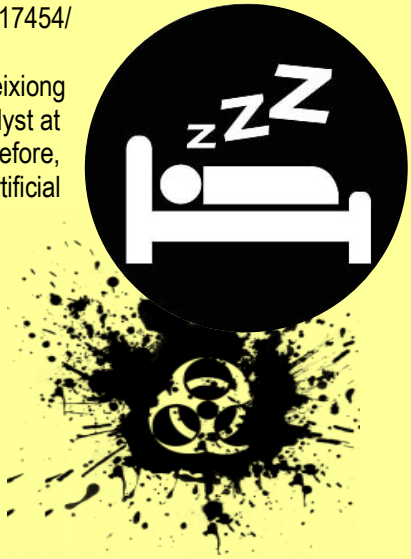
All arrivals into the country must have multiple negative test results and quarantine for at least 14 days in a designated hotel on arrival, with many cities and regions imposing additional home observation requirements.

EDITOR'S COMMENT: Countless times I have changed the photos accompanying various articles mainly because they are irrelevant to the topic or just decorative. The photo above is one of them. Can you imagine experiencing an anal covid test in this setting made for nasopharyngeal swab testing? Unless you are an acrobat!

The Mysterious Link Between COVID-19 and Sleep

By James Hamblin

Source: https://www.theatlantic.com/health/archive/2020/12/covid-19-sleep-pandemic-zzzz/617454/



Dec 21 – The newly discovered coronavirus had killed only a few dozen people when Feixiong Cheng started looking for a treatment. He knew time was of the essence: Cheng, a data analyst at the Cleveland Clinic, had seen similar coronaviruses tear through China and Saudi Arabia before, sickening thousands and shaking the global economy. So, in January, his lab used artificial intelligence to search for hidden clues in the structure of the virus to predict how it invaded human cells, and what might stop it. One observation stood out: The virus could potentially be blocked by melatonin.

Melatonin, best known as the sleep hormone, wasn't an obvious factor in halting a pandemic. Its most familiar role is in the regulation of our circadian rhythms. Each night, as darkness

falls, it shoots out of our brain's pineal glands and into our blood, inducing sleep. Cheng took the finding as a curiosity. "It was very preliminary," he told me recently—a small study in the early days before COVID-19 even had a name, when anything that might help was deemed worth sharing.

After he published his research, though, Cheng heard from scientists around the world who thought there might be something to it. They noted that, in addition to melatonin's well-known effects on sleep, it plays a part in calibrating the immune system. Essentially, it acts as a moderator to help keep our self-protective responses from going haywire—which happens to be the basic problem that can quickly turn a mild case of COVID-19 into a life-threatening scenario.

Cheng decided to dig deeper. For months, he and colleagues pieced together the data from thousands of patients who were seen at his medical center. In results published last month, melatonin continued to stand out. People taking it had significantly lower odds of developing COVID-19, much less dying of it. Other researchers noticed similar patterns. In October, a study at Columbia University found that intubated patients had better rates of survival if they received melatonin. When President Donald Trump was flown to Walter Reed National Military Medical Center for COVID-19 treatment, his doctors prescribed—in addition to a plethora of other experimental therapies—melatonin.

Eight clinical trials are currently ongoing, around the world, to see if these melatonin correlations bear out. Few other treatments are receiving so much research attention. If melatonin actually proves to help people, it would be the cheapest and most readily accessible medicine to counter COVID-19. Unlike experimental drugs such as remdesivir and antibody cocktails, melatonin is widely available in the United States as an over-the-counter dietary supplement. People could start taking it immediately.

Yet Cheng emphasizes that he's not recommending that. Like any substance capable of slowing the central nervous system, melatonin is not a trifling addition to the body's chemistry. Its apparent benefit to COVID-19 patients could simply be a spurious correlation—or, perhaps, a signal alerting us to something else that is actually improving people's outcomes. Cheng thinks that might be the case. He and others suggest that the real issue at play may not be melatonin at all, but the function it most famously controls: sleep.

In fact, several mysteries of how COVID-19 works converge on the question of how the disease affects our sleep, and how our sleep affects the disease. The virus is capable of altering the delicate processes within our nervous system, in many cases in unpredictable ways, sometimes creating long-term symptoms. Better appreciating the ties between immunity and the nervous system could be central to understanding COVID-19—and to preventing it.

Throughout the pandemic, the department of neurology at Johns Hopkins University has been flooded with consultation requests for people suffering from insomnia. Rachel Salas, one of the team's neurologists, says she initially thought this surge in sleep disorders was merely the result of all the anxieties that come with a devastating global crisis: worries about health, the economic impact, and isolation. Indeed, patterns of sleep disruption have played out around the world. Roughly three-quarters of people in the United Kingdom have had a change in their sleep during the pandemic, according to the British Sleep Society, and less than half are getting refreshing sleep. "In the summer, we were calling it 'COVID-somnia,'" Salas says.

In recent months, however, Salas has watched a more curious pattern emerge. Many people's sleep continues to be disrupted by predictable pandemic anxieties. But more perplexing symptoms have been arising specifically among people who have recovered from COVID-19. "We're seeing referrals from doctors because the disease itself affects the nervous system," she says. After recovering, people report changes in attention, debilitating headaches, brain fog, muscular weakness, and, perhaps most commonly, insomnia. Many don't seem anxious or preoccupied with pandemic-related concerns—at least not to a degree that could itself explain their newfound inability to sleep. Rather it is sometimes part of what the medical community has begun to refer to as "long COVID," where symptoms persist indefinitely after the virus has left a person. When it comes to sleep disturbances, Salas worries, "I expect this is just the beginning of long-term effects we're going to see for years to come."

Her colleague Arun Venkatesan has been trying to get to the bottom of how a virus could cause insomnia. He focuses specifically on autoimmune and inflammatory diseases that affect the nervous system. Initially, Venkatesan says, the common assumption among doctors was that many post-COVID-19 symptoms were due to an autoimmune reaction—a misguided, targeted attack on cells of one's own body. This can happen in the nervous system after infections by various viruses, in predictable patterns, such as that of Guillain-Barré syndrome. In the days after an infection, as new antibodies mistakenly attack nerves, weakness and numbness spread from the tips of the extremities inward. Disconcerting as it can be, this type of pattern is at least identifiable and predictable; doctors can tell patients what they're dealing with and what to expect.

By contrast, the post-COVID-19 patterns are sporadic, not clearly autoimmune in nature, says Venkatesan. The symptoms can appear even after a mild case of COVID-19, and timescales vary. "We've seen a number of patients who were not even hospitalized, and felt much better for weeks, before worsening," Venkatesan says. And the findings aren't limited to the brain. At Northwestern University, the radiologist Swati Deshmukh has been fielding

a steady stream of cases in which people experience nerve damage throughout the body. She has been looking for evidence that the virus itself might be killing nerve cells. Hepatitis C and herpes viruses are known to do so, and autopsies have found SARS-CoV-2 inside nerves in the brain.

Still, she believes, symptoms are most likely due to inflammation. Indeed, the leading theory to explain how a virus can cause such a wide variety of neurologic symptoms over a variety of timescales comes down to haphazard inflammation—less a targeted attack than an indiscriminate brawl. This effect is seen in a condition known as myalgic encephalomyelitis, sometimes called chronic fatigue syndrome. The diagnosis encompasses myriad potential symptoms, and likely involves multiple types of cellular injury or miscommunication. In some cases, damage comes from prolonged, low-level oxygen deprivation (as after severe pneumonia). In others, the damage to nerve-cell communication could come by way of inflammatory processes that directly tweak the functioning of our neural grids.

The unpredictability of this disease process—how, and how widely, it will play out in the longer term, and what to do about it—poses unique challenges in this already-uncertain pandemic. Myalgic encephalomyelitis is poorly understood, stigmatized, and widely misrepresented. Medical treatments and diagnostic approaches are unreliable. General inflammatory states rarely respond to a single prescription or procedure, but demand more holistic, ongoing interventions to bring the immune system back to equilibrium and keep it there. The medical system is not geared toward such approaches.

But this understanding of what is happening may also offer some hope. Although the technical details are clearly thorny, there is some reassurance in what the doctors are *not* seeing. When nerves are invaded and killed, the damage can be permanent. When nerves are miscommunicating—in ways that come and go—that process can be treated, modulated, prevented, and quite possibly cured. Although sleep cycles can be disturbed and damaged by the post-infectious inflammatory process, radiologists and neurologists aren't seeing evidence that this is irreversible. And among the arsenal of ways to attempt to reverse it are basic measures such as sleep itself. Adequate sleep also plays a part in minimizing the likelihood of ever entering into this whole nasty, uncertain process.

A central function of sleep is maintaining proper channels of cellular communication in the brain. Sleep is sometimes likened to a sort of anti-inflammatory cleansing process; it removes waste products that accumulate during a day of firing. Without sleep, those by-products accumulate and impair communication (just as seems to be happening in some people with post-COVID-19 encephalomyelitis). "In the early stages of COVID-19, you feel extremely tired," says Michelle Miller, a sleep-medicine professor at the University of Warwick in the U.K. Essentially, your body is telling you it needs sleep. But as the infection goes on, Miller explains, people find that they often can't sleep, and the problems with communication compound one another.

The goal, then, is breaking out of this cycle, or preventing it altogether. Here the benefits of sleep extend throughout the body. "Sleep is important for effective immune function, and it also helps to regulate metabolism, including glucose and mechanisms controlling appetite and weight gain," Miller says. All of these bear directly on COVID-19, as risk factors for severe cases include diabetes, obesity, and sleep apnea. Even in the short term, getting enough deep, slow-wave sleep will optimize your metabolism and make you maximally prepared should you fall ill. These effects may even bear on vaccination. Flu shots appear to be more effective among people who have slept well in the days preceding getting one.

All of this leads back to the basic question: Is one of the most glaring omissions in public-health guidelines right now simply to tell people to get more sleep?

The only health advice more banal than being told to wash your hands is being told to sleep more. But it's a cliché for a reason. Sleep fortifies and prepares us for any given crisis, but especially when the days are short and cold, and people have little else they might do to empower and protect themselves. Monotonous days can slip people into depression, alcohol abuse, and all manner of suboptimal health. It may well turn out that standard pandemic advice should be to wear a mask, keep distances, and get sleep.

That's easier said than done. Asim Shah, a psychiatry and behavioral-sciences professor at Baylor College of Medicine, believes sleep is at the core of many of the mental-health issues that have spiked over the course of the year. "There's a complete lack of structure. That has caused a huge disturbance in the sleep cycles," he says. "Usually everyone has a schedule. They get sunlight and they generate melatonin and it puts them to sleep. Right now, we're seeing people losing interest in things, isolating, not exercising, and then not getting sleep." Depression and anxiety make insomnia worse, and the cycle degenerates.

This may be where melatonin—or other approaches to enhancing the potent effects of sleep—could be consequential. Russel Reiter, a cell-biology professor at the University of Texas at San Antonio, is convinced that widespread treatment of COVID-19 with melatonin should already be standard practice. In May, Reiter and colleagues published a plea for melatonin to be immediately given to everyone with COVID-19.

If the world of melatonin research had a molten core, it would be Reiter. He has been studying the hormone's potential health benefits since the 1960s, and tells me he takes 70 milligrams daily. (Most bottles at the pharmacy recommend from 1 to 10 milligrams.) After

we spoke, he sent me some of the many journal articles he has published on melatonin and COVID-19, at least four of which appeared in *Melatonin Research*. He blithely referred to them as "propaganda" and noted that he has been studying melatonin since before I was born (without asking when that was). "I know melatonin sideways and backwards," Reiter said, "and I'm very confident recommending it."

The majority of sleep scientists, though, seem to agree that the most crucial interventions that facilitate sleep will not be medicinal, or even supplemental. The general recommendation is that getting your body's melatonin cycles to work regularly is preferable to simply taking a supplement and continuing to binge Netflix and stare at your phone in bed. Now that so many people's days lack structure, Shah believes a key to healthy pandemic sleep is to deliberately build routines. On weekends, wake up and go to bed at the same time as you do other days. Take scheduled walks. Get sunlight early in the day. Reduce blue light for an hour before bed. Stay connected with other people in meaningful ways, despite being physically distant.

Even small daily rituals can help, says Tricia Hersey, the founder of a nap-advocacy organization called the Nap Ministry. Light a candle. Have a cup of tea in a specific place at a certain time. "Repetitive rituals are part of what makes us human and ground ourselves," she told me. They're also perhaps the most attainable intervention there is. Wherever you are, Hersey says, "you can daydream. You can slow down. You can find small ways to stop and remember who you are."

To her, feeling in control over sleep is important precisely because order is lacking in so many other parts of life for so many people. Year over year, there are significant sleep disparities across the U.S. population. The amount and quality of sleep we get depend on our environment as much as, if not more than, our personal behavior. Socioeconomic status and quality sleep chart on parallel lines. The most effective way to improve sleep is to ensure that people have a calm and quiet place to rest each night, free of concerns about basic needs such as food security. The pandemic has brought the opposite assurances, exacerbating the uncertainties at the root of already-stark disparities.

As the quest for sleep falls only more to individuals, many are left to think outside the box. That has included, for some, dabbling in hypnosis. Not the kind of hypnosis where you're onstage and told to act like a chicken, but a process slightly more refined. Christopher Fitton is one of a number of hypnotherapists who have spent the pandemic creating YouTube videos and podcasts meant to help put people to sleep. Fitton's sessions involve 30 minutes of him saying empowering things to listeners in his pleasant, semi-whispered voice. He tells me he is now getting more than 1 million listens a month.

Hypnotherapy is meant to slow down the rapid firing of our nerves. Similar to guided meditation or deep breathing, the intent is to stop people from overthinking and allow sleep to happen naturally. As you listen to Fitton saying banal things about the muscles in your back or asking you to envision a specific tree in a specific place, "the aim is to get into a relaxed, trancelike state, where your subconscious is open to more suggestion," he says. Then, when he tells you to sleep, your brain is less likely to argue with him about how you're too busy, or how you need to worry more about why someone read your text message but didn't reply.

Hypnotherapists such as Fitton provide tools to ground yourself, ultimately in pursuit of being able to do it unassisted, sans the internet. (It's better not to bring your phone into your bedroom anyway.) Focusing involves practice; the trancelike state rarely happens easily, and no single way works for everyone. Some experimentation is usually needed. Apparently it still is for me. While listening to one of Fitton's recordings, I couldn't fully escape the image of him in his home office speaking softly into his microphone, reading an ad for Spotify, just as alone as everyone else.

But regardless of whom you trust to help relieve you of consciousness, now seems like an ideal time to get serious about the practice. Draw boundaries for yourself, and sleep like your life depends on it. Hopefully it won't.

***James Hamblin, M.D.**, is a staff writer at The Atlantic. He is also a lecturer at Yale School of Public Health, co-host of Social Distance, and author of Clean: The New Science of Skin.*

If You Squeeze the Coronavirus, Does It Shatter?

By Katherine J. Wu

Source: https://www.nytimes.com/2021/01/26/science/coronavirus-physics-vaccine.html

Jan 26 – Of all the pandemic questions bedeviling scientists, the one that Juan Perilla is asking might be among the strangest: **If a shrunk-down hand were to squeeze the coronavirus, would it squish, or would it shatter?**

Viruses like H.I.V. tend to be on the softer side, smooshing down like a foam ball, whereas the ones that cause influenza are more brittle, prone to cracking like an egg, said Dr. Perilla, a biophysical chemist at the University of Delaware in Newark. Coronaviruses, he suspects, are somewhere in the middle, a sort of tactile Goldilocks in the world of infectious disease.

"It's something you never consider when you talk about viruses," Dr. Perilla said. But it's part and parcel, he added, of "trying to understand how a virion is strung together."

Like many other microbes, viruses are known best as malady-toting motes of misfortune — obvious grist for biologists keen to understand the inner workings of infection. But in recent years, physicists too have joined the field, eager to decipher how viruses cobble themselves together and move from place to place despite lacking most of the machinery that enables cells to replicate and run.

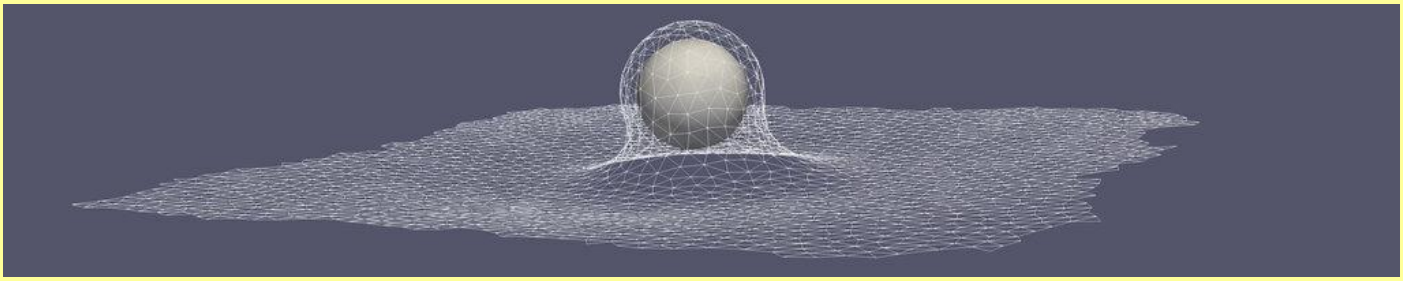
Some physicists, like Dr. Perilla, are teasing apart the mechanical properties of virus particles, while others monitor the forces that bring the bits and pieces of viruses together or tear them apart. Some are even enlisting physics to design the next generation of Covid-19 treatments, whether by disrupting the forces that assemble viruses inside human cells or by creating a suite of self-replicating vaccines.

"Once you understand how something works, you can understand how to sabotage it," said Jodi Hadden-Perilla, a biophysical chemist at the University of Delaware. (Dr. Perilla and Dr. Hadden-Perilla, a married couple, are professional collaborators.)

Physics and virology are now so academically intertwined that their union has acquired a formal name: virus physics (or, to some, physical virology). And the data its pioneers produce can have consequences far beyond the microbial world.

"At the end of the day," said LaNell Williams, a virologist and physicist at Harvard University, "we're trying to figure out what physics viruses already know."

Simply complex



A simulation showing one possible step of the coronavirus assembly process. After the virus's genome is condensed (the sphere), it "buds" from a membrane-bound compartment, stealing a fatty coat (the web-like matter that forms a bubble around the sphere). Part of this process involves forcing the host membrane to curve around the virus's genome. Video by Roya Zandi, University of California Credit...

Viruses are both absurdly simple and dizzyingly complex. Many are composed of little more than a tangle of genetic material stuffed into a protein coat — not even enough for some scientists to consider them alive. They are entirely dependent on the inner workings of cells, and cannot make more of themselves without help from the life-forms they infect.

And yet, under the right conditions, basic viral components can accomplish what many natural phenomena cannot: a process called self-assembly, combining their bits into neat, structured particles without any external forces to guide them, like cake ingredients mixing themselves into batter or snowflakes sprouting spontaneously out of room-temperature water.

It's a beguiling question, Ms. Williams said: "Why do ordered things form without any assistance?"

Scientists can recreate this mysterious process in laboratory test tubes. They swirl together hunks of genetic material and proteins in salty chemical soup, and watch the viruses erupt forth. "It's remarkable," said Vinothan Manoharan, a biophysicist and engineer at Harvard University and Ms. Williams's adviser. "You have these pieces spontaneously coming together, without any active intervention: It just happens."

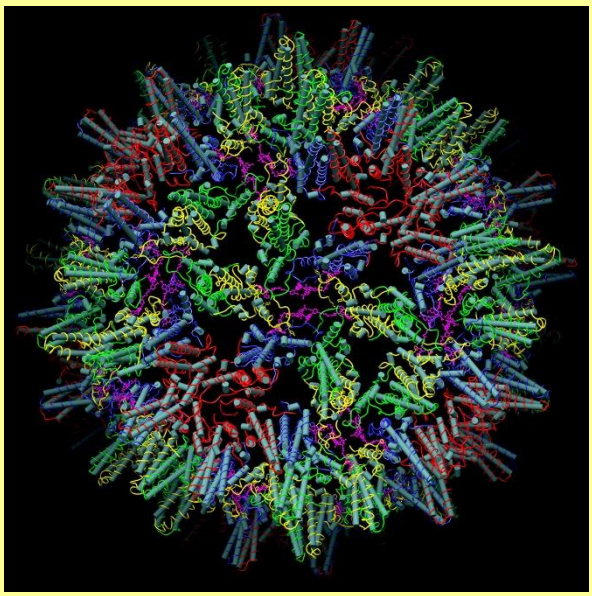
Bill Gelbart, a physical-chemist-turned-virologist at the University of California, Los Angeles, said it was this astounding buildability that drew him to viruses 20 years ago — an unexpected midcareer transition. Other diseases, like cancer, could not be boiled down to their base components and assembled or disassembled at will. Even bacteria, some of the simplest and best understood life-forms, can't reform once ripped apart.

Viruses are different. "I was powerfully fascinated by the idea that an infectious virus particle can be made from scratch from purified components," Dr. Gelbart said. "I think the Dr. Frankenstein in me got the better of me. I thought, 'I have to do that.'"

That same desire has seeded dozens of virus physics labs around the globe (several of which cite Dr. Gelbart as an inspiration). Dr. Manoharan's lab is one, focused on the assembly of bacteriophages, viruses that exclusively infect bacteria.
The static pictures and diagrams in textbooks don't do viruses justice, Dr. Manoharan said. They tend to focus on the products of virus assembly. But the pieces within viruses — the genomes and proteins — start out as a dynamic jumble, and the chaotic motions are an obstacle for any virus that might organize itself into existence. Moreover, its components must find each other, without mistaking the cell's cargo for its own.
By and large, researchers don't yet have answers for how viruses solve this packaging problem. The process is especially complex for coronaviruses, which possess some of the largest known RNA-based genomes known to science. (RNA is a cousin of the DNA that encodes the human genome.)
But scientists have already figured out ways to spy on the coronavirus's assembly process, and start to replicate it for themselves.

A tight squeeze

A crucial early step in the coronavirus's construction is carried out by a protein called nucleocapsid, which wrangles the virus's RNA into a tight conformation and holds it in place, so it can be more easily packaged
Jasmine Cubuk, a biochemist and biophysicist at Washington University in St. Louis, is using a microscopy technique called fluorescence resonance energy transfer, or FRET, to monitor these molecular tangos in real time. In a study that has not yet been published in a scientific journal, Ms. Cubuk and her colleagues showed that nucleocapsids are wiggly, which might help them shimmy around a host cell in search of their viral RNA partners.
Ms. Cubuk compared the flexibility of nucleocapsids to fly casting, where the compliance of the line that's cast yields "a larger capture radius" and makes it easier to snare the target.
Once nucleocapsid and RNA have partnered up, they cloister themselves from the surrounding molecules, like globs of oil separating out of a salad vinaigrette, Ms. Cubuk and her colleagues found. These movements appear to create concentrated pockets of viral material, and may help explain how the vast genome of the coronavirus "gets packaged into something so tiny," Ms. Cubuk said.
At the University of California, Riverside, a team led by the physicist Roya Zandi has turned its lens to the next step of the process: bundling the virus's newly-condensed genome into its fatty, fragile outer coat, called the envelope. To accomplish this, the virus must steal some of its host cell's greasy membranes, while interlacing proteins of its own. Dr. Zandi and her colleagues, using computational models and simulations, are testing how human and virus ingredients come together.
One point of fascination, she said, is how the virus forces its outer packaging to curve around it, transforming the pathogen into an intricate, spike-studded sphere. "The membrane has to bend quite a lot around such a big genome," she said. "What kind of interactions between proteins can induce that?"
The knowledge contained within these experiments can teach scientists not just how to build viruses, but how to destroy them as well.



A graphic, made using cryo-electron microscopy, of a hepatitis B virus capsid where the protein is in red, green, yellow and blue (colors chosen to highlight capsid geometry) and a drug-like compound, HAP-TAMRA, in magenta.Credit...Schlicksup, Wang, et al (2018)

Breaking a virus

Decades of work have reaffirmed that the virus assembly process is extraordinarily fickle. Tweak one variable and the whole contraption falls apart, or never forms.
That frailty is exactly what many researchers are counting on. Adam Zlotnick, a biophysicist at Indiana University Bloomington, specializes in disrupting virus assembly. An obvious strategy, he said, would be to introduce a drug or other treatment to slow or stop the building of new viruses. But he and his colleagues have found that using drugs to speed up the process can also prove disastrous. Unable to wriggle into the proper configuration, or to correct initial errors, the virus's bits and pieces might glue together improperly, layering mistakes atop mistakes until the entire structure is malformed.

"If you make it go a little bit faster, that's bad, you get more virus," said Dr. Zlotnick, who compared the acceleration to the chaos that might unfold if an assembly line was moving too fast. "But a lot faster? It's going to screw up and make defective particles."
Dr. Zlotnick has spent much of his career working on the hepatitis B virus, and has helped to develop drugs that can foil the pathogen's assembly process, some of which are now in clinical trials. Although the coronavirus is a very different beast, it could someday be vulnerable to the same general strategy, Dr. Zlotnick said.
Other researchers are eyeing another step in the virus-building pipeline: the generation of virus genes, before they are packaged into their protein capsules. Carlos Bustamante, a biophysicist at the University of California, Berkeley, is set on sabotaging a protein called polymerase, which copies the coronavirus's genome.
The polymerase zooms over a stretch of RNA and replicates it letter for letter, a process that requires an intimate connection between the molecules and enough force to propel the protein. That force can be measured with a tiny set of "optical tweezers" — a laser that hooks on to one end of the polymerase, using a microscopic glass bead, and pulls in the direction opposite the protein's path. "We are playing tug of war," Dr. Bustamante said. "Every time it moves, it has to pull us."
The hope, he said, is to understand the tug well enough to design a drug that blocks the RNA-copying process.
In Delaware, Dr. Perilla and Dr. Hadden-Perilla are studying a moment even earlier in the process, when the coronavirus enters a human cell and unravels its genome. This transforms the virus from a hardy infectious particle, which must move through the air and evade immune cells, into a naked and vulnerable template, unspooling itself for evaluation. The coronavirus "is a shape-shifter," Dr. Hadden-Perilla said. But scientists don't fully understand how the virus can tell when it's time to disrobe.
Dr. Perilla said he suspected that some sort of signal inside human cells might trigger the virus's shell to pop open and release its RNA. That's the case for the Ebola virus, he said: "It wants to open." Stopping that process could be vital to halting an infection before it spirals out of control.

A more viral vaccine

In his laboratory in Los Angeles, Dr. Gelbart is tackling a construction project of his own: the next great coronavirus vaccine.
His vaccine, designed in collaboration with virologist Otto Yang, contains two main ingredients, both inspired by ultrasimple viruses that consist of only RNA and protein. The first is an empty protein shell, derived from a harmless plant virus, studded with ready-made coronavirus spike proteins. This virus-like particle is, in a sense, a caricature of the coronavirus. It is not infectious in itself, but can teach the immune system to recognize the actual virus and fight it off, should it try to invade the body.
The Gelbart team's vaccine also includes a second, spike-free virus shell containing RNA that can instruct human cells to churn out a second wave of coronavirus proteins.
Shots developed by the companies Pfizer-BioNTech and Moderna use similar technology, and are already finding their way into arms around the world. But the RNA in these vaccines is fragile, capable of persisting for only a couple of days after injection, which limits the period when the immune system is exposed to the coronavirus's spike protein.
To prolong the RNA's tenure in the body, Dr. Gelbart's next-generation vaccine comes packaged with another molecule to copy the genetic material a few times over, with the hope that the body will both strengthen and lengthen its memory of the coronavirus. Early experiments in the lab suggest that the team's vaccine, which is still in its infancy, appears to elicit a more vigorous response from certain immune cells. No infectious virus would be produced, only a lengthy lesson for immune cells to learn from.
At the heart of his team's idea is the ingenuity of viruses, which have already found success at entering their hosts unharmed and delivering their contents to cells. That process, Dr. Gelbart said, doesn't need much modification to become a safe and sustainable option to ward off future disease.
"We're learning from the virus," he said. "How to protect RNA, and get it where you want it."
For him and others in the field, the simplicity of viruses is the source of their appeal, and their strength — one that humankind has yet to fully match.
"Cells want to kill them, societies want to kill them," Dr. Perilla, of the University of Delaware, said. "And yet, they survive."

Eli Lilly, Regeneron Report Positive Phase III COVID-19 Antibody Results

Source: https://www.genengnews.com/news/eli-lilly-regeneron-report-positive-phase-iii-covid-19-antibody-results/

Jan 27 – Three antibody candidates designed to fight COVID-19, including two that are authorized for emergency use by the FDA, have shown positive late-stage clinical results according to separate studies released by their developers, Eli Lilly and Regeneron Pharmaceuticals.

Lilly said its authorized bamlanivimab (LY-CoV555), in combination with another of its antibody candidates, etesevimab (LY-CoV016), met the primary endpoint of the Phase III BLAZE-1 trial (NCT04427501) by significantly reducing COVID-19-related hospitalizations and deaths in high-risk patients recently diagnosed with COVID-19.
Of the 10 patients who died during the study, all were randomized to placebo, Lilly added.

Lilly reported 11 events (2.1%) in patients receiving its antibody combination, compared with 36 events (7%) in placebo patients—a 70% risk reduction among the study's 1,035 patients. That decrease was consistent with the reduction in risk of hospitalization or ER visits seen with bamlanivimab alone in the Phase II portion of BLAZE-1, the company said.

EDITOR'S COMMENT: Is it ethical to test drugs/vaccines on real/active patients? What if these 10 patients who DIED were in the active drug group. Would they be alive today? The argument that this way many others will be saved does not justify this especially if one of the dead was your family or relative. We urgently need alternative ways to test the effectiveness of our drugs – urgently!

The bamlanivimab-etesevimab combo also showed statistically significant improvements on all four key secondary endpoints—the change from baseline to day 7 in SARS-CoV-2 viral load, persistently high SARS-CoV2 viral load on day 7, time to sustained symptom resolution, and COVID-related hospitalization, ER visit or death from any cause from baseline by day 29.
By generating positive results in the secondary endpoints, Lilly said, bamlanivimab-etesevimab offered strong evidence that the combination shrunk viral load and accelerated symptom resolution.
"These exciting results, which replicate positive Phase II data in a much larger set of patients, add valuable clinical evidence about the role neutralizing antibodies can play in fighting this pandemic," Daniel Skovronsky, MD, PhD, Lilly's chief scientific officer and president of Lilly Research Laboratories, said yesterday in a statement. "These data further support our belief that bamlanivimab and etesevimab together have the potential to be an important treatment that significantly reduces hospitalizations and death in high-risk COVID-19 patients," Skovronsky added.
The results marked the second time in less than a week that Lilly announced a positive clinical outcome for bamlanivimab.
On January 21, the company trumpeted findings from its BLAZE-2 trial (NCT04497987), saying that bamlanivimab significantly reduced the risk of contracting symptomatic COVID-19 among residents and staff of long-term care facilities compared with placebo after eight weeks. Lilly said that 299 SARS-CoV-2 negative residents randomized to bamlanivimab had up to an 80% lower risk of contracting COVID-19 versus residents in the same facility randomized to placebo.
BLAZE-2 enrolled 965 participants who tested negative for SARS-CoV-2 at baseline (299 residents and 666 staff), and 132 participants (41 residents and 91 staff) who tested positive. Lilly is conducting BLAZE-2 with the NIH's National Institute of Allergy and Infectious Diseases (NIAID) and the COVID-19 Prevention Network (CoVPN).

Discovery platforms
Bamlanivimab is a recombinant, neutralizing human immunoglobulin G1 (IgG1) monoclonal antibody first identified in a blood sample from one of the first U.S. patients who recovered from COVID-19. The antibody was discovered through the rapid pandemic response platform of partner AbCellera, in collaboration with NIAID's Vaccine Research Center. Lilly and AbCellera partnered in March 2020 to identify the most promising of 500+ antibodies discovered through the platform.
Etesevimab is a recombinant fully human monoclonal neutralizing antibody designed to specifically bind to the SARS-CoV-2 surface spike protein receptor-binding domain with high affinity, while blocking the binding of the virus to the ACE2 host cell surface receptor.
The FDA is reviewing Lilly's request for an Emergency Use Authorization (EUA) for the bamlanivimab-etesevimab combination. The FDA granted an EUA to bamlanivimab on November 9, allowing for distribution and emergency administration via a single intravenous infusion at the lowest IV dose studied, 700 mg. Nearly two weeks later on November 21, the FDA authorized REGEN-COV (casirivimab and imdevimab) for emergency use, with administration via a single intravenous infusion at 2,400 mg—consisting of 1,200 mg of casirivimab and 1,200 mg of imdevimab. Casirivimab and imdevimab were the two most potent, non-competing, and virus-neutralizing antibodies selected from thousands produced through Regeneron's monoclonal antibody discovery platform VelocImmune®, part of the company's VelociSuite™ technologies. Regeneron has said it has produced two distinct antibody cocktails, an initial cocktail and a backup.
Both the Regeneron and Lilly antibody treatments are indicated for adults and youths ages 12 years and older with mild-to-moderate COVID-19. In granting the companies their EUAs, the FDA emphasized that the antibody therapies are not authorized for patients who are hospitalized due to COVID-19 or require oxygen therapy due to COVID-19, since no benefit to the treatments has been shown in those patients.

Bamlanivimab and REGEN-COV2 are also among 21 "Front Runner" leading candidates among the more than 300 COVID-19 therapeutics under study in *GEN*'s "COVID-19 Drug & Vaccine Candidate Tracker."

Regeneron's passive cocktail

Fifteen minutes after Lilly released its data, Regeneron Pharmaceuticals announced positive initial results from an ongoing Phase III clinical trial assessing its two-antibody "cocktail" REGEN-COV (casirivimab and imdevimab) as a passive vaccine for preventing COVID-19 in people at high risk of infection due to household exposure to a patient with SARS-CoV-2.

"Passive" vaccines provide immediate short-term or passive immunity by delivering protective virus-neutralizing antibodies directly to patients, either through antibody treatments or from mother to child through breast milk.

Regeneron said passive vaccination with REGEN-COV resulted in full 100% prevention of symptomatic infection (zero of 186 REGEN-COV patients) compared with the eight patients with symptomatic infections among the 223 randomized to placebo in the study, which was jointly conducted with NIAID.

"**The 100% reduction in symptomatic COVID-19 with prophylactic use of REGEN-COV is striking,"** Geoffrey C. Porges, MBBS, director of therapeutics research and a senior research analyst at SVB Leerink, wrote yesterday in a research note.

REGEN-COV also resulted in approximately 50% lower overall rates of symptomatic and asymptomatic infection—10 of 186 patients, compared with 23 of 223 placebo patients. The lower number of infections occurring with REGEN-COV therapy were all asymptomatic, with decreased peak virus levels and short duration of viral shedding, Regeneron said.

The increased rate of SARS-CoV-2 infections in the placebo group in turn drove more frequent adverse events, Regeneron observed. According to its data, 18% of placebo patients experiencing adverse events, compared with 12% of patients treated with REGEN-COV.

Infections in the REGEN-COV group lasted no more than one week, the company added, compared with the 3-to-4 week duration of approximately 40% of infections in the placebo group. Also, none of the asymptomatic infected individuals in the REGEN-COV group (0 of 9) showed high viral loads (>10^4 copies/mL), compared to the 62% of infected patients (13 of 21) in the placebo group.

Additionally, REGEN-COV was associated with lower disease burden by showing:

- Fewer total viral shedding weeks (44 weeks placebo vs. 9 weeks REGEN-COV)
- Fewer total high viral shedding weeks (>10^4 copies/mL) (22 weeks placebo vs. 0 weeks REGEN-COV)
- Fewer total symptomatic weeks (18 weeks placebo vs. 0 weeks REGEN-COV)

"These data using REGEN-COV as a passive vaccine suggest that it may both reduce transmission of the virus as well as reduce viral and disease burden in those who still get infected," George D. Yancopoulos, MD, PhD, Regeneron's president and chief scientific officer, said in a statement.

Distribution, manufacturing "boon"

As significant as the findings of the dosage of the antibody cocktail, Porges said, was the administration of REGEN-COV at a dosage of 1,200 mg—not the 2,400 mg infusion authorized by the FDA EUA. That "should be a boon to both distribution and manufacturing," Porges predicted.

Regeneron's data came from an exploratory analysis conducted on the first 409 evaluable individuals enrolled in the trial. They were randomized to receive passive vaccination with REGEN-COV (1,200 mg via subcutaneous injections) or placebo.

Confirmatory Phase III results are expected in the second quarter.

"We look forward to seeing the full dataset early next quarter and will discuss the current results with regulatory authorities, including the potential to expand the Emergency Use Authorization," stated David Weinreich, MD, executive vice president and head of global clinical development at Regeneron.

Weinreich also noted **that REGEN-COV was administered via injections rather than infusion, which he said "makes administration much more convenient and efficient for patients and overburdened healthcare providers and facilities**."

Both REGEN-COV2 and bamlanivimab are indicated for administration as soon as possible after a positive COVID-19 test and within 10 days of symptom onset. Before patients can be treated with either treatment, according to their EUAs, they must weigh at least 40 kilograms (about 88 pounds) and be deemed at high risk for progressing to severe COVID-19 and/or hospitalization. That high-risk category includes adults who are ages 65 or older, or who have chronic medical conditions.

"Even with the emerging availability of active vaccines, we continue to see hundreds of thousands of people infected daily, actively spreading the virus to their close contacts," Yancopoulos added. "The REGEN-COV antibody cocktail may be able to help break this chain by providing immediate passive immunity to those at high risk of infection, in contrast to active vaccines which take weeks to provide protection."

Potential Solutions to the COVID-19 Oxygen Crisis in the United States

By Eric Toner, MD
Johns Hopkins Center for Health Security
Source: https://www.centerforhealthsecurity.org/resources/COVID-19/COVID-19-resources/210126-oxygen-memo.pdf

Jan 27 – Healthcare system, state, and national leaders need to act now to avoid medical oxygen shortages in the weeks and months ahead. Medical oxygen supplies are already at crisis levels in some cities and states due to severe surges in coronavirus disease 2019 (COVID-19) hospitalizations. In Southern California, the shortages have affected not only hospitals and other health facilities but also emergency medical transportation practices.[1] These shortages apply to wall oxygen in hospitals as well as portable oxygen (cylinders and concentrators) in hospitals and medical facilities and for at-home and emergency use. Oxygen shortages were also reported in New York City[2] (March 2020) and Texas[3] (November 2020) during the COVID-19 hospital surges last year and are occurring in other countries.[4,5] Hospitals and health systems everywhere should begin to prepare now for potential oxygen shortages. As hospitals reach capacity due to surges in COVID-19 patients, this crisis is likely to be repeated in other locations. If enough areas are severely affected concurrently, a national crisis could ensue.

In January 2021, discussions took place with frontline clinicians and public health officials in California, Minnesota, and New York. The following descriptions of and lessons learned from oxygen supply shortages and the suggested solutions derive from those discussions.

Oxygen shortages are occurring because a large number of patients require oxygen therapy as part of their COVID-19 treatment. Over the course of the pandemic, medical providers have seen the survival benefits of providing high flow nasal oxygen, rather than mechanical ventilation, to many COVID-19 patients. The challenge is that high flow oxygen therapy uses roughly 5 to 10 times the amount of oxygen as a mechanical ventilator. The resulting high flow of oxygen through hospital oxygen systems is causing liquid oxygen vaporizers to freeze over. These vaporizers, which convert a hospital's stored liquid oxygen to gas for the hospital's oxygen systems, are located outside of the building next to tanks where bulk liquid oxygen is stored. Additionally, oxygen pipes in many older hospitals are not able to accommodate the increased flow demands due to design limitations. To reduce the draw on the wall oxygen in hospitals, portable oxygen is being used, especially in alternate treatment sites; however, the increased use of portable oxygen is contributing to a shortage of oxygen cylinders of all sizes. Timely oxygen delivery to hospitals has also been a problem, and oxygen flow regulators, which are needed for both wall oxygen and portable oxygen tanks, are in critically short supply.

Hospital systems, state officials, and the federal government must act now to avert these problems in additional hospitals.

Applying Lessons from Other Hospitals: Solutions Currently Being Implemented

- Some hospitals have added secondary oxygen supply lines that bypass the existing oxygen delivery systems, allowing more oxygen to flow without freezing the vaporizers. These secondary systems can connect directly to trucks or tanks carrying bulk liquid oxygen.
- Some hospitals have improvised warm water sprinkler systems to keep the external vaporizers from freezing.
- Oxygen concentrators are being used as much as possible in place of oxygen cylinders. These draw oxygen from the air and do not need oxygen resupply or flow regulators.
- Some providers are splitting the tubing from 1 concentrator to supply 2 patients at once; conversely, sometimes 2 concentrators are being used on a single patient to provide higher oxygen concentrations than a single concentrator can provide.

- Oxygen is being conserved by lowering the saturation threshold for deemed adequate patient oxygenation.
- Large H oxygen cylinders are being fitted with manifolds to service multiple patients simultaneously.
- The state of California has augmented both bulk oxygen delivery and portable oxygen supply. It is also working with vendors and authorities to remove regulatory barriers to oxygen transport and ensure cooperation among oxygen vendors.

Healthcare System, State, and Federal Leaders Need to Act Now: Where Solutions Are Still Needed

- **Improve awareness of potential oxygen shortages.** Clinicians need to be more aware of shortages and the need to conserve oxygen. Health systems, public health departments, professional organizations, and federal agencies should raise awareness of this issue by communicating the risks consistently. Hospitals should provide frequent updates to their staff on the status of their oxygen system and oxygen availability.
- **Develop operational plans to share resources between states.** Oxygen-related equipment such as tanks, regulators, and liquid oxygen delivery trucks may need to be shared across states. The plans should be developed now so states can efficiently share resources based on patient surges.
- **Relax enforcement of certain state and federal regulations pertaining to the transport of oxygen** at state and federal levels to allow for easier sharing of resources, as needed. This might include, for example, regulations that limit who can drive trucks carrying oxygen and how long drivers can work.
- **Conduct rapid research into the manufacturing capacity and supply chain of oxygen cylinders, concentrators, regulators, and associated supplies.** Determine if use of the Defense Production Act—which has already been invoked to increase production of masks, testing kits, and vaccine materials[6]—could help to boost production quickly. The Department of Health and Human Services (HHS) should consider this a priority as many products are now unavailable commercially.
- **Commission a broad-based committee of experts**, led by HHS, to advise the Department on the multifaceted issues related to oxygen supply and delivery for current and future disasters.

We need to act now to ensure that oxygen supply shortages will be proactively addressed so that all patients can get the life-sustaining care they need throughout the course of the pandemic.

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Next Pandemic Might Be the Result of Bioterrorism, Says Bill Gates

Source: https://in.mashable.com/tech/19844/next-pandemic-might-be-the-result-of-bioterrorism-says-bill-gates

Jan 28 – Billionaire philanthropist and business leader Bill Gates recently published the **2021 annual letter** on his blog along with wife Melina Gates where he has stated that **the next pandemic might be the result of bioterrorism**.

In his blog "GatesNotes", Bill Gates **states** that "the unfortunate reality is that COVID-19 might not be the last pandemic. We don't know when the next one will strike, or whether it will be a flu, a coronavirus, or some new disease we've never seen before. But what we do know is that we can't afford to be caught flat-footed again. The threat of the next pandemic will always be hanging over our heads—unless the world takes steps to prevent it".

He further added that "to prevent the hardship of this last year from happening again, pandemic preparedness must be taken as seriously as we take the threat of war. The world needs to double down on investments in R&D and organizations like CEPI that have proven invaluable with COVID-19. We also need to build brand-new capabilities that don't exist yet".
Gates also talked about different kind of measures that governments can take to stay prepared for such unprecedented situations in the future. Gates said that governments should start by continuing their investments in the scientific tools that are currently getting us through the coronavirus pandemic.
The letter also states that huge advances in development of new vaccines are expected over the next five years and that there needs to be a global alert system which will be based on diagnostic testing, something that isn't available in large scale today.
"I am hopeful that we'll see broad support for efforts that make sure we never have to experience this hardship again. We're already seeing new pandemic preparedness strategies emerge, including from this year's UK-led G7, and I expect to see more in the months and years to come. The world wasn't ready for the COVID-19 pandemic. I think next time will be different," said Bill Gates.

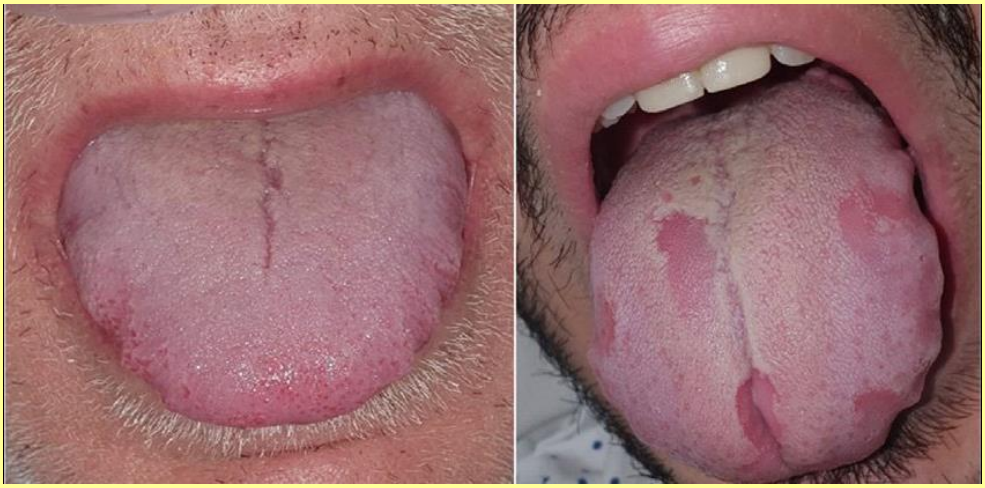
'COVID Tongue' Could Be One of The Signs of Infection, Doctors Warn

Source: https://www.sciencealert.com/covid-tongue-could-be-one-of-the-signs-of-infection-doctors-warn

Jan 21 – A swollen or patchy tongue may be a sign of coronavirus infection, according to new research.

Researchers found that one in four coronavirus patients noticed changes to their tongue, including swelling, sores, raised bumps on the surface of the tongue, indentations, and/or discolored patches. A small percentage of patients also reported a burning sensation in their mouth.

These findings were based on observations from 666 patients with COVID-19 and mild or moderate pneumonia at a field hospital in Spain.
The symptoms were often combined with patients losing their sense of taste, which has emerged as an increasingly common sign of the virus.



It's not yet clear whether these symptoms may be widespread. Since the patients included in the study had moderate cases of infection, researchers aren't sure whether these symptoms, dubbed "COVID tongue," might also affect people with severe coronavirus, or those with milder cases.
While viral infections are known to cause symptoms in the mouth and tongue, there hasn't been much data on this phenomenon in COVID-19 patients. That may be partly because medical experts avoid spending too much time in patients' mouth due to safety concerns about the highly infectious virus.
The new findings were presented in January 26, but first published in September in the *British Journal of Dermatology*.

Skin rashes are also linked COVID-19, but there's a lot we don't know

This study also found that about 40 percent of patients experienced skin problems on the palms of their hands or soles of their feet. These included burning sensation, redness, peeling skin, and small bumps. About one in ten patients also experienced a rash.

Previous research has also found coronavirus infection can affect the hands, feet, and skin. In May, dermatologists reported patients with red, swollen toes and rashes associated with COVID-19. And "long haulers" or people with prolonged symptoms, have also reported skin conditions, which may be a sign of inflammation caused by the virus.
The research is mixed on how common it is for the coronavirus to cause rashes and other dermatological symptoms.
This most recent study found more examples of skin-related symptoms than many previous studies, so there may have been other factors involved.

Scientists also don't fully understand when these types of symptoms tend to emerge, so at this point, so it's difficult to know if they might help predict more severe cases or long-term cases of COVID-19.

Monoclonal antibodies may prevent severe COVID-19, but there's a catch

Source: https://newatlas.com/health-wellbeing/monoclonal-antibodies-coronavirus-regeneron-phase3-data/

Jan 27 – Promising interim data from a unique Phase 3 trial testing the efficacy of a monoclonal antibody cocktail developed to prevent SARS-CoV-2 infection has been announced by pharmaceutical company Regeneron. The preliminary results suggest this novel treatment is 100 percent effective at preventing symptomatic infection, but despite these positive signs there are concerns the prohibitive cost of producing monoclonal antibody therapies will severely limit widespread use.

Last week pharma company Eli Lilly revealed its monoclonal antibody treatment for COVID-19 is 80 percent effective at preventing viral infection. Not to be outdone, Lilly's major monoclonal antibody competitor Regeneron is now announcing early results from its ongoing Phase 3 clinical trial.

Monoclonal antibody treatments are a little different to vaccines. Instead of teaching a body how to produce antibodies against a virus, monoclonal antibodies are a single dose of lab-produced antibodies intended to either prevent infection or reduce the severity of a disease for a short period of time.

Regeneron's therapy is called REGEN-COV and it comprises two different but complimentary types of lab-engineered antibodies developed to rapidly stop the virus from replicating inside an infected patient. These kinds of monoclonal antibody therapies are designed to be administered to subjects at high-risk of being infected with SARS-CoV-2, or given to patients at the very earliest stage of COVID-19.

Because monoclonal antibodies only offer limited short-term protection the trials testing them must be very focused. Eli Lilly's bamlanivimab treatment, for example, is being trialled in nursing homes and aged care centers at the first sign of a localized outbreak. Regeneron on the other hand is looking at how well its antibody cocktail can prevent viral infection in subjects living in households with a confirmed COVID-19 case.

To qualify for the trial subjects must be recruited and dosed with the antibodies within four days of their household contact testing positive for SARS-CoV-2. Regeneron plans to recruit 2,450 subjects in this blinded, randomized and placebo-controlled Phase 3 trial. Regeneron's interim data analysis comprises the first 409 subjects enrolled in the trial. The data has yet to be peer-reviewed or published in a journal but complete results for the entire trial are hoped to be delivered in the first half of 2021.

These early results reveal the antibody cocktail delivered 100 percent protection from symptomatic infection (8/223 placebo vs. 0/186 REGEN-COV). The trial is also testing for asymptomatic infections and found the treatment effective on that measure (23/223 asymptomatic infections in placebo group vs. 10/186 REGEN-COV).

The interim data also shows those in the REGEN-COV group who did still get infected with SARS-CoV-2 displayed decreased peak viral levels and significantly shorter durations of viral shedding. In other words, those asymptomatic cases in the antibody group were potentially much less contagious than similar cases in the placebo group.

"These data using REGEN-COV as a passive vaccine suggest that it may both reduce transmission of the virus as well as reduce viral and disease burden in those who still get infected," says Regeneron's chief scientific officer, George D. Yancopoulos.

Perhaps the most significant aspect of this new announcement from Regeneron is the way the therapy was administered. Traditionally monoclonal antibodies must be administered by intravenous infusion. Eli Lilly's competing therapy requires a 60 minute infusion which severely limits how broadly these treatments can be deployed.

This new REGEN-COV trial, however, tested the efficacy of administration by subcutaneous injection. This essentially turns an onerous, medically supervised 60 minute infusion into a swift single injection that can be delivered virtually anywhere. Considering this kind of monoclonal antibody treatment may be most effective as a very early preventative measure in communities at high-risk of infection, delivery by injection is nothing short of a game-changer.

"In this prevention trial, REGEN-COV was given as injections rather than an infusion, which makes administration much more convenient and efficient for patients and overburdened healthcare providers and facilities," says David Weinreich, Regeneron's Head of Global Clinical Development.

Penny Ward, from King's College London, suggests this preliminary data is interesting and awaits the full panel of data from the trial. Taken on its own merits, Ward says this monoclonal antibody therapy is "a potentially exciting addition to the therapeutic armamentarium," offering clinicians an important tool to intervene and suppress outbreaks in places such as universities, prisons and hospitals.

"Vaccination will prevent disease but takes 14-21 days to take effect: in an immediate contact situation, this is too long to prevent illness which may, in an individual at high risk, be fatal," says Ward. "This approach could protect patients receiving chemotherapy for cancer, enable control/prevention of outbreaks in an institutional setting and reduce pressure on health services."
The massive issue that will ultimately hold these monoclonal antibody therapies back from widespread use is sadly their prohibitive cost. It's speculated both Regeneron and Eli Lilly's antibody therapies could cost over US$1,000 per dose.
As explained by Arturo Casadevall, from Johns Hopkins School of Medicine, the excessive cost of monoclonal antibody therapy is less about greedy pharmaceutical companies and more to do with time-consuming and labor-intensive modes of production.
"The reason that monoclonal antibodies are so expensive is because they have to be made in what we call tissue culture," said Casadevall in an interview last November. "You have to grow the cells. And these cells have to produce the protein which then needs to be purified. It's not only labor-intensive, [but] the reagents are very expensive. In general, monoclonal antibody therapies— whether for COVID, cancer, or for rheumatological problems—tend to be expensive."
Stephen Evans, from the London School of Hygiene and Tropical Medicine, suggests monoclonal antibodies such as those developed by Regeneron may be too expensive to deploy widely but that does not mean they won't be a useful tool.
"As a prevention of Covid disease it would probably be too expensive for very widespread use (we are not informed of its cost), but it could be very useful in situations where people are at very high risk of exposure to the virus and their own immune system is deficient in its response to any standard Covid vaccine," says Evans.

Estimating the COVID-19 *R* number: a bargain with the devil?

Source: https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30840-9/fulltext

The deeper understanding Faust sought
Could not from the Devil be bought
But now we are told
By theorists bold
All we need know is R_0.[1]
Robert May, 1936–2020

Bob May's limerick alludes to both the promises and dangers of characterising epidemic control by a single number. The basic reproduction number (R_0) is the average number of infections produced by a single infectious person in a population with no immunity. R_0 has a close relative named the effective reproduction number (R), which is the average number of infections produced by a single infected person in a population with partial immunity. In *The Lancet Infectious Diseases*, You Li and colleagues[2] estimate how the imposition and lifting of non-pharmaceutical interventions (NPIs) changed the R number for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in 131 countries in the first half of 2020.
If the R value is less than 1, an epidemic eventually dies out because each infected person generates less than one new infection. Ending an epidemic by keeping the R value below 1 could take a long time if there are currently many infections, like the proverbial small rudder on a big ship. However, when the R value is higher than 1, the epidemic could continue to grow. R can also change over time: NPIs such as closing schools, physical distancing, and mask use can reduce R. Hence, R is often used to gauge whether pandemic mitigation is working.
Li and colleagues compared daily estimates of R at the country level against a database describing which NPIs each country applied and when. Generally, they found that imposing NPIs reduced R, and lifting them later on increased R. School closure, a public event ban, requirements to stay at home, and internal movement limits—both when being imposed and when lifted—had the biggest individual effects, changing R between 3% and 25%.
NPIs in combination were even more effective. The combined effect of school and workplace closure, a ban on public events and gatherings of more than ten people, internal movement limits, and a stay-at-home requirement reduced R by 52% (95% CI 29–68) 28 days after they were introduced. The R_0 value for SARS-CoV-2 lies somewhere between 2 and 3.[3]
Hence, early pandemic interventions must reduce R by between 50% and 67% to bring it below 1. Li and colleagues' estimates do not include the effects of contact tracing and isolation. Despite this omission, the estimate suggests that it might have been exceedingly difficult to flatten the curve in spring, 2020, had the R_0 for SARS-CoV-2 been a little higher.
But R is not without shortcomings. Just as our body-mass index does not tell us everything about our state of health, a single number cannot provide a complete picture of the state of

a pandemic. National-level estimates can hide local heterogeneity. Seasonal differences in contact patterns from spring to autumn are not captured by the short time windows used in many epidemiological studies. Reporting delays, stochastic effects, and superspreading can also bias *R*. Moreover, *R* does not tell us what proportion of infections are caused by an infected individual before symptom onset. This crucial distinction for infection control might explain why severe acute respiratory syndrome coronavirus did not cause a pandemic, whereas SARS-CoV-2 did, despite their comparable R_0 values.[4, 5]
Li and colleagues discuss some of these limitations and also raise the issue of behavioural inertia. Timelines of decision making lend the perception that governments can turn NPIs on and off like a switch. But in fact, populations can take weeks to adjust their mobility patterns in response to imposition of NPIs.[2, 6]
This effect probably contributes to the authors' finding that NPIs did not exhibit their maximal effect on *R* until up to 28 days later.
R promises crystal clarity in a time when there are no crystal balls. Hence, the allusion to R_0 as a bargain with the devil. Statistician George Box has been widely paraphrased as writing “All models are wrong, but some are useful.”[7]
I like to re-paraphrase this as some models are useful precisely because they are wrong. A model including all the real-world details of a study system would no longer be a model, because it would be the system itself.
Despite *R*'s imperfections, the findings of Li and colleagues tell us that NPIs work and which ones work best. This information is crucial, given that some NPIs have massive socioeconomic effects. In a similar vein, transmission models that project COVID-19 cases and deaths under different NPI scenarios could be highly valuable for optimising a country's portfolio of NPIs.[8, 9, 10]
Moreover, I think *R* provides a social utility that epidemiologists can easily overlook. The success of large-scale NPIs requires population adherence. *R* can stimulate populations to act and gives them useful feedback on the fruits of their labour. Perhaps this is one reason that *R* has entered our vernacular in 2020.

The next global pandemic may be caused by a bioterrorist attack, says Harvard tech expert

By Marta Godoy and Jeevan Ravindran (Business Insider España)

Source: https://www.businessinsider.com/next-pandemic-result-bioterrorist-attack-coronavirus-harvard-terrorism-genetic-modification-expert

Jan 28 – The next global pandemic could be the result of a bioterrorist attack, a tech expert has warned.
Vivek Wadhwa, a distinguished fellow and adjunct professor at Carnegie Mellon's School of Engineering, said in an essay for Foreign Policy that this was largely due to advances in cheap and easily accessible methods of genetic engineering.
Conspiracy theories have often suggested that the COVID-19 pandemic is a "bioweapon" manufactured in a Chinese lab.
However, Wadhwa, who is also a distinguished fellow of Harvard Law School's Labor and Worklife Program, insisted that the pandemic was not created in a lab, citing a report by Nature Medicine.
"But if genetic engineering wasn't behind this pandemic, it could very well unleash the next one," Wadhwa said.
He believes the current pandemic should be treated as a "dress rehearsal of what is to come, including viruses deliberately engineered by humans."

Advances in genetic engineering are a double-edged sword

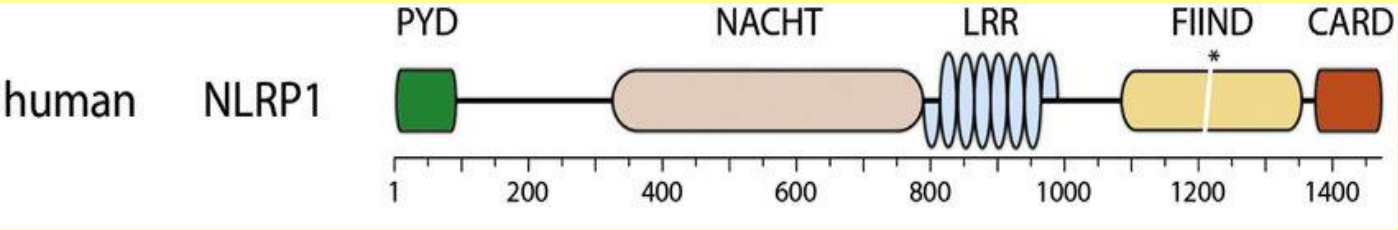
The concerns of those in science and tech have slowly been becoming a reality, with Wadhwa pointing to the ease of access to gene editing kits in the US.
Mail-order do-it-yourself kits can be ordered by anyone, with a bacterial engineering kit costing as little as $169. Meanwhile, a human engineering kit comes in at $349.
One reviewer said they were a high-school student while another said they "didn't know it could be this easy."
This ease of accessibility is largely due to the advances of CRISPR gene editing, which enables scientists to cut and paste genes, with the possibility of curing or eradicating malaria or Huntingdon's disease, but also of damaging species and ecosystems.
Wadhwa said CRISPR makes it "almost as easy to engineer life forms as it is to edit Microsoft Word documents."
"There should have been international treaties to prevent the use of CRISPR for gene editing on humans or animals. The U.S. Food and Drug Administration should have kept companies from selling DIY gene-editing kits," Wadhwa added.
In April 2015, Chinese researchers genetically engineered human embryos, and this was followed by a failed attempt to genetically modify two babies to be HIV-resistant in 2018.
The scientist involved in the latter experiment, He Jiankui, was eventually sentenced to three years in prison.

There is still much research to be done on CRISPR, which has not yet been declared safe for use and has previously caused concern due to potential links with cancer.
Although this was largely dismissed as an "overreaction", there is no clear consensus among scientists, with geneticist Allan Bradley of the Wellcome Sanger Center saying the effects of CRISPR had been "seriously underestimated."
From board games simulating a bioterrorist attack to a bipartisan report declaring the US to be "significantly underprepared" for bioterrorism, it seems a bioterrorism pandemic could well be in our future.
"The bad is just too terrible to think about," said Wadha, who maintained "the only solution is to accelerate the good side of these technologies while building our defenses."
Piers Millett, of the University of Oxford's Future of Humanity Institute, is more optimistic than Wadhwa.
Speaking to Future of Life, he said gene editing was not a significant step forward for biowarfare, and pinned the possibilities of bioterrorist attacks on "states" rather than lone actors.
He did, however, concede that the intentional creation of a harmful pathogen would be "amongst the most dangerous things on the planet."
In 2018 the John Hopkins Center for Health Security ran a simulation exercise with US policymakers, testing their reactions and decisions in the face of a bioterrorist attack involving a highly contagious disease, according to Vox.
Vox reported that the results showed worldwide deaths in excess of 150 million and a 90% tumble for the Dow Jones.
"It is now too late to stop the global spread of these technologies — the genie is out of the bottle," Wadhwa said.
Their potential harmful impact will depend on how quickly a counter-response can be formed. If used for good, however, these technologies could be the answer to curing "all disease."

Immune system found to evolve a tripwire defense for invading viruses

Source: https://newatlas.com/medical/immune-system-evolve-tripwire-defense-viruses/

Jan 28 – Just as pathogens evolve new tricks to evade our body's safeguards and cause infection, our immune system can also develop new tricks that keep these nasty invaders at bay. New research has revealed an interesting example of this, demonstrating how the mammalian immune system deploys a type of tripwire defense to fend off viral attacks.
The research was carried out by biologists at the University of California San Diego, who pitted cells from the mammalian immune system against the *Picornaviridae* family of viruses. These include common foes like rhinovirus, poliovirus and the coxsackievirus (the pathogen behind hand, foot and mouth disease) and work by activating **a protein called NLRP1** that drives potent inflammation in the host.



As part of this process, viruses generate enzymes that act as molecular scissors to snip portions of the protein, which they then use to take hold, replicate and spread throughout the host. But through its analysis, the team discovered that the NLRP1 protein has recently evolved some useful new capabilities.
The protein is able to effectively set traps for the pathogens, mimicking the component that they usually cut away as they invade the host. The cutting of this "tripwire" has the effect of triggering an immune response to the pathogens, which helps swing the battle back in favor of the host.
"In our paper we're showing that NLRP1 acts to bait viral protease cleavage and set off a sort of alarm, or tripwire, in the organism," said Brian Tsu, the lead author of the study. "This is like an Achilles heel to the virus. This allows the host organism to evolve ways to take advantage of this evolutionarily constrained cleavage."
In terms of what this could mean for clinical applications, the scientists imagine this mechanism one day being leveraged to fend off viral infections in the lungs, brain or other parts of the body. Such feats are a long way off, but in the meantime, the discovery offers fascinating new insights into the way immune systems can evolve.

"We often think of viruses taking advantage of the fact that hosts evolve slowly, but we're seeing that the hosts have turned the tables and used the fact that the viruses are really stuck here to their advantage, and therefore they use this constraint to activate an immune response," says study author Matt Daugherty.

▶▶ **The research was published in the journal *eLife*.**

A Shocking Number of COVID-19 Survivors Have Been Diagnosed with Neurological Issues

Source: https://www.sciencealert.com/a-shocking-percentage-of-covid-19-survivors-are-being-diagnosed-with-neurological-and-psychiatric-illnesses

Jan 28 – Six months after testing positive for COVID-19, one in eight survivors are diagnosed with a neurological or psychiatric illness like dementia for the first time in their lives, a study led by Oxford researchers found.
Patients who've been hospitalized are especially susceptible to psychiatric complications, though even non-hospitalized patients had an increased risk for issues like depression and stroke, the study also found.
The findings, which have not yet been peer-reviewed, add to growing evidence that the coronavirus can lead to short- and long-term cognitive and mental health issues. Just how long they persist remains to be seen.

The study included more than 200,000 coronavirus patients in the US
To conduct the study, the researchers looked at the health records of 236,379 US coronavirus survivors.
They found that, within six months, 33.6 percent of the coronavirus survivors received a neurological or psychiatric diagnosis; 13 percent received such a diagnosis for the first time.
Patients who'd been hospitalized, and particularly those who'd experienced encephalopathy, a broad term describing altered brain function or structure, were particularly at risk for mental illnesses.
Most of the conditions - including stroke, intracranial haemorrhage, dementia, and psychotic disorders - were more common than in a comparable group of patients who'd had the flu or a respiratory tract infection, the researchers found.
It's unlikely simply being under clinicians' care is what led to an increase in mental health diagnoses, the authors said.
While the researchers took into account factors like age, sex, race, underlying conditions, and socioeconomic status, the study was still subject to some limitations. It couldn't prove cause and effect, for one, nor are electronic medical records flawless.
The first time a diagnosis is entered into a database isn't always the first time a person is diagnosed, and the records tend to lack descriptions of socioeconomic and lifestyle factors.
Still, when set against findings from a study led by the same researcher looking at neurological complications after three months of a COVID-19 diagnosis, the study helps fill in the picture of which brain-based conditions are most common at different stages of survival.
"For diagnoses like a stroke or an intracranial bleed, the risk does tend to decrease quite dramatically within six months," Dr. Max Taquet of the department of psychiatry at the University of Oxford, told *The Guardian*.
"But for a few neurological and psychiatric diagnoses, we don't have the answer about when it's going to stop."

Researchers are still uncovering why the virus can have such wide-ranging and long-lasting neurological consequences
Past studies have shown how COVID-19 can have wide-ranging cognitive and neurological consequences, including head and muscle aches, confusion and dizziness, seizures and strokes, and brain swelling and delirium.
Survivors have also reported terrifying hallucinations, coordination issues, and memory lapses.
Experts continue to hunt for reasons why a virus that was once thought of as strictly respiratory can do such damage to the brain.
It's understandable that the nervous system can be affected by COVID-19 if, for example, the virus's impact on the lungs and heart makes it tough to get enough oxygen to the brain. That in turn can contribute to the strokes some COVID-19 patients have experienced.
The virus may also infect the brain directly, some researchers say, and the immune system's reaction to it can cause inflammation that damages the brain and nerves.
Some experts fear that for some survivors, some effects may be permanent, or even lead to another epidemic of brain damage.

"My worry is that we have millions of people with COVID-19 now. And if in a year's time we have 10 million recovered people, and those people have cognitive deficits … then that's going to affect their ability to work and their ability to go about activities of daily living," Adrian Owen, a neuroscientist at Western University in Canada, told Reuters.

Vaccines Have Saved 37 Million Children's Lives Since 2000

Source: https://www.sciencealert.com/vaccines-have-saved-37-million-children-s-lives-in-lower-income-countries-since-2001

Jan 29 – Vaccinations are medicine's greatest lifesavers. Since the turn of the century, new modelling shows immunisations for 10 major diseases have prevented the deaths of 37 million people in nearly a hundred low- and middle-income countries (LMICs).

By 2030, that number could double, and many of the lives saved will be young children.

Without access to certain vaccinations, which protect humans against diseases like measles, rotavirus, HPV and hepatitis B, kids born in 2019 (in the 98 LMICs investigated) who are not vaccinated are 45 percent more likely to die before the age of five, researchers say.

Even into adulthood, the difference between those who are vaccinated and those who aren't is stark. The new model shows children born in 2019 in these countries will experience 72 percent lower mortality over their lifetimes if they are vaccinated for the ten diseases modelled.

"Our study signifies the huge public health benefits that can be achieved from vaccination programmes in low-income and middle-income countries," says epidemiologist Neil Ferguson from Imperial College London in the United Kingdom.

"By projecting up until 2030 in these 98 countries we have provided insight on where investments in vaccine coverage should be directed to achieve further gains."

Putting a number on lives saved from vaccination is tricky and imperfect business, but that doesn't mean it's not worth calculating.

The new model has limitations, especially since many LMICs do not have complete or consistent data on disease burden and death. That said, it's a valuable estimate and the largest scale study on the subject to date, taking into account vaccination programs against hepatitis B virus, *Haemophilus influenzae* type B, human papillomavirus, Japanese encephalitis, measles, *Neisseria meningitidis* serogroup A, *Streptococcus pneumoniae*, rotavirus, rubella, and yellow fever.

Sixteen independent research groups applied multiple models for each of these pathogens.

Over the lifetime of those born between 2000 and 2030, the findings reveal 120 million deaths will be averted by vaccination, of which 96 million will be saved by the measles vaccine and the hepatitis vaccine together.

The results largely align with previous estimates, which found vaccines have saved the lives of nearly 20 million children in some of 73 of the world's poorest countries since 2001.

The measles vaccine alone was recently found to have prevented more than 20 million deaths around the world since the beginning of the 21st century.

"By estimating how much higher mortality levels would be if there were no vaccination programmes in place, our study has highlighted how crucial it is to maintain high coverage levels," says Katy Gaythorpe, who studies public health at Imperial College London.

Yet sustaining the status quo is only part of the picture. Expanding coverage is also a key priority, especially for some of the newer vaccines.

If HPV vaccination programs can be accessed by enough young people, for instance, experts think cervical cancer could be eliminated in LMICs by the end of the century. In fact, the new model predicts increasing HPV coverage in girls will save more lives per person vaccinated than any other immunisation activity.

Vaccination programs to prevent some forms of pneumonia were also found to be highly effective and could be expanded to great success in poorer countries. These vaccines, known collectively as PCVs, had the largest impact on deaths of children under five.

Estimates from this modelling will no doubt change as our understanding of disease and our vaccination programs improve, but the sheer scale of this study gives us a great baseline to work with.
Vaccine programs clearly work. Now we just need to make sure everyone has access.

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

NOVAVAX vaccine

new

Source: https://ir.novavax.com/news-releases/news-release-details/novavax-covid-19-vaccine-demonstrates-893-efficacy-uk-phase-3

NVX-CoV2373 contains a full-length, prefusion spike protein made using Novavax' recombinant nanoparticle technology and the company's proprietary saponin-based Matrix-M™ adjuvant. The purified protein is encoded by the genetic sequence of the SARS-CoV-2 spike (S) protein and is produced in insect cells. **It can neither cause COVID-19 nor can it replicate**, is stable at **2°C to 8°C** (refrigerated) and is shipped in a ready-to-use liquid formulation that permits distribution using existing vaccine supply chain channels.
The first interim analysis is based on 62 cases, of which 56 cases of COVID-19 were observed in the placebo group versus 6 cases observed in the NVX-CoV2373 group, resulting in a point estimate of vaccine efficacy of **89.3%** (95% CI: 75.2 – 95.4). Of the 62 cases, 61 were mild or moderate, and 1 was severe (in placebo group). Preliminary analysis indicates that the UK variant strain that was increasingly prevalent was detected in over 50% of the PCR-confirmed symptomatic cases (32 UK variant, 24 non-variant, 6 unknown). Based on PCR performed on strains from 56 of the 62 cases, efficacy by strain was calculated to be 95.6% against the original COVID-19 strain and 85.6% against the UK variant strain [post hoc].
Novavax' patented saponin-based Matrix-M™ adjuvant has demonstrated a potent and well-tolerated effect by stimulating the entry of antigen presenting cells into the injection site and enhancing antigen presentation in local lymph nodes, boosting immune response.

Johnson & Johnson single dose shot is effective against Covid-19

new

Source: https://www.thenationalnews.com/world/europe/johnson-johnson-single-dose-shot-is-effective-against-covid-19-1.1156096

Jan 29 – Vaccine is **66 per cent** effective overall, but less so against South African variant
Johnson & Johnson's long-awaited single-shot vaccine appears to protect against Covid-19 with just one shot, the company announced.
J&J said that in the US and seven other countries, the single-shot vaccine was 66 per cent effective overall at preventing moderate to severe illness, and much more protective — 85 per cent — against the most serious symptoms.
That means it is not as strong as some two-shot rivals but still potentially helpful for a world in dire need of more doses.
US infectious disease specialist Anthony Fauci said the variations in effectiveness around the world underlined the need to vaccinate as many people as quickly as possible to prevent new variants from emerging.
"It's really a wake up call for us to be nimble and to be able to adjust as this virus will continue for certain to evolve," Mr Fauci said.
A high bar has been set by two authorised vaccines from Pfizer/BioNTech and Moderna, which were around 95 per cent effective in preventing symptomatic illness in pivotal trials when given in two doses.
Those trials, however, were conducted mainly in the US and before new variants emerged.
A **single dose vaccine** would offer governments a simpler route to proving protection for more people. It costs around $10 a dose, so would be beneficial for poorer countries, and can be stored at regular fridge temperatures so distribution and handling is easier.
"We're proud to have reached this critical milestone and our commitment to address this global health crisis continues with urgency for everyone, everywhere," the company's CEO Alex Gorsky said.
The company is quickly expected to apply for a US emergency authorisation, and could therefore soon be the third vaccine available in the world's hardest-hit country.
J&J's chief scientific officer Paul Stoffels said: "These topline results with a single-shot Covid-19 vaccine candidate represent a promising moment.

"The potential to significantly reduce the burden of severe disease, by providing an effective and well-tolerated vaccine with just one immunisation, is a critical component of the global public health response.
"A one-shot vaccine is considered by the World Health Organisation to be the best option in pandemic settings, enhancing access, distribution and compliance."
The vaccine is made by the US giant's subsidiary Janssen, based in the Netherlands, and was trialled in the UK. The British government has bought 30 million doses, while the EU has ordered 400 million doses.
There was some geographic variation in the J&J findings. The vaccine worked better in the US — 72 per cent effective against moderate to severe Covid – compared to 57 per cent in South Africa, where it was up against an easier-to-spread mutated virus.
"Gambling on one dose was certainly worthwhile," said Dr. Mathai Mammen, global research chief for J&J's Janssen Pharmaceutical unit.
With vaccinations off to a rocky start globally, experts had been counting on a one-dose vaccine that would stretch scarce supplies and avoid the logistical difficulties of getting people to return for boosters.
But with some other competing vaccines shown to be 95 per cent effective after two doses, at question is whether somewhat less protection is an acceptable trade-off to get more shots in arms quickly.
The company said within a week it will file an application for emergency use in the US, and then abroad. It expects to supply 100 million doses to the US by June, and expects to have some ready to ship as soon as authorities give the green light.
These are preliminary findings from a study of 44,000 volunteers that isn't completed yet. Researchers tracked illnesses starting 28 days after vaccination – about the time when, if participants were getting a two-dose variety instead, they would have needed another shot.
After day 28, no one who was vaccinated needed to go to hospital or died, regardless of whether they were exposed to "regular Covid or these particularly nasty variants," Mr Mammen said. When the vaccinated did become infected, they had a milder illness.
The announcement came shortly after success was announced for another vaccine.
The Novavax vaccine trials showed it offers 89 per cent protection against coronavirus.
The product is due to be manufactured in Britain and appears to be effective against the original strain of coronavirus and a mutant strain first identified in Kent, south-east England.
The Novavax drug showed about 60 per cent effectiveness against the strain of Covid-19 first identified in South Africa, which has been problematic for scientists owing to concerns it may evade vaccines.
The UK secured access to 60 million Novavax doses, which will be available in the second half of this year if the vaccine is approved by the medicines regulator.
More than 15,000 people in the UK took part in the clinical trial, 27 per cent of whom were over the age of 65. The study assessed how effective the vaccine was when transmission of Covid-19 was high in the UK, and with the variant strain first identified in Kent circulating widely.
Prof Paul Heath, Novavax's clinical trial chief investigator, said the data showed science was able to adapt to mutations.
Kate Bingham, the former head of the UK's vaccine task force and the person who placed the orders for Novavax doses, said that she was delighted but the next goal was to find an easier way to administer vaccines.
"Frankly, two injections delivered by healthcare professionals is not a good way of delivering vaccines," she said. "We need to get vaccine formats that are much more scalable and distributable. So whether they're pills or patches or nose sprays, we need to find better ways of delivering vaccines."
Dozens of ambulances with patients wait outside Santa Maria Hospital in Lisbon, Portugal. EPA
Defeating the scourge that has killed more than 2 million people worldwide will require vaccinating billions, and the shots being rolled out in different countries so far all require two doses a few weeks apart for full protection. Early data is mixed on exactly how well all the different kinds work, but shots made by Pfizer and Moderna appear to be about 95 per cent protective after the second dose.
But amid shortages, some countries have advised delaying the second dose of certain vaccines with little data on how that would affect protection.
All Covid-19 vaccines train the body to recognise the new coronavirus, usually by spotting the spikey protein that coats it. But they are made in very different ways.
J&J's shot uses a cold virus like a Trojan horse to carry the spike gene into the body, where cells make harmless copies of the protein to prime the immune system in case the real virus comes along.
Rival AstraZeneca makes a similar cold virus vaccine that requires two doses. Both the AstraZeneca and J&J vaccines can be stored in a refrigerator, making them easier to ship and to use in developing countries than the frozen kind made by Pfizer and Moderna.

It is not clear exactly how well the AstraZeneca version, being used in Britain and several other countries, works. Tests in Britain, South Africa and Brazil suggested two doses are about 70 per cent effective although there are questions about how much protection older adults get. An ongoing US study may provide more information.
J&J said its vaccine works consistently in a broad range of people: A third of participants were over age 60, and more than 40 per cent had other illnesses putting them at risk of severe Covid-19, including obesity, diabetes and HIV.
J&J said the vaccine is safe, with reactions similar to other Covid-19 shots such as fever that occur when the immune system is revved up.
While it released few details, the company said there were no serious allergic reactions. But occasionally other Covid-19 vaccines trigger such reactions, which can be reversed if promptly treated – and authorities have warned people to be on the lookout regardless of which type of vaccine is used.
J&J had hedged its bets with a study of a two-dose version of its vaccine, which is still underway.

Metformin use reduces risk of death for patients with COVID-19 and diabetes

Source: https://www.uab.edu/news/research/item/11795-metformin-use-reduces-risk-of-death-for-patients-with-covid-19-and-diabetes

Jan 14 – Use of the diabetes drug metformin — before a diagnosis of COVID-19 — was associated with a threefold decrease in mortality in COVID-19 patients with Type 2 diabetes. Use of the diabetes drug metformin — before a diagnosis of COVID-19 — is associated with a threefold decrease in mortality in COVID-19 patients with Type 2 diabetes, according to a racially diverse study at the University of Alabama at Birmingham. Diabetes is a significant comorbidity for COVID-19.
"This beneficial effect remained, even after correcting for age, sex, race, obesity, and hypertension or chronic kidney disease and heart failure," said Anath Shalev, M.D., director of UAB's Comprehensive Diabetes Center and leader of the study.

"Since similar results have now been obtained in different populations from around the world — including China, France and a UnitedHealthcare analysis — this suggests that the observed reduction in mortality risk associated with metformin use in subjects with Type 2 diabetes and COVID-19 might be generalizable," Shalev said.
How metformin improves prognosis in the context of COVID-19 is not known, Shalev says. The UAB findings suggest that the mechanisms may go beyond any expected improvement in glycemic control or obesity, since neither body mass index, blood glucose nor hemoglobin A1C were lower in the metformin users who survived as compared to those who died.
"The mechanisms may involve metformin's previously described anti-inflammatory and anti-thrombotic effects," Shalev said.
The study — first made available in MedRxiv and now published in the peer-reviewed journal Frontiers in Endocrinology — included 25,326 patients tested for COVID-19 at the tertiary care UAB Hospital between Feb. 25 and June 22 of last year. Of the 604 patients found to be COVID-19-positive, 311 were African Americans.
The primary outcome in the study was mortality in COVID-19-positive subjects, and the potential association with subject characteristics or comorbidities was analyzed.
Researchers found that Blacks, who are only 26 percent of Alabama's population, were 52 percent of those who tested positive for COVID-19, and only 30 percent of those who tested negative. In contrast, only 36 percent of the COVID-19-positive subjects were white, while whites made up 56 percent of those who tested negative, further underlining the racial disparity. Once COVID-19-positive though, no significant racial difference in mortality was observed.
"In our cohort," Shalev said, "being African American appeared to be primarily a risk factor for contracting COVID-19, rather than for mortality. This suggests that any racial disparity observed is likely due to exposure risk and external socioeconomic factors, including access to proper health care."
Overall mortality for COVID-19-positive patients was 11 percent. The study found that 93 percent of deaths occurred in subjects over the age of 50, and being male or having high blood pressure was associated with a significantly elevated risk of death. Diabetes was associated with a dramatic increase in mortality, with an odds ratio of 3.62. Overall, 67 percent of deaths in the study occurred in subjects with diabetes.

The researchers looked at the effects of diabetes treatment on adverse COVID-19 outcomes, focusing on insulin and metformin as the two most common medications for Type 2 diabetes. They found that prior insulin use did not affect mortality risk.
However, prior metformin use was a different matter. Metformin use significantly reduced the odds of dying, and the 11 percent mortality for metformin users was not only comparable to that of the general COVID-19-positive population, it was dramatically lower than the 23 percent mortality for diabetes patients not on metformin.
After controlling for other covariates, age, sex and metformin use emerged as independent factors affecting COVID-19-related mortality. Interestingly, even after controlling for all these other covariates, death was significantly less likely — with an odds ratio of 0.33 — for Type 2 diabetes subjects taking metformin, compared with those who did not take metformin.
"These results suggest that, while diabetes is an independent risk factor for COVID-19-related mortality," Shalev said, "this risk is dramatically reduced in subjects taking metformin — raising the possibility that metformin may provide a protective approach in this high-risk population."
The researchers say future studies will need to explore how metformin is protective, as well as assess the risks and benefits of metformin treatment and the indications for its use in the face of the ongoing COVID-19 pandemic.
This study is part of a new Precision Diabetes Program, a collaboration between the UAB Comprehensive Diabetes Center and the Hugh Kaul Precision Medicine Institute at UAB.
Co-authors with Shalev for the paper, "Metformin use is associated with reduced mortality in a diverse population with COVID-19 and diabetes," are Andrew B. Crouse and Matthew Might, the Hugh Kaul Precision Medicine Institute at UAB; Tiffany Grimes and Fernando Ovalle, the Comprehensive Diabetes Center and the Department of Medicine Division of Endocrinology, Diabetes and Metabolism at UAB; and Peng Li, UAB School of Nursing.
Support came from National Institutes of Health grants DK078752, DK120379 and TR001417.
Shalev is a professor in the UAB Department of Medicine Division of Endocrinology, Diabetes and Metabolism, and she holds the Nancy R. and Eugene C. Gwaltney Family Endowed Chair in Juvenile Diabetes Research.

Pandemic Shows Need for Biological Readiness

By Andy Weber
Source: http://www.homelandsecuritynewswire.com/dr20210129-pandemic-shows-need-for-biological-readiness

Jan 29 – President Joe Biden's inauguration comes during the worst stage of the deadliest biological event of our lifetimes. Too many thousands of citizens have suffered and died due to President Donald Trump's failures. As bad as this pandemic is, imagine if instead it were caused by the deliberate release of a sophisticated biological weapon. About 2 percent of those infected have died of COVID-19, while a disease such as smallpox kills at a 30 percent rate. A bioengineered pathogen could be even more lethal. Our failed response to the pandemic in 2020 has exposed a gaping vulnerability to biological threats, ranging from natural outbreaks to deliberate biological weapons attacks.
North Korea have employed prohibited chemical weapons in brazen attacks in Syria, the United Kingdom, Malaysia, and last summer against Russian dissident Alexei Navalny in Siberia. Although these were not biological attacks, a country that develops and uses horrific chemical weapons seems unlikely to respect the parallel taboo against bioweapons. We need to strengthen the Chemical Weapons and Biological Weapons Conventions and make pariah countries that wantonly violate them pay a heavy price.
Biological weapons are not an abstract concept. Twenty-five years ago, I led a secret U.S. visit to the world's largest biological weapons factory, just over the Russian border in the formerly secret town of Stepnogorsk, Kazakhstan. The Soviet Union built this massive facility in the 1980s, not long after the entry into force in 1975 of the Biological Weapons Convention (BWC). It was proven capable of producing 300 metric tons of anthrax agent during a wartime mobilization period of about eight months. Remember the havoc that less than two grams of anthrax agent delivered in a letter caused at the Hart Senate Office Building in the fall of 2001. Thanks to the foresight of Senators Richard Lugar (R-Ind.) and Sam Nunn (D-Ga.), the Nunn-Lugar Cooperative Threat Reduction (CTR) programs helped Kazakhstan safely destroy the biological weapons factory there.
Biden has a unique opportunity to lead an effort to help make this the last pandemic and render biological weapons obsolete as a weapon of mass destruction. We cannot let our country slip back into complacency after this pandemic, as we always have shortly following other biological crises in this century. Indeed, we must use the lessons of the current crisis to strengthen the U.S. and global system of early warning, data sharing, planning, and exercises. We must also focus on developing, manufacturing, and delivering rapid medical countermeasures to such a degree that it will deter any adversary from developing and using biological weapons.

The new administration can start by showcasing Biden's vision and plans in a global speech about eliminating biological dangers, much the way President Barack Obama so artfully did for nuclear dangers in Prague in April 2009. A joint session of the World Health Assembly and the BWC member states in Geneva would be a possible venue. Biden should announce an offer to host in September the first in a series of biological security summits, modeled on the successful Obama administration nuclear security summit series in Washington, Seoul, and the Netherlands.

Of course, the new president's first priority must be leading a coordinated global effort to end the COVID-19 pandemic. Although the United States is well positioned to end it domestically once the vaccines are widely available this spring, many other countries are less fortunate. In early 2014, the United States launched the Global Health Security Agenda and later that year mobilized more than 70 countries to contribute to ending the Ebola outbreak in West Africa. Biden should build on those efforts with a new pandemic prevention and biodefense initiative crafted to end this one quickly and strengthen the infrastructure to prevent, detect, and rapidly respond to future biological events no matter what their origin.

Domestically, Biden must make crystal clear that preventing biological threats is a core mission of U.S. defense and national security agencies, in addition to the traditional health agencies. As Obama did during the Ebola crisis, the president should chair regular meetings of the National Security Council with the secretary of the Department of Health and Human Services (HHS) to expand U.S. efforts and monitor progress.

Budgets matter, and perversely the Department of Defense's program for chemical and biological defense was cut 10 percent in 2020, with 30 percent of those cuts falling on the medical biodefense component that includes vaccines, therapeutics, and diagnostics. The Nunn-Lugar Biological Threat Reduction Program was also cut by one-third. Operation Warp Speed, fueled by one-time emergency appropriations, has been a stunningly successful partnership between the Defense Department and HHS, and Biden will need to find ways to institutionalize and further expand these agencies' joint contributions to national and global biodefense. One model would be to invest $10 billion each in HHS and the Pentagon over each of the next 10 years. We should also encourage our allies and partners to make complementary investments.

Just as Biden has called for made-in-America green technologies to create jobs and combat the climate crisis, investments in our bioeconomy will fuel growth and help us prevent existential biological risks. Thanks to increasingly cheap and ubiquitous genetic sequencing and related diagnostic and information technologies, it is now possible to create a real-time global pathogen mapping and forecasting capability modeled on the U.S. Weather Service.

Such information can feed into our medical countermeasures' ecosystem, as we observed a year ago when the Chinese posted the SARS-COV-2 sequence and mRNA vaccine prototypes were built from it in just weeks. These and other rapid medical countermeasures were supported by the Pentagon's biodefense program and the Defense Advanced Research Projects Agency, which for decades have had the right goal of compressing the time from discovery of a novel natural or engineered pathogen to deployment of tailored vaccines and therapeutics. Reducing these times further should be the overarching goal of U.S. research, development, and stockpiling efforts. To lead this agenda, Biden should create an H-ARPA for health, with joint HHS-Defense Department sponsorship, that will focus on moonshot medical discoveries instead of the incrementalism characteristic of the National Institutes of Health.

There are three existential risks to the survival of our species: biological, climatological, and nuclear. Unfortunately, our investments in biological defense and pandemic prevention have been episodic and woefully inadequate. Given the stakes, Biden should use all of the powers of the presidency to lead a muscular approach to reducing these dangers. Future generations will applaud his efforts.

***Andy Weber** is a senior fellow at the Council on Strategic Risks and a member of the Arms Control Association Board of Directors.*

COVID-19 Vaccination Raises Ethical Questions

By John Whyte, MD, MPH and Arthur L. Caplan, PhD

Source [full text]: https://www.medscape.com/viewarticle/944846

- **Healthcare professionals who are patient-facing should get the COVID-19 vaccine as soon as they can. Furthermore, priority vaccination lists should include all hospital staff to keep the facilities functioning.**
- **The goal of public health is to control the spread of the epidemic, which is why prisons should be prioritized.**

- "Vaccine nationalism" is when countries prioritize their own vaccine needs. The United States should make sure its at-risk populations are vaccinated before providing vaccines to other countries.
- It may be difficult for some employers to require vaccination while the vaccines are under emergency use authorization. However, employers in such places as nursing homes, hospitals, and home healthcare companies should mandate vaccines now.
- Once clinical trials show that the vaccines are safe for children, they will probably be added to the required immunization schedule for children.
- Most likely, people will have to show proof of vaccination before taking part in activities such as getting on a plane, checking into a hotel, and entering a sports stadium.

COVID-19 rarely spreads through surfaces. So why are we still deep cleaning?

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Source: https://www.nature.com/articles/d41586-021-00251-4

Workers spray disinfectant on a street in Shijiazhuang, China, in January 2020. Credit: Zhai Yujia/China News Service via Getty

Jan 29 – When Emanuel Goldman went to his local New Jersey supermarket last March, he didn't take any chances. Reports of COVID-19 cases were popping up across the United States, so he donned gloves to avoid contaminated surfaces and wore a mask to prevent him inhaling tiny virus-laden droplets from fellow shoppers. Neither gloves nor masks were recommended at the time.

Then, at the end of March, a laboratory study showed that the coronavirus SARS-CoV-2 can persist on plastic and stainless steel for days[1]. That triggered startling headlines and a slew of advice on how to decontaminate everything from doorknobs to groceries. It also seemed

to confirm guidance issued by the World Health Organization (WHO) in February that the virus that causes COVID-19 can spread through contaminated surfaces, known as fomites.

By May, the WHO and health agencies around the world were recommending that people in ordinary community settings — houses, buses, churches, schools and shops — should clean and disinfect surfaces, especially those that are frequently touched. Disinfectant factories worked around the clock to keep up with heavy demand.

But Goldman, a microbiologist at Rutgers New Jersey Medical School in Newark, decided to take a closer look at the evidence around fomites. What he found was that there was little to support the idea that SARS-CoV-2 passes from one person to another through contaminated surfaces. He wrote a pointed commentary for *The Lancet Infectious Diseases* in July, arguing that surfaces presented relatively little risk of transmitting the virus[2]. His conviction has only strengthened since then, and Goldman has long since abandoned the gloves.

Many others reached similar conclusions. In fact, the US Centers for Disease Control and Prevention (CDC) clarified its guidance about surface transmission in May, stating that this route is "not thought to be the main way the virus spreads". It now states that transmission through surfaces is "not thought to be a common way that COVID-19 spreads".

As evidence has accumulated over the course of the pandemic, scientific understanding about the virus has changed. Studies and investigations of outbreaks all point to the majority of transmissions occurring as a result of infected people spewing out large droplets and small particles called aerosols when they cough, talk or breathe. These can be directly inhaled by people close by. Surface transmission, although possible, is not thought to be a significant risk.

But it's easier to clean surfaces than improve ventilation — especially in the winter — and consumers have come to expect disinfection protocols. That means that governments, companies and individuals continue to invest vast amounts of time and money in deep-cleaning efforts. By the end of 2020, global sales of surface disinfectant totalled US$4.5 billion, a jump of more than 30% over the previous year. The New York Metropolitan Transit Authority (MTA), which oversees subways and buses and lost billions of dollars in passenger revenue in 2020, spent $484 million last year in its response to COVID-19, including enhanced cleaning and sanitization, according to a spokesperson.

Part of the problem is that specialists can't rule out the possibility of fomite transmission, and the guidance from many health agencies about how to deal with surfaces has been unclear as the science has changed. In November, Chinese authorities introduced guidelines requiring disinfection of imported frozen-food packages. And the CDC directs people to a comprehensive list of agents that kill SARS-C0V-2 and says: "Frequent disinfection of surfaces and objects touched by multiple people is important."

Experts say that it makes sense to recommend hand washing, but some researchers are pushing back against the focus on surfaces. In December, engineer Linsey Marr at Virginia Tech in Blacksburg co-wrote an opinion article for *The Washington Post* imploring people to ease up on cleaning efforts. "It's become clear that transmission by inhalation of aerosols — the microscopic droplets — is an important if not dominant mode of transmission," says Marr, who studies airborne disease transmission. Excessive attention on making surfaces pristine takes up limited time and resources that would be better spent on ventilation or the decontamination of the air that people breathe, she says.

Virus RNA can mislead

The focus on fomites — rather than aerosols — emerged at the very beginning of the coronavirus outbreak because of what people knew about other infectious diseases. In hospitals, pathogens such as methicillin-resistant *Staphylococcus aureus*, respiratory syncytial virus and norovirus can cling to bed rails or hitch a ride from one person to the next on a doctor's stethoscope. So as soon as people started falling ill from the coronavirus, researchers began swabbing hospital rooms and quarantine facilities for places the virus could be lurking. And it seemed to be everywhere.

In medical facilities, personal items such as reading glasses and water bottles tested positive for traces of viral RNA — the main way that researchers identify viral contamination. So, too, did bed rails and air vents. In quarantined households, wash basins and showers harboured the RNA, and in restaurants, wooden chopsticks were found to be contaminated. And early studies suggested that contamination could linger for weeks. Seventeen days after the *Diamond Princess* cruise ship was vacated, scientists found[3] viral RNA on surfaces in cabins of the 712 passengers and crew members who tested positive for COVID-19.

But contamination with viral RNA is not necessarily cause for alarm, says Goldman. "The viral RNA is the equivalent of the corpse of the virus," he says. "It's not infectious."

To address that part of the equation, researchers began testing whether coronavirus samples left for days on various surfaces could infect lab-grown cells. One study in April found that the virus remained infectious on hard surfaces such as plastic and stainless steel for 6 days; on bank notes, it lasted for 3 days; and on surgical masks, at least 7 days[4]. A later study announced that viable virus was present on skin for up to 4 days, but on clothes

it survived for less than 8 hours[5]. And others found infectious virus on library books bound in natural and synthetic leather after 8 days[6].

Unrealistic conditions

Although these types of experiment demonstrate that the coronavirus can survive on surfaces, this doesn't mean that people are catching it from surfaces such as doorknobs. Goldman and others caution against reading too much into virus-survival studies, because most don't test conditions that exist outside the lab. "They were experiments that started out with humongous amounts of virus, nothing that you would encounter in the real world," he says. Other tests have used mock saliva and controlled conditions such as humidity and temperature, all of which widen the gulf between experimental and real-world conditions, says Goldman.

Only a handful of studies have looked for viable virus outside the lab. Tal Brosh-Nissimov, who heads the infectious-diseases unit at the Assuta Ashdod University Hospital in Israel, and his colleagues swabbed personal items and furniture in hospital isolation units and rooms at a quarantine hotel. Half of the samples from two hospitals and more than one-third of samples from the quarantine hotel were positive for viral RNA. But none of the viral material was actually able to infect cells, the researchers reported[7].

Cleaning efforts involved sanitizing tables and chairs at a school in Karachi, Pakistan, in September 2020.Credit: Akhtar Soomro/Reuters

Indeed, researchers have struggled to isolate viable virus from any environmental samples, not just fomites. In the only study[8] that has succeeded, researchers grew virus particles from hospital air samples collected at least 2 metres from a person with COVID-19.

Nevertheless, scientists warn against drawing absolute conclusions. "Just because viability can't be shown, it doesn't mean that there wasn't contagious virus there at some point," says epidemiologist Ben Cowling at the University of Hong Kong.

Human exposure studies of other pathogens provide additional clues about fomite transmission of respiratory viruses. In 1987, researchers at the University of Wisconsin— Madison put healthy volunteers in a room to play cards with people infected with a common-cold rhinovirus[9]. When the healthy volunteers had their arms restrained to stop them touching their faces and prevent them transferring the virus from contaminated surfaces, half became infected. A similar number of volunteers who were unrestrained also became infected. In a separate experiment, cards and poker chips that had been handled and coughed on by sick volunteers were taken to a separate room, where healthy volunteers were instructed to play poker while rubbing their eyes and noses. The only possible mode of transmission was through the contaminated cards and chips; none became infected. The combination of experiments provided strong evidence that rhinoviruses spread through the air. But such studies are considered unethical for SARS-CoV-2, because it can kill.

Although it's probably rare, says Cowling, transmission through surfaces can't be ruled out. "It just doesn't seem to happen that much, as far as we can tell."

Estimates of transmission based on levels of viral RNA persisting in the environment seem to bear this out. From April to June, environmental engineer Amy Pickering then at Tufts University in Medford, Massachusetts, and her colleagues took weekly swabs of indoor and outdoor surfaces around a town in Massachusetts. On the basis of the levels of RNA contamination and how often people touched surfaces such as doorknobs and buttons at pedestrian crossings, the team estimated[10] that the risk of infection from touching a contaminated surface is less than 5 in 10,000 — lower than estimates for SARS-CoV-2 infection through aerosols, and lower than surface-transmission risk for influenza or norovirus.

"Fomite transmission is possible, but it just seems to be rare," says Pickering, who is now at the University of California, Berkeley. "A lot of things have to fall into place for that transmission to happen."
That might explain why a global comparison of government interventions to control the pandemic in its early months found that cleaning and disinfection of shared surfaces ranked one of the least effective at reducing transmission[11]. Social distancing and travel restrictions, including lockdowns, worked the best.

Messy data

That leaves researchers sorting through messy epidemiological data about how the virus spreads. Hundreds of studies of COVID-19 transmission have been published since the pandemic began, yet there is thought to be only one that reports transmission through a contaminated surface, by what it termed the snot–oral route. According to the report, a person with COVID-19 in China blew his nose with his hand and then pressed a button in his apartment building elevator. A second resident in the building then touched the same button and flossed with a toothpick immediately after, thereby transferring the virus from button to mouth[12]. But without genome sequences of the viruses infecting each person, transmission through another unknown person couldn't be ruled out.
In one other case, eight people in China are thought to have been infected after stepping in sewage containing the virus on the street and then walking the contamination into their homes[13].
Despite the rarity of published examples of fomite transmission, Chinese authorities require that imported frozen food be disinfected. The change in guidelines followed a report, which has not been released in detail, that a worker at a frozen-food business in the northern port city of Tianjin became infected after handling contaminated packaging of frozen pork imported from Germany. But the WHO and other experts have disputed claims that people can be infected through the food chain in this manner.
Cowling says that more detailed investigations are needed, carefully tracking who infects whom, and what surfaces and spaces they shared around the time of infection. "What we really, really value is epidemiological investigations of transmission patterns, whether it's in households or workplaces or elsewhere," he says. "I don't think we've been doing enough of that."

The greatest threat

Armed with a year's worth of data about coronavirus cases, researchers say one fact is clear. It's people, not surfaces, that should be the main cause for concern. Evidence from superspreading events, where numerous people are infected at once, usually in a crowded indoor space, clearly point to airborne transmission, says Marr. "You have to make up some really convoluted scenarios in order to explain superspreading events with contaminated surfaces," she says.
Hand washing is crucial, says Marr, because surface transmission can't be ruled out. But it's more important to improve ventilation systems or to install air purifiers than to sterilize surfaces, she says. "If we've already paid attention to the air and we have some extra time and resources, then yes, wiping down those high-touch surfaces could be helpful," she says.
Households can also ease up, says Pickering. Quarantining groceries or disinfecting every surface is going too far. "That's a lot of work and it also is probably not reducing your exposure that much," she says. Instead, reasonable hand hygiene, as well as wearing a mask and social distancing to reduce exposure from close contacts is a better place to focus efforts.
The WHO updated its guidance on 20 October, saying that the virus can spread "after infected people sneeze, cough on, or touch surfaces, or objects, such as tables, doorknobs and handrails". A WHO spokesperson told *Nature* that "there is limited evidence of transmission through fomites. Nonetheless, fomite transmission is considered a possible mode of transmission, given consistent finding of environmental contamination, with positive identification of SARS-CoV-2 RNA in the vicinity of people infected with SARS-CoV-2." The WHO adds that "disinfection practices are important to reduce the potential for COVID-19 virus contamination".
The CDC did not respond to *Nature*'s queries about inconsistencies in its statements about the risks posed by fomites.
The conundrum facing health authorities, says Marr, is that definitively ruling out surface transmission is hard. Authorities can be reluctant to tell people not to be cautious. "You never want to say, 'Oh, don't do that,' because it can happen. And you know, we should follow the precautionary principle," she says.
Despite the evolving evidence, the public might have grown to expect extra levels of sanitization after the early months of the pandemic. When the New York MTA surveyed passengers in late September and early October, three-quarters said that cleaning and disinfecting made them feel safe when using transport.
Goldman continues to wear a cloth mask when he leaves home, but when it comes to the possibility of catching the coronavirus from a contaminated surface, he doesn't take any special precautions. "One of the ways we protect ourselves is by washing our hands," he says, "and that applies pandemic or no pandemic."

Vaccines – by country and product

Source: https://ourworldindata.org/covid-vaccinations

Location	Source	Last observation date	Vaccines
Argentina	Ministry of Health	January 30, 2021	Sputnik V
Austria	Ministry of Health	January 30, 2021	Pfizer/BioNTech
Bahrain	Ministry of Health	January 29, 2021	Pfizer/BioNTech, Sinopharm
Belgium	Sciensano	January 29, 2021	Moderna, Pfizer/BioNTech
Bermuda	Ministry of Health	January 23, 2021	Pfizer/BioNTech
Brazil	Regional governments via Coronavirus Brasil	January 30, 2021	Oxford/AstraZeneca, Sinovac
Bulgaria	Ministry of Health	January 29, 2021	Moderna, Pfizer/BioNTech
Canada	Government of Canada	January 29, 2021	Moderna, Pfizer/BioNTech
Chile	Department of Statistics and Health Information	January 29, 2021	Pfizer/BioNTech
China	National Health Commission	January 27, 2021	CNBG, Sinovac
Costa Rica	National Health Commission	January 25, 2021	Pfizer/BioNTech
Croatia	Ministry of Health	January 29, 2021	Pfizer/BioNTech
Cyprus	Ministry of Health	January 29, 2021	Pfizer/BioNTech
Czechia	Ministry of Health	January 29, 2021	Moderna, Pfizer/BioNTech
Denmark	Statens Serum Institut	January 30, 2021	Moderna, Pfizer/BioNTech
Ecuador	Government of Ecuador	January 28, 2021	Pfizer/BioNTech
England	Government of the United Kingdom	January 29, 2021	Oxford/AstraZeneca, Pfizer/BioNTech
Estonia	National Health Board	January 30, 2021	Pfizer/BioNTech
Finland	Finnish Institute for Health and Welfare	January 30, 2021	Pfizer/BioNTech
France	Public Health France	January 28, 2021	Pfizer/BioNTech
Germany	Robert Koch Institut	January 29, 2021	Moderna, Pfizer/BioNTech
Gibraltar	Government of Gibraltar	January 29, 2021	Pfizer/BioNTech
Greece	Ministry of Health	January 30, 2021	Pfizer/BioNTech
Hungary	Government of Hungary	January 29, 2021	Pfizer/BioNTech
Iceland	Directorate of Health	January 27, 2021	Moderna, Pfizer/BioNTech
India	Ministry of Health	January 29, 2021	Covaxin, Oxford/AstraZeneca
Indonesia	Ministry of Health	January 30, 2021	Sinovac
Ireland	Heath Service Executive	January 27, 2021	Pfizer/BioNTech
Isle of Man	Isle of Man Government	January 30, 2021	Pfizer/BioNTech
Israel	Government of Israel	January 29, 2021	Moderna, Pfizer/BioNTech
Italy	Extraordinary commissioner for the Covid-19 emergency	January 29, 2021	Pfizer/BioNTech
Kuwait	Ministry of Health	December 28, 2020	Pfizer/BioNTech

Latvia	National Health Service	January 29, 2021	Pfizer/BioNTech
Lithuania	Ministry of Health	January 29, 2021	Moderna, Pfizer/BioNTech
Luxembourg	Government of Luxembourg	January 28, 2021	Pfizer/BioNTech
Malta	Ministry of Health	January 29, 2021	Pfizer/BioNTech
Mexico	Secretary of Health	January 29, 2021	Pfizer/BioNTech
Myanmar	Ministry of Health	January 27, 2021	Oxford/AstraZeneca
Netherlands	National Institute for Public Health and the Environment	January 30, 2021	Moderna, Pfizer/BioNTech
Northern Cyprus	Ministry of Health	January 22, 2021	Pfizer/BioNTech, Sinovac
Northern Ireland	Government of the United Kingdom	January 29, 2021	Oxford/AstraZeneca, Pfizer/BioNTech
Norway	Norwegian Institute of Public Health	January 28, 2021	Pfizer/BioNTech
Oman	Ministry of Health	January 27, 2021	Pfizer/BioNTech
Panama	Ministry of Health	January 24, 2021	Pfizer/BioNTech
Poland	Ministry of Health	January 29, 2021	Pfizer/BioNTech
Portugal	National Health Service	January 30, 2021	Pfizer/BioNTech
Romania	Government of Romania	January 30, 2021	Pfizer/BioNTech
Russia	Russian Direct Investment Fund	January 13, 2021	Sputnik V
Saudi Arabia	Saudi Health Council	January 29, 2021	Pfizer/BioNTech
Scotland	Government of the United Kingdom	January 29, 2021	Oxford/AstraZeneca, Pfizer/BioNTech
Serbia	Government of Serbia	January 29, 2021	Pfizer/BioNTech, Sinopharm, Sputnik V
Seychelles	Extended Programme for Immunisation	January 29, 2021	Oxford/AstraZeneca, Sinopharm
Singapore	Ministry of Health	January 28, 2021	Pfizer/BioNTech
Slovakia	Ministry of Health	January 29, 2021	Pfizer/BioNTech
Slovenia	National Institute of Public Health, via Sledilnik	January 29, 2021	Pfizer/BioNTech
Spain	Ministry of Health	January 28, 2021	Moderna, Pfizer/BioNTech
Sri Lanka	Ministry of Health	January 30, 2021	Oxford/AstraZeneca
Sweden	Public Health Agency of Sweden	January 29, 2021	Pfizer/BioNTech
Switzerland	Federal Office of Public Health	January 29, 2021	Moderna, Pfizer/BioNTech
Turkey	COVID-19 Vaccine Information Platform	January 30, 2021	Sinovac
United Arab Emirates	National Emergency Crisis and Disaster Management Authority	January 30, 2021	Pfizer/BioNTech, Sinopharm
United Kingdom	Government of the United Kingdom	January 29, 2021	Oxford/AstraZeneca, Pfizer/BioNTech
United States	Centers for Disease Control and Prevention	January 29, 2021	Moderna, Pfizer/BioNTech
Wales	Government of the United Kingdom	January 29, 2021	Oxford/AstraZeneca, Pfizer/BioNTech

Should People Who Have Recently Had COVID-19 Be Vaccinated?

By Matt Webster

Source: https://globalbiodefense.com/2021/01/30/should-people-who-have-recently-had-covid-19-be-vaccinated/

Jan 30 – A recent report from Public Health England showed that 83% of people who had had COVID were protected from reinfection five months later. Given that 3.7 million people in the UK have had COVID, should those with antibodies be at the back of the vaccine queue?

With the current high death rate, rising case numbers, closed schools and a seemingly interminable lockdown, it is natural to look for ways to speed up the vaccination rollout. Surely those who have already had COVID and recovered can be deprioritised so that people shielding at home can receive the vaccine sooner?

Certainly, the government is not afraid of hacking the process to increase short-term vaccine coverage. The recent example of lengthening the wait for a second dose proves that. But how feasible and effective would it be to not vaccinate people who have had the virus?

First, how sure are we that those people recovered remain protected five months later? While there is no doubt that the antibodies that helped you recover from COVID will last for some time after your illness, hopefully reducing the chance of reinfection, this study was on recovered healthcare professionals, looking at whether they went on to catch COVID again.

Despite the rising case number, a lot improved in those five months, particularly in the availability of protective equipment for healthcare workers and the isolation of COVID patients in hospital. This complicates checking healthcare worker's antibody-derived protection rates and the calculation for how long you may remain protected.

Antibody Testing

But can't we just check the antibodies at the test centres, sending those home that don't need their immune system trained in COVID-focused jiu-jitsu? We can definitely test for antibodies. The test has been available – with a few stop-starts – for some time, but critically it relies on a blood test.

England's test-and-trace programme, which has struggled to process swab tests on the scale needed to match case numbers, would surely collapse at the request to process antibody tests for the entire UK population. Shipping, extraction, processing, testing … all while poor Mrs Jones sits in a school hall with a nurse poised with a vaccine jab waiting for the green light.

How about using the test-and-trace data to sort those that need the jab from those that don't?

While I will overlook that use of "don't" (antibodies are not everlasting, even if you have had COVID) the real question here is how much do you trust the accuracy of test and trace, and of people's ability to self-declare accurately? At the start of the pandemic everyone I spoke with had "had that COVID" despite being untested and unable to identify any exposure other than "I went on a train".

This improved with mass swab-testing, but accuracy, particularly false positives, would be an issue if used to exclude vulnerable people from the vaccine queue.

Like many things related to this pandemic, a good idea is complicated by the detail. Vaccine deployment could be targeted more precisely if we knew how long each of us retained antibodies and had an instant test capable of estimating how much and for how long we would be protected. Given that we have neither – and the NHS is under immense pressure already – the approach of vaccinating in demographic groups currently appears to be our only option.

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Top 10 Technology Hazards: Pandemic Plays Key Role

Source: https://www.medscape.com/viewarticle/944969

Jan 29 – The pandemic has posed unprecedented challenges for patient care — difficulties faced each day by clinicians, clinical engineers, IT specialists, supply chain managers, and other healthcare professionals. As a result, ECRI notes in its 14th annual report on the top 10 health technology hazards, that a number of new threats to patient and staff safety have emerged.

In addition, the list from ECRI, a leading national patient safety organization, highlights the dangers posed by some developing technologies, such as artificial intelligence and 3D printing.
Here are the group's Top 10 Health Technology Hazards for 2021.

Complexity of Managing Medical Devices With COVID-19 Emergency Use Authorization

To meet urgent clinical needs during the pandemic, the Food and Drug Administration (FDA) has temporarily authorized the use of hundreds of medical devices. Under this authority, "FDA can designate previously unapproved products — or new uses for previously approved products — as acceptable for use during an emergency."
However, ECRI notes, these devices may not be as safe or effective as devices approved through FDA's normal clearance process. The reason is that the agency uses a lower standard for checking safety and effectiveness before granting an emergency use authorization (EUA).
"Healthcare facilities that use EUA devices face a complex challenge: They must manage inventories of EUA devices and their documentation, monitor each device's status daily to determine whether the EUA remains active and unchanged, and determine what to do with these devices once the EUA ends."

Fatal Medication Errors Can Result When Drug Entry Fields Populate After Only a Few Letters

To make drug search and selection easier, many medication ordering, storage, and delivery systems "allow the practitioner to enter only a few letters of a drug name before the system populates the drug selection field with a list of drugs to choose from."
This drug searching and selection functionality exists in EHRs, CPOE systems, ambulatory prescribing systems, automated dispensing cabinets, inpatient and community pharmacy systems, and infusion pumps.
Designed to be a convenience, this feature can display similar-looking drug names as options, increasing the risk that users will mistakenly select an incorrect drug. In several cases, this has led to severe harm or the death of patients, ECRI says.

Rapid Adoption of Telehealth Technologies Can Leave Patients and Data at Risk

Because of the pandemic, there has been a rapid increase in the use of telehealth. However, as organizations transition to the new telehealth delivery models, "programs may struggle to provide sufficient user training, to coordinate patient care, or to overcome technology resource inequalities among patients."
Failure to address these challenges could adversely affect patient care, lead to suboptimal treatment, increase risk of medical errors, or prevent certain populations from accessing care. Rushed implementation might also result in inadequate cybersecurity controls to protect health IT systems and patient data.

Imported N95-Style Masks May Fail to Protect Healthcare Workers From Infectious Respiratory Diseases

For healthcare workers exposed to aerosols from COVID-19 patients, an N95 respirator is vital equipment. However, some imported N95-style masks — especially KN95 masks imported from China — fail to provide the level of protection claimed. According to ECRI testing, more than 60% of imported N95 masks fail to block at least 95% of airborne particles.
ECRI suggests that healthcare facilities test N95 respirators not certified by the US federal government before using them in high-risk areas.

Relying on Consumer-Grade Products Can Lead to Inappropriate Healthcare Decisions

Consumer-grade pulse oximeters, blood pressure cuffs, glucose monitors, and other devices are being used not only in the home, but also in other healthcare settings, ECRI observes. "Patients and clinicians alike are increasingly interested in such products to provide some level of care when a traditional medical device is unavailable, inappropriate, inconvenient, or too expensive."
During the pandemic, moreover, such devices have been used to reduce bedside visits and exposure risks, and to address medical device shortages. Nevertheless, ECRI notes, these products shouldn't be relied on to make healthcare decisions because their measurements may be inaccurate or misleading. "Most consumer-grade devices have not been through FDA's medical device approval process," the report says.

Hasty Deployment of UV Disinfection Devices Can Reduce Effectiveness and Increase Exposure Risks

Ultraviolet light can be used to disinfect surfaces and spaces to supplement normal cleaning and disinfection processes. But UV light must be used at the right wavelengths and for the right amount of time to inactivate microorganisms. Improper use of these devices not only

renders them ineffective, but can also expose operators or bystanders to unsafe levels of UV radiation. UV disinfection devices are not typically regulated by the FDA, because most are not considered medical devices. There is no standard protocol for demonstrating their safety and effectiveness, so healthcare organizations have to pay extra attention when purchasing these devices.

Vulnerabilities in Third-Party Software Components Present Cybersecurity Challenges

For a number of reasons, the incorporation of third-party software into medical devices creates challenges for cybersecurity. If a medical device is compromised due to software vulnerability, it could disrupt patient care, perhaps at a systemwide level, or could lead to a data breach. Among the cyber-attacks cited by ECRI are the WannaCry ransomware attack in 2017.

Artificial Intelligence (AI) Applications for Diagnostic Imaging May Misrepresent Certain Patient Populations

As AI begins to make an impact in healthcare, especially in diagnostic imaging, healthcare organizations should be aware of the limitations of current AI-based technologies.
The quality of the conclusions reached by AI algorithms, ECRI points out, depends on the quality of the data used to train the AI application. "Unreliable AI functionality can lead to misdiagnoses or can prompt inappropriate care decisions."
A key challenge in developing an AI algorithm is overcoming bias in the data, the report says. AI software is inherently biased toward patient populations that "look like" the population used in building the algorithm. If that data doesn't accurately represent a particular population, the resultant output may not be appropriate for those patients.

Remote Operation of Medical Devices Designed For Bedside Use Introduces Insidious Risks

During the surge periods of the pandemic, methods for remotely operating ventilators, infusion pumps, and other devices have been deployed as a way to conserve PPE, minimize health worker exposure, and avoid delays associated with donning PPE. But when medical devices designed to be operated at the bedside are operated remotely instead, the switch can result in challenges for patient care. Among ECRI's concerns:

- Less frequent visual assessment of the patient, which may prevent staff from observing clinically relevant conditions or device complications
- Adverse effects on device performance because of longer tubing sets or staff being unable to see or hear the functioning of the device
- Infection risks associated with increased connection points on infusion tubing or with compromised patient isolation (eg, if cables are channeled through an ajar door)

Insufficient Quality Assurance of 3D-Printed Patient-Specific Medical Devices May Harm Patients

According to ECRI, "3D-printing technology is now being used to create a range of patient-specific devices, including implants, anatomical models for surgical planning, surgical guides for orthopedic procedures, and prostheses."
However, the report notes, "the use of an improperly created 3D-printed device could lead to procedure delays, surgical complications, infection, or patient injury."
ECRI throws in a couple of other caveats: "Considerable engineering expertise" is required to convert imaging data into a digital design and make the object on a 3D printer. Also, the physician who will be using a patient-specific 3D-printed device plays a key role in the design process. So, doctors bear increased responsibility for making sure that quality assurance measures have been followed in creating a 3D-printed object.

Israel Says Pfizer Coronavirus Vaccine Shows 92% Effectiveness

Source: https://www.voanews.com/covid-19-pandemic/israel-says-pfizer-coronavirus-vaccine-shows-92-effectiveness

Jan 30 – In the first large-scale, controlled data outside clinical trials, the two-dose Pfizer coronavirus vaccine is showing 92 percent effectiveness, according to Israeli health officials. It's good news for Pfizer, which says the vaccine also appears to work against the British mutation of COVID-19.

The Maccabi Health Fund studied 163,000 Israelis who had received two doses of the Pfizer coronavirus vaccine. Only 31 of them caught COVID-19 after they were fully vaccinated. In an equivalent sample of unvaccinated Israelis, almost 6,500 developed the disease.

The study shows the Pfizer vaccine had 92 percent effectiveness, which was close to the 95 percent Pfizer saw in clinical trials. Israeli infectious-disease experts said the study is good news and that the slight difference between the clinical trials and this current study is within the standard deviation.
Israel has become a real-time laboratory for the Pfizer vaccine, which is being widely distributed in the country through the public health funds. Israel bought the vaccine early, paying double the market price, according to media reports, and agreed to share all of its data with Pfizer. All Israelis belong to one of four health funds and all medical records are digitized.

So far, almost 3 million Israelis out of a total population of 9.3 million have received the first dose of the vaccine, and almost 1.5 million have received the second dose.

Rising death rate
Despite the good news, the country is seeing a rising death rate and more seriously ill patients. Israel has been under a third lockdown for three weeks, which is due to be lifted next week. All schools and businesses, except for essential businesses like supermarkets and pharmacies, are closed, and Israelis are allowed to travel only a half-mile from their homes.
Some in the ultra-Orthodox community have ignored those restrictions, and there have been violent demonstrations when police have come to enforce them.
Israel's health minister, Yuli Edelstein, said lifting the lockdown would be a mistake.
He said the lockdown had stopped the increase in new cases, but the British mutation, which is being found in about a third of all new cases, is more infectious and more serious. He said that opening schools and workplaces now would be a big mistake and would result in more deaths.
Of the total 4,600 deaths in Israel, more than 1,000 were in the month of January alone. Professor Nachman Ash, who is leading Israel's coronavirus response, said he was most worried about the number of seriously ill patients.
He said that Israel currently has 1,200 seriously ill patients and that some hospitals are on the verge of collapse. He said he expected the numbers of seriously ill patients to begin to drop in the next week.
Israel closed its airport this week to air traffic, hoping to stop new cases from being brought into the country. Israeli officials said they hoped to extend both the lockdown and the airport closure for another week.

Covid lockdown fatigue: why some populations obey and others refuse

Source: https://www.thenationalnews.com/uae/science/covid-lockdown-fatigue-why-some-populations-obey-and-others-refuse-1.1157140

Feb 01 – Poor government communication, flip-flopping on rules and the spread of disinformation are all to blame, experts say
The Netherlands was hit by a second wave of riots after protesters again went on the rampage in several cities following the introduction of a coronavirus curfew over the weekend. AFP
Governments worldwide are grappling with the challenge of vaccinating millions of citizens against coronavirus.
But how can authorities enforce stay-at-home measures when Covid fatigue has set in?
Given that vaccination is not 100 per cent effective at stopping illness - and because it may still allow individuals to pass on the virus - social distancing, mask wearing and hand washing will still be needed while the pandemic rages.
But night-time riots in the Netherlands and protests in Denmark have highlighted the presence of anti-lockdown sentiment, which, coupled with simple lockdown fatigue, may lead increasing numbers of people to ignore rules.
Research has found that multiple factors influence compliance with lockdown rules. For example, certain groups are more likely than others to go against regulations, according to Prof Linda Bauld, professor of public health at the University of Edinburgh.
Young adults, men, people in urban areas and those with children are less likely to comply, although Prof Bauld cautioned that in some instances this was because compliance was harder than for, say, elderly people.
Research on people in 55 countries published last year found that another important influence on whether a person complied with lockdown rules was personality type.
Released in the journal *American Psychologist*, the study found that extroverts were less likely to follow stay-at-home orders, while people classed as neurotic were more likely to follow rules.
Individuals with open-minded personalities too tended to stay at home, possibly because they took a greater interest in what was happening with the pandemic and realised its gravity.

While the work was carried out early in the pandemic and so may not be as relevant to current circumstances, Friedrich Götz, a researcher at the University of Cambridge behind the study, said other research had found similar results.
“There is … converging evidence from multiple other studies that found very similar personality-pandemic behaviour associations at different time points and across diverse populations,” he said.
Prof Stephen Reicher, of the University of St Andrews in the UK and a member of the British government’s Scientific Advisory Group for Emergencies (SAGE), said a person’s ability – not just willingness – to comply with lockdown rules was also key.
For example, poorer individuals might find it harder to adhere to self-isolation rules because they cannot afford the loss of income if no compensation is available.

“The problem isn’t people following the rules, but the support so that people can follow them,” said Prof Reicher.
“Compliance is variable but it’s not so much due to motivation, but support and clarity of messaging.

Rotterdam, The Netherlands

“Where the messaging becomes poor and people don’t think there’s a problem, compliance is poor.”
Governments should, he said, ensure rules are clear, and provide assistance to people who might otherwise be unable to comply with rules.
With rules that people can easily follow, such as social distancing, compliance typically remains high, said Prof Reicher, and, if anything, higher than earlier in the pandemic. Signs of lockdown fatigue therefore appear to be limited.
“There’s this [view that] the public will be the weak link, but the evidence is not there,” he said.
Simpler messaging is thought to be one reason, suggested Prof Bauld, why compliance has improved in the UK as lockdown rules have become stricter with the emergence of the more easily transmissible British variant.
“Certainly from a behavioural science perspective … people are just as scared as they were in the spring.
"I think that’s to do with the news of the new variant. That’s caused genuine public concern,” she said.
Messaging – among other factors – may account for why compliance appears to have varied from country to country, with Prof Bauld suggesting that some parts of East and South East Asia, such as Taiwan, Thailand, Singapore, South Korea and Hong Kong, may have had more public adherence to rules.
“There are differences with these populations. The governments are very good at sending clear and consistent messaging,” she said.
“There’s perhaps more acceptance of government intervention in people’s lives, wider acceptance of face coverings and maybe more community cohesion. Maybe disinformation is something that’s not in play there.”
As well as in the United States, disinformation has, she said, been a major problem in countries such as Brazil and Argentina, not always helped by the leadership in Brazil, which has made “statements that were not evidence-based”.
In some countries, such as India, which has embarked on what has been described as the world’s biggest Covid vaccination drive, vaccine hesitancy is an acute problem, fuelled by disinformation and unwarranted concerns over vaccine safety.
Similar issues have affected some South Asian communities and some other ethnic minority communities elsewhere in the world.
“There’s less hesitancy around childhood vaccination in these countries. People are used to having their children vaccinated for polio and rubella,” said Prof Bauld.
Now that vaccines are being rolled out, Prof Bauld said governments should follow a two-pronged approach that encouraged people to get vaccinated while still emphasising the importance of preventing coronavirus spread.
“[Governments must] build confidence that these vaccines are effective and safe,” she said.
“That has to be done in parallel with an explanation that vaccination doesn’t protect people from passing the virus on. That means public health behaviours still need to be maintained.”

Researcher states 16 Covid-19 personality types amid pandemic

Source: https://www.thehindubusinessline.com/news/science/researcher-states-16-covid-19-personality-types-amid-pandemic/article33701762.ece

Jan 30 – New research has been conducted by Mimi E. Lam, a researcher at the University of Bergen, that explores the impacts of salient viral or Covid-19 behavioural identities that are emerging.

The study, published in Humanities and Social Sciences Communications, identifies 16 personality types of people according to their response to the pandemic situation.

"These emergent Covid-19 behavioural identities are being hijacked by existing social and political identities to politicise the pandemic and heighten racism, discrimination, and conflict," said Lam.

She added, "The Covid-19 pandemic reminds us that we are not immune to each other. To unite in our fight against the pandemic, it is important to recognise the basic dignity of all and value the human diversity currently dividing us."

"Only then can we foster societal resilience and an ethical Covid-19 agenda. This would pave the way for other global commons challenges whose impacts are less immediate, but no less dire for humanity," she further said.

Lam also argued that liberal democracies need an ethical policy agenda with three priorities: to recognize the diversity of individuals; to deliberate and negotiate value trade-offs; and to promote public buy-in, trust, and compliance.

Some emergent "Covid-19 personality types" that she noted in her study include:

Deniers:
People who downplay the viral threat, promoting business as usual.

Spreaders:
People who want the coronavirus to spread, herd immunity to develop, and normality to return.

Harmers:
People who try to harm others by, for example, spitting or coughing at them.

Realists:
People who recognise the reality of potential harm and adjust their behaviours.

Worriers:
People who stay informed and safe to manage their uncertainty and fear.

Contemplators:
People who isolate and cut off from the world to ponder on life.

Hoarders:
People who panic-buy and hoard products to quell their insecurity.

Invincibles:
Often youth, who believe themselves to be immune.

Rebels:
People who think that social distancing protocols and lockdown measures restrict their individual freedoms and hence, do not like to comply.

Blamers:
People who vent their fears and frustrations onto others.

Exploiters:
People who exploit the situation for power, profit or brutality.

Innovators:
People who design or repurpose resources to fight the pandemic.

Supporters:
People who show their solidarity in support of others.

Altruists:
People who help the vulnerable, elderly, and isolated.

Warriors:
This includes people who are front-line health-care workers and are combating this grim reality.

Veterans:
People who experienced SARS or MERS and willingly comply with restrictions.

DeepCOVID-XR: An Artificial Intelligence Algorithm to Detect COVID-19 on Chest Radiographs Trained and Tested on a Large US Clinical Dataset

By Ramsey M. Wehbe, Jiayue Sheng, Shinjan Dutta, … Aggelos K. Katsaggelos

Radiology | 24 Nov 2021

Source: https://pubs.rsna.org/doi/10.1148/radiol.2020203511

Background

There are characteristic findings of Coronavirus Disease 2019 (COVID-19) on chest imaging. An artificial intelligence (AI) algorithm to detect COVID-19 on chest radiographs might be

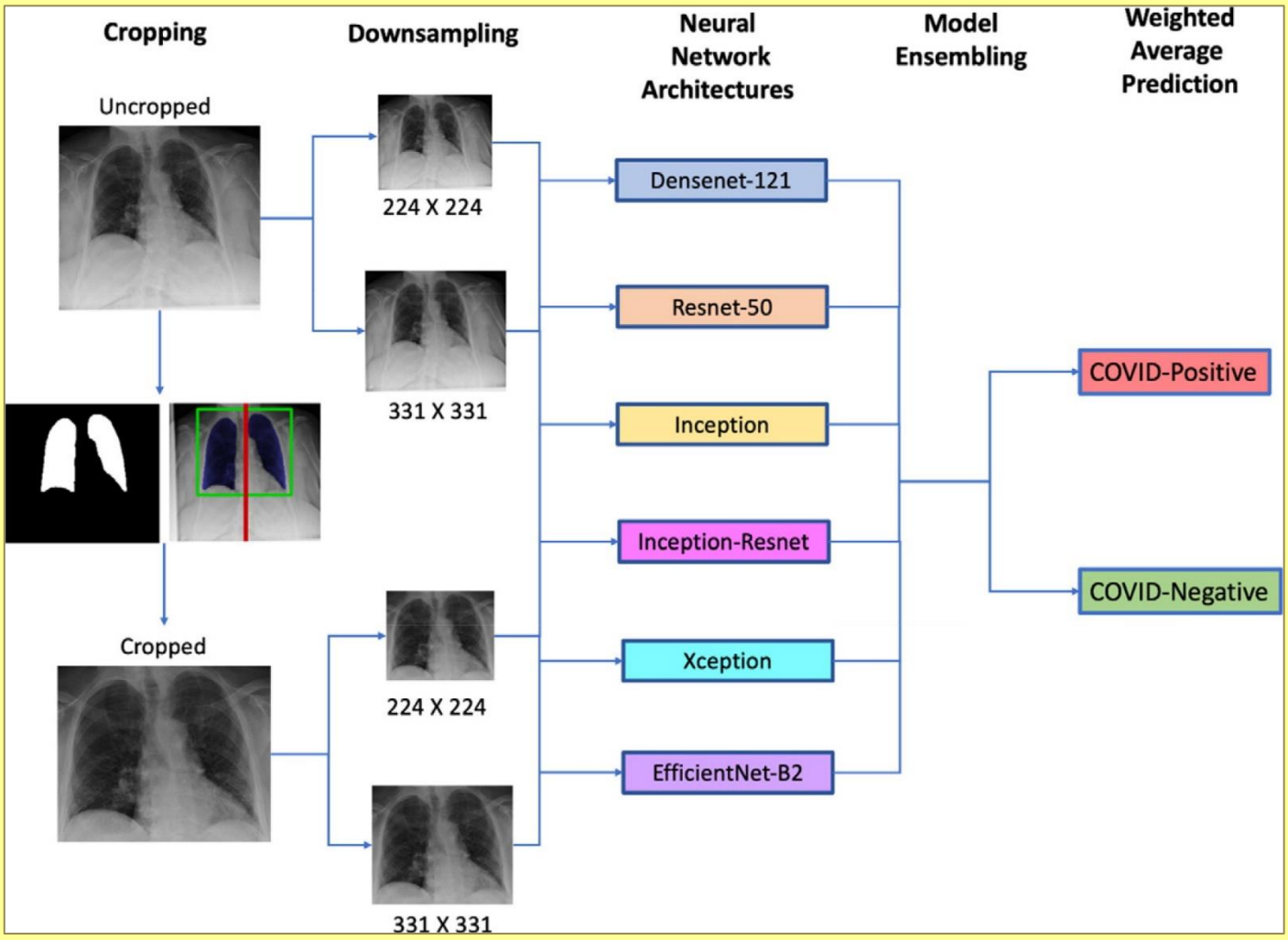
useful for triage or infection control within a hospital setting, but prior reports have been limited by small datasets and/or poor data quality.

Purpose

To present DeepCOVID-XR, a deep learning AI algorithm for detecting COVID-19 on chest radiographs, trained and tested on a large clinical dataset.

Materials and Methods

DeepCOVID-XR is an ensemble of convolutional neural networks to detect COVID-19 on frontal chest radiographs using real-time polymerase chain reaction (RT-PCR) as a reference standard. The algorithm was trained and validated on 14,788 images (4,253 COVID-19 positive) from sites across the Northwestern Memorial Healthcare System from February 2020 to April 2020, then tested on **2,214 images** (1,192 COVID-19 positive) from a single hold-out institution. Performance of the algorithm was compared with interpretations from 5 experienced thoracic radiologists on 300 random test images using the McNemar test for sensitivity/specificity and DeLong's test for the area under the receiver operating characteristic curve (AUC).



Results

A total of 5,853 patients (58±19 years, 3,101 women) were evaluated across datasets. On the entire test set, DeepCOVID-XR's accuracy was 83% with an AUC of 0.90. On 300 random test images (134 COVID-19 positive), DeepCOVID-XR's accuracy was 82% compared to individual radiologists (76%-81%) and the consensus of all 5 radiologists (81%). DeepCOVID-XR had a significantly higher sensitivity (71%) than 1 radiologist (60%, p<0.001) and higher specificity (92%) than 2 radiologists (75%, p<0.001; 84% p=0.009). DeepCOVID-XR's AUC was 0.88 compared to the consensus AUC of 0.85 (p=0.13 for comparison). Using the consensus interpretation as the reference standard, DeepCOVID-XR's AUC was 0.95 (0.92-0.98 95%CI).

Conclusion

DeepCOVID-XR, an AI algorithm, detected COVID-19 on chest radiographs with performance similar to a consensus of experienced thoracic radiologists.
See also the editorial by van Ginneken.

Summary

DeepCOVID-XR, an artificial intelligence algorithm for detecting COVID-19 on chest radiographs, demonstrated performance similar to the consensus of experienced thoracic radiologists.

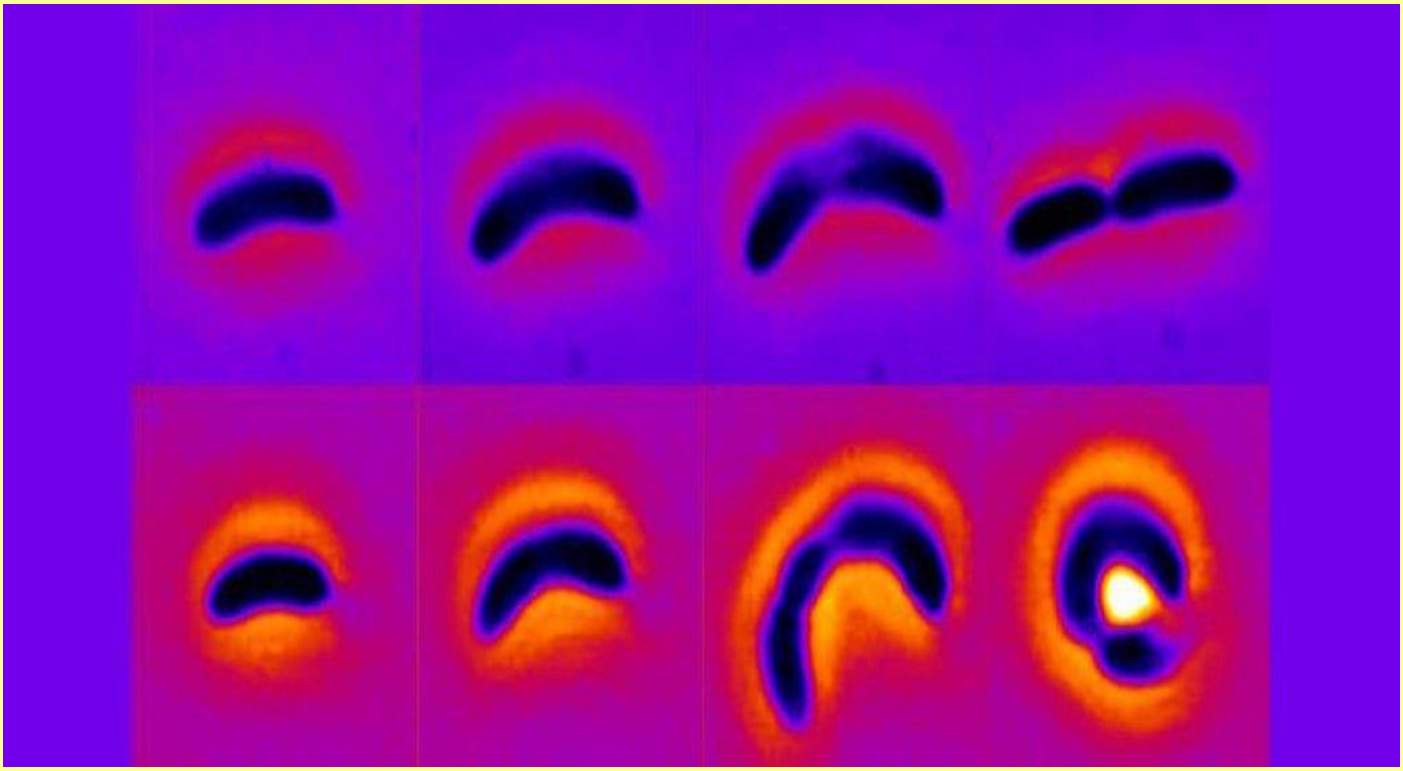
Key Results

- DeepCOVID-XR classified 2,214 test images (1,194 COVID-19 positive) with an accuracy of 83% and AUC of 0.90 compared with the reference standard of RT-PCR.
- On 300 random test images (134 COVID-19 positive), DeepCOVID-XR's accuracy was 82% (AUC 0.88) compared to 5 individual thoracic radiologists (accuracy 76%-81%) and the consensus of all 5 radiologists (accuracy 81%, AUC 0.85).
- Using the consensus interpretation of the radiologists as the reference standard, DeepCOVID-XR's AUC was 0.95.

Bacteria Have Been Seen Literally Changing Shape to Avoid Antibiotics

Source: https://www.sciencealert.com/bacteria-can-change-shape-to-help-them-become-more-resillient-to-antibiotics

Feb 01 – If you're a bacterium just trying to survive in a world filled with antibiotics you need some tricks up your sleeve. You can be poked by another bacterium to get some exciting new genetic material, or you can genetically mutate through the generations and hope you find the secret sauce to stop the poison.



Comparison of growth of Caulobacter crescentus when exposed to an antibiotic (bottom) and not. (Shiladitya Banerjee)

Scientists have long known about these strategies, but now a team of researchers have observed a worryingly simple new way bacteria are avoiding antibiotics in the human body - by changing shape.
"We find that *Caulobacter crescentus* cells can recover their pre-stimulus growth rates and undergo dramatic changes in cell shape," the team writes in their new paper.

Can Moms Transfer COVID-19 Immunity to Their Newborns?

Source: https://www.sciencealert.com/mom-s-might-be-passing-on-covid-19-immunity-to-their-newborns

Feb 01 – If a woman catches COVID-19 during pregnancy, can her baby pick up any immunity to the virus in the womb? Early data hint that the answer is yes, but many questions still remain.

In a new study, published Jan. 29 in the journal *JAMA Pediatrics*, scientists analyzed blood samples from more than 1,470 pregnant women, 83 of whom tested positive for antibodies for SARS-CoV-2, the coronavirus that causes COVID-19, at the time of delivery. Umbilical cord blood samples from the majority of babies born to these women also tested positive for antibodies, suggesting the babies picked up this passive immunity. The number of antibodies passed to the baby largely depended on the type and quantity of antibodies that were present in the mother, and when she caught COVID-19 during pregnancy.

"The longer [the] time between maternal infection and delivery, the greater the antibody transfer," study authors Dr. Karen Puopolo and Dr. Scott Hensley of the University of Pennsylvania Perelman School of Medicine wrote in an email.

This correlation held true whether the mother developed symptoms of COVID-19 or remained asymptomatic during her infection.

The transferred antibodies may provide protection to the newborn baby, but "work remains to be done to determine what levels and types of antibody are needed to protect newborns from SARS-CoV-2 infection, and how long those antibodies may last in the newborn circulation," the authors said.

Another big question is how well the transferred antibodies "neutralize" the coronavirus, meaning block its ability to infect cells, they said.

"It is hopeful to have this data," said Dr. Flor Muñoz-Rivas, an associate professor of pediatric infectious disease at the Baylor College of Medicine in Houston, who was not involved in the study.

By studying antibody transfer after natural COVID-19 infection, we can gather hints about whether vaccines given to pregnant people provide similar protection to newborns, she said.

Early findings

In the new study, the team specifically tested for antibodies that latch onto the coronavirus spike protein, a structure that sticks off the virus's surface; the antibodies the team looked for all target the "receptor-binding domain" (RBD), the part of the spike that binds directly to the receptor, or doorway, into cells. RBD antibodies are the most critical for neutralizing the coronavirus, Live Science previously reported.

But not all RBD antibodies can cross the placenta, Muñoz-Rivas said. That's because the placenta allows only certain antibodies through, using a special receptor and protein that transports antibodies into the organ. Only small, Y-shaped antibodies called immunoglobulin G (IgG) can fit into the receptor, so they alone can reach the fetus and provide immune protection, she said.

Not all the babies got protection: 72 of the 83 babies born to antibody-positive mothers had IgG in their cord blood, and the overall quantity correlated with the IgG concentrations in their mothers' blood. The 11 remaining babies who tested negative for antibodies did so for two reasons.
Six of the babies' mothers had relatively low IgG levels, suggesting that they were likely "so early in their infection that there had not been time for them to produce and transfer antibody across the placenta," the authors said.
Either that, or the mothers simply produced fewer antibodies than average, but this is a less likely scenario, they added. The other five babies' mothers only tested positive for so-called IgM antibodies, which cannot cross the placenta.
IgM antibodies appear early in an infection and then disappear once the infection clears, Muñoz-Rivas said, so the five moms who only tested positive for IgM were in the very early stages of infection. If IgM antibodies appear in a fetus or newborn, this indicates that the fetus was directly infected with the virus. In this study, no IgM for SARS-CoV-2 was detected in any cord blood samples, meaning no fetus caught COVID-19 while still in the womb.
However, the study cannot say for sure that SARS-CoV-2 is never transmitted to the fetus before birth, the authors said.

What does this mean for vaccines?
While the study shows that IgG antibodies can cross the placenta, scientists still need to determine how well the transferred antibodies protect against infection, the authors said.
Researchers can test how well antibodies block infection using "neutralization assays" - experiments in which they grow the virus in a dish with antibodies and human cells, to see if the antibodies prevent infection, Live Science previously reported. The authors could also follow up on the babies born with antibodies, to see how long their antibodies persist and if any of the babies later catch COVID-19, Muñoz-Rivas said.
These kinds of studies would provide a benchmark of what to expect after a pregnant person catches COVID-19; the natural immune response could then be compared to what we see in vaccinated mothers and their newborns, Muñoz-Rivas said.
Right now, both the Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) recommend that only people at high risk of SARS-CoV-2 exposure or high risk of severe illness, due to medical conditions, should consider getting the vaccine during pregnancy and that they should consult with a doctor before receiving one.
With other vaccines given in pregnancy, such as those for tetanus and whooping cough, antibody levels in the newborn drop rapidly by the time the baby is two months old, Muñoz-Rivas wrote in an editorial published Jan. 29 in *JAMA Pediatrics*. This decline then slows, and the antibody levels continue to fall steadily over the next four to eight months.
Similarly, for COVID-19 vaccines, the antibodies found in cord blood would be the "starting point," or the peak number of antibodies the baby gets before levels begin to drop, she said. To maximize the number of antibodies passed to the fetus, mothers would likely need to wait until the second trimester to be vaccinated; after about 17 weeks of gestation, the placenta grows big enough to pump a significant number of antibodies to the developing baby, she said.
Although it's encouraging that maternal vaccines could offer protection to newborns, "for COVID, as best as we know right now, the goal would be to protect the mother," Muñoz-Rivas said.
Pregnancy increases the risk for severe illness and death from COVID-19, while most newborns who have tested positive have had mild or no symptoms and recovered from the virus, according to the CDC. As with influenza infections, mothers appear especially vulnerable in the third trimester and are more likely to develop severe conditions, like pneumonia and respiratory failure, if they catch COVID-19 at that stage, Muñoz-Rivas said.
So the second trimester might be the best time to get vaccinated, she said. That way, potential side effects could be avoided in the first trimester, when conditions like inflammation and fever can disrupt fetal development, while the immune system would still have plenty of time to ramp up its response before the third trimester. Of course, scientists still need to conduct observational studies and clinical trials to figure out the best time during pregnancy to give the COVID-19 vaccine, Muñoz-Rivas said.
"If we can, in addition to that, protect the baby, that's a bonus," she said. That said, since COVID-19 vaccines won't be available for infants anytime soon, Muñoz-Rivas said that she would consider it a fairly significant bonus.

The FDA Has Approved These KN95 Face Masks for Emergency Usage

Source: https://www.yahoo.com/entertainment/fda-approved-kn95-face-masks-010030212.html

Feb 02 – As coronavirus cases continue to spread worldwide, you may be searching to upgrade your face mask collection. The Centers for Disease Control and Prevention now recommends wearing a mask made with two or more layers, and some experts even advise

double-masking for extra effectiveness. If you're having trouble deciding what the best options are, the Food and Drug Administration has an ongoing list of Emergency Use Authorized masks, and these popular KN95 masks on Amazon made the cut.

Made with four layers of fabric, including cotton, the Powecom KN95 Disposable Masks are over 95 percent efficient at filtering particles, including dust, smog, and droplets. (Some reviewers who cut open the masks say they also noticed a "meltblown layer.") Sold in packs of 10 on Amazon, the white disposable masks each include elastic ear loops and an adjustable nose clip. Each package also comes with an anti-counterfeit label that can be verified for authenticity via the brand's website.

The masks usually cost $15, but they're on sale for $13, meaning the price of one mask comes out to just $1.26 right now.

In addition to being FDA-approved, the masks have the stamp of approval from over 7,000 Amazon shoppers who left a five-star rating. The Powecom masks are also currently the number two best-selling disposable respirator safety masks on Amazon. Customers say that they "fit very well" and are "easy to talk to and breathe in."

What If a Colleague Refuses the COVID Vaccine?

By Alok S. Patel, MD
Source: https://www.medscape.com/viewarticle/943897

Jan 26 – All over social media, people are sharing photos and selfies of themselves getting the COVID-19 vaccine. They are really excited about the light at the end of the tunnel, and that light is a vaccine that is going to get us to herd immunity.
At the time of this recording, I haven't seen any hospitals making the shot mandatory for healthcare professionals. Enthusiasm and compliance have been high, as they should be. With everything that is at stake, I want to ask you: Do you think getting the COVID-19 shot should be a requirement for healthcare professionals?
My next question is, does it even need to be required? Susan Bailey, the president of the American Medical Association, said she was confident that once physicians saw the evidence behind the vaccine, they would go out and get the shot. Well, they have and they are. I think this is true with all healthcare professionals.
Case in point: Many of you saw the video of one of the first people to get the shot, a critical care nurse in New York City. I love what she said: "I trust the science and I guide my practice by it." Since then, thousands of healthcare workers have followed suit, have shared photos and facts about the vaccine, and have debunked misinformation.
Unfortunately, there is still some reluctance within the medical community about the vaccine. That's why we're talking about this. According to an October survey, only one third of US nurses said they're willing to go and get the shot. Now, granted, that was a little while ago. More recently, per the executive director of the Association for Immunization Managers, state and local health departments are reporting that **only about 50%-70% of healthcare workers said they were going to go and get the vaccine**.
In early December, I read a Medscape article about vaccine side effects. I noticed the comment section was littered with rants from healthcare workers talking about why they were not going to go and get the shot. Hopefully, all the recent data have swayed some of them, but who really knows.
Plenty, if not all, major healthcare organizations stand by the science of the vaccine and trust it — the FDA, CDC, ACIP, American Hospital Association, AMA, ANA, AAP, and the list goes on.
Many hospitals are just waiting for full FDA approval rather than emergency use authorization to mandate the shot. Maybe healthcare systems just need more time and more data.
Can you imagine working in a COVID unit and one of your colleagues refuses the vaccine? Maybe a mandate would remove the personal politics from all of this by sending a clear signal, saying, "We want our workers to get the shot," like they do with the flu shot. But maybe a mandate that is rushed would cause more mistrust and division.
The legality of all this is yet another topic. A recent article by healthcare attorney Carolyn Buppert made me think and raised some questions. What happens with worker's compensation if a hospital employee refuses the COVID-19 vaccine and then gets sick with it? I know we are still waiting to see what happens with transmission after getting vaccinated. In theory, would a hospital be liable if an employee refuses the vaccine and then goes and causes an outbreak? It's a lot to think about.
We play a crucial role in building public trust, not only with the vaccine itself but also with the entire process that got us to approval, from research to review. Maybe this entire discussion will fade in time and healthcare workers will unanimously march out and get their shots. Maybe it will evolve into a more complicated topic that will push national organizations to support a mandate.
Hopefully, in the meantime, we won't have to have difficult conversations with vaccine-hesitant peers. But time will tell.
For now, what I want to know from all of you is whether you think the COVID-19 vaccine should be mandatory for frontline healthcare workers.

***Alok S. Patel, MD**, is a pediatric hospitalist, television producer, media contributor, and digital health enthusiast. He splits his time between New York City and San Francisco, as he is on faculty at Columbia University/Morgan Stanley Children's Hospital and UCSF Benioff Children's Hospital. He hosts The Hospitalist Retort video blog on Medscape.*

EDITOR'S COMMENT: We always read about the consequences of refusing vaccination but almost never about the reasoning behind colleagues' decision. In example,

my main objections are: (1) why should I have to vaccinate with a specific vaccine only? (2) why do we think that "western" products are better than "eastern" products? (2) why companies change their minds many times regarding the interval between the two jabs? (2) why we need two or maybe three doses of the same content to acquire immunity? The latter is a question with no satisfactory answer to my ears. The 30% of colleagues that is reluctant to vaccinate now are not anti-vaxxers. What if they are just people that base their decisions on solid facts and scientific proof instead of enthusiasm and relief after 13 months in a pandemic status? The questions posed in this article are logical there is no doubt about it. But how many cases we have already read about vaccinated people that got a second covid infection or even die because of Covid-19? Complicated issues require a more holistic approach than easy conviction and public ridicule if certain opinions do not agree with those of others.

COVID Vaccine Anaphylaxis: Who Is at Risk?

By Gary J. Stadtmauer, MD
Source: https://www.medscape.com/viewarticle/944936

Jan 29 – Some of the celebration and excitement over the approval of the COVID vaccines has been dampened by recent reports of allergic complications. Twenty-one cases of confirmed anaphylaxis were identified after the first 1.8 million doses of the Pfizer-BioNTech vaccine were administered (roughly 1 in 87,000 injections). Though rare, this is substantially higher than the risk associated with other vaccines (1.3 per million).
So far, the majority of episodes of anaphylaxis occurred within 30 minutes of receiving the vaccine and readily responded to treatment. Of 21 identified case reports, five patients were food allergic, of whom three also had a history of drug allergy. A total of 12 patients had had prior allergic reactions to medications or vaccines, and one patient had environmental allergies.
As for the Moderna vaccine, a couple of cases of delayed facial swelling have occurred without serious consequences. The Centers for Disease Control and Prevention (CDC) now recommends a brief period of observation after vaccination in a facility that is capable of and prepared to treat anaphylaxis.
So, what's the most likely cause of these reactions, and how can we keep our patients safe? Here are the answers to some questions you might have.

Are Vaccine Allergies Common?
Vaccine allergy is rare. The cause of these rare allergic reactions to vaccines is usually not the antigen but an excipient — additives that may include antibiotics, preservatives, or adjuvants. Meat proteins (gelatin and, rarely, alpha-gal) have also been identified as causes of IgE-mediated reactions in vaccines with higher gelatin content (MMR and VZV). Therefore, in some instances, atopy (especially food allergy) may be a risk factor for reactions to certain vaccines. On the other hand, influenza vaccine cultured in eggs contains so little egg allergen that it is no longer a concern for patients with even severe egg allergy.

What Might Be Causing COVID-19 Vaccine Anaphylaxis?
It was recently proposed that the cause of these reactions is the known allergen polyethylene glycol (PEG), which is present in both the Moderna and Pfizer vaccines to help stabilize the mRNA. PEG has been identified as the cause of reactions to colonoscopy preparations; stool softeners (such as Miralax); and medications, including topical and parenteral corticosteroids, as well as PEG-coated tablets and toothpaste**. The high molecular weight of PEG may be immunogenic. Both IgE and IgG antibodies to these excipients, along with positive skin tests, support this.**

Who Is at Risk for COVID-19 Vaccine Anaphylaxis?
This remains to be determined and may be different for each COVID-19 vaccine. Operating under the assumption that the causative agent *may* be PEG, then patients with a history suspicious for IgE-mediated reactions to a stool softener, colonoscopy prep, and other products containing PEGylated products may be considered at risk.

How Do You Evaluate Patients Who Could Be At Risk?
Skin prick and intradermal testing to PEG-3350 (the polyethylene glycol in Miralax stool softener) has been reported and was positive in some patients with a history of anaphylaxis to this product; the skin test resulted in a mild urticarial rash with dyspnea and diffuse pruritus. Because there is at least some experience with PEG skin testing, this could be done in

patients with a questionable history of PEG allergy. But how to proceed beyond that would still be uncharted territory.

How Should We Manage Higher-Risk Patients?

The CDC recommends that patients who have an anaphylactic reaction to the first dose of the COVID-19 vaccine not receive the second dose. When the diagnosis is in doubt — for example, in the setting of a possible vasovagal reaction post-vaccination — measuring serum tryptase (or SC5b-9, the terminal complement complex) may confirm the diagnosis of anaphylaxis. I advise interpretation of the test result in consultation with an allergist-immunologist. A history of an anaphylactic reaction to any polysorbate (such as PEG) is also a contraindication to the Pfizer and Moderna vaccines.

How Should We Manage Patients With Vaccine Contraindications?

The Johnson & Johnson COVID-19 vaccine utilizes an adenovirus vector rather than mRNA. For patients who *may* have had **anaphylaxis after the first dose** but in whom the reaction is seriously in doubt, an allergist could consider performing a scratch test with sequential challenge. It's debatable whether that is worth the risk, because the first vaccine dose has moderate efficacy and an alternative vaccine is on the horizon.

Gary J. Stadtmauer, *MD, is an allergist-immunologist in New York City.*

COVID-19 Has Turned Cardiac Resuscitation Upside Down

By Amal Mattu, MD

Source: https://www.medscape.com/viewarticle/944738

Jan 27 – On October 20, 2020, the American Heart Association (AHA) released online its latest update of the Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. The update included no major or groundbreaking changes from the 2015 guidelines, and it did not address the COVID-19 pandemic, which has turned many traditional concepts of resuscitation upside down.

Fortunately, in April 2020, the AHA issued Interim Guidance for Basic and Advanced Life Support, which addresses many modifications of the guidelines in patients with known or suspected COVID-19. Now that we are in the throes of a third wave of the pandemic, it is a good time to review those recommendations, with an emphasis on the modifications, in caring for patients with cardiac arrest and known or suspected COVID-19.

At the time of this writing, more than 24 million Americans have been infected with SARS-CoV-2 and over 400,000 have died. It is estimated that 5% of infected patients become critically ill, and up to 40% of these will die.The actual overall mortality of those who are infected is uncertain but varies by age and overall is probably less than 2%. This is a relatively low mortality rate, but because of the tremendous number of infected individuals, a large absolute number of patients die. Not surprisingly, a rise in out-of-hospital cardiac arrests has been noted in major metropolitan centers.

Caring for patients with known or suspected COVID-19 who are critically ill or in cardiac arrest is a challenge. Providers must protect themselves and their colleagues to avoid virus exposure and infection while at the same time delivering effective care to the patient. To address this challenge, the AHA issued its recommendations.

The following is a list of key recommendations for managing adult cardiac arrest, with an emphasis on modifications in caring for the patient with known or suspected COVID-19.

Providers should make every effort to reduce their own exposure to COVID-19. Exposed or infected providers further decrease the workforce that is caring for these patients. The number of personnel in the room should be limited to the minimum necessary to deliver care. This includes an emphasis on the use of mechanical devices for chest compressions when they are available.

Prioritize oxygenation and ventilation strategies that lower the risk for aerosolization of virus particles. After initial rhythm assessment and defibrillation, when indicated, patients should be endotracheally intubated with a cuffed tube as soon as feasible. Pause chest compressions in order to intubate.

This is a major departure from previous recommendations, which emphasized the need to minimize interruptions in compressions and allowed for delayed intubation in favor of simple bag-valve-mask (BVM) ventilation. In addition:

- Endotracheal intubation should be performed by the most experienced operator to minimize the time to securing the airway.

- Video laryngoscopy is recommended over direct laryngoscopy to reduce the intubator's exposure to aerosolized particles.

The endotracheal tube should be connected to a ventilator with a high-efficiency particulate air (HEPA) filter when available. A HEPA filter should always be securely attached to any manual or mechanical device in the path of any exhaled gas before any breaths are administered.
BVM ventilations should be avoided, if possible, because of the risk for aerosolization of virus particles. If intubation cannot be achieved early, passive oxygenation with a non-rebreather mask covered by a surgical mask is a reasonable option, or BVM ventilation with a HEPA filter and a tight seal can be used as a last resort.
If intubation is delayed, consider manual ventilation with a supraglottic airway or bag-mask device with a HEPA filter.
Once the patient is intubated and connected to the ventilator, minimize disconnections in this closed circuit to reduce aerosolization.

Consider the appropriateness of starting and continuing resuscitation
None of us likes giving up during a cardiac arrest, but now more than ever, we must remember the potential harm to our staff when continuing with futile resuscitations. When there is no shockable rhythm, consider early termination of efforts. Consider these prepandemic statistics to put things in perspective:

- If the patient has no return of spontaneous circulation (ROSC) after three cycles of cardiopulmonary resuscitation (CPR), no shocks, and the arrest was unwitnessed by emergency medicine services (EMS) personnel, the likelihood of survival is 1%.
- If the patient has no ROSC by hospital arrival and no prehospital shock, the 30-day survival is 0.03%.

Recent data have demonstrated that rates of ROSC and survival from out-of-hospital cardiac arrest have fallen further during the COVID-19 pandemic. The reasons for this are multifactorial but may include a reluctance of bystanders to perform CPR; social distancing causing more arrests to be unwitnessed; changes in EMS protocols or other factors that lead to delays in EMS intervention; or disease-related factors (COVID-19–related cardiac or pulmonary insult).

Viewpoint
The COVID-19 pandemic has certainly turned upside down a great deal of what we learned about resuscitation of critically ill patients and those in cardiac arrest. In my opinion, the largest modifications of traditional care are:

1. The early emphasis on securing a definitive airway rather than simply BVM ventilation;
2. The recommendation to pause compressions during the intubation; and
3. The push to seriously consider the appropriateness of starting and continuing resuscitation.

All of these measures prioritize the safety of the providers over the patient.
The interim guidelines did not address any modifications in the use of medications during cardiac arrest. Emerging literature indicates that a possibly significant cause of malignant arrhythmias in COVID-19 is the prolonged QT interval. There are several contributing factors: Severe inflammation that occurs during the COVID-19 infection itself can cause a prolonged QT interval; diarrhea and dehydration can produce hypokalemia and hypomagnesemia, which lead to a prolonged QT interval; COVID-19 can produce kaliuresis, leading to a prolonged QT interval; and many medications, when administered concurrently (eg, ondansetron, hydroxychloroquine, azithromycin), can further prolong the QT interval.
With these factors in mind, it would seem prudent to avoid amiodarone, which may further prolong the QT interval, and have a low threshold to administer magnesium in patients with cardiac arrest, although this has not been studied.
It will be interesting to watch the resuscitation guidelines continue to evolve as we learn more about COVID-19 in the coming months.
Remember the common saying: You can't take care of others unless you take care of yourself (and your staff) first.

***Amal Mattu, MD**, is a professor, vice chair of education, and co-director of the emergency cardiology fellowship in the department of emergency medicine at the University of Maryland School of Medicine in Baltimore.*

Covid Hunter

Source: https://www.expressnews.com/business/article/Covid-Hunter-the-scanner-that-detects-15912631.php

Feb 01 – It is now possible to detect the **coronavirus** without testing, thanks to the **Covid Hunter** device, a scanner that identifies the presence of **the SARS-CoV-2 virus** immediately. The developers describe it as *"the world's first non-contact viral detector"* and will be **manufactured in Mexico**.

The **Covid Hunter**, developed by the American company **Advanced Medical Solutions International (AMSI**), is capable of detecting traces of coronavirus immediately in people and objects, without touching them. It can also identify **new variants of COVID-19** and other viruses, such as influenza, the company reported in a statement.

*"The **Covid Hunter** is a non-invasive, non-contact, immediate and portable virus detector, specially designed for the **SARS-CoV-2** virus that causes **covid-19** disease, demonstrating **99% effectiveness** and with **sensitivity within 0 to 2 meters** on surfaces, **through glass or transparent material**, and **inside the human body**"* , explained the company.

The company detailed that the scanner **can locate the coronavirus in various human organs**, such as the lungs, throat, nose and skin, and even on clothing. Simply point the scanner at the object less than two meters away.

How does the Covid Hunter work?

At first glance, it looks like any ordinary laser scanner, but the beam it emits and its software **analyze in real time, by refraction, if the spike protein of the SARS-CoV-2 virus is present**. When the scanner identifies this protein, characteristic of the **coronavirus**, it emits an alert sound, and if there is no presence of **COVID-19,** it remains silent.

The doctor **Alejandro Díaz Villalobos**, a specialist in immunology and allergies, is the only Mexican who is part of the project. The researcher also explained that the **Covid Hunter** has had a 100% efficiency level in the tests presented by the team. The device detected positive **COVID-19** samples validated via **PCR test**, and also managed to differentiate between positive and negative patients.

Since the vaccine will take time to be applied to the entire world population, Díaz believes that the best way to contain the pandemic is prevention. Thus, the **Covid Hunter** would be a key tool for authorities and companies to detect the virus in real time in crowded areas such as restaurants, public transport, airports or similar.

"If we can immediately detect who is infected, we can mitigate their contact with other people or control their access ," Diaz said in an interview with Forbes. The doctor added that, as the scanner locates the virus on surfaces or clothes, the disinfection work becomes 100% accurate.

The Covid Hunter will be Made in Mexico

Díaz Villalobos revealed that the team, made up of experts from Jordan and the United States, agreed that **the manufacture and distribution of Covid Hunter will be in Mexico**.

"You do not know the work it took to arrive and agree that Mexico was the country of manufacture," revealed the Mexican researcher. He pointed out that they are in talks with several **medical equipment manufacturing companies** to finalize production details.

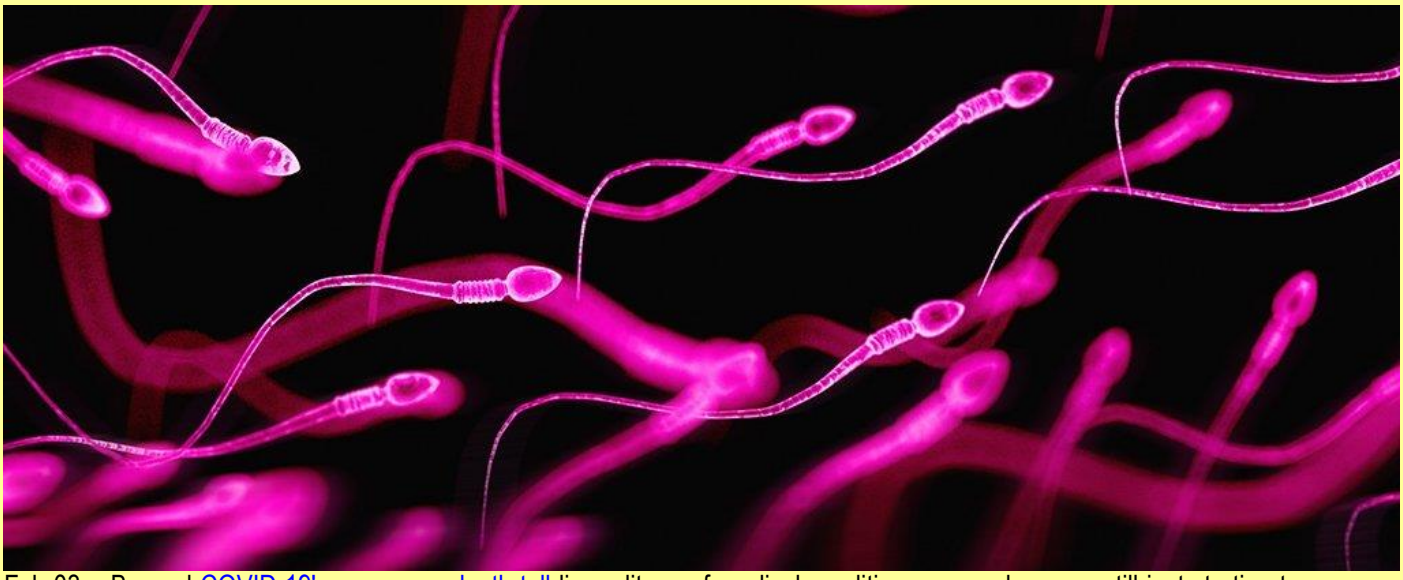
The doctor pointed out that he hopes *"to have the first production prototype in three weeks*." It foresees that when the first production is carried out, they can achieve certification from health authorities, such as the **FDA in the United States** and **Cofepris in Mexico** *"I would ask Cofepris to allow us to move forward as quickly as possible with the entire process for authorization, especially because we are at the most critical point in the spread of the virus,"* said Díaz.

The final price of the **Covid Hunter** has not been established, but they anticipate that it will be very affordable. The plan is to distribute the first units produced in the centers of high human concentration, so that later "this technology can reach everyone's hands, because its objective is none other than to save human lives," concluded the Mexican specialist.

▶▶ **Watch:** https://www.youtube.com/watch?v=CNwa0F6uQS0&feature=youtu.be

Men May Be Less Fertile in The Aftermath of COVID-19 Infection, Scientists Warn

Source: https://www.sciencealert.com/researchers-warn-men-could-be-less-fertile-in-the-aftermath-of-a-covid-19-infection



Feb 03 – Beyond COVID-19's gruesome death toll lies a litany of medical conditions researchers are still just starting to uncover. One potential concern demanding closer scrutiny is the virus's impact on male fertility.

Scientists have suspected for some time that the novel SARS virus has the potential to wreak havoc with sperm counts. A review of the state of research, along with strong new evidence, emphasises the need to monitor men's reproductive systems as vulnerable routes for coronavirus infection.

Researchers from the Huazhong University of Science and Technology in Wuhan, China conducted an analysis of existing reports on possible mechanisms SARS-CoV-2 might employ to interfere with male reproduction.

While they couldn't state with confidence there was a clear reduction in fertility, they warned there was every reason to pay close attention to the possibility.

"We propose that there is an urgent need to track male COVID-19 patients during their recovery," microbiologist Yu Tian and reproductive biologist Li-quan Zhou argue in their report.

Medical researchers have become intimately familiar with the way SARS-CoV-2 slips into our bodies and promotes a flurry of destructive immune responses.

Central to its break-and-enter strategy is a common cell receptor called angiotensin-converting enzyme 2, or ACE2. Wherever the body makes use of this enzyme, it's a sound bet SARS-CoV-2 will leave its mark, putting multiple organs at risk.

This means the virus not only affects our olfactory and respiratory system, but can impact our digestive system, leave our circulatory system weakened, and even spark inflammatory responses deep inside our brain.

The fact tissue inside the testes is just one more potential target hasn't been lost on researchers. Early studies finding presence of the virus in semen samples added to the growing need to investigate.

But findings haven't exactly been consistent. Past research carried out on SARS-CoV-2's predecessor, SARS-CoV-1, also tended to dismiss serious concerns that the testes were vulnerable, with most studies failing to find any trace of the virus inside its tissues.

Now, however, the weight of evidence appears now to be tipping well in favour of arguments that testicular tissue is commonly being damaged as a direct result of COVID.

A recently published longitudinal investigation conducted by researchers from Justus-Liebig-University in Germany and Allameh Tabataba'i University in Iran reports direct experimental evidence of just such damage.

Their study looked instead at inflammation markers in samples of tissue from 84 men diagnosed with COVID-19, alongside 105 controls. They also evaluated sperm quality and searched for signs of oxidative stress in the samples.

It was clear having COVID-19 made at least some difference, with inflammation and cellular stress appearing twice as severe in those who'd been diagnosed as positive for the virus, compared with those who hadn't.

What's more, the sperm of men who'd been infected were roughly three times as slow, and their sperm counts were far lower as well.

"These effects on sperm cells are associated with lower sperm quality and reduced fertility potential," says lead researcher Behzad Hajizadeh Maleki, a sports scientist from Justus-Liebig-University.
"Although these effects tended to improve over time, they remained significantly and abnormally higher in the COVID-19 patients, and the magnitude of these changes were also related to disease severity."
What this means for men recovering from a SARS-CoV-2 infection isn't clear, especially in the long term. Authors of both the review and the experimental study call for more research before making a call on how – or even whether – the decreased fertility will have any real impact on efforts to conceive.
Yet, with many nations around the globe already facing a mounting fertility crisis that promises to curb population growth in the future, COVID-19 could be another hurdle to overcome.
Hopes are pinned on vaccines putting an end to the worst of the pandemic in the near future. But even if our best efforts prevail, the scars of the coronavirus will be left on our bodies and our population for a long time to come.

▶▶ **This research was published in *Reproduction*,** here and here.

Scientists uncover potential antiviral treatment for COVID-19

University of Nottingham
Source: https://www.eurekalert.org/pub_releases/2021-02/uon-sup020121.php

Feb 02 – Researchers from the University of Nottingham have discovered a novel antiviral property of a drug that could have major implications in how future epidemics / pandemics - including Covid-19 - are managed.
The study, published in *Viruses**, shows that **thapsigargin** is a promising broad-spectrum antiviral, highly effective against Covid-19 virus (SARS-CoV-2), a common cold coronavirus, respiratory syncytial virus (RSV) and the influenza A virus.

Given that acute respiratory virus infections caused by different viruses are clinically indistinguishable on presentation, an effective broad-spectrum that can target different virus types at the same time could significantly improve clinical management. An antiviral of this type could potentially be made available for community use to control active infection and its spread.
The study is a collaborative project led by Professor Kin-Chow Chang and experts at the University of Nottingham (Schools of Veterinary Medicine and Sciences, Biosciences, Pharmacy, Medicine, and Chemistry), and colleagues at the Animal and Plant Health Agency (APHA), China Agricultural University and the Pirbright Institute.
In this ground-breaking study, the team of experts found that the plant-derived antiviral, at small doses, triggers a highly effective broad-spectrum host-centred antiviral innate immune response against three major types of human respiratory viruses - including Covid-19.
The key features based on cell and animal studies, which make thapsigargin a promising antiviral are that it is:

- effective against viral infection when used before or during active infection
- able to prevent a virus from making new copies of itself in cells for at least 48 hours after a single 30-minute exposure.
- stable in acidic pH, as found in the stomach, and therefore can be taken orally, so could be administered without the need for injections or hospital admission.
- not sensitive to virus resistance.
- at least several hundred-fold more effective than current antiviral options.
- just as effective in blocking combined infection with coronavirus and influenza A virus as in single-virus infection.
- safe as an antiviral (a derivative of thapsigargin has been tested in prostate cancer).

Professor Chang said: "Whilst we are still at the early stages of research into this antiviral and its impact on how viruses such as Covid-19 can be treated, these findings are hugely significant.
"The current pandemic highlights the need for effective antivirals to treat active infections, as well as vaccines, to prevent the infection. Given that future pandemics are likely to be of animal origin, where animal to human (zoonotic) and reverse zoonotic (human to animal)

spread take place, a new generation of antivirals, such as thapsigargin, could play a key role in the control and treatment of important viral infections in both humans and animals."
Indeed, influenza virus, coronavirus and RSV are global pathogens of humans as well as animals. Thapsigargin represents a lead compound in the development of a new generation of powerful host-centred antivirals (as opposed to conventional antiviral drugs that directly target viruses) that could even be adopted in a holistic "One Health" approach to control human and animal viruses.
Professor Chang adds: "Although more testing is clearly needed, current findings strongly indicate that thapsigargin and its derivatives are promising antiviral treatments against COVID-19 and influenza virus, and have the potential to defend us against the next Disease X pandemic."

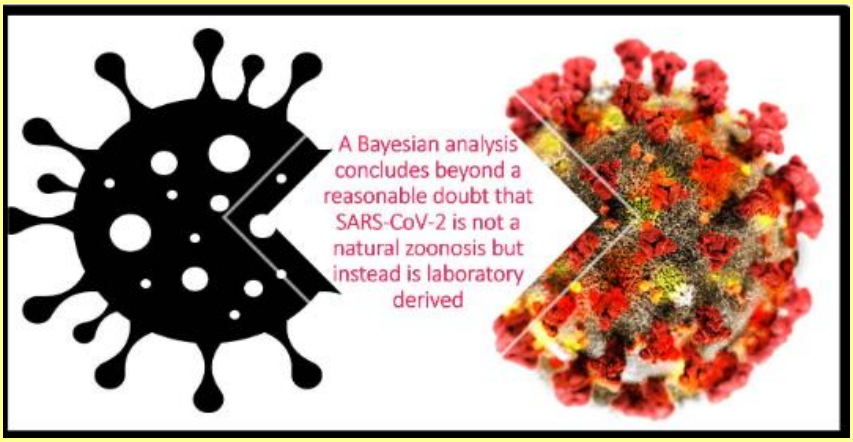
New Study by Dr. Steven Quay Concludes that SARS-CoV-2 Came from a Laboratory

Source: https://www.prnewswire.com/news-releases/new-study-by-dr-steven-quay-concludes-that-sars-cov-2-came-from-a-laboratory-301217952.html

Jan 29 – A paper was published today by Dr. Steven Quay, M.D., PhD., CEO of Atossa Therapeutics, Inc. (NASDAQ: ATOS), entitled, "A Bayesian analysis concludes beyond a reasonable doubt that SARS-CoV-2 is not a natural zoonosis but instead is laboratory derived."

The 193-page paper can be downloaded from Zenodo, a general-purpose open-access repository operated by CERN, here: https://zenodo.org/record/4477081# . A short 'explainer' video about the paper is here: https://zenodo.org/record/4477212#.

The purpose of the analysis was to determine the origin of SARS-CoV-2, the virus that causes COVID-19. Beginning with a likelihood of 98.2% that it was a zoonotic jump from nature with only a 1.2% probability it was a laboratory escape, twenty-six different, independent facts and evidence were examined systematically. The final conclusion is that it is a 99.8% probability SARS-CoV-2 came from a laboratory and only a 0.2% likelihood it came from nature.



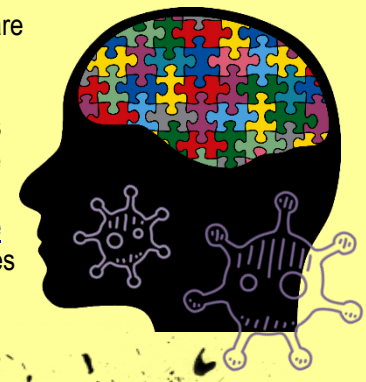
"Like many others, I am concerned about what appear to be significant conflicts of interest between members of the WHO team and scientists and doctors in China and how much this will impede an unbiased examination of the origin of SARS-CoV-2," said Dr. Quay.
"By taking only publicly available, scientific evidence about SARS-CoV-2 and using highly conservative estimates in my analysis, I nonetheless conclude that it is beyond a reasonable doubt that SARS-CoV-2 escaped from a laboratory. The additional evidence of what appears to be adenovirus vaccine genetic sequences in specimens from five patients from December 2019 and sequenced by the Wuhan Institute of Virology requires an explanation. You would see this kind of data in a vaccine challenge trial, for example. Hopefully the WHO team can get answers to these questions."
To assist in finding the truth and to get feedback on the methodologies used and conclusions reached in this paper, a pre-publication copy of this paper was sent to twenty-six scientists worldwide, including the WHO investigators currently in Wuhan, Wuhan Institute of Virology scientists, as well as other prominent virologists.

Dr. Steven Quay, MD, Ph.D., *has 360+ published contributions to medicine and has been cited over 10,000 times, placing him in the top 1% of scientists worldwide. He holds 87 US patents and has invented seven FDA-approved pharmaceuticals which have helped over 80 million people. He is the author of the best-selling book on surviving the pandemic, Stay Safe: A Physician's Guide to Survive Coronavirus. He is the CEO of Atossa Therapeutics Inc., a clinical-stage biopharmaceutical company developing novel therapeutics for treating breast cancer and COVID-19. He received his M.D. and Ph.D. from The University of Michigan, was a postdoctoral fellow in the Chemistry Department at MIT with Nobel Laureate H. Gobind Khorana, a resident at the Harvard-MGH Hospital, and spent almost a decade on the faculty of Stanford University School of Medicine.*

A MAN to remember!

Schizophrenia Identified as Second Greatest Risk Factor For COVID-19 Death

Source: https://www.sciencealert.com/schizophrenia-ranks-second-only-to-age-as-greatest-risk-factor-for-covid-19-death



Feb 04 – COVID-19 vaccination programs are rolling out around the world. Meanwhile, scientists are still hard at work identifying the groups of people most at risk of contracting the infection or dying from it – people who more urgently need the long-awaited protection vaccines can provide.

Now, a new study of nearly 7,400 people in New York, who all tested positive for COVID-19, has found that the odds of people diagnosed with schizophrenia dying from COVID-19 are nearly three times higher than for those without the disorder.

It suggests there might be something about schizophrenia that makes these people more vulnerable to viral infections, though the startling findings may just be a reflection of healthcare inequalities exposed by the pandemic.

"Our findings illustrate that people with schizophrenia are extremely vulnerable to the effects of COVID-19," said psychiatrist Katlyn Nemani from New York University (NYU) Langone Medical Center.

"With this newfound understanding, health care providers can better prioritise vaccine distribution, testing, and medical care for this group," she added.

In the study, Nemani and her colleagues compared how people treated for COVID-19 in New York at the height of the region's coronavirus pandemic fared 45 days after testing positive.
Scouring medical records from the NYU Langone health system, which includes four hospitals, the team identified 7,350 adults who had tested positive for COVID-19 between March and May 2020, of which 75 had diagnosed schizophrenia.
Schizophrenia is a mental disorder that interferes with a person's perception of reality and affects their mood.
But it's worth noting here that schizophrenia is an enigmatic disease that scientists are still trying to understand, and this study only considered people with a documented history of the disorder.
The number of people with schizophrenia in the study was also not huge, though the overall sample size was broad and diverse.
People with mood disorders such as anxiety also featured, but the analysis found these people had no increased risk of dying from COVID-19, even though previous studies have found individuals with mental conditions are more likely to get infected.
The odds of people with schizophrenia dying from COVID-19 were pretty grim: found to be 2.67 times more likely to die from coronavirus than people without schizophrenia.
The result means schizophrenia ranked as the second greatest risk factor (after age) for death by COVID-19 in this group of New Yorkers, after the study authors accounted for other variables, such as age, sex, race, diabetes, heart disease, and smoking (but not medication use or obesity).
"This is an alarming finding," said Tom Pollak, a psychiatrist at King's College London, who was not involved in the study.
"These patients are already amongst the most vulnerable members of society and are probably underserved by most healthcare systems worldwide."
One possible explanation, proposed by the study authors, is that because schizophrenia disturbs the body's immune system – it's sent into overdrive by inflammatory cytokines – it could make these people more vulnerable to COVID-19 infections.
Yet some researchers who weren't involved in the study are making more cautious interpretations, saying that the observed disparity is more likely to be explained by lifestyle factors and comorbidities, such as obesity, common among people with schizophrenia.
Even without COVID-19, people with schizophrenia often have poor physical health, and it has long been known that this translates to a higher likelihood of dying early – as much as 20 years earlier than the average person, in some cases.
According to clinical psychiatrist David Owens from the University of Edinburgh, who was not involved in the research, the study "may, again, be illustrating the health and social inequalities to which patients with long-term psychiatric disorders such as schizophrenia remain prone".
Troubled by paranoia and barred by stigma, people with schizophrenia are often reclusive and may avoid seeking help.
But the study, by design, only looked at people who had access to COVID-19 testing and medical care – at a time when health services were greatly disrupted, and testing was restricted.
This could mean that the people in the study had a pretty severe case of COVID-19, or had family or friends who could help them get to hospital. Sadly, we cannot say what happened to anyone who perhaps had COVID-19 at home but did not seek medical care.
Even with the different takes on this study, if anything, it shows the need to focus our collective efforts on helping vulnerable people, like those with schizophrenia and other life-long health conditions.
"This [research] indicates it is vital that people with schizophrenia are seen as [a] high-risk group and have early access to vaccines," said psychiatrist and epidemiologist Matthew Hotopf, at King's College London, who wasn't involved with the study.

▶▶ **The research was published in the journal** *JAMA Psychiatry*.

Recycling face masks into roads to tackle COVID-generated waste

Source: https://www.eurekalert.org/pub_releases/2021-02/ru-rfm020221.php

Feb 02 – Researchers have shown how disposable face masks could be recycled to make roads, in a circular economy solution to pandemic-generated waste.
Their study shows that using the recycled face mask material to make just one kilometre of a two-lane road would use up about 3 million masks, preventing 93 tonnes of waste from going to landfill.
Developed by researchers at RMIT University in Melbourne, Australia, the new road-making material is a mix of shredded single-use face masks and processed building rubble designed to meet civil engineering safety standards.
Analysis shows the face masks help to add stiffness and strength to the final product, designed to be used for base layers of roads and pavements.

The study published in the journal *Science of the Total Environment* is the first to investigate potential civil construction applications of disposable surgical face masks.

The use of personal protective equipment (PPE) has increased dramatically during the COVID-19 pandemic, with an estimated 6.8 billion disposable face masks being used across the globe each day.

First author Dr Mohammad Saberian said multidisciplinary and collaborative approaches were now needed to tackle the environmental impact of COVID-19, particularly the risks associated with the disposal of used PPE.

"This initial study looked at the feasibility of recycling single-use face masks into roads and we were thrilled to find it not only works, but also delivers real engineering benefits," Saberian said.

"We hope this opens the door for further research, to work through ways of managing health and safety risks at scale and investigate whether other types of PPE would also be suitable for recycling."

Making roads with masks

Roads are made of four layers: subgrade, base, sub-base and asphalt on top. All the layers must be both strong and flexible to withstand the pressures of heavy vehicles and prevent cracking.

Processed building rubble - known as recycled concrete aggregate (RCA) - can potentially be used on its own for the three base layers.

But the researchers found adding shredded face masks to RCA enhances the material while simultaneously addressing environmental challenges on two fronts: PPE disposal and construction waste.

Construction, renovation and demolition account for about half the waste produced annually worldwide, and in Australia, about 3.15 million tons of RCA is added to stockpiles each year rather than being reused.

The study identified an optimal mixture - 1% shredded face masks to 99% RCA - that delivers on strength while maintaining good cohesion between the two materials.

The mixture performs well when tested for stress, acid and water resistance, as well as strength, deformation and dynamic properties, meeting all the relevant civil engineering specifications.

While the experimental study was conducted with a small amount of unused surgical face masks, other research has investigated effective methods for disinfecting and sterilising used masks.

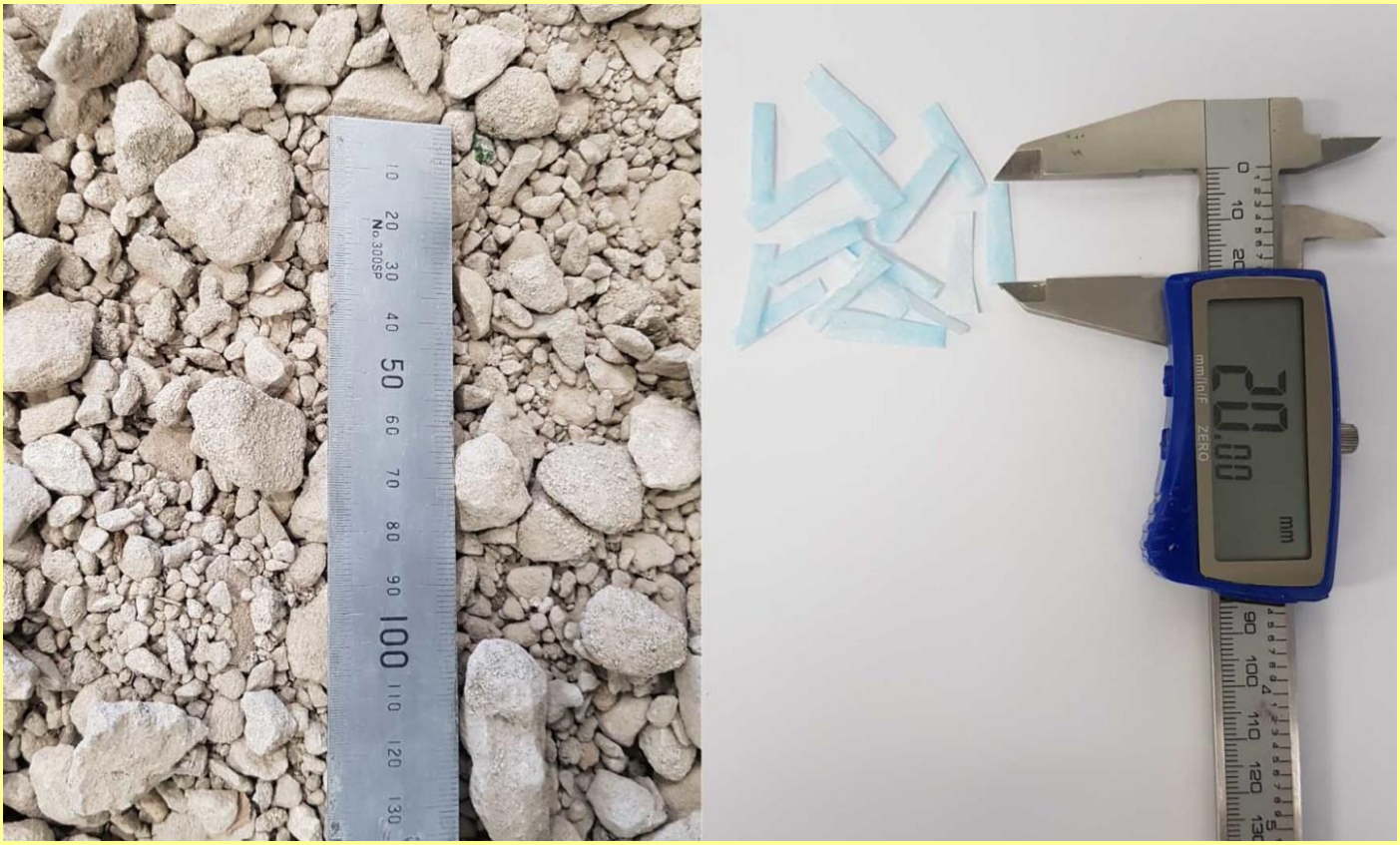
A comprehensive review of disinfection technologies found 99.9% of viruses could be killed with the simple "microwave method", where masks are sprayed with an antiseptic solution then microwaved for one minute.

In related work, the RMIT researchers have also investigated the use of shredded disposable face masks as an aggregate material for making concrete, with promising preliminary findings.

Professor Jie Li leads the RMIT School of Engineering research team, which focuses on recycling and reusing waste materials for civil construction.

Li said the team was inspired to look at the feasibility of blending face masks into construction materials after seeing so many discarded masks littering their local streets.

"We know that even if these masks are disposed of properly, they will go to landfill or they'll be incinerated," he said.



RMIT's new road material is made from a blend of shredded face masks and recycled concrete aggregate – RMIT University

"The COVID-19 pandemic has not only created a global health and economic crisis but has also had dramatic effects on the environment.
"If we can bring circular economy thinking to this massive waste problem, we can develop the smart and sustainable solutions we need."

How I really feel after my second Moderna COVID-19 vaccine shot today?

A true eyewitness story on the COVID Vaccine experience

Source: https://eturbonews.com/2797826/how-i-really-feel-after-my-second-moderna-covid-19-vaccine-shot-today/

Dr. Peter Tarlow *is member of the Editorial Team of the C²BRNE Diary. He is also is the co-founder of the World Tourism Network, and he leads Safer Tourism, department of the Travel News Group.*

A Third of Americans Say They Are Unlikely or Hesitant to Get COVID-19 Vaccine

Source: http://www.homelandsecuritynewswire.com/dr20210204-a-third-of-americans-say-they-are-unlikely-or-hesitant-to-get-covid19-vaccine

Feb 04 – News reports indicate COVID-19 vaccines are not getting out soon enough nor in adequate supplies to most regions, but there may be a larger underlying problem than shortages. A University of California, Davis, study found that more than a third of people nationwide are either unlikely or at least hesitant to get a COVID-19 vaccine when it becomes available to them.
The results are from public polling of more than 800 English-speaking adults nationwide in a study published online earlier this month in the journal Vaccine.

"Our research indicates that vaccine uptake will be suboptimal … with 14.8 percent of respondents being unlikely to get vaccinated and another 23 percent unsure," said Jeanette B. Ruiz, assistant professor of teaching communication at UC Davis and lead author of the study.
"Even though vaccination remains one of the most effective public health initiatives, some still doubt the efficacy and safety of vaccines. Unfortunately, the seemingly rushed process of the COVID-19 vaccine may have further fueled these doubts."
Co-author is Robert Bell, emeritus professor of communication, UC Davis.
Respondents cited vaccine safety and effectiveness assessments as the primary basis for hesitancy, the authors said.
In the study, compensated participants were recruited from the United States through an Internet survey panel of 2.5 million residents developed by a commercial survey firm. Recruitment was based on quota sampling to produce a U.S. census-matched sample representative of the nation, and was representative of the U.S. population in terms of region of residence, sex and age, but also diverse with regard to all demographic variables assessed.
Researchers measured the respondents' intention to vaccinate; demographic and health status profile of individuals least likely to vaccinate; general vaccine knowledge and vaccine conspiracy beliefs; and the role of media and partisan politics played in their resistance to vaccination.

Contributing Factors
The authors indicated demographic characteristics, vaccine knowledge, perceived vulnerability to COVID-19, risk factors for COVID-19, and politics likely contribute to vaccination hesitancy. The study was conducted relatively early in the pandemic outbreak during two days in June 2020.
Demographic predictors of likelihood of being vaccinated against COVID-19 included having an income of $120,000 or higher, or being a Democrat (in comparison to the reference category Republican). The members of three political groups — Democrat, Republican or Independent — did not differ in their reported vaccine knowledge, however. One fourth of those identifying with no political party reported they were not likely to get vaccinated.
Media had an effect, too. Respondents relying primarily on social media for information about COVID-19 anticipated a lower likelihood of COVID-19 vaccine acceptance. Those reporting getting their information from various other media did not show significant differences in vaccine acceptance, but viewers of Fox News did report being more hesitant than viewers of other broadcast news, the research showed. Authors noted that it is possible that individuals gravitate toward the cable news networks that present a view on the pandemic that is aligned with their own opinions.
Media reports have regularly noted that men, adults age 65 and over, and individuals with pre-existing conditions are most vulnerable to COVID-19, and respondents from these groups said they were more likely to accept a future vaccine in this survey. A majority of the least-educated respondents did not expect to get vaccinated against COVID-19, researchers said.

The top four reasons given for vaccination hesitancy were as follows: concerns about vaccine side effects, worries about allergic responses to the vaccine, doubts about vaccine effectiveness and a preference for developing immunity through infection. Other reasons were less frequently cited — including being healthy, fear of needles, being immune from past infection, being young and lack of concern about developing a serious illness.

Unfortunately, the health disparities present in the spread and treatment of COVID-19 were reflected in survey participants' vaccination hesitancy estimations," researchers said in the paper. "The pandemic has especially burdened the African American, Latino and Native American communities, who account for a disproportionate number of COVID-19 cases and deaths. Greater likelihood of COVID-19 vaccine acceptance was associated with more knowledge about vaccines, less acceptance of vaccine conspiracies, elevated COVID-19 threat appraisals and being current with influenza immunization."

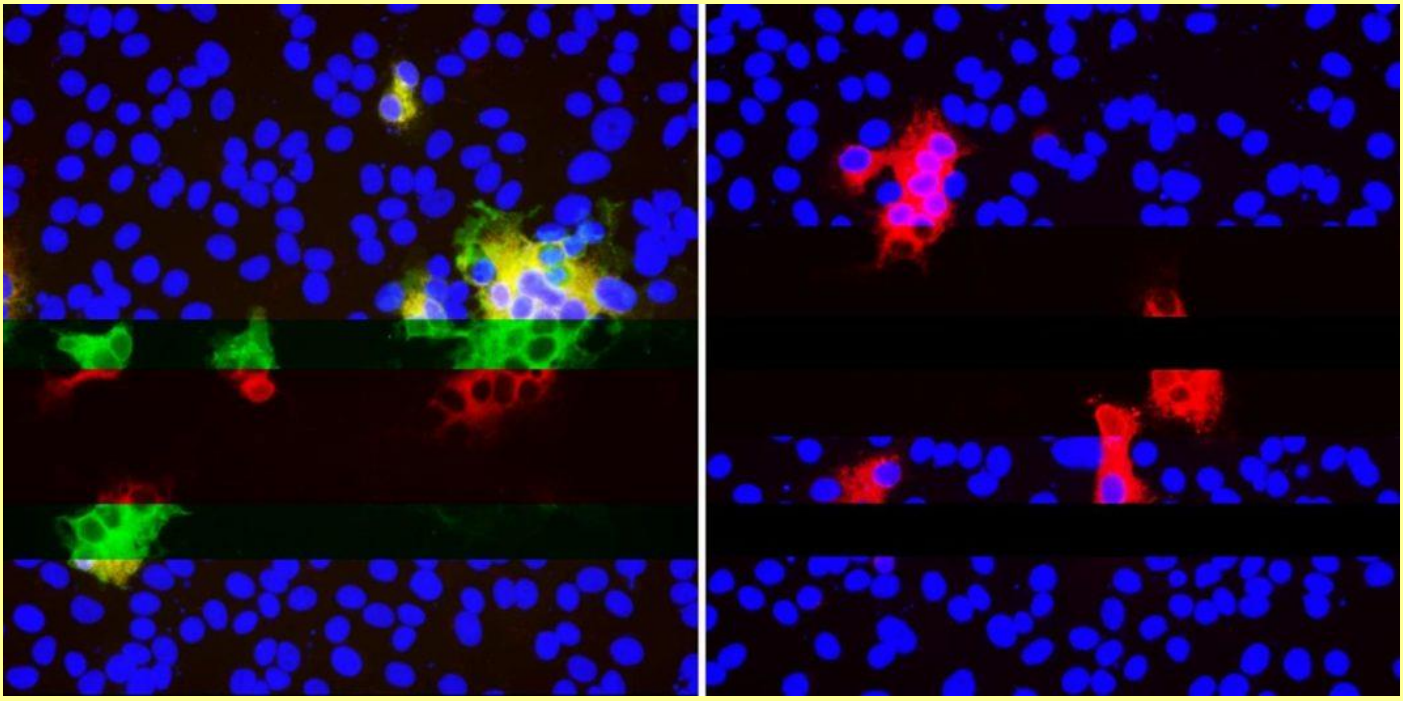
Small, Recurrent Deletions in SARS-CoV-2's Spike Protein May Drive Antibody Escape

Source: https://www.genengnews.com/news/small-recurrent-deletions-in-sars-cov-2s-spike-protein-may-drive-antibody-escape/

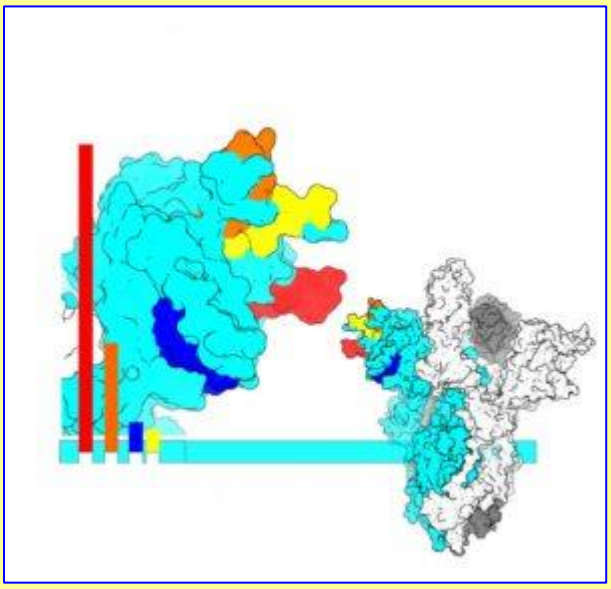
Feb 05 – New variants of SARS-CoV-2 are making headlines and, for some, raising concerns. The biggest worry lies in whether the changes in the genome of the virus will affect the efficacy of the vaccine. Now, new research from the University of Pittsburgh School of Medicine suggests that SARS-CoV-2 can evade immune responses, in a recurring pattern of evolution, by selectively deleting small bits of its genetic sequence.

This work is published in *Science* in the paper, "Recurrent deletions in the SARS-CoV-2 spike glycoprotein drive antibody escape." The deletions occur in genes that encode for the shape of the spike protein, creating a situation where the formerly neutralizing antibody can't grab hold of the virus. And because the molecular "proofreader" that usually catches errors during SARS-CoV-2 replication is "blind" to fixing deletions, they become cemented into the variant's genetic material.

"You can't fix what's not there," said study senior author Paul Duprex, PhD, director of the Center for Vaccine Research at the University of Pittsburgh. "Once it's gone, it's gone, and if it's gone in an important part of the virus that the antibody 'sees,' then it's gone for good."



Multiple antibodies (green and red) bind SARS-CoV-2 spike protein within cells (blue) when there are no deletions (LEFT). Spike protein deletions stop neutralizing antibody from binding (absence of green) but other antibodies (red) still attach very well (RIGHT). Recurrent deletion generates variants that escape from neutralization. [Kevin McCarthy and Paul Duprex]



The researchers have watched this pattern play out over the last few months, as several variants of concern rapidly spread across the globe. The variants first identified in the United Kingdom and South Africa have these sequence deletions.

Deletions in the SARS-CoV-2 spike protein sequence (horizontal cyan bar) affect the shape of different parts of the protein (cyan). Bar graph at left shows the relative frequency of recurrent deletions in the correspondingly colored part of the spike protein. Deletions tend to occur outside the region that binds to cells at the beginning of the infection. [Kevin McCarthy and Paul Duprex]

Duprex's group first came across these neutralization-resistant deletions in a sample from an immunocompromised patient, who was infected with SARS-CoV-2 for 74 days before ultimately dying from COVID-19. That's a long time for the virus and immune system to play "cat and mouse," and gives ample opportunity to initiate the coevolutionary dance that results in these worrisome mutations in the viral genome that are occurring all over the world.

Then, Duprex enlisted the help of lead author Kevin McCarthy, PhD, assistant professor of molecular biology and molecular genetics at Pitt and an expert on influenza virus—a master of immune evasion—to see whether the deletions present in the viral sequences of this one patient might be part of a larger trend.
McCarthy and colleagues pored through the database of SARS-CoV-2 sequences collected across the world since the virus first spilled over into humans.
When the project started, in the summer of 2020, SARS-CoV-2 was thought to be relatively stable, but the more McCarthy scrutinized the database, the more deletions he saw, and a pattern emerged. The deletions kept happening in the same spots in the sequence, spots where the virus can tolerate a change in shape without losing its ability to invade cells and make copies of itself.
"Evolution was repeating itself," said McCarthy, who recently started up a structural virology lab at Pitt's Center for Vaccine Research. "By looking at this pattern, we could forecast. If it happened a few times, it was likely to happen again."
Among the sequences McCarthy identified as having these deletions was B.1.1.7. By this point, it was October 2020, and B.1.1.7 hadn't taken off yet. In fact, it didn't even have a name, but it was there in the datasets. The strain was still emerging, and no one knew then the significance that it would come to have. But McCarthy's analysis caught it in advance by looking for patterns in the genetic sequence.
Reassuringly, the strain identified in this Pittsburgh patient is still susceptible to neutralization by the swarm of antibodies present in convalescent plasma, demonstrating that mutational escape isn't all or nothing. And that's important to realize when it comes to designing tools to combat the virus.
"Going after the virus in multiple different ways is how we beat the shapeshifter," Duprex said. "Combinations of different antibodies, combinations of nanobodies with antibodies, different types of vaccines. If there's a crisis, we'll want to have those backups."
Although this paper shows how SARS-CoV-2 is likely to escape the existing vaccines and therapeutics, it's impossible to know at this point exactly when that might happen. Will the COVID-19 vaccines on the market today continue to offer a high level of protection for another six months? A year? Five years?
"How far these deletions erode protection is yet to be determined," McCarthy said. "At some point, we're going to have to start reformulating vaccines, or at least entertain that idea."

Phase 1 trial of Israeli covid-19 cure proves effective in 96% of tested cases – report

Source: https://www.debka.com/mivzak/phase-1-trial-of-israel-covid-19-cure-proves-effective-for-96pc-tested-report/

Feb 04 – An **innovative medication EXO-CD24** produced at the Tel Aviv Ichilov Medical Center was reported by national broadcaster Kan 11 on Thursday night to have effected a cure in 95pc of the cases tested in its first trial on human beings. The technology was developed over many years of research at Prof. Nadir Arber's laboratory in Ichilov. The medication was first designed to slow the deterioration of medium-to-serious coronavirus cases. However, **after it was administered to 30 seriously ill patients, 29 showed improvement after 2-3 days and shortly after were discharged from hospital.** The Health Ministry's Helsinki commission has been asked to approve further trials of EXO-CD24 in view of its promising results. No one has so far come up with a cure for Covid-19 beyond Phase 1 of trials. A possible breakthrough at the Tel Aviv hospital is causing great excitement in scientific and medical circles.

No evidence COVID-19 vaccines cause death, epidemiologists say: 'Coincidences are going to happen'

Source: https://www.yahoo.com/lifestyle/no-evidence-covid-19-vaccines-cause-death-epidemiologists-say-225955258.html

Feb 05 – America's COVID-19 vaccination program has been plagued with logistical issues from the start, but increasingly it seems a new enemy — misinformation — is proving even more dangerous. On social media, individuals have been perpetuating myths about the COVID-19 vaccine for weeks, claiming it can cause infertility or can alter a person's DNA, neither of which is true.
The latest myth, that the vaccine is responsible for several recent deaths, may be the most alarming.
The idea gained steam with the loss of famed baseball player and civil rights activist Hank Aaron, who died on Jan 22, two weeks after receiving the Moderna vaccine. Aaron's death was determined to be the result of natural causes but left some questioning whether his

recent inoculation played a role. A similar conversation circulated online a few weeks earlier when a Florida doctor died of a rare blood disorder 16 days after getting the vaccine. His death led to since-deleted Reddit threads questioning if there was a link.
But now, with more than 33 million doses of the COVID-19 vaccine administered in the U.S., is there any evidence that they are deadly? In interviews with Yahoo Life, three experts in infectious disease and vaccinology say the claims are unfounded, and likely motivated by a desire to make sense of the world. "Humans are wired to think this way, and it misleads them — temporality is not causality," says Dr. Gregory Poland, an immunologist and director of the Mayo Clinic's Vaccine Research Group. "In other words, just because the event happened in association with another event doesn't mean it was caused by it."
Susan Ellenberg, professor of biostatistics, medical ethics and health policy at the University of Pennsylvania's Perelman School of Medicine, agrees. "People are always looking for a cause," Ellenberg says. "Why did this happen to me? Why did this happen to my child? Why did this happen to my spouse? There's a certain comfort in at least knowing the cause and when you have something that happens in close temporal proximity, that's an obvious thing to look at."
Ellenberg points to the large clinical trials that both Moderna and Pfizer conducted as evidence of their safety — trials that were not only much larger than typical vaccine studies but also much longer. In the wake of these studies, both vaccines were granted emergency-use authorization by the Food and Drug Administration, which conducted rigorous analysis of their safety data. The main side effects, as confirmed by the CDC, continue to be non-life-threatening and temporary, such as muscle aches, fever and fatigue.
Dr. Jeffrey Klausner, an infectious disease expert and professor at the University of Southern California, says that deaths occurring in the weeks afterward shouldn't draw suspicion. "Most serious events from vaccines are going to occur within 15 minutes or 30 minutes," says Klausner. Anaphylaxis, for example, a severe allergic reaction, occurs within minutes of exposure and can be treated with an EpiPen. The CDC says it is occurring at a rate of 11 out of a million for the COVID-19 vaccines.
Poland adds that with more than 30 million doses given, it would be extremely clear at this point if the vaccine was deadly. "If [the COVID-19 vaccine] had even a 1 percent chance of causing death, we'd have hundreds of thousands of deaths — it would be noticed immediately," he says. "We're just not seeing any difference in background [death] rates and that's what's important."
Ellenberg, who spent more than a decade at the FDA, says Americans need to realize that deaths will happen. "The vaccine is intended to prevent illness associated with the infection, but it can't prevent any other bad things that happen to people," she says. "It's not going to prevent you from being killed in an automobile accident. It's not going to prevent you from having a heart attack. All of the things that happen to older people especially. So when you start giving a vaccine to millions and millions of people, all of the bad things that would have happened to people without the vaccine are still going to happen."
As someone who's spent decades helping people better understand vaccine safety, Ellenberg says she understands the desire to link a tragedy to a vaccine. "It's the most natural thing in the world," she says. "So I don't fault people for being suspicious." But she hopes Americans understand that two things occurring at once don't prove one caused the other. "Some people will experience bad things and, by chance, some of them will happen shortly after a vaccine," she says. "Even though it seems hard to think it's a coincidence, when you've got millions and millions of people, coincidences are going to happen."
"People should feel confident in this vaccine," adds Klausner. "Both in the safety and that it works."

EDITOR'S COMMENT: I do not like this approach. Should somebody drop dead during the jab in order his death be connected with the vaccine? Was it to die that particular day that he got the jab and death coincided? Yes, we all know that vaccines saved and will continue to save lives. But enough with these silly statistics (11/1,000,000). Elven is not just a number. It refers to 11 people and one of them might be you or your family member or grandfather. So, try be more scientifically polite when you are trying to explain things about a vaccine that you do not really know how it is working against a virus with a brain of its own.

Side effects after your second dose of COVID vaccine may be more intense. Here's why

Source: https://news.yahoo.com/side-effects-second-dose-covid-185558497.html

Feb 04 – More than 27.1 million Americans have been poked with a coronavirus vaccine so far, with 6.4 million of them having received their second and final dose.
Like most regularly recommended vaccines, the two authorized for COVID-19 produce their fair share of expected side effects. Most people report fevers, headaches, fatigue, muscle aches and soreness around injection sites.
For many, the side effects are more powerful after the second dose is administered.

REALLY? **Health experts say these side effects are just normal signs your body is building the immune response it needs to protect you from severe disease. But these signs tend to grab more of your attention after the second shot — kind of like a roadside billboard that's been revamped with flashing neon lights.**

The first shot floods your immune system with instructions that teach your cells to pump out harmless proteins similar to those the coronavirus uses to infect people. Meanwhile, special cells in your immune system recognize the proteins as foreign invaders and send signals to other immune cells to fight them off.

REALLY? **The end result is an army of antibodies that are primed to spot and kill real coronavirus proteins if your body ever encounters them.**

The second dose, which repeats this process, is a firm reminder of the threat of infection.

Not only does the threat make the immune system work even harder to nail the fight down, but it also solidifies maximum protection against COVID-19, a feat one dose can't do alone.

"[The immune system is] asking, 'Why is this happening 21 or 28 days later? I thought we took care of this four weeks ago,'" Dr. Mark Slifka, a vaccine expert and an immunologist at Oregon Health and Science University, told The Atlantic.

Users of V-safe — a smartphone-based tool that you can use to report side effects to the Centers for Disease Control and Prevention after getting a COVID-19 vaccine — have reported stronger side effects within a week of getting their second jab compared to their first.

Reports of muscle aches and fatigue jumped the highest following second doses with the Pfizer-BioNTech vaccine, from about 17% to about 42% and from about 29% to about 50%, respectively. All other post-shot reactions such as pain, headache, chills, fever, swelling, joint pain and nausea spiked as well.

Reactogenicity reported to v-safe

Local and systemic reactions, day 0-7*,†	All vaccines %	Pfizer-BioNTech dose 1 %	Pfizer-BioNtech dose 2 %	Moderna dose 1 %
Pain	70.7	67.7	74.8	70.1
Fatigue	33.4	28.6	50.0	29.7
Headache	29.4	25.6	41.9	26.0
Myalgia	22.8	17.2	41.6	19.6
Chills	11.5	7.0	26.7	9.3
Fever	11.4	7.4	25.2	9.1
Swelling	11.0	6.8	26.7	13.4
Joint pain	10.4	7.1	21.2	8.6
Nausea	8.9	7.0	13.9	7.7

* v-safe data lock point 1/14/2021, 5 AM ET
† Reported on at least one health check-in completed on days 0-7 after receipt of vaccine

Side effects for the authorized COVID-19 vaccines reported to V-safe, a smartphone-based tool.

White House coronavirus adviser Dr. Anthony Fauci told reporters in January that his second shot "knocked" him out for about 24 hours, according to The Hill. "Fatigued. A little achy. You know. Chilly. Not sick," he said.

"It's normal," Dr. Emily Landon, an epidemiologist at the University of Chicago Medical Center, told the Chicago Tribune. "Their immune system is doing a lot more work the second time… That's where the memory kind of sticks."

Although side effects may be uncomfortable, health officials say they should go away in a few days. After all, they're just confirming your body is responding as it should.

"[It] means you had such a good immune response to the first dose and now you are seeing the effects of that," Dr. Drew Weissman, an immunologist at the University of Pennsylvania, told Science in November.

And don't worry if you miss out on the joy that is cold sweats and achy bones, experts say. No immune system is like the other, so some people may not experience side effects at all, even though their bodies are working just as hard.

EDITOR'S COMMENT: In that respect, a third or a fourth jab would make our body invulnerable after been teared apart! Yes?

Bill Gates predicts next two disasters facing mankind - climate change and bio-terrorism

Source: https://www.express.co.uk/news/world/1394201/bill-gates-warning-coronavirus-pandemic-climate-change-bioterrorism-usa-joe-biden-ont

Feb 06 – The Microsoft co-founder famously warned the world in 2015 of the likelihood of a new pandemic caused by a respiratory virus, like the coronavirus. In a talk organised by TED media and titled 'The next outbreak? We're not ready', Mr Gates stressed that it would be the emergence of a new virus and not war that would wipe out millions of human beings. He said: "If anything kills over 10 million people in the next few decades, it's likely to be a highly infectious virus rather than a war.
"Not missiles, but microbes."
Now, in an interview with Derek Muller, host of the YouTube channel "Veritasium", the software entrepreneur outlined what he believed to be the next deadly threats facing humankind.
"One is climate change. Every year that would be a death toll even greater than we have had in this pandemic," Mr Gates said.
He then went on to name the second, even more terrifying danger lurking out there, as bio-terrorism.
We will use your email address only for sending you newsletters. Please see our Privacy Notice for details of your data protection rights.
"Bio-terrorism. Somebody who wants to cause damage could engineer a virus and that means the cost, the chance of running into this is more than the naturally-caused epidemics like the current one."
The Microsoft chief said he felt no satisfaction at all that his 2015 prophecy had come to pass.
He questioned whether he could have been more persuasive in convincing people to take the threat of a new pandemic more seriously.
Asked by Mr Muller how he had been so sure that a viral pandemic would occur, Mr Gates replied: "There are a number of respiratory viruses and, from time to time, one will come along.
"Respiratory diseases are very scary because you're still walking around on a plane, a bus when you're infectious.
"Unlike some other diseases like ebola where you are mostly in a hospital bed by the time viral load infects other people."
The interview comes as the number of coronavirus infections in the USA approaches 27 million, with over 450,000 deaths confirmed.
The death total from Covid in America equates to almost the entire population of the city of Liverpool in the UK.

EDITOR'S COMMENT: When a billioner speaks, people listen. When a scientist or an expert speaks people do not give a shit. What is wrong with people? And no! it is not because of Covid-19 affecting hearing!

A lymph node–targeted Amphiphile vaccine induces potent cellular and humoral immunity to SARS-CoV-2

By Martin P. Steinbuck, Lochana M. Seenappa, Aniela Jakubowski, et al.
Science Advances 05 Feb 2021: Vol. 7, no. 6, eabe5819
Source: https://advances.sciencemag.org/content/7/6/eabe5819.full

Abstract

The profound consequences of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) mandate urgent development of effective vaccines. Here, we evaluated an Amphiphile (AMP) vaccine adjuvant, AMP-CpG, composed of diacyl lipid–modified CpG, admixed with the SARS-CoV-2 Spike-2 receptor binding domain protein as a candidate vaccine (ELI-005) in mice. AMP modification efficiently delivers CpG to lymph nodes, where

innate and adaptive immune responses are generated. Compared to alum, immunization with AMP-CpG induced >25-fold higher antigen-specific T cells that produced multiple T helper 1 (T_H1) cytokines and trafficked into lung parenchyma. Antibody responses favored T_H1 isotypes (IgG2c and IgG3) and potently neutralized Spike-2-ACE2 receptor binding, with titers 265-fold higher than natural convalescent patient COVID-19 responses; T cell and antibody responses were maintained despite 10-fold dose reduction in Spike antigen. Both cellular and humoral immune responses were preserved in aged mice. These advantages merit clinical translation to SARS-CoV-2 and other protein subunit vaccines.

Israel invents miracle inhaler to cure coronavirus

Source: https://www.marca.com/en/lifestyle/2021/02/06/601e8d76ca4741fd218b4571.html

Feb 06 – Vaccines are claimed to be the biggest hope in getting out of the coronavirus pandemic and returning to normality. However, they may not be the only solution, or even the best one.

In Israel, Professor Nadri Aber has invented a miracle inhaler which can cure COVID-19 in just five days.

His inhaler has an efficacy of 96 percent, with 29 of the 30 patients who trialled it at the Tel Aviv Sourasky Medical Centre recovering rapidly from the virus and leaving the hospital between three and five days. Only one inhalation was enough to fight off the virus, even with more serious cases.

Nadir himself described it as an "unprecedented invention" after seeing the results.

"It is an innovative device based on exosomes enriched in CD24 that can be inhaled directly into the lungs ", said Nadir.

The device now only needs to be approved by national and international health authorities in order to be used amongst the general public.

Israel isn't the only place where alternatives to vaccines are being studied. In the Gregorio Maranon hospital in Madrid, tests are being carried out with a treatment for serious cases which involves an intravenous injection of enriched immunoglobulin. Early results have been promising with the first two patients to receive the treatment having been released from hospital.

What NFL, NBA, and MLB COVID Protocols Taught Us

By Robert D. Glatter, MD; John P. DiFiori, MD; James Kinderknecht, MD and Kathryn D. McElheny, MD

February 05, 2021

Source: https://www.medscape.com/viewarticle/943514

Editor's note: This interview is intended to reflect the current state of medical care for athletes in the era of COVID-19, given the experience of Major League Baseball (MLB), the National Basketball Association (NBA), and the National Football League (NFL). The goal is to highlight protocols for testing, isolation, and quarantines, and what seems to work best in light of the current outcomes in the professional leagues this past season.

Robert D. Glatter, MD: Hi. I'm Dr Robert Glatter, medical advisor for Medscape Emergency Medicine. Today we'll be discussing the care of athletes during the COVID-19 pandemic. Joining me today is a distinguished panel of sports medicine physicians from the Hospital for Special Surgery who provide care to professional athletes. Dr John DiFiori is currently the director of sports medicine for the NBA, Dr James Kinderknecht is a team physician for the New York Giants and the New York Mets, and Dr Kathryn McElheny is a nonoperative medical director and associate team physician for the New York Mets.

Welcome, everyone.

I want to talk about league protocols for the NFL, MLB, and the NBA. Kat, let's start with you. Can you talk to me a little bit about the protocols at MLB that you're using to test players?

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

Superspreader Sunday: The Super Bowl with COVID Variants Afoot

Source: https://www.medscape.com/viewarticle/945399

Feb 05 – As Tom Brady of the Tampa Bay Buccaneers gets ready for his tenth Super Bowl against Patrick Mahomes and the defending champions, the Kansas City Chiefs, experts tracking the COVID-19 pandemic are worried that people at the stadium and at home will get sick if they don't put their own best defensive play forward.

After almost every major holiday in 2020 — Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas, and New Years — the United States had an increase in COVID-19 cases.

This Sunday, Raymond James Stadium in Tampa, Florida — a venue that normally seats 65,890 fans and can expand to 75,000 — will be filled to about one-third capacity. The National Football League has announced the sale of 14,500 tickets; in addition, approximately 7500 vaccinated healthcare workers will attend as guests.

The Weeknd will headline the halftime show and measures will be taken to ensure the safety of on-site attendees. However, it is the off-site celebrations that are a concern to many health professionals.

"I'm not so much worried about the 22,000 fans in attendance, some of whom will be vaccinated healthcare workers," Cedric Dark, MD, from the Baylor College of Medicine in Houston, told *Medscape Medical News*. "I'm more concerned about the indoor parties happening all over the country."

Football is the favorite sport of 62% of Americans, according to a recent Gallop poll. Friends and families typically gather before and after the game, around the TV, with food and alcohol in what some consider an unofficial national holiday.

Home of the Super Bowl Already Home to COVID-19 Variants

Florida has already emerged as the state leader in COVID-19 variants, according to a February 4 report from the Centers for Disease Control (CDC) and Prevention, outpacing areas like California, which also has more variants than average.

"We know that the Florida Department of Health did genome sequencing of about 500 patients in January with the virus, and about 90 showed up with the Brazilian variant," epidemiologist Marco Salemi, PhD, from the Emerging Pathogens Institute at the University of Florida in Gainesville, told *Medscape Medical News*. "Back in December, when they sequenced 500, they didn't find any variants. We went from zero variants to 20% in 1 month."

And just because some of the attendees at the Super Bowl are vaccinated, it doesn't mean they are not infected, he pointed out. "They can still pass the virus on to others."

The variants are of grave concern. "Even though we are beginning to vaccinate, the virus is continually mutating. And the more it mutates, the more it may become vaccine resistant," Salemi explained.

Multiple variants of the virus that causes COVID-19 have already been documented in the United States, including variants originally detected in Brazil, South Africa, and the United Kingdom, according to CDC spokesperson Joel London.

These variants seem to spread more easily and quickly than other variants, which could lead to more cases of COVID-19, he warned. "An increase in the number of cases will put more strain on healthcare resources, lead to more hospitalizations, and potentially more deaths."

Although National Football League organizers say that in-stadium fans will be required to wear masks, stadium time is only one aspect of the overall risk. "It's the gathering before

and after, it's standing in lineups. We live in a state where policy for social distancing and masks has not been implemented," Salemi said.
Outside the stadium, the game will go on — likely without masks. "Will people wear masks while gathered in front of the TV?" Salemi said he's hopeful but is not convinced they will.
So far, the American population has shown a lack of enthusiasm toward changing behavior to protect others from getting sick, and that won't likely change for game day. "I have been given the vaccine, but I still wear masks and social distance. I don't want to risk infecting other people."
People who are not normally careful about taking COVID-19 precautions likely won't be more cautious just because it's Super Bowl day. "And some others may be even more relaxed for this event," Salemi said.
Individual behaviors are the fuel that keep the pandemic burning. "If we want this to end sooner rather than later, we have to put in the work," said Dark. He added that he hopes any Super Bowl parties will include only the people in that household's bubble. And if not, "they should be outdoors and people should wear masks."

EDITOR'S COMMENT: Super Bowl – Public Health: 1-0 – so simple! How silly the last paragraph sounds …

US Kids in ICU for COVID Are Likely to Be Older, Black, Have Asthma

Source: https://www.medscape.com/viewarticle/945402

Feb 05 – Little has been known about children sick enough with COVID-19 to require intensive care because such patients are relatively few, but preliminary data analyzed from a nationwide registry indicate that they are more likely to be older, Black, and have asthma.
Gastrointestinal distress is also more common in children with severe COVID-19, according to research by Sandeep Tripathi, MD. Tripathi, a pediatric intensivist and associate professor at the University of Illinois College of Medicine, Peoria, Illinois, presented the findings on February 3 at the Society for Critical Care Medicine (SCCM) 2021 Critical Care Congress.

Registry Data Gathered From 49 Sites

Results from the SCCM's VIRUS: COVID-19 Registry, which involved data from 49 sites, included 181 children admitted to an intensive care unit (ICU) between February and July 2020. Those in the ICU were older than patients who did not receive care in the ICU (10 years vs 3.67 years; $P < .01$) and were more likely to be Black (28.8% vs 17.8%; $P = .02$).

More of the patients who required intensive care had preexisting conditions (58.2% vs 44.3%; $P = .01$), the most common of which was asthma.
For both the ICU patients and the non-ICU group, the most common presenting symptom was fever.
Symptoms that were more common among children needing ICU care included nausea/vomiting (38.4% vs 22.1%; $P < .01$), dyspnea (31.8% vs 17.7%; $P < .01$), and abdominal pain (25.2% vs 14.1%; $P < .01$).
Significantly higher proportions of ICU patients had multisystem inflammatory syndrome of childhood (MIS-C) (44.2% vs 6.8%; $P < .01$) and acute kidney injury (9.34% vs 1.7%; $P < .01$).
"The children who presented with MIS-C tended to be much sicker than children who present with just COVID," Tripathi told *Medscape Medical News*.
In this analysis, among children in ICUs with COVID, the mortality rate was 4%, Tripathi said.
He said he hopes the information, which will be periodically published with updated data, will raise awareness of which children might be likely to experience progression to severe disease.
"The information may help physicians be more mindful of deterioration in those patients and be more aggressive in their management," he said. When children are brought to the emergency department with the features this analysis highlights, he said, "physicians should have a low threshold for treating or admitting the patients."

Another study that was presented on February 3 in parallel with the registry study described patterns of illness among 68 children hospitalized with COVID-19 in a tertiary-care pediatric center.
In that analysis, Meghana Nadiger, MD, a critical care fellow with Nicklaus Children's Hospital in Miami, Florida, found that all patients admitted to the pediatric ICU (n = 17) had either MIS-C or severe illness and COVID-related Kawasaki-like disease.
The investigators also found that the patients with serious illness were more commonly adolescents with elevated body mass index (BMI) (73%). In this study, 83.8% of the hospitalized children were Hispanic. They also found that 88.8% of the children older than 2 years who had been hospitalized with COVID-19 were overweight or obese, with a BMI >25 kg/m^2.
Jerry Zimmerman, MD, PhD, SCCM's immediate past president, told *Medscape Medical News* that he found it interesting that in the Nadiger study, "All of the children with severe illness had MIS-C as compared to adults, who typically are critically ill with severe acute respiratory distress syndrome." Zimmerman was not involved in either study.
He said that although the high percentage of Hispanic patients in the hospitalized population may reflect the high percentage of Hispanic children in the Miami area, it may also reflect challenges of controlling the disease in the Hispanic community. Such challenges might include shortages of personal protective equipment, poorer access to healthcare, and difficulty in social distancing.
Zimmerman pointed out that obesity is an important risk factor for COVID-19 and that according to the Centers for Disease Control and Prevention, childhood obesity is much more common among Hispanics (25.8%) and non-Hispanic Blacks persons (22.0%) compared to non-Hispanic White persons (14.1%).

A Single Immunization with Spike-Functionalized Ferritin Vaccines Elicits Neutralizing Antibody Responses against SARS-CoV-2 in Mice

By Powell, A. E.; Zhang, K.; Sanyal, M.; et al.
ACS Central Science 2021
Source: https://doi.org/10.1021/acscentsci.0c01405

The development of a safe and effective SARS-CoV-2 vaccine is a public health priority We designed subunit vaccine candidates using self-assembling ferritin nanoparticles displaying one of two multimerized SARS-CoV-2 spikes Full-length ectodomain (S-Fer) or a C-terminal 70 amino-acid deletion (SÎC-Fer) Ferritin is an attractive nanoparticle platform for production of vaccines, and ferritin-based vaccines have been investigated in humans in two separate clinical trials We confirmed proper folding and antigenicity of spike on the surface of ferritin by cryo-EM and binding to conformation-specific monoclonal antibodies After a single immunization of mice with either of the two spike ferritin particles, a lentiviral SARS-CoV-2 pseudovirus assay revealed mean neutralizing antibody titers at least 2-fold greater than those in convalescent plasma from COVID-19 patients Additionally, a single dose of SÎC-Fer elicited significantly higher neutralizing responses as compared to immunization with the spike receptor binding domain (RBD) monomer or spike ectodomain trimer alone After a second dose, mice immunized with SÎC-Fer exhibited higher neutralizing titers than all other groups Taken together, these results demonstrate that multivalent presentation of SARS-CoV-2 spike on ferritin can notably enhance elicitation of neutralizing antibodies, thus constituting a viable strategy for single-dose vaccination against COVID-19.

Died with or Died of? Development and Testing of a SARS CoV-2 Significance Score to Assess the Role of COVID-19 in the Deaths of Affected Patients

By Giorgetti, Arianna, Orazietti, Vasco, Busardò, Francesco Paolo, Pirani, Filippo, Giorgetti, Raffaele.
Diagnostics 2021
Source: https://doi.org/10.3390/diagnostics11020190

Since December 2019, a new form of coronavirus, SARS-CoV-2, has spread from China to the whole word, raising concerns regarding Coronavirus Disease 2019 (COVID-19) endangering public health and life Over 1 5 million deaths related with COVID-19 have been recorded worldwide, with wide variations among countries affected by the pandemic and continuously growing numbers The aim of this paper was to provide an overview of the literature cases of deaths involving COVID-19 and to evaluate the application of the COVID-19 Significance Score (CSS) in the classification of SARS CoV-2-related fatalities, comparing it with the Hamburg rating scale The results obtained allowed us to highlight that CSS used after a complete accurate post-mortem examination, coupled to the retrieval of in vivo data, post-mortem radiology, histology and toxicology, as well as to additional required analyses (e g , electronic microscopy) is a useful and concise tool in the

assessment of the cause of death and the role played by this virus A shared use of this scale might hopefully lower the inhomogeneities in forensic evaluation of SARS CoV-2-related fatalities.

Does Point-Of-Care SARS-CoV-2 Antibody Testing Have Similar Sensitivity and Specificity To High Complexity Serology?

By Kelly O'Shea, MD, Charles Schuler, MD, Jesse Chen, et al.
JACI Volume 147, ISSUE 2, SUPPLEMENT , AB77, February 01, 2021
Source: https://www.jacionline.org/article/S0091-6749(20)32060-1/fulltext

Rationale
Point-of-care (POC) antibody screening for SARS-CoV-2 infection has yielded varied results. We analyzed two POC antibody testing devices to study whether these are comparable to ELISA testing done in a high complexity CLIA facility employed as a standard.
Methods
We enrolled 146 individuals, with 41 individuals having had a history of positive PCR for COVID-19. After informed consent, we obtained serum and at the same time performed a finger stick for whole blood. Autobio and MEDsan rapid IgG/IgM tests that use SARS-CoV-2 spike protein to detect antibody were performed with serum and compared to Roche's SARS-CoV-2 immunoassay, which uses nucleocapsid protein to detect antibody. The Autobio test was also evaluated using whole blood obtained by finger stick.
Results
Serum testing using the Autobio kit versus the Roche immunoassay (used as the standard for comparison) revealed a sensitivity of 93.2% and a specificity of 96.1%; whole blood testing using the Autobio kit vs. the Roche immunoassay revealed a sensitivity of 90.5% and a specificity of 97.9%. Whole blood compared to serum testing using the Autobio POC kit revealed a sensitivity of 90.7% and a specificity of 99.0%. Serum testing using the MEDsan kit vs. the Roche immunoassay revealed a sensitivity of 100% and a specificity of 96.1%.
Conclusions
Despite using different antigens, both the POC devices showed comparable results to the high complexity ELISA. POC testing for antibodies to SARS-CoV-2 is easier, requires fewer resources than high-complexity lab testing and provides rapid results regarding individual antibody status to SARS-CoV-2. However, the specific test characteristics for each kit must be rigorously evaluated, as they vary substantially.

▶▶ **Read also:** https://www.jacionline.org/article/S0091-6749(20)32059-5/fulltext

Evaluation of the practicability of a finger-stick whole-blood SARS-Cov-2 self-test adapted for the general population

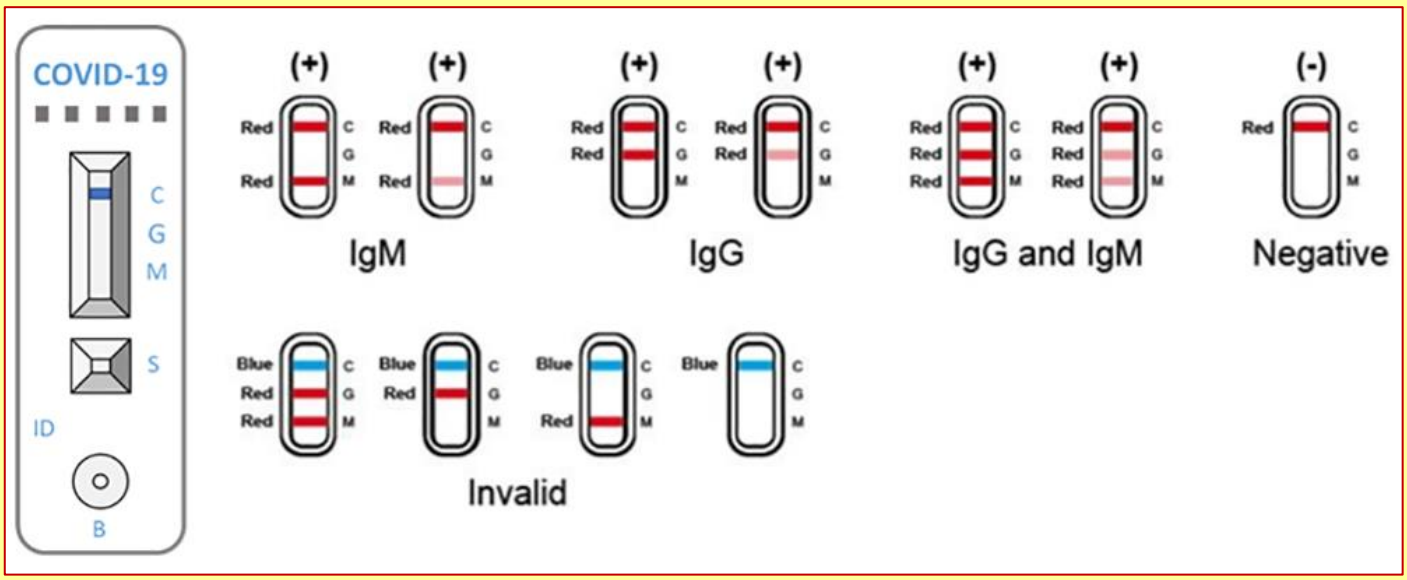
By Thierry Prazuck, Jean Phan Van, Florence Sinturel, et al.
PLoS ONE 16(1): e0245848.
Source: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0245848

COVID-19 (COronaVIrus Disease 2019) is an infectious respiratory disease caused by the novel SARS-CoV-2 virus. Point of Care (POC) tests have been developed to detect specific antibodies, IgG and IgM, to SARS-CoV-2 virus in human whole blood. They need to be easily usable by the general population in order to alleviate the lockdown that many countries have initiated in response to the growing COVID-19 pandemic. A real-life study has been conducted in order to evaluate the performance of the **COVID-PRESTO® POC test** and the results were recently published. Even if this test showed very high sensitivity and specificity in a laboratory setting when used by trained professionals, it needs to be further evaluated for practicability when used by the general public in order to be approved by health authorities for in-home use.
Methods
143 participants were recruited between March 2020 and April 2020 among non-medical populations in central France (nuclear plant workers, individuals attending the Orleans University Hospital vaccination clinic and Orleans University Hospital non-medical staff). Instructions for use, with or without a tutorial video, were made available to the volunteers.

Two separate objectives were pursued: evaluation of the capability of participants to obtain an interpretable result, and evaluation of the users' ability to read the results.

Results

88.4% of the test users judged the instructions for use leaflet to be clear and understandable. 99.3% of the users obtained a valid result and, according to the supervisors, 92.7% of the tests were properly performed by the users. Overall, 95% of the users gave positive feedback on the COVID PRESTO® as a potential self-test. Neither age nor education had an influence.



Conclusion

COVID-PRESTO® was successfully used by an overwhelming majority of participants and its use was judged very satisfactory, therefore showing promising potential as a self-test to be used by the general population. This POC test can become an easy-to-use tool to help detect whether individuals are protected or not, particularly in the context of a second wave or a mass vaccination program.

Lessons learned from COVID-19 pandemic in Italy – A commentary

By Antonio Minni, Massimo Ralli, Francesca Candelori, et al.

BJBMS | Vol. 21 No. 1 (2021)

Source: https://www.bjbms.org/ojs/index.php/bjbms/article/view/4847

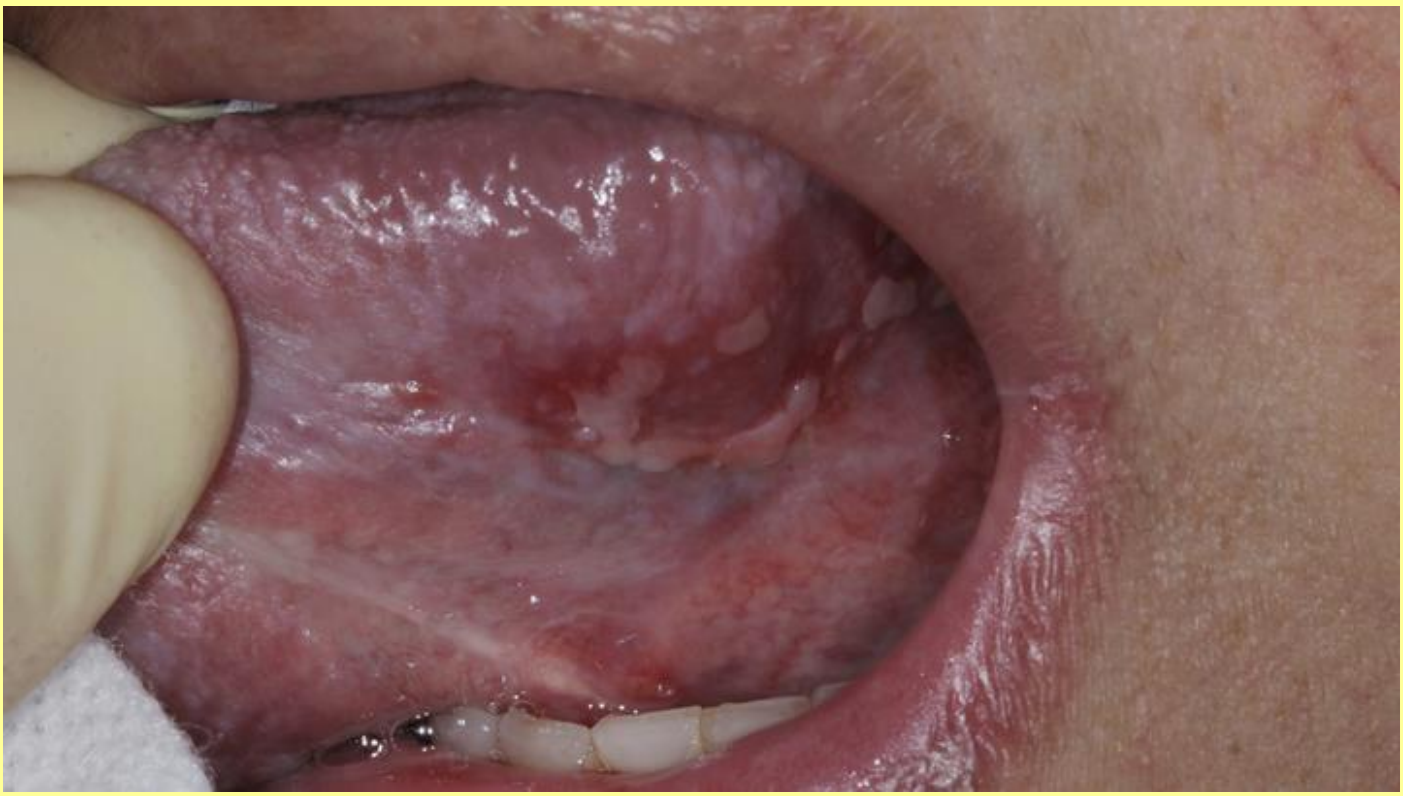
Since the COVID-19 outbreak, Italy has been one of the most affected countries in Europe and the second for number of deaths. In this commentary, we discuss some lessons that we learned as health-care providers working in a large public hospital during the pandemic, with a special focus on the importance of infection containment and early diagnosis, the role of swab, serological tests, home isolation and individual protection devices, and the available therapies and management indications to better face a possible new outbreak in the near future. These comments should stimulate a more diffused, efficient, and efficacious management of COVID-19 patients, also reducing the number of admissions to hospital emergency departments and the related spread of the infection.

Is 'COVID tongue' the newest symptom? Here's why experts aren't convinced.

Source: https://www.yahoo.com/lifestyle/covid-tongue-new-symptom-234827246.html

Feb 03 – Although COVID-19 cases are beginning to trend downward in the U.S., millions are still battling the virus — and struggling to sift through their symptoms in the process. In recent months, the Centers for Disease Control and Prevention has added new symptoms to its information page, including loss of smell/taste and congestion. But now anecdotal reports have floated a new one, which has earned the moniker "COVID tongue."

The reports, many posted on Facebook, describe symptoms such as a swollen tongue, one with a scalloped appearance, or a "furry surface" of the tongue. Still, COVID-19 experts say it's too soon to link them. So what's really happening? Here's what you need to know.



Some patients on social media say they've experienced tongue reactions

In the COVID-19 Facebook group Survivor Corps, a grassroots organization of COVID-19 patients, many have shared oral symptoms that they say coincided with their testing positive for the coronavirus. Carol Van Der Spuy, a marketing manager in Cape Town, South Africa, said she noticed the symptoms when she tested positive for COVID-19 a second time. "I had big patches on [my tongue] which were a different color," she says. "It almost looks like it has been 'burned clean.'"

New Yorker Martha Barrera says she developed symptoms two weeks after getting COVID-19 in March. "My tongue swelled up," she tells Yahoo Life. "It was painful and so sensitive and I could not tolerate anything cold or hot. It also was white ... didn't matter how many times I brushed; the color was different. Doctor didn't know what to do, so he prescribed thrush medication for three weeks. Ten months later, my tongue swells up out of the blue. I still have issues."

There has been little research to suggest that the symptoms are linked to COVID-19

Two small studies have analyzed COVID-19 and oral symptoms, neither of them conclusive. One comes from researchers at La Paz hospital in Madrid, who reviewed the records of more than 600 COVID-19 patients and found 25 percent of them had some type of tongue reaction. "We found changes in the tongue that until then had not been linked to Covid," said Dr. Almudena Nuño González in a press release. "The tongue is enlarged, it appears swollen, the teeth marks can be seen and ... with small indentations in the back where the taste buds are flattened."

Another report was published in *The Egyptian Journal of Otolaryngology* in mid-January but contained less detail about the potential symptoms. In it, researchers simply said that the symptoms should not be overlooked. "It is crucial for ENT [ear, nose and throat] physicians to have high index of suspicion to identify those COVID 19 patients with atypical presentations," the authors write.

Experts in the U.S. say they haven't seen the reaction

According to multiple experts who spoke with Yahoo Life, there is not enough evidence at this point to connect the tongue symptoms to COVID-19. Experts at Mount Sinai Health System's Center for Post-COVID Care — the first recovery center for survivors in the U.S.

— haven't seen a "single case" involving COVID tongue among the "thousands of patients" being treated.
Doctors at the Ohio State University Wexner Medical Center agreed, saying tongue reactions are also not a condition they're treating. "I can't say I've come across anything like this, and it's not something that we've discussed as a group," says Dr. Jeffrey Horowitz, professor of medicine and division director of pulmonary, critical care and sleep medicine.

An otolaryngologist says the symptoms could be unrelated
Dr. Nina Shapiro, director of pediatric ear, nose and throat at the UCLA Mattel Children's Hospital and a professor at the David Geffen School of Medicine at UCLA, says none of the symptoms described in the studies are uncommon, meaning they could be occurring for other reasons. "Do some of these people have [these symptoms] anyway, and because they're getting so closely followed, they're finding it?" she asks. "That's hard to know."
She notes that oral symptoms can be caused by things like the common cold or other illnesses, as well as be reactions to certain medications that weaken the immune system, such as steroids. Dexamethasone, a corticosteroid, has been identified as an "effective" treatment for COVID-19.

The symptoms themselves are less mysterious than they seem
Shapiro breaks down exactly what is happening in the strange descriptions from the studies. "Some of these pictures [in the studies] resemble what's called 'geographic tongue,' which makes the tongue look like a map with little islands and whitish discoloration," she says. "It's been associated with colds and other kinds of illnesses, but it's not a worrisome condition in and of itself." The Mayo Clinic describes geographic tongue as "an inflammatory but harmless condition affecting the surface of your tongue."
Sores or other wounds on the tongue may be a sign of another infection, she says. "Lesions of the tongue such as ulcers can be associated with viral illness," she says. "It could be due to a secondary viral infection, such as herpes, or other sorts of viruses that grow in the mouth and the throat such as Coxsackievirus. So there certainly could be a viral association."
A woolly-looking tongue, Shapiro says, is likely candida. "The furry tongue, where it almost looks like a little shag carpet, is typically just a fungal infection," she says. "If your immune system is weakened for any reason — which could just be from stress itself or from some of the treatments they're using — then you can develop secondary infections such as candida of the mouth."
And what about the scalloped appearance? Also nothing to worry about. "Some irregularity to the borders of the tongue could be from a lot of things," she says. "A lot of the patients described [in the studies] had pneumonia so they may have been intubated or on oxygen and severely dehydrated or congested."
Overall, Shapiro says, oral issues are typically secondary and not the "primary problem." They're also likely unrelated to loss of smell and taste, which stem from the olfactory nerves. So aside from antifungal medications or other targeted drugs, she says, the best way to address them is to get rid of the underlying infection. "They should resolve as the illness resolves."

Molecular Partners and Novartis COVID-19 Antiviral Candidate, Ensovibep, Maintains Binding and Neutralization of New Viral Variants in vitro

Source: https://www.molecularpartners.com/molecular-partners-and-novartis-covid-19-antiviral-candidate-ensovibep-maintains-binding-and-neutralization-of-new-viral-variants-in-vitro/

Feb 04 – Molecular Partners AG (SIX: MOLN), a clinical-stage biotech company that is developing a new class of custom-built protein drugs known as DARPin® therapeutics, and its collaborator Novartis, today announced results from a study conducted at Spiez Laboratory. The study assessed leading SARS-CoV-2 anti-infective molecules, including the collaboration's candidates ensovibep and MP0423, against new viral variants of SARS-CoV-2, including the variants first identified in the United Kingdom (UK) and South Africa (SA). These variants are associated with faster transmissibility and an ability to evade the immunity induced by some currently available vaccines and monoclonal antibodies. The study design and results were published on the research preprint service bioRxiv here.
The study showed that ensovibep maintained very high potency and activity on all tested viral variants and mutants. MP0423 maintained activity against all tested viral variants and mutants, but demonstrated a slight loss of potency against the UK variant, while remaining in the therapeutic range. **These data indicate that ensovibep and MP0423 are potentially a better approach than monoclonal antibody approaches, many of which have previously reported significant potency loss.**
"At Molecular Partners, we built our antiviral candidates to deal with the issue of viral escape, through targeting multiple sites on the virus at once with a single molecule. As designed, this

approach is providing broad efficacy against SARS-CoV-2, even in the presence of emerging mutations, unlike approaches that only target single viral sites," said Patrick Amstutz, Ph.D., CEO of Molecular Partners. "These new data are highly encouraging as we look to initiate our global COVID-19 phase 2/3 registrational study in early Q2 2021 to establish our candidates' emerging profile as potent antiviral agents with the possibility for early therapeutic intervention. Additional trials are under discussion to broaden the application space further, in other therapeutic settings. We and Novartis are committed to quickly bring our candidates to patients in need across the globe."

In the study, based on a pseudovirion model, two new SARS-CoV-2 variants first identified in the United Kingdom (UK) (lineage B.1.1.7., del69-70, del145, N501Y, A570D, D614G, P681H, T716I, S982A, D1118H) and South Africa (SA) (early evolved variant of lineage B.1.351.; D80A, D215G, E484K, N501Y, A701V), were analyzed for infectivity in the presence of different inhibitors. The Company's two distinct multi-specific DARPin® candidates, ensovibep and MP0423, were shown to protect well against these variants, as well as against multiple individual point mutations previously described. Further analyses in context of the full Brazilian P.1 lineage are ongoing. Of note, key spike mutations from the newly emerged variants identified in UK and SA, as well as from the variant detected in Brazil (lineage P.1), E484K, 69/70-deletion and N501Y, were tested individually and in the context of the full variants as described above, and were inhibited by the two DARPin® candidates. These results are highly encouraging as the Company continues the clinical development of these candidates. Full data can be found in the bioRxiv publication linked above.

Ensovibep is presently in its ongoing phase 1 study which is expected to provide data in the first quarter of 2021.

Tracking COVID-19 using online search

By Vasileios Lampos, Maimuna S. Majumder, Elad Yom-Tov, et al.

npj Digital Medicine volume 4, Article number: 17 (2021)

Source: https://www.nature.com/articles/s41746-021-00384-w

Abstract

Previous research has demonstrated that various properties of infectious diseases can be inferred from online search behaviour. In this work we use time series of online search query frequencies to gain insights about the prevalence of COVID-19 in multiple countries. We first develop unsupervised modelling techniques based on associated symptom categories identified by the United Kingdom's National Health Service and Public Health England. We then attempt to minimise an expected bias in these signals caused by public interest—as opposed to infections—using the proportion of news media coverage devoted to COVID-19 as a proxy indicator. Our analysis indicates that models based on online searches precede the reported confirmed cases and deaths by 16.7 (10.2–23.2) and 22.1 (17.4–26.9) days, respectively. We also investigate transfer learning techniques for mapping supervised models from countries where the spread of the disease has progressed extensively to countries that are in earlier phases of their respective epidemic curves. Furthermore, we compare time series of online search activity against confirmed COVID-19 cases or deaths jointly across multiple countries, uncovering interesting querying patterns, including the finding that rarer symptoms are better predictors than common ones. Finally, we show that web searches improve the short-term forecasting accuracy of autoregressive models for COVID-19 deaths. Our work provides evidence that online search data can be used to develop complementary public health surveillance methods to help inform the COVID-19 response in conjunction with more established approaches.

Yes, a Whole Lot of Super Bowl Attendees May Have Caught COVID-19 Yesterday

Source: https://www.sciencealert.com/here-s-how-likely-it-is-that-yesterday-s-super-bowl-attendees-caught-covid-19

Feb 08 – Despite the precautions in place for the roughly 25,000 fans who attended Super Bowl LV in Tampa, Florida on Sunday, some experts are concerned that the game could be a coronavirus superspreader event.

"On paper it looks reassuring," Dr. Peter Chin-Hong, an infectious disease specialist at the University of California, San Francisco, told Insider. "But the reality is sobering."

Coaches, players, and staff of the Kansas City Chiefs and Tampa Bay Buccaneers had been tested daily throughout the season and recently as much as twice daily, ESPN reported. The 25,000 fans were spread out among Raymond James Stadium's more than 75,000 seats, with 30,000 cardboard cutouts of people used to fill in the empty space.

But while these measures are good, Chin-Hong says there's still a significant cause for concern.

Of those in attendance, 7,500 were fully vaccinated healthcare workers. However, others at the game were not required to be vaccinated or tested in advance, which Chin-Hong said includes more than half of all attendees.
He also said even though the Tampa stadium is open-air, the nature of the event makes it especially risky.
"Any time you have 25,000 potentially inebriated people together shouting, yelping and screaming in one place in the middle of a pandemic, you are bound to have transmission," he said, adding that alcohol increases the likelihood of people not following safety protocols.
Chin-Hong said shouting and yelling helps the droplets that cause COVID-19 to travel much farther than six-foot distancing guidelines.
The length of the game, which lasted nearly four hours, also means the virus was more likely to spread, since longer exposure time increases the likelihood of infection from virus-laden aerosols.
The Super Bowl, which was won by the Tampa Bay Buccaneers, also took place in Florida, a state that is still battling its latest coronavirus surge. While its daily case count is dropping, Sunday was the 40th day in a row that the daily COVID-19 death count was in triple digits, *The Miami-Herald* reported.
Chin-Hong said that emerging coronavirus variants in Florida are another concern, noting recent data from the Centers for Disease Control and Prevention that showed the state has reported more cases of the UK variant than anywhere else in the country.
"The variants circulating are at best more transmissible – at worst, will cause more severe disease and make our vaccines not work as well," he said.
Whether or not coronavirus transmission occurred at the Super Bowl is not a question, Chin-Hong said. "The question is how much."
"And that is just the game – not the parties in Tampa's open bars and in people's private homes."
Photos and videos shared on social media during and after the game confirmed those concerns, with large groups of people gathering without masks.

EDITOR'S COMMENT: Just wondering if Americans could survive WITHOUT the Super Bowl final game.

Delaying the Second AstraZeneca Dose Actually Increases Protection, New Data Suggests

By Paul Hunter
Source: https://www.sciencealert.com/new-data-suggests-delaying-second-astrazeneca-dose-increases-protection

Feb 08 – The Oxford/AstraZeneca vaccine is effective at preventing people from developing COVID-19 and could reduce viral transmission, according to a new scientific paper from the team behind the vaccine.
The paper also suggests that delaying the second dose to **12 weeks** after the first works especially well. The protective effect of the first dose doesn't appear to wane during these 12 weeks, and leaving a longer gap between doses ultimately seems to make the second more protective.
These promising new findings come from an analysis of clinical trial data, updating a previous paper on the vaccine's trial results published in early December. However, it's important to keep in mind that the paper is a preprint – meaning its results haven't yet been scrutinised formally by other scientists.
The main difference between this paper and the last is that more cases of COVID-19 have been included. In the December paper, 192 cases of illness were included in the analysis, enough to give a general estimate of the amount by which the vaccine reduces the risk of developing symptomatic COVID-19 – otherwise known its efficacy. This new paper analyses 332 cases.
More cases appearing among trial participants doesn't mean the vaccine isn't working as well. As before, the majority occurred in those who didn't get the vaccine, meaning its overall efficacy is broadly the same: 67 percent (still lower than other authorised COVID-19 vaccines, but nevertheless offering important protection).
Rather, having more cases to look at means the authors can now make more robust estimates of the vaccine's efficacy. It's also allowed them to address the dosing regimen, whether the vaccine prevents asymptomatic infection and how protective a single dose actually is.

The half-dose debate
One surprising trial outcome reported in the earlier paper was that efficacy seemed to be much higher in volunteers given only half a dose in their first injection. The half-dosing was apparently an error and so was considered to be a serendipitous mistake.

In the UK part of the trial, giving two standard doses resulted in 59 percent efficacy, whereas the efficacy of a half dose followed by a standard dose was 90 percent.
In an earlier Conversation article, I raised concerns about the reliability of any conclusions drawn on starting with a half-dose. The UK Medicines and Health Products Regulatory Agency licensed the standard-dosing schedule, saying that when assessing the data, the benefits of the initial half-dose "were not borne out by the full analysis".
It's very clear in this second paper that the dosing error was not serendipitous at all. Rather, the greater efficacy for those receiving an initial half-dose appears to be down to many of them receiving their second injection much later.
This new analysis shows that vaccine efficacy after the second dose was only 55 percent if the gap between doses was less than six weeks, but was 81 percent if the gap was 12 weeks or more. Although not directly presented in the paper, it appears that with a 12-week gap between doses there was very little difference in efficacy for those receiving an initial half or full dose.

Mind the gap

One of the more intense debates around the UK vaccine rollout has concerned increasing the gap between doses to 12 weeks. The thinking was that although a single injection may not be as protective as two, delaying the second dose would allow more people to be given some protection with the first, leading to fewer deaths.
In light of this, this paper also looks at the efficacy of a single injection of the Oxford/AstraZeneca vaccine. Of course, this is only relevant to people receiving this vaccine. Anyone receiving the Pfizer/BioNTech or Moderna vaccines in the UK will also have their doses spaced out by 12 weeks, but we don't have a clear view yet of what effect – if any – this has on these vaccines' efficacy.
From 22 days after being given, the paper states that the efficacy of the first dose of the Oxford/AstraZeneca vaccine is 76 percent. The paper also finds no evidence of efficacy declining during the 90 days following the first injection – meaning a first dose should remain protective until the second is given 12 weeks later.
At first sight, it appears that a single-dose regimen may even provide better protection than two doses (76 vs 63 percent). However, the confidence intervals for these figures overlap, meaning that in reality these results may not be that different.
Indeed, overall, we need to be a little cautious here. Testing the vaccine's efficacy after delaying the second dose for different amounts of time wasn't an original aim of the trial. This means that people weren't randomly assigned how long they would have to wait for their second dose to eliminate potential bias. Because of this, it could be that these findings have been influenced by other factors.

Preventing transmission?

One aspect of this paper picked up by the media is the suggestion that the vaccine could substantially cut the spread of the virus. However, we also have to be somewhat cautious with accepting this conclusion.
As well as recording symptomatic infections, the authors also took regular throat swabs for PCR testing to see what effect the vaccine had on asymptomatic infections. The overall efficacy at preventing symptomatic infections after two standard doses was 67 percent, but for preventing any infection (as measured by a positive PCR test) it was 50 percent – a worthwhile reduction, but not enough to prevent all transmission.
Any vaccine that reduces the incidence of symptomatic infections will also reduce the transmission of the virus somewhat. But people with asymptomatic infections can still spread the virus, albeit rather less effectively.
So, unless a vaccine is highly effective at preventing these, it won't be able to fully prevent the disease spreading.
And, as others have noted, seeing a reduction in the number of people carrying the virus as a result of being vaccinated doesn't definitively prove that it will reduce transmission – this is still quite a big inference to make.

***Paul Hunter** is Professor of Medicine @ University of East Anglia.*

EDITOR'S COMMENT: And then people wonder why healthcare professional are reluctant to be vaccinated with the specific genetic vaccines. A logic person would simply ask: "why should we believe you?"

Some COVID Vaccine Reactions Could Be Pseudoallergy, Experts Say

Source: https://www.medscape.com/viewarticle/945313

Feb 05 – On January 13, two days after a drive-through vaccination "superstation" opened in San Diego, a cluster of six people were treated for anaphylaxis after they received the Moderna vaccine, leading the California state epidemiologist to recommend pausing the administration of that particular lot.

A group of allergy and immunology experts and public health officials reviewed the cases, as well as an incident that occurred the day before, and concluded that at least some of the responses were angioedema, or swelling — a serious allergic reaction — but none were actually anaphylaxis. No similar clusters had occurred with the same vaccine lot in other states, and California resumed using the doses.

Yet questions remain about the reactions and the mechanisms for them. Some might have been triggered by an allergy to a vaccine component, most likely the polyethylene glycol (PEG) that stabilizes the lipid surrounding the mRNA, the key vaccine component in both the Moderna and Pfizer vaccines.

Another possible explanation is that some could be pseudoallergic reactions to a blood protein known as complement, a little-understood process that resembles an antigen-based reaction but doesn't leave an immune memory and might not recur. Cases of complement-activation-related pseudoallergy look like a severe allergic reaction but occur through a different mechanism and don't require previous exposure to an allergen.

"It has the same signs and symptoms and is treated the same way, but it occurs through a different pathway," explained Neal Halsey, MD, director emeritus of the Institute for Vaccine Safety and emeritus professor at the Johns Hopkins Bloomberg School of Public Health in Baltimore.

Pseudoallergies are not well understood, but they have been associated with reactions to the contrast media used in imaging, such as with MRI. "If people have had an anaphylaxis-type reaction following the injection of contrast-dye material, that is a strong signal that it might be a complement-activation-related pseudoallergy," said Halsey, who is a member of the Clinical Immunization Safety Assessment Network. "Those are the people who definitely need to consider seeing an allergist before getting the COVID vaccines."

When Aleena Banerji, MD, clinical director of the allergy and clinical immunology unit at Massachusetts General Hospital in Boston, talks to patients about vaccine reactions, she addresses the risk for COVID-19 infection. All of the people who developed allergies after the Pfizer and Moderna vaccines recovered, but more than 445,000 Americans have died from COVID.

Most people with common allergies, such as to food or oral medications, don't need to worry about reactions, said Banerji, who is lead author of a review that assessed the risk for allergic reactions to the Pfizer and Moderna vaccines.

Investigating Reactions

As investigators search for the answers to what causes reactions, transparency is crucial to trust, said Kathryn Edwards, MD, principal investigator of the Clinical Immunization Safety Assessment (CISA) Project, a vaccine safety network funded by the Centers for Disease Control and Prevention (CDC).

"Unless the public knows that we're really investigating and we're taking this seriously, then I think the vaccine hesitancy is going to increase," said Edwards, who is professor of pediatrics at Vanderbilt University Medical Center and scientific director of the Vanderbilt Vaccine Research Program in Nashville, Tennessee.

First reports of anaphylaxis came quickly after COVID-19 vaccinations began. In the 2 weeks before the holidays, almost 2 million healthcare workers received the Pfizer vaccine, and 21 of them developed anaphylaxis, according to CDC researchers who reviewed case reports from the Vaccine Adverse Event Reporting System (VAERS). That rate of about one in 100,000 is 10 times higher than the occurrence with other vaccines. No deaths from anaphylaxis were reported.

As the vaccinations ramped up, the rate declined. As of January 18, 50 cases of anaphylaxis were reported to VAERS after the administration of 9,943,247 Pfizer doses, for a rate of 5.0 per million, according to data presented at the January 27 meeting of the CDC Advisory Committee on Immunization Practices. And 21 cases of anaphylaxis were reported to VAERS after the administration of 7,581,429 Moderna doses, for a rate of 2.8 per million.

The anaphylaxis occurred almost exclusively in women; only three of the VAERS anaphylaxis reports were from men. Only 24% had a history of anaphylaxis.

The earlier CDC report explored the potential link to allergies. One person with anaphylaxis had a history of allergy to iodinated contrast media, and others had allergies to various medications, vaccines, foods, and animals. The researchers reported 86 nonanaphylaxis

allergic reactions and 61 nonallergic adverse events among the 175 case reports they reviewed as possible cases of severe allergic reaction.

Of 1266 reports that VAERS received from December 21 to January 10, the CDC identified 108 possible cases of severe allergic reaction after the Moderna vaccine. Only 10 met the case definition of anaphylaxis put forward by the Brighton Collaboration, a vaccine safety organization. All but one case involved a history of allergies or allergic reactions; only five had a previously experienced anaphylaxis.

There were 47 nonanaphylaxis allergic reactions.

The San Diego cluster also met the Brighton case definition for anaphylaxis, Edwards reported. This discrepancy highlights the difficulties in characterizing vaccine reactions.

Measuring a pseudoallergic reaction is a challenge. It requires that a blood sample be drawn soon after the incident and then frozen to protect heat-sensitive blood markers, Edwards explained.

And as vaccinations rise, so do adverse-event reports. But unlike in clinical trials, there is no control group for comparison. That is why vaccine safety experts urge caution when evaluating events and, where possible, advise looking at background rates.

"A major way to determine whether the adverse event is causally related is to assess the incidence of the adverse event in vaccines versus nonvaccines," said Walter Orenstein, MD, who directed the US Immunization Program from 1988 to 2004 and is now associate director of the Emory Vaccine Center and professor of infectious diseases at Emory University School of Medicine in Atlanta. Public health officials could then identify vaccine risk factors, he said.

When a reaction occurs almost immediately after vaccination, vaccine safety investigators look for probable triggers. If allergy to PEG is the culprit in anaphylactic reactions, then the individuals would have had a previous exposure, perhaps from injectable medications, Edwards said.

It might be feasible to perform a skin test for allergy to PEG. "If the skin testing is negative, that doesn't completely rule out allergy, but it can be used in the decision-making about giving the first or second vaccine dose," Banerji said.

Other vaccines, such as childhood vaccines, contain polysorbate as a stabilizer, which has a similar chemical structure, and it's not clear why someone would react to PEG but not to polysorbate, Edwards said.

Meanwhile, other illnesses and even deaths sometimes occur in the days after vaccination, but that doesn't mean the vaccine caused them, cautioned Steve Black, MD, emeritus professor of pediatrics at Cincinnati Children's Hospital and cofounder of the Global Vaccine Data Network, an international vaccine safety collaboration.

"Different events and clusters of events will occur by chance alone, as these events can occur without vaccines. We need to not immediately assume that they're due to the vaccine," he said. "You don't want to undermine the whole vaccine program every time something comes up and assume that it's associated with the vaccine."

The CDC only has three contraindications for the vaccines:

- Severe allergic reaction (such as anaphylaxis) after a previous dose of an mRNA COVID-19 vaccine or any of its components
- Immediate allergic reaction of any severity to a previous dose of an mRNA COVID-19 vaccine or any of its components (including PEG)
- Immediate allergic reaction of any severity to polysorbate (due to potential cross-reactive hypersensitivity with PEG).

People who have had an immediate allergic reaction to other vaccines or injectable therapies should consider consulting with an allergist or immunologist before getting the Pfizer or Moderna vaccines, the CDC advises.

The CDC also says that people with a history of anaphylaxis from any cause should be observed for 30 minutes after vaccination. Vaccination protocol calls for everyone else to wait on site for 15 minutes after vaccination.

Inhaled budesonide in the treatment of early COVID-19 illness: a randomised controlled trial

By Sanjay Ramakrishnan, Dan V. Nicolau Jr., Beverly Langford, et al.

Source: https://www.medrxiv.org/content/10.1101/2021.02.04.21251134v1

Background Multiple early hospital cohorts of coronavirus disease 2019 (COVID-19) showed that patients with chronic respiratory disease were significantly under-represented. We hypothesised that the widespread use of inhaled glucocorticoids was responsible for this finding and tested if inhaled glucorticoids would be an effective treatment for early COVID-19 illness.

Methods We conducted a randomised, open label trial of inhaled budesonide, compared to usual care, in adults within 7 days of the onset of mild Covid-19 symptoms. The primary end point was COVID-19-related urgent care visit, emergency department assessment or hospitalisation. The trial was stopped early after independent statistical review concluded that study outcome would not change with further participant enrolment.
Results 146 patients underwent randomisation. For the per protocol population (n=139), the primary outcome occurred in 10 participants and 1 participant in the usual care and budesonide arms respectively (difference in proportion 0.131, p=0.004). The number needed to treat with inhaled budesonide to reduce COVID-19 deterioration was 8. Clinical recovery was 1 day shorter in the budesonide arm compared to the usual care arm (median of 7 days versus 8 days respectively, logrank test p=0.007). Proportion of days with a fever and proportion of participants with at least 1 day of fever was lower in the budesonide arm. Fewer participants randomised to budesonide had persistent symptoms at day 14 and day 28 compared to participants receiving usual care.
Conclusion Early administration of inhaled **budesonide (800 µg X2)** reduced the likelihood of needing urgent medical care and reduced time to recovery following early COVID-19 infection.

Physiological Data from a Wearable Device Identifies SARS-CoV-2 Infection and Symptoms and Predicts COVID-19 Diagnosis: Observational Study

By Robert P Hirten, Matteo Danieletto, Lewis Tomalin, et al.
Source: https://preprints.jmir.org/preprint/26107/accepted

ABSTRACT

Background: Changes in autonomic nervous system function, characterized by heart rate variability (HRV), have been associated with and observed prior to the clinical identification of infection.
Objective: We performed an evaluation of HRV collected by a wearable device to identify and predict Coronavirus disease 2019 (COVID-19) and its related symptoms.
Methods: Health care workers in the Mount Sinai Health System were prospectively followed in an ongoing observational study using the custom Warrior Watch Study App which was downloaded to their smartphones. Participants wore an Apple Watch for the duration of the study measuring HRV throughout the follow up period. Survey's assessing infection and symptom related questions were obtained daily.
Results: Using a mixed-effect COSINOR model the mean amplitude of the circadian pattern of the standard deviation of the interbeat interval of normal sinus beats (SDNN), a HRV metric, differed between subjects with and without COVID-19 (P=0.006). The mean amplitude of this circadian pattern differed between individuals during the 7 days before and the 7 days after a COVID-19 diagnosis compared to this metric during uninfected time periods (P =0.01). Significant changes in the mean MESOR and amplitude of the circadian pattern of the SDNN was observed between the first day of reporting a COVID-19 related symptom compared to all other symptom free days (P =0.01).
Conclusions: Longitudinally collected HRV metrics from a commonly worn commercial wearable device (Apple Watch) can identify the diagnosis of COVID-19 and COVID-19 related symptoms. Prior to the diagnosis of COVID-19 by nasal PCR, significant changes in HRV were observed demonstrating its predictive ability to identify COVID-19 infection.

We Need to Plan Now for The Pandemic That Comes After COVID-19, Scientists Say

Source: https://www.sciencealert.com/we-need-to-plan-now-for-the-pandemic-that-comes-after-covid-19-scientists-say

Feb 10 – It's hard to imagine right now, in a world wracked by the ongoing crisis of the COVID-19 pandemic, that something equally bad or even worse than the coronavirus might await us in our future. But it is possible, even probable, scientists say.

Long before the first cases of COVID-19 were reported and the dangers of SARS-CoV-2 were known, scientists were aware a deadly outbreak of something unknown could be lurking on the horizon, with failure to adequately prepare for it meaning a death toll likely in the millions could result.

The vision was bleak, but nonetheless faultlessly prescient: COVID-19 was effectively everything scientists said it would be. After humanity's reckless, endless incursions into nature, exposing us ever more closely to the pathogens that exist within animals, something like this was perhaps inevitable, even though the precise origins of SARS-CoV-2 remain unclear.

The shocking thing, though, is that nothing has actually changed in all this.

Despite COVID-19's emergence, we are still vulnerable to as-yet-unseen viral mutations SARS-CoV-2 might adopt – let alone whatever the next unknown future pandemic may be – and it's imperative we begin researching and preparing vaccines now that could help defend us from such threats, researchers say.

In a new commentary published in *Nature*, scientists from Scripps Research in San Diego, California, argue that governments and the private sector need to begin investing now in the research and development of broadly neutralizing antibodies: protective proteins that are effective against multiple strains of a virus.

"Such antibodies could be used as first-line drugs to prevent or treat viruses in a given family, including new lineages or strains that have not yet emerged," co-authors Dennis Burton and Eric Topol explain.

"More importantly, they could be used to design vaccines against many members of a given family of viruses."

Effectively, the researchers emphasize, we were lucky with COVID-19 – which isn't something people tend to say very often. The reason was SARS-CoV–2's spike protein: a convenient feature of the viral particle's molecular architecture that just happens to make vaccine design easier.

We might not be so lucky next time, however.

"The next pathogen to emerge might be less accommodating," the researchers write.

"A vaccine could take much longer to make. Even SARS-CoV-2 could be becoming more problematic for vaccines, because of the emergence of new variants."

One way to get ahead of this would be to **develop pan-virus vaccines**, designed around broadly neutralising antibodies that could individually target priority viruses, including potentially SARS-CoV–2 variants, HIV, influenza subtypes, Ebola, MERs, and others.

While isolating these antibodies isn't easy – taking both significant amounts of time and money to do – the outlay is incomparable to the cost of not acting, the researchers say: to reach phase I trials, investment per virus might be US$100 million to $200 million over several years, against the trillions of dollars of damage done by a pandemic like COVID-19.

"Unlike a reactive programme that swings into action when a new pathogen appears, our proposal has goals that can be described now and projects that could begin on a large scale immediately," the authors explain.

"We will have outbreaks in the future, and are very likely to see further epidemics. We must stop these becoming pandemics."

▶▶ **The commentary is published in** *Nature*.

SARS-CoV-2 Infection Prevented and Treated in Human Lung Tissue Model

Source: https://www.genengnews.com/news/sars-cov-2-infection-prevented-and-treated-in-human-lung-tissue-model/

Feb 10 – Given the steady numbers of new COVID-19 cases, the appearance of new variants, and the considerable time that vaccinations will take to reach target levels needed for herd immunity, the development of treatments and useful therapeutics remains a top priority. In particular, treatments and preventive approaches that can be widely and rapidly implemented are urgently needed to curb the risk for COVID-19 related hospitalization and death in multiple settings including nursing homes and long-term care facilities.

Now, scientists at UNC have found that the orally administered experimental drug EIDD-2801 (now known as molnupiravir or MK-4482) halts SARS-CoV-2 replication and prevents infection of human cells in a new in vivo lab model containing human lung tissue. Separate

Phase II and III clinical trials are ongoing to evaluate molnupiravir safety in humans and its effect on viral shedding in COVID-19 patients, and the first results could be released as early as March.
This work is published in *Nature* in the paper titled, "SARS-CoV-2 infection is effectively treated and prevented by EIDD-2801."
Molnupiravir is being developed by Merck & Co. in collaboration with Ridgeback Therapeutics.
Mouse models can be useful in studying highly pathogenic human coronaviruses including SARS-CoV-2 and compounds that might control infection. But human coronaviruses do not replicate in mice unless researchers alter the virus, genetically modify the mice, or introduce the individual human receptor genes into mice so the virus can infect cells. Such mouse models have added to the scientific community's understanding of coronavirus infection and disease progression, but none of these models possess the diverse human cells found in human lungs where viral infection can cause severe disease. UNC scientists created a solution to this problem—a line of mice with human lung tissue that includes all the primary human cells infected when individuals fall ill with COVID-19.
In this study, they used a single experimental platform based on human lung-only mice (LoM) to demonstrate efficient in vivo replication of all recently emerged human coronaviruses (SARS-CoV, MERS-CoV, and SARS-CoV-2) and two highly relevant endogenous pre-pandemic SARS-like bat coronaviruses.
The immune-deficient mice implanted with human lung tissue allowed for replication of SARS-CoV-2, which resulted in infection that recapitulates several features of early diffuse lung damage seen in COVID-19 patients. In addition, acute SARS-CoV-2 infection induced a robust and sustained Type I interferon and inflammatory cytokine/chemokine response.
To evaluate the therapeutic efficacy of molnupiravir for COVID-19, the researchers administered the drug to LoM starting 24 hours or 48 hours post SARS-CoV-2 exposure and every 12 hours thereafter.
"We found that EIDD-2801 had a remarkable effect on virus replication after only two days of treatment—a dramatic, more than 25,000-fold reduction in the number of infectious particles in human lung tissue when treatment was initiated 24 hours post-exposure," said senior author J. Victor Garcia, PhD, professor of medicine and director of the International Center for the Advancement of Translational Science. "Virus titers were significantly reduced by 96% when treatment was started 48 hours post-exposure."
Next, the researchers tested the ability of molnupiravir to prevent SARS-CoV-2 infection by administering the drug 12 hours prior to SARS-CoV-2 exposure and every 12 hours thereafter.
"Remarkably, we found that EIDD-2801 pre-exposure prophylaxis significantly inhibited SARS-CoV-2 replication—reducing virus titers in the human lung tissues of LoM by over 100,000-fold in two independent experiments," said co-first author Angela Wahl, PhD, assistant professor of medicine and assistant director of the International Center for the Advancement of Translational Science.
Bats are the presumed source of SARS-CoV-2 and the highly pathogenic human coronaviruses SARS-CoV and MERS-CoV, all of which emerged into the human population within the past two decades.
"We show that LoM allow for the in vivo study of all recently emerged human coronaviruses in a single platform," said co-first author Lisa Gralinski, PhD, assistant professor of epidemiology. "Our model allows researchers to directly compare infection between human coronaviruses and the effectiveness of potential preventative and therapeutic approaches."
Gralinski added, "We also show efficient replication of endogenous bat coronaviruses in LoM human lung tissue without the need for prior adaptation of the viruses, confirming that bats harbor viruses that are capable of directly infecting humans without the need for further adaptation."
In short, the authors wrote, "Bats harbor endogenous coronaviruses capable of direct transmission into humans."
"Previously, we demonstrated that EIDD-2801 is also efficacious against SARS-CoV and MERS-CoV infection in vivo and in primary human airway epithelial cultures," said Ralph Baric, PhD, the William Kenan distinguished professor of epidemiology at the UNC Gillings School of Global Public Health and the UNC School of Medicine. "Overall, these results indicate that EIDD-2801 may not only be efficacious in treating and preventing COVID-19, it could also prove to be highly effective against future coronavirus outbreaks as well."

**Ridgeback Therapeutics is co-developing EIDD-2801 (more recently called molnupiravir or MK-4482) with Merck & Co.*

FDA Authorizes Lilly COVID-19 Antibody Combination for Emergency Use

Source: https://www.genengnews.com/news/fda-authorizes-lilly-covid-19-antibody-combination-for-emergency-use/

Feb 10 – The FDA last night granted Emergency Use Authorization (EUA) for a 700 mg dose of bamlanivimab (LY-CoV555) in combination with a 1400 mg dose of a second Lilly antibody candidate, etesevimab (LY-CoV016), for the treatment of mild to moderate COVID-

19 in patients aged 12 and older who are at high risk for progressing to severe COVID-19 and/or hospitalization.
The EUA is the second for bamlanivimab, and comes three months after the agency authorized emergency use of the antibody by itself, administered via a single intravenous infusion at the lowest IV dose studied in clinical trials. As with the monotherapy EUA, before patients can be treated with the combination antibody therapy, they must weigh at least 40 kilograms (about 88 pounds) and be deemed at high risk for progressing to severe COVID-19 and/or hospitalization.
According to Lilly, bamlanivimab should be administered together via a single intravenous infusion as soon as possible after a positive COVID-19 test and within 10 days of symptom onset.
The FDA also authorized infusion times of 16 minutes for bamlanivimab and 21 minutes for the bamlanivimab-etesevimab combination—compared with the previously authorized time of 60 minutes. Lilly said it reduced the infusion times in response to feedback received from nurses and doctors administering the infusions.
"Bamlanivimab alone under emergency use authorization has already provided many people with an early treatment option that could prevent hospitalizations and we are excited to now add an additional therapeutic option with a similar demonstrated clinical benefit," Daniel Skovronsky, MD, PhD, Lilly's chief scientific officer and president of Lilly Research Laboratories, said in a statement. "Additionally, with the risk of resistance emerging as various strains of the virus arise, bamlanivimab and etesevimab together could potentially allow efficacy against a broader range of naturally occurring SARS-CoV-2 variants as these new strains spread around the world."

70% Risk reduction

The EUA is based on Phase III data from the Phase II/III BLAZE-1 trial (NCT04427501), a randomized, double-blind, placebo-controlled study. Of the 10 patients who died during the study, all were randomized to placebo, Lilly added.
Lilly reported 11 events (2.1%) in patients receiving its antibody combination, compared with 36 events (7%) in placebo patients—a 70% risk reduction among the study's 1,035 patients. That decrease was consistent with the reduction in risk of hospitalization or ER visits seen with bamlanivimab alone in the Phase II portion of BLAZE-1, the company said.
The bamlanivimab-etesevimab combo also showed statistically significant improvements on all four key secondary endpoints—the change from baseline to day 7 in SARS-CoV-2 viral load, persistently high SARS-CoV2 viral load on day 7, time to sustained symptom resolution, and COVID-related hospitalization, ER visit or death from any cause from baseline by day 29.
The data replicated earlier results published in *JAMA* in a much larger group of patients. Lilly said the outcomes seen with bamlanivimab and etesevimab together were consistent with the reduction in risk of hospitalization or ER visits seen with bamlanivimab alone. The most common adverse event more often reported for patients receiving bamlanivimab and etesevimab together vs. placebo was nausea on the day of infusion.
In granting the EUA, the FDA stated that bamlanivimab is not authorized for patients who are hospitalized due to COVID-19 or require oxygen therapy due to COVID-19, or require an increase in baseline oxygen flow rate due to COVID-19 among those on chronic oxygen therapy due to underlying non-COVID-19-related comorbidity.

1M Doses by mid-2021

In collaboration with Amgen, Lilly said it plans to manufacture up to 1 million doses of etesevimab for administration with bamlanivimab by mid-2021. There are 100,000 doses ready immediately and an additional 150,000 doses will be available throughout the first quarter, Lilly added.
Procurement and allocation of bamlanivimab and etesevimab together will follow the process created for bamlanivimab alone of making the therapy available directly to governments for allocation based on unmet needs, according to Lilly.
Bamlanivimab generated $871 million in revenues for Lilly last year, with the company projecting $1 billion to $2 billion in sales this year.
Washington has committed up to $1.5 billion in a pair of agreements toward bamlanivimab.
In December, the U.S. government exercised its option to purchase another 650,000 vials of bamlanivimab from the company for $812.5 million through January 31, 2021, under the contract through which the government bought an initial 300,000 vials over two months for $375 million—$1,250 a vial—to be provided by the Biomedical Advanced Research and Development Authority (BARDA) partnered with the DoD Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense and Army Contracting Command.
The contract is part of Operation Warp Speed, the Trump administration-launched program designed to accelerate the development, manufacturing, and distribution of COVID-19 vaccines, drugs, and diagnostics.

Bamlanivimab is a neutralizing immunoglobulin G, subclass 1 (IgG1) monoclonal antibody designed to bind to the receptor binding domain of the spike protein of SARS-CoV-2. The antibody was first identified in a blood sample from a recovered COVID-19 patient, and discovered through the rapid pandemic response platform of partner AbCellera, in partnership with NIAID's Vaccine Research Center.
Bamlanivimab is among 21 "Front Runner" leading candidates among the more than 300 COVID-19 therapeutics under study in *GEN*'s updated and just-launched "COVID-19 Drug & Vaccine Candidate Tracker."

Peginterferon-lambda accelerates COVID-19 recovery, finds trial

Source: https://www.europeanpharmaceuticalreview.com/news/142122/peginterferon-lambda-accelerates-covid-19-recovery-finds-trial/

Feb 08 – A new trial suggests a single injection of an experimental antiviral drug, peginterferon-lambda, can significantly sped up the recovery of non-hospitalised patients with COVID-19. In the trial, participants who received peginterferon-lambda were four times more likely to clear the infection within seven days than those on placebo.
"People who were treated cleared the virus quickly, and the effect was most pronounced in those with the highest viral levels. We also saw a trend towards quicker improvement of respiratory symptoms in the treatment group," explained study leader, Dr Jordan Feld, a liver specialist at Toronto Centre for Liver Disease, University Health Network (UHN), Canada.
According to Dr Feld, peginterferon-lambda could become an important intervention for helping to curb the spread of the vaccine and lessen the burden on healthcare systems while vaccines are rolled out.
The Phase II study enrolled 60 outpatients with laboratory confirmed mild-to-moderate COVID-19. Half were randomised to receive a single subcutaneous injection of peginterferon-lambda 180µg or placebo within seven days of symptom onset or first positive swab (if asymptomatic).
In the trial, those with higher viral levels (above one million copies per mL) were more likely to clear infection with the treatment than placebo: 79 percent in the peginterferon-lambda arm, compared to 38 percent in the placebo group. Additionally, the viral load of patients receiving the treatment decreased quickly, which the researchers said may reduce the likelihood of patients transmitting the virus to others.
A total of five participants went to emergency rooms with deteriorating respiratory symptoms. Of those, four were in the placebo group and one was in the peginterferon-lambda group.

Peginterferon-lambda is a long-acting version of the interferon-lambda protein naturally produced by the body in response to viral infections. SARS-CoV-2, the virus which causes COVID-19, has been shown to reduce the body's ability to produce interferons, signalling molecules which can activate cellular pathways to kill invading viruses. Treating patients with interferon-lambda or peginterferon-lambda should upregulate the pathways inhibited by the virus.
Additionally, interferon-lambda can activate multiple pathways, limiting the chance of resistant strain and, unlike some interferons, the receptors for interferon-lambda are only present in specific tissues, including the lung, liver and intestines – all known replication sites for SARS-CoV-2 – which should limit off-target effects.

According to the researchers, following the positive results, a large Phase III trial has been planned.
This was an investigator-initiated phase 2, double-blind randomized study, done in Toronto, with a total of 60 participants – 30 who received the drug while 30 received placebo. The study was conducted from May to November 2020, with referrals from six outpatient assessment centres.
With these positive results, a large phase 3 trial is planned to start in the near future. Additional studies are already underway at the University of Toronto, Harvard University and Johns Hopkins University evaluating peginterferon-lambda in hospitalised patients and in a post-exposure prophylaxis setting.

▶▶ **The results of the study were published in** *Lancet Respiratory Medicine*.

VBI Vaccines Announces Progress of Coronavirus Vaccine Program

Source: https://www.vbivaccines.com/wire/coronavirus-vaccine-program-update/

Jan 21 – VBI Vaccines Inc. (Nasdaq: VBIV) (VBI), a commercial-stage biopharmaceutical company developing next-generation infectious disease and immuno-oncology vaccines, today provided an update on the progress of its coronavirus vaccine program, consisting of

two vaccine candidates: (1) VBI-2901, a trivalent pan-coronavirus vaccine candidate expressing the SARS-CoV-2 (COVID-19), SARS-CoV (SARS), and MERS-CoV (MERS) spike proteins; and (2) VBI-2902, a monovalent vaccine candidate expressing the SARS-CoV-2 spike protein.

"Over the last several months, the preclinical results achieved with our two coronavirus vaccine candidates continue to excite us, and we are working hard to get these candidates into the clinic in forms that are optimized both for clinical outcome and long-term commercial viability," said Jeff Baxter, VBI's president and CEO. "The COVID-19 challenge we face as an industry is two-fold: first, how do we get the ongoing pandemic under control, and second, how do we ensure long-term protection against known and emerging coronaviruses. We continue to progress our candidates as we work to optimize, assess, and manufacture them, with the goal of bringing forward candidates that add meaningful clinical and medical benefit to those vaccines already approved – be it as a one-dose administration and/or providing broader protection against known and mutated future strains of COVID-19."

Preclinical Hamster Challenge Study

The protective efficacy of VBI-2902, with two different adjuvant formulations, was assessed in hamsters where SARS-CoV-2 infection resembles features found in humans with moderate COVID-19 infection and is characterized by a rapid weight loss starting two days post infection. These challenge study data reaffirm the high antibody binding and neutralizing antibody titer data seen in previously announced preclinical studies. Additionally, VBI-2902, regardless of adjuvant formulation, was able to stop and reverse weight loss seen at two days post infection. Where VBI-2902 led to animals regaining normal weight seven days post-infection, the animals who received placebo lost an average of 15% body weight in that same timeframe. Additional observations in the vaccinated cohorts include prevention of peak viral replication in the lungs by approximately 10,000-fold and significantly reduced inflammation in the lungs compared to the placebo cohort.

These and other preclinical data are being targeted for publication.

Phase 1/2 Human Clinical Study

VBI expects to initiate the first Phase 1/2 clinical study of VBI-2902 in Canada in Q1 2021. The clinical study protocol has previously been positively reviewed by Health Canada. Though there have been unanticipated delays in receipt of release testing materials due to recent industry-wide supply chain issues, the Company has been working closely with its partners and Health Canada to complete testing and release of clinical materials to enable clinical study initiation. This study will use clinical material manufactured by our manufacturing partner, National Resilience, Inc., formerly Therapure Biomanufacturing.

Work is ongoing to further optimize and manufacture the Company's pan-coronavirus vaccine candidate, VBI-2901, with the anticipation that a Phase 1/2 study will begin later in 2021.

To support the Phase 1/2 studies, VBI was awarded up to CAD$56 million by the Strategic Innovation Fund of the Government of Canada, to be paid as retrospective reimbursement for eligible expenses incurred.

China Probe: SARS-CoV-2 Jump from Go-Between Host Most Likely Scenario

By Lisa Schnirring

Source: http://www.homelandsecuritynewswire.com/dr20210209-china-probe-sarscov2-jump-from-gobetween-host-most-likely-scenario

Feb 09 – Representatives from China and an international joint mission team led by the World Health Organization (WHO) Monday in Wuhan detailed the results of a 2-week probe into the zoonotic source of the outbreaks, which didn't reveal a definitive source but did shed new light on the events.

At the nearly 3-hour briefing, officials laid out four main theories, some of them less likely possibilities. The 10-person joint mission team has been in China since Jan 14 and followed investigation terms that a WHO advance team fleshed out with the country over the summer.

The team was quarantined for the first part of its stay, followed by 12 days of field work that took them to locations in Wuhan, such as hospitals, the seafood market initially thought to have triggered the first outbreaks, and the Wuhan Institute of Virology (WIV).

Intermediary Host Most Likely Pathway

At the briefing, Peter Ben Embarek, PhD, who led the WHO team, said introduction through an intermediary host species is the most likely of the four scenarios, according to CNN. Confirmation will require more studies and targeted research.

Ben Embarek also said transmission through the sale of frozen products is possible. China has pushed the **cold-chain packaging theory** and has said the virus on imported frozen foods has been one likely source of small flare-ups that followed the country's first surge. However, over the past months, the WHO has said there's no evidence that people can contract the virus from food or food packaging.
The group's seafood market tour found that vendors were selling frozen animal products, including farmed wild animals, and further studies into the supply chain might be useful, he said, according to Reuters. "The possible path from whatever original animal species all the way through to the Huanan market could have taken a very long and convoluted path involving also movements across borders," Ben Embarek said.
The two other possibilities, a **direct spillover from the animal reservoir** and a **lab-incident possibility**, are less likely, Ben Embarek said. The spillover is still considered a topic of further study, though, while investigators assessed the lab-incident possibility as the least likely cause of SARS-CoV-2 jump to humans due to safety protocols that are in place at the facility.
Ben Embarek said the team was able to question lab scientists and administrators about coronavirus work that was done at the lab.

Some Cases Predated Seafood Market Cluster
Liang Wannian, PhD, China's team lead, said the Wuhan seafood market that first emerged as the potential source of the outbreak may not have been the first place where the virus transmitted. He said the earliest illness onset for a confirmed COVID-19 patient was Dec 8, 2019, and that the earliest illness onset linked to the market was Dec 12.
Ben Embarek said a detailed case database review found no indications that there were large COVID-19 outbreaks before December 2019 in Wuhan or anywhere else in China, according to Reuters.
At the briefing, Chinese officials repeated their earlier assertions that the virus could have come from outside of China, and Liang said investigations going forward should not be restricted to any locations, according to the *New York Times*. Though a number of scientists dispute the possibility, the WHO team said they would weigh reports of early COVID-19 cases that occurred outside of China.

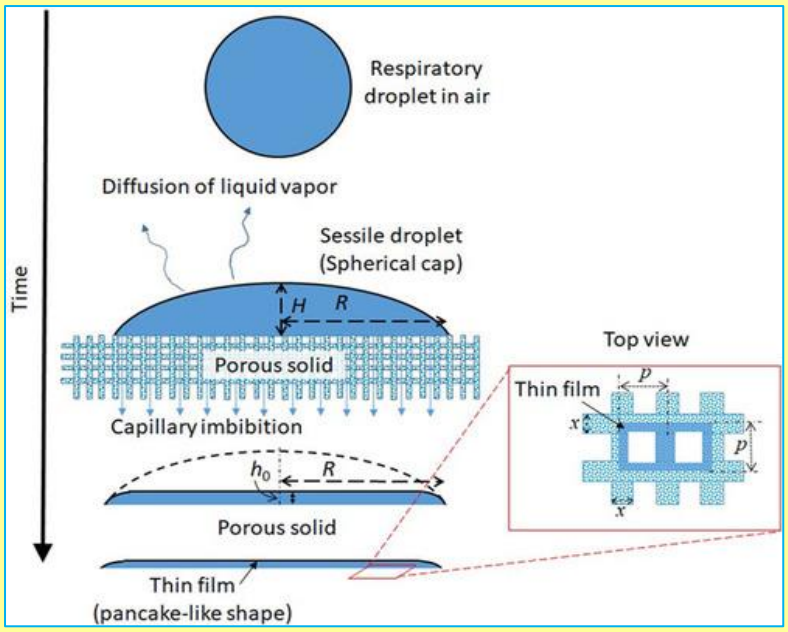
More Studies Needed in Market Animals
Investigators also urged more studies of the animals sold at the seafood market in Wuhan linked to the first reported patient cluster.
Peter Daszak, PhD, a team member from the United States who is with EcoHealth Alliance, said on Twitter Monday that there were no SARS-CoV-2 positives from animals at the seafood market, but some are thought to be susceptible to coronaviruses, including ferret badgers.
Some also trace back to farms or regions where bats harbor coronaviruses. "This, to me, is a critical finding."
He also said the team recommends sampling intermediate hosts and bats in and outside of China, keeping in mind a possible role of frozen wild animals that could have been infected with SARS-CoV-2.
Liang said no labs in Wuhan worked with SARS-CoV-2, though the WIV researches coronaviruses from bats in southwestern China, including two known relatives of SARS-CoV-2, according to the *Washington Post*.
The WHO said Monday that the team will finalize a summary of the report in the coming days and that it will publish a link to the full findings, once the report is published.

***Lisa Schnirring** is news editor at CIDRAP.*

Why coronavirus survives longer on impermeable than porous surfaces

By Sanghamitro Chatterjee, Janani Srree Murallidharan, Amit Agrawal, *and* Rajneesh Bhardwaj
Physics of Fluids 33, 021701 (2021)
Source: https://aip.scitation.org/doi/10.1063/5.0037924

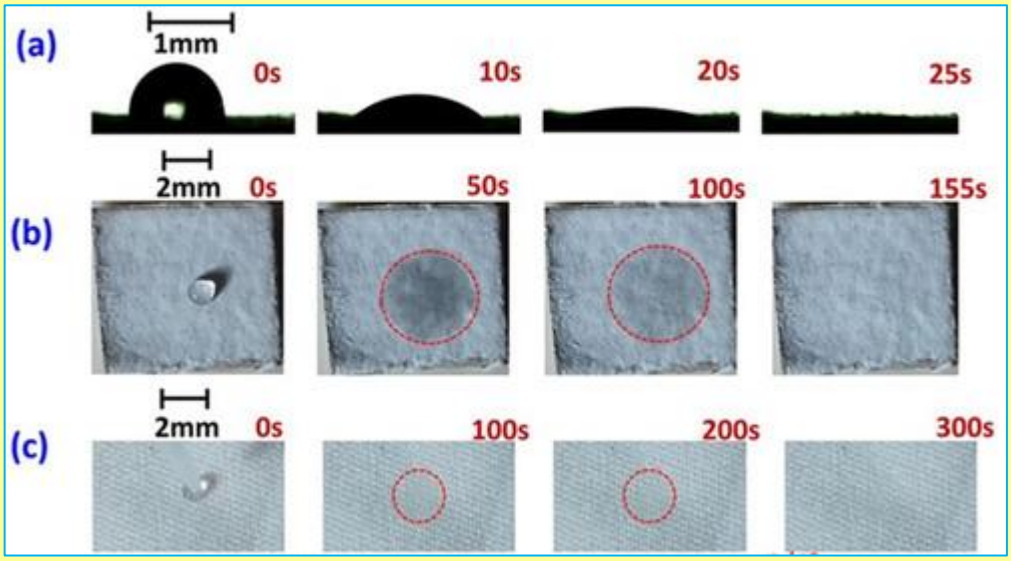
ABSTRACT
Previous studies reported that the drying time of a respiratory droplet on an impermeable surface along with a residual film left on it is correlated with the coronavirus survival time. Notably, earlier virus titer measurements revealed that the survival time is surprisingly less on porous surfaces such as paper and cloth than that on impermeable surfaces. Previous studies could not capture this distinct aspect of the porous media. We demonstrate how the mass loss of a respiratory droplet and the evaporation mechanism of a thin liquid film are modified for the porous media, which leads



to a faster decay of the coronavirus on such media. While diffusion-limited evaporation governs the mass loss from the bulk droplet for the impermeable surface, a much faster capillary imbibition process dominates the mass loss for the porous material. After the bulk droplet vanishes, a thin liquid film remaining on the exposed solid area serves as a medium for the virus survival.

Schematic of the problem considered in the present work. The inset shows the geometry of porous fibers.

However, the thin film evaporates much faster on porous surfaces than on impermeable surfaces. The aforesaid faster film evaporation is attributed to droplet spreading due to the capillary action between the contact line and fibers present on the porous surface and the modified effective wetted area due to the voids of porous materials, which leads to an enhanced disjoining pressure within the film, thereby accelerating the film evaporation. **Therefore, the porous materials are less susceptible to virus survival.** The findings have been compared with the previous virus titer measurements.



Droplet spreading and temporal evolution of the droplet geometry on porous media. (a) Paper, side view; (b) paper, top view; and (c) cloth, top view. The red dotted circles indicate the wetted diameter of the liquid patch left after complete spreading of the droplet, i.e., when the contact angle reaches to zero.

A new study published in Canadian Medical Association Journal on February 10, 2021, found that the **risk of death from COVID-19 was 3.5 times higher than from influenza**.
"We can now say definitively that COVID-19 is much more severe than seasonal influenza," stated Dr. Amol Verma, St. Michael's Hospital, Unity Health Toronto, and the University of Toronto, in a press statement. "Patients admitted to hospital in Ontario with COVID-19 had a 3.5 times greater risk of death, 1.5 times greater use of the ICU, and 1.5 times longer hospital stays than patients admitted with influenza."
These findings are similar to study results recently reported in France and the United States.

260 billion - **The possible cost of COVID-19 in British Pounds for the UK**

J&J Vaccine 85% Efficacious Against Severe COVID Globally

Source: https://www.medscape.com/viewarticle/944933

Jan 29 – The Janssen/Johnson & Johnson single-dose adenovirus vaccine provides 85% efficacy globally against severe COVID-19 illness, and it is 72% efficacious against moderate-to-severe illness in the US, according to highly anticipated interim Phase 3 results announced this morning.

The efficacy against severe disease provided by the Janssen/J&J vaccine held true regardless of age, race/ethnicity, absence or presence of comorbidities, and geography. The 44,000-participant ENSEMBLE study was conducted in the United States, South America, and South Africa.

"My overall take is that the 70 plus percent efficacy in the US for a single shot vaccine is great," Robert Atmar, MD, professor of infectious diseases at Baylor College of Medicine in Houston, told *Medscape Medical News*.

"If we had said a year ago that we'd have a vaccine that was 70% efficacious, we would have been more than happy with that result. And it has the significant advantage of being a single injection and being easier to ship," he added. "So that to me is the good news."

The overall efficacy against moderate to severe SARS-CoV-2 28 days post-vaccination was 66% globally, 72% in the United States, 66% in Latin America, and 57% in South Africa, officials from the National Institutes of Health and Janssen reported during a media briefing.

"The reason for differences in efficacy in different geographic areas does likely largely reflect what [variant] was circulating in those areas," Atmar said.

Circulating virus variants are vexing many officials. "The team is very diligently monitoring all the variants that come up, and there are literally thousands of these. We are acting in anticipation of a variant being a potential problem," said Mathai Mammen, MD, PhD, global head, Janssen Research & Development.

"The South African variant we too acted on right away. So, we too are preparing that antigen for testing. With data today, we do see that not a single South African, after 28 days post-vaccination, ended up needing to go to the hospital, no South African died who was vaccinated. We do see that 85 plus percent protection in South Africa against severe disease. That is one of the most exciting results in the dataset today," Mammen added.

Atmar said efforts are underway to stay one step ahead of the variants if possible. "We are already discussing, even with the Moderna and Pfizer vaccines, boosters and how to enhance protection against some of these variant strains. The same questions will be asked with this vaccine."

The J&J vaccine has potential advantages over the existing two-dose Pfizer/BioNTech and Moderna mRNA vaccines because it's single-dose and has less stringehe addednt storage requirements — only regular refrigeration is needed versus a need to freeze the two-dose Pfizer/BioNTech and Moderna COVID-19 vaccines. The J&J vaccine can be refrigerated for up to 3 months at 36°-46°F (2°-8°C).

But the difference between these just-released efficacy figures and the 94% to 95% efficacy provided by the existing Pfizer/BioNTech and Moderna mRNA vaccines generated many questions during the briefing.

Anthony Fauci, MD, director of the National Institute of Allergy and Infectious Diseases, said the focus should not just be on the overall numbers. "The most important thing from a public health standpoint domestically is to keep people out of the hospital and prevent them from getting severe illness," he said. "Many in the general public might look at a number and want to know if they get symptomatic disease or not."

"More important than preventing someone from getting some aches and a sore throat is to prevent people — particularly people who have underlying conditions and the elderly, the ones most susceptible to a severe outcome — [from getting] severe disease," Fauci added. Prevention of severe outcomes in a high percentage of individuals "will alleviate so much of the stress, human suffering, and death."

Fauci acknowledged that many people will naturally focus on the distinction between 72% efficacy and 94% to 95% efficacy. "This could be a messaging challenge...[but] you have to make sure people understand the implications."

It is more complex, he added, than just asking people: "If you go to the door on the left, you get 94% or 95%. If you go to the door to the right, you get 72%. What door do you want to go to?"

Instead, the messaging should be that "this and the other vaccines we have actually preventing severe disease to a very substantial degree."

"We need to see more of the data," Atmar said. **"The level of antibody induced by a single injection of the J&J vaccine is somewhat lower than what has been reported for the Moderna and Pfizer vaccine."**

"Potentially it's a small price to pay to overcome issues with cold chain [distribution requirements] and achieve still high levels of protection against disease with a single shot vaccine," he added.

Company Defends Numbers

Janssen defended their efficacy findings, pointing out that it is not a fair comparison.

"The vaccine programs that went a couple of months ago, they ran their studies during different times, when the pandemic was less complex. There were not these variants and there was not the same level of incidence, which puts pressure on vaccine efficacy," said Mammen.

"So, the numbers cannot really be compared, and that does pose a messaging challenge," he said. "But the reality is if one was to run the same studies [for the Pfizer and Moderna vaccines] today you would likely see different results."

Asked if the efficacy figures could affect vaccine hesitancy, NIH Director Francis Collins, MD, PhD, said at the announcement that most reluctance among people to get vaccinated against SARS-CoV-2 stems from concerns about safety. "The safety record is extremely good for this vaccine, as it is for the others who have received emergency use authorization."

Janssen/J&J plans to submit for emergency use authorization from the US Food and Drug Administration next week, at which point the company plans to release more information of side effects, deaths, patient subpopulation efficacy, and more from the ENSEMBLE trial.

Janssen is aiming to provide 1 billion doses by the end of this year.

"We should be happy with the 70-plus percent, but by comparison it wasn't quite as high as what was described for Moderna and Pfizer. And we still don't really know what the reasons for that are," Atmar said. "Like so much more in this COVID pandemic, we have much more to learn."

COVID-19 Vaccine AstraZeneca

Product Information as approved by the CHMP on 29 January 2021, pending endorsement by the European Commission

Includes: Package leaflet (for patients); Summary of product characteristics (for healthcare professionals); Manufacturers and conditions of the marketing authorization; Labelling

Source: https://www.ema.europa.eu/en/documents/product-information/covid-19-vaccine-astrazeneca-product-information-approved-chmp-29-january-2021-pending-endorsement_en.pdf

Scientists Think They've Figured Out What's Triggering Brain Fog in COVID-19 Patients

Source: https://www.sciencealert.com/scientists-may-have-identified-what-causes-brain-fog-in-people-with-covid-19

Feb 11 – Not long after the first wave of COVID-19 infections hit, doctors all around the world began to notice something strange – a host of lingering effects persisting in patients, long after they appeared to have otherwise recovered from the virus.

These unusual neurological symptoms – encompassing fatigue, memory loss, confusion, and other abnormalities – are sometimes known as 'brain fog' or 'COVID brain', and new research may have identified an underlying cause of the condition.

"We were initially approached by our colleagues in critical care medicine who had observed severe delirium in many patients who were hospitalised with COVID-19," says neuro-oncologist Jessica Wilcox from the Memorial Sloan Kettering Cancer Centre (MSK) in New York.

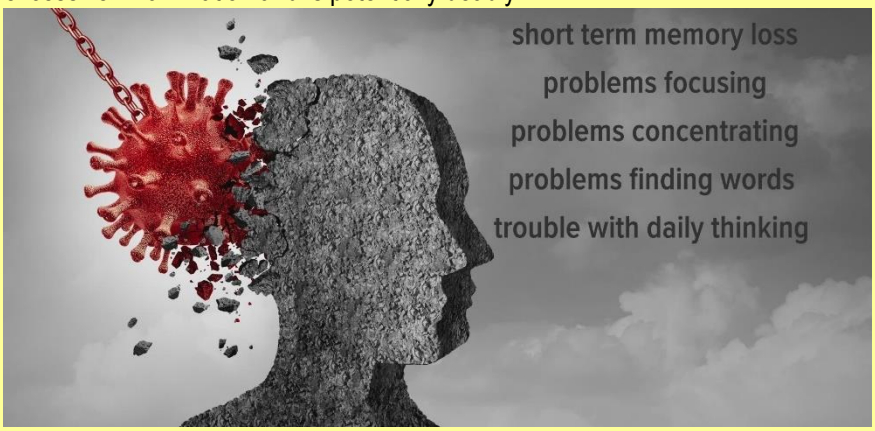
"That meeting turned into a tremendous collaboration between neurology, critical care, microbiology, and neuroradiology to learn what was going on and to see how we could better help our patients."

As part of the new study, Wilcox and fellow researchers screened the cerebrospinal fluid of 18 cancer patients who were experiencing neurological dysfunction (aka encephalopathy) after having been infected with the SARS-CoV-2 virus.

Initially, it was suspected that an ongoing viral infection might be the cause of their brain fog symptoms, but microbiological analysis of fluid taken in spinal taps did not reveal any sign of the virus, suggesting the patients had recovered from COVID-19.

Nonetheless, the search did turn up an important clue as to what was going on.

"We found that these patients had persistent inflammation and high levels of cytokines in their cerebrospinal fluid, which explained the symptoms they were having," explains MSK researcher and co-first author of the study, Jan Remsik.
Cytokines are a broad category of proteins that are involved with signalling in the immune system.
In some cases of coronavirus, an over-production of these molecules results in what's known as a cytokine storm, which can cause excessive inflammation and is potentially deadly.



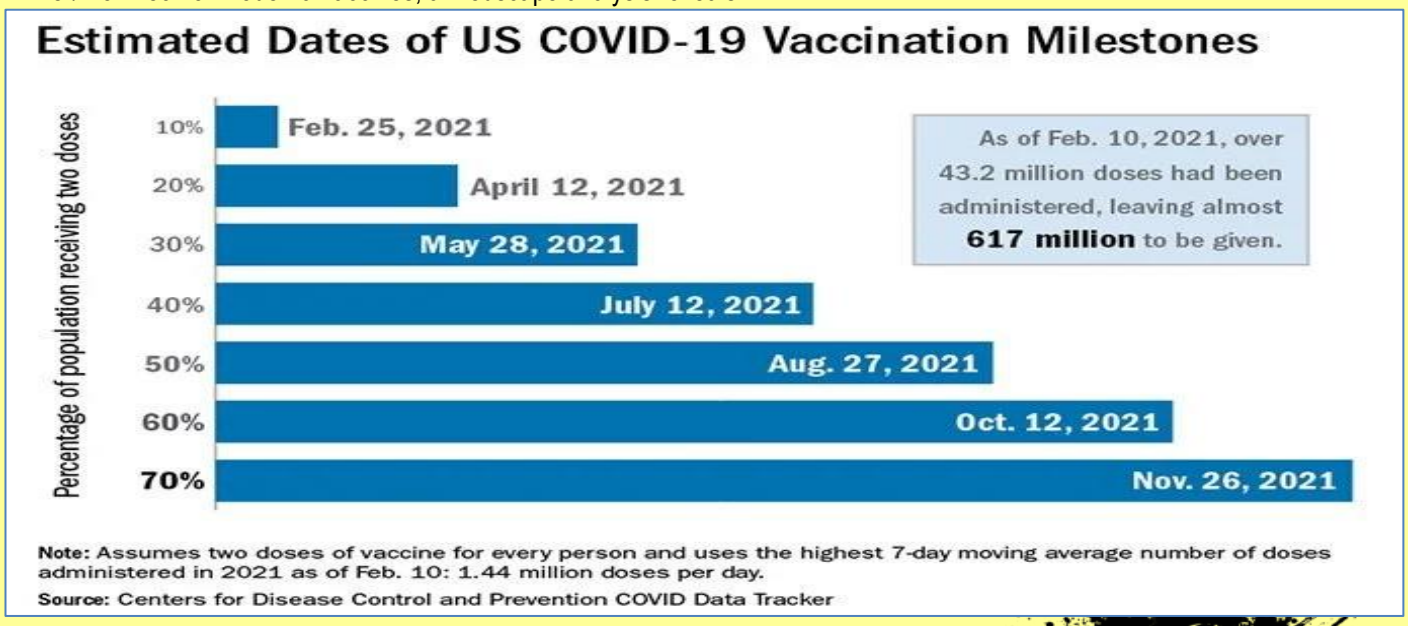
A similar phenomenon showing high levels of inflammatory cytokines is sometimes seen as a side effect of chimeric antibody receptor (CAR) T cell therapy, an immunotherapy treatment, which can also produce confusion, delirium, and other neurological effects that bear a resemblance to COVID brain fog.
The thinking is that the flood of these inflammatory chemicals in the immune system seeps into the brain, producing symptoms of encephalopathy as seen in patients.
While this is the largest study to date to demonstrate this potential link between COVID-19 and post-infection neurological effects, we'll need a lot more data to untangle this association.
That said, the findings here suggest anti-inflammatory drugs might be helpful in mitigating brain fog in patients, and could highlight new directions in terms of diagnosing this strange, lingering malaise.
"We used to think that the nervous system was an immune-privileged organ, meaning that it didn't have any kind of relationship at all with the immune system," MSK neuro-oncologist Adrienne Boire explains.
"But the more we look, the more we find connections between the two."

▶▶ **The findings are reported in** *Cancer Cell*.

At Current Vaccination Pace, When Can US Expect Herd Immunity?

Source: https://www.medscape.com/viewarticle/945699

Feb 11 – It could take almost 9 more months to vaccinate 70% of Americans against SARS-CoV-2 infection and reach a herd immunity threshold, assuming the current pace of immunizations continues and requires a two-dose regimen with either the Pfizer/BioNTech or Moderna vaccines, a Medscape analysis reveals.



Aviation Public Health Initiative (APHI)

Source: https://npli.sph.harvard.edu/resources-2/aviation-public-health-initiative-aphi/

The Aviation Public Health Initiative (APHI) is studying current aircraft, airline, and airport practices and their impact on public health during the COVID-19 pandemic. A team of environmental, infectious disease and social scientists assembled by the National Preparedness Leadership Initiative is reviewing current research as well as analyses conducted by the industry. The findings will report on strategies and tactics to reduce risks of disease transmission during air travel.

US 653 cases where Vaccine targets COVID-19 and Patient Died

The interesting thing about this site is that it provides a detailed history of all the people died

The Covid-19 War: Military Lessons Applied to a Public Health Campaign

By Alexander Gerard Garza, MD, MPH, Wm. Claiborne Dunagan, MD, MS and Keith Starke, MD
February 9, 2021
Source: https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0549#.YCPubR3Krpo.twitter

"Plans are worthless, but planning is everything." —General Dwight D. Eisenhower

Summary

Public health officers, elected officials, and health care leaders are well versed at addressing common public health problems, as well as geographically and population-limited disasters such as tornadoes and floods. However, they were — and continue to be — challenged in planning for an overwhelming and widespread threat, such as a pandemic. The authors detail how the St. Louis Metropolitan area health care systems used the Military Decision-Making Process as a foundational tool to plan against the viral threat.

Israeli drug that substantially alleviates serious Covid symptoms completes second phase trials

Source: https://news.yahoo.com/israeli-drug-substantially-alleviates-serious-193541719.html?.tsrc=daily_mail&uh_test=2_04

Feb 10 – A new Israeli drug that can substantially alleviate serious Covid symptoms in as little as two hours has successfully completed its second phase of trials.

The drug, **Allocetra**, treats the extreme overreaction of the body's immune system seen in some severe coronavirus patients, which can sometimes lead to organ failure and death. The phenomenon is known as a "cytokine" storm.

According to Israel's Channel 13, **90 per cent of a sample of 20 patients who were seriously ill recovered after they were treated with the drug during the trials. The drug is now commencing its third trial phase.**

Yair Tayeb, one of the recovered patients, told the Times of Israel that he felt much better only two hours after receiving the drug.

"I couldn't breathe, I could barely speak. [I was in] very, very serious condition," he said. "I went through an experience you can't put into words."

"They gave me the drug. Suddenly after two hours I started feeling something strange in my body. I stopped coughing, my breathing started to come back, I was feeling better. I stopped sweating. I couldn't believe it. I was afraid to tell people I was okay; I was so excited."

He added: "Two days ago I couldn't stand on my legs… look at me now, going home."

It is one of two drugs being developed in Israel which scientists hope will be a game changer in tackling serious Covid cases.

The other drug, EXO-CD24, was tested on 30 patients with moderate to severe Covid symptoms who all recovered, with 29 of them feeling better within five days.

It was developed at the Ichilov Medical Centre in Tel Aviv and was initially designed to treat ovarian cancer.
"Even if the vaccines do their job, and even if there aren't any new mutations, one way or another, the coronavirus will be staying with us," said Professor Nadir Arber, who designed the drug.

The 2020 Worldwide Corona Crisis: Destroying Civil Society, Engineered Economic Depression, Global Coup d'État and the "Great Reset"

By Prof Michel Chossudovsky
Global Research E-Book, Centre for Research on Globalization (CRG) | February 09, 2021
Source: https://www.globalresearch.ca/the-2020-worldwide-corona-crisis-destroying-civil-society-engineered-economic-depression-global-coup-detat-and-the-great-reset/5730652

World's largest COVID-19 drug trial identifies second compound that cuts risk of death

By Kai Kupferschmidt
Source: https://www.sciencemag.org/news/2021/02/world-s-largest-covid-19-drug-trial-identifies-second-compound-cuts-risk-death

Feb 11 – The world's largest trial of COVID-19 drugs has produced more good news: The anti- inflammatory drug **tocilizumab** cut the death risk of people hospitalized with the disease, reduced their need for a mechanical ventilator, and shortened time spent in the hospital, investigators of the United Kingdom's Recovery trial announced today at a press conference. A preprint about the data has been published on medRxiv.

"This is an incredibly significant result," says Athimalaipet Ramanan, a rheumatologist at the University of Bristol who was not involved in the study but sits on the steering committee of a tocilizumab trial in India. "This is probably only the second drug that has an impact on mortality," he says, after the steroid dexamethasone. If the data pan out, it's "fantastic news," adds Jason Pogue, a pharmacist at the University of Michigan, Ann Arbor, and president of the Society of Infectious Diseases Pharmacists. "I think this will (and I think it should) lead to more widespread use in the United States," Pogue wrote in an email.
But tocilizumab is about 100 times more expensive than dexamethasone, raising questions once again about how to make sure populations across the world can benefit from scientific progress against COVID-19.
Used to treat rheumatoid arthritis and other autoimmune diseases, tocilizumab is a monoclonal antibody that blocks the protein that serves as receptor for interleukin-6 (IL-6), a signaling molecule in the immune system. That dampens the immune response, which is often overactive in late-stage COVID-19, causing serious disease and sometimes death. Soon after the pandemic started, physicians began to test tocilizumab against COVID-19 in small clinical trials. They were encouraged when Recovery showed in June 2020 that dexamethasone reduced COVID-19 deaths by up to one-third in hospitalized patients. That drug quickly became part of the standard of care.
"You might think of corticosteroids like dexamethasone as a very sort of shotgun approach," to turning down the immune system, Peter Horby, one of Recovery's principal investigators, said at today's press conference. "We're now looking at drugs that are very targeted."

In the trial, 2022 patients were randomly allocated to receive tocilizumab and compared with 2094 others randomized to receive usual care; 82% of the patients also received dexamethasone. After 28 days, 596 patients in the tocilizumab group had died, compared with 694 in the control group, a reduction of the mortality rate from 33% to 29%. That means on average 25 patients have to be treated with the drug to save one life. That may seem like a small effect compared with that of dexamethasone, but "a 4% absolute reduction in mortality is not marginal," says physician Ashish Jha, dean of Brown University's School of Public Health. Dexamethasone's success may have raised unrealistic expectations about what other drugs can do, Jha says: "Those results were so fantastic that in some ways, it ruined it for people." The benefit of tocilizumab came on top of the steroid's, the analysis showed.

The mortality benefits spanned all groups, Martin Landray, another Recovery investigator, said at the press conference: "We saw them in the young and the old, we saw them in men

and women, we saw them in different types of ethnicity, we saw them in people who are on invasive ventilators, noninvasive … ventilators and people on simple oxygen masks on the general ward." The drug also significantly reduced the likelihood that a COVID-19 patient would progress to invasive mechanical ventilation.

Early COVID-19 trials of tocilizumab had mixed results, but they were smaller than Recovery. Recently released results from the Randomized, Embedded, Multifactorial Adaptive Platform Trial for Community-Acquired Pneumonia (REMAP-CAP) convinced some doctors that the drug was beneficial, Pogue wrote. "Others, given the mixed bag of clinical trial data previously, were waiting for RECOVERY," he wrote. And although the REMAP-CAP trial only included the sickest patients, the Recovery results suggest the benefit extends to patients with milder disease as well.

The drug comes at a steeper price than dexamethasone, however: about £500 per treatment course in the United Kingdom, versus £5 for the steroid. "This is going to be one more tool for wealthy countries to add to the mix, but not something that's going to be widely available for the rest of the world," Jha says. But that can change, Horby says: "I would hope that there will be a lot of work going on behind the scenes now and in the next few months, to see what can be done to make sure … that this drug does become available to everyone, not just to those in rich countries."

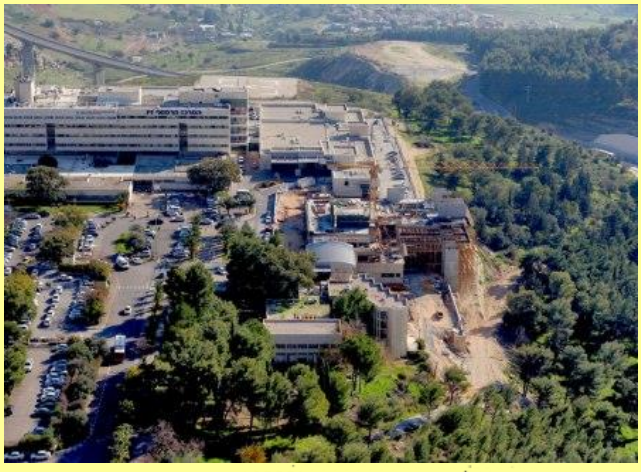
Tocilizumab is not the only available IL-6 inhibitor. Another inhibitor called sarilumab showed a similar effect in the REMAP-CAP trial, but results from two large, completed trials of that drug are yet to be reported. "Publication of results from those trials is now essential to assess whether alternative [interleukin-6] antagonists to tocilizumab are effective," the Recovery investigators write in their preprint. **The largest trial of COVID-19 therapeutics in the world, Recovery has so far enrolled more than 36,000 patients at about 170 U.K. clinics.** In addition to identifying two successful drugs, it helped rule out several others, including the antimalarial hydroxychloroquine, the HIV drug combination lopinavir/ritonavir, and azithromycin, an antibiotic. The trial is still testing aspirin, an anti-inflammatory drug named colchicine, an antibody cocktail from drug company Regeneron, and baricitinib, another drug used to treat rheumatoid arthritis.

Kai Kupferschmidt *is a contributing correspondent for* Science *magazine based in Berlin, Germany. He writes about infectious diseases as well as food science, nutrition, evolution and science policy. Kai received a diploma in molecular biomedicine from the University of Bonn, Germany and later visited the Berlin Journalism School. In 2013 Kai won the Journalism Prize of the German AIDS Foundation. He is the author of a book about the color blue, published in 2019.*

One COVID-19 Vaccine Dose Provokes Immune Response in Those Previously Infected

Source: https://www.precisionvaccinations.com/2021/02/12/one-covid-19-vaccine-dose-provokes-immune-response-those-previously-infected

Feb 12 – **Israeli researchers from Bar-Ilan University and Ziv Medical Center reported preliminary evidence that people previously infected with the SARS-CoV-2 coronavirus responded very strongly to one dose of the Pfizer - BioNTech SE vaccine (Comirnaty), regardless of when they were infected and whether or not they had detectable antibodies against COVID-19 before receiving the vaccine.**



Their study, published on February 11, 2021, in the journal Eurosurveillance, was conducted on a cohort of 514 staff members at Ziv Medical Center (photo).

"This finding can help countries make informed decisions regarding vaccine policy. For instance, whether those previously infected should be vaccinated in priority and, if so, with how many doses," says Prof. Michael Edelstein, of the Azrieli Faculty of Medicine of Bar-Ilan University, who led the study, in a press statement.

"It also offers reassurance that not having detectable antibodies after being infected does not necessarily mean that protection following infection is lost."

These researchers also provided evidence that immune response was similar across multi-ethnic groups.

The Ziv Medical Center, where the study was conducted, is staffed by a workforce comprised of Jews, Arabs, Druze, and others. Members of each of these groups responded very

similarly to the first dose of the vaccine, a welcome finding considering that the virus itself is known to affect some groups more than others.
However, the researchers emphasize that their findings should be confirmed in a larger cohort before reaching definitive conclusions.

Smallpox Vaccine: The Good, the Bad, and the Ugly

By Edward A. Belongia, MD and Allison L. Naleway, PhD
Clin Med Res. 2003 Apr; 1(2): 87–92.
Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1069029/

ABSTRACT

Smallpox inarguably shaped the course of human history by killing countless millions in both the Old World and the New World. Dr. Edward Jenner's discovery of vaccination in the late 18th century, and the global eradication of smallpox in the 1970s, rank among the greatest achievements in human history. Amidst recent growing concerns about bioterrorism, smallpox vaccination has resurfaced from the history books to become a topic of major importance. Inoculation with vaccinia virus is highly effective for the prevention of smallpox infection, but it is associated with several known side effects that range from mild and self-limited to severe and life-threatening. As the United States moves forward with plans to vaccinate selected health care workers and the military, and perhaps offer the vaccination to all citizens in the future, it is important to fully understand and appreciate the history, risks, and benefits of smallpox vaccination.

In simulated smallpox attack, vaccine shortage crippled national response

By O'Toole T, Mair M, Inglesby TV
Shining light on 'Dark Winter.' Clin Infect Dis 2002 Apr 1;34(7):972-83 [Abstract]
Source: https://www.cidrap.umn.edu/news-perspective/2002/03/simulated-smallpox-attack-vaccine-shortage-crippled-national-response

March 2002 – It is 13 days since the emergence of a hypothetical smallpox epidemic caused by the release of virus in three US shopping malls. Some 16,000 cases have been reported, 1,000 people have died, and the nation is running out of vaccine. Hospitals are overflowing, and federal and state officials are at odds over how to contain the epidemic.
That was the situation near the end of "Dark Winter," a simulation exercise in which government and health officials were faced with an imaginary bioterrorist attack involving smallpox virus. The exercise was staged in June 2001, a few months before real bioterrorism materialized in the form of the anthrax attacks in October. Experts from the Center for Civilian Biodefense Strategies at Johns Hopkins University describe and analyze the exercise in the April 1 issue of *Clinical Infectious Diseases.*
The exercise found the nation ill-prepared in several ways to deal with a smallpox epidemic, according to the analysts (two of whom helped design the exercise). Besides spotlighting the problems mentioned above—shortages of vaccine and hospital capacity and conflicts between federal and state authorities—the exercise showed that leaders just didn't know much about the likely consequences of a bioterrorist attack.
"Dark Winter" was a 2-day tabletop exercise in which 12 current and former high-level government and military officials portrayed members of the National Security Council. The players were presented with the smallpox scenario and asked to make policy decisions, which were then incorporated into the further development of the scenario.
The scenario assumed that 3,000 people were infected with smallpox by simultaneous release of the virus in shopping malls in Oklahoma City, Philadelphia, and Atlanta. On the basis of European smallpox outbreaks between 1958 and 1973, the designers of the exercise assumed that each infected person would infect 10 more people. These two assumptions were based on existing information about smallpox but "were not intended to be definitive mathematical predictors or models," the authors state. Further, the designers assumed that only about 20% of the US population still had some immunity to smallpox from childhood vaccinations. The players were told to assume that 12 million doses of vaccine—most of the CDC's stockpile (at the time) of 15.4 million doses—were available and that vaccination within 4 to 5 days after exposure may prevent or ameliorate the disease. (Acambis Inc. now is under contract to produce 209 million doses of smallpox vaccine for the US stockpile, and federal officials also hope to increase the existing number of doses by diluting the vaccine.)
The exercise posited that terrorists released smallpox virus on or about Dec 1 and that, given the diseases's 9- to 17-day incubation period, the NSC was informed of the outbreak on Dec 9. The outbreak began with the confirmation of 20 cases in Oklahoma and news of suspected cases in Georgia and Pennsylvania. In response, the NSC members decided to fully inform

the public of the situation, to focus initial vaccination efforts on patient contacts and healthcare and public safety personnel in the affected states (ring vaccination), and to set aside a supply of vaccine for the Department of Defense, estimating that the department would need about 1 million doses.

By Dec 15, 6 days after the outbreak was reported to the NSC, 2,000 smallpox cases and 300 deaths were reported in 15 states, and isolated cases were reported in Canada, Mexico, and the United Kingdom. Only 1.25 million doses of vaccine remained, and vaccine distribution efforts in some states were chaotic and marred by violence. The NSC members decided to launch a crash program to produce vaccine and to accept vaccine offered by Russia. At a press conference, the president appealed to the people to work together and to follow the guidance of public health officials.

Matters were worse by Dec 22, or day 13 of the scenario. With 16,000 US cases, the vaccine supply was gone, and no new supply was expected for at least 4 weeks. States were restricting nonessential travel, food shortages were growing in some areas, and the economy was suffering. The public demanded isolation of smallpox patients and their contacts, but identifying contacts had become "logistically impossible." Health experts advised the NSC that they expected to succeed in containing the epidemic. However, the experts said that in the worst case—ie, if no more vaccine became available and systematic, broad containment measures could not be implemented—the epidemic could lead to 3 million cases and 1 million deaths. The scenario finally ended with the announcement that anonymous letters to three major newspapers had demanded the removal of all US forces from Saudi Arabia and the Persian Gulf.

The authors present seven lessons from the scenario, all based on comments and decisions by the participants during the exercise and on their later congressional testimony and public statements:

- "Leaders are unfamiliar with the character of bioterrorist attacks, available policy options, and their consequences." Oklahoma Gov. Frank Keating, a participant, said, "This was very revealing to me—that there is something out there that can cause havoc in my state that I know nothing about."
- "After a bioterrorist attack, leaders' decisions would depend on data and expertise from the medical and public health sectors." The players often wanted information that was not immediately available, such as the sites of the attacks and a forecast of the likely size of the epidemic on the basis of the first cases.
- The lack of enough vaccine or drugs to prevent the spread of disease severely limited management options." The shortage of vaccine "led to great public anxiety and flight by people desperate to get vaccinated."
- The healthcare system lacks the capacity to deal with mass casualties. The challenge of distinguishing the sick from the worried well, rationing scarce resources, and dealing with staff shortages and staff members worried about their own health posed a huge burden on the system.
- "To end a disease outbreak after a bioterrorist attack, decision makers will require expert ongoing advice from senior public health and medical leaders." Some NSC members favored geographic quarantines around affected areas, but didn't clearly understand the implications of those measures at first.
- "Federal and state priorities may be unclear, differ, or conflict; authorities may be uncertain; and constitutional issues may arise." Tensions quickly developed between state and federal authorities over access to vaccine and other disease-containment measures, such as isolation. "My fellow governors and I are not going to permit you to make our states leper colonies," said Keating.
- Because the actions of individuals will be critical in fighting an epidemic, leaders must gain the trust and sustained cooperation of the people. "There is no federal force out there that can require 300 million people to take steps they don't want to take," said Sam Nunn, participant and former senator.

Adverse Events Following Civilian Smallpox Vaccination – United States, 2003

Source: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5305a4.htm

During January 24 to December 31, 2003, smallpox vaccine was administered to 39,213 civilian health-care and public health workers in 55 jurisdictions to prepare the United States for a possible terrorist attack using smallpox virus. This report updates information on vaccine-associated adverse events among civilians vaccinated since the beginning of the program and among contacts of vaccinees, received by CDC from the Vaccine Adverse Event Reporting System (VAERS) during August 9--December 31.

In this vaccination program, CDC, the Food and Drug Administration, and state health departments are conducting surveillance for vaccine-associated adverse events among civilian vaccinees (1,2). As part of the vaccination program, civilian vaccinees receive routine

follow-up, and reported adverse events after vaccination receive follow-up as needed. The U.S. Department of Defense is conducting surveillance for vaccine-associated adverse events among military vaccinees and providing follow-up care to those persons with reported adverse events (3).

Adverse events associated with smallpox vaccination are classified on the basis of evidence supporting the reported diagnoses. Cases verified by virologic testing or, in some instances, by other diagnostic testing, are classified as confirmed (Table 1). Cases are classified as probable if possible alternative etiologies are investigated and excluded and supportive information for the diagnosis is found. Cases are classified as suspected if they have clinical features compatible with the diagnosis, but either further investigation is required or investigation of the case did not provide supporting evidence for the diagnosis. All reports of events that follow vaccination (i.e., events associated temporally) are accepted; however, reported adverse events are not necessarily associated causally with vaccination, and some or all of these events might be coincidental. This report includes cases reported as of December 31 that are either under investigation or have a reported final diagnosis.

During August 9--December 31, no new cases of selected adverse events were reported (Table 1). During the vaccination program, no cases of eczema vaccinatum, erythema multiforme major, fetal vaccinia, or progressive vaccinia have been reported.

During August 9--December 31, a total of 20 other serious adverse events were reported (Table 2). Also during this period, 59 other nonserious events were reported. Among the 712 vaccinees with reported other nonserious adverse events during January 24--December 31 (Table 2), the most common signs and symptoms were rash (n = 142), fever (n = 135), pain (n = 122), headache (n = 111), and fatigue (n = 97). All of these commonly reported events are consistent with mild expected reactions following receipt of smallpox vaccine. Some vaccinees reported multiple signs and symptoms.

During this reporting period, no vaccinia immune globulin was released for civilian vaccinees. No cases of vaccine transmission from civilian vaccinees to their contacts have been reported during the vaccination program (Table 3). Surveillance for adverse events during the civilian and military smallpox vaccination programs is ongoing.

References

1. CDC. Smallpox vaccine adverse events monitoring and response system for the first stage of the smallpox vaccination program. MMWR 2003;52:88--9, 99.
2. CDC. Update: adverse events following civilian smallpox vaccination---United States, 2003. MMWR 2003;52:819--20.
3. CDC. Secondary and tertiary transfer of vaccinia virus among U.S. military personnel---United States and worldwide, 2002--2004. MMWR 2004;53:103--5.

TABLE 1. Number of cases* of selected adverse events associated with smallpox vaccination among civilians, by type — United States, January 24–December 31, 2003

Adverse events	No. new cases (August 9–December 31)			Total no. cases (January 24–December 31)		
	Suspected†	Probable§	Confirmed¶	Suspected	Probable	Confirmed
Eczema vaccinatum	—**	—	—	—	—	—
Fetal vaccinia	—	—	—	—	—	—
Generalized vaccinia	—	—	—	2	—	1
Inadvertent inoculation, nonocular	—	—	—	11	—	9
Ocular vaccinia	—	—	—	1	—	2
Progressive vaccinia	—	—	—	—	—	—
Erythema multiforme major (Stevens-Johnson syndrome)	—	—	—	—	—	—
Myo/pericarditis	—	—	—	16	5	—
Postvaccinial encephalitis or encephalomyelitis	—	—	—	1	—	—
Pyogenic infection of vaccination site	—	—	—	—	—	—

* Under investigation or completed as of December 31, 2003; numbers and classifications of adverse events will be updated regularly on CDC's website at http://www.cdc.gov/od/oc/media/spadverse.htm.
† Events are classified as suspected if they have clinical features compatible with the diagnosis, but either further investigation is required or additional investigation of the case did not provide supporting evidence for the diagnosis and did not identify an alternative diagnosis.
§ Events are classified as probable if possible alternative etiologies are investigated and excluded and supportive information for the diagnosis is found.
¶ The first six events listed are classified as confirmed if virologic tests are positive. The last four events are classified as confirmed on the basis of diagnostic testing (e.g., histopathology); confirmation of events thought to be immunologically mediated (i.e., erythema multiforme, myo/pericarditis, postvaccinial encephalitis, or encephalomyelitis) does not establish causality.
** No cases reported.

TABLE 2. Number of cases* of other adverse events reported after smallpox vaccination among civilians, by severity — United States, January 24–December 31, 2003

Adverse events	No. new cases (August 9–December 31)	Total no. cases (January 24–December 31)
Other serious adverse events†	20§	97
Other nonserious adverse events¶	59	712

*Under investigation or completed as of December 31, 2003; numbers and classifications of adverse events will be updated regularly in *MMWR* as more information becomes available.
†Events that result in hospitalization, permanent disability, life-threatening illness, or death. These events are temporally associated with vaccination but are not necessarily causally associated with vaccination.
§Include nine cases of chest pain, two cases of myocardial infarction, two cases of unspecified neurologic disorder, and one case each of angina, dilated cardiomyopathy, Parkinson's disease, lymphoma, appendicitis, seizure, and cellulitis secondary to trauma.
¶Include expected self-limited responses to smallpox vaccination (e.g., fatigue, headache, pruritis, local reaction at vaccination site, regional lymphadenopathy, lymphangitis, fever, myalgia and chills, and nausea); additional events are temporally associated with smallpox vaccination but are not necessarily causally associated with vaccination.

TABLE 3. Vaccinia immune globulin release and vaccinia transmission to contacts — United States, January 24–December 31, 2003

Event	No. new cases (August 9–December 31)	Total no. cases (January 24–December 31)
Vaccinia immune globulin release	0	1
Vaccinia transmission to contacts*		
Health-care settings	0	0
Other settings	0	0

*No cases of transmission from civilian vaccinees have been reported. Sixteen cases of transmission from military personnel to civilian contacts have been reported and are included in Table 1 (14 cases of inadvertent inoculation, nonocular, and two cases of ocular vaccinia).

In the report, "Update: Adverse Events Following Civilian Smallpox Vaccination---United States, 2003," on page 107, the page numbers in reference 3 were incorrect. The correct reference should read, "CDC. Secondary and tertiary transfer of vaccinia virus among U.S. military personnel---United States and worldwide, 2002--2004. MMWR 2004;53:103--5."

In the report, "Global Polio Eradication Initiative Strategic Plan, 2004," on page 109, an error occurred in the address of the website listed in the last sentence of the last paragraph. The correct website address is http://www.polioeradication.org/all/news/document.asp.

These Three Things Are More Likely to Make Someone a Superspreader

Source: https://www.sciencealert.com/these-three-things-are-more-likely-to-make-someone-a-superspreader

Feb 13 – We know that some people are more likely than others to pass on COVID-19 to those they come into contact with, and new research identifies three factors that particularly raise the risk of someone being a superspreader.

The study involved 194 healthy people as well as 8 monkeys from two different species infected with the coronavirus, and highlighted how a higher age, a higher body mass index (BMI), and a higher level of COVID-19 infection could all significantly increase the chances of the virus being passed on from one individual to the next.

According to the researchers' analysis, it's likely that COVID-19 is following the pattern of other infectious disease epidemics, where 18 percent of those infected are responsible for 80 percent of the transmission.

The key to superspreading lies in the mucus in the airways, the study reports. How likely or unlikely this membrane is to break up as air passes over it would appear to go a long way to influencing how readily coronavirus-laden droplets are sent through the air.

"Our findings indicate that the capacity of airway lining mucus to resist breakup on breathing varies significantly between individuals, with a trend to increasing with the advance of COVID-19 infection and body mass index multiplied by age," write the researchers in their published paper.

Across the humans and primates in the study, the older subjects with higher BMI and a heavier dose of COVID-19 infection passed on as many as three times the number of exhaled respiratory droplets.

And it's the tiny droplets that are a particular problem: they travel further, stay afloat longer, and go deeper into the lungs when inhaled. The research found that at the peak of COVID-19 infection, typically a week after the initial infection, exhaled particles were at their smallest – as small as a single micron, a millionth of a metre.

"We've seen a similar increase in droplets during the acute infection stage with other infectious diseases like tuberculosis," says microbiologist Chad Roy, from Tulane University.

"It seems likely that viral and bacterial infections of the airway can weaken airway mucus, which promotes the movement of infectious particles into this environment."

We all push out respiratory droplets as we breathe, talk, cough, and sneeze though, and the researchers are keen to emphasise that the young, fit, and infection-free still have a responsibility to take precautions to make sure they're not infecting others.

"While our results show that the young and healthy tend to generate far fewer droplets than the older and less healthy, they also show that any of us, when infected by COVID-19, may be at risk of producing a large number of respiratory droplets," says bioengineer David Edwards, from Harvard University.
Even as vaccine programmes roll out worldwide, the study suggests that assessing and managing the airborne spread of COVID-19 is still going to be crucial in turning the tide of infections, hospitalisations and deaths – with identifying superspreaders key to that.

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

Background data on Lab accidents in Canada in 2019

By Lien A, Abalos C, Atchessi N, Edjoc R, and Heisz M.
Can Commun Dis Rep 2020;46(9):292–8.
Source:https://doi.org/10.14745/ccdr.v46i09a07

Abstract

Background: The Human Pathogens Act and the Human Pathogens and Toxins Regulationsmandates laboratory incident reporting to the Public Health Agency of Canada's Laboratory Incident Notification Canada (LINC) surveillance system. The objective of this report is to describe laboratory incidents involving exposures that occurred in Canada during 2019 and individuals affected in these incidents.
Methods: Laboratory incidents occurring in licensed Canadian laboratories in 2019 were analyzed. Exposure incident rate was calculated and descriptive statistics were performed. Exposure incidents were analyzed by sector, root cause, activity, occurrence type, and pathogen/toxin. Affected persons were analyzed by education, route of exposure, sector, role and laboratory experience.

Human pathogens or toxins involved in reported exposure incidents by risk group level and security sensitive status, Canada 2019 (N=71) [Security-sensitive biological agents (SSBA)]

Biological agent type by risk group	Non SSBA		SSBA		Total	
	n	%	n	%	n	%
RG2	44	72	0	0	44	62
Bacteria	32	52	0	0	32	45
Fungus	2	3	0	0	2	3
Parasite	1	2	0	0	1	1
Virus	9	15	0	0	9	13
Unknown	0	0	0	0	0	0
RG3	8	13	10	100	18	25
Bacteria	4	7	9	90	13	18
Fungus	2	3	1	10	3	4
Parasite	0	0	0	0	0	0
Virus	2	3	0	0	2	3
Unknown	0	0	0	0	0	0
Unknown	9	15	0	0	9	13
Bacteria	0	0	0	0	0	0
Fungus	0	0	0	0	0	0
Parasite	0	0	0	0	0	0
Virus	0	0	0	0	0	0
Unknown	9	15	0	0	9	13
Total	61	100	10	100	71	100

Results: Sixty exposure incidents involving 86 individuals were reported to LINC in 2019. The annual exposure rate was six incidents per 100 active licenses. Most exposure incidents involved microbiology (n=39; 65%) activities and/or were reported by the academic (n=22; 37%) sector. The public health sector had the highest proportion of exposure incidents while the private sector had the lowest. Procedural (n=18, 23%) was the most cited occurrence type. Over a third of exposed individuals had 0–5 years of laboratory experience (n=32; 37%) and were hospital technicians or technologists (n=31; 36%). Inhalation was the most common route of exposure (n=53, 62%). Human interaction (n=35; 24%) was the most cited root cause.
Conclusion: Laboratory incidents were lower in 2019 than in 2018. The most common occurrence type was procedural while issues with human interaction was the most cited root cause. Most exposed individuals were hospital technicians or technologists.

Could Spike Protein in Moderna, Pfizer Vaccines Cause Blood Clots, Brain Inflammation and Heart Attacks?

By Lyn Redwood, February 11, 2021

Dr. J. Patrick Whelan, a pediatric rheumatologist, warned the FDA in December that mRNA vaccines could cause microvascular injury to the brain, heart, liver and kidneys in ways not assessed in safety trials.

501 Deaths + 10,748 Other Injuries Reported Following COVID Vaccine, Latest CDC Data Show

By Children's Health Defense, February 06, 2021

The numbers reflect the latest data available as of Jan. 29 from the CDC's Vaccine Adverse Event Reporting System website. Of the 501 reported deaths, 453 were from the U.S. The average age of those who died was 77, the youngest was 23.

Did CDC Deliberately Mislead Public on Allergic Reactions to Moderna Vaccine?

By Dr. Meryl Nass and John Stone, January 29, 2021

On Jan. 13, California health officials issued a hold on 330,000 doses of Moderna's COVID-19 vaccine after "fewer than 10" people at San Diego's Petco Park stadium vaccine clinic suffered allergic reactions to the vaccine.

The Injection Fraud – It's Not a Vaccine

By Catherine Austin Fitts, January 18, 2021

Of all the questions that I had, the one that I spent the most time researching and thinking about was why. Why was the medical establishment intentionally poisoning generations of children?

Two new but separate Ebola outbreaks flare up in Africa

Source: https://newatlas.com/health-wellbeing/ebola-outbreaks-drc-guinea-africa-who/

Feb 15 – The World Health Organization is rapidly responding to a pair of new Ebola outbreaks in Africa. The two unrelated outbreaks, in Guinea and the Democratic Republic of Congo, have both appeared in locations previously connected to Ebola flare-ups.

The first outbreak was announced in the Democratic Republic of the Congo (DRC) on February 7th. To date, four cases have been detected in Butembo, a city in the North Kivu Province. Two of those cases have died.

The primary case in DRC is claimed to be the wife of an Ebola survivor from a prior outbreak. Butembo was an epicenter for the second largest-ever Ebola outbreak, officially declared over in June 2020.

It's unclear how the woman contracted the virus, but the WHO is hypothesizing it is possible the case is linked to her husband. Sporadic cases have, in the past, been linked to surviving patients who can harbor traces of the virus for months after recovering.

Scores of close contacts have already been identified and isolated, while the WHO has rapidly commenced vaccinating health workers in the area.

"The expertise and capacity of local health teams has been critical in detecting this new Ebola case and paving the way for a timely response," says WHO Regional Director for Africa, Matshidiso Moeti. "WHO is providing support to local and national health authorities to quickly trace, identify and treat the contacts to curtail the further spread of the virus."

A second outbreak, this time in a rural community in Guinea, Gouéké in the N'Zerekore prefecture, is of even more concern to world health authorities. So far six people have presented with Ebola-like symptoms after attending a recent funeral. All six were hospitalized and two have since died. Guinean authorities have confirmed three positive Ebola cases while other lab work is ongoing.

These are the first cases of Ebola reported in Guinea since 2016, which saw the world's worst ever ebola outbreak beginning in a similar geographical location. That prior outbreak spread to neighboring Sierra Leone and Liberia, ultimately taking 11,000 lives.

"It's a huge concern to see the resurgence of Ebola in Guinea, a country which has already suffered so much from the disease," says Moeti in a recent WHO statement. "However, banking on the expertise and experience built during the previous outbreak, health teams in Guinea are on the move to quickly trace the path of the virus and curb further infections."

The good news is these new cases of Ebola are most likely related to the same strain of the virus responsible for recent outbreaks. Called *Zaire ebolavirus*, this strain is known to be responsive to a recently developed vaccine.
Both new outbreaks are occurring in regions familiar with the virus. This is allowing for the swift deployment of health care workers well versed in tackling this particular problem.
Mohammed Mukhier, from the Red Cross, suggests more than 700 volunteers have already been activated in Guinea following an "epidemic preparedness and response" strategy previously devised for this very scenario.
"Time is of the essence," says Mukhier. "The resurgence of the virus in Guinea comes at the worst possible time when the country is already facing the COVID-19 pandemic. There are reasons for fear, but there are also reasons for hope. While we are extremely concerned, we are also reassured by the lessons we learned from previous outbreaks, and by recent medical advances."

Whistleblower aus Berliner Altenheim: Das schreckliche Sterben nach der Impfung

(Whistleblower from a Berlin old people's home: The terrible death after the vaccination)
Source: https://2020news.de/whistleblower-aus-berliner-altenheim-das-schreckliche-sterben-nach-der-impfung/

Russian Scientists Are Probing Prehistoric Viruses Emerging from Siberian Permafrost

Why?

Source: https://www.sciencealert.com/russian-lab-announces-plans-to-research-ancient-viruses-from-permafrost

Feb 17 – **Russian state laboratory Vektor** on Tuesday announced it was launching research into prehistoric viruses by analysing the remains of animals recovered from melted permafrost.
The Siberia-based lab said in a statement that the aim of the project was to identify paleoviruses and conduct advanced research into virus evolution.

The research in collaboration with the University of Yakutsk began with analysis of tissues extracted from a prehistoric horse believed to be at least 4,500 years old.
Vektor said the remains were discovered in 2009 in Yakutia, a vast Siberian region where remains of Paleolithic animals including mammoths are regularly discovered.
Researchers said they would probe too the remains of mammoths, elk, dogs, partridges, rodents, hares and other prehistoric animals.
Maxim Cheprasov, head of the Mammoth Museum laboratory at Yakutsk University, said in a press release that the recovered animals had already been the subject of bacterial studies.
But he added: "We are conducting studies on paleoviruses for the first time".

A former centre for the development of biological weapons in Soviet times, the Vektor laboratory in Siberia's Novosibirsk region is one of only two facilities in the world to store the smallpox virus.
Vektor has developed a vaccine against the coronavirus, EpiVacCorona, which was licensed in October in Russia and is scheduled to begin mass production later this month.
Scientists say the Arctic is warming twice as fast as the global average, endangering local wildlife as well as releasing carbon stored in the melting permafrost.

What Are the Chances of Another COVID? Much Greater Than We Realised

Source: https://www.sciencealert.com/what-are-the-chances-of-another-covid-higher-than-we-previously-thought

Feb 17 – It's been nearly two decades since a coronavirus capable of wreaking havoc on our bodies threatened global pandemic. Last year, that threat was made good with the emergence of a deadly new version, dubbed SARS-CoV-2.

With the world still reeling from the devastation of COVID-19, the question of if – and when – we'll see yet another member of this family pop up in the near future has the attention of researchers. Their findings should have us on high alert.

A recent investigation has employed machine learning to predict which mammals could host multiple strains of coronavirus, allowing the pathogens to mix and piece together the makings of a next-gen COVID.

The numbers hint at close to a dozen times more coronavirus-host associations than estimates based on observations alone.

Alarmingly, they also found more than 30 times the potential hosts that could harbour SARS-CoV-2 and allow it to recombine into something uglier; and over 40 times the number of species previously suspected to host a handful of coronavirus subgenera.

The study, carried out by researchers from the University of Liverpool in the UK, can't tell us where or even when future pandemics will arise, but it does suggest our current models on the coronavirus ecosystem are in serious need of an overhaul.

While the name of this family of spiky viruses is now synonymous with 2020's shut-downs and high death toll, most of its members are relatively benign. It's even likely you've experienced infections as a seasonal sniffle in the past.

There are four genuses making up the coronavirus family, simply titled alpha, beta, gamma, and delta, which variously infect a wide variety of mammals and birds.

Of all of these, just alpha and beta coronaviruses contain variants that infect humans, with the latter of those harbouring severe acute respiratory syndrome (SARS) strains.

While we love sorting biology into clear categories, nature isn't quite so discriminating.

Viruses regularly shuffle genes and recode their genome as they infect hosts, chancing on clever new methods for unlocking cells, evading eviction from the immune system, or even jumping to new animals, giving rise to what we call new species and strains.

Just to make it all more confusing, members of different groups can congregate inside the same tissues of a host and swap those handy new tools, giving rise to ever more powerful combinations that take the virus's spread to a whole new level.

Keeping track of this swap-meet is no easy feat. Researchers are still trying to work out the exact origins of SARS-CoV-2, with evidence currently pinning it on bats.

Thanks in part to the amazingly robust immune systems, many bat species can harbour a number of viruses comfortably for long periods, giving them all a chance to mix-and-match their genes.

From there, a leap into a human host simply requires a chance encounter, either directly or through an intermediate host, such as a pangolin brought into civilisation for its meat.

Whether this was simply bad luck or an inevitability depends entirely on the frequency of recombination events. And the answer to that question depends on knowing a thing or two about the diversity of the viruses, their potential hosts, and the circumstances under which they meet.

Virologists aren't completely in the dark on these facts, but are also aware that they've barely seen the tip of an epidemiological iceberg when it comes to viruses quietly jumping from species to species, especially in the wild.

In this case, computerised algorithms were designed to find patterns among three different but complementary perspectives – genomic features among the virus's family tree, traits of hundreds of potential mammalian hosts, and characteristics of the virus-host network.

The results reveal the breadth of the landscape open to members of the coronavirus family for sharing their secrets. And with SARS-CoV-2 still circulating, it's clear that there is huge potential for combinations to form that could quickly get out of hand.

That landscape is looking pretty vast. Observations tell us there are only four non-human mammals known to be able to host both SARS-CoV-2 and one other coronavirus.

When the researchers' data is taken into account, there's a whopping 126 SARS-CoV-2 hosts and 2,544 total unique interactions that could teach SARS-CoV-2 how to return with a vengeance.

"Any of these SARS-CoV-2 hosts that are also hosts of other coronaviruses are potential recombination hosts in which novel coronaviruses derived from SARS-CoV-2 could be generated in the future," the researchers explain.

It isn't enough to tell us the exact odds of a new COVID emerging in the near future. But whatever those odds might be, the possibility of another SARS virus outbreak occurring in the future isn't something we ought to be gambling on.

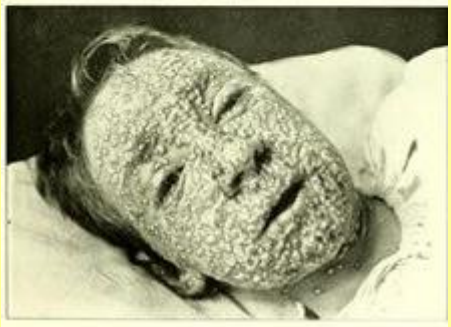
▶▶ **This research was published in** *Nature Communications*.

With COVID Vaccinations Comes a Potential Nightmare Scenario

By F. Perry Wilson, MD, MSCE

Source: https://www.medscape.com/viewarticle/945433

Feb 10 – No one talked about it much, but public health professionals were all aware of a potential nightmare scenario when COVID vaccinations started up in bulk. No, not a slew of severe adverse events; the clinical trials made it clear that these were fairly safe interventions. The nightmare scenario, discussed in small groups online and on campus, was this: What if the vaccines reduce the severity of COVID-19 but not the transmissibility? In other words, what if the vaccine takes someone who would have been sick with COVID-19, isolating at home, and converts them into an asymptomatic carrier, out in the world and spreading virus like millions of Typhoid Marys?



It's not a crazy proposition. Remember that the vaccine trials were designed to see if the vaccine prevented symptomatic COVID-19, not total infections. And I need to point out that this is fine — reducing symptoms is hugely important.

This picture (left) was published in 1901.

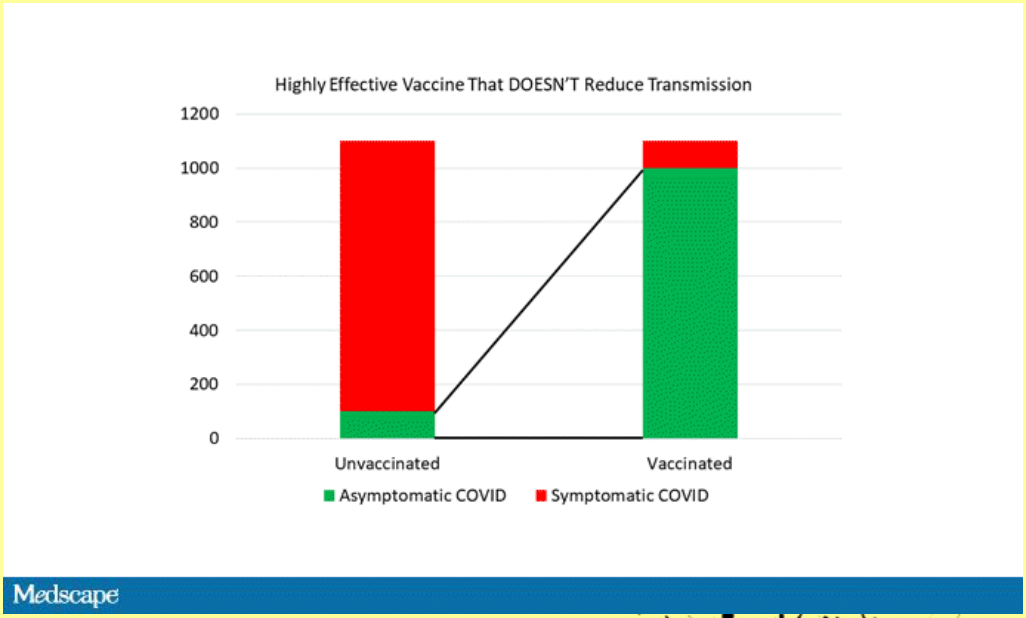
Two sisters were both exposed to smallpox from the same source. The woman on top, aged 21, was vaccinated as an infant. The girl on the bottom, 15 years old, was not. You can see that the vaccine did not eradicate the disease; the woman on top has a couple of lesions. But it's clear you'd rather be her than her sister.

On an individual level, reducing the severity of disease is critical. From a public health perspective, we *also* want to reduce transmission.

Public health officials have been cautious about this, generally pointing out that we don't yet know if vaccines reduce transmission, and encouraging the vaccinated to keep distancing, wearing masks, and whatnot. That's reasonable. But let's be honest: It would be really strange to have a vaccine that is 95% effective at eliminating symptomatic COVID-19 but didn't have any effect on overall infections.

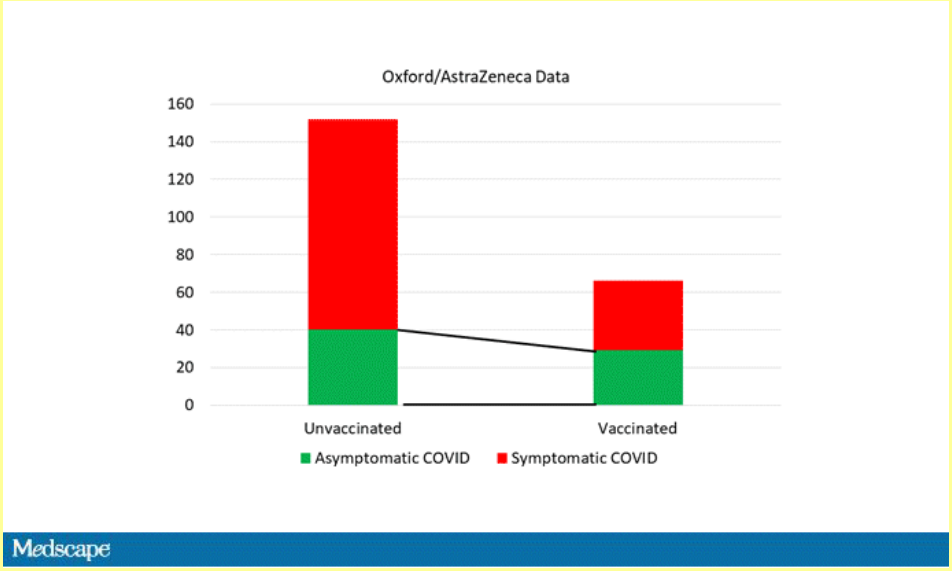
The one good argument I've heard for this is that the vaccines generate blood-borne immunoglobulins like IgM but not mucosal ones like IgA, and so maybe the vaccines protect against big systemic infections but the virus can still set up shop in the nasal passages.

What this purely hypothetical vaccine does is show dramatic efficacy at reducing symptoms of COVID-19, but it doesn't reduce infections at all. It basically takes people who would be sick and turns them into asymptomatic carriers, spreading to the unvaccinated masses.



Fortunately, it doesn't look like this scenario will come to pass.

First, let's look at the AstraZeneca data. Their protocol for UK trial participants included weekly at-home nasal swabs, regardless of symptoms. That gives us good data on the number of asymptomatic infections in the vaccine and control groups. You can see from this graph a significant reduction in *any* infection as well as a smaller reduction in asymptomatic infections.

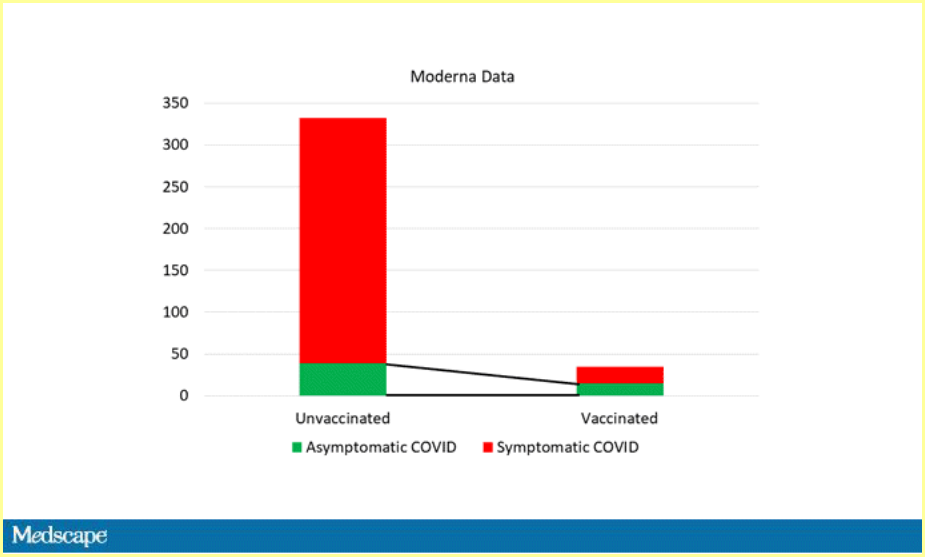


This is great news. Even having the same number of asymptomatic infections but fewer infections overall is good for public health. The nightmare scenario only occurs if a vaccine *increases* the number of asymptomatic infections.

Moderna has a bit of data too, though not as systematically collected. They swabbed everyone in the trial before they got the second dose of vaccine. So — caveat here — these people were not fully protected. Nevertheless, we can see a similar result: dramatic reductions in overall infections and a reasonable reduction in asymptomatic infections.

As of this recording, I don't have data regarding asymptomatic infections in the Pfizer trial, though I understand that they are coming.

So, can the vaccinated take their masks off? Not yet. There clearly is an asymptomatic infection rate even after vaccination; it is just thankfully smaller than among the nonvaccinated. Of course, there are two ways to make this issue moot. One is to have a ubiquitous testing system catching all of those asymptomatic cases. We still don't have that in the US. Two is to vaccinate everyone all at once; this is basically what happens each flu season. If everyone is vaccinated, or at least all the high-risk people are, the impact of asymptomatic spread is seriously mitigated.



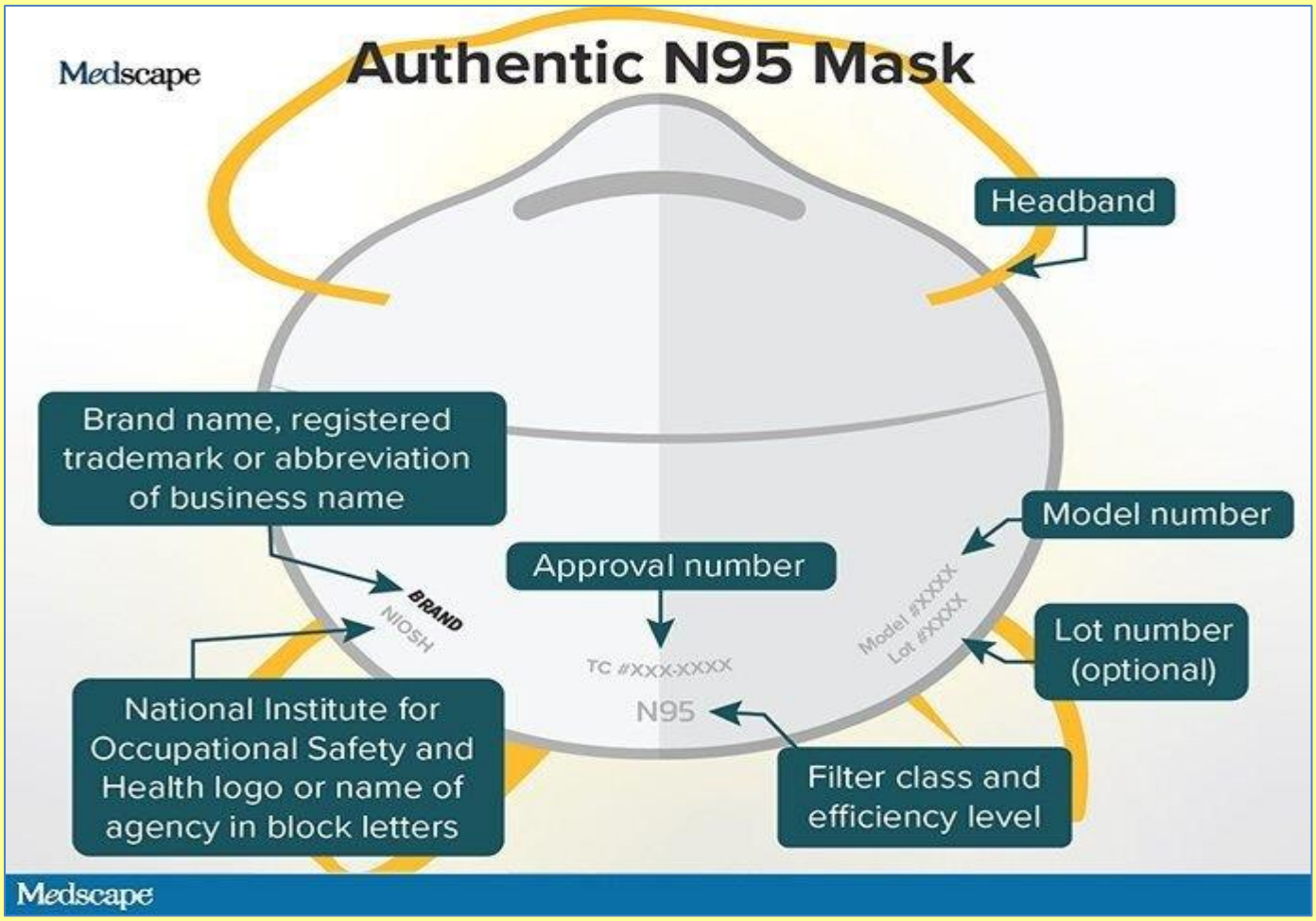
The next set of data to look for is from postvaccination antibody tests. The mRNA and protein vaccines all focus on the spike protein, meaning vaccinated people have anti-spike antibodies. If they *also* have antibodies to other parts of SARS-CoV-2, that is a sign that they were infected with wild-type virus. In the absence of daily nasal swabs, that will be the best way we have to truly understand the risk for asymptomatic spread from vaccinated individuals. But for now, at least, we can sleep easier. There will be no nightmares tonight.

***F. Perry Wilson, MD, MSCE**, is an associate professor of medicine and director of Yale's Clinical and Translational Research Accelerator. His science communication work can be found in the Huffington Post, on NPR, and here on Medscape.*

How to Spot a Fake N95

Source: https://www.medscape.com/viewarticle/946132

Feb 19 – Counterfeit N95 face masks are on the rise and according to the Centers for Disease Control and Prevention, there is no guarantee they provide the same protection as masks approved by the National Institute for Occupational Safety and Health (NIOSH), the agency in the United States that regulates filtering facepiece respirators.



But recognizing phony N95s can be easy using a few simple steps.

Authentic N95 masks have an approval number, which is preceded by the letters TC, as well as a labeled model number and possibly a lot number.

Reliable masks have information about the filter class (as designated by the letters N, P, or R) and the filter efficiency (as indicated by the numbers 95, 99, or 100). An N95 mask has N for the filter class and 95 for the filter efficiency, meaning it can filter 95% or more of certain sized particles.

Valid masks also feature the NIOSH logo or the name of the agency in block letters and the brand name, registered trademark, or abbreviated name of the business holding approval for the mask. It will also have headbands, not ear loops, to secure the mask to the user's face.

A clear sign of a counterfeit mask is the presence of an FDA logo or mention of a Food and Drug Administration approval or registration; the FDA does not regulate face masks, only NIOSH does. And NIOSH does not approve face masks for children — so if there is any mention of child safety, that's another sign of a bogus mask.

Healthcare Providers Can Use Several Strategies to Maximize COVID-19 Vaccines

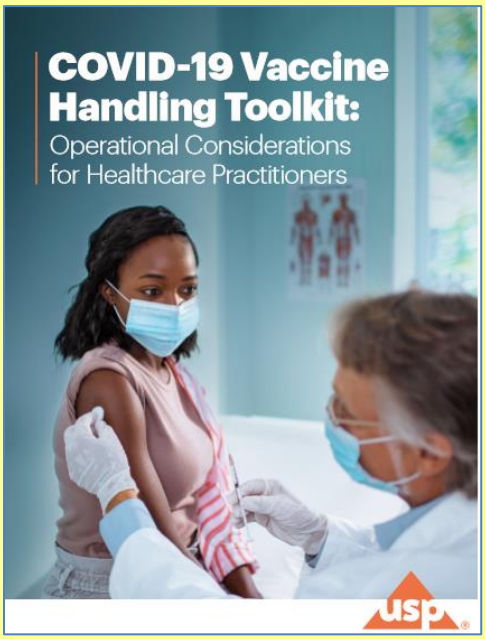
Source: https://www.medscape.com/viewarticle/946052

Feb 19 – Healthcare practitioners can consistently get the most out of each vial of COVID-19 vaccine by using certain syringes and needles and considering waste with pre-drawn syringes, according to the U.S. Pharmacopeia.

The USP created a COVID-19 Vaccine Handling Toolkit to help providers withdraw the highest number of doses from each vial, whether six or seven doses from the Pfizer-BioNTech vaccine or 11 doses from the Moderna vaccine.

"We're in a race against time and need to get more shots in arms as quickly and as safely as possible," said Dr. Farah Towfic, director of CEO operations for USP, who led the toolkit initiative.

To create the toolkit, the USP team brought together a group of immunization experts who developed strategies to maximize vaccine supplies and build a national and global standard for COVID-19 vaccines. The toolkit is available for free and featured on the USP.org homepage.



"In the U.S., we're trying to immunize 300 million people, which will use 600 million doses," she told Reuters Health by phone. "It's absolutely imperative that we maximize every single dose out of a vial in the race to vaccinate as many people as possible."

The toolkit covers three aspects of vaccine administration: preparation, storage and transportation, and waste minimization and supply disposal. While preparing and withdrawing doses, providers should be aware of the different types of syringes, such as low-dead-volume, non-low dead-volume and pre-drawn syringes.

Each option has a unique use that can reduce the waste of syringe supplies, the toolkit authors write, though providers should opt for low-dead-volume syringes and needles whenever possible.

A low-dead-volume syringe is designed to limit the dead space that exists between the syringe hub and the needle. A low-dead-volume needle is designed with less space between the needle and the plunger.

In some cases where not enough low-dead-volume syringes are available, a combination may be useful, such as three low-dead-volume syringes and three non-low-dead-volume syringes for the Pfizer-BioNTech vaccine to withdraw six doses, the toolkit authors write.

In addition, Pfizer recommends a 21-gauge or narrower needle to prevent leaking from the stopper when doses are withdrawn. Since Moderna recommends a 20-22-gauge needle for dose preparation and a 22-25-gauge needle for administration, USP recommends a 22-gauge needle for both preparation and administration of the vaccine.

The toolkit also offers detailed steps for reconstituting the vaccines to help maximize the number of doses, as well as strategies to pre-draw the vaccine into syringes for efficient administration. Providers should carefully consider the number of pre-drawn syringes to prepare to minimize waste, the authors write, and use pre-drawn syringes with the earliest discard time to avoid spoilage.

In addition, providers should refrain from using transfer devices, mini spikes or one needle to prepare multiple syringes due to the potential loss of medicine in dead space. Dispensing pins and needleless devices may also lead to vaccine loss or be incompatible with vaccine materials.

Rotating and inserting the needle in various locations of the vial septum can also reduce leaking of the vaccine and maximize the number of doses.

USP plans to update the toolkit as more COVID-19 vaccines receive authorization from the U.S. Food and Drug Administration this spring. The team is also developing a global version of the toolkit to help providers in different countries to maximize their doses.

So far, Dr. Towfic and colleagues at the USP have received feedback that the strategies have helped providers to deliver 50% more immunizations, particularly at large vaccine clinics and within large health systems. Local independent pharmacists have also been able to get more out of their vials and better serve their communities, she said.

"Delivering 50% more immunizations is exciting because that's how we're going to get to the other side of this pandemic," Dr. Towfic said. "We hope this builds confidence for healthcare providers, as well as confidence for patients."

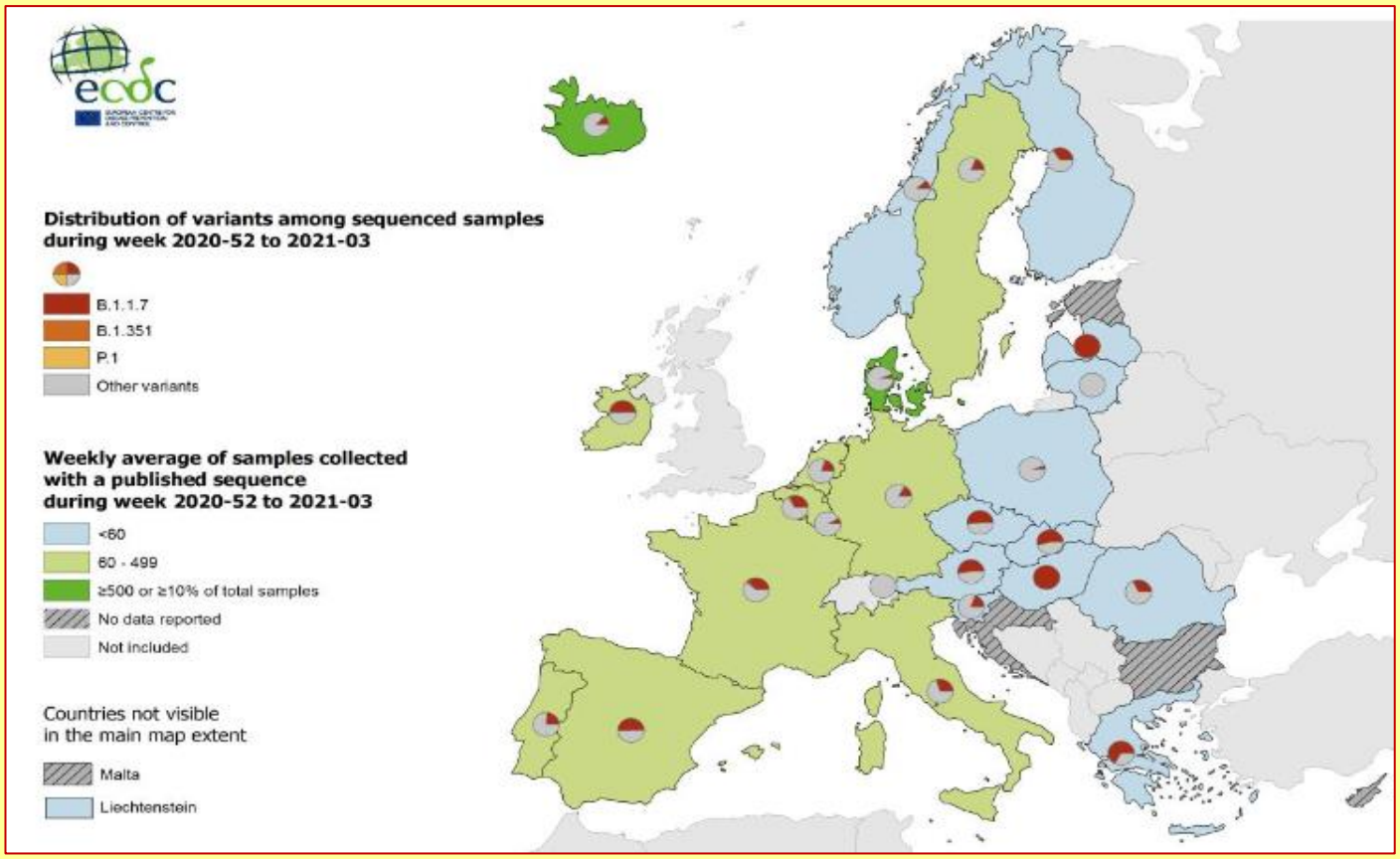
▶▶ **SOURCE:** https://www.usp.org/covid-19/vaccine-handling-toolkit

SARS-CoV-2 variants of concern

Source: https://www.ecdc.europa.eu/sites/default/files/documents/RRA-covid-19-14th-update-15-feb-2021.pdf

Feb 2021 – The SARS-CoV-2 VOCswhich are the focus for this risk assessment include B.1.1.7, as well as the B.1.1.7 variant with an additional E484K mutation; B.1.351 and P.1.Additionalinformation on the characteristics of these variantsis provided in the Disease Background sectionbelow. Further details on other mutations and variants are provided in

previousECDC risk assessments [2,3]. The VOCB.1.1.7, first reported by the UK, continues to predominate in cases reported in the UK, and has been registeredin 83 countries globally (Figure A1, Annex). This variantbelongs to Nextstrain clade 20B [4,5], GISAID clade GR [6,7]and PANGO lineage B.1.1.7[8,9]. B.1.1.7 is defined by multiple spike protein changes (deletion 69-70, deletion 144, amino acid change N501Y, A570D, D614G, P681H, T716I, S982A, D1118H) as well as by mutations in other genomic regions [10].



The B.1.1.7 variant has now been detected in all EU/EEA countries that have any significant detection capability (Figure A2, Annex). Since its identification, approximately 57400 cases have been reportedglobally, includingaround 5700cases in the EU/EEA. Public Health England hasreported 28 genomically confirmedB.1.1.7 cases with an additional mutation (E484K)[11]. This mutation is also carried by the B.1.351 and P.1 variants. Preliminaryphylogenetic analysis suggests at least three separate acquisition events.According to PCR-based screening and whole genome sequencing,the proportion of cases caused by B.1.1.7 has risen in recent weeks[12]and is now very high in some EU/EEA countries, indicating that community transmission is ongoing in many, if not all, EU/EEA countries.European countries indicate the following proportions of B.1.1.7 among all cases sequenced in recent weeks: Denmark 27%[13], France 13.2%(based on ThermoFisher scientific screening, beforesequencingconfirmation)[14],Germany 5.6%[15],Ireland 75%,Italy 17.8%[16],the Netherlands >30%[17], Poland 9%, Portugal 45%, Spain 0.4–53% (depending on the region)[18], Sweden 11%[19]. These figures vary in terms of sampling strategy used, time-period covered and screening method and, therefore, cannot be directly compared. In countries carrying out sequencing during recent weeks, the proportion of B.1.1.7 cases among all sequenced cases appears to be almost doubling each week, strongly suggesting that the variantis on course to become more dominant than the strainspreviously circulating in the EU. In the UK, the S-gene dropout proxy for B.1.1.7 cases went from less than 5% of all positive SARS-CoV-2 cases to more than 60% in less than sixweeksduring November to mid-December 2020, resulting in sharp increases in incidence, hospitalisations and mortality [11]. Environmental surveillance from sewage systemsalso provides usefulinsights intothe rapiditywith whichB.1.1.7can spread. In recent sewage treatment plantsamplesin Lower Austria, B.1.1.7 accountedfor up to 99% of SARS-CoV-2-RNA, while in recent sewage samples from Vienna B.1.1.7 accountedfor 30–50% [20]. The B.1.351variant, first identified in South Africa, belongs to Nextstrain clade 20C[4,5], GISAID clade GH[6,7], and PANGO lineage B.1.351[8,9]. B.1.351 is defined by multiple spike protein changes present in all viruses in the cluster (amino acid change D80A, D215G, E484K, N501Y and A701V), and more recently collected viruses have additional changes [10] (amino acid change L18F, R246I, K417N, and deletion 242-244) [21]. Three of

the changes (amino acid change K417N, E484K, and N501Y) are located within the receptor-binding domain. As of 11February 2021, according to media and official sources, thevariantB.1.351has been identified in 40 countries and approximately 1400 cases have been reported globally (Figure A3 in Annex). More than 90% of cases sequenced in South Africa since late November have been dueto this variant and there is evidence that the variant has beencirculating since at least Novemberin Mozambique as well, indicating that itmay be widespread in other countries in the region where sequencing is not performed or publicly reported [21,22]. In the EU/EEA, around 350 cases have been identified in 16 countries (Figure A4 in Annex). Although somecases reported in EU/EEA are linked to travel, casesare increasinglyreported without an epidemiological link. A large number of cases (295) of this variant haverecently been reported in Austria, mostly concentrated in the region of Tyrol; mass testing and tracing is ongoing in response to this increase, and mandatory testing has been implemented for any person leaving Tyrol [23]. Environmental surveillance ofa recent sewage sample from a village inTyrol shows70% of RNA belongingto lineage B.1.351[20]. Belgium has reported clusters of cases with this variant in long-term care facilities and one school [24-27]. A rapid upsurge in cases of the variant has also been reported in the French Overseas Territory Mayotte [28]. In countries reporting sequencing results, B.1.351 still comprises<1% of cases sequenced. However, it is unknown if this variant hasselective advantage over B.1.1.7, and thereby the potential to compete in settings where the two variants co-circulate.

Variant P.1, first reported by Japan in returning travellers from Brazil, and then laterin Brazil, belongs to Nextstrain clade 20B [4,5], GISAID clade GR [6,7]and PANGO lineage P.1. The variant has 11 amino acid changes in the spike protein compared to its ancestral lineage B.1.1.28, three of which are located in the receptor-binding domain. The full set of spike protein changes for the variant are L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, H655Y, T1027I, and V1176F. TheP.1varianthas since been reported sporadically in travellers elsewhere. As of 11February 2021, P.1 has been identified in 17 countries and approximately200 cases have been reportedglobally. In the EU/EEA, around 30 cases have been identified in fivecountriesand areas (France, including La Reunion, Germany, Italy, the NetherlandsandSpain). In countries reporting sequencing results, P.1 still comprises far less than <1% of cases sequenced. There is currently no detected ongoing community transmission of this variant in the EU/EEA but thiscannot be excluded, given the current levels of genome sequencing activity.

Is wearing a face mask rocket science?

This photo was accompanying an article about the benefits of wearing glasses regarding the possibility to catch the virus.

I do not know who this man is. I presume that he might be a state official because of the seal printed on his mask.

The think is that he promotes the combination of masks that is the latest fashion in coronavirus protection.

So, he uses a surgical mask for his mouth and a cotton mask for his nose and he wears glasses to avoid touching his eyes during the day.

And laypeople who see this person might think that this is the proper way to wear face masks.

Come on! It is not rocket science! Use your logic!!!

Rich countries 'stockpile one billion vaccines', report says

By Elena Sánchez Nicolás

Source: https://euobserver.com/coronavirus/150995

Feb 22 – The world's richest countries have monopolised over half of current and projected production doses of vaccines, leaving low-and-medium-income countries struggling to secure vaccines, a report by anti-poverty campaigners found on Friday (19 February).

Ten countries in total have so far administered 75 percent of all Covid-19 vaccines - while 130 countries have not yet received a single dose.

In their analysis, the ONE Campaign revealed that the 27 EU countries, Australia, Canada, Japan, UK, and the US have already secured a total of over three billion doses of approved vaccines - almost one billion more doses than they would need to vaccinate all their citizens.
The excess doses of rich countries alone would be sufficient to vaccinate the entire adult population of Africa.
Meanwhile, the rest of the world has only been able to buy 2.5 billion doses.
The EU alone has secured 2.6 billion vaccines doses - an amount that would allow the bloc to vaccinate every European twice, and still have almost 500 million doses left, according to the advocacy group.
The report focusses specifically on contracts with the five leading vaccine developers: Pfizer/BioNTech, Moderna, AstraZeneca, Johnson & Johnson, and Novavax.
However, it notes that if other vaccine candidates are found to be safe and effective, like those from Sanofi or CureVac, there would be an additional one billion excess doses available to share.
Anti-poverty campaigners warned that the monopoly of vaccines by rich countries could lead to twice as many deaths from Covid-19.
"As long the virus remains unchecked anywhere on the planet, it will continue to mutate, breach borders, and wreak havoc on communities and the global economy," reads the report, which estimates that vaccine hoarding could cost the global economy about €7.6 trillion.

Number of excess doses available to share by country

Country	Population (total)	Doses Purchased*	100% coverage (2-doses)	Doses available to share
Australia	25,364,310	114,800,000	50,728,620	64,071,380
Canada	37,589,260	190,000,000	75,178,520	114,821,480
Japan	126,264,930	290,000,000	252,529,860	37,470,140
United Kingdom	66,834,400	247,000,000	133,668,800	113,331,200
United States	328,239,520	1,110,000,000	656,479,040	453,520,960
European Union	447,512,040	1,360,000,000	895,024,080	464,975,920
			TOTAL	1,248,191,080

This analysis looks at doses purchased of the five leading vaccines on the market: Pfizer, Moderna, Oxford/AZ, Novavax, J&J

Table: EUobsever • Source: Analysis by the ONE Campaign • Created with Datawrapper

Voluntary solidarity

Last month, the head of the World Health Organization (WHO) said that the world was on the brink of a "catastrophic moral failure" because of the unequal distribution of vaccines.
The WHO has recommended that all countries vaccinate at least 20 percent of their populations, covering health care workers and the most vulnerable, before vaccinating more widely.
But reaching this target in 92 low-and-medium-income economies is subjected to raising funds for COVAX - the UN's programme which aims to ensure that 190 countries have equal access to two billion vaccines by the end of the year.
Norway, for example, has already started to share doses through COVAX.
The EU has also announced that they will share vaccine doses with other countries through COVAX, although with no clear timeline.

"There might be a limited number of doses, for now, we are waiting for the delivered [doses] to become more stable overall. Perhaps it is only at this stage that we will have more to offer," a commission spokesperson said on Friday.
Under the EU vaccine strategy, member states can share doses with poorer and neighbouring countries voluntarily.
French president Emmanuel Macron has called on the US and member states to allocate up to five percent of current vaccine supplies to developing countries. Macron said German chancellor Angela Merkel has also agreed that sharing EU's vaccine stockpile should be a common effort.
The EU and its member states are one of the lead contributors to COVAX with over €2.2bn. The US has pledged €3.2bn to ramp up global vaccination efforts.

Vaccine diplomacy

The so-called "vaccine nationalism," or the seizing of the first batches of doses by rich states that can pay the most or the quickest, has simultaneously triggered a race to show geopolitical leadership.
According to Brandon Locke form the ONE Campaign, "while Russia and China are already sharing Covid-19 vaccine doses with lower-income countries, the EU is losing ground in the race to deliver a global response to the pandemic".
Indonesia, the Philippines, Thailand and Nigeria, among others, are lining up to receive China's Sinovac vaccine, while Russia's Sputnik V had been approved already in 26 countries, including Algeria, Argentina, Armenia, Belarus, Bolivia, and Guinea.
Last week, EU Commission president Ursula von der Leyen shed doubts on the Sputnik V vaccine, questioning why "Russia is offering millions of millions of doses while not sufficiently progressing in vaccinating their own people".
Moscow has responded, saying that von der Leyen's comments could indicate "an effort to politicise the issue in an unsubstantiated and…deplorable way" or an inadequate level of awareness, regarding the reported 92-percent efficiency of the vaccine.

A separate study recently revealed that while the vast majority of the adult population in rich countries will be vaccinated by mid-2022, some 85 poorer countries may not have widespread access to vaccines before 2023, at the earliest.

* Josep Borrell is European Union's Minister for Foreign Affair

In 1959, Thousands of Vaccines Were Stolen in a Heist. Here's Why That's Important Now

By Paula Larsson

Source: https://www.sciencealert.com/in-1959-thousands-of-vaccines-were-stolen-in-a-heist-here-s-why-that-s-important-now

Feb 22 – We find ourselves at a precarious time in global health. Many people are anxiously awaiting their turn to receive a vaccine for COVID-19, yet roll-out is slow and disorganized, with many countries facing supply shortages.

The conditions are ripe for opportunists to exploit the situation. Reports of unethical line-jumping by wealthy elites have started to surface, while others warn of the potential for a black-market trade in vaccines.

This isn't the first time people have waited anxiously for a vaccine. The looking-glass of history reveals the uneasiness of emotion that accompanies moments like these, as well as the dark consequences that can arise when evil-doers take advantage of them.

One case in particular stands out as an important lesson for today: when thousands of vaccine doses were stolen by armed men during a supply shortage in 1959.

The polio epidemic

It was the summer of 1959, when the last great epidemic of poliomyelitis swept across Canada. Québec saw the most cases that year, with the newspapers reporting over a thousand cases and 88 deaths.

Although the health authorities in Montréal warned the public about the seriousness of the summer epidemic, they also begged the populace to remain calm. This was far from comforting for parents who feared for their children.

Polio infection could cause permanent paralysis and was deadly in 5 percent of cases. Montréalers rushed to the vaccine clinics, sometimes waiting for hours in the rain.

Vaccine production in Canada was limited to only two laboratories, with the majority being provided by Connaught Labs at the University of Toronto. This put intense pressure on vaccine supplies and Québec, like the rest of North America, soon faced a vaccine shortage.

Headline images showing the lone lines of people waiting to get a Salk vaccine. 'The Montreal Gazette,' Aug. 11, 1959. (The Montreal Gazette)

A planned robbery

By August, Montréal was waiting desperately for more vaccines. It was a great relief when a huge shipment of the cherry-red vials arrived from Connaught Labs at the end of the month. The supply was enough to cover the city, and the surplus was planned for redistribution across the province.

Yet the redistribution never came to pass. One man by the name of Jean Paul Robinson, a temporary vaccine worker, had found the circumstances too enticing.

Robinson had been tasked with running vials between the various clinics. He knew there was a shortage and that people were desperate. He also knew where the main supply of vaccine was stored: at the Microbiology Institute in the University of Montréal.
At 3 am on 31 August 1959, Robinson and two accomplices broke into the university armed with revolvers. They first locked the night guard in a cage with 500 lab monkeys. The thieves then broke the lock on the massive refrigerator, looted all the cases of the vaccine and stole the guard's car as the getaway vehicle.
In the end, they made away with 75,000 vials, valued at CA$50,000 (equivalent to almost $500,000 today). Robinson rented an empty apartment building and stashed his prize.
The crime shocked the country. The next day, the city announced it had completely run out of its vaccine supplies. Reporters seized on the situation; publishing reports of desperate mothers turned away from vaccine clinics in vain.
The provincial police were called in, and a special four-man team of investigators was assembled. They began by interviewing the hapless night guard. He couldn't identify the culprits - who had been wearing nylon leggings over their faces - but he did overhear them speak about transporting the vaccines. The conversation provided the only lead: it seemed that at least one of the men had been "familiar with medical terms".
The police soon brought in a medical student for questioning. By the next day, they had seized a supply of fresh vaccine from the shelves of a Pont-Viau drug store. The confiscated vials displayed the same serial number as the missing supply.
Yet questioning both the medical student and the druggist led the police nowhere, and over the next few days, all leads ran dry. Worse yet, it seemed that the city was facing an upswing in infections, with another 36 patients admitted to hospital.

Risk and capture

Meanwhile, Robinson was trying to figure out what to do with his ill-gotten supply of vaccine. Keeping the product cold was a difficult task - if left unrefrigerated for too long, the vaccine would be useless.
He filled the refrigerator (saving one shelf for beer), while the rest of the cases were simply left on the floor at room temperature. Although he had been lucky to sell 299 vials for a tidy sum of $500 to the druggist at Pont-Viau, dispensing with the rest of the vaccine was too risky.
Taking a chance that the police were more interested in recovering the vials than catching the culprit, Robinson placed a call to the public police line. Posing as a concerned citizen, he declared that he had seen a large amount of suspicious cases labelled "Connaught Laboratories" being loaded out of a car on St. Hubert Street in the East End.
The police quickly discovered the missing cases of vaccine, but before they could be used, the vaccines would need to be tested thoroughly. This process could take up to two months, meaning the vials could not be used despite the epidemic. Fresh shipments of the vaccine were not planned to arrive for a few more weeks.
The public met the outcome of the investigation with outrage, with the *Montréal Star* going so far as to speculate that the police had made a deal with the guilty parties in order to recover the vaccine. Truly, it declared, "in the history of justice in Canada, this case must be unprecedented." The stolen vaccines were eventually cleared for general use in October.
For their part, the police were far from done investigating. They soon turned their attention to identifying the culprit. They discovered that the man who had provided the police tip was also the man who had sold the Pont-Viau druggist his 299 vials.
Evidence continued to mount against Robinson when the janitor of the apartment building identified him. After denying all charges, Robinson fled. He was discovered three weeks later hiding out in a small shed on an "isolated backroad farm."

Victoria Daily Times

75TH YEAR
The Home Paper
Telephone EV 2-3131
Duncan 1600

VICTORIA, B.C., MONDAY, AUGUST 31, 1959—26 PAGES

PRICE: 10 CENTS SATURDAY, 15 CENTS

NAB IKE
GOOD LUCK
housewives seized an
a personal chat with
as he headed through
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on High Street, a big
to the curb for Presi-

Bandits Take Polio Vaccine
In Bizarre Laboratory Raid

The vaccine heist of 1959 shocked the Canadian public and made headlines across the country. 'Victoria Daily Times,' Aug. 31, 1959 (Victoria Daily Times)

'Beyond reasonable doubt'

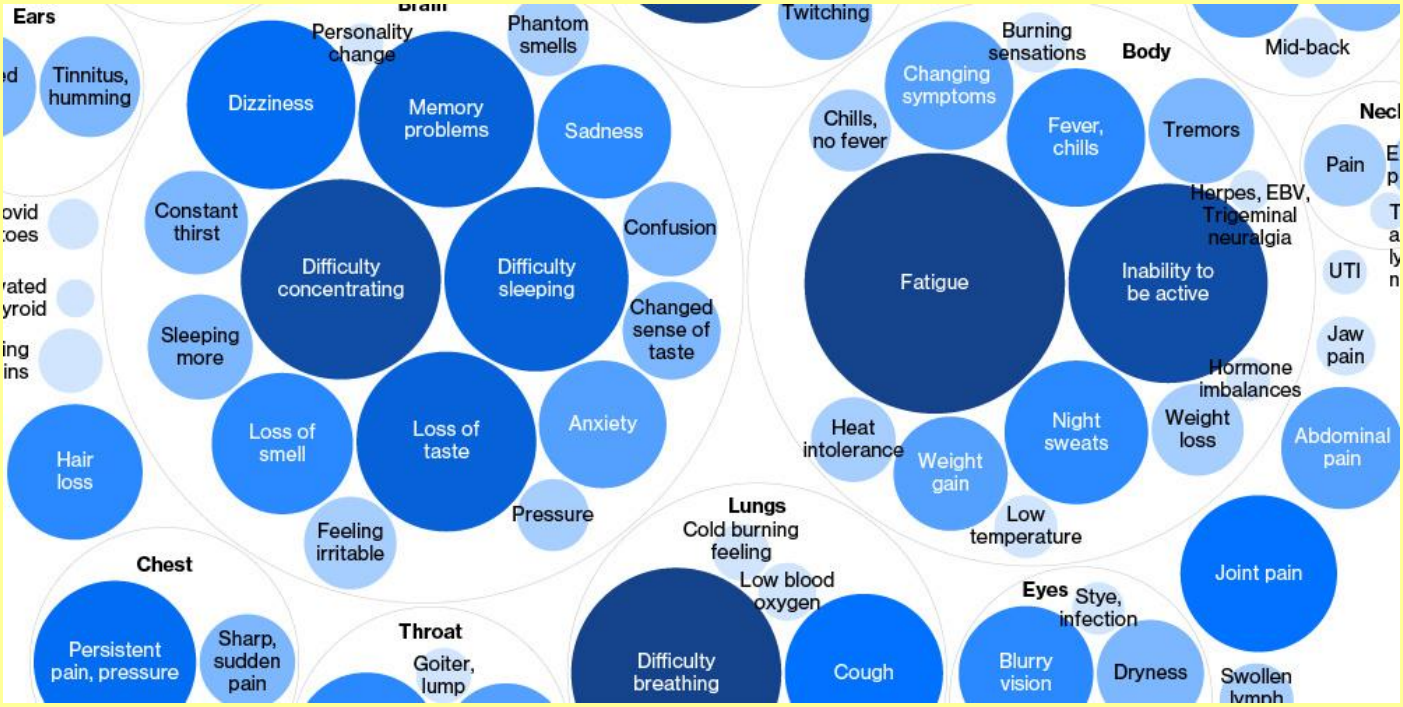
Prosecuting Robinson turned out to be a much harder task, and the case eventually fell apart. Although one of his accomplices had originally identified Jean Paul Robinson as the

mastermind of the heist, when the trial came around two years later, the witness recanted his original statement (he would later be charged with perjury).
Robinson himself proved imperturbable during courtroom interrogations. He painted himself a public-spirited citizen who had simply tried to "retrieve" the stolen vaccines from the true criminal mastermind: a mysterious man by the name of Bob. Robinson claimed that Bob had set the whole thing up before he had disappeared and escaped justice.
The judge eventually ruled that although Robinson's story was "strange and a little far-fetched," in the end, "the Crown had not proven a case beyond a reasonable doubt" and he was acquitted.
As millions of people worldwide anxiously await the distribution of the COVID-19 vaccines, this case warns of the possible consequences of disorganized and poorly planned vaccine programs. Those looking to profit from mistakes, shortages and desperation are out there, and it is important that policy makers keep this in mind as vaccination programs are rolled out.

Paula Larsson *is Doctoral Student @ Centre for the History of Science, Medicine, and Technology, University of Oxford.*

Thousands of COVID-19 'Long-Haulers' Are Still Suffering. Now, There Is Finally Hope

Source: https://www.sciencealert.com/recovery-clinics-for-covid-long-haulers-are-offering-hope-to-those-still-struggling-months-later



Feb 22 – Amy Watson has had a chronic fever for 344 days.
Almost a year after she was diagnosed with COVID-19, the schoolteacher from Portland, Oregon, is still suffering from ongoing symptoms.
Apart from the fever, Watson told Insider that she is still experiencing chronic fatigue, 'brain fog', intense migraines, gastrointestinal issues, and severe body aches.
The 47-year-old, who had no underlying health condition before catching the virus, has also developed tachycardia and says every time she steps under the shower, her heart rate goes over 100 beats per minute.
"It's really challenging. I don't want people to have to know from personal experience what this is like," Watson told Insider.
Watson is among a growing group of COVID's longtime victims, or so-called 'long-haulers', whose bodies have been left debilitated by a virus about which little remains known.

But now, post-recovery clinics specifically catered to long-haulers are opening up across the country and are offering people like Watson some much-needed hope.

Post-COVID clinics offer a "centralized" way to get long-haulers access to care

According to a CDC study published in the summer, around 1 in 3 people with COVID-19 will have symptoms that last longer than the typical two weeks.

The symptoms, which can vary from an ongoing cough to scarred lungs, affect not only people who had to be hospitalized with COVID-19 but also those with milder cases.

Post-COVID care centers aim to bring together a team of experts from a broad range of specialties to address all the wide-ranging issues long-haulers face, based on the disease's latest understanding.

One of the first such clinics was the Mount Sinai Hospital in New York City. It has treated 1,500 people since it opened its doors in May.

Dr. Ruwanthi Titao, a cardiologist who works at the clinic, told Insider: "The purpose of the center was to fill this void of patients looking to seek care, who are feeling frustrated, worried, and concerned that they weren't getting access to the proper care out in the community.

"And this was a nice, centralized way to get them access to care, to get their symptoms documented so that we can start recognizing patterns in terms of disease, and to then refer them to the appropriate specialist to get the proper therapy," she added.

Patients usually have a one-hour long intake appointment to review their medical history before looking at their current coronavirus-induced symptoms.

"From that point, the post COVID office will make appropriate referrals. So that would be, for example, to cardiology, neurology, rehab medicine, or psychiatry," Dr. Titano said.

But treating people with multiple - and often severe - symptoms is challenging for a disease that still lacks long-term research.

Dr. Greg Vanichkachorn, the medical director of Mayo Clinic's Covid Activity Rehabilitation Program (CARP) in Rochester, Minnesota, told Insider that his center is taking a "slow and steady" approach that is based on treatments used before the coronavirus pandemic.

"You know, this is is not the first coronavirus outbreak. We've had SARS and MERS, for example, and already have some research from that time that definitely shows that there was a post-viral syndrome similar to this as well," he said.

"What we have stressed with our patients is helping them adapt and develop what's called a 'Paste' therapy program, where they slowly, with hands-on help, engage in rehabilitation," Dr. Vanichkachorn continued.

"It's all about the slow, consistent activity with small gains."

The therapy often incorporates simple measures, such as encouraging patients to increase their fluid and salt intake or giving them compression socks to help with blood flow.

"And then if we really need to, we can also use medications to help with the symptoms either to bump up the blood pressure if we need to or help with things like rapid heart rate," Dr. Vanichkachorn added.

Dr. Titano from Mount Sinai confirmed that her recovery clinic was taking a similar approach.

"We're fixers and healers, we want to have a clear diagnosis, and we want to fix this. But when there are flares of symptoms, or when there are relapses or setbacks, of course, we take it very much to heart," Dr. Titano said.

But even though Dr. Titano admits that "it's been a very arduous, slow process of improvement," she remains hopeful.

Mental health is a problem too

Clinics, like the one at Mount Sinai, are also giving patients access to social workers or therapists to work through their trauma.

Many long-haulers, especially those who were hospitalized, have been left with depression or, in some cases, post-traumatic stress disorder (PTSD).

This is the case for Heather-Elizabeth Brown, a 36-year-old corporate trainer from Detroit, Michigan, who had to be put on a ventilator in April after coronavirus-induced pneumonia caused her lungs to fail.

Brown, who was in a coma for 31 days, said her experience was "traumatizing".

Shortly after doctors had told her that a ventilator would be the only way they could save her life, Brown had to have a "FaceTime family meeting" to make her decision. Her mother had to take the call from the hospital parking lot.

"I remember I wrote my will on a napkin and put it in one of my boots and made sure to tell the nurses where it was just in case," Brown said. "I just didn't know at that time if I was going to come out alive."

"I have very strong faith. I trust God. But it's one of those things that you don't know. It was just a very big question mark," she added.
Brown is currently doing therapy alongside a range of different treatments.
"I'm just lucky that a lot of my care is under one health system. So at least all of my records are in one place," Brown said.
"But for people who may have other challenges or have different barriers to access, having one center that also provides mental health help is a phenomenal idea. It's like a one-stop-shop," she added.

Long-haulers feel forgotten about

Schoolteacher Watson said that finding treatment for all of her conditions has been frustrating, and she very often feels dismissed by healthcare professionals.
The US is still grappling with tens of thousands of acute COVID-19 cases a day and many states are now turning their focus to administering the vaccines as swiftly as possible. This often means long-haulers are sidelined.
"When we do go to our appointments, doctors tell us they don't feel like our symptoms are severe enough and tell us they're not going to waste their time on us. And that's pretty disconcerting as a patient," Watson continued.
This was part of the reason Watson started one of the largest Facebook support groups for long-haulers.
For Watson, having a program that is specifically tailored to long-haulers would be "life-changing".
"I would personally love to go to one, but sadly there isn't one in my area at the moment. But this is definitely something I am advocating for," she said.
"People just need to understand that we're growing a bit impatient. We would like to get better and get back to our lives and hopefully not have a significant portion of the population disabled by this disease," she added.

COVID-19 Disease Severity May Be Driven by Antibody Responses

Source: https://www.genengnews.com/news/covid-19-disease-severity-may-be-driven-by-antibody-responses/
Feb 22 – COVID-19's wide range of symptoms has been a particularly challenging piece of the disease's puzzle to figure out. For children, the situation is even more complicated as they almost exclusively experience mild or asymptomatic COVID-19. But children who contract COVID-19 are at risk for a rare but serious syndrome called multisystem inflammatory syndrome in children (MIS-C). Severe cases of MIS-C can lead to cardiac disease and ventricular failure and require hospitalization and intense medical support.
In a recent study, researchers identified immune mechanisms that result in these disparate clinical phenotypes in children could provide critical insights into COVID-19 pathogenesis. More specifically, they found specific types of antibodies that may be driving these different responses, including one specific to severe disease in adults and another specific to MIS-C in children.
Their work is published in *Nature Medicine*, in the article, "Humoral signatures of protective and pathological SARS-CoV-2 infection in children."
"We noticed children who developed MIS-C after COVID disease or exposure had high levels of a specific type of antibody called IgG," said Lael Yonker, MD, director of the Massachusetts General Hospital Cystic Fibrosis Center. "Normally, IgG acts to control an infection, but with MIS-C, the IgG is triggering activation of immune cells, which may be driving the severe illness seen in MIS-C."
Specifically, explained Yonker, IgG antibodies interact with cells called macrophages, which live throughout the body's tissues. If there are too many IgG bodies activating these macrophages, this could cause inflammation in many different organs and systems, which is seen in MIS-C. These high levels of IgG antibodies were only found in children who developed MIS-C after contracting or being exposed to COVID-19.
Yonker, a pediatric pulmonologist at Massachusetts General Hospital (MGH) and assistant professor at Harvard Medical School (HMS), runs a biorepository that collects samples from pediatric cystic fibrosis patients. When the pandemic hit, she began to collect samples from children with mild cases of COVID-19. When Yonker and other pediatricians began seeing children hospitalized with what is now called MIS-C, which typically onsets three to six weeks after developing COVID-19, she quickly began collecting those samples too. She wanted to understand how a mild case of COVID-19 could lead to severe MIS-C weeks after recovery.
Seeking a detailed understanding of the immune response, Yonker teamed up with Galit Alter, PhD, professor at HMS and an immunologist in the department of infectious diseases at MGH. Alter's team used her unique "systems serology" technology to carefully perform a detailed comparison of the immune responses in children—17 with MIS-C and 25 with mild COVID-19—to the responses of 26 adults with severe disease and 34 adults with mild disease.
"We were expecting the children's immune responses to look drastically different from the adults', regardless of the severity of disease," said Alter. "But instead, we found that adults with mild COVID-19 and children with COVID-19 had remarkably similar immune responses. It was only the adults with severe COVID-19 whose immune responses looked different."

For adults with severe COVID-19, Alter explained, they saw increased levels of IgA antibodies, which interact with a type of immune cells called neutrophils and cause the neutrophils to release cytokines. If there are too many IgA antibodies, the neutrophils may be pushed to release too many cytokines, which could contribute to a cytokine storm, one of the symptoms of severe COVID-19.
In both cases, the study shows, it may be a high level of a specific type of antibody causing the disease severity. "In MIS-C, high levels of IgG antibodies may be activating macrophages, which can drive inflammation in organs throughout the body," said Yannic Bartsch, PhD, the study's first author and a research fellow at the Ragon Institute. "In adults with severe COVID-19, high levels of IgA antibodies could be driving neutrophils to release too many cytokines, with the potential of causing a cytokine storm."
Identifying the immune mechanisms of multiple, distinct responses to the same virus is the first step to understanding why it mounts different responses in divergent populations. Discovering how the immune system's response shapes the disease and its outcome in both children and adults can help researchers develop treatments that can prevent or modulate the immune response, keeping its protective functions but lessening the unintentional, yet harmful, ones.

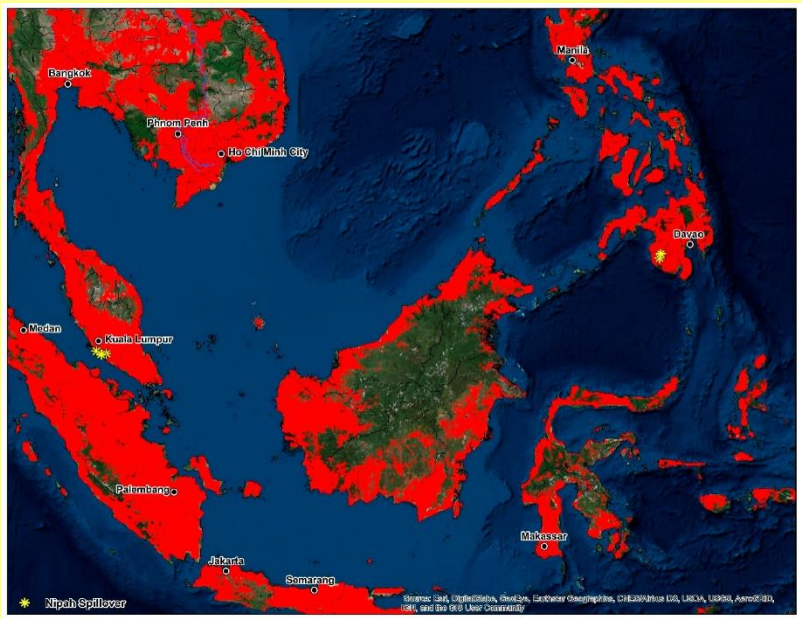
Bird Flu: Russia Detects First Case of H5N8 Bird Flu in Humans

Russian officials said on Saturday that seven workers at a poultry plant in its south had been infected with H5N8 avian influenza virus, in what appears to be the first case of the pathogen being passed from fowl to human. There is no sign of onward human-to-human transmission so far. Siberia's Vector Institute said on Saturday it would start developing human tests and a vaccine against H5N8, RIA news agency reported. BBC News and Reuters

Nipah virus panic: Scientists scramble for vaccine to fight disease - bioterrorism alert

Source: https://www.express.co.uk/news/world/1401055/Nipah-virus-latest-news-scientists-develop-vaccine-disease-bioterrorism-warning-alert

Feb 22 – So far there is no treatment or vaccine to combat the agonising effects of Nipah virus. However, biotech company Moderna is currently using mRNA technology to create a vaccine for the Nipah virus. The mRNA technique has been called advanced "21st-century science" by experts.



This unproven technology, named messenger RNA delivers genetic instructions into the heart of human cells, it is the base process behind the current Moderna and Pfizer coronavirus vaccines.

In mid-January Modern got approval to develop a vaccine for Nipah virus that has occurred in India, Bangladesh, Malaysia, and Singapore.

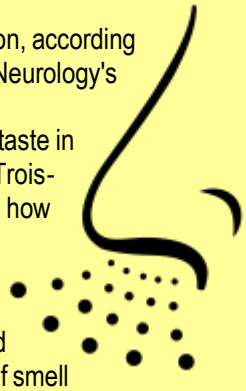
Moderna described the virus as, "a zoonotic virus transmitted to humans from animals, contaminated food, or through direct human-to-human transmission and causes a range of illnesses including fatal encephalitis."
Moderna CEO Stéphane Bancel in a statement made in January said: "The uniquely challenging year of 2020 for all of society proved to be an extraordinary proof-of-concept period for Moderna.
"Even as we have shown that our mRNA-based vaccine can prevent COVID-19, this has encouraged us to pursue more-ambitious development programs within our prophylactic vaccines modality."
Moderna then said that they are currently in Phase 1 clinical trials for a Nipah vaccine program.

The deadly Nipah virus has been listed in the 'C' category of possible bioterrorism agents.

Category C of the US Bioterrorism Agents List contains emerging deadly pathogens that could cause mass panic and illness in the future because of their "potential for high morbidity and mortality rates and major health impact".
Pathogens such as the Nipah virus are included on the list because of their "ease of production and dissemination".
Another infectious disease on the list is hantavirus, which also has a "high mortality (death) and high morbidity (disease)" rate.
The Nipah virus is a deadly virus that can be spread between animals and humans.
This zoonotic pathogen initially caused symptoms like fever, headaches, muscle pain.

Loss of sense of smell and taste may last up to 5 months after COVID-19

Source: https://eurekalert.org/pub_releases/2021-02/aaon-los021821.php



Feb 22 – People with COVID-19 may **lose their sense of smell and taste for up to five months** after infection, according to a preliminary study released today, February 22, 2021, that will be presented at the American Academy of Neurology's 73rd Annual Meeting being held virtually April 17 to 22, 2021.
"While COVID-19 is a new disease, previous research shows that most people lose their sense of smell and taste in early stages of the illness," said study author Johannes Frasnelli, M.D., of the University of Quebec at Trois-Rivieres in Canada. "We wanted to go further and look at how long that loss of smell and taste lingers, and how severe it is in people with COVID-19."
The study involved 813 health care workers who tested positive for COVID-19. Each person completed an online questionnaire and home test to evaluate their sense of taste and smell on average five months after diagnosis. They rated their senses of taste and smell on a scale from 0 to 10. Zero meant no sense at all, and 10 meant a strong sense of taste or smell. Researchers found the average person did not regain their sense of smell entirely.
A total of 580 people lost their sense of smell during the initial illness. Of this group, 297 participants, or 51%, said they still had not regained their sense of smell five months later, while 134 participants, or 17%, had persistent loss of smell when evaluated with the home test. On average, people ranked their sense of smell at a seven out of 10 after the illness, compared with a nine out of 10 before they had gotten sick.
A total of 527 participants lost their sense of taste during the initial illness. Of this group 200 people, or 38%, said they still had not regained their sense of taste five months later, while 73 people, or 9%, had persistent loss of taste when evaluated with the home test. On average, people ranked their sense of taste at an eight out of 10 after the illness, compared with a nine out of 10 before they had gotten sick.
"Our results show that an impaired sense of smell and taste may persist in a number of people with COVID-19," Frasnelli said. "This emphasizes the importance of following up with people who have been infected, and the need for further research to discover the extent of neurological problems associated with COVID-19."
Limitations of the study include the subjective nature of the smell and taste ratings and the single timepoint at which data was collected.

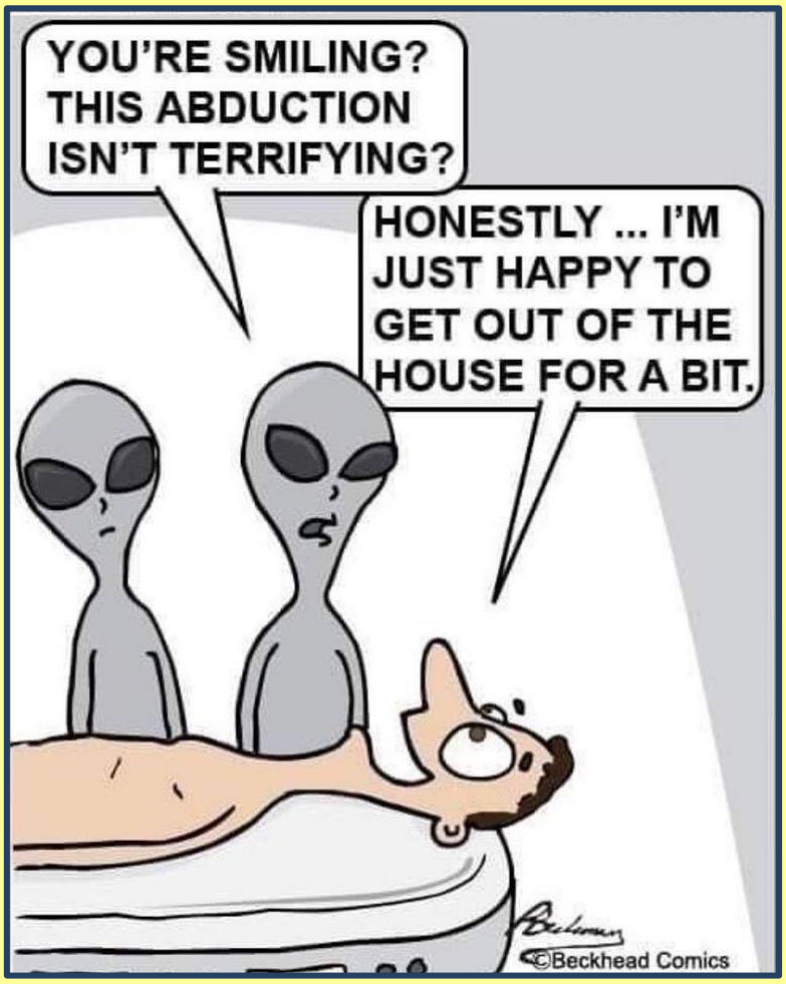
What does 95% COVID-19 vaccine efficacy really mean?

Source: https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00075-X/fulltext

Feb 17 – It is imperative to dispel any ambiguity about how vaccine efficacy shown in trials translates into protecting individuals and populations. The mRNA-based Pfizer[1, 2] and Moderna[3]
vaccines were shown to have 94–95% efficacy in preventing symptomatic COVID-19, calculated as 100 × (1 minus the attack rate with vaccine divided by the attack rate with placebo). It means that in a population such as the one enrolled in the trials, with a cumulated COVID-19 attack rate over a period of 3 months of about 1% without a vaccine, we would expect roughly 0·05% of vaccinated people would get diseased. It does not mean that 95% of people are protected from disease with the vaccine—a general misconception of vaccine protection also found in a *Lancet Infectious Diseases* Editorial.[4]
In the examples used in the Editorial, those protected are those who would have become diseased with COVID-19 had they not been vaccinated. This distinction is all the more important as, although we know the risk reduction achieved by these vaccines under trial conditions, we do not know whether and how it could vary if the vaccines were deployed on populations with different exposures, transmission levels, and attack rates.

Simple mathematics helps. If we vaccinated a population of 100 000 and protected 95% of them, that would leave 5000 individuals diseased over 3 months, which is almost the current overall COVID-19 case rate in the UK. Rather, a 95% vaccine efficacy means that instead of 1000 COVID-19 cases in a population of 100 000 without vaccine (from the placebo arm of the abovementioned trials, approximately 1% would be ill with COVID-19 and 99% would not) we would expect 50 cases (99·95% of the population is disease-free, at least for 3 months).

Accurate description of effects is not hair-splitting; it is much-needed exactness to avoid adding confusion to an extraordinarily complicated and tense scientific and societal debate around COVID-19 vaccines.



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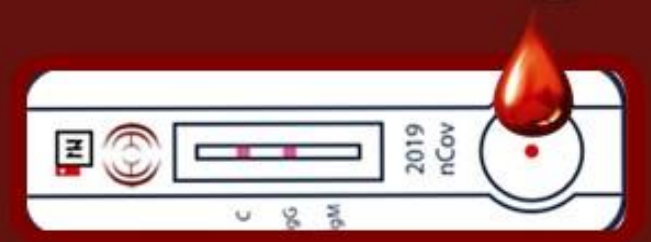

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