01\21

HZS CBRNE DIARY

Dedicated to Global First Responders

January 2021

A HOTZONE SOLUTIONS GROUP PUBLICATION

HZS C²BRNE DIARY– 2021©

January 2021

Website: www.cbrne-terrorism-newsletter.com

Editor-in-Chief

BrigGEN (ret.) Ioannis Galatas MD, MSc, MC (Army)
PhD cand
Consultant in Allergy & Clinical Immunology
Medical/Hospital CBRNE Planner & Instructor
Senior Asymmetric Threats Analyst
Manager, CBRN Knowledge Center @ International CBRNE Institute (BE)
Senior CBRN Consultant @ HotZone Solutions Group (NL)
Athens, **Greece**

Contact e-mail: igalatas@yahoo.com

Editorial Team

- **Bellanca Giada, MD, MSc (Italy)**
- **Hopmeier Michael, BSc/MSc MechEngin (USA)**
- **Kiourktsoglou George, BSc, Dipl, MSc, MBA, PhD (UK)**
- **Photiou Steve, MD, MSc EmDisaster (Italy)**
- **Tarlow Peter, PhD Sociol (USA)**

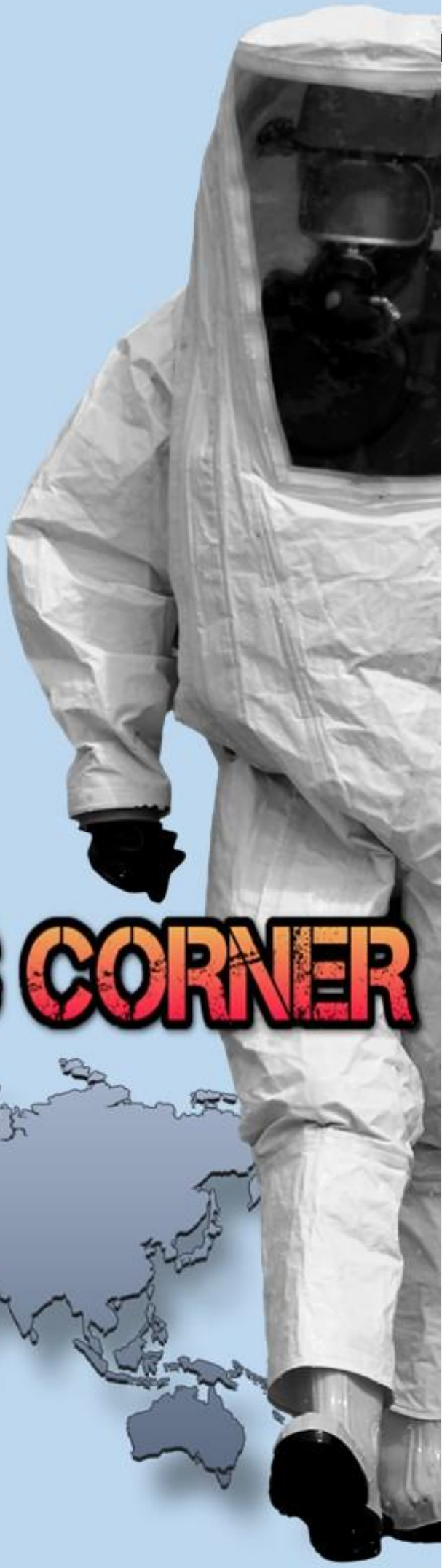
A publication of
HotZone Solutions Group
Prinsessegracht 6, 2514 AN, The Hague,
The Netherlands
T: +31 70 262 97 04,
F: +31 (0) 87 784 68 26
E-mail: info@hotzonesolutions.org

International CBRNE Institute

CBRNE-Terrorism Newsletter

HOTZONE SOLUTIONS GROUP

C2BRNE DIARY



EDITOR'S CORNER


To Nefeli

Editorial

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

Editor-in-Chief
HZS C²BRNE Diary

Dear Colleagues,

New Year, Blank Page?

Unfortunately, not! 2021 comes together with the ongoing pandemic and the struggle to retrieve our lives and return to normal or as close as possible. The unexpected that all hoped never to happen did happened and if one thinks about the consequences it can be said that it could be much worse regarding mortality – not that 1,9mil deaths are not much, but for a disease that is airborne and without a counter drug or vaccine the overall death toll is excusable.

What else comes to the same package? There is no doubt that there is something that should be taken very serously and that is the human behavior during a health emergency. Planners expected that people will cope with rules and restriction and that they would help public health authorities to deal with the problem – together. This is what happened in the beginning of the crisis but during the following months this was turned in a struggle between the people and their government. It was kind of the "resistance" observed during the WWII only that now the *modern guerillas* are the next door citizens that are not fighting for their core values but for things that do not seem so important like holidays, parties, drinks, personal beauty care and training. In parallel, both the people and their governments were not prepared (if this is the proper word) to deal with the financial catastrophe that escorts a pandemic with its lockdowns or quarantines. The latter could be a good excuse for a civic collaboration in the effort to contain the problem but it was not. Minorities here and there triggered behaviors requiring restrictive measures to avoid overspreading. This, together with the involvement of scientists (epidemiologists; infectious diseases specialists; etc.) into politics, created an additional problem difficult to solve. Vaccines were the ultimate hope for the global society but when we manage to have them in an all-time record time we now do not really believe on them and not even front-line health professional are very enthousiastic about them. It would be unfair to say that it is only people who are responsible to this. When something is happening under extreme pressure it is for sure that certain things will not go by the book of perfection especially when comes to adverse effects and duration of effectiveness of vaccination. On top of that is the ever existing problem of politics. Who will make the vaccine first? Which vaccine protects more or for a bigger period of time and alike – stupid things as always. Whatever is "Whestern" is good; whatever is Russian or Chinese is bad – whether it is a missile, a computer, a vaccine or a car. And people have to follow this pattern even if it has to do with their own health and survival. And of course there is the profit issue that it seems that it is above everything in our developed world. Sometimes it crosses my mind that this pandemic was a punishment for our ill behavior and the destruction of mandatory values that there is no point to mention since they would look like a Klingon language.

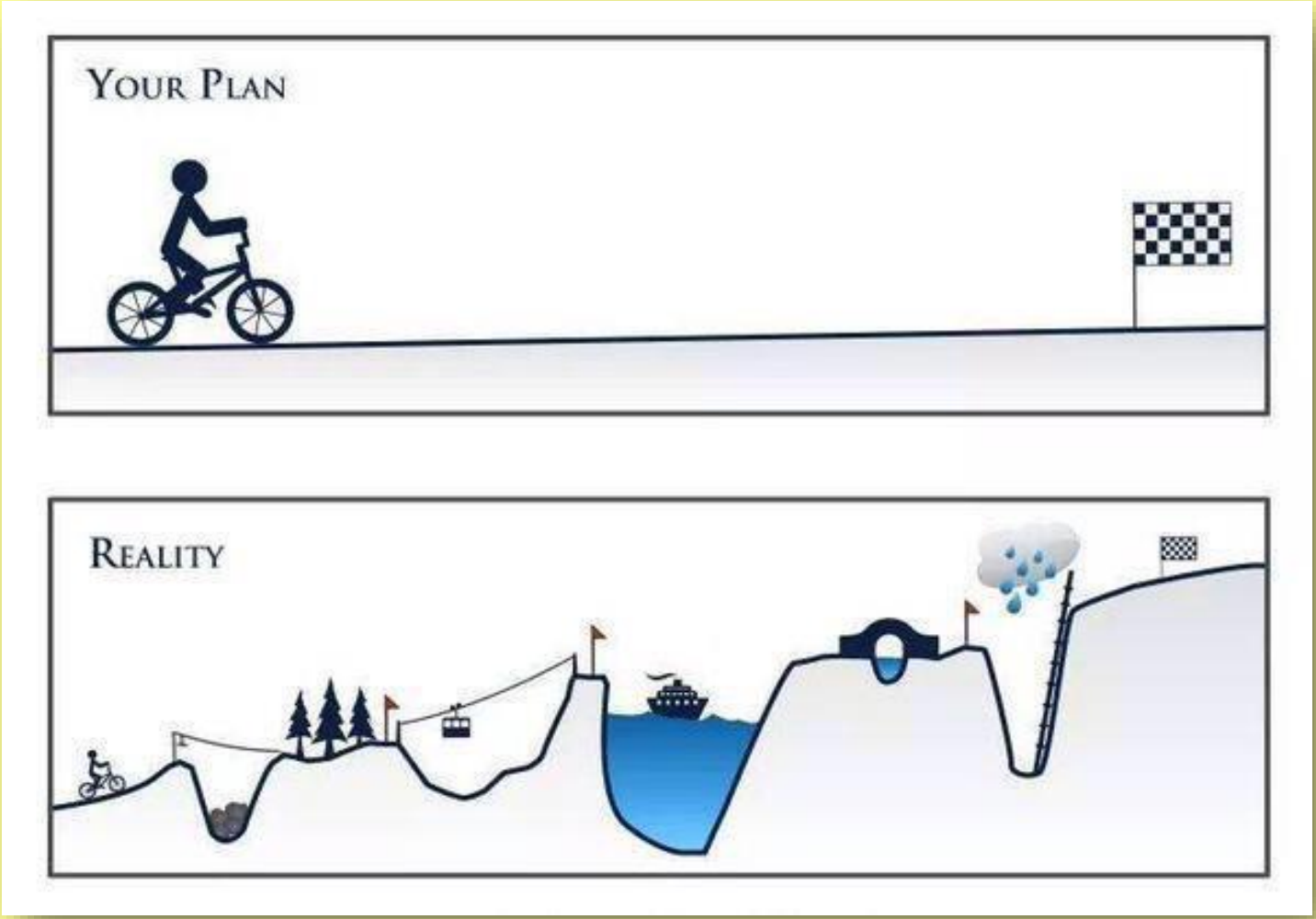
When we will return to normal? Most probably around mid 2022. And how long it will take to reach the 2019 financial level? I cannot answer to this – not my field. I estimate around 2027. Do whatever it takes to survive and adjust to new norms. Unless something new happens. Equal or worse to what we experience now. They call it Pandemic X. It could be something nuclear as well – yes we have enough nukes to lighten the universe with a spectacular blast. In addition, keep in mind that in troubled times there are always those that would take advantage of the situation for their own goals and endeavors. Turkey is a fine example: the vision of a modern Othoman Empire; the vision of an Islamic NATO equivalent; the aquirement of nuclear weapons via peaceful uses of atomic energy; the revenge against European resistance to the Muslim way of life are all constituents that can make an explosive recipe. Somebody has to do something about this but I am afraid that it would be Greece that will do it – not because it is strong enough or favors an offensive policy but because usually there is somebody who sucrifices a hand in order to take the snake out of the hole. And when you do that there are no friends or allies. It is just you and your own two hands! Hope it will never happen. Hope the snake will not underestimate the Greeks.

On the other side of the

ocean, fellow Americans suffer their own Golgotha with their presidential elections and democratic change of rulers. The myth was busted and the bubble was ruptored out loud. The voting system became the Achilles tendon of the nation and it makes you wonder how come 331 million Americans cannot elect a suitable person for President. I have to read again the study entitled "Why clevel people are not involved in politics".

Would 2021 be an interesting year after all? For sure it will not be a pleasant year. It is up to the people to change the route of the planet and a good opportunity to focus on important issues and values. Sometimes, people of my age tend to forget that there is continuity in life and that there are new generations that will follow and continue to follow no matter what we do to make this harder. I think we deserve to be remembered as those who fought a pandemic and won the the battles and the WWIII. This is where First Responders will play a crucial role and this is why preparedness is more important than ever before. Be alert! Be safe!

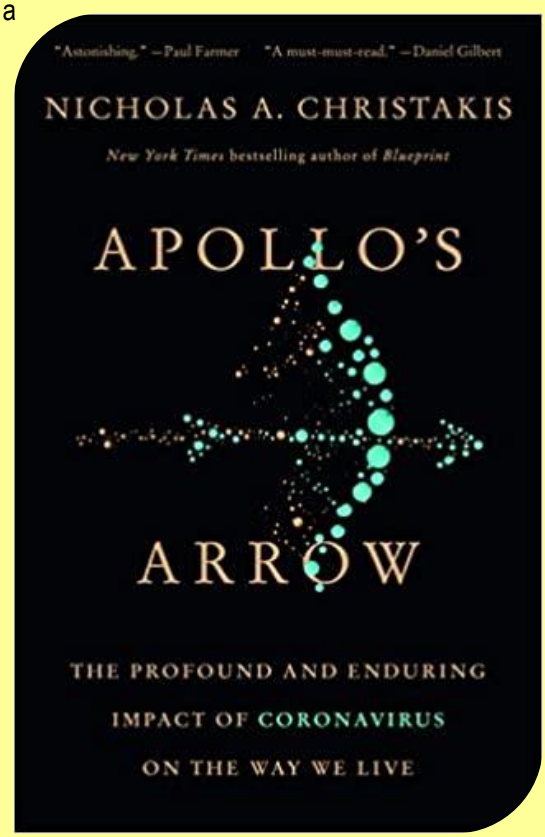
The Editor-in-Chief



Nicholas Christakis — Apollo's Arrow: The Profound and Enduring Impact of Coronavirus on the Way We Live

Source [video]: https://www.skeptic.com/science-salon/nicholas-christakis-apollos-arrow-profound-enduring-impact-of-coronavirus-on-the-way-we-live/

Apollo's Arrow offers a riveting account of the impact of the coronavirus pandemic as it swept through American society in 2020, and of how the recovery will unfold in the coming years. Drawing on momentous (yet dimly remembered) historical epidemics, contemporary analyses, and cutting-edge research from a range of scientific disciplines, bestselling author, physician, sociologist, and public health expert Nicholas A. Christakis explores what it means to live in a time of plague — an experience that is paradoxically uncommon to the vast majority of humans who are alive, yet deeply fundamental to our species. Featuring new, provocative arguments and vivid examples ranging across medicine, history, sociology, epidemiology, data science, and genetics, *Apollo's Arrow* envisions what happens when the great force of a deadly germ meets the enduring reality of our evolved social nature.



Shermer and Christakis discuss:

- the replication crisis in social science and medicine,
- determining causality in science and medicine,
- how we know smoking causes cancer and HIV causes AIDS, but vaccines do not cause autism and cell phones do not cause cancer,
- randomized controlled trials and why they can't be done to answer many medical questions,
- natural experiments and the comparative method of testing hypotheses (e.g., comparing different countries differing responses to Covid-19),
- the hindsight bias and the curse of knowledge in judging responses to pandemics after the fact,
- looking back to January 2020, what should we have done?
- comparing Covid-19 to the Black Death, the Spanish Flu, and other pandemics,
- bacteria vs. viruses, coronaviruses and their effects, and why viruses are so much harder to treat than bacteria,
- Bill Gates' TED talk warning in 2015 and why we didn't heed it,
- treatments: hydroxychloroquine, remdesivir, Vitamin D.

How civilization will change:

- medical: coronavirus is here to stay — herd immunity naturally and through vaccines,
- personal and public health: handshakes, hugs, and other human contact; masks, social distancing, hygiene,
- long run healthier society (e.g., body temperatures have decreased from 98.6 to 97.9),
- economics and business,
- travel, conferences, meetings,
- marriage, dating, sex, and home life,
- entertainment, vacations, bars, and restaurants,
- education and schools,
- politics and society (and a better understanding of freedom and why it is restricted),
- from pandemic to endemic.

Nicholas A. Christakis *is a physician and sociologist who explores the ancient origins and modern implications of human nature. He directs the Human Nature Lab at Yale University, where he is the Sterling Professor of Social and Natural Science, in the Departments of Sociology, Medicine, Ecology and Evolutionary Biology, Statistics and Data Science, and Biomedical Engineering. He is the Co-Director of the Yale Institute for Network Science, the co-author of Connected, and the author of Blueprint.*

Adelaide airport, Australia – July 2020

V-Dem INSTITUTE

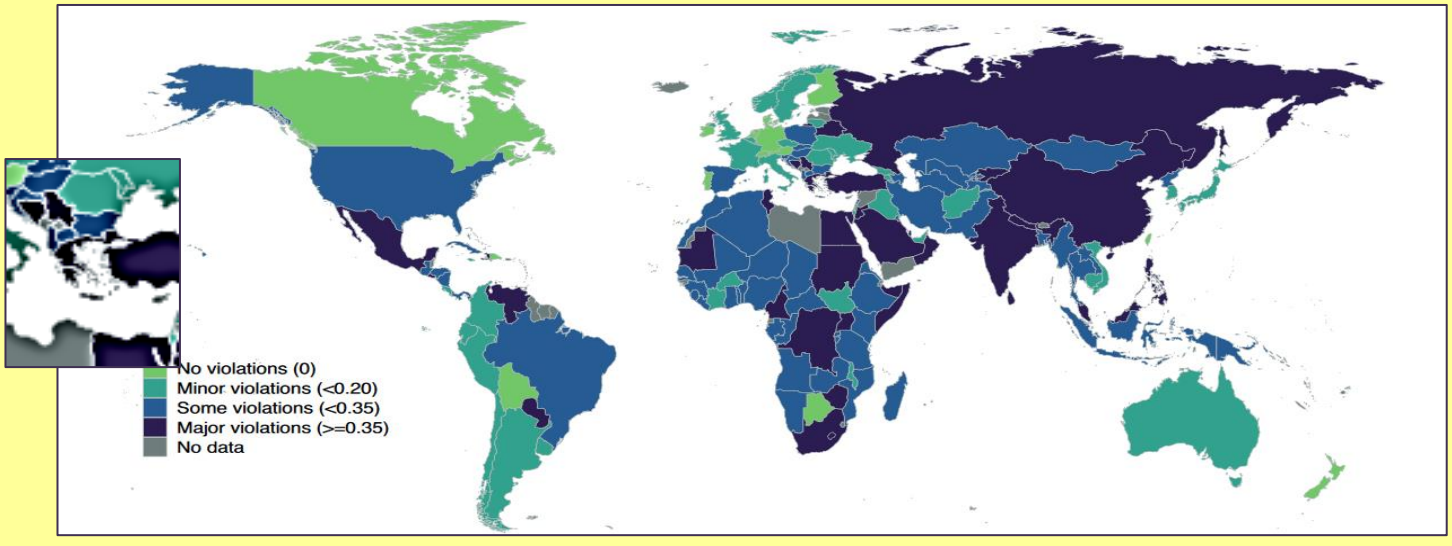
POLICY BRIEF

No. #26, 14 December 2020. Palina Kolvani, Shreeya Pillai, Amanda B. Edgell, Sandra Grahn, Stefanie Kaiser, Jean Lachapelle and Anna Lührmann[1]

Pandemic Backsliding: Democracy Nine Months into the Covid-19 Pandemic

Source: https://www.v-dem.net/media/filer_public/13/1a/131a6ef5-4602-4746-a907-8f549a5518b2/v-dem_policybrief-26_201214_v31.pdf

As another wave of Covid-19 tests the healthcare systems in many countries, renewed government responses to the pandemic appear to be more in line with democratic standards for emergency measures than those taken during the first wave of the pandemic. Since the beginning of the pandemic, the Gothenburg-based V-Dem Institute has tracked violations of democratic standards in relation to Covid-19 measures in 144 countries.



Pandemic violations of democratic standards index (March to December 2020)

EDITOR'S COMMENT: It is strange than the only reference to Greece in this document has to do with illegal immigrants with a reference from Amnesty International based mainly on NGOs' reports.

The latest update in mid-December 2020 shows somewhat encouraging developments. The situation has improved over the last three months for more than a quarter of the countries (26) that had engaged in at least some violations of democratic standards at the beginning of the pandemic. This is a continuation of the positive trend we reported in the third quarter
In the fourth quarter of 2020, some or major violations of democratic standards persisted in 69 countries, most of which were already autocratic before the pandemic.

Terrorist Groups Using COVID-19 to Reinforce Power and Influence: INTERPOL

Source: http://www.homelandsecuritynewswire.com/dr20201223-terrorist-groups-using-covid19-to-reinforce-power-and-influence-interpol

Dec 23 – The impact of COVID-19 on global terrorism, trends and potential risks related to attacks on vulnerable targets and bioterrorism is the focus of a new report issued by INTERPOL.
The assessment, which is for law enforcement use only, takes into consideration the following five main threat factors:

- COVID-19 outbreak characteristics and medical advances
- Global or national response
- Social climate
- Resilience of the security apparatus
- Strategies and capabilities of terrorists and other non-state actors (NSAs)

As COVID-19 cases subside in some regions and surge in others, the report underlines the critical need to monitor the reaction and response by terrorist networks, violent extremist groups, and other potentially dangerous NSAs.

Economic impact

Early in the pandemic, certain terrorist groups and other NSAs used the pandemic to reinforce their power and influence, particularly among local populations, or to expand their external financial resources. The report also highlights how the impact of COVID-19 on the global economy is likely to indirectly affect funding available to terrorist organizations.
"Our terrorism assessment report is another tool to help law enforcement identify and address these evolving threats, in what continue to be challenging circumstances," added Secretary General Stock.
The use of disinformation and conspiracy theories also appears as a common denominator across all idealistic spectrums, and as an indicator of prevailing threats against priority targets.

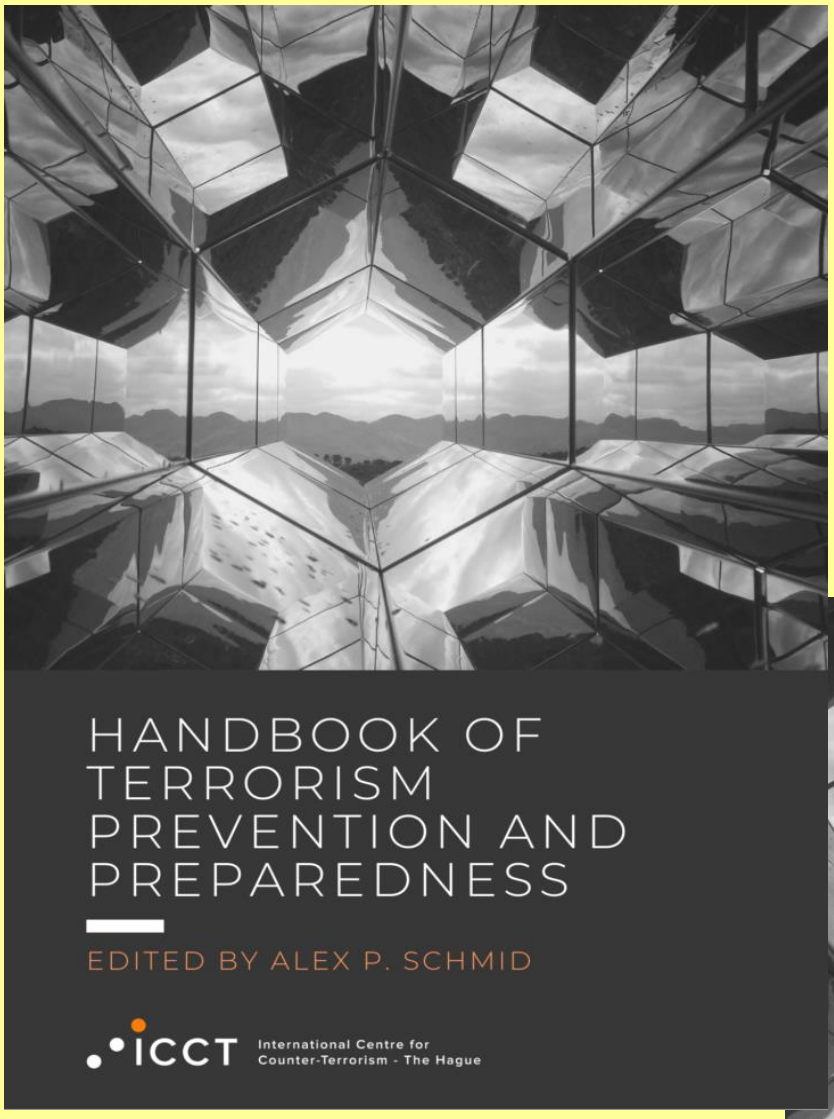
Exploiting divisions

The presence of far-right supporters in anti-COVID-19 activities in a growing number of western countries illustrates attempts to use the pandemic to exploit divisions. Law enforcement will continue to face attempts by far-right violent extremists to radicalize social movements, such as clashing with far-left groups and/or provoking the use of force.
Member countries are encouraged to exchange and crosscheck information related to individuals and groups using COVID-19 conspiracy theories to call and plan for violent acts. Coordinated and consistent use of INTERPOL Notices remain key to anticipate threats resulting from the direct and indirect impact of the pandemic.
The INTERPOL report also underscores how the recurring reinstatement of restrictive measures is likely to sustain a degree of civil unrest as well as impact on the choice of timing and targets for terrorist acts.
The report includes recommendations and early-warning signs for the global law enforcement community to monitor in addressing these threats.

Handbook of Terrorism Prevention and Preparedness

Source: https://icct.nl/handbook-of-terrorism-prevention-and-preparedness/

Edited by Prof em. Alex P. Schmid and featuring contributions from leading experts in the field, this ambitious joint project aims to be an authoritative resource on counter-terrorism.
The Handbook consists of five parts. New chapters will be released on a weekly basis. To receive a monthly update on chapter releases, **subscribe here**.



Introduction: Terrorism Prevention and Preparedness

Front Matter

This section contains the book's copyright information, table of contents, list of contributors, list of abbreviations, acknowledgements and a foreword by ICCT Director Alexander von Rosenbach.

Download

Edition 1st Edition
First Published 2020
Publication Location The Hague
Imprint ICCT Press
DOI 10.19165/2020.6.01
ISBN 9789090339771

Chapter 1: Introduction: Purpose and Organization of the Handbook

Chapter 2: Terrorism Prevention: Conceptual Issues (Definitions, Typologies and Theories)

Part I: Lessons for Terrorism Prevention from Literature in Related Fields

Chapter 3: A Criminological Approach to Preventing Terrorism: Situational Crime Prevention and the Crime Prevention Literature

Chapter 4: De-Exceptionalizing the Terrorist Phenomenon: Lessons and Concepts from Conflict Prevention and Transformation

Chapter 5: Contributions from the Military Counterinsurgency Literature for the Prevention of Terrorism

Chapter 6: 'Killing Them to Save Us': Lessons from Politicide for Preventing and Countering Terrorism

ICCT International Centre for Counter-Terrorism - The Hague

Part II: Prevention of Radicalisation

Chapter 7: At the Crossroads: Rethinking the Role of Education in Preventing and Countering Violent Extremism
Chapter 8: Prevention of Radicalization to Terrorism in Prisons: A Practical Guide
Chapter 9: Prevention of Radicalization to Terrorism in Refugee Camps and Asylum Centers
Chapter 10: Preventing Terrorism from Students of Extremist Madrasahs: An Overview of Pakistan's Efforts
Chapter 11: Prevention of Radicalization in Western Muslim Diasporas
Chapter 12: Prevention of Radicalization on Social Media and the Internet
Chapter 13: Prevention of Recruitment to Terrorism

Part III: Prevention of Preparatory Acts

Chapter 14: Prevention of Terrorist Financing
Chapter 15: Prevention of Cross-Border Movements of Terrorists: Operational, Political, Institutional and Strategic Challenges for National and Regional Border Controls
Chapter 16: Prevention of the Procurement of Arms and Explosives by Terrorists
Chapter 17: Prevention of CBRN Materials and Substances Getting into Terrorist Hands
by Ioannis Galatas
Chapter forthcoming
Chapter 18: Prevention of (Ab-) Use of Mass Media by Terrorists
Chapter 19: Prevention of (Ab-)Use of the Internet for Terrorist Plotting and Related Purposes
Chapter 20: The Role of Intelligence in the Prevention of Terrorism (Early Warning – Early Response)

Part IV: Prevention of, and Preparedness for, Terrorist Attacks

Chapter 21: Prevention of Low-tech, Lone Actor Terrorist Attacks: The Case of the United States, 1970s - 2019
Chapter 22: Prevention of Gun-, Knife-, Bomb- and Arson-based Killings by Single Terrorists
Chapter 23: Prevention of Bomb Attacks by Terrorists in Urban Settings (with a focus on Improvised Explosive Devices)
Chapter 24: Prevention of Kidnappings and Hostage-Takings by Terrorists
Chapter 25: Preventing Suicide Attacks by Terrorists
Chapter 26: The Terrorist Threat to Transportation Targets and its Prevention
Chapter 27: Layers of Preventive Measures for Soft Target Protection Against Terrorist Attacks
Chapter 28: Prevention of Terrorist Attacks on Critical Infrastructure
Chapter 29: Cyber Attacks by Terrorists and Other Malevolent Actors: Prevention and Preparedness. With Three Case Studies on Estonia, Singapore and the United States
Chapter 30: Prevention of Lasting Traumatization in Direct and Indirect Victims of Terrorism

Part V: Preparedness and Consequence Management

Chapter 31: Prevention of Public Panic in the Wake of Terrorist Incidents
Chapter 32: Prevention of Major Economic Disruptions Following Acts of Terrorism – The Case of the Bali Bombings of 2002 and 2005
Chapter 33: Prevention of Revenge Acts and Vigilantism in Response to Acts and Campaigns of Terrorism
Chapter 34: Prevention of Human Rights Violations and Violations of International Humanitarian Law while Fighting Terrorism

Conclusions

Chapter 35: Terrorism Prevention and Preparedness – An Agenda for Action
General Bibliography on Terrorism Prevention and Preparedness

▶▶ NOTE: You can download Chapters 1 to 10. Stay tuned for the rest of chapters!

Are you

ready for

Pandemic X?

The year Europe woke up to its Islamist problem

By Rakib Ehsan

Source: https://www.spiked-online.com/2020/12/26/the-year-europe-woke-up-to-its-islamist-problem/

Dec 26 – 2020 will be primarily remembered for the Covid-19 pandemic. But while most have looked on this crisis with great worry, there are a number of radical Islamist ideologues who treated the pandemic as a golden opportunity to wreak terror and havoc.

In the earlier stages of the pandemic, terrorist organisations such as Islamic State were revving up their jihadists. According to this bloodthirsty death cult, the pandemic offered the perfect conditions to pounce and unleash deadly acts of terror in the Western world. In an editorial produced in its weekly newspaper, *Al-Naba*, titled 'The Crusaders' Worst Nightmare', ISIS members were encouraged to step up their efforts and to exploit the West's preoccupation with Covid. With security services and national armies 'stretched' to help government efforts to tackle outbreaks, Western countries were perceived to be 'restricted' in terms of fighting jihadists abroad – presenting a golden opportunity for them to 'strike'.

Lo and behold, Europe was indeed struck by a spate of Islamist terrorist attacks, particularly in the autumn. On 4 October, a man was stabbed to death in an Islamist terrorist attack in the German city of Dresden. The alleged perpetrator, a 20-year-old Syrian national, arrived in Germany in 2015 to seek asylum. He was previously investigated after he was suspected of plotting a terrorist attack. He had known links with Islamic State as well as an extensive criminal record.

On 16 October, schoolteacher Samuel Paty was decapitated on a quiet street on the outskirts of Paris by an Islamist terrorist after showing pictures of the Prophet Muhammad during a civics class on freedom of expression. The perpetrator, Abdoullakh Anzorov, an 18-year-old, Chechen-origin refugee, referenced Islamic State in a post-attack social-media post. Near the end of October, the French city of Nice was struck by an Islamist terror attack in which three people were stabbed to death. The alleged perpetrator, 21-year-old Tunisian national Brahim Aouissaoui, entered Europe in late September via the Italian island of Lampedusa.

On 2 November, Austria's capital city, Vienna, was rocked by a string of Islamist attacks in which four people were killed and 22 injured. Kujtim Fejzullai was given a 22-month prison sentence in April 2019 for attempting to join Islamic State jihadists in Syria. However, he was paroled eight months into his sentence. Before unleashing his deadly act of terror, Fejzullai is said to have participated in a 'deradicalisation' scheme supported by the European Union (the DERAD project). Austria's interior minister, Karl Nehammer, went as far as to say that Fejzullai had 'fooled' de-radicalisation practitioners into believing that he had detached himself from his extremist Islamist views. Ultimately, he tricked the authorities into facilitating his premature release from prison. Before carrying out the attack, Fejzullai pledged allegiance to Islamic State on Instagram, under the name Abu Dujana al-Albani.

After repeated system failures, it appears that some of Europe's politicians have woken up to the dangers posed by the Islamist political project on the continent. French president Emmanuel Macron has unveiled a number of measures to tackle 'Islamist separatism'. The French government will closely monitor social associations so they do not regress into extremist hubs, improve

oversight of the financing of mosques, bring the importation of foreign imams to an end, and place restrictions on home-schooling. Reacting to the Vienna attacks, Austrian chancellor Sebastian Kurz urged the European Union to 'focus much more strongly on the problem of political Islam in the future'. Former president of the European Parliament Antonio Tajani repeated his call for the creation of a European FBI to help coordinate the work of police and intelligence services against Islamist extremism. His compatriot, Italian foreign minister Luigi Di Maio, called for an 'EU Patriot Act', mimicking the US surveillance powers established in the aftermath of 9/11.

For years, European liberal elites have overestimated the willingness of newcomers from unstable Muslim-majority societies to integrate into European liberal democracy. And they have underestimated the potentially devastating effects of failed social and cultural integration. Islamist extremism is a poison which has now taken root in much of Europe, posing a fundamental threat to the rule of law, basic liberal freedoms and broader social stability.

But the tide is turning. Soft liberalism is increasingly being sidelined in favour of political assertiveness. Make no mistake – 2020 was a turning point.

***Dr Rakib Ehsan** is a research fellow at the Henry Jackson Society.*

Ethics in Special Operations and the Joint Special Operations Forces Senior Enlisted Academy

By Joseph E. Long, Kari A. Thyne, Christopher D. Hughes, and Wojciech Labuz

Source: https://smallwarsjournal.com/jrnl/art/ethics-special-operations-and-joint-special-operations-forces-senior-enlisted-academy

Dec 25 – The emerging global environment marked by the competing interests of current and emerging great powers has enmeshed American foreign policy and strategic military preparations in understanding the 21st century's new "converging, trans-regional compound security dilemmas" (Wilson III, 2020, p. 3). This compound security dilemma combines the Joint Special Operations Forces' (SOF) decades-long imperatives to counter violent extremist organizations (CVEO) and counter weapons of mass destruction (CWMD), all within the global framework of "rising competition with China and Russia, under conditions of eroding US relative military advantage" (p. 3). To confront these challenges, SOF must reimagine ethical decision-making as a foundational aspect of leadership and leader development in the context of the future SOF environment.

As discussed in recent Joint Special Operations University (JSOU)-sponsored forums on JSOU Next, the strategic need for American SOF to build micro-level relationships in highly complex, increasingly diverse and remote, potentially hostile environments within developing states and often tribal societies has never been more critical. In developing this new way of thinking about the strategic importance of relational leadership in SOF formations, the Joint Special Operations Forces Senior Enlisted Academy (JSOFSEA) is increasingly recognizing that the emerging concepts of *guerrilla leadership* and the *guerrilla-leader identity* characterize the SOF-distinct-and-SOF-peculiar nature of the future global environment (Long, 2017, 2019; Long & Walton, 2019).

Introduction

The emerging global environment marked by the competing interests of current and emerging great powers has enmeshed American foreign policy and strategic military preparations in understanding the 21st century's new "converging, trans-regional compound security dilemmas" (Wilson III, 2020, p. 3). This compound security dilemma combines the Joint Special Operations Forces' (SOF) decades-long imperatives to counter violent extremist organizations (CVEO) and counter weapons of mass destruction (CWMD), all within the global framework of "rising competition with China and Russia, under conditions of eroding US relative military advantage" (p. 3). To confront these challenges, SOF must reimagine ethical decision-making as a foundational aspect of leadership and leader development in the context of the future SOF environment.

As discussed in recent Joint Special Operations University (JSOU)-sponsored forums on JSOU Next, the strategic need for American SOF to build micro-level relationships in highly complex, increasingly diverse and remote, potentially hostile environments within developing states and often tribal societies has never been more critical. In developing this new way of thinking about the strategic importance of relational leadership in SOF formations, the Joint Special Operations Forces Senior Enlisted Academy (JSOFSEA) is increasingly recognizing that the emerging concepts of *guerrilla leadership* and the *guerrilla-leader identity* characterize the SOF-distinct-and-SOF-peculiar nature of the future global environment (Long, 2017, 2019; Long & Walton, 2019).

In preparing the Joint SOF senior enlisted community for understanding leadership in the future SOF environment, JSFOSEA recognized that traditional professional military

education (PME) inadequately addresses the skills required for gaining the competitive edge needed to analyze, interpret, and act decisively and effectively in the increasing ambiguity of the future SOF environment. JSOFSEA has reimagined ethical decision-making and leadership development in a way that arms SOF leaders with new and innovative approaches to leading SOF units and partner forces. As such, JSOFSEA is building on the academic concepts of relational and *guerrilla leadership* studies in the development of the newly designed "Leader-Shift" program. This innovative concept is specifically designed to foster the next generation of ethically minded Highly Educated, Hyper-Enabled, Responsible Operators (HE²RO).

Re-Imagining Ethical Decision-Making and SOF Leadership Development

This new JSOFSEA leadership development curriculum empowers the next-generation SOF HE² RO as a program that teaches enlisted team members how to capitalize on their personal individual leadership experiences while providing advanced, ethically grounded leadership education designed to develop SOF's senior enlisted leaders as highly effective organizational leaders. Within this academic area, SOF enlisted leaders research the essential concepts of proven leadership theories, apply the proven SOF Leadership Competency Model (LCM), complete personalized evaluations of leadership traits, and discuss executive leadership considerations centered around tenets of (a) organizational change and (b) management and conflict resolution. Simultaneously, they focus their research and study on creating a culture of shared responsibility and commitment grounded in ethical behavior.

As indicated by the future SOF environment, ethical awareness by enlisted leaders and ethical decision-making in complex SOF operational engagements remains increasingly vital to how operational units frame the quality of their leaders and how their actions and behaviors impact mission effectiveness. For JSOFSEA educators, "humans are more important than hardware" is a bedrock truth of the SOF community and the driving force behind deliberate educational investment in SOF operators. This multi-dimensional approach to creating leaders with values and behaviors will synergistically develop and strengthen SOF's unique organizational culture.

Ethical Decision-Making in SOF

A key aspect of organizational culture is that it guides individuals when faced with ethical dilemmas, making ethical decision-making the glue that holds mission success and SOF operational culture together. Specifically, ethical decision-making has become increasingly relevant in the modern Joint SOF world where Senior Enlisted Leaders (SELs) remain the key to building relationships and enhancing the survivability of the Special Operators who deploy alone or in small teams, across and within the hazards of the developing world. As the 2017 ambush of American Green Berets in Niger reminds us, SOF operators are in harm's way wherever they go. Therefore, when the ethical concerns of SOF units' conflict with the distinct needs of micro-level partner forces, risks to mission and risks to force can skyrocket.

Understanding the nuances of ethical decision-making in the future SOF environment requires that SOF operators receive an increasingly realistic and deliberate ethics education underwritten by a thorough understanding of both human nature and the realities of the complex challenges found in SOF operating environments. Only an ethical education tailored for SOF leaders, operators, and operational teams remains sufficient for developing SELs capable of maximizing the physical and mental strength and resilience of the modern SOF cross-functional team. JSOFSEA recognizes this reality with a redesigned curriculum that emphasizes the reality that ethically capable problem-solvers are key to forming trustworthy and empowered teams that sharpen SOF's competitive edge in environments where small, decentralized teams operate alone and far from support, in dangerous environments, often dependent on partner forces for survival.

The JSOFSEA ethical decision-making program builds on a thorough review of traditional ethical theory combined with a SOF-specifical viewpoint expressed as the Six SOF Ethical Truths (Thyne & Long, 2020). This ethical framework sets the parameters for the redesigned ethics portion of the Leader-Shift curriculum and focuses on the broader demands of the environments in which SOF teams operate:

> #1: Individual moral character is neither inherent nor fixed. Ethical decision-making requires continuing education for even the most experienced SOF operators. Members of SOF units who cannot be shaped by education and experience must be removed from SOF formations because SOF environments, like other respected professions, invite moral drift. This is particularly true if operators are not prepared to deal with the complexities of SOF environments ahead of time.
>
> #2: SOF does a great job of selecting and training the right people. Despite rigorous selection and training programs, SOF operators will be morally challenged when they are least prepared to deal with it. Ethical problem-solving skills must be

developed and strengthened. Education provides the opportunity for slow thinking that builds the intellectual arsenal operators will draw upon in situations where there is only time for fast thinking.

#3. SOF ethical decision-making must be developed with honest and frank consideration for the harsh realities of SOF environments and operational requirements. SOF units must see the world for the way it is, not for how they might want it to be. In addition, a better understanding of human nature will ensure SOF sees both its strengths and weaknesses clearly.

#4. Binary ethical codes do not provide sufficient guidance in SOF environments. In fact, strict adherence to binary ethical codes, which are characteristically black-and-white, can be harmful in some SOF environments. They encourage oversimplification when what is critical is obscured by complexity.

#5. SOF leaders should not be naïve or insensitive to human behavior and must recognize that people are not as ethical as they think they are. SOF operators need training to close the gap between the expectation and reality of what they must do and must endure. Leaders at all levels should not expect others to adhere to standards they were unable or unwilling to maintain.

#6. SOF culture must be an environment where conversations about ethical decisions, good and bad, are a natural occurrence. Since JSOFSEA recognizes that conversation is education, asking one another questions, sharing experiences, and developing possible solutions becomes a practical exercise in building moral fitness within each other. Moral fitness is essential when lives are at stake, and intellectual overmatch defines operational success.

Operationalizing SOF Ethical Decision-Making

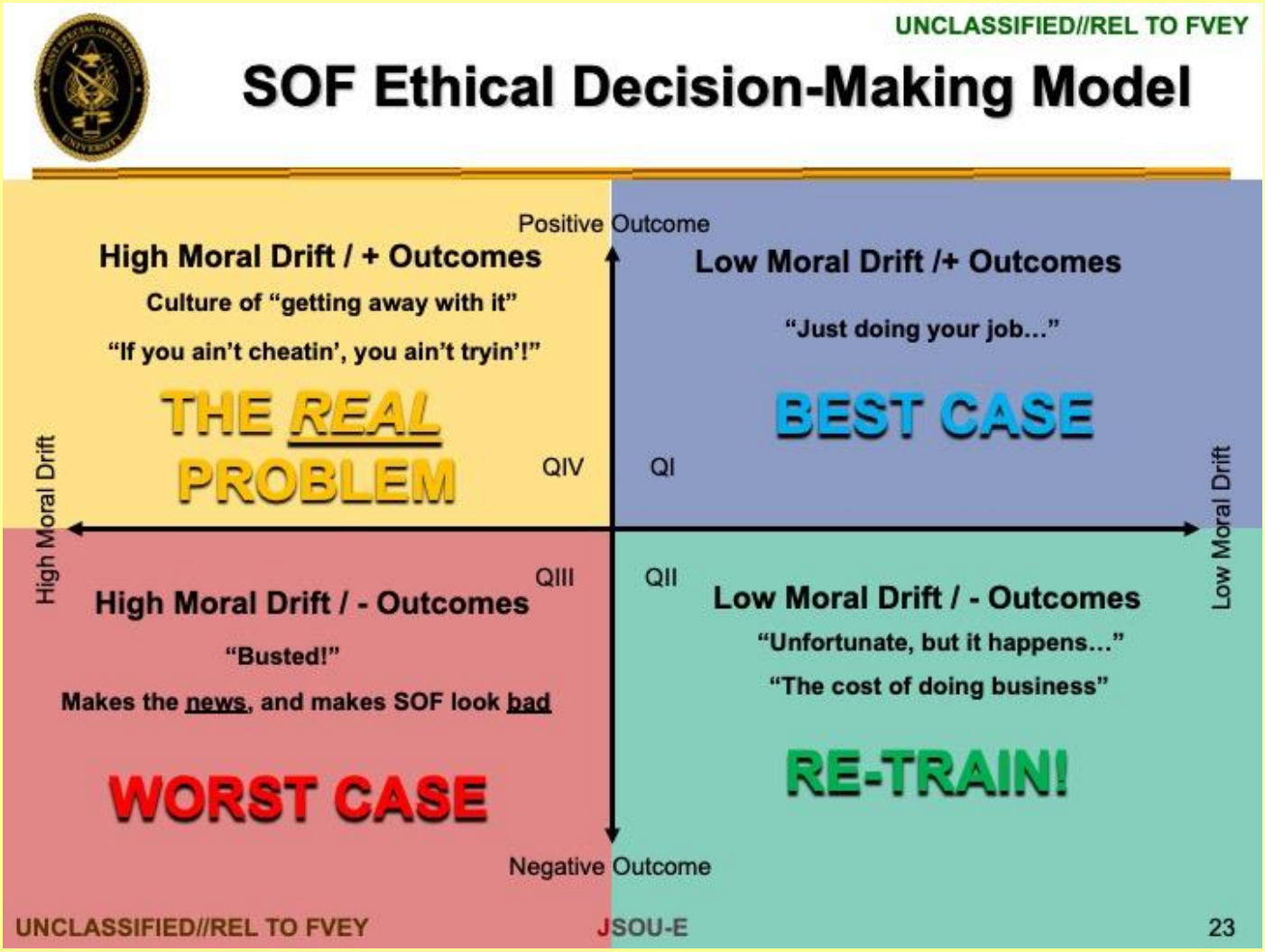
The JSOFSEA Leader-Shift approach to understanding the *guerrilla-leader identity* necessary for leading in the future SOF environment builds explicitly on the Six SOF Ethical Truths as well as a detailed understanding of human behavior, moral drift, and moral injury. By recognizing that human beings are all susceptible to moral drift and that moral drift often leads to moral injury, the ethical component of the *guerrilla leader theory* captured in the JSOFSEA Leader-Shift program recognizes the leader's responsibility to operationalize the logic of ethical decision-making and take active steps to reverse the effects of moral drift.

As a fundamental aspect of human dynamics, moral drift can be imagined as a concept similar to mission creep. As such, moral drift is the gradual decline in how people consider ethical behavior that often occurs with individuals and within groups, often resulting from the pressures of organizational cultures (Junegi, 2015). When people experience moral drift or observe moral drift in others, they often remain unaware, although people most often drift for the worse, not the better. Because inattention often goes hand in hand with moral drift, people and organizations only realize it after the long-term effects of moral drift have become observable and, in many cases, the person or organization will have completely lost all original bearings and resort to rationalization (Sternberg, 2012). When this happens, a significant event often shines a light on moral drift, leaving people and organizations shocked by the moral misbehavior of others, or the absence of shock serves as a reminder that the organization may have also drifted right alongside them.

Moral drift left unchecked typically leads to moral misconduct, which is causal to moral injury. Although there are nuances to defining moral injury, a summary definition is a “violation of confidence in one's moral behavior or in expectations that others will behave in a just and ethical manner” (Litz et al., 2009). Moral injury manifests as profound emotional guilt and shame, and in some cases, also a sense of betrayal, anger, and profound moral disorientation. Given the complexity of ethical decision-making in SOF operational environments and the insufficiency of guidance in current ethical models, SOF units must find pragmatic anchors to improve ethical decision-making.

Countering Moral Drift in SOF

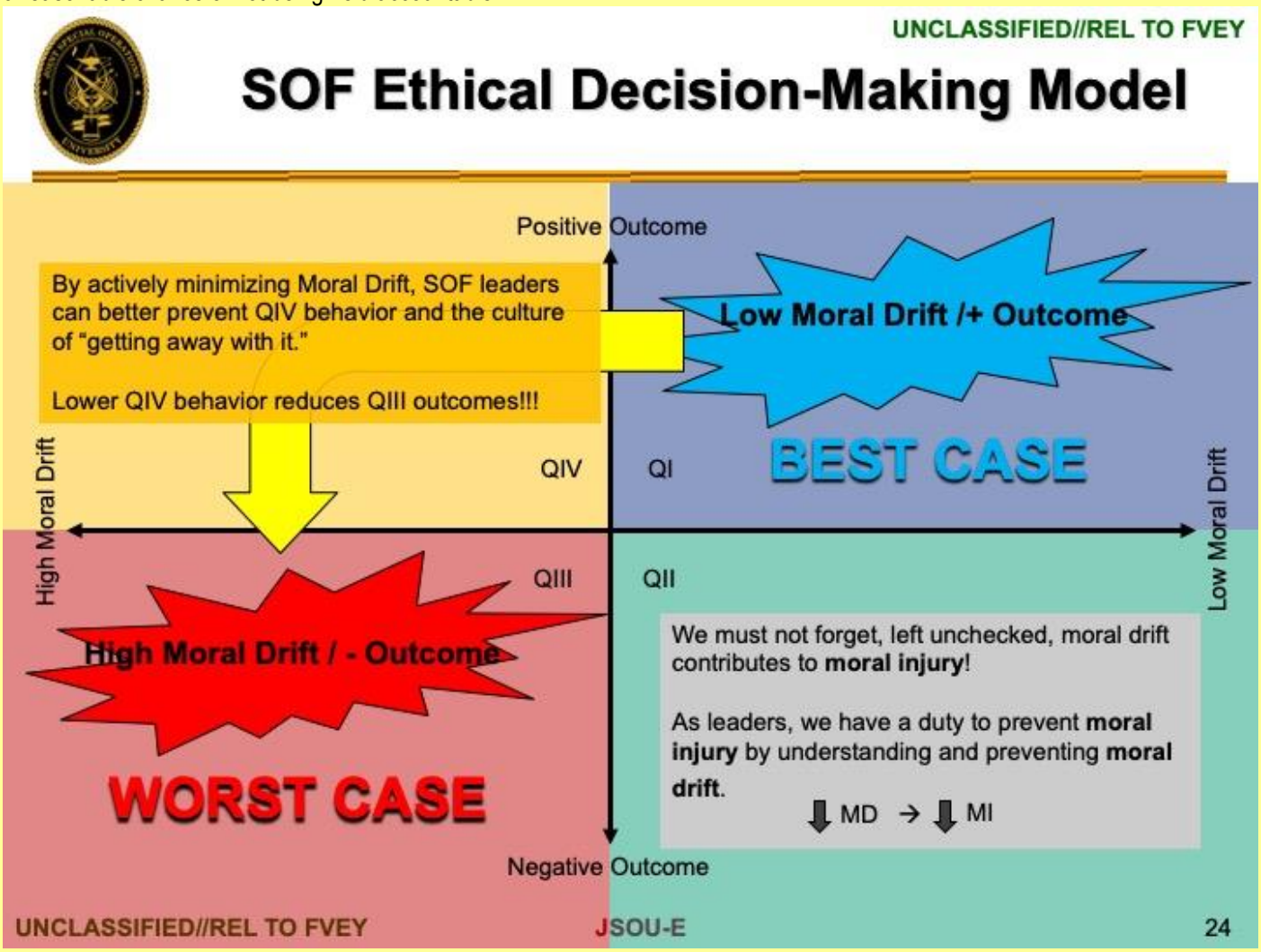
As a first step in combining the practical and the theoretical, JSOFSEA has developed a SOF Ethical Decision-Making Model to better understand how moral drift affects the operational outcomes of SOF teams. The model is anchored in ethical theory from the Western philosophical theories of the past 2,300 years and accepts the reality that moral drift is an essential part of human nature, especially in high-performing professions similar to SOF. The model provides a common language designed to enhance the collective understanding of ethics throughout the enterprise and to build increased trust from the team room to the strategic levels of leadership to the American people SOF serves.



Quadrant 1 (blue) of the SOF Ethical Decision-Making Model is the best-case scenario and the one at which everyone should aim. In this quadrant, low moral drift combines with positive operational outcomes. It is the arena in which SOF expertly executes mission sets. Quadrant II is the adverse outcomes arena. Even in cases of low moral drift, there are less-than-fully-successful operational outcomes. These outcomes are considered "unfortunate," but many SOF leaders and operators recognize that they occasionally happen as a "cost of doing business." In such cases, re-training is often the remedy. Quadrant III (red) is the worst-case scenario wherein SOF teammates and teams are "busted" and make headlines in the national news. In this arena, high moral drift combines with low operational outcomes, that is, failed missions. Because of the rarity that SOF operators actually make news headlines, it is tempting to undervalue the nature of ethical decision-making in SOF. On the surface, things look fine as over 70,000 people assigned to special operations units across the joint force produce only a handful of news-worthy ethical problems. From this lens, the ethical failure-rate of SOF ethical behavior is statistically indistinct from zero.

The model challenges the logic of these conclusions in Quadrant IV (yellow), where high levels of moral drift combine with positive operational outcomes. This is the quadrant mark by leaders who say, "I don't worry about ethical misbehavior unless it affects the mission," which means they value competence over character. Quadrant IV (yellow) is the real problem in SOF, although remaining cleverly hidden and widely unrecognized. Until one sees and recognizes the reality of Quadrant IV (yellow), it is not at all clear that there is anything other than the other three more obvious quadrants, and in the absence of Quadrant IV (yellow), it is not illogical to or inappropriate to think there is no ethics problem in SOF. However, once Quadrant IV (yellow) is drawn from the shadows and exposed, the realities of the quadrant cannot be forgotten or unseen. This is the quadrant that imbues the SOF culture of "getting away with it," where SOF leaders and operators sanction this behavior if they do not otherwise address

it. This is the behavior that is often famously encouraged through the use of common tongue-in-cheek phrases like “If you ain’t cheatin’, you ain’t tryin’!”
However, the data points in Quadrant IV (yellow) will not surprise anyone who understands the essential characteristics of human beings. Though not a complete list, human beings are essentially an unstable mix of animal drives with a varying capacity to discipline those animal drives in ourselves and others. We are self-interested and often selfish on the one hand, while on the other, humans have the capacity to limit ourselves out of regard for others. We can modify our behaviors if we are motivated to do so. We often find that motivation in our respect for others. Finally, we will do wrong, and often what is unethical, whenever we want if we think there is a reasonable chance of not being held accountable.



With the SOF Ethical Decision-Making Model in mind, the JSOFSEA curriculum explores how behavior might migrate from Quadrant I (blue) to Quadrant III (red), going from best case to worst case. In doing so, senior enlisted leaders can see that the change that makes Quadrant III (red) behavior possible occurs when moral drift shifts from low to high. As such, the path from best-case to worst-case ethical behavior is directly through the “getting away with it” culture of Quadrant IV (yellow). By illuminating this path, SELs and other SOF leaders and operators can better understand the need for exposing and actively preventing Quadrant IV (yellow) behavior since reducing Quadrant IV behavior also reduces Quadrant III (red) outcomes.
Minimizing or eliminating the culture of "getting away with it" is not impossible. However, changes cannot happen without the active leadership of SOF enlisted leaders because of their combined experience and the accompanying authority that permeates SOF culture writ large. No single variable is more influential as an agent of change, a driving motivation behind JSOFSEA’s update of the leadership curriculum. The SOF Ethical Decision-Making Model also suggests a more profound relevance to leadership at the senior enlisted level. Looking at the model, we

cannot forget that unchecked moral drift contributes directly to moral injury, and SOF leaders at every level have a sacred duty to prevent moral injury by understanding and preventing moral drift. In short, lower levels of moral drift will yield fewer cases of moral injury.

Conclusion

In revising the leadership curriculum, JSOFSEA is focused on understanding the role that *guerrilla leadership* education plays in preparing SELs for the strategic challenges of the future SOF environment where relational leadership at the micro-level of complex and dangerous environments characterizes the utility of the Joint SOF enterprise to American strategic engagement. As a foundational aspect of this educational paradigm is reimagining the educational needs of the SOF HE²RO, the impact of moral drift on moral injury, and ways that SOF operators and leaders can work collectively to both prevent moral drift and maximize mission effectiveness. The JSOFSEA Leader-Shift program teaches SELs and enlisted team members to be highly effective organizational leaders by capitalizing on their individual leadership experiences and providing advanced, ethically grounded leadership. JSOFSEA provides an innovative and unparalleled methodology for enhancing students' research and study opportunities while they think, read, and discuss with peers, veterans, and scholars. ‘

As leaders preparing to meet the leadership challenges of the future SOF environment, JSOFSEA provides a unique environment that encourages SOF enlisted leaders to challenge status-quo thinking and ignite their passion for designing and developing team cultures that value shared responsibility and positive ethical behavior. The Leader-Shift program recognizes the changing paradigm of leadership in the modern SOF environment by incorporating SOF-specific academic leadership theory into this innovative and multi-dimensional approach to SOF leader and leadership development.

By combining the relational aspects of *guerrilla leadership* and the SOF *guerrilla-leader identity*, JSOFSEA sets the standard for how the Joint SOF enterprise understands SOF utility and SOF leadership moving into the compound security dilemma of the 21st century. Likewise, the common language of the six SOF ethical truths and the SOF ethical decision-making model enable leaders at all levels of SOF and their partner forces to remain mission-focused while recognizing the invisible hazards of moral drift. The models' language fundamentally reduces subsequent risks to mission and the health of the force while increasing the general trust between SOF formations and the American people.

References

- Junegi, P. (2015). *Edgar Schein model of organization culture*. Management Study Guide. https://www.managementstudyguide.com/edgar-schein-model.htm
- Litz, B. T., Stein, N., Delaney, E., Lebowitz, L., Nash, W. P., Silva, C., & Maguen, S. (2009). Moral injury and moral repair in war veterans: A preliminary model and intervention strategy. *Clinical Psychology Review*, *29*, 695–706. https://doi.org/10.1016/j.cpr.2009.07.003
- Long, J. E. (2017). Framing indigenous leadership. *Advances in Social Sciences Research Journal*, *4*(6), 248–257. https://doi.org/10.14738/assrj.46.2936
- Long, J. E. (2019). *The guerrilla leader theory: Maximizing the strategic impact of leading with competence and connectedness in counterinsurgency operations* [Doctoral Dissertation, University of Charleston]. https://search.proquest.com/openview/bee80767747d77d7c2018fa6ae6f7866/1?pq-origsite=gscholar&cbl=18750&diss=y
- Long, J. E., & Walton, D. (2019). Green Berets: Regaining the guerrilla leader identity. *Small Wars Journal*. https://www.researchgate.net/publication/330913923_Long2019-The_Guerrilla_Leader_Theory
- Sternberg, R. J. (2012, Summer). *Ethical drift*. Association of American Colleges & Universities. https://www.aacu.org/publications-research/periodicals/ethical-drift
- Thyne, K., & Long, J. E. (2020). Ethics Quick Look. *Joint Special Operations University Press Publications*, *February*, 1–4.
- Wilson III, I. (2020). *Sharpening the edge of SOF's advantage: Towards an adapted vision and plan of action for JSOU "Next."* 3.

Wojciech John Labuz *is a retired ARSOF CSM and JSOFSEA Academic Chair at the Joint Special Operations University with over 23 years of operational and academic experience.*

Sergeant Major Christopher (Chris) Hughes *is a JSOFSEA Instructor at the Joint Special Operations University. SGM Hughes is a career Civil Affairs NCO with 26 years of service. His most recent assignments include Command Sergeant Major, 91st CA BN (A) (SO) and G9 Sergeant Major, United States Army Africa (USARAF).*

Dr. Kari A. Thyne *is a retired Air Force officer and Faculty Member at the Joint Special Operations University's Center for Ethics and Leadership. Her research interests include ethical decision-making and values education.*
Dr. Joseph E. Long *is a retired Green Beret and Faculty Member at the Joint Special Operations University's Center for Irregular Warfare. His research interests include Irregular Warfare and ethical decision-making in Special Operations.*

Do you know that you can understand Greek?

In 1957 and 1959, the Greek economist Professor Xenofon Zolotas, Governor of the bank of Greece and Governor of the Funds for Greece, delivered two speeches in English using Greek words only. As Prof. Zolotas said:
"`I always wished to address this Assembly in Greek, but I realized that it would have been indeed Greek to all present in this room. I found out, however, that I could make my address in Greek which would still be English to everybody. With your permission, Mr. Chairman, I shall do it now, using with the exception of articles and prepositions only Greek words".

First speech - September 26, 1957
IMF and the International Bank for Reconstruction and Development

" Kyrie,
I eulogize the archons of the Panethnic Numismatic Thesaurus and the Ecumenical Trapeza for the orthodoxy of their axioms, methods and policies, although there is an episode of cacophony of the Trapeza with Hellas.
With enthusiasm we dialogue and synagonize at the synods of our didymous Organizations in which polymorphous economic ideas and dogmas are analyzed and synthesized.
Our critical problems such as the numismatic plethora generate some agony and melancholy. This phenomenon is characteristic of our epoch. But, to my thesis, we have the dynamism to program therapeutic practices as a prophylaxis from chaos and catastrophe.
In parallel, a panethnic unhypocritical economic synergy and harmonization in a democratic climate is basic.
I apologize for my eccentric monologue. I emphasize my eucharistia to you Kyrie, to the eugenic and generous American Ethnos and to the organizers and protagonists of this Amphictyony and the gastronomic symposia."

Prof. Xenofon Zolotas

Second speech - October 2, 1959
International Bank for Reconstruction and Development conference

" Kyrie,
It is Zeus' anathema on our epoch for the dynamism of our economies and the heresy of our economic methods and policies that we should agonise between the Scylla of numismatic plethora and the Charybdis of economic anaemia.
It is not my idiosyncrasy to be ironic or sarcastic but my diagnosis would be that politicians are rather cryptoplethorists. Although they emphatically stigmatize numismatic plethora, energize it through their tactics and practices.
Our policies have to be based more on economic and less on political criteria.
Our gnomon has to be a metron between political, strategic and philanthropic scopes. Political magic has always been antieconomic.
In an epoch characterised by monopolies, oligopolies, menopsonies, monopolistic antagonism and polymorphous inelasticities, our policies have to be more orthological. But this should not be metamorphosed into plethorophobia which is endemic among academic economists.
Numismatic symmetry should not antagonize economic acme.
A greater harmonization between the practices of the economic and numismatic archons is basic.
Parallel to this, we have to synchronize and harmonize more and more our economic and numismatic policies panethnically.

These scopes are more practical now, when the prognostics of the political and economic barometer are halcyonic. The history of our didymous organisations in this sphere has been didactic and their gnostic practices will always be a tonic to the polyonymous and idiomorphous ethnical economics. The genesis of the programmed organisations will dynamize these policies. I sympathise, therefore, with the aposties and the hierarchy of our organisations in their zeal to programme orthodox economic and numismatic policies, although I have some logomachy with them.
I apologize for having tyrannized you with my hellenic phraseology.
In my epilogue, I emphasize my eulogy to the philoxenous autochthons of this cosmopolitan metropolis and my encomium to you, Kyrie, and the stenographers."

Prof. Xenofon Zolotas

Trump's Big Lies, and Biden's

By Gary Leupp
Source: https://www.counterpunch.org/2020/12/25/trumps-big-lies-and-bidens/

Dec 25 – People with eyes to see and ears to hear realize that Donald Trump is a pathological liar. He lies about little things and big things. Some lies seem off the cuff, others well planned. The lie about Obama's birthplace was one of the latter. It was a racist lie designed to rally racists as the basis for a political campaign.
People paying attention also recall how this century began with George W. Bush promoting Big Lies. These were as blatantly false as any of Trump's lies, but much more destructive in their ramifications. Bush and his pathological liar partner Dick Cheney declared with absolute assurance that Iraq had been collaborating with al-Qaeda and stockpiling weapons of mass destruction. Those lies succeeded in unifying U.S. public opinion around the invasion and destruction of Iraq, a long occupation, half a million deaths, waves of refugees, civil war, the emergence of the grotesque ISIL "caliphate." Remember when Big Lies meant mass death?
When it became clear (by the end of 2003) that there had been no appreciable Iraqi al-Qaeda ties, and no WMDs, the administration acknowledged "intelligence errors" had been made. Gosh. But we gradually realized what had happened: officials including Cheney had pushed fake news through their contacts in the New York Times, then cited "news reports" to support their claims when interviewed by the press. It's now common knowledge (including among Trump supporters) that the Iraq War was based on lies. Not "mistakes," mind you, but calculated lies designed to scare Americans into supporting a criminal war. The magnitude of the news hoax was spectacular: hundreds of millions had been snookered by neocon fabrications to endorse the crime of the century.
Thus, when Trump started referring to the mainstream press as "Fake News" he was tapping into what have become a deep well of popular contempt and skepticism. There is in fact a lot of Fake News out there.
At present Trump is promoting the fake news that he won the election. Meanwhile the cable networks are reporting as fact that Russia has massively cyber-attacked U.S. government sites. (The estimable Veteran Intelligence Professionals for Sanity [VIPS] has questioned the reports, and published thorough critiques of what was in fact a "Russian hoax": the accusation of Trump campaign "collusion" with Russia.)
Recall that after Trump was elected, the intelligence agencies of the outgoing administration threw together a report noting that Russian television had favored Trump over Clinton (as though this were shocking) and that Russians had spent hundreds of thousands of dollars posting fake news on social media, mostly after the election. The occasion, ergo, called for sweeping sanctions. Then the Democrats demanded a special investigation, hoping that Mueller would tie Trump to Russia; they were bitterly disappointed when he failed to do so. But then the House impeached Trump over the Ukraine matter. The hearings provided a pulpit for scholars and officials to declare that if we don't fight the Russians in Ukraine, we'll have to do it here.
Three decades after the collapse of the Soviet Union, this 1950s-style fearmongering flourishes, just without the anticommunist element—all the more ridiculous because Moscow heads no global movement, mounts no military threat, and simply wants the U.S. to stop toppling its neighbors' regimes and surrounding it with military bases, pressuring its partners to cancel trade deals,
The Big Lie here was that Russia is "our adversary" because it "opposes our interests" all over the world. (Note the vagueness of the lie. The actual content is: Russia tries to thwart U.S. corporate expansion in some parts of the world, U.S. efforts to seal new military alliances, access new markets and raw materials, etc. The Big Lie is that Russians' protests against their own military encirclement—by the most ferocious military alliance in history headed by murderous cowboys who lie through their teeth every time they go war—itself constitute aggression. In other words, totally backwards thinking. So it is not a matter of the U.S.provoking Russia by NATO expansion. It's a matter of Russia (as current incarnation of

the old tsarist empire) wanting to expand again, and the U.S.A. from 4000 miles away coming to the rescue of the (imagined) threatened countries. As though Russia would invade Estonia but for the beneficent presence of U.S. troops at Amari Air Base.
It doesn't make any sense, unless you embrace the religious conception of American Exceptionalism as Biden does.
This Big Lie (about Russia as adversary) was suspended for about a decade (1991-2001) when Boris Yeltsin (the dismally unpopular Russian president who actually bombarded the Russian parliament building in 1995) was in charge, succeeded by Vladimir Putin at the end of 1999. Russia had overtly embraced capitalism and bourgeois democracy; it was now a friend and partner. Relations had been damaged by the NATO bombing of Bosnia (1995), the NATO war on Serbia (1999), and the expansion of NATO to include Poland, Hungary and Czechoslovakia (1999) in violation of George H. W. Bush's promise to Mikhail Gorbachev that NATO would not expand "one inch" towards the east after the reunification of Germany. But in 2001 Vladimir Putin supported the U.S.-NATO effort in Afghanistan.
Despite his deep resentment at the expansion of the anti-Russian military alliance, and the breach in trust, Putin offered to allow NATO transit rights through Russia to Afghanistan. George W. Bush repaid him by adding seven more countries to NATO in 2004, including two (Latvia and Estonia) that border Russia. Then in 2008, the U.S. recognized the Serbian province of Kosovo as an independent country in an egregious violation of international law. In the same year NATO announced plans to admit Georgia and Ukraine, both of which border Russia. Their inclusion would almost complete the encirclement of European Russia. This was too much.
The Soviet Union's Warsaw Pact alliance (with five east European nations) had dissolved itself in 1991. Putin's Russia had a handful of foreign military bases to the U.S.'s 800. The Russian military budget was less that 20% of NATO's. The U.S. had broken its word by expanding NATO by ten more nations and now was announcing two more.
In Georgia at the time of the breakup of the Soviet Union the districts of South Ossetia and Abkhazia had sought autonomy within Georgia, or inclusion in the Russian Federation. Fighting between Georgian state forces and separatists had drawn in Russian peace-keepers. When the pro-NATO president Mikhail Saakashvili foolishly pounded a South Ossetian position killing Russian troops Putin pounced. Following a punitive 9-day war Russia announced it was recognizing South Ossetia and Abkhazia as independent countries, just as the U.S. has recognized Kosovo.
That's when Sen. John McCain—that monstrous war-monger now lionized as a bipartisan hero—declared "We're all Georgians now" and advocated U.S. military intervention. That's when the post-Cold War relationship really soured. If Hillary Clinton, the unreconstructed Goldwater Girl, thought she could "reset" the relationship during the Obama era, while still enlarging NATO (Albania and Croatia on her watch) she was mistaken. If she thought she could improve relations by condemning the Russian elections of 2011 (and by, Putin charges, funding government opponents) she miscalculated. The embodiment of American Exceptionalism, she found no problem with the U.S. interfering in the 1996 election (to help Yeltsin versus the communist front runner) or interfering in Russia again in 2011. But recall her moral outrage at Russians posting Facebook ads favoring Trump!
Georgia has not in fact joined NATO, due in part to rational German reluctance to provoke Russia. Nor has Ukraine joined. U.S. electoral interference in 2005 ("the Orange Revolution") brought a pro-NATO regime to power in Ukraine, but it was replaced (in a "free, fair" election) by the anti-NATO government of Viktor Yanukovych in 2010. The U.S. spent $ 5 billion to bring Yanukovych down (through the coup in February 2014) and to bring another pro-NATO team into power.
The Maidan coup—backed by the U.S. so openly that the State Department's Victoria Nuland and Sen. John McCain were filmed giving cookies to the protestors, and sharing stages with neofascists—was an extraordinary provocation. Ukraine included the Crimean Peninsula, center of the Russian Black Sea Fleet since 1775, site of the wartime conference between Stalin, Roosevelt and Churchill. It had been transferred from the Russian Soviet Socialist Republic to the Ukrainian Soviet Socialist Republic in 1954 but Russia had retained control over the military facilities by long-term lease. Now Putin had two options: accept U.S. hegemony over the neighboring country (the largest in Europe aside from Russia, larger than France) and the loss of a key naval port (Russia has so few); or re-annex Crimea, taking advantage of its Russian inhabitants' enthusiasm for reunion with the motherland, while encouraging ethnic Russian sentiment in the Dionbas region.
The Big Lie in the corporate media was that the Ukrainian people, tired of Russian oppression and aspiring for European Union membership, thwarted in their "European aspirations" by the pro-Russian Yanukovych, rose up in rebellion creating a democracy that the Russians attack because they want to suppress democracy and maintain control over the country. One unspoken Big Lie is that NATO expansion is not the issue. Another is that Ukrainians are united on EU membership, when they are in fact deeply divided.
The Ukraine coup in 2014 was (as you know) followed in months by Joe Biden's assignment to oversee Ukraine's anti-corruption drive (required prior to NATO admission). Meanwhile Biden's son Hunter was appointed to the board of Ukraine's largest gas company, Burisma, from which he "earned" three million dollars in five years for unknown reasons.

01 JAN 2021 North Korea

01 JAN 2021 Greece

Trump may lie with every breath. But he hasn't lied much about NATO. He has—intermittently and ineffectively— suggested that NATO may have lost its relevance, and is not worth the expense. This is among his gravest crimes to the Democratic mainstream for whom NATO is a sacred cow.

The ascent of Biden (which will surely happen) will mean the substitution of old lies with new or ongoing lies. These include:

1. The U.S. is the "exceptional" country entitled to use force anywhere, anytime to preserve peace and stability. Its troops are always heroes. "May God bless our troops" Biden concludes all statements, no doubt thinking about his son Beau who "served" in the criminal bloody occupation of Iraq from 2008 to 2009.
2. The expansion of NATO to surround Russia is needed to prevent Russian aggression. (As though the U.S.-NATO bombing of Bosnia and Serbia was anything other than aggression.)
3. China threatens international shipping in the South China Sea and East China Sea such that U.S. warships and aircraft carriers need to patrol these areas and challenge Chinese sovereignty claims.

These lies are even more dangerous than the lie that Obama was born in Kenya, that Mexicans are rapists, that a wall is being built, that Muslims hate Americans, that the kidnapped Central American kids are safe, that the virus will disappear. They are lies that structure U.S. foreign relations, that Trump does not entirely buy. Trump has no coherent critique of them, although he has (refreshingly) pooh-poohed the butthead patriots like McCain and (again) questioned the need for NATO.

Biden on the other hand accepts American Exceptionalism, is eager (partly to just define himself against Trump) to confront Russia with sharp language, even harsher sanctions—and efforts at NATO expansion. He's not necessarily more "hawkish" on China than Trump but he did tell Japanese Prime Minister Suga the other day that the U.S. would join with Japan to defend the Senkaku (Diaoyutai) islands in the East China Sea in the event of a war. Since the Japanese claim to the islands is dubious (according to my understanding of the history they have in fact been Chinese islands since the 1390s claimed by Japan only in 1895) this is highly dangerous. (Before Hillary Clinton was secretary of state the U.S. position was to have no position of Senkaku sovereignty. Since the Allies forced Japan in 1945 to renounce sovereignty over all territories gained (through imperialist wars) from 1894, you'd think these islets would have been included. But while Japan withdrew from Korea, Manchuria, the Chinese mainland, Taiwan, Southeast Asia, and the South Pacific, Tokyo continued to claim the uninhabited East China Sea isles as part of Okinawa Prefecture.

A few rocks off Taiwan might seem a small issue. But it is infuriating to many Chinese that islands historically theirs are claimed and militarily "defended" by Japan, whose military killed around 6 million Chinese during the Second Sino-Japanese War. There is no reason for Biden to side with Tokyo on this issue, other than to signal China that the U.S. sides with all its opponents as a matter of principle.

MSNBC, the DNC's unofficial organ, has been emphasizing the heroic role of Harry Truman, the U.S. president who dropped the bombs on Hiroshima and Nagasaki, slaughtered 5 million in the Korean War, and established NATO in 1949. Truman's being praised for his anti-communism; he used all means necessary including election rigging, political assassination, military suppression (of the heroic Greek Communist movement, etc.), coups, and propaganda to counter the menace of Soviet Communism! And in that, he'll be a model for Joe Biden!

Now, what would Truman's efforts 80 years ago against global communism have to do with Biden today? Putin is not Stalin. Stalin was the leader of the world's first socialist country, that had experienced dramatic growth in the 1930s, was able somehow to defeat the Nazi juggernaut losing 20 million in the process but emerging with the world's second largest economy and scientific community able to test a nuclear weapon (1949) and launch Sputnik (1957). Stalin was the acknowledged leader of a global movement that by 1949 included the People's Republic of China. Truman, a small-minded racist Missouri politician, asserted U.S. power in Europe because Europe was exhausted and in ruins, receptive to the Marshall Aid offered in exchange for anticommunist alliances.

That world is gone. The Communist Bloc peaked in the 1950s, then deteriorated as a result of the Sino-Soviet split. Russia is not today the center of a global alliance based on shared ideology. It is a proud old European country with a glorious culture and unique experience of (for a time) successful socialist construction. Russia is now governed by a conservative political party, headed by Putin, linked to the Orthodox Church. Why should Biden model himself on Truman in today's world—other than to promote and expand NATO? And not even to fight a supposedly threatening ideology but rather to surround a non-threatening country with no comparable military alliance and making no threats on its neighbors?

The 'Back to Normal" drive underway by the Democrat center-right pro-imperialist mainstream is designed to return the people's attention to the need for America to responsibly use its power—to maintain the long-term bipartisan strategy of "full-spectrum dominance" (control of the world). Biden is much more rooted in "Shock and Awe" terror than Trump. His normalcy will be Hillary Clinton-Barack Obama normalcy. And Bush-Cheney normalcy; did not Joe not just endorse the invasion of Iraq put passionately promote it, long after it was clear it had been based on lies?

To those breathing a sigh of relief that the Trump era's over and normalcies returned, I suggest the old normalcy was terrifying and it's returning. Watch Biden's comments on Ukraine and Georgia; he's known as a keen advocate for NATO expansion and will want to define himself further as such in distinction from "Putin's puppet "Trump. Watch what he says about reversing Trump's "irresponsible" withdrawals from Afghanistan, Iraq and Syria and maintaining bases in these countries (to "protect our freedoms," "aid our allies," prevent our heroes from dying in vain, or whatever). Watch what he has to say about China's Uighurs, the Hong Kong protests, and Chinese "aggression"in its own waters.
And ask: what does this career imperialist with a particular veneration for the military give to the anti-imperialist voters who only participated in the vote to topple Trump? How is Biden an improvement? Because he seems "decent" (like many old doddering folks), has been packaged as "compassionate" (I've even seen "a man of sorrows, acquainted with grief" see Isaiah 53:3), and has pragmatically appointed an ethnically and gender diverse cabinet of like-minded pro-imperialist "centrists" in a concession to identity politics (if only to discourage critical thought about capitalism and imperialism)?

Whose lies are bigger, or worse?
Sen. Ladda Tammy Duckwort of Illinois is a half-Thai American. In 2004 she was sent as an Army reservist to bomb Iraqis (whom, you recall, were resisting the criminal invasion based on lies supported by Joe Biden). She chose to fly helicopters. She lost her right leg while it was shot off by Iraqis in their airspace over their criminally invaded country.
Duckwort was under consideration for a cabinet post, due to her being a woman, and half-Asian. Wouldn't that be progress in itself? No. A half-Asian woman proud of her service bombing Iraq in 2004 is no better than a white Blackwater mercenary proud of similar feats. And Biden is no better than Trump and, in some ways, much worse.

Gary Leupp *is Professor of History at Tufts University, and holds a secondary appointment in the Department of Religion. He is the author of Servants, Shophands and Laborers in in the Cities of Tokugawa Japan; Male Colors: The Construction of Homosexuality in Tokugawa Japan; and Interracial Intimacy in Japan: Western Men and Japanese Women, 1543-1900. He is a contributor to Hopeless: Barack Obama and the Politics of Illusion, (AK Press).*

The Most Common Pain Relief Drug in The World Has Been Linked to Risk-Taking Behaviour

Source: https://www.sciencealert.com/the-most-common-pain-relief-drug-in-the-world-has-been-linked-to-risk-taking-behaviour

Dec 25 – One of the most consumed drugs in the US – and the most commonly taken analgesic worldwide – could be doing a lot more than simply taking the edge off your headache, recent evidence suggests.
Acetaminophen, also known as paracetamol and sold widely under the brand names Tylenol and Panadol, also increases risk-taking, according to a September 2020 study that measured changes in people's behaviour when under the influence of the common over-the-counter medication.
"Acetaminophen seems to make people feel less negative emotion when they consider risky activities – they just don't feel as scared," said neuroscientist Baldwin Way from The Ohio State University in September 2020.
"With nearly 25 percent of the population in the US taking acetaminophen each week, reduced risk perceptions and increased risk-taking could have important effects on society."
The findings add to a recent body of research suggesting that acetaminophen's effects on pain reduction also extend to various psychological processes, lowering people's receptivity to hurt feelings, experiencing reduced empathy, and even blunting cognitive functions.
In a similar way, the recent research suggests people's affective ability to perceive and evaluate risks can be impaired when they take acetaminophen. While the effects might be slight, they're definitely worth noting, given acetaminophen is the most common drug ingredient in America, found in over 600 different kinds of over-the-counter and prescription medicines.
In a series of experiments involving over 500 university students as participants, Way and his team measured how a single 1,000 mg dose of acetaminophen (the recommended maximum adult single dosage) randomly assigned to participants affected their risk-taking behaviour, compared against placebos randomly given to a control group.

In each of the experiments, participants had to pump up an uninflated balloon on a computer screen, with each single pump earning imaginary money. Their instructions were to earn as much imaginary money as possible by pumping the balloon as much as possible, but to make sure not to pop the balloon, in which case they would lose the money.
The results showed that the students who took acetaminophen engaged in significantly more risk-taking during the exercise, relative to the more cautious and conservative placebo group. On the whole, those on acetaminophen pumped (and burst) their balloons more than the controls.
"If you're risk-averse, you may pump a few times and then decide to cash out because you don't want the balloon to burst and lose your money," Way said.
"But for those who are on acetaminophen, as the balloon gets bigger, we believe they have less anxiety and less negative emotion about how big the balloon is getting and the possibility of it bursting."
In addition to the balloon simulation, participants also filled out surveys during two of the experiments, rating the level of risk they perceived in various hypothetical scenarios, such as betting a day's income on a sporting event, bungee jumping off a tall bridge, or driving a car without a seatbelt.
In one of the surveys, acetaminophen consumption did appear to reduce perceived risk compared to the control group, although in another similar survey, the same effect wasn't observed.
Overall, however, based on an average of results across the various tests, the team concludes that there is a significant relationship between taking acetaminophen and choosing more risk, even if the observed effect can be slight.
That said, they acknowledge the drug's apparent effects on risk-taking behaviour could also be interpreted via other kinds of psychological processes, such as reduced anxiety, perhaps.
"It may be that as the balloon increases in size, those on placebo feel increasing amounts of anxiety about a potential burst," the researchers explain.
"When the anxiety becomes too much, they end the trial. Acetaminophen may reduce this anxiety, thus leading to greater risk taking."
Exploring such psychological alternative explanations for this phenomenon – as well as investigating the biological mechanisms responsible for acetaminophen's effects on people's choices in situations like this – should be addressed in future research, the team said.
While they're at it, scientists no doubt will also have future opportunities to further investigate the role and efficacy of acetaminophen in pain relief more broadly, after studies in recent years found that in many medical scenarios, the drug can be ineffective at pain relief, and sometimes is no better than a placebo, in addition to inviting other kinds of health problems.
Despite the seriousness of those findings, acetaminophen nonetheless remains one of the most used medications in the world, considered an essential medicine by the World Health Organisation, and recommended by the CDC as the primary drug you should probably take to ease symptoms if you think you might have coronavirus.
In light of what we're finding out about acetaminophen, we might want to rethink some of that advice, Way said.
"Perhaps someone with mild COVID-19 symptoms may not think it is as risky to leave their house and meet with people if they're taking acetaminophen," Way said.
"We really need more research on the effects of acetaminophen and other over-the-counter drugs on the choices and risks we take."

▶▶ **The findings are reported in** *Social Cognitive and Affective Neuroscience*.

Using a Humidifier Might Reduce Your Chances of Contracting COVID-19

Source: https://www.sciencealert.com/using-an-indoor-humidifier-might-reduce-your-chances-of-contracting-covid-19

Dec 25 – Respiratory viruses love the winter. These pathogens thrive in the cold and travel easier from host to host in dry air.
"When cold outdoor air with little moisture is heated indoors, the air's relative humidity drops to about 20 percent," Akiko Iwasaki, an immunobiologist at Yale University, said in a statement.
"This dry air provides a clear pathway for airborne viruses."
Relative humidity (RH) is a measure of how saturated the air is with water vapour. So in a room with 40 percent relative humidity, the air holds 40 percent of the total amount of moisture it could hold in total.
The drier the air, the lower the relative humidity, and the easier it is for viruses – including the coronavirus – to spread.
That's why Linsey Marr, an aerosol researcher from Virginia Tech University who studies coronavirus transmission, recommends using a humidifier in your home.

"You could invest in a humidifier and set it to keep the humidity above 40 percent but below 60 percent in the wintertime," she told Business Insider. "The virus doesn't survive as well under these conditions, and your immune response works better than when the air is dry."

Humidity and temperature affect how the coronavirus spreads

Research shows that the coronavirus spreads more easily when temperatures and humidity are low.

A July analysis by aerosol research scientist Ajit Ahlawat and his colleagues found that the chances of airborne transmission of the coronavirus in dry places are higher than in humid areas.

That's because coronavirus particles in drier, less humid air absorb less moisture and therefore remain aloft longer. That makes them more likely to be inhaled and infect someone new.

Plus, coronavirus particles become more stable as temperatures and humidity levels decrease, helping them remain stable enough to infect a new host when they arrive.

What's more, like the flu, the coronavirus is ensconced in a fatty layer called a lipid envelope that helps it survive the journey from one person to the next. This sheath dries out more quickly in higher temperatures.

Wetter air can also work against the protective layer by wreaking havoc on the structure of the lipid envelope, inactivating the virus.

"To control the coronavirus airborne transmission indoors, especially in poorly ventilated indoor places like certain hospitals, schools, and public buildings, we recommend the use of humidifiers," Ahlawat told Business Insider.

Like Marr, he recommends an indoor RH between 40 percent and 60 percent.

Higher temperatures can also hinder the virus' spread via surfaces, though that type of transmission is rare.

A study published in June revealed that warmer weather conditions can truncate how long the coronavirus survives on surfaces.

40 to 60 percent relative humidity benefits our immune systems, too

This fall, Iwasaki helped launch a petition calling on the World Health Organisation to set guidelines for indoor humidity levels. It calls 40-60 percent RH "a sweet spot," since indoor air in that range "allows our nose and throat to maintain robust immune responses" against many viruses.

Our immune systems' built-in protections – such as the mucus in our noses – work better when the air is wetter.

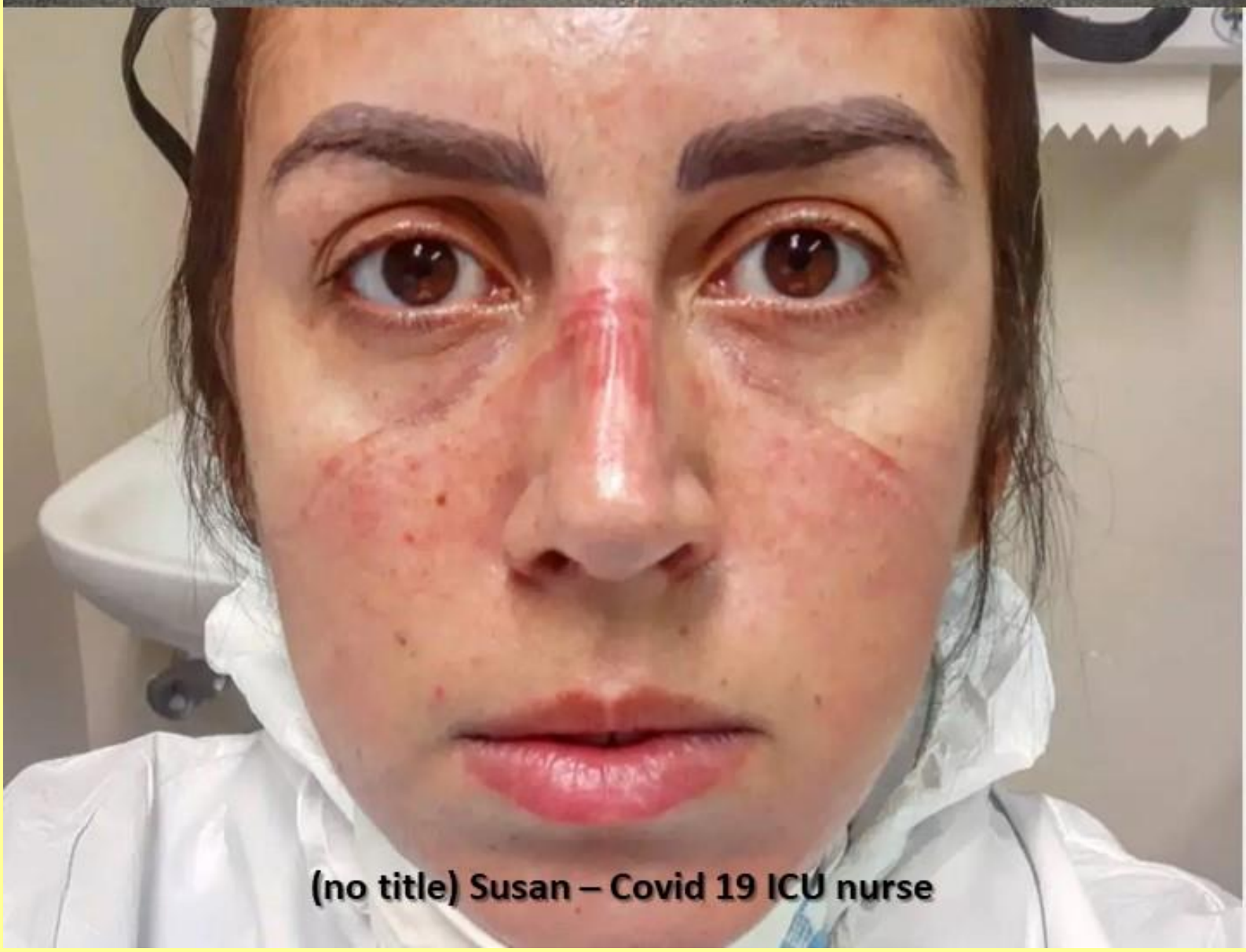
That's because mucus coats flexible hair-like appendages called cilia that jut out from cells in our airways (picture them like swaying seaweed underwater). Cilia are tasked with catching viral particles that try to float into our lungs.

According to a recent study by Iwasaki and her colleagues, low humidity dries out that mucus; as the lubricating mucus dries, those protective cilia fall flat, hampering their ability to snag viruses.

But experts warn against too much humidity

It's critical not to overdo the humidity, however.

Sir Lewis Hamilton – car driver



(no title) Susan – Covid 19 ICU nurse

"Be very careful to avoid getting above 65 percent, because that can promote mould growth," Marr said. The resulting mould can trigger asthma, and many people are allergic to mould spores.
Ahlawat also said a humidity level over 60 percent "would be too much uncomfortable for the indoor residents."
Numbers aside, some experts are against using humidifiers at all as a means of reducing viral transmission.
"This is an unproven approach and has potential for very bad side effects," Donald Milton, a professor of environmental health at the University of Maryland, told Elemental in November. "I don't recommend it."
Marr also cautioned that using a humidifier should not be seen as a panacea for stopping the virus' spread.
"The most important things to do are to wear a mask, maintain distance, ensure good ventilation and/or filtration of the air, and wash your hands," she said.

National vaccination show

By the Editor-in-Chief

Today (Dec 27, 2020) we watch the long-anticipated TV show with iconic people (53 in total) vaccinated with the new SARS-CoV-2 vaccine (by Pfizer) as follows (not all the same day – until Jan 10, 2021):
First was an 88 years old man from a nursing home: OK
Second was an ICU nurse: OK (but an IED intensive care physician would have been more appropriate and symbolic; a military nurse of physician would have been a polite gesture as well]
Third was the President of Hellenic Republic (photo – right): Why?
Fourth was the Prime Minister: OK
Fifth was the head epidemiologist of the Covid-19 Advisory Committee: OK (although he should be the first one)
Sixth was the President of the Hellenic Parliament: Why?
#7 The Secretary General of an opposition party: Why?
#8 The President of the major opposition party: Why?
#9 The Secretary General of an opposition party: Why?

#10 The Secretary General of an opposition party: Why?
#11 Minister of Foreign Affairs: OK
#12 Deputy Minister of Foreign Affairs (European issues): OK
#13 Deputy Minister of Foreign Affairs (Economic Diplomacy issues): Why?
#14 Deputy Minister of Foreign Affairs (Greek Immigration/Diaspora issues): Why?
#15 Minister of Citizens Protection: OK
#16 Deputy Minister of Citizens Protection (Counter-crime policy issues): OK
#17 Deputy Minister of Citizens Protection (Civil Protection & crisis management issues): OK
#18 Secretary General of Public Order: OK
#19 Secretary General of Counter-crime Policy: OK
#20 Secretary General of Civil Defense: OK
#21 Minister of National Defense: OK
#22 Deputy Minister of National Defense: OK
#23 Secretary General of National Defense: OK
#24 The Miister of Health: OK
#25 Deputy Minister of Health (Sanitary Services issues): OK
#26 Deputy Minister of Health (Psychic Services issues): Why?
#27 Four Secretary General of Ministy of Health: OK
#31 President of National Organization of Public Health: OK
#32 President of National Organization of Sanitary Services: OK
#33 Minister of Digital Governance: Why?
#34 Deputy Minister of Digital Governance: Why?
#35 National Defense Chief of Staff: OK should be on top of the list)
#36 National Defense Deputy Chief of Staff: OK should be on top of the list)
#37 Chief of Army General Staff: OK should be on top of the list)
#38 Deputy Chief of Army General Staff: OK should be on top of the list)
#39 Chief of Navy General Staff: OK should be on top of the list)
#40 Deputy Chief of Nave General Staff: OK should be on top of the list)
#41 Chief of Air Force General Staff: OK should be on top of the list)
#42 Deputy Chief of Air Force General Staff: OK should be on top of the list)
#43 Chief of Hellenic Police: OK should be on top of the list)
#44 Deputy Chief of Hellenic Police: OK should be on top of the list)
#45 Chief of Fire Service: OK should be on top of the list)
#46 Deputy Chief of Fire Service: OK should be on top of the list)
#47 Chief of Hellenic Coast Guard: OK should be on top of the list)
#48 Two Deputy Chiefs of Hellenic Coast Guard: OK should be on top of the list)
#50 Director of National Intelligence Service: OK should be on top of the list)
#53 Three Deputy Directors of National Intelligence Service: OK should be on top of the list)

Ruly by example is not a modern practice any more basically because there is global lack of pure leaders from top to bottom. This means that the vaccination of the Number One citizen does not serve its purpose. The vaccination of the heads of the political parties serves nothing in particular unless mimitism is the new norm of brainless supporters. Front-line physicians are missing from the list (perhaps expressing certain arguements make them unpopular) – especially of those serving in the Gates of European Union (Greek islands facing the Turkish coastline hosting millions of illegal immigrants. Having the defense and security forces at the end of the list is absolutely disappointing especially in a country neighboring the biggest bully of the modern world. Ah! There is a high rank priest representing the Head of the Hellenic Church – that is a global first! Vaccination by a representative!
Another issue was the vaccination process itself. A nurse with a prefilled syringe instead of the whole picture: show the Pfizer box; open the box; fill the syringe with the vaccination liquid; inject the arm – just to persuade evil minds that the content of the syringe is normal saline or similar. Propaganda is based either on detailed truth or total distortion of truth.

Finally, when comes to priorities, you cannot have everybody happy; but if you want to use symbolism then the selection process should be more up to the point with a generous portion of valuable logic. In general, it was a bad show!

Will Turkey's Bully Cave to Europe's Pressure?

By Burak Bekdil

Source: https://www.meforum.org/61883/erdogan-reprieve-on-eu-sanctions

Dec 26 – If Turkey's Islamist strongman, President Recep Tayyip Erdoğan, spent more sleepless nights the first week of December than he had over his concerns for U.S. sanctions, it was because of the more imminent and potentially punishing European Union sanctions that would take shape at a summit on December 10-11. He must have had a relatively peaceful sleep when the summit was over. He might have thought that he had managed to get away from a huge European sanctions bomb, at least until March. It may, however, be a bit premature for him to sigh with relief.

After the EU leaders gave Turkey an unambiguous warning in October, Erdoğan chose to escalate tensions, bringing what otherwise would have been mere diplomatic issues to the level of a mini-clash of civilizations. Erdoğan calculated that he could play the tough Ottoman sultan until the last moment and that the EU would never dare burn their bridges with Turkey. He was right and wrong. He bought time, the EU did not burn their bridges, the sanctions at the December summit were not powerful enough to change Turkey's course. Nevertheless, Erdoğan now has another deadline by which he must choose between a further clash of civilizations and sustainable de-escalation.

Shortly before the December summit, Turkey pulled a hydrocarbon exploration ship from disputed waters of the Mediterranean Sea. After months of challenging EU-backed exploration efforts, the survey ship *Oruç Reis* was brought home.

Additionally, in a bogus charm offensive, Ankara embraced a pluralist rhetoric toward the country's non-Muslim minorities. "Religious minorities are the wealth of our country, based on the principle of equal citizenship and common history," presidential spokesman, Ibrahim Kalın said in a Twitter post. "Discriminating against them would weaken Turkey."

Erdoğan also said that he sees Turkey's future in Europe -- the same Europe he had just accused of being "Nazi remnants and fascists."

On the summit table were also an EU-wide arms embargo on Turkey, as pushed persistently by Greece and Cyprus. Instead of opting for an immediate embargo, German Chancellor Angela Merkel announced, the EU leaders would discuss issues with NATO and U.S. officials. "We also spoke about how questions about arms exports must be discussed within NATO. We said that we want to coordinate with the new US administration about Turkey," Merkel told a press conference.

The issue of an arms embargo was simply not the heart of the matter. In 2018, total EU arms exports to Turkey stood at a negligible $54 million. In 2019, several weapons-producing countries in the EU (Germany, France, Italy, Spain, Sweden, Finland and the Netherlands) individually halted or restricted arms sales to Turkey.

EU leaders agreed to hold off on major sanctions until they consult with the incoming U.S. Biden administration.

The heart of the matter was how tough the EU would go in sanctions at a time when Turkey's national economy was in free-fall. What Brussels decided, it turned out, was: Not so tough. EU leaders agreed to impose sanctions on an unspecified number of Turkish officials and entities involved in gas drilling in Cypriot-claimed waters -- but they deferred the bigger decisions such as trade tariffs until they consult with the upcoming U.S. administration of presumptive President-elect Joe Biden.

The EU foreign affairs chief, Josep Borrell, will announce the names of those facing sanctions in the next few weeks. But that will not be the end of the story. At the December summit, Borrell was tasked to prepare proposals on a broader approach to Turkey by March, giving the EU time to consult with Biden's national security team.

This window gives Erdoğan a short, temporary relief. By the end of February, he will have to play his final cards before the EU hardens sanctions or delays hardening them for another three months. These postponements of tougher sanctions are not a winning game for Erdoğan, especially when simultaneous U.S. and European sanctions threaten further to weaken Turkey's fragile economy.

The trouble is, an inherently anti-Western, Islamist politician who has built his popularity largely on constant confrontations with other nations cannot mentally transform into a peaceful partner within a span of three months. He is unwilling at least to stop widening his country's atrocious democratic deficit. "Don't expect me to reward that terrorist [by releasing him]," Erdoğan said just a few days before the EU summit, speaking of Selahattin Demirtaş, the jailed leader of a pro-Kurdish political party that won over 10% of the national vote in last elections.
Demirtaş, along with 12 Kurdish MPs, has been awaiting trial in detention on terrorism charges since 2016. Legally speaking, the man Erdoğan referred to as a "terrorist" is only a suspect without a court verdict. This, however, is Erdoğan's sick understanding of constitutional rights: He is the elected leader, so he believes he can take the liberty to declare suspects guilty or not guilty while their court cases are in progress.
To buy more time in March, Erdoğan will also have to swallow big words and challenges. He will have to stop Turkish hydrocarbon exploration activity in the eastern Mediterranean, stop tensions with Greece and Cyprus and switch to a diplomatic language with Europe, a language that will not contain words such as Nazis, fascists and anti-Muslim racists.
Some very tough homework awaits the schoolyard bully.

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

Yep, 2020 Was Tough. But Here Are 5 Things We're Relieved Didn't Happen

Source: https://www.sciencealert.com/sure-2020-was-bad-but-here-are-five-things-that-didn-t-happen

Jan 01 – It's been twelve months since we counted down the final minutes of 2019 and joyfully screamed 'Happy New Year'. We were so blissfully unaware of what was in store for us in the days ahead.
For those who lost their livelihood, their health, or most tragically of all, their loved ones, there is no silver lining that could possibly compensate the overwhelming grief the COVID-19 pandemic has wrought. Or the damage caused by this years' supersized wildfires and hurricanes.
Some of us have been a little more fortunate. Barring inconveniences such as the need to ration toilet paper or putting on pants for your next Zoom meeting, 2020 was more weird than woeful. It really could have been worse, after all.
How much worse? Well, we can be grateful …

Yellowstone's supervolcano didn't explode

Roughly 640,000 years ago, more than a thousand cubic kilometres (about 240 cubic miles) of rock, dirt, and trees were thrown high into the sky when a bubble of magma and hot gases blew a continent wide open.
That same caldera of molten rock, now known as the Yellowstone caldera in North America, is technically overdue for a repeat performance.
Now, there's a lot packed into that word, 'technically'. Technically the final book in the *Game of Thrones* series is overdue. But the timing of past releases just isn't a reliable indication of when to expect a sequel.
Still, every shimmy and shake of the national park's landscape has had people wondering if Another Big One is close.
This past June saw a string of a dozen earthquakes shake the region in quick succession. And just this October the regular tick-tock spurting of the geyser known as Old Faithful stopped being so faithful and fell suspiciously quiet.
Nobody would have been surprised if Yellowstone chose 2020 to explode.
Well, nobody except most of the world's vulcanologists. Research suggests that if anything, the Yellowstone supervolcano was a lot more active in the deep past, and we should readjust our expectations on when it might blow.
Whenever that year is, 2020 wasn't it.

An asteroid didn't slam into Earth

All eyes were on a nugget of mineral called 2018VP1 earlier in the year, which had a 1 in 240 chance of smacking into Earth on the day of the US election.
At barely 2 metres (around 7 feet) across, 2018VP1 falls well short of the 140 metres (460 feet) NASA sets as a bare minimum for rocks we really need to worry about. It's a pebble compared with the 10-kilometre behemoth that wiped out the dinosaurs, and even that one just happened to hit the planet in the worst possible way.

Still, any fast-moving boulder coming within 5,000 kilometres of the planet is a good reason to think about the risks we face from hazardous near-Earth asteroids.
On November 13 – a Friday, no less – the Asteroid Terrestrial-impact Last Alert System (ATLAS) survey at the Mauna Loa Observatory in Hawaii alerted sky-watchers to the passing of a rock the size of a small house.
At a mere 400 kilometres over the Pacific, the observation set a new record for the closest pass of an asteroid. Worse still, since it was obscured by the Sun's blinding glare, we had no idea it even existed until hours after it had already passed.
It's not that we had much to worry about, had it hit. The rock wasn't much bigger than the Chelyabinsk meteor which famously exploded over Russia in 2013.
But the close shave indicates that under the right circumstances we could easily be blindsided by an unexpected cosmic sniper. And if we were going to be blasted back into the Stone Age by an asteroid, 2020 would have made sense, right?
Needless to say, no asteroids of any concern hit Earth this year. Yay!

We weren't broiled alive by solar radiation

Betelgeuse is a red giant star more than 600 light years away which we all wish would just hurry up and die, because the resulting light show would be fantastic.
Earlier this year everybody got a wee bit excited when the star dimmed with what we all took to be a suggestive wink. It happened again in August. Were those the first notes of its swan song?
Nope. In at least one instance, it was probably an intruding veil of dust - about as exciting as a cloud passing the Sun on a cold winter's day.
Then we learned Betelgeuse was probably a lot younger than she first looked, so wouldn't go supernova for a long time, and we all turned our attention to other gloomy topics. If Betelgeuse had exploded, it would still be too far away to do us much harm.
But if the star were a fair bit closer – like just 65 light years away – its death could strip our planet of its ozone and leave us exposed.
Indeed, we have more to worry about from our own Sun's frequent outbursts of fast-moving charged particles. Thankfully we have a nice magnetic shield protecting us … which is still securely in place, right?
This year just so happens to mark the start of the star's 25th solar cycle. Hip hooray! Right now we're at a low point in its mood swings, which is nothing all that special. We see this kind of lull every 11 years.

Aliens never invaded

Remember back in 2017 when our Solar System was visited by a ridiculously fast asteroid?
We still have to triple-check our spelling of 'Oumuamua every time, but as it was the first confirmed visitor from outside our Solar System, it really wasn't long before the word 'aliens' was mentioned. Throw in the fact it's a weird shape and has a reddish colour, and it's a History Channel documentary in the making.
So, to our absolute and utter surprise, it turns out it wasn't aliens. Go figure.
Not to worry; late last year we had our second confirmed interstellar visitor in the form of a comet called 2I/Borisov, so we got our hopes up again.
Astronomers have been keeping a close eye on it through 2020, and we've learned a great deal about the object. It's a good thing, too. Given the chaos Earth has endured this year, our planet would be ripe for an alien takeover. No doubt they'd even bring their own supply of masks.

Armies of the undead never rose from the grave

It's rare that archaeologists find intact Egyptian tombs containing sealed sarcophagi that have remained untouched for centuries, let alone millennia. But when they do, it's a cause for excitement.
The secrets they contain can show us not just what our ancestors might have looked like, but how they sounded, how they lived, and how they died.
But this is 2020. So when the sealed coffins just kept coming this year, we were certain that this was how it would all end; in a wave of desiccated corpses waving their bandages about angrily as they rampage through the streets, right?
With 2020 now officially over, we think we can safely admit it's unlikely that hordes of the undead are on their way, and any secrets we find in Egyptian graves will ultimately benefit humanity.
Let's just not open any tombs in January though. Just to be sure.

Study of More Than 1 Million People Finds Intriguing Link Between Iron Levels And Lifespan

Seven of the 10 highest risk countries for terrorism are now in Africa

Source: https://amp-thenationalnews-com.cdn.ampproject.org/c/s/amp.thenationalnews.com/world/africa/seven-of-the-10-highest-risk-countries-for-terrorism-are-now-in-africa-1.1126986

Dec 11 – Seven African nations are among the 10 riskiest global locations for terrorism, according to a new study.
Terrorist incidents in Africa have risen by 13% in the last quarter alone, according to research by Verisk Maplecroft, illustrating the heightened risk from ISIS and other Islamist insurgents on the continent.
The National has published an investigation into how the extremist group has gained a territorial foothold, particularly in West Africa, which has suffered much of the violence.

Analysts say their findings should be a "major cause of concern" for the region's governments, with the outlook likely to get worse in 2021.
"Terrorist groups operating throughout sub-Saharan Africa are unlikely to lose their momentum in the next year," said Alexandre Raymakers, senior Africa analyst at Verisk Maplecroft.
"As the economic fallout from Covid-19 empties government coffers, governments will struggle to implement the comprehensive counterterrorism strategies required to contain these security threats."
Here are the African countries most exposed to a resurgent ISIS and the renewed threat of terrorism, according to the report.

Burkina Faso, Mali and Somalia
These three nations were considered the world's joint most at-risk countries for terrorism, alongside Syria and Afghanistan in the Middle East.
The report said militants will avoid striking mining sites and instead target government and military installations in order to extend their territorial control.
The National reported how ISIS has significant control of large swathes of the Sahel borderlands between Burkina Faso and Mali as it continues its quest for landmark territory.
"The Islamic State in the Greater Sahara has been stepping up its presence, expanding its activities and even competing with Al Qaeda-affiliated groups already operating in the area," warned Dr Francesco Milan, a lecturer in violent extremism at King's College London.

Cameroon
Cameroon has struggled with an uptick in terror attacks in recent years and was considered to have the world's sixth worst terror risk.

The nation has fallen victim to worsening violence in the Sahel, amid intensification of Boko Haram attacks in Chad, Nigeria and Cameroon, the study said.

Mozambique

Gas-rich Mozambique is also facing an "extreme" threat from extremist groups and was placed seventh on the list.
Intelligence analysts have reported a "drastic increase in sophistication" in the Mozambique extremists' planning and attacks.
Earlier this year, terrorist groups annexed a Mozambican port and nearby islands in a campaign that allegedly had been coordinated by ISIS commanders in Iraq.
The National's investigation found that after a series of successful attacks, concerns are growing that the ISIS is aiming to take resource-rich Cabo Delgado in the north of the country

DR Congo

Poaching and proceeds from illegal ruby, diamond and gold mining have fuelled the security risk in the central African nation, which was ranked ninth.
An investigation by *The National* found that the Mbororo semi-nomadic people of the region have become affiliated to ISIS as it regroups and grows in strength and resources.
"They are not only poaching hundreds of elephants, especially in Garamba National Park, in north-east Congo, but they carry a strong ISIS message that is influencing impoverished people," a security officer in the DRC said.
Verisk Maplecroft warned that the country's "security-heavy approach to counterterrorism" could result in substantial human rights violations committed against the civilian population.

Niger

Niger was ranked as having the globe's ninth highest terrorist risk by the study following a spate of attacks.
Many of these attacks were coordinated using lesser known social media platforms after being booted off Facebook and Twitter, The National revealed. The extremists have moved to a platform called Rocket Chat where they use their own servers.
Rocket Chat is insulated from outside attack, "which means that it's a place where conversations and content can be really interesting", said Charlie Winter, of the International Centre for the Study of Radicalisation at King's College London.

Nothing is impossible when logic comes first – I

Israel: MDA crew Avraham Mintz και Zoher Abu Jama praying together after a successful transportation of a medical emergency

Nothing is impossible when logic comes first – II

Qatar's Amir, GCC leaders sign Al Ula solidarity agreement to end Gulf crisis

Source: https://www.qatarday.com/news/local/qatars-amir-gcc-leaders-sign-al-ula-solidarity-agreement-to-end-gulf-crisis/81824

Jan 05 – HH The Amir Sheikh Tamim bin Hamad Al Thani signed the **Al Ula solidarity agreement** that will pave the way to end the Gulf crisis.

Qatar's Amir was joined by other Gulf leaders in the signing ceremony, held at the 41st session of the Supreme Council of the Cooperation Council for the Arab States of the Gulf (GCC), this afternoon in Al Ula, Saudi Arabia.

HH The Amir signed the declaration along with Kuwait Amir HH Sheikh Nawaf Al-Ahmed Al-Jaber Al-Sabah, Saudi Crown Prince HRH Mohammed bin Salman bin Abdulaziz Al-Saud, Bahrain's Crown Prince HE Salman bin Hamad Al Khalifa, Vice President of the UAE and Ruler of Dubai, HE Sheikh Mohammed bin Rashid and Omani Deputy Prime Minister HE Fahd bin Mahmoud Al Said.

The summit has been named as Sultan Qaboos Sheikh Sabah Summit in honour of the two great leaders - Sultan Qaboos bin Said bin Taimur and Sheikh Sabah Al-Ahmed Al-Jaber Al-Sabah - from Oman and Kuwait who passed away last year.

Saudi Arabia has already opened the airspace, land and sea border with Qatar as part of the agreement. In the coming days, more steps to end the crisis are expected to happen.

A Look at What's Ahead for 2021

Source: https://clarionproject.org/your-2021-extremism-forecast/

Jan 05 – Americans are still in shell shock from 2020, a year that projected the public onto the frontlines of extremism. Few people exited 2020 without a crash course on the complex reality of what extremist behavior and extremist ideologies look like.

And while most are heaving a collective sigh of relief that a torrential year of chaos and instability is over, it is most likely the case that extremism is our new reality for several years to come.

Here to help map out the year to come, we offer our 2021 forecast on how this pattern will unfold in 2021.

1. The Normalization of Extremist Groups

In 2020, Antifa gained a maelstrom of public support among civilians who believed in the the group's propaganda that it is simply anti-fascist. Despite Antifa's violent behavior that included singling out individuals or smaller groups amidst their mob and demanding uniform or compliant behavior, it has been largely lost on their public supporters that the group has exhibited the very thing it claims to stand: fascism.

Antifa protesters in Olympia, Washington on Dec. 12, 2020 (Photo: David Ryder/Getty Images)

In 2020, America witnessed, for example, everyday American mothers building a human wall (aka the "Wall of Moms") to protect Antifa rioters from law enforcement. On the eve of the new year, Antifa announced a Portland-based Anti-Fascist Soccer League.

The move to build community-oriented sports clubs not only normalizes Antifa, but takes a page out of other extremist groups that seek these venues as soft ground for recruitment and outreach.
In 2021, expect further normalization and specifically integration of this extremist group into the fabric of society.

2. Asymmetrical Terror Attacks
Terror ideologies and terror tactics adapt to the times, as covered in Clarion Project's iinaugural podcast launch last year that looked at how jihadists were exploiting the COVID-19 crisis. Less than two weeks ago, on Christmas Day, an explosion in Nashville offered a new curveball in understanding terrorism.
Terrorism analysts Max Abrahams and Joseph Mroszczyk offered several points of significance that set the Nashville Christmas Day explosion apart from other terror attacks. The attack tried to minimize civilian casualties and was not accompanied by the dissemination of any ideological manifesto. Even though the Nashville attack was not a jihadist attack, the perpetrator copied the jihadi tactic of using a vehicle-borne improvised explosive device.

3. The Death of Nuance
A meme circulating around 2016 was "Everyone who doesn't agree with me is a Nazi." It was tongue-in-cheek phrase marking the rise of polarization. Today, the more appropriate meme would be "Everyone who doesn't agree with me must be an extremist."
In 2020, the American landscape erupted in the war of extremes with opposing ideological groups engaging in open violence. The hyper-polarization driving more simplistic (and more dangerous) forms of tribalism will only escalate in 2021, with a combination of open violence along with antagonization and intimidation.
In 2021, vague identity markers — sloppily used by the media and political celebrities (where anyone can be marked as a white supremacist, an Islamist, etc.) — will be used by a broader percentage of the civilian population over issues that are not extremist in nature.
Case in point: Last month, a teacher out of Charlotte, North Carolina, called parents who want schools to re-open "white supremacists."
While more terror attacks and splintering extremist factions are most likely in our future, the most dangerous of all is the rising radicalization of the American public via the death of nuance.
The most necessary course of action in 2021 will be disengagement and de-escalation. While the average American is not directly responsible for nor has control over major events, we all have a part to play in the perimeter that encircles our lives, whether on- or offline.

Umbilical cord mesenchymal stem cells for COVID-19 acute respiratory distress syndrome: A double-blind, phase 1/2a, randomized controlled trial

By Giacomo Lanzoni, Elina Linetsky, Diego Correa, Shari Messinger Cayetano, Roger A. Alvarez, Dimitrios Kouroupis, et al.
STEM CELLS Transl Med. 2021;1–14
Source: https://stemcellsjournals.onlinelibrary.wiley.com/doi/epdf/10.1002/sctm.20-0472

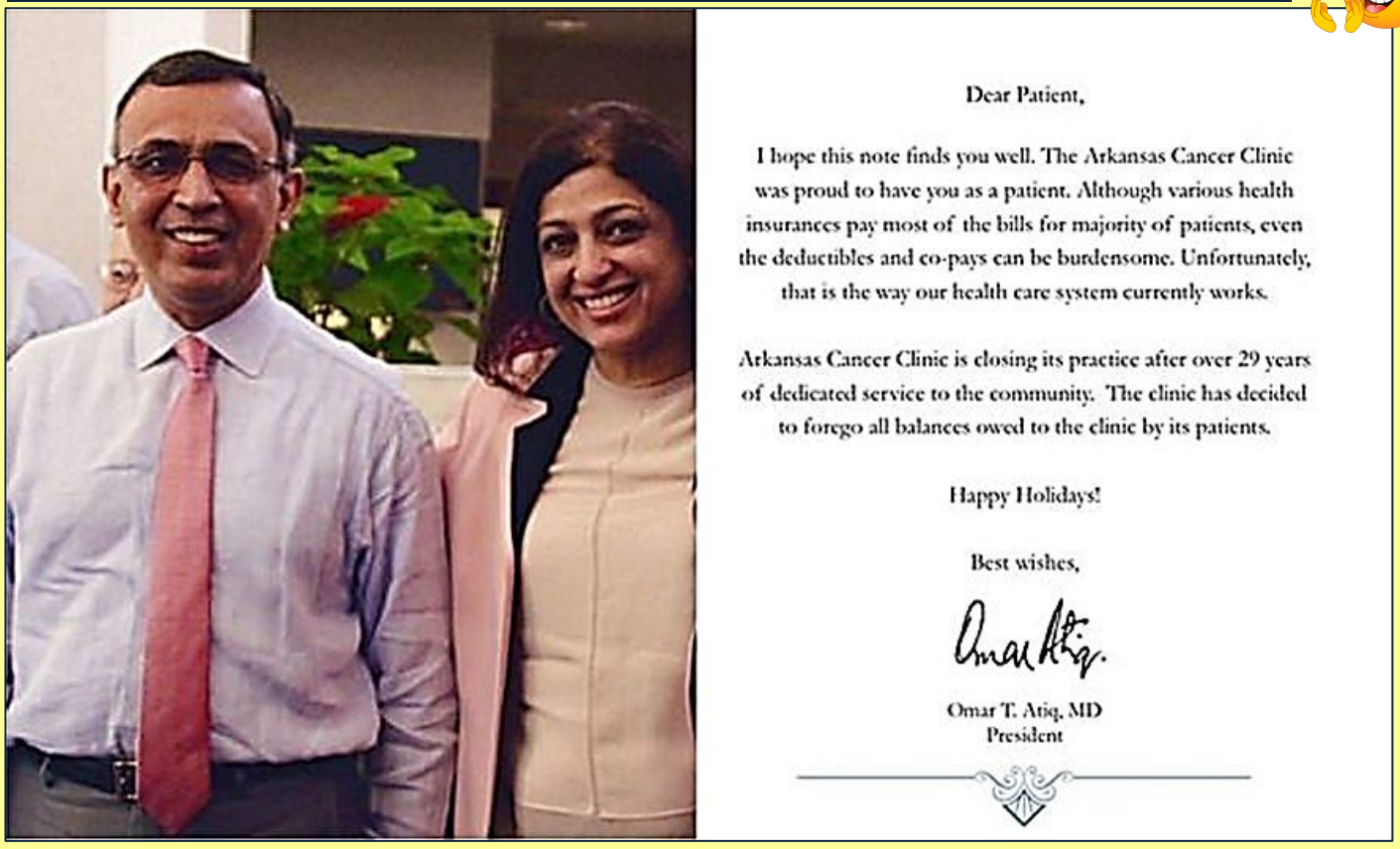
Acute respiratory distress syndrome(ARDS) inCOVID-19isassociatedwithhighmortality. Mesenchymal stem cells are known to exert immunomodulatory and anti-inflammatory effects and could yield beneficial effects in COVID-19 ARDS. The objective of this study was to determine safety and explore efficacy of umbilical cord mesenchymal stem cell (UC-MSC) infusions in subjects with COVID-19 ARDS. A double-blind, phase 1/2a, randomized, controlled trial was performed. Randomization and stratification by ARDS severity was used to foster balance among groups. All subjects were analyzed under intention to treat design.
Twenty-four subjects were randomized 1:1 to either UC-MSC treatment (n = 12) or the control group (n = 12). Subjects in the UC-MSC treatment group received two intravenous infusions (at day 0 and 3) of $100 \pm 20 \times 10^6$ UC-MSCs; controls received two infusions of vehicle solution. Both groups received best standard of care. Primary endpoint was safety (adverse events [AEs]) within 6 hours; cardiac arrest or death within 24 hours postinfusion).
Secondary endpoints included patient survival at 31 days after the first infusion and time to recovery. No difference was observed between groups in infusion-associated AEs. No serious adverse events (SAEs) were observed related to UC-MSC infusions. UC-MSC infusions in COVID-19 ARDS were found to be safe. Inflammatory cytokines were significantly decreased in UC-MSC-treated subjects at day 6. Treatment was associated with significantly

improved patient survival (91% vs 42%, P = .015), SAE-free survival (P = .008), and time to recovery (P = .03). UC-MSC infusions are safe and could be beneficial in treating subjects with COVID-19 ARDS.

Lessons learned

- Two intravenous infusions of umbilical cord mesenchy-mal stem cells (UC-MSCs), at a dose of 100 million cellsper infusion, given 72 hours apart, are safe in COVID-19patients with acute respiratory distress syndrome.
- This double blind randomized controlled trial in 24 subjectsdemonstrated fewer serious adverse events in the UC-MSCtreatment group compared with the control group.
- UC-MSC treatment was associated with a significantdecrease in a set of inflammatory cytokines involved inthe COVID-19"cytokine storm."
- UC-MSC treatment was associated with significantlyimproved patient survival and time to recovery.
- The observed findings strongly support further investigationin a larger trial designed to estimate and establish efficacy.

A good doctor



Dear Patient,

I hope this note finds you well. The Arkansas Cancer Clinic was proud to have you as a patient. Although various health insurances pay most of the bills for majority of patients, even the deductibles and co-pays can be burdensome. Unfortunately, that is the way our health care system currently works.

Arkansas Cancer Clinic is closing its practice after over 29 years of dedicated service to the community. The clinic has decided to forego all balances owed to the clinic by its patients.

Happy Holidays!

Best wishes,

Omar T. Atiq, MD
President

The overall patients' dept was circa 650,000 USD.

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.

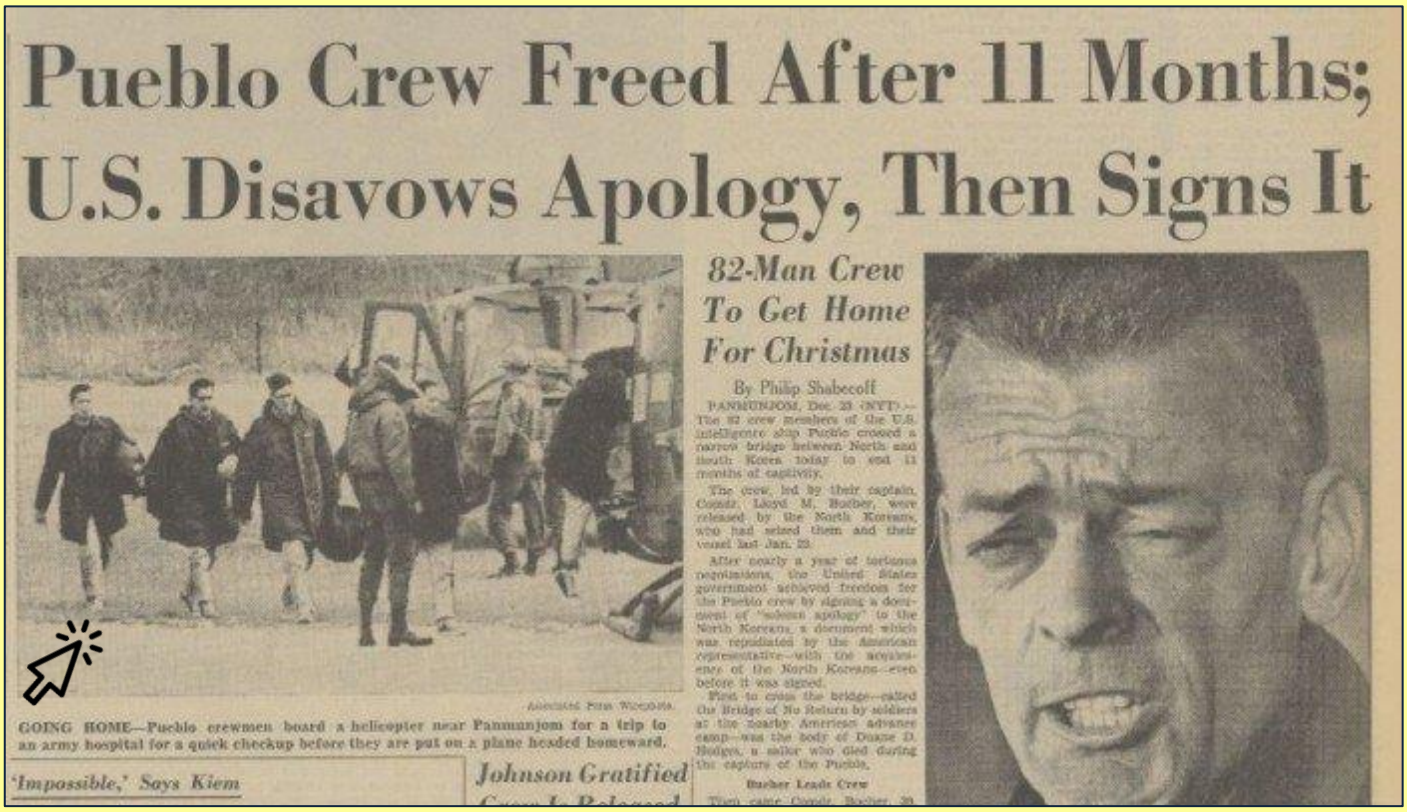
Afghan officials have reported that the relationship between the Taliban and al-Qaeda seems as cozy as ever since the Taliban inked a deal with the United States in a Doha ceremony on Feb. 29 – as First Vice President Amrullah Saleh said last week, trying to separate the deeply intertwined groups "is 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.*

EDITOR'S COMMENT: Perhaps we should consider "vaccine-terrorism" as well. We do know that terrorists adapt to circumstances and currently vaccine stockpiles are the most valuable survival assets worldwide. Thousands of jabs stored in one place; electricity-dependent; with normal security (anti-theft) presence pose an ideal target. Not to mention Mafia as well!

A forgotten story



Pueblo Crew Freed After 11 Months; U.S. Disavows Apology, Then Signs It

82-Man Crew To Get Home For Christmas

By Philip Shabecoff

PANMUNJOM, Dec. 23 (NYT) — The 82 crew members of the U.S. intelligence ship Pueblo crossed a narrow bridge between North and South Korea today to end 11 months of captivity.

The crew, led by their captain, Comdr. Lloyd M. Bucher, were released by the North Koreans, who had seized them and their vessel last Jan. 23.

After nearly a year of tortuous negotiations, the United States government achieved freedom for the Pueblo crew by signing a document of "solemn apology" to the North Koreans, a document which was repudiated by the American representative—with the acquiescence of the North Koreans—even before it was signed.

First to cross the bridge—called the Bridge of No Return by soldiers at the nearby American advance camp—was the body of Duane D. Hodges, a sailor who died during the capture of the Pueblo.

Bucher Leads Crew

GOING HOME—Pueblo crewmen board a helicopter near Panmunjom for a trip to an army hospital for a quick checkup before they are put on a plane headed homeward.

'Impossible,' Says Kiem

Johnson Gratified

Racist, Extremist, Anti-Semitic Conspiracies Surround Coronavirus Vaccine Rollout

Source: http://www.homelandsecuritynewswire.com/dr20210105-racist-extremist-antisemitic-conspiracies-surround-coronavirus-vaccine-rollout

Jan 05 – Since the beginning of the coronavirus pandemic, extremists across the ideological spectrum have used the virus as a platform for elaborate and alarming conspiracy theories. In March and April 2020, anti-Semitic, anti-government and Sinophobic conspiracies about the virus's origins and "true purpose" were rampant online. In December 2020, as the COVID-19 vaccine was being shipped to frontline workers across the country, very familiar conspiracy theories took root in online spaces alongside mainstream concerns about vaccine distribution and effectiveness.

Purveyors of these theories suggest that the vaccine is a new form of population control or elevate debunked fears about the vaccine's side effects. Some are peddling anti-Semitic tropes about Jewish control of the virus and vaccine, while arguing that Black Americans should be used to test the vaccine's safety.

The following are a sampling of these conspiracy theories circulating online:

The "Jew Vaccine"

Anti-Semitism has been an ongoing theme since the pandemic began, with conspiracies alleging that Jews are behind the coronavirus and are using it as a tool to expand global influence and derive profit. As countries begin administering the vaccine, Jews are once again the target of anti-Semitic conspiracies, mostly aimed at dissuading people from being vaccinated.

Much of the anti-Semitic messaging around the vaccine highlights Pfizer CEO Albert Bourla's Jewish heritage. This fact provides anti-Semites with "evidence" that the widespread vaccine effort is part of a calculated, long-term Jewish plot to institute a "Global Jew Government," a new iteration of the age-old canard of international Jewish control.

Some believe Jews will achieve this power by using the vaccine ingredients to sterilize the "white race." Still others assert that the "ZOG" (Zionist Occupied Government) plans to "enslave of all humanity" by preventing the unvaccinated from working, travelling or going to school.

These anti-Semitic theories of the "Jew Vaccine" proliferate across white supremacist and neo-Nazi websites like Stormfront and The Daily Stormer, as well as in anti-Semitic and coronavirus conspiracy social media channels. One conspiracy, posted to the white supremacist website Stormfront, alleges: "The Jews vaccine changes DNA so that the DNA itself will produce any proteins that the Jews program it to produce via 5G. This gives the Jews the ability to kill you by using 5G to tell the DNA to produce poisons."

Others evoke the Holocaust when discussing the vaccine. A Greek newspaper compared Pfizer CEO Bourla, who was born in Greece, to Nazi war criminal Josef Mengele, known for his gruesome medical experiments on concentration camp prisoners. A UK newspaper printed an image of the entrance to Auschwitz, changing the iconic "Arbeit Macht Frei" to "Vaccines are Safe Path to Freedom," and vaccination cards have been compared to the yellow star Jews were forced to wear in Nazi Germany.

The Nation of Islam (NOI) strongly rejects current vaccination efforts – demonstrating a combination of general anxiety about vaccines and the history of medical experimentation on vulnerable populations of color, as well as conspiratorial claims alleging that the coronavirus vaccines were designed to intentionally harm Black people. NOI leader Louis Farrakhan asserts that the coronavirus vaccines are part of a "satanic" US government depopulation plot and that they are "shots of toxic waste" and a means to "quicken death" among Black people. In warning against the coronavirus vaccines, various NOI sources, including prominent national leaders and official social media channels, have implicated Jews in a larger conspiracy to target Black populations through vaccines. During a December 6 sermon broadcast live from NOI headquarters at Chicago's Mosque Maryam, Student Minister Ishmael Muhammad repeated Farrakhan's 2013 claim that Jews are given a special version of the flu shot, while other populations receive one with toxic chemical additives. In his December 20 sermon, Muhammad also referenced the "Synagogue of Satan" (an anti-Semitic phrase used to refer to Jews) for allegedly promoting vaccines to sterilize Black people.

Anti-Government Movement Paranoia and Fear

For decades prior to the coronavirus pandemic, some anti-government extremists warned that vaccines could be used as a means of extending government control over the population or even as a tool to depopulate the United States. Across anti-government forums, the announcement of a vaccine rollout has been met with deep skepticism and fear. Many people have announced that they will refuse the vaccine.

True to their anti-government beliefs, some have asserted that the vaccine is part of a nefarious government plot, though they differ on the putative objective. Some argue that it is part of a depopulation effort, perhaps to bring the narrative into accordance with conspiracy theorists' darkest beliefs regarding Agenda 21 or Agenda 2030 – voluntary United Nations programs designed to help countries meet sustainability goals, which some conspiracists believe will be used to take away civil rights.

Others assert that the vaccine will usher in mass surveillance by injecting microchips directly into people. As one user wrote on mymilitia.com, "They've been working on a nano drug delivery system for almost a decade but probably longer… there is absolutely no doubt in my mind that this is the catalyst for complete surveillance, monitoring, and future banking/money for anyone who survives anyway." Still others have shared articles about the Centers for Disease Control and Prevention's "immunity cards" as proof that the vaccine is part of a governmental effort to infringe on people's liberty by requiring people to prove they have been vaccinated before traveling.

Militia boards users express fear that the coronavirus vaccines are part of a globalist or foreign (usually Chinese) plot to lay the groundwork for an invasion. Posters are sharing articles alleging that Chinese agents have infiltrated the pharmaceutical companies manufacturing the vaccines and intend to use the injections as part of "unrestricted warfare" to poison the U.S. military, leaving it incapable of fending off an invasion. As one commenter warns, "Corona virus (covid-19) is a man-made bio-weapon created by the Chi-Coms by splicing AIDS, SARS, and a Corona Virus" [sic]. Adds another, "They are attacking just not with bullets and bombs."

QAnon Adherents Echo Vaccine Skepticism

Those who populate the numerous QAnon-centric online spaces are similarly skeptical when it comes to the COVID-19 vaccine, with concerns ranging from the efficacy and alleged undisclosed side effects of the vaccine to the existence of the vaccine itself.

In early December, as the vaccine roll-out began in Europe, an article posted on the right-wing and conspiratorial website "Health & Money" began to circulate on niche social media platforms like Gab, Parler and MeWe. The article quoted two scientists, one of whom once worked for Pfizer, warning that the Pfizer vaccine might lead to infertility in women. While the article was thoroughly debunked, it was picked up by many popular QAnon influencers who spun the story into narratives about forced sterilization, population control and genocide.

Some took this even further, speculating that the COVID-19 vaccine contains nanobots and technology to connect the recipient to a "global hive mind."

When ostensibly mainstream conservative voices raise doubts about the vaccine, their baseless claims are picked up – and further amplified by – Qanon adherents.

For example, Sidney Powell, formerly part of President Trump's legal team, joined the many voices warning about the alleged downsides of the vaccine. On December 4, in response to reports of government-issued vaccination cards, Powell tweeted: "NO WAY #America. This is more authoritarian communist control imported straight from #China."

QAnon conspiracy theorists also express more conventional concerns about the vaccines, alleging that their long-term success is unproven, and their long-term side effects are unknown. But they take it a step further, claiming the vaccine is part of a massive, global experiment designed to permanently alter humans' genetic makeup.

Finally, there are those who believe that the vaccine does not exist at all. This theory is an extension of the claim that COVID-19 was entirely a hoax. Some who subscribe to the hoax theory believe that the people receiving the vaccine publicly are actors who have been hired to make the charade seem real.

White Supremacists Allege Sterilization, DNA Altering

White supremacists have also adopted conspiracy theories about the vaccine's nefarious purpose and theoretical side effects. Despite statements from medical professionals assuring the public of the vaccine's safety, online white supremacist spaces continue to push claims that the vaccine will permanently alter white DNA and will sterilize or even kill the recipient. The vaccine is seen by some as another coordinated attack against white people and a threat to the future of white children.

Some white supremacists have turned this "population control" conspiracy into a racist advocacy mission, pushing the hashtag "VaxTheBlacks," and urging people of color to get vaccinated. The rationale, according to one Telegram poster: "if you protected a sizeable portion of Whites from the sterilisation [sic] vaccine; the world would be ripe for the reconquering by the Aryan man."

The "VaxTheBlacks" hashtag is spreading across white supremacist social media channels, couched as fake concern for the Black community, which has been disproportionally impacted by coronavirus. They offer to give up their place in their vaccine line so that more people of color can be prioritized (and therefore, according to their conspiracy, sterilized or harmed). One Telegram user posted: "To make reparations for the hardship of White colonialism, blacks should get free COVID vaccinations and get the injections first to protect them from the pandemic" while another responded to the vaccination of Sandra Lindsay, a New York City nurse and the first American to receive the vaccine, with a post reading, "I'm so proud that the first person to receive this vaccine was a much-disenfranchised person of color. We have come so far as a society. All I ask now is that whites continue to realize their privilege and get out of the way. Make sure every black person has gotten the vaccine before a single white decides to get it."

This weaponization of the vaccine mirrors the early days of the pandemic, when white supremacists posted memes encouraging people to intentionally infect elected officials and marginalized communities with the virus.

Characteristically, other white supremacists — generally from the accelerationist fringe whose goal is to speed up the eventual downfall of society — see the vaccine and distribution plans as further opportunity for conflict. Accelerationists believe the current American system is rotten, due to Jewish control, and should be eliminated. Federal and state efforts to control the spread of coronavirus are evidence of this rot.

Accelerationists promote pushback against or unease about state mandated closures, lockdowns and vaccinations as potential triggers for civil unrest and rebellion. One Telegram user posted a vaccine distribution "Christmas wish," calling for "vaccine refusals, National Guard deployment, no vaccine liabilities, civil unrest, and martial law" resulting in violence or death.

Jan 20, 2021

The new administration cares about the spread of SARS-CoV-2

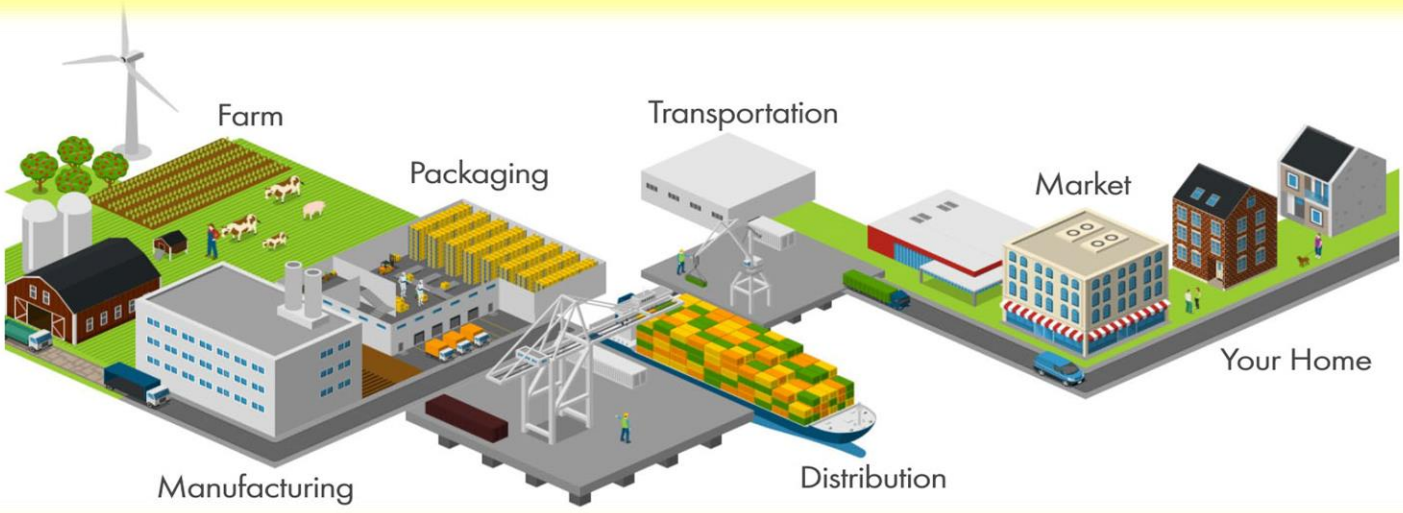
Pharmacist Arrested After Grafton Police Say He Sabotaged More Than 500 COVID-19 Vaccine Doses

Source: https://eu.jsonline.com/story/news/2020/12/31/500-doses-covid-19-vaccine-thrown-out-hospital-worker-aurora-removed-from-fridge-on-purpose-grafton/4098837001/

Jan 01 – A pharmacist accused of tampering with over 500 doses of COVID-19 vaccine at Aurora Medical Center in Grafton, Wis., was arrested Thursday.
Grafton police said the pharmacist, a Grafton resident, removed 57 vials from a refrigerator and left them out overnight last week. They said the man knew this would render the vaccines "useless" and make people who received them believe they were vaccinated when they were not.
Each vial contained about 10 doses of vaccine. Aurora discarded more than 500 doses and Thursday said it has determined 57 people were given less-effective or ineffective vaccines.

Secure Food Supply Chain

By Adam Thomas
Source: http://www.homelandsecuritynewswire.com/dr20210107-secure-food-supply-chain



Jan 07 – University of Delaware's Kyle Davis investigates how to make the global food supply more resilient
As the world grows increasingly globalized, one of the ways that countries have come to rely on one another is through a more intricate and interconnected food supply chain. Food produced in one country is often consumed in another country — with technological advances allowing food to be shipped between countries that are increasingly distant from one another.
This interconnectedness has its benefits. For instance, if the United States imports food from multiple countries and one of those countries abruptly stops exporting food to the United States, there are still other countries that can be relied on to supply food. But, as the coronavirus COVID-19 global pandemic has made abundantly clear, it also leaves the food supply chain — all the steps involved in bringing food from farms to people's tables across the world — exposed to potential shocks to the system.
A new study published in *Nature Food* led by the University of Delaware's Kyle Davis looked at how to ensure that food supply chains are still able to function under these types of environmental shocks and highlighted key areas where future research should be focused. Co-authors on the study include Shauna Downs, assistant professor at Rutgers University's School of Public Health, and Jessica A. Gephart, assistant professor in the Department of Environmental Science at American University.
Davis said the motivation behind the paper was to understand current knowledge on environmental disruptions in food supply chains and to investigate evidence that disruptions in one step of the food supply chain impact subsequent stages. The steps on the global food supply chain are described in the paper as food production, storage, processing, distribution and trade, retail and consumption.

"Does a disruption in food production get passed through different steps and ultimately impact distribution and trade, all the way down to the consumers?" asked Davis, assistant professor in the Department of Geography and Spatial Sciences in UD's College of Earth, Ocean and Environment and the Department of Plant and Soil Sciences in UD's College of Agriculture and Natural Resources who is also a resident faculty member with UD's Data Science Institute. "If there's a shock to agriculture on the other side of the world, will you see the effects in your grocery store?"

The environmental disruptions covered in the paper include events like floods, droughts, and extreme heat, as well as other phenomena like natural hazards, pests, disease, algal blooms, and coral bleaching.

Davis said that this work is especially timely — given the unprecedented effects that the COVID-19 pandemic has had on the entire food supply chain — and highlights the importance of understanding how to make global food supply chains function properly under stress.

"COVID-19 has affected all steps in the supply chain simultaneously, from not having enough seasonal workers to harvest the crops to meat processing plants temporarily closing because workers get sick, to hoarding behaviors and runs on grocery stores," Davis said. "We've also seen many people losing their jobs, and as a result, they may not be able to purchase certain foods anymore."

Researchers have focused on understanding how temperature and precipitation affect staple crops at the production step in the supply chain, Davis said, but how that impacts the rest of the steps in the food supply chain has not been researched thoroughly. Because of this, we don't have a good grasp of how a suite of disruptions on a variety of food items ultimately impact consumption, food security, and nutrition.

To address these gaps in knowledge, the researchers identified key areas for future research: 1) to understand the shape of a supply chain, meaning its relative number of farmers, distributors, retailers and consumers to identify possible vulnerabilities; 2) to evaluate how simultaneous shocks — such as droughts in two different places — impact the whole supply chain; and 3) to quantify the ability for substitutions to occur within supply chains, like switching cornmeal for flour if there is a wheat shortage.

Ultimately, Davis said this work can help policy makers and businesses make food systems more capable of predicting and absorbing unprecedented shocks.

"As climate change and other sudden global events like pandemics exercise greater influence on food systems," Davis said, "we will need to continue building resilience into our food supply chain so that we're able to absorb a disruption that may be bigger than what we've seen in the past but still maintain the function of the supply chain — getting food from field to fork."

***Adam Thomas** is a fee-lance journalist.*

A judgment recognizes (without saying it) the status of climate refugee

Source: http://www.tellerreport.com/life/2021-01-07-%0A---a-judgment-recognizes-(without-saying-it)-the-status-of-climate-refugee%0A--.rJw3aXc40w.html

Jan 07 – In December, the Bordeaux administrative court of appeal refused the deportation of an undocumented Bengali living in Toulouse and suffering from a chronic respiratory disease, basing its decision on cries. Sheel lives 200 km from Dhaka, the capital of Bangladesh which is also one of the most polluted cities in the world.

Could this be the first judgment of an administrative court of appeal which enshrines the status of climate refugee?

"Yes, because indeed, I am not aware of another case where justice would have considered as is the case here, that sending a person who suffers from respiratory problems in one of the most polluted countries in the world, I 'would expose him to a risk of aggravation of his disease, or even to premature death,' relishes the lawyer from Toulouse, Ludovic Rivière.

Arrived in France in 2011 to flee persecution, Sheel *, forty years old, from a small town in Bangladesh 200 km north of the capital Dhaka, is now living in Toulouse where he works in a restaurant as a that cook waiter.

Since 2015, he has held a temporary residence permit as a sick foreigner.

Allergic asthma

And for good reason: he suffers from an asthma allergic to dust mites and a severe sleep apnea syndrome which requires the daily assistance of a breathing apparatus to sleep.

Electrical equipment that must undergo rigorous maintenance, with a monthly replacement of the mask, filters and hoses.

Not to mention the heavy drug treatment that he must follow in parallel to the letter.

A health condition which did not prevent the Prefecture of Haute-Garonne from taking against it on June 18, 2019, an obligation to leave French territory (OQTF).

For the administration, “he can benefit from appropriate treatment in his country of origin”.
It is not the opinion of his lawyer which is based on a detailed medical opinion: "the assumption of responsibility in his country of origin is not possible".
And to recall that "the rate of fine particles suspended in the air, measured in Bangladesh, is among the highest in the world".
As for the mortality rate linked to asthma, a pathology presented by Sheel, it is “12.92 per 100,000 inhabitants, against 0.82 in France”.

"Worsening of his pathology" in case of return to Bangladesh
On June 15, 2020, the Toulouse administrative court canceled the obligation to leave the territory, but without brandishing the criterion of air pollution as a criterion of danger.
On the other hand, last December 18, the administrative court of appeal of Bordeaux, seized by the Prefect of Haute-Garonne, was much more categorical.
For the court, sending Sheel back to his country of origin would lead to "an aggravation of his respiratory pathology due to air pollution".
Without taking into account that he "would be confronted with the risks of interruption of a treatment less well adapted to his state of health and to dysfunctions of the respiratory system of which he has a vital need, because, on the one hand difficulties in replacing parts, and on the other hand, power cuts during the night ".
In other words, justice brought in the climatic criterion to assess the state of health risk in which a sick foreigner finds himself and that is a first ...

EDITOR'S COMMENT: According to first national asthma prevalence study (NAPS) in Bangladesh about 7 million people (5.2%) suffering from current asthma, more than 90% of whom do not take modern treatment. In a study done by Aggarwal et al the prevalence of asthma was found to vary from 4.3%-6.9% in the Indian subcontinent population. In case Bangladeshi do not know it, Switzerland has fantastic asthma clinics in the Davos mountainous area – tons of oxygen! Not sure about asylum!

Plague may have caused die-offs of ancient Siberians

Source: https://www.sciencenews.org/article/plague-bacteria-die-offs-ancient-siberians-genetics-dna

Jan 06 – Ancient people brought the plague to Siberia by about 4,400 years ago, which may have led to collapses in the population there, a new genetic analysis suggests.
That preliminary finding raises the possibility that plague-induced die offs influenced the genetic structure of northeast Asians who trekked to North America starting perhaps 5,500 years ago. If the result holds up, it, along with other newly uncovered insights into human population dynamics in the region, would unveil a more complex ancestry among those ancient travelers than has usually been assumed.
A team led by evolutionary geneticists Gülşah Merve Kilinç and Anders Götherström, both of Stockholm University, extracted DNA from the remains of 40 human skeletons previously excavated in parts of eastern Siberia. Among those samples, DNA from *Yersinia pestis*, the bacterium that causes plague, was found in two ancient Siberians, the researchers report January 6 in *Science Advances*. One person lived around 4,400 years ago. The other dated to roughly 3,800 years ago.
It's unclear how the plague bacterium first reached Siberia or whether it caused widespread infections and death, Götherström says. But he and his colleagues found that genetic diversity in their ancient samples of human DNA declined sharply from around 4,700 to 4,400 years ago, possibly the result of population collapse.
The new data coincide with evidence reported in June 2020 in *Cell* of *Y. pestis* DNA in two ancient individuals from eastern Siberia's Lake Baikal region, dating to around 4,500 years ago.
The plague may well have reached Siberia by roughly 4,500 years ago, at a time when *Y. pestis* infected people inhabiting other parts of Eurasia (*SN: 10/22/15*), says evolutionary geneticist Hendrik Poinar of McMaster University in Hamilton, Canada who did not participate in the new study.
But it's possible that the ancient Siberians were infected with a version of *Y. pestis* that wasn't virulent. If so, the bacterium wouldn't have killed enough people to alter the genetic structure of Siberians. Genetic data from only two individuals provides too little evidence to confirm that they possessed a virulent strain of *Y. pestis*, Poinar says.

The genetic findings do provide a glimpse of a series of previously unknown ancient population shifts in that region. Ancient individuals included in the new research dated from around 16,900 years ago, shortly after the last Ice Age peaked, to 550 years ago. The researchers compared those ancient Siberians' DNA to DNA from present-day humans in different parts of the world and to previous samples of ancient human DNA — mainly from Europe, Asia and North America. The analyses showed that despite Siberia's harsh climate, groups near Lake Baikal and regions further east mixed with various populations in and outside of Siberia from the Late Stone Age up to medieval times. The two plague-carrying Siberians, in particular, came from regions that had experienced major population transformations during much of the sampled time period, the researchers say. Those events could have included migrations of plague-carrying people from outside Siberia. For instance, the 4,400-year-old skeleton was found just west of Lake Baikal, a region that witnessed the emergence of several distinct genetic groups — with roots mainly further to the west and southwest of Lake Baikal — between around 8,980 and 560 years ago.

2020 Year in Review: COVID, Collapsing America and the Most Censored Stories of the Year

By Michael Welch, Patrick Henningsen, Dmitry Orlov, and Andy Lee Roth

Source: https://www.globalresearch.ca/2020-year-in-review-covid-collapsing-america-and-the-most-censored-stories-of-the-year/5733883

"Make New Mistakes. Make glorious, amazing mistakes. Make mistakes nobody's ever made before. Don't freeze, don't stop, don't worry that it isn't good enough, or it isn't perfect, whatever it is: art, or love, or work or family or life. Whatever it is you're scared of doing, Do it. Make your mistakes, next year and forever."

– Neil Gaiman[1]

▶▶ **Click to download the audio (MP3 format)**

Jan 08 – So what was the biggest story of 2020?

I don't think a lot of our listener audience will disagree with the view that a little coronavirus which goes by the name SARS-CoV-2 could be the star performer in the world's 'plaque of the year' drama!

As it turns out, the germ which is responsible for COVID-19 is replacing all other contenders for the role of Humanity's number one threat. Not only does this tiny menace get a daily mention in city newspaper's death toll, we mark the number of people who tested positive.

[1] Neil Gaiman's Journal: My New Year Wish; journal.neilgaiman.com/2011/12/my-new-year-wish.html

In fact, for the first time in history, many, many cities and countries are shutting right down, masking themselves, social distancing and eagerly waiting for the magic elixir, the COVID vaccine, to come to their rescue.
Who or what can possibly top that?
The story is about more than citizens of every country getting sick. It has altered how children are educated. It deflated early on the popularity of Donald Trump. It forced nations into debt as they coped with the situation. And in a recent report, according to Americans for Tax Fairness (ATF) and the Institute for Policy Studies (IPS), America's 651 billionaires combined saw their wealth collectively grow from $1 Trillion from the beginning of the outbreak to roughly $4 Trillion as of December 7, 2020!
On this week's Global Research News Hour, we are going to take a look, not only at COVID, but how it impacts our lives in so many new ways.
Our first guest, **Patrick Henningsen**, takes a look at how COVID altered journalism, internet research and shut down our society, while looking ahead to where this will lead us in 2021. A little later, the Global Research News Hour reads a section of **Dmitry Orlov's** latest article which assesses where the US has a chance of waging a war.
For our second half hour, **Andy Lee Roth** joins us for his annual review of Project Censored's latest publication and a list of the most censored stories of 2020. Following that, the Global Research News Hour mentions a brief assessment of the horrific events on Capitol Hill on Wednesday January 6 in the context of the previous discussions.

Patrick Henningsen *is an American writer and global affairs analyst and founder of independent news and analysis site 21st Century Wire, occasional co-host of UK Column and is host of the SUNDAY WIRE weekly radio show broadcast globally over the Alternate Current Radio Network (ACR). He has written for a number of international publications and has done extensive on-the-ground reporting in the Middle East including work in Syria and Iraq.*
Dmitry Orlov *is a Russian-American writer, blogger and geopolitical analyst based in Moscow. He has degrees in Computer Engineering and Linguistics and has worked in the fields of high energy physics, internet commerce, advertising and network security. He is the author of Reinventing Collapse: The Soviet Experience and American Prospects and Shrinking the Technosphere: Getting a Grip on the Technologies that Limit our Autonomy, Self-sufficiency and Freedom. His blog site is cluborlov.com.*
Andy Lee Roth*, is the Associate Director of Project Censored, a media research program which fosters student development of media literacy and critical thinking skills as applied to news media censorship in the United States.*

This Small Device will Save Wounded Soldiers at Battlefield

Source: https://i-hls.com/archives/106265

Jan 09 – As the US Army prepares for future war, resupplying isolated units on the battlefield with medical necessities such as blood and IV solution will be a constant challenge. A portable device that medics can use to transform even "ditch water" into intravenous fluid will become a life-saving battlefield necessity for treating wounded soldiers.
The Army Medical Materiel Development Activity has been working for the past two years with TDA Research to create a working prototype of what it calls the **Lactated Ringer's Solution Generator**, providing the fluid you may receive if you're dehydrated, having surgery, or receiving IV medications. The briefcase-sized lightweight device can transform any groundwater source in austere terrain into a one-liter bag of the solution in roughly six minutes.
The company has received just over $1 million in research funding from the Defense Health Agency's Small Business Innovation Research program to design and build the device. Austin Langdon, a former Army flight medic, who serves as the assistant product manager on the effort, said: "This unit can make LR solution from practically any water source,

including ditch water," Langdon said in the release. "Without question, this small device will dramatically reduce the Army's logistical footprint of having to ship and store lactated Ringer's solution, which is the fluid of choice for resuscitation if blood is not available on the battlefield."

The LR generator runs on a rechargeable lithium-ion cell that can produce more than 30 bags of LR solution from a single charge.

The next step is looking for some funding from a program office to make large numbers of prototypes and get FDA approval, according to military.com.

Leaning into Uncertainty: A Life of Anticipating the Worst-Case Scenario

By Debra Winter

Source: http://www.homelandsecuritynewswire.com/dr20210108-leaning-into-uncertainty-a-life-of-anticipating-the-worstcase-scenario

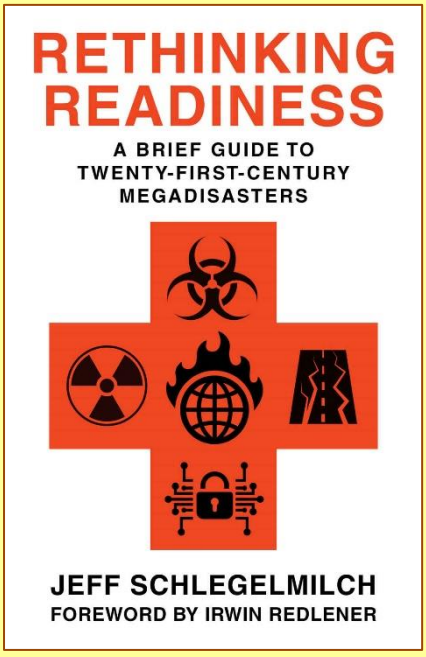
Jan 08 – **One of the most difficult things about the COVID era is not knowing anything for certain.** At first, no one knew the great reach of the virus, how exactly it spread, or how many would die. Twelve months in, we are still fuzzy on the details. **In a world of loud talkers that is starved of true leadership, where do we as individuals turn for information and reliable answers?**

The director of the National Center for Disaster Preparedness at Columbia University's Earth Institute, Jeffrey Schlegelmilch, agrees that managing the unknown is indeed uncomfortable. But his advice differs from most experts. Rather than leading us down one path with extremist conviction, he suggests instead that we lean into our uncertainty. I spoke with him by Zoom to discuss managing our new world of unknowns in the current pandemic.

"Our tendency is to reject uncertainty," Schlegelmilch told me. "We want answers, a checklist, a pill, a vaccine, something discrete and simple to solve these problems."

It's true—we all want fast answers and fast solutions, especially when dealing with the unknown. Not only is this virus a moving target, with lots of unexplained medical impacts, but also our understanding of it is so limited it feels overwhelming.

"Instead we need to build systems that focus on the ranges of things that could happen, and to build options that can be employed as more information is available," said Schlegelmilch, "This is a different mindset with different questions than we are used to asking, but will build stronger resilience to the challenges we face."



In his recently published book on preparedness, Rethinking Readiness: A Brief Guide to Twenty-First-Century Megadisasters, Schlegelmilch guides the reader through the five major disaster scenarios: **biothreats, climate change, critical infrastructure failure, cyberthreats, and nuclear conflict**. The book is refreshingly direct in its dealing with global threats and vulnerabilities. Surprisingly, Schlegelmilch wrote *Rethinking Readiness* before the pandemic. Another indication on how he landed in one the most prestigious positions in his field—he was prepared.

Schlegelmilch has spent his entire career preparing for the troubling global catastrophes many of us avoid thinking about. His experience spans roles in epidemiology, emergency planning, pandemic planning, disaster preparedness policy—and yet, his undergraduate path to preparedness wasn't through memorizing statistics and probable outcomes. Surprisingly, Schlegelmilch was a theater major.

Raised in the Bay Area in California, Schlegelmilch majored in theater studies at DePaul University for his undergraduate degree. While theater seems an unlikely match for a disaster preparedness expert, there are some parallels. Both involve writing a plan or script, having clearly defined roles, team work, set-building, and of course improvisational elements. One of his favorite classes was about globalization with playwright and poet Ntozake Shange, who wrote the play 'For Colored Girls Who Have Considered Suicide When the Rainbow Is Enuf' and was a guest professor at DePaul.

"We were also studying social issues in works written about marginalized populations by writers such as Cornel West, and Homi Bhabha, and bell hooks, and just all of this wide cultural awakening," Schlegelmilch told me. For Schlegelmilch, theater was an exploration of the complexities of life.

In the midst of this awakening, his third year was marked by 9/11. The extraordinary national tragedy combined with "the complexity of the world revealing itself" solidified Schlegelmilch's preparedness trajectory. "I became interested in international health, global health, and this new world of bioterrorism and homeland security," he said.

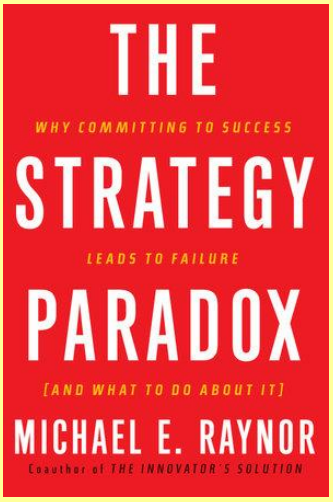
Schlegelmilch wanted to find out how he could "contribute to broader society in a meaningful way," so after completing his fine-arts degree and with a minor in sociology, he went on to complete his MPH and MBA (Master of Public Health and Business Administration, respectively). He completed his undergraduate and initial graduate schooling all while working at Starbucks, which provided its own lessons in management and working with people from various backgrounds.

Preparing for unknown threats combined with unpredictable human reactions is a complex feat. When it came to the US response to the coronavirus, there were many factors at play, not to mention a contentious political climate that impeded the response from the beginning.

"In terms of activating the plans nationally, [it] was just kind of one misstep after another," said Schlegelmilch. He's disappointed that the federal government has left much of the decision-making up to states, and for its impatience to get things back to normal. **"There's this expectation that it'll be gone in a couple of months, and it also doesn't help when you have such inconsistent messaging coming along as well, too."**

The messaging from the government ranges from inconsistent to often erroneous and is proliferated globally by for-profit news media outlets. This **misinformation crisis is unique**—unfolding during an election year in a culture of highly divisive politics, when the intricacy of this pandemic requires media to interpret complicated medical science for a general audience. For example, in April, models and forecasts showed wildly different projections for what might happen next. These discrepancies left some of the public not only confused, but distrustful of media and the medical forecast models.

But to Schlegelmilch, the models aren't there as an all-knowing oracle; rather they are tools to gather insight and prepare for a multitude of scenarios. He sees the larger picture in these models and encourages us to do the same. Rather than looking for one exact answer, we should search for multiple potential outcomes.



"**If you step back from the idea of precision, or the idea that a model's usefulness is only in the precise numbers that it spit out, and instead look for the trends that these numbers suggest in terms of what is working to stop the spread of the virus, you now have a tool that offers many more solutions than one numerical answer.** Models are good for gaming out the consequences of different decisions. By analyzing these various trends, you can reduce the transmission by making incremental changes in our behavior patterns by implementing these immediately. That's incredibly powerful."

But looking for trends again asks us to accept a moving target. Schlegelmilch's suggestion, not unlike his uncertainty principle, is to work down the middle of an issue, with each side expanding the scope of their positions and assumptions. **"What are the boundaries of your uncertainty?"** he then asks, drawing on lessons from ***The Strategy Paradox***, a book by Michael Raynor.

The next step is to "create options for different ways that it might play out. Rather than trying to force certainty where it doesn't exist, or rather than trying to cram more and more information for an answer that continues to be elusive, is instead to take that energy and devote it to creating different options in our response."

There are other ways we can improve our current situation, beyond models and masks. Schlegelmilch says that another really important variable that is often overlooked in ideal outcomes is social capital. "[N]eighbors helping neighbors is one of the strongest predictors of how people do after a disaster. Things like social capital and social cohesion are undervalued."

As a journalist, my aim is to discover essential threads to be digested by a general audience, so leaving my interview with an overarching theme of 'uncertainty' wasn't entirely what I hoped for—at least, not at first. But the more I went over my notes, the more "leaning into uncertainty" became a gift—if one is to act on the uncertainty and create more and better options for themselves. Suddenly disaster preparedness gets very Darwinian; it is in our options that we increase our chances of survival, not in our allegiance to one set of ideas.

As Schlegelmilch says: "The catastrophes we face are growing more complex, but at the same time, we also have access to more perspectives and more resources to face that complexity."

*Journalist **Debra Winter** wrote this profile as part of her work in the Sustainability Management course, "Writing About Global Science for the International Media."*

New administration, big problems

or which cover to choose!

Instead of the powder blue power suit Harris wore for her cover shoot, the first African American woman elected vice president is instead seen in more casual attire and wearing Converse Chuck Taylor sneakers, which she sometimes wore on the campaign trail. Harris' team was unaware that the cover photo had been switched until images leaked late Saturday, according to a person involved in the negotiations over how Harris would be featured on the cover. Harris' office declined comment and the person spoke Sunday on condition of anonymity. The 'other' online cover was later released online, but will only be the digital cover for the magazine and the brown suits remains the print version.

Tragedy at the Capitol: Four Questions that Demand Answers

Source: http://www.homelandsecuritynewswire.com/dr20210108-tragedy-at-the-capitol-four-questions-that-demand-answers

Jan 08 – How can the U.S. Capitol, surrounded by one of the largest concentrations of law enforcement and national security personnel in the world, be so quickly overrun by Trump insurrectionists hell-bent on "stopping the steal," halting our cherished democratic processes, and potentially harming lawmakers?

Mark Nevitt writes in *Just Security* that this tragedy and breach of the Capitol Building on Wednesday is a failure of leadership and planning at the highest levels.

> A full and comprehensive investigation will be conducted. And it is important not to jump too quickly to conclusions without having a full understanding of the events and decisions that took place that day and the days leading up to it. Nevertheless, several key questions and themes are beginning to emerge. These must be addressed prior to President-elect Joe Biden's inauguration on Jan. 20. These questions center around the difficulty in swiftly coordinating a response across overlapping federal, state, and local jurisdictions. Despite being surrounded by the nation's vast national security and law enforcement apparatus, the U.S. Capitol

response appears to have been plagued by and not taking the threat of right-wing extremism seriously. This was further exacerbated by different chains of command, overlapping legal authorities, and complex jurisdictional issue.

In what follows, I highlight four initial questions to focus on:

- Was the District of Columbia National Guard properly deployed and resourced?
- What prevented other state National Guards from being expeditiously deployed?
- What role do other federal law enforcement have and why did the DC police have to play such a critical role in the Capitol's defense?
- What other assets may have assisted?

Nevitt concludes:

it was always drilled home from my time in the military the importance of unity of command and unity of effort. These are absolutely essential to succeed in any mission. The protection of our nation's capital should be no different. This requires a straightforward chain of command, clear understanding of the underlying legal authorities, rapid decision-making processes, and a clear understanding of the mission. Unity of command is particularly difficult to achieve in the nation's capital, where there are so many overlapping jurisdictions and legal authorities as outlined above. And unity of command requires the person at the top of the chain of command—the president, as commander-in-chief—to provide clear direction and be fully invested in the mission. But prior to the insurrection, Trump himself incited it, in tweets and in a speech that morning. Shockingly, the person at the very top of the chain of command was not interested in protecting the Capitol nor the lawmakers inside during a time of national crisis, a point not lost on lawmakers calling for his immediate impeachment.

U.S. Capitol Police Overrun by Mob After Declining Help

Source: http://www.homelandsecuritynewswire.com/dr20210108-u-s-capitol-police-overrun-by-mob-after-declining-help

Jan 08 – Law enforcement officials in charge of protecting the U.S. Capitol repeatedly declined offers of additional assistance ahead of Wednesday's protest-turned-riot that forced lawmakers to take shelter, delaying certification of the results of the country's presidential election. The allegations, from defense and military officials, come a day after large crowds of extremists supporting President Donald Trump pushed past barricades and members of the Capitol Police to rampage through the building.

The Uncomfortable Questions Facing Capitol Police over the Security Breach by MAGA Mob

Source: http://www.homelandsecuritynewswire.com/dr20210108-the-uncomfortable-questions-facing-capitol-police-over-the-security-breach-by-maga-mob

Jan 08 – When die-hard Trump supporters are able to storm the U.S. Capitol and forcefully occupy offices in the House and the Senate, questions over security are going to be asked. Something clearly didn't go to plan on Wednesday. The man in charge of policing that day, U.S. Capitol Police Chief Steven Sund, has since announced he is resigning. But even with him gone, what will remain are serious questions that will need to be answered about how an angry mob was able to circumvent security and enter the Capitol building.

EDITOR'S COMMENT: Capitol siege is a fine example of what happens when wrong people are in charge of important posts. We have seen that in conflicts. We have seen that in mega-fires and floods. We have seen that in mega-terrorist incidents and man-made disasters. To be a leader is a natural gift but a very rare gift. The next best is a person with common logic and brain flexibility that keeps the person away from the belief "I am the one and I can do better than others!" This person can be trained via worst-case scenarios; red-bleu/war games; simulations and field drills in a way that at the end he/she will be able to compose solutions from a given situation via thinking entirely out of the box. Otherwise, next time it will be just another case of

seeing the tsunami in the horizon and open an umbrella to be protected from possible rain. Let us all help change the repetition of history!

Provocation or animation?

The new face of future criminals/terrorists?

Tokyo company makes hyperrealistic masks from 3D face prints

Source: https://sea.mashable.com/tech/13409/japanese-company-will-pay-you-to-let-them-turn-your-face-into-hyper-realistic-mask

In the world of the weird and the wonderful, Japanese company Kamenya Omote stands out in the sense that it caters to a need we don't normally associate with being a necessity.

They're a specialty mask store based in Tokyo, and they've got a special project coming up. But they'll need your help.

The company wants to pay you to let them use your face to make a super-realistic mask.

As if the cover image above wasn't obvious (and creepy) enough to grab your attention.

They're reaching out to Tokyo residents specifically, and promise to pay each willing participant US$380 to allow their faces to essentially be copied and pasted onto super-realistic 3D-printed masks.

Part of the company's 'That Face' project, they plan to sell the finished products for US$750 a pop.

They also hope to be able to take in irregular applicants in the future, assuming the current project is a success. But for now, only Tokyo residents can have their faces turned into 3D-printed doppelgangers.

The shop owner himself used his own face to make a realistic 3D-printed mask, with pre-orders of the mask already selling out on their website.
According to the product description, each mask is designed to be 105 percent of the ratio of the person's actual face. This way, it'll fit just about anyone who buys one.
The most intriguing thing is the level of detail preserved in the 'face' mask. You can see each individual hair, including beard and moustache stubble.

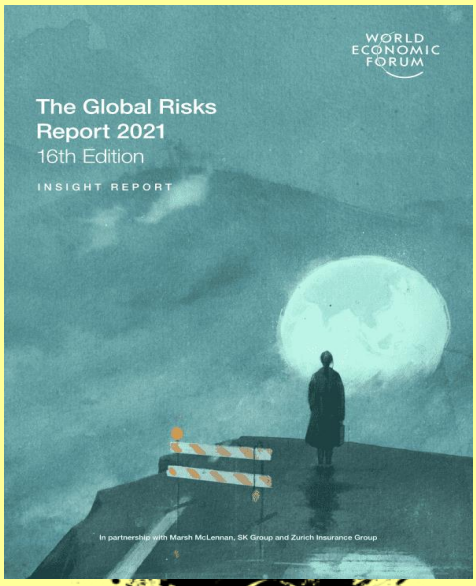
"We will buy and sell your faces. A science fiction story has now become reality," the company said in a statement. "No one yet knows what will happen to a world full of the same faces as you."

Greece: Lockdown rules are only for Greeks . . .

Pakistanis in Greece together with illegal immigrants and members of the far left demonstrating in Mercury Square, Petralona, Athens despite lockdown regulations and alike valide only for Greek citizens… requesting free houses, vaccination and legal papers for everybody

The Global Risks Report 2021

Source: http://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf



Jan 19 – The 16th edition of the World Economic Forum's *Global Risks Report* analyses the risks from societal fractures—manifested through persistent and emerging risks to human health, rising unemployment, widening digital divides, youth disillusionment, and geopolitical fragmentation. Businesses risk a disorderly shakeout which can exclude large cohorts of workers and companies from the markets of the future. Environmental degradation—still an existential threat to humanity—risks intersecting with societal fractures to bring about severe consequences. Yet, with the world more attuned to risk, lessons can be drawn to strengthen response and resilience. In 2020, the risk of a pandemic became reality. As governments, businesses, and societies grapple with COVID-19, societal cohesion is more important than ever.

These are the world's greatest threats in 2021

Source: https://www.weforum.org/agenda/2021/01/world-greatest-threats-2021/

The Global Risks Report 2021 is the 16th edition of the Forum's annual analysis and looks back at a year ravaged by a global pandemic, economic downturn, political turmoil and the ever-worsening climate crisis. The report explores how countries and businesses can act in the face of these risks.

Unsurprisingly, one of the big changes between this year and last, in terms of risks, has been brought about by the COVID-19 coronavirus pandemic. The risk posed by infectious diseases is now ranked at number one, while in 2020 it came in 10th place.

Widespread effects

"The immediate human and economic costs of COVID-19 are severe," the report says. "They threaten to scale back years of progress on reducing global poverty and inequality and further damage social cohesion and global cooperation."

For those reasons, the pandemic demonstrates why infectious diseases hits the top of the impact list. Not only has COVID-19 led to widespread loss of life, it is holding back economic development in some of the poorest parts of the world, while amplifying wealth inequalities across the globe.

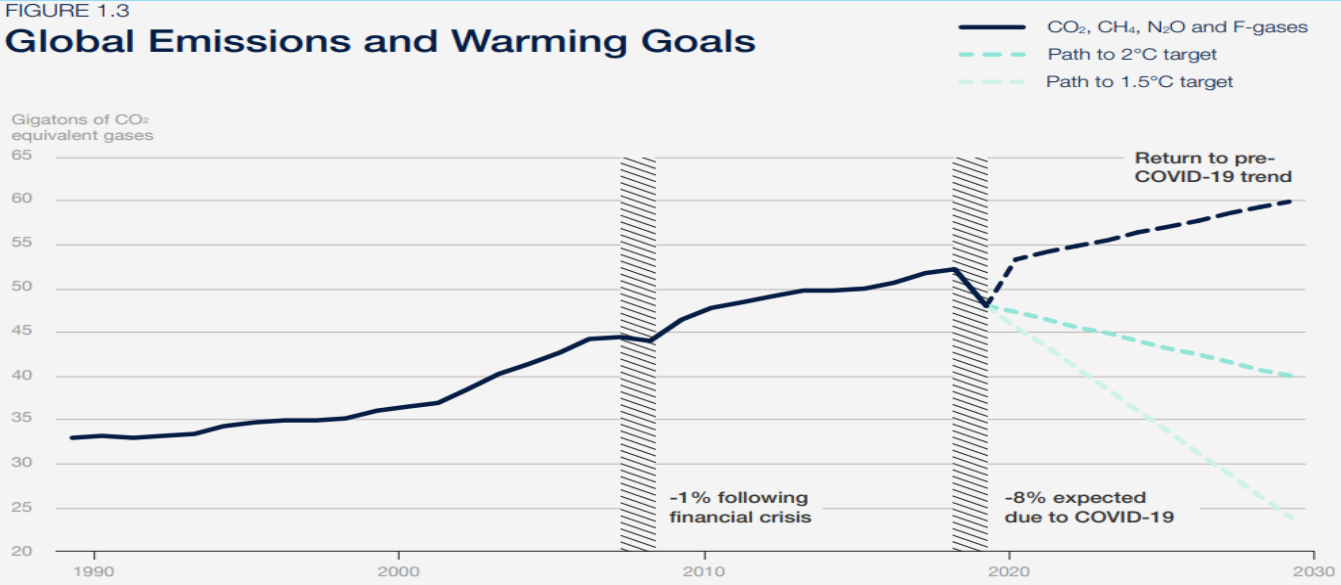
At the same time, there are concerns the fight against the pandemic is taking resources away from other critical health challenges - including a disruption to measles vaccination programmes.

Climate concerns

But despite the inescapable fallout from COVID-19, it is climate-related matters that make up the bulk of this year's risk list, which the report describes as "an existential threat to

FIGURE 1.3

Global Emissions and Warming Goals



Source: PBL (Netherlands Environmental Assessment Agency). 2019. Climate and Energy Outlook 2019. 11 January 2019. https://www.pbl.nl/en/publicaties/klimaat-en-energieverkenning-2019; UNCTAD. 2020. "COVID-19's economic fallout will long outlive the health crisis, report warns". 19 November 2020. https://unctad.org/news/covid-19s-economic-fallout-will-long-outlive-health-crisis-report-warns

humanity." Despite a drop in carbon emissions caused by lockdowns and disruption to international trade and travel, there are concerns that as economies start to recover, emissions will soar.

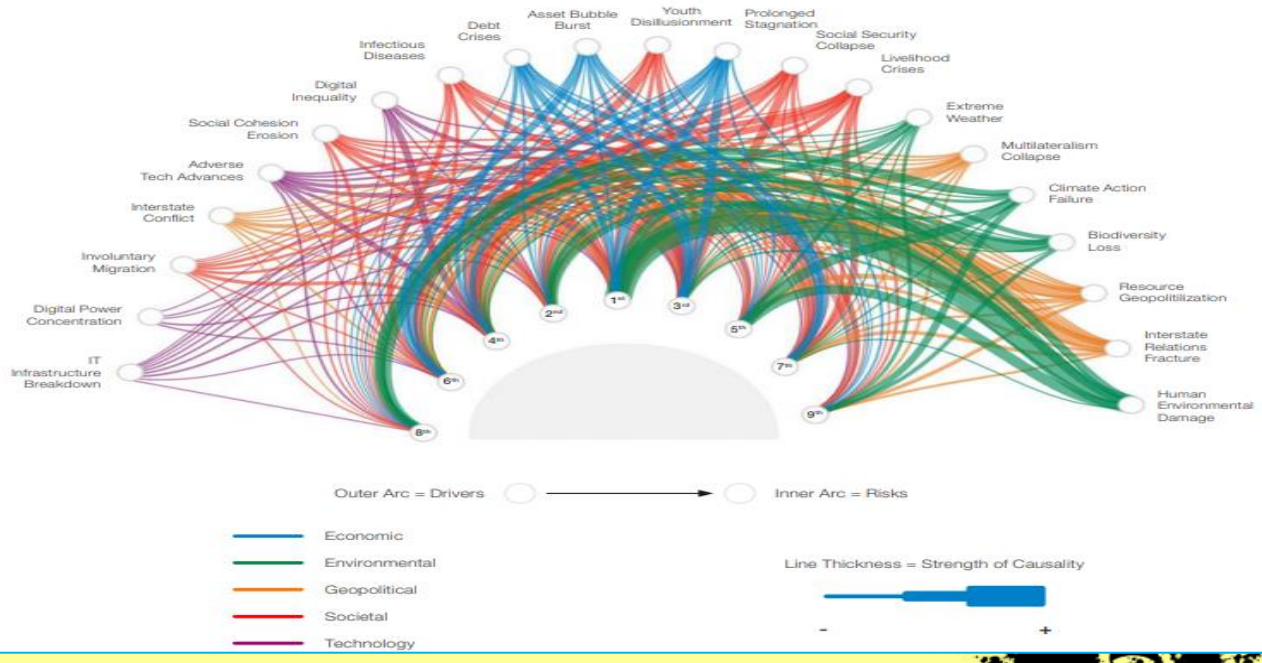
FIGURE III

Global Risks Network

What drives global risks?

Respondents rank the most concerning risks globally and their drivers.

8th	6th	4th	2nd	1st	3rd	5th	7th	9th
Extreme Weather	Debt Crises	Social Cohesion Erosion	Infectious Diseases	Climate Action Failure	Livelihood Crises	Biodiversity Loss	Prolonged Stagnation	Human Environmental Damage



The 2021 risks report draws upon data and insights from a wide array of respondents via the World Economic Forum's Global Risks Perception Survey. The survey was completed by over 650 members of the Forum's diverse leadership communities.
One of those communities is the Global Shapers – the Forum's network of young people driving dialogue, action and change. For them, climate-related risks are seen as "the most likely and most impactful long-term risks." They also sound a note of caution about the dangers of "youth disillusionment" around the world.
"They see personal risks as immediate threats, macro risks in the medium term and fundamental geopolitical risks in the long term," the report says.
Among the short-term threats, which are likely to come to fruition within the next two years, are infectious diseases, livelihood crises, digital inequality and youth disillusionment.
As for medium-term risks in next three-to-five years, the Global Shapers identified asset bubble bursts, IT infrastructure breakdown, price instability and debt crises.
In the longer term, the community voiced concerns about weapons of mass destruction, state collapse, biodiversity loss and adverse technological advances.

Countering risks
Alongside the risks listed, the report reflects on responses to COVID-19 to draw lessons that could bolster global resilience.
These include formulating analytical frameworks, creating new forms of partnership and building trust through clear and consistent communication.
It also includes recommendations to help countries and businesses act, rather than react, in the face of risks.
The Forum's upcoming virtual Davos Agenda event will bring together global leaders to discuss how to advance the principles, policies and partnerships needed to do this.

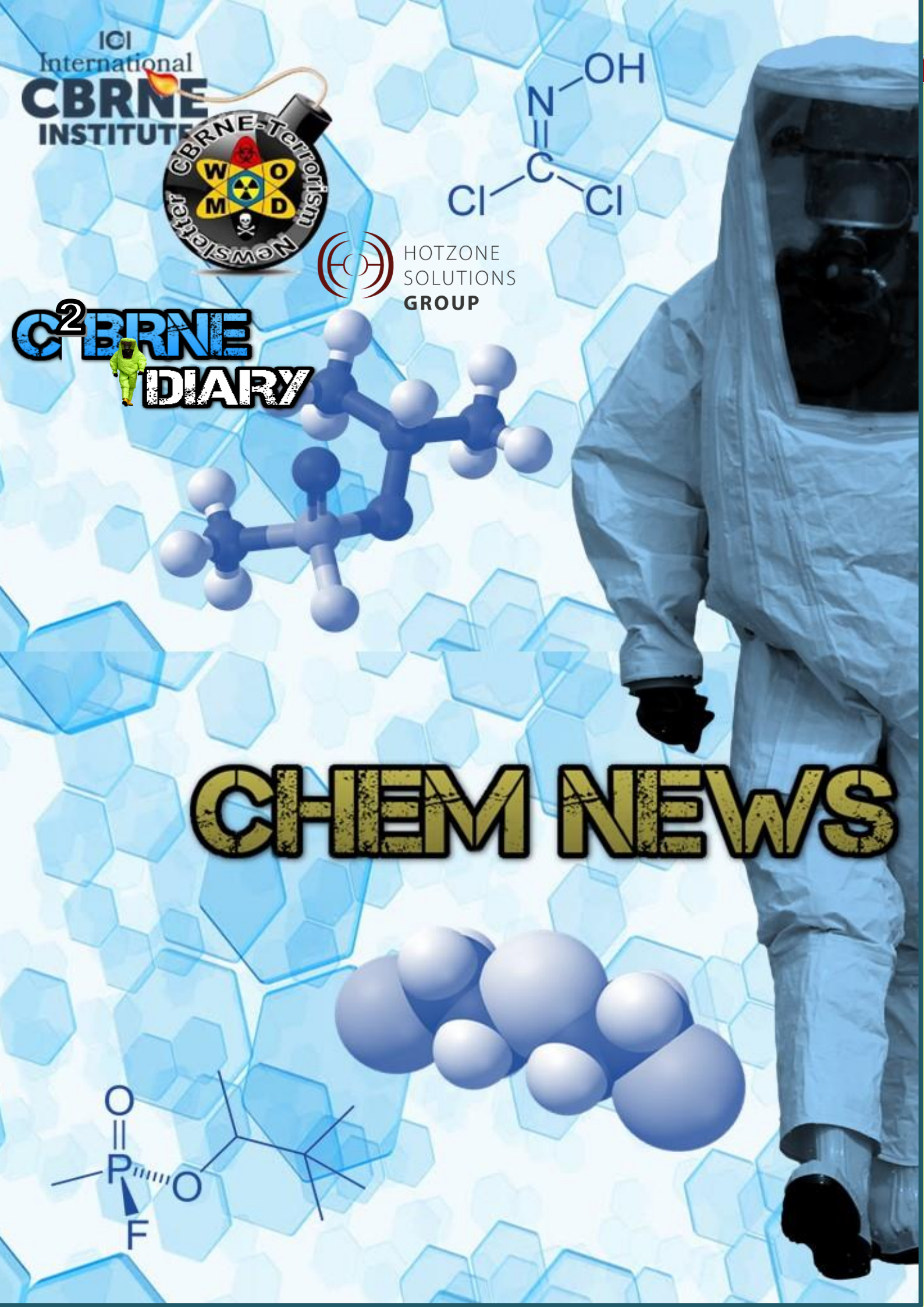
ICI International CBRNE INSTITUTE

CBRNE-Terrorism Newsletter

HOTZONE SOLUTIONS GROUP

C²BRNE DIARY

CHEM NEWS



BionTech CEO says will work with others to boost vaccine capacity

Source: https://www.reuters.com/article/health-coronavirus-turkey-vaccine/biontech-ceo-says-will-work-with-others-to-boost-vaccine-capacity-anadolu-idINKBN2900FA

Dec 26 – BioNTech Chief Executive Ugur Sahin said his company would be open to cooperating with others as it looks to increase production capacity for its COVID-19 vaccine developed with Pfizer and was considering opening an office in Turkey.

Sahin repeated BioNTech aimed to distribute 1.3 billion doses of its vaccine by the end of 2021 and that 70% of the world needed to be vaccinated by next winter to go back to "normal life", according to an interview with Turkey's state-run Anadolu news agency.

"We want to produce more than 1 billion doses with Pfizer next year. We need to distribute them to over 80 countries," he was cited as saying. "This is not easy. Vaccines are made in a complex manner. We will start cooperating with other companies again," he added.

"If we can carry out our plans on how to increase capacity, we can disclose it in January or February. I believe we can increase it. We don't have a guaranteed plan yet."

Ankara has agreed to buy 4.5 million doses of the BioNTech and Pfizer vaccine, with an option to procure 30 million more doses later.

Sahin, the son of a Turkish immigrant to Germany, told Anadolu BioNTech was in talks with **Turkey's state scientific agency Tubitak**, and would aim to deliver the 30 million doses to the country by the end of 2021.

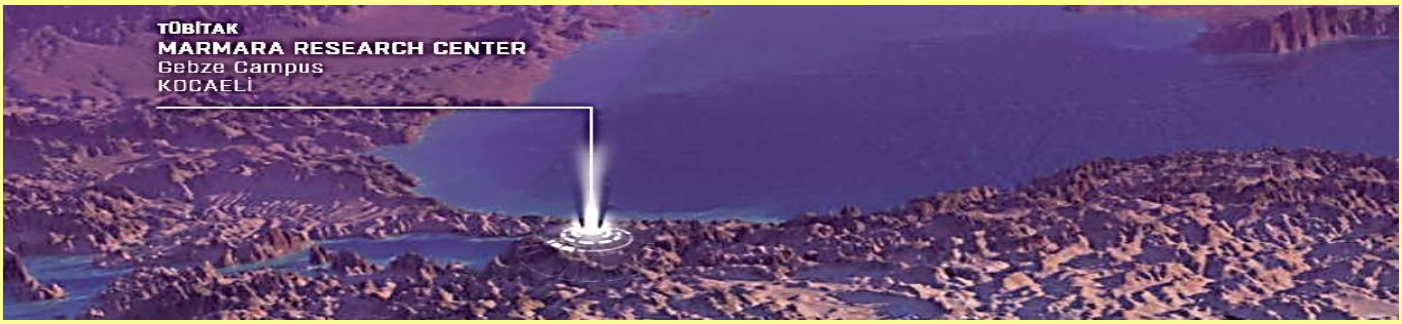
"It is a great joy to be able to help people in Turkey," Sahin was quoted as saying by Anadolu.

"We also want to carry out research in Turkey. We have talks with Tubitak, we have started working with some professors at universities. We want to open a branch of the BioNTech company in Turkey," he said, adding he hoped to start clinical work on cancer research in the country in the summer of 2021.

Turkey has also agreed to buy 50 million doses of China's Sinovac vaccine, CoronaVac, and a first shipment of 3 million doses of CoronaVac arrives on Monday.

Tubitak MAM

Institute of Chemical Technology is a competent research institution that pioneers studies in the field of chemical technologies with



its more than 40 years of experience and accumulation of knowledge and serves the industry and society by conducting applied researches to meet needs and by developing products with high value-added in parallel with the advancements in science and technology. Among others:

Research and Development on CBRN (Chemical, Biological, Radiological and Nuclear) Technologies

- Chemical Sensor Technologies (gas/liquid media), electronic nose and electronic tongue applications

- A device to detect chemical warfare agents and poisonous industrial substances in gaseous state. Product Properties: Detection of the chemical warfare agents of nerve gases (GA, GB, GD, GF, VX) and vesicants (HD and L), and of the Poisonous Industrial Substances of NH3, AsH3, CS2, HCN, HNO3, HCN, PCl3 and SO2 gases. Possibility to make training by programming with harmless simulant gases. Weighing 2.2 kg and measuring 13 x 31 x 7 cm (width x length x height).
- Development of Sensing Materials (Design, Synthesis and Characterization)
- Development of Sensor Systems (Electronic and Mechanical Design, Test, Data Analysis and Software Application)
- Synthesis of spherical activated carbon for filter layer of CBRN Protective suit
- Development of impregnated activated carbon for use in the CBRN protective filters
- Development of activated carbon and other adsorbents (removing radioactive materials in Nuclear plants, decontamination of Radon containing underground water, supercapacitors, toxic industrial chemicals, etc.)
- Development of CBRN decontamination materials
- Sensor Technologies, Sensor Systems and Device Developmen
- Development of Hand-Held Chemical Warfare Agents Detection Device
- Development of Toxic Industrial Chemicals Detection Device
- Detection of hazardous chemicals in drinking and natural water sources (pesticides, heavy metals, endocrine disruptive fenolic compounds)
- Air quality measurements (indoor/outdoor)

Novichok nerve agent poisoning

By David Steindl, MD, Wolfgang Boehmerle, MD, Roland Körner, MD, Damaris Praeger, MD, Marcel Haug, MD, Jens Nee, MD, et al.

The Lancet online | December 22, 2020

Source: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)32644-1/fulltext

On Aug 20, 2020, a 44-year-old man who was previously healthy suddenly became confused and began to sweat heavily on a domestic flight in Russia approximately 10 min after departure; he vomited, collapsed, and lost consciousness. After an emergency landing, the man was admitted to the toxicology unit of a local hospital in Omsk, Russia, approximately 2 h after symptom onset. According to the discharge report, the patient presented comatose with hypersalivation and increased diaphoresis and was diagnosed to have respiratory failure, myoclonic status, disturbed carbohydrate metabolism, electrolyte disorders, and metabolic encephalopathy. Therapeutic measures included intubation, mechanical ventilation, and unspecified drugs for symptom control and neuroprotection. On Aug 22, 2020, the patient was transferred by a German air ambulance to the Charité-Universitätsmedizin Berlin at the request of his family. Severe poisoning with a cholinesterase inhibitor was subsequently diagnosed. 2 weeks later, the German Government announced that a laboratory of the German armed forces designated by the Organization for the Prohibition of Chemical Weapons (OPCW) had identified an organophosphorus nerve agent from the novichok group in blood samples collected immediately after the patient's admission to Charité,[1] a finding that was subsequently confirmed by the OPCW.[2] Here, we report clinical details of this case.

Clinical course

Approximately 31 h after symptom onset, a doctor from the German air ambulance crew had temporary access to the patient and recorded bradycardia (44 beats per min [bpm]), hypothermia (34·4°C), wide pupils non-reactive to light, and intermittent myoclonus under sedation with propofol, the only obvious drug given at that time. Peripheral oxygen saturation was 100% while the patient was on pressure-regulated volume control ventilation with low positive end-expiratory pressure and a fractional concentration of oxygen in inspired air (FiO_2) of 30%. 16 h later, when the patient was handed over to the

German air ambulance crew for transportation to Berlin, his condition had slightly improved (pupils constricted, heart rate 59 bpm). Propofol was again the only drug administered at that time.

During subsequent airborne transport in an EpiShuttle isolation system (EpiGuard, Oslo, Norway), the patient received propofol, fentanyl, and crystalloids and continued to be ventilated with 30% FiO_2. On arrival at an intensive care unit at Charité, approximately 55 h after symptom onset, the patient was deeply comatose, with mild bradycardia (51 bpm, subsequently declining to 33 bpm), hypersalivation, hypothermia (33·5°C), increased diaphoresis and small pupils not reactive to light, decreased brainstem reflexes, hyperactive deep tendon reflexes, and pyramidal signs. Laboratory analyses showed substantially decreased levels in plasma of butyrylcholinesterase (also called pseudocholinesterase) and increased levels of amylase, lipase, high-sensitivity troponin T, and sodium in plasma (appendix p 1). Based on clinical and laboratory findings, severe cholinesterase inhibition was diagnosed and the patient was started on atropine and obidoxime (250 mg bolus followed by continuous administration of 750 mg per day). Cholinergic signs returned to normal within 1 h after the onset of this antidotal therapy. Analgosedation with sufentanil and propofol was supplemented with midazolam for neuroprotection.[3]

Toxicological analysis and drug screening in blood and urine samples obtained on admission to the intensive care unit at Charité identified several drugs, including atropine, which we attributed to the previous treatment the patient had received in the intensive care unit in Omsk before the medical transfer to Germany (appendix p 2). Testing for cholinesterase status[4]
in a specialised external laboratory showed complete inhibition of acetylcholinesterase in red blood cells, thereby confirming the exposure to a cholinesterase inhibitor, and no evidence for reactivation by obidoxime or free unbound cholinesterase inhibitor in plasma (appendix p 3). Accordingly, obidoxime was stopped after 1 day.[5]

Atropine was continued for 10 days and titrated to suppress cholinergic symptoms (figure 1). On day 5, the patient developed a fever that was treated with external cooling for 9 days and subsequently with antipyretic therapy using pethidine, metamizole, and paracetamol. Intermittent myoclonic muscular contractions, predominately of the thoracic and abdominal muscles, responded poorly to atropine and increased sedation and persisted for up to 15 days.

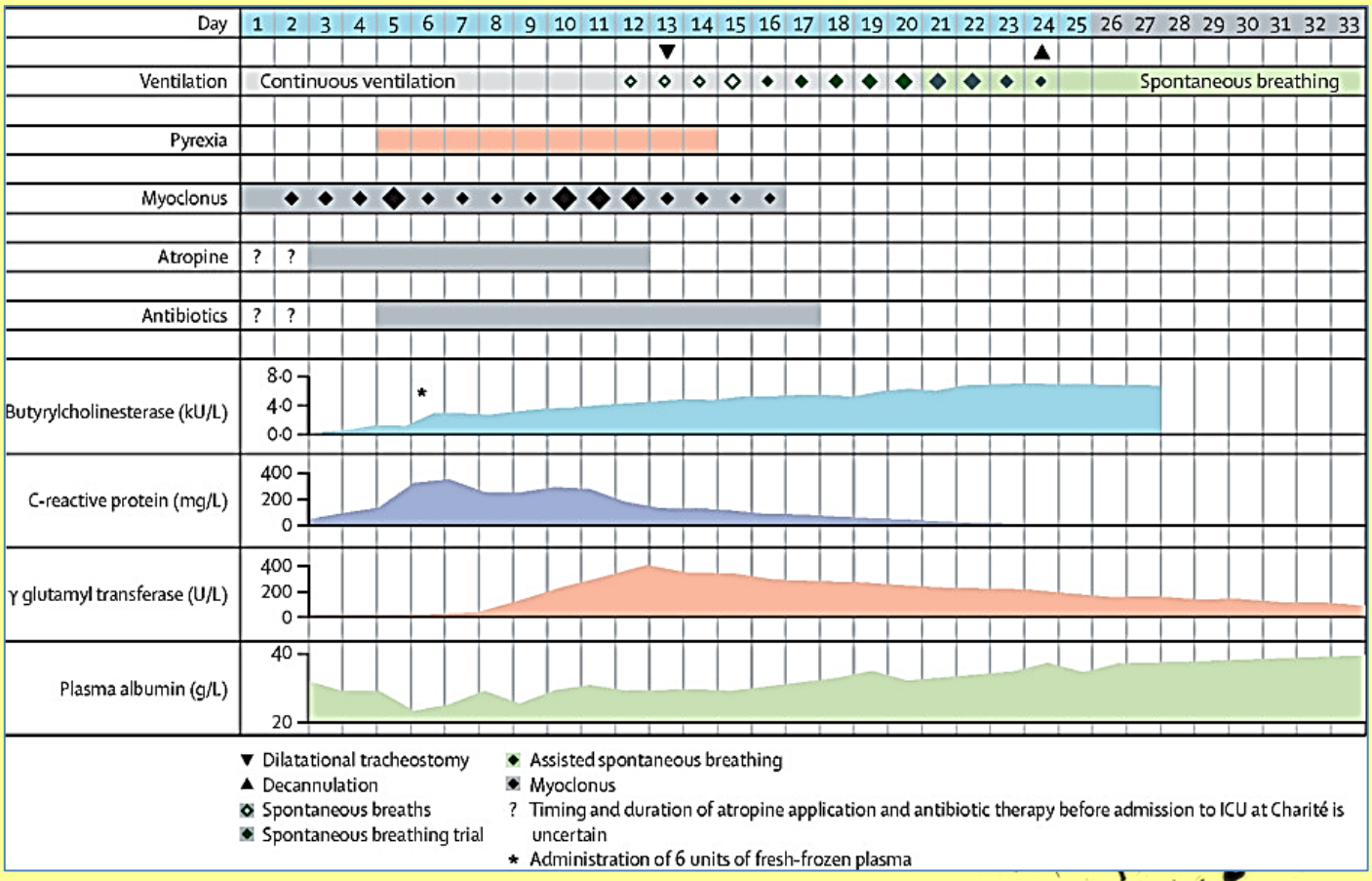


Figure shows selected clinical findings, treatment aspects, and laboratory values during the patient's stay in intensive care (days 1–25) and on a regular hospital ward (days 26–33).

Cranial CT and MRI scans, analysis of cerebrospinal fluid, short-latency somatosensory evoked potentials, and plasma neuron-specific enolase concentration on day 4 were all within normal ranges, and an electro -encephalogram was consistent with sedation. Electrophys-iological examinations showed the specific kind ofdysfunction of neuromuscular transmission that istypical for cholinesterase inhibition. Repetitive responses were noted after a single supramaximal electricalstimulus (figure 2A). Repeated nerve stimulation showed a decrement-increment response pattern at frequenciesof 10 Hz or greater, which was more pronounced at higher stimulation frequencies (figure 2B, 2C), consistentwith blockade of neuromuscular transmission caused by depolarisation.6 Stimulated single-fibre electromyographyshowed prolonged variation in the time between action potentials of the same motor unit, which is called jitter (figure 2D). These findings improved continuously within the next 7 days (figure 2A, 2C, 2D).

During the period in the intensive care unit at Charité, the patient temporarily showed signs of systemic inflam-mation and increases in liver enzymes (figure 1; appendix p 4). Activity of butyrylcholinesterase in plasma started to increase on day 4 but plateaued on day 6 at levels below normal, which prompted us to administer 6 units of fresh-frozen plasma; this transfusion led to a pro-nounced increase in activity with no subsequent decline, thus excluding consumption of butyrylcholinesterase by unbound inhibitory nerve agent in blood, consistent with findings of in vitro testing (appendix p 3). On day 10, the spontaneous increase in plasma butyrylcholinesterase activity resumed, and values within the normal range were reached on day 20 (appendix p 4). By comparison, activity of acetylcholinesterase in red blood cells recov-ered more slowly and only partly until day 21 (appendix p 3). The patient's haemoglobin concentration dropped from 12·2 g/dL to 7·5 g/dL and recovered after intra-venous iron and oral folate supplementation.

In skin swabs obtained on admission to the intensive care unit at Charité, we noted colonisation with five different multidrug-resistant bacteria: Staphylococcus aureus, Acinetobacter baumannii complex, Pseudomonas aeruginosa, Escherichia coli, and Klebsiella pneumoniae. Microbial characterisation of subsequent rectal swabs and urine samples showed two different variants of K pneumoniae. Based on these findings, we used antibiotics very reluctantly. A urinary tract infection with K pneumoniae was treated with co-trimoxazole, and a possible bloodstream infection with Staphylococcus epidermidis was treated with a 4-day course of vanco-mycin. CT on admission and plain chest radiography on days 3, 5, 9, 10, and 13 showed no clear signs of pulmonary infiltration. Because of purulent bronchoalveolar fluid in conjunction with increased levels of C-reactive protein, the patient received colistin inhalations for 9 days, sub-sequently tapered to prophylactic doses. During the patient's stay in intensive care at Charité, gas exchange was never severely impaired. FiO2 was usually below 40%, except on day 9, when it was temporarily increased to 50%. We did a percutaneous dilatational tracheostomy on day 13 in anticipation of complicated weaning. On day 12, the patient started to breathe spon-taneously (figure 1) and could subsequently be weaned from mechanical ventilation completely by day 24. He gradually recovered from a delirium and was mobilised and transferred to a regular hospital ward on day 26. At discharge on day 33, a neurological examination showed enhanced physiological tremor and hyperactive deeptendon reflexes but neither pyramidal signs nor evidence of polyneuropathy. Neuropsychological testing performedin Russian, the patient's native language, showed subtle impairments in processing speed and verbal fluency, which had completely resolved 3 weeks later. At the last follow-up visit on day 55 we found near-complete recovery of neurological, neuropsychological, and neurophysi-ological findings without evidence of polyneuropathy. DiscussionNovichoks are a group of nerve agents developed in the former Soviet Union in the 1980s.7 Five recent cases of novichok poisoning, including one fatal, have been reported in the UK.7,8 However, up to now, no clinical details have been published. Identification of an individual organophosphorus compound is a complex and time-consuming process.9In fact, ascertaining the involvement of a novichok agent and its biotransformation products in this case was only achieved several days after establishing the diagnosis of cholinesterase inhibitor poisoning and did not affecttherapeutic decisions.Organophosphorus nerve agents exert the same mechanism of action as do organophosphorus pesti-cides (ie, inhibition of acetylcholinesterase) and clinical management is largely based on experience with organo-phosphorus pesticide poisonings, which still pose a major health burden in southeast Asia, with more than 100000 deaths per year.10 Clinical diagnosis of organophosphorus poisoning should be straightforward. The range of findings caused by overstimulation of muscarinic and nicotinic receptors seen in our patient was in line with published literature: miosis, conjunctival injection, hypersalivation, diaphoresis, bradycardia, and elevation of plasma lipase and amylase, which are attributed to pancreatic and salivary gland stimulation, hyperactive deep tendon reflexes, pyramidal signs, and prolonged muscular hyperactivity.11 Moreover, we observed typical pathological changes in electro-physiology and single-fibre electromyography studies.12,13After normalisation of neuromuscular transmission, the patient started to breathe spontaneously on day 12.Tests for butyrylcholinesterase activity, which are primarily used as a liver function test, are widely available in clinical routine practice and are usually the only laboratory parameter to confirm a clinical diagnosis of organophosphorus poisoning. The cholinesterase status provides additional important information for therapeutic decisions, such as the presence of unboundacetylcholinesterase inhibitor in patient's plasma and the possibility to reactivate organophosphorus–acetylcho-linesterase conjugates with a particular oxime (appendix p 3).4 In fact, absence of inhibitory activity in our patient's plasma in conjunction with inability to reactivate acetylcholinesterase in red blood cells prompted

early termination of obidoxime. Consistent with findings of experimental and clinical studies, sufcient muscle function enabling spontaneous breathing on day 21 correlated with approximately 30% activity of acetylcho-linesterase in red blood cells (figure 1; appendix p 3).14

Additional findings with less clear pathophysiology have previously been described in organophosphorus poisoning. Among these was a refractory disturbance of thermoregulation with initial hypothermia followed by fever. Hypothermia during the early course might, in part, have been caused by increased diaphoresis, whereas side-effects of atropine, infectious complications, and unknown factors are considered to cause subsequent fever.15 We also recorded a transient rise of troponin in conjunction with repolarisation disturbances on electro-cardiogram in the presence of normal echocardiography, consistent with cardiotoxicity of nerve agents.16 Signs of hepatic injury with increases of aminotransferases and γ glutamyl transferase have also previously been reported4,17 and, in part, been attributed to obidoxime,18which our patient received for less than 24 h. An unexplained finding seen in this case was pronounced transient hypoalbuminaemia, which could not be attribu-ted to enteric or renal loss or impaired liver function. Our patient had a very favourable outcome. Pre-sumably, intubation and mechanical ventilation within 2–3 h of symptom onset and absence of preceding severe hypoxia were decisive. Onset and duration of atropine therapy during the first 2 days remain unclear.

Fortunately, despite a high risk for aspiration during the initial period of unconsciousness, and colonisation with several multidrug-resistant bacteria, the patient did not develop severe infection. His good health status before the poisoning probably favoured his recovery.

▶▶ References are available at source's URL.

A New, Highly Sensitive Chemical Sensor Uses Protein Nanowires

Source: https://cbrnecentral.com/a-new-highly-sensitive-chemical-sensor-uses-protein-nanowires/24069/

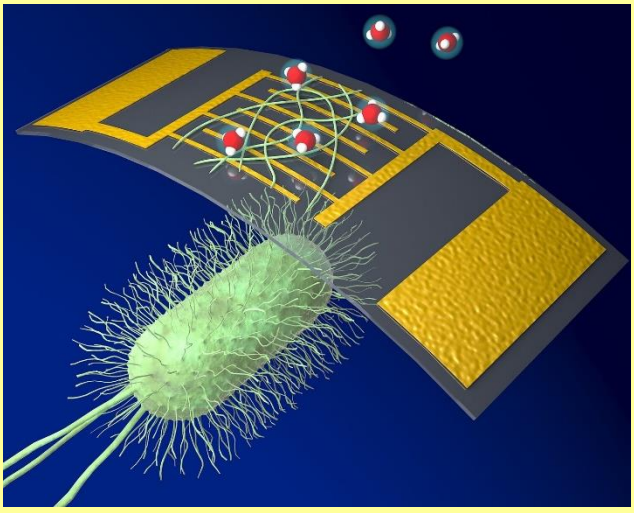
A team at the University of Massachusetts Amherst has developed bioelectronic ammonia gas sensors that are among the most sensitive ever made.

More than 30 years ago, microbiologist Derek Lovley discovered the Geobacter in river mud. The microbes grow hair-like protein filaments that work as nanoscale "wires" to transfer charges for their nourishment and to communicate with other bacteria.

Many years later, Lovley and colleagues have developed a sensor which uses electric-charge-conducting protein nanowires derived from Geobacter to provide biomaterials for electrical devices.

Alexander Smith, with his advisor Jun Yao and Lovley, say they designed this first sensor to measure ammonia because that gas is important to agriculture, the environment and biomedicine. For example, in humans, ammonia on the breath may signal disease, while in poultry farming, the gas must be closely monitored and controlled for bird health and comfort and to avoid feed imbalances and production losses.

Yao says, "This sensor allows you to do high-precision sensing; it's much better than previous electronic sensors." Smith adds, "Every time I do a new experiment, I'm pleasantly surprised. We didn't expect them to work as well as they have. I really think they could have a real positive impact on the world."



Smith says existing electronic sensors often have either limited or low sensitivity, and they are prone to interference from other gases. In addition to superior function and low cost, he adds, "our sensors are biodegradable so they do not produce electronic waste, and they are produced sustainably by bacteria using renewable feedstocks without the need for toxic chemicals."

Protein nanowires (light green) harvested from Geobacter (background) are sandwiched between electrodes (gold) to form bioelectronic sensor for detection of biomolecules (red). Credit: UMass Amherst/Yao lab

Smith conducted the experiments over the past 18 months as part of his Ph.D. work. It was known from Lovley's earlier studies that the protein nanowires' conductivity changed in response to pH – the acid or base level- of solution around the protein nanowires. This moved the researchers to test the idea that they could

be highly responsive to molecule binding for biosensing. "If you expose them to a chemical, the properties change and you can measure the response," Smith notes.
When he exposed the nanowires to ammonia, "the response was really noticeable and significant," Smith says. "Early on, we found we could tune the sensors in a way that shows this significant response. They are really sensitive to ammonia and much less to other compounds, so the sensors can be very specific."
Lovley adds, that the "very stable" nanowires last a long time, the sensor functions consistently and robustly after months of use, and work so well "it is remarkable."
Yao says, "These protein nanowires are always amazing me. This new use is in a completely different area than we had worked in before." Previously, the team has reported using protein nanowires to harvest energy from humidity and applying them as memristors for biological computing.
Smith, who calls himself "entrepreneurial," won first place in UMass Amherst's 2018 Innovation Challenge for the startup business plan for the company he formed with Yao and Lovley, e-Biologics. The researchers have followed up with a patent application, fundraising, business development and research and development plans.
Lovley says, "This work is the first proof-of-concept for the nanowire sensor. Once we get back in the lab, we'll develop sensors for other compounds. We are working on tuning them for an array of other compounds."
Support for the work came as a CAREER grant and Graduate Research Fellowship from the National Science Foundation, UMass Amherst's Office of Technology Commercialization and Ventures and the campus's Center for Hierarchical Manufacturing, an NSF-funded Nanoscale Science and Engineering Center.

▶▶ Bioelectronic protein nanowire sensors for ammonia detection. *Nano Research*, 11 May 2020

Red Cross Publishes Guidelines for Workers Encountering CBRN Hazards

Source: https://cbrnecentral.com/red-cross-publishes-guidelines-for-workers-encountering-cbrn-hazards/18894/

The International Committee of the Red Cross (ICRC) and Red Crescent Movement have recently published risk-management guidance for staff members and volunteers working in any country that is affected by conventional weapons and/or chemical, biological, radiological and nuclear (CBRN) hazards.

The guidelines are written in general terms so as to apply to all situations involving weapon contamination, based firmly on the p rinciple that all interventions should be tailored to the specific regional context following a thorough assessment.
Resilience to weapon contamination means operations can be run more safely in weapon-contaminated environments. For example, where access to the civilian population is hindered by weapon contamination, humanitarian operations can take place if staff are aware of the risk and know how to operate safely in aweapon-contaminated environment.
Sometimes other mitigation measures need to be implemented by technical weapon-contamination specialists, and requests can be made to the relevant authorities, or other organizations in the country for such action. The ICRC also has technical weapon-contamination specialists within the Weapon Contamination Unit who can be requested to provide technical assistance to an ICRC delegation or a National Society.
These can involve:

- Surveying an area to identify alternative safe routes
- Marking hazardous areas, and training staff to recognize these markings
- Providing CBRN detection equipment and PPE to staff, and training them in how to use the equipment appropriately
- Removing the hazard (i.e. through EOD, mine clearance or CBRN hazard containment and removal).

The guidelines were prepared with some assistance from the Working Group on Weapon Contamination, which operates within the Disaster Management Advisory Group (DMAG) for the Middle East and North Africa; along with the Norwegian Red Cross.

▶▶ **Download the *.pdf* version of the full report for free here:** Increasing Resilience to Weapon Contamination through Behaviour Change

Investigating Extended Shelf-Life of Soman Nerve Agent Pre-Treatment

Source: https://cbrnecentral.com/rfi-investigating-extended-shelf-life-of-soman-nerve-agent-pre-treatment/19452/

The Joint Program Executive Office for Chemical and Biological Defense (Medical Countermeasures Systems) Chemical Defense Pharmaceutical Division is seeking information on the capabilities of private entities (academic, non-profit and commercial) to conduct FDA compliant studies on the stability of Soman Nerve Agent Pre-Treatment Pyridostigmine Bromide (PB) tablets.
Pyridostigmine bromide (PB) is approved by the Food and Drug Administration (FDA) to be used as a pretreatment for exposure to the chemical nerve agent, soman.
SNAPP is packaged in an immediate container containing twenty-one (21) tablets individually sealed in a blister strip package supplied in a protective sleeve. The FDA-approved storage conditions for SNAPP is under refrigeration between 2°C and 8°C (36°F to 46°F) for a period of 10 years or at controlled room temperature at 20°C to 25°C (68°F to 77°F) for a period of five (5) years. Personnel are advised not to dispense the content of the unit packages (10 blister packs) and shipping containers (10 packages of

10 each blister packs) after removal from refrigeration or controlled room temperature for more than a total of 3 months. Military personnel are advised to discard the contents of the individual unit packages of SNAPP three (3) months after issue.
SNAPP is for Military Use only and is manufactured by Bausch Health Companies, Inc, Laval, Quebec, Canada and is distributed by the Defense Supply Center, Philadelphia, PA, U.S.A. The sponsor is the U.S. Army.
The purpose of this RFI is to solicit information on the availability of industry to conduct stability studies of SNAPP under a variety of storage conditions (temperature, humidity) to support shelf-life extension. The respondent should address extended stability studies over a period of 0 months to 132 months across a range of temperature, humidity, and storage conditions.

▶▶ **Additional requirements are detailed on FBO.gov under Solicitation Number:** W911QY-19-S-0010.

Army Turbulence Model Predicts Dispersion of CBRN Threats in Atmosphere

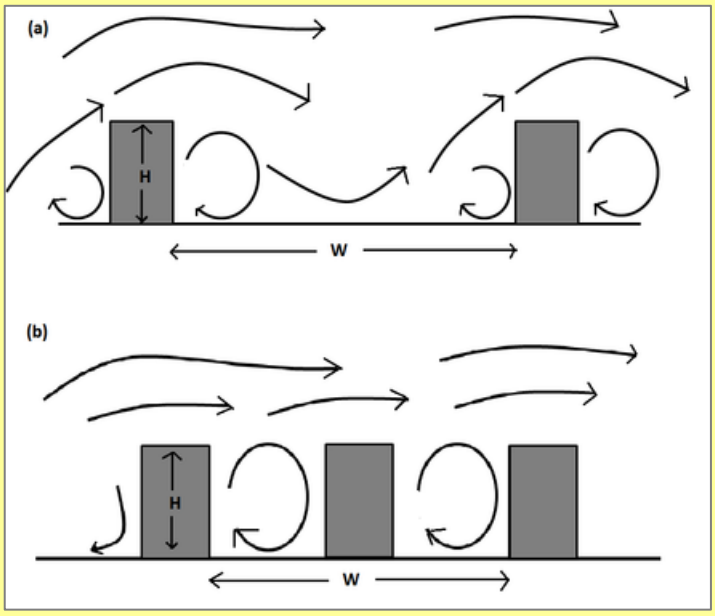
Source: https://cbrnecentral.com/army-turbulence-model-predicts-dispersion-of-cbrn-threats-in-atmosphere/25592/

Nov 2020 – Breakthrough research from Army scientists in the fundamentals of atmospheric turbulence modeling provides a prototype model for the dispersion of the chemical, biological, radiological and nuclear (CBRN) threats in the atmosphere.

The unique turbulence model has broad applications to both civilian and military activities to include the prediction and control of air contamination, during both day and night, the first of its kind to ever do so.
Dr. Xiping Zeng, researcher with the U.S. Army Combat Capabilities Development Command's Army Research Laboratory, described the importance of such a model in protecting against a CBRN attack. "Their defense is usually implemented via CBRN passive protection, contamination avoidance and CBRN mitigation. All of these defense actions rely on an accurate turbulence model for the dispersion of CBRN materials in the atmosphere. An accurate turbulence model can provide direction for a defense action, just as GPS provides direction for a car driving."
Turbulence is the oldest unsolved problem in classical physics, Zeng said. It is more complicated in the atmosphere than in the laboratory, as atmospheric stability and other meteorological factors are involved. Hence, the turbulence in the atmosphere is usually treated as the hardest problem in the atmospheric sciences.
According to Zeng, the Army and other government agencies need an operational software package to respond to CBRN attacks; however, a perfect software package depends on two factors, a high-performance computing, or HPC, facility and an accurate turbulence model on CBRN dispersion.

Some portions of cities, such as Chicago shown here, consist of complicated building structure. This Army turbulence model will be used to simulate/replicate CBRN dispersion in a field whose structure is similar to that of Chicago. (U.S. Army)

Since powerful HPC facilities are now available in the Department of Defense, this new turbulence model provides the last "brick" to build a perfect software package.
"Current turbulence models are quite primitive and are based on concepts developed decades ago," Zeng said. "In contrast, this proposed model is constructed based on the new, much more accurate concepts of the atmospheric turbulence and its processes."



The comparison of (a) isolated roughness flow and (b) skimming flow regimes in a street canyon (after Oke, 1988)

The model properly represents two processes, thermals and gravity waves. As a result, it works well during both daytime and nighttime, the first of its kind to ever do so.
The model's results are being compared with observational data, showing the model works well even while the atmospheric stability and meteorological factors vary greatly.
Since turbulence is commonly observed around us, he said, the developed turbulence model has broad applications to both civilian and military activities. The model, for example, can be used to improve the prediction of weather and climate change; help the design of buildings/bridges in civil engineering by computing the force of wind on buildings/bridges; improve the prediction and control of air pollution, as turbulence

determines the dispersion of pollutants; and help plan the flight of aircraft and unmanned aerial vehicles, as turbulence can create severe hazards for these vehicles.
"For the Army, when a CBRN attack occurs, there is little information for the Soldier to react," Zeng said. "This computer model can retrieve more information on the attack for the Soldier using the limited information available."
Once an attack occurs, the CBRN-dispersion model receives the information from the battlefield and then determines the location of the CBRN source. Finally, the information on the location is sent to the Soldier to remove the CBRN source as well as the optimum locations to avoid the hazard.
Zeng's next step in the research is to extend the model's capability into more complex environments, such as battlefields in dense urban areas or under forest canopies, helping ensure its practical application in the future.

Tracing the Source of Chemical Weapons

Source: https://www.hstoday.us/subject-matter-areas/counterterrorism/tracing-the-source-of-chemical-weapons/

Soldiers of the 23rd Weapons of Mass Destruction Civil Support Team decontaminate their protective suits after sweeping the area utilizing special biological and chemical detectors in response to a possible biological threat during a training exercise at the David C. Canegata Recreational Center and Sports Complex on Sept. 25, 2019. (U.S. Army National Guard photo by Army Staff Sgt. Gregory Camacho)

Jan 01 – The forensic chemical attribution process seeks to trace chemical agents used in attacks. Investigators take a sample of the agent from a victim or site, and then analyze its physical and chemical properties. The data can be used to identify a "chemical fingerprint," which could provide information to investigators about how the agent was made. Investigators could use this data to match and trace the agent to its source to help find and prosecute attackers, impose sanctions, or deter future attacks. The Government Accountability Office explored the opportunities and challenges to implementing the forensic chemical attribution process.

Some governments are suspected of using chemical weapons despite international prohibitions under the Chemical Weapons Convention. For example, sarin and VX nerve gas have been identified in attacks. Most recently, Novichok nerve agent was used in 2020. Technologies exist to identify chemical warfare agents and possibly their sources, but challenges remain in identifying the person or entity responsible.

According to the Global Public Policy Institute, there have been more than 330 chemical weapons attacks since 2012. Such attacks are prohibited under the Chemical Weapons Convention. A set of methods called forensic chemical attribution has the potential to trace the chemical agent used in such attacks to a source. A set of methods called forensic chemical attribution has the potential to trace the chemical agent used in such attacks to a source. For example, investigators could use these methods to identify the geographic sources of raw materials used to make the agent, for example, or to identify the manufacturing process Such information can aid leaders in deciding on whether or how to respond to a chemical weapons attack.

Forensic chemical attribution is a three-step process, though the third step is being developed. First, a sample is taken from a victim or the site of an attack. Second, the sample's chemical components are analyzed and identified, either at a mobile lab or at one of 18 authorized biomedical labs worldwide. Common identification methods are:

- Gas chromatography, which separates chemical components of a mixture and quantifies the amount of each chemical.
- Mass spectrometry, which measures the mass-to-charge ratio of ions (i.e., charged particles) by converting molecules to ions and separating the ions based on their molecular weight.
- Nuclear magnetic resonance (NMR), which can determine the structure of a molecule by measuring the interaction between atomic nuclei placed in a magnetic field and exposing it to radio waves. NMR works on is the same principle as magnetic resonance imaging (MRI) used in medical diagnostics.

In the third step—still under development—investigators use the data from the forensic chemical identification and analysis and identification methods from step two to develop a "chemical fingerprint." The fingerprint can be matched to a database of information on existing methods or known sources to identify chemical agents. However, a comprehensive database containing complete, reliable data for known agents does not exist.

Forensic chemical analysis and identification is mature for known chemical agents. For example, investigators determined the nerve agent sarin was used in an attack on civilians in 2017. The methods can also identify new agents, as when investigators determined the chemical composition of the Novichok nerve agent after its first known use, in 2018.

Forensic chemical analysis and identification methods are also mature enough to generate data that investigators could use as a "chemical fingerprint"– that is, a unique chemical signature that could be used in part to attribute a chemical weapon to a person or entity. For example, combining gas chromatography and mass spectrometry can provide reliable information about the chemical components and molecular weight of an agent. To achieve Step 3, scientists could use this these methods in a laboratory experiment to match impurities in chemical feedstocks of the weapon to potentially determine who made it. In an investigation, such impurities could indicate the geographic origin of the starting material and the process used to create the agent.

▶▶ Read the GAO report

EDITOR'S COMMENT: Level-A PPE for recon/detection operations in open space? Just wondering if the officer supervising the exercise has a single hour inside this type of personal protective equipment.

Nitecore T4K flashlight straps 4,000 lumens to your keychain

Source: https://newatlas.com/outdoors/nitecore-4000-lumen-keychain-flashlight/

Jan 05 – It wasn't quite eight years ago when Nitecore was getting buzz for introducing what it billed as the world's smallest 3,500-lumen flashlight, a little something dubbed the Tiny Monster. Flashlights have only increased in claimed lumens per gram ever since, and now Nitecore is able to pack that much power into a flashlight a fraction the size. The all-new T4K soaks the foreground in up to 4,000 lumens of light from the comfort of your keychain.

There was no denying that the Tiny Monster TM26's output was impressive back in 2013, but its stubby, squared-off quad-lamp design was never the sleekest thing on the market. Since that time, Nitecore has continuously sculpted slimmer, more compact housings around increasingly powerful lamp internals, making its various flashlights easier to carry and brighter to use. The T4K debuts this week as its latest triumph, the flagship of its keychain lineup and a torch it calls the world's smallest 4,000-lumen flashlight.

Like the 2013 TM26, the new T4K uses a four-LED array, this time packed into a single head instead of individual lenses. The user can shuffle between five output modes to throw light up to 686 feet (209 m) forward.

Diving deeper into the spec sheet, the news here is really a 4,000-lumen "turbo" mode, not so much a 4,000-lumen flashlight. That can be said of many flashlights from Nightcore and others, but the T4K experiences a particularly large cliff-drop when dialing down from limited-run turbo mode to the highest standard mode, which puts out only 200 lumens. Similarly, beam distance drops down to 148 feet (45 m).

Turbo boost or not, the T4K certainly packs a lot of power into a pocket-sized everyday carry (EDC) torch package. It measures 3.2 x 1.2 x 1.2 in (8.2 x 3 x 3 cm) and weighs in at 2.7 oz (77 g) with the pocket clip attached.

The T4K borrows its dual lockout modes from the larger Tiny Monster series, ensuring it doesn't flash on accidentally and drain the battery while in a pocket or pack. An OLED display on the front shows information about battery life, mode and remaining runtime. The 1,000-mAh lithium-ion battery lasts up to 67 hours on the lowest single-lumen brightness level.

The T4K is available for preorder now at the Nitecore US online store for US$89.95. While the 4,000 claimed lumens grab attention, we're not sure they make up for the extra size and price over Nitecore's other keychain torches, as the T4K looks a little larger than anything we'd want to carry on a keychain. The $64.95 TUP that sits the next step down in Nitecore's keychain light family has a slimmer 53-g (1.9-oz) construction and even offers longer runtimes in certain modes, but only "turbos" up to 1,000 lumens. The $39.95 19-g (0.7-oz) TINI2 that Nitecore introduced two months ago (pictured just above) puts out 500 lumens in turbo and has the same four lower outputs as the T4K and TUP, albeit with shorter runtimes.

EDITOR'S COMMENT: 4,000 lumens for night CBRN operations weighting 77g? Not bad! Not bad at all!

Syria's Initial Declaration on Chemical Weapons Stockpiles Not 'Accurate and Complete', Top Disarmament Official Tells Security Council

Source: https://reliefweb.int/report/syrian-arab-republic/syria-s-initial-declaration-chemical-weapons-stockpiles-not-accurate-and

Jan 05 – Outstanding issues related to Syria's initial declaration of its chemical weapons stockpile and programme still cannot be considered "accurate and complete", the High Representative for Disarmament Affairs told the Security Council today via video-teleconference, during her regular monthly briefing on the implementation of resolution 2118 (2013).

High Representative Izumi Nakamitsu said the assessment by the Organisation for the Prohibition of Chemical Weapons (OPCW) is due to "identified gaps, inconsistencies and discrepancies that remain unresolved", in accordance with the Chemical Weapons Convention. The international community cannot yet have full confidence that Syria's chemical weapons programme has been eliminated, she added.

The outcome of the seventh round of inspections by the OPCW Technical Secretariat at the Barzah and Jamrayah facilities of the Scientific Studies and Research Centre, she said, will be reported to the OPCW Executive Council in due course. Syria has yet to provide sufficient technical explanations or information that would allow the Technical Secretariat to close the issue related to the finding of a Schedule 2 chemical detected at the Barzah facilities during the third round of inspections held in 2018.

Meanwhile, she continued, the OPCW Declaration Assessment Team is working to clarify all outstanding issues related to Syria's initial declaration, recalling that the OPCW Director-General noted on 11 December 2020 that, while some progress was made during the last round of consultations with Syria's National Authority, 19 issues remain outstanding.

One of them pertains to a chemical weapons production facility declared as never having been used for production, she continued. However, a review of all materials gathered by the Declaration Assessment Team since 2014, including samples, indicates that production and/or weaponization of chemical warfare nerve agents took place there. Syria also has yet to respond to a request by the Technical Secretariat to declare the exact types and quantities of chemical agents produced and/or weaponized at the site in question.

She said the OPCW fact-finding mission is studying all available information related to the use of chemical weapons in Syria and continues to engage with Damascus and other States parties to the Convention on "a variety of incidents". Similarly, the Investigation and Identification Team continues to investigate incidents in which the fact-finding mission determined use or likely use of weapons, and will issue further reports in due course.

Regarding inspections mandated by Executive Council decision EC-94/DEC.2 — "Addressing the Possession and Use of Chemical Weapons by the Syrian Arab Republic" — she said the Technical Secretariat is monitoring the situation and will inform Syria when it is prepared to deploy for that purpose.

"It cannot be repeated often enough," she emphasized. "There is no justification for the use of chemical weapons by anyone, anywhere and under any circumstances." She underscored the imperative of holding accountable all those who have used chemical weapons, expressing hope that the Council will "unite on this issue".

In the ensuing discussion, delegates differed over the impartiality and objectivity of the OPCW's actions, and whether or not Syria had indeed cooperated fully with the watchdog.

The representative of the United States said that, while there is no disagreement that the use of chemical weapons is unacceptable, Council members are still fighting to uphold the century-old global norm to never use them again. Citing the Council's obligation to uphold its commitments under the Chemical Weapons Convention and its own resolution 2118 (2013) to hold Syria accountable, he said that, in the seven years since Syria's accession to the Convention, it has failed to fulfil its obligations and sought to make a mockery of the structures in place to create a world free of chemical weapons. The Council is obliged to ensure that there are serious consequences for those who use or have used these arms, he emphasized, declaring: "We cannot remain silent."

He went on to condemn in the strongest terms the Assad regime's use of chemical weapons, often in civilian areas, stressing that it is not a matter of opinion. "It is a matter of fact, confirmed by the OPCW," and it is incumbent upon the Council to hold Syria accountable under resolution 2118 (2013), he said, expressing support for all efforts towards accountability, which are long overdue to bring justice to the regime's victims. Accountability is also a confidence-building measure as part of the broad political process called for in resolution 2254 (2015). The United States firmly supports the impartial and independent work of OPCW, he said, applauding its leadership and Technical Secretariat for the credible, objective and professional manner in which it carries out its mission, he added.

In response to the OPCW Investigation and Identification Team findings of Syria's chemical weapons use, he recalled, the OPCW Executive Council adopted a decision in July 2020 requesting that Syria take measures to redress the situation. In October and December 2020, the OPCW Director-General informed that Syria failed to complete any of the measures set forth in the July 2020 decision, he noted. "The world is still waiting for Syria to complete these measures," he stressed, calling upon OPCW to take appropriate action when it reconvenes later in the year and to send a strong message to Syria about the consequences of violating the Convention.

Recalling that the United States and 45 others submitted a draft decision at the Conference of States Parties in response to Syria's failure to fulfil the measures requested, he declared: "We, as the Council, must call on all countries to support this decision," aiming to promote accountability for the Assad regime's actions. The Russian Federation is carrying out an accelerated public campaign to discredit OPCW, he said, stressing that "the world is not fooled". What is true is that the Assad regime used chemical weapons against its own people, and OPCW demonstrated that credibly and objectively, corroborating information offered by non-governmental groups, he said. The Russian Federation should encourage Syria to "come clean" about its use of chemical weapons and its current stocks, he said. "It is time for the Assad regime to uphold its commitments under the Chemical Weapons Convention."

The representative of the Russian Federation welcomed the absence of opposition among Council members to holding today's meeting on the Syria chemical weapons dossier, while underscoring his delegation's approach to transparency and facts. Recalling remarks by independent experts during an Arria-formula meeting in September 2020 and a closed briefing by former OPCW Director-General in October 2020, he noted that their statements provided objective assessments. The current Director-General, however, finally addressing the Council in December 2020, repeated what was already known to all and avoided answering questions raised during the meeting, he said. He should appear in the Council again to answer those questions. He went on to state that Syria voluntarily joined OPCW at the Russian Federation's suggestion and destroyed all its stocks of chemical weapons.

He recalled that, in 2014, the Syrian military's chemical programme was completely closed, its chemical weapons stockpiles liquidated and chemical weapons production facilities destroyed, pointing out that OPCW has repeatedly confirmed that. All these years, several States continue to use a "chemical card" to increase pressure on the Government of Syria. Western countries have repeatedly put forward extremely serious accusations against Damascus, citing such inconclusive evidence as videos from social media and "testimonies" provided by knowingly biased witnesses from the anti-Government opposition or the notorious "White Helmets". Evidence to the contrary presented by Syria, the Russian Federation and some independent experts and organizations was ignored, he said, adding that the number of frauds, manipulations and internal violations within OPCW reached a critical mass by the beginning of 2021.

The most striking examples are egregious irregularities in the investigation of the incidents in Khan Shaykhun in April 2017 and Douma in April 2018, he continued. Calling attention to the testimony of a former OPCW inspector that the conclusions about the use of chemical weapons in Douma were falsified under direct pressure from Western countries, he said the Investigation and Identification Team's 2017 report about Ltamenah was the culmination of all bad-faith efforts by the Technical Secretariat. The OPCW Executive Council's decision in July 2020 to declare alleged remaining chemical weapons and related objects, which simply do not exist, imposed obviously impossible conditions on Syria. Naturally, Syria cannot fulfil such an ultimatum, he emphasized, warning that Western colleagues are trying to initiate the process of denying Syria's rights in OPCW. He expressed hope that most delegations to the Conference of States Parties in April will refuse to participate in that attempt initiated by a group of Western countries.

Many countries have similar problems in their initial declarations, but for some, they were "minor flaws", he said, noting that additional declarations of certain stocks happen all the time and are not extraordinary. The United States regularly updates its declaration, joining the ranks of Canada, Belgium, France and Germany, he continued, pointing out that about 500 undeclared munitions were found in Libya in 2021. In Iraq, the initial declaration was not confirmed at all, as it was done only on the basis of available United Nations documents, he noted. Reiterating that Syria's initial declaration is not exceptional, he called upon the OPCW Director-General to explain why the Technical Secretariat openly resorts to the practice of double standards, "forgiving" minor flaws in one country while fanning accusations against others. OPCW's problem is broad and systemic in nature, he said, calling it a crisis of trust in what was once one of the most authoritative international organizations. Unfortunately, it has turned into an instrument of political manipulation and punishment, he added, describing OPCW as seriously ill with politicization.

The representative of Estonia noted that, despite consistent, science-based evidence that the Syrian regime used chemical weapons against its own people on seven occasions, all attempts to take action have been blocked by the Russian Federation, which rejects OPCW reports. He denounced as "a concerted disinformation campaign" claims that the OPCW Technical Secretariat exercises double standards, engages in political smear campaigns and falsifies reports. Seven years and 87 reports after the passage of resolution 2118 (2013), there are 19 outstanding issues related to Syria's initial declaration, he said. Damascus has also ignored the July 2020 decision of the OPCW Executive Council, yet the Security Council, rather than condemn such behaviour, hears encouragements to non-compliance. He went on to decry the 2018 use of Novichok in the United Kingdom and in the Russian Federation in 2020 as threats to international peace and security, pressing the Council to uphold its resolutions, the Chemical Weapons Convention and the United Nations Charter.

The representative of Mexico described the Convention as an example of effective multilateralism, emphasizing that its States parties are obliged to demand compliance, including with decisions emanating from its governing bodies. Mexico fully trusts the professionalism of OPCW and has collaborated with it, he said, noting that his country will assume the presidency of the twenty-fifth Conference of States Parties. Mexico also trusts that Syria will clarify outstanding inaccuracies in its initial declaration and facilitate access for the fact-finding mission and the investigation team to carry out their work on the presumed use of chemical weapons, he added. Mexico calls upon Member States not to let Syria's chemical weapons issue polarize deliberations and decisions in other United Nations bodies, including the First Committee, he emphasized.

The representative of Ireland expressed regret that the Technical Secretariat has spared no effort over seven long years to assess Syria's initial declaration, yet it is still not possible to assess that declaration as either accurate or complete. Such problems are not a minor issue, he emphasized. There have been 17 amendments to the declaration, including the addition of a production facility, four research and development centres, and a doubling of the amount of declared agents and chemicals, he noted. The Joint Investigative Mechanism, and now the Investigation and Identification Team, have attributed responsibility for using chemical weapons in some instances to the Syrian authorities, he recalled. In April, the Conference of States Parties to the Convention will meet in The Hague and will have to decide on the necessary course of action, he said, stressing that Dublin will support all measures available under the Convention to ensure Syria's compliance, as well as the European Union's chemical weapons sanctions regime.

The representative of Niger noted that, seven years after the adoption of resolution 2118 (2013), the elimination of Syria's chemical stockpiles and accountability for its use of

chemical weapons is struggling to find resolution due to the lack of agreement among the parties, the influence of external actors and management of the Syria chemical weapons dossier. As such, Niger calls for "a true unity of purpose" to ensure the verifiable disposal of these chemical weapons, he said, emphasizing: "This is essential." He went on to take note of Syria's allegations that armed groups have brought material into the country that could be used for a chemical weapons attack "under a false flag", underlining that "these reports should not be ignored" and calling upon OPCW to grant the attention those allegations require.

The representative of Viet Nam emphasized his country's policy to categorically condemn the use of chemical weapons in any form, by anyone, anywhere, under any circumstances or for any reason. Investigations must be conducted into any alleged use to ensure implementation of the Convention, he said. He called for continued cooperation between OPCW and Syria, encouraging both to step up their efforts. Stressing the fundamental importance of that unity and cooperation in the Council and OPCW, he urged all sides to engage in a constructive and non-politicized manner, focusing on the common goal of full implementation of the Chemical Weapons Convention.

The representative of Norway, noting that the use of chemical weapons in Syria is well documented and confirmed by the former Joint Investigative Mechanism and the Investigation and Identification Team, recalled that Norway and Denmark, as part of the joint OPCW-United Nations mission, conducted a naval operation to ensure the transportation of chemical weapons and components out of Syria in 2014. That was a contribution to the destruction of that country's chemical weapons to prevent further atrocities against the civilian population, he said. Norway has full confidence in OPCW and its Technical Secretariat, including the findings of the Investigation and Identification Team concerning the use of chemical weapons in Ltamenah, he added. Oslo is co-sponsoring a draft decision of the Conference of States Parties to suspend certain rights and privileges of Syria under the Convention, he stated, emphasizing his delegation's firm rejection of attempts to discredit or bring into disrepute OPCW and the work of the Technical Secretariat.

The representative of Saint Vincent and the Grenadines, reiterating her delegation's position that any chemical weapons use constitutes a reprehensible violation of international law, emphasized that perpetrators of such atrocities must be held accountable. She expressed support for efforts to strengthen OPCW's capacity, and the need to ensure that both that agency and its subsidiary bodies are beyond reproach. "The important work of the OPCW must therefore remain impartial, transparent and should never be politicized," she stressed, adding that its findings must be able to withstand rigorous scrutiny. Calling for consensus-based decisions to prevent further polarization, she said the Council, meanwhile, should not overlook the Syrian Government's many notifications regarding preparations by armed groups to use or stage chemical weapons attacks.

The representative of Kenya said that, from the ravages of terrorism to the politicization of counter-terrorism by multiple actors, as well numerous claims of chemical weapons use, Syria is both a victim and a symbol of a global order under immense strain from unilateralism, power politics and wars without limit. As entrenched as the positions of the major parties to the conflict have been, however, it is still possible for the Council to pull together, he emphasized. "The basis of renewing our appetite for collaboration is that it is in the interest of all members, permanent and elected, to show the world that the Security Council can still deliver in the most difficult circumstances." Such a fulfilment of its core mandate would lead to Council support for a Syrian-led and Syrian-owned dialogue incorporating all actors committed to security and opposed to terrorist violence as a means to promote political aims, he added.

The representative of China said that alleged uses of chemical weapons must be investigated in an objective, transparent manner and on the basis of factual evidence. Syria's expressed willingness to cooperate with the Technical Secretariat deserves recognition by the Council, he said, emphasizing that the detailed reports presented to the Council by that country's representative also deserve its full attention. He went on to emphasize that Syria is a legitimate United Nations Member State, deserving of respect, warning Council members against calling that country's Government a "regime". Stressing that investigations should not be unduly hasty, he urged OPCW to present complete evidence with no loose ends. The Technical Secretariat's work must be science-based, he said. Noting the prevailing challenges and sharp divisions, he urged States parties to the Convention to avoid forced voting and requested that the OPCW Director-General respond publicly to questions answer raised.

The representative of India encouraged engagement and cooperation between Syria and the OPCW Technical Secretariat towards early resolution of all outstanding issues, noting that his country provided $1 million to the OPCW Trust Fund for activities relating to the destruction of chemical stockpiles in Syria. Strongly condemning the use of chemical weapons, he called for an impartial, objective investigation into any alleged use in Syria, and expressed concern that the weapons could fall into the hands of terrorists, who have taken advantage of the decade-long conflict in the country. "The world cannot afford to give these terrorists any sanctuary," he emphasized. Noting that India has consistently called for a comprehensive and peaceful resolution of the conflict through a Syrian-led dialogue, he said India remains supportive of both the Geneva and Astana processes for an expeditious resolution of the conflict.

The representative of France noted that no progress has been registered, yet simple gestures could be made and it is incumbent upon the Syrian regime to make them, firstly to shed light on its initial declaration. Asking how it could be explained that 19 issues remain open seven years after resolution 2118 (2013), or that new questions "continue to add to the old ones", he called for clarity around the production sites evidenced by OPCW. The fact-finding mission, meanwhile, has evidence gathered in 2019, including witness statements and samples related to events in Douma, which it presented with clear conclusions. He went on to recall that the first OPCW report stated that responsibility for three chemical weapons attacks in March 2017 falls to the regime, yet the authorities have taken no measures to come into compliance. That is why France submitted to the OPCW secretariat a draft decision on behalf of 46 delegations in November 2020, to be forwarded to the Conference of Parties in April. He went on to lament the "mendacious accusations of those trying discredit the OPCW", emphasizing that "there is no conspiracy". There are simply facts, he said. "The regime has used weapons of war banned under international law against its own population." The fight against impunity and against the use of chemical weapons remains the rationale behind France's partnerships and actions, he added.

The representative of the United Kingdom expressed regret that, seven years in, Syria's declaration can still not be considered "accurate and complete". Its unresolved issues — including the unaccounted-for whereabouts of thousands of munitions and hundreds of tons of chemical agents — are both serious and substantive, she said, also citing OPCW evidence that a facility previously declared by Syria as not having been used to produce chemical weapons, was indeed used to produce or weaponize chemical warfare nerve agents. "The ongoing threat posed to international peace and security by these unresolved issues is not hypothetical," especially for the thousands of Syrian civilians who have suffered the horrifying effects of such agents, she said, emphasizing that the recent closure of three unresolved issues demonstrates that, contrary to some assertions, resolution is possible if Syria chooses to engage genuinely and constructively.

The representative of Tunisia, Council President for January, spoke in his national capacity, emphasizing that those who used chemical weapons must be held accountable, whatever their justifications. Expressing his delegation's full support for the OPCW's technical work, he highlighted the importance of constructive cooperation between Syria and that agency to resolve pending issues. Tunisia looks forward to the Conference of States Parties in April, he said, emphasizing the need for the international community and the Council to work collectively and in solidarity to close the file.

The representative of Syria said Western Governments have attempted for years to use the chemical weapons file as a way to blackmail his country. Recalling that resolution 2118 (2013) stipulates that all chemical weapons in Syria must be eliminated, he said the Head of the Joint Investigative Mechanism confirmed seven years ago that Damascus had implemented the resolution, pointing out that chemical material was destroyed aboard the United States vessel MV Cape Ray. Citing seven years of cooperation with the [former] Joint Investigative Mechanism and the Declaration Assessment Team, he took issue with the word "outstanding", saying that, if Syria were to close 18 of the 19 issues, 40 more would be opened. "The aim is to keep this file open, to blackmail Syria," he reiterated asserted.

Underlining his country's strong commitment to disarmament and non-proliferation, he pointed to its 1968 accession to the 1925 Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare; its 1969 accession to the Treaty on the Non-Proliferation of Nuclear Weapons; and its 1972 signing of the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction. "We did practise what we preached," he emphasized. Syria even tabled a resolution on the elimination of all weapons of mass destruction in the Middle East, but the United States threatened to wield its veto in seeking to protect Israel's arsenals, he recalled, noting that, as a result, the draft "remains in blue" in the Security Council archives.

He went on to condemn the use of chemical and other weapons of mass destruction, anywhere, at any time, by any party, under any circumstance, citing their use by terrorists and their sponsors in campaigns intended to demonize Syria. He called attention to a letter (document S/2012/917) informing the Council and the Secretary-General about Al-Qaida operatives manufacturing chemical weapons near the Turkish city of Gaziantep and threatening to use them against Syrian civilians. Damascus sent related footage from Turkish media to the bodies entrusted with implementing counter-terrorism resolutions and requested that the [former] United Nations Supervision Mission in Syria (UNSMIS) inspect and conduct an inventory of chlorine at a private laboratory east of Aleppo, he recalled. However, that request it was not honoured, as terrorists opened fire on its members and took control of the lab.

Moreover, he continued, Syria sent a letter to then Secretary-General Ban Ki-moon about a March 2013 chemical missile attack in Khan al-Assal in Aleppo Governorate — on the day of the incident — and requested an investigation. Instead, France and the United Kingdom sent their own joint letter, requesting an inquiry into chemical weapons incidents in Damascus and Homs. Other Governments that sponsor terrorism followed suit, sending 44 letters, he said, adding that, rather than helping Syria, the file was politicized and used to cover up crimes by terrorist groups and their sponsors — actions that continue today. He also described as a scandal the dispatch of an investigation team to Khan al-Assal in August

2013, five months after chemical weapons were used there, and its subsequent diversion to the Damascus countryside. "This incident was never investigated," he stressed, citing other events in Khan Shaykhun in 2017, and Douma in April 2018. He went on to characterize OPCW as a tool for those opposed to Syria and whose reports lack objectivity. Instead, the reports are based on information furnished by terrorists and their mouthpiece, the so-called White Helmets, as well as false witnesses.

He went on to underline that OPCW denied information provided by Syria and the Russian Federation on the 2018 events in Aleppo, he said, adding that despite inquiries into incidents in October 2017, 7 July 2017, 4 August 2017, 9 August 2017 and 8 November 2017, the fact-finding mission issued no reports. Syria has proven scientifically that the allegations against it are false, having repeatedly presented testimonies by the former OPCW Director-General, he said, pointing out that Western countries obstructed the latter's attendance in the Security Council in October 2020. The same month, Damascus sent its monthly report to OPCW on the destruction of production facilities, he said, adding that his country is ready to continue consultations with the OPCW Technical Secretariat and coordinate dialogue on closing all outstanding issues. He went on to condemn actions intended to force OPCW to adopt the French-Western draft decision that falsely alleges Syria's non-compliance with the Convention. Any decision based on the decision emanating from the Executive Council's ninety-fourth session would be one-sided, aimed at framing Damascus for the use of chemical weapons and exonerating the terrorists, he stressed, while renewing Syria's call for OPCW to address its politicization and its own flaws in order to regain its credibility.

The representative of Turkey said his delegation has analysed the OPCW Director-General's eighty-seventh monthly report on Syria's chemical weapons programme and its findings deepen its concerns regarding the outstanding issues in relation to the Assad regime's initial declaration. Of the 19 outstanding issues, one is particularly alarming, he said, emphasizing that a chemical weapons production facility obviously exists, in stark contradiction with the regime's claim to the contrary. This is yet further proof of the declaration's fraudulent nature, he added, stressing that the regime must immediately declare the full extent of its chemical weapons programme. The OPCW Executive Council's decision of 9 July 2020 remains particularly important, he said, noting that it set clear and verifiable parameters for action and required the Syrian regime to return to full compliance with the Convention in 90 days. Turkey co-sponsored that decision alongside 45 other States parties, which will be considered during the second part of the twenty-fifth Conference of States Parties, he noted. It is high time to take concrete action to ensure accountability in Syria, he said, declaring: "We have enough evidence for the culpability of the regime." He went on to underline the special responsibility of those with influence over the regime in that regard. He added that he would not respond to statements by the speaker from Syria, saying the delegate is not the legitimate representative of that country and its people.

How to succeed in designing a CBRN protected vehicle

Source: https://www.linkedin.com/pulse/how-succeed-designing-cbrn-protected-vehicle-andrey-shpak/

"Preparation is better than panic"

… especially in CBRN (Chemical, Biological, Radiological and Nuclear) event

Sep 2020 – The question I have been asked frequently is "why to equip the vehicle with CBRN protection systems, if the chance for CBRN event is very low?". The answer is the same as for other protection systems… we add ballistic or mine protection for even the smallest of chances that you may need it.

The CBRN Threats

Military, Police and other Special Purpose Vehicles need to function in very different conditions and fast changing environments. It is crucial that the crew and the sensitive equipment inside the vehicles will safely continue performing their mission even in a contaminated environment following a CBRN event. We can find many examples in the modern History of CBRN events like industrial hazards or transport accidents with Toxic Industrial Chemicals (TIC) release, war scenarios or terror attacks with use of Weapon of Mass Destruction (WMD), as well as epidemics, fires, natural hazards and many others.

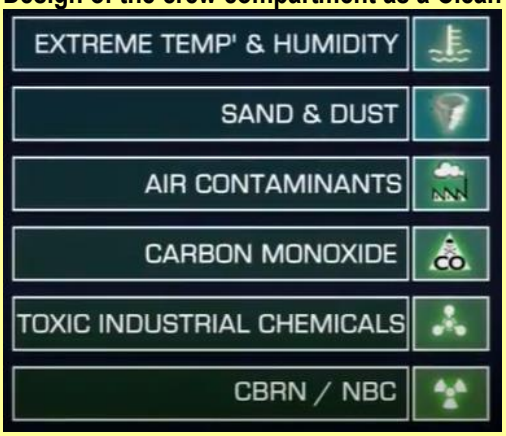
Critical components for vehicle protection

Vehicle design and the life support systems are the main components that are critical for building an efficient CBRN protected vehicle. Let's talk about every part in more details:

Vehicle Design

In the design of CBRN protected vehicle, we need to take into consideration the following: creation of Toxic Free Area (TFA), use of the right materials and correct air distribution inside.

Design of the crew compartment as a Clean & Toxic Free Area



For creating a TFA inside the crew compartment, we will need to seal the crew compartment… sounds easy, but on the practical side, to seal the compartment 100% is just "Mission Impossible". Every small opening can cause an air leakage that may not allow creation of overpressure (pressure higher than atmospheric pressure) that is critical for creating a TFA.

When designing a CBRN protected vehicle the approach has to be different than to "regular" vehicle, as the vehicle has to be airtight. This can be created with careful design of the compartment structure, sealing technical openings and pass-through (for cables, hoses etc.), doors and hatches sealing, and even bolt threads need to be sealed, as they can be a source for air leakages.

To create overpressure inside the compartment, the volume of air that is "pushed" into the compartment has to be higher that the volume of air that "pushed" outside (the same principle as inflating balloon). When the compartment is airtight, the air supply system by pushing fresh air to the compartment will create an overpressure inside. This will prevent contaminated air from entering the compartment and in case of small leakages to push the air out.

An important consideration when the vehicle is on the move, the external air pressure on the vehicle is rising and the level of the overpressure inside the compartment needs to be sufficiently high to prevent the air from entering through the small openings.

Using the right Materials

Materials, coating and seals have to be durable and resistant to chemicals. Following exposure to war chemicals or toxic industrial chemicals, as well as to chemicals used in the decontamination process, the rubber seals and other surfaces could be damaged or degraded. The rubber parts have to be very durable and resistant to different environmental conditions, as they effect the sealing and airtightness of the complete compartment.

Air distribution inside the compartment

Effective air distribution that will "flush" the compartment with fresh air will allow to control the CO2 levels. In the CBRN mode the fresh air have to be filtered with CBRN filtration system and the AC system will work in recirculation mode. The easiest way to insure the air flushing effect is to place the overpressure valve in the opposite corner to the CBRN filtration system and the air inlet.

Life support systems

CBRN filtration system is considered a life support system and has a critical role in protecting the crew and allowing continuous work of the people and the equipment in CBRN contaminated environment.

There are two main types of systems:

1. Pushing system – is installed outside the TFA and pushes the air into the compartment. This type of systems is usually used in armored vehicles.

The main advantages of the pushing system, is that the filter can be changed from outside the TFA without contamination and the compartment will be kept "clean".

Additional advantage it extra protection in case of leakage from the CBRN filter, the filters installed outside and will not contaminate the cabin.

2. Pulling system – that is usually used in bomb shelters and pulls the air from outside. The filters usually placed inside the TFA or in additional room connected to the TFA area.

In both cases the pushing and pulling systems needs to filter the dust and CBRN particles to the safe levels. The safety level usually determined by the user or according to the standards, like the AEP-54 or others.

The other role of the air filtration systems is to create an overpressure inside the vehicle introducing air into the protected TFA area and to perform complete air changes in the compartment to prevent raising of the CO2 concentration levels.

It is important to emphasize that CBRN filters are usually designed to deal with certain CBRN threats and with certain capacity but can be ineffective for some Toxic Industrial Chemicals (TIC) or substances released in burning of different materials. The ability to absorb different chemicals is dependent on the formula of the carbon used in the filter and can be different in different types of filters.

The overpressure in the vehicle compartment is usually controlled by an overpressure valve that has a blast protection mechanism, that locks the valve if the air pressure suddenly rises outside and prevents contamination entering the TFA area.

In case the vehicle cannot be sealed and it is impossible to create a TFA inside the vehicle, there are several solutions based on face-masks that can be applied. Although this solution may be simpler and less expensive, the use for the crew is more complicated and may affect their operational capabilities.

As you can see, to create a CBRN protected vehicle you need to take into consideration many different aspects starting from design of the vehicle and choosing the right systems for the purpose and protection needs.

Andrey Shpak *is Regional Director at Plasan Sasa Ltd. | Survivability Solutions for Land Vehicles, Aircraft and Naval Platforms. A special thank you to Plasan's directon of Design Nir Kahn for support in writing the article.*

ILC escape masks given to lawmakers during Capitol riots

Source: https://delawarestatenews.net/business/ilc-escape-masks-given-to-lawmakers-during-capitol-riots/

SCape CBRN 30 escape masks, developed by ILC Dover in Frederica, were provided to lawmakers during the breach of the U.S. Capitol building last week. (Submitted photo/ILC Dover)

Jan 12 — Members of Congress were implored by police to crawl under their chairs after waves of Trump supporters clashed with police and mobbed the U.S. Capitol on Jan. 6.

Shortly after protesters breached the Capitol, disputing President-elect Joe Biden's victory, the lawmakers were asked to grab their gas masks as the violent crowd fought its way past police.

That's when ILC Dover, a company based in Frederica that has become famous for manufacturing spacesuits for NASA, became a part of the extraordinary — and harrowing — event.

The gas masks that each member of Congress was provided during the attempted takeover of the Capitol building was a **SCape CBRN 30 escape mask**, which was designed and made at ILC's campus in Frederica. The lawmakers were provided with them as a precaution.

"We take great pride in providing high-quality protective products both for health care and for unexpected events (such as the protest at the Capitol)," said Doug Durney, director of marketing and new business development for ILC Dover. "We've made thousands and delivered thousands of health care (protection gear) for front line health care workers these days to support the COVID (fight) — and while this (Capitol breach) was a sad event, we were happy to be there to provide the protection."

The easy-to-use respirator developed by ILC is the only one of its kind that meets the National Institute for Occupational Safety and Health standards for an escape respirator that can be used for a 30-minute duration during a chemical, biological, radiological or nuclear event.

Members of both the House and the Senate were told to grab the escape masks as they were evacuated from their respective chambers.

House members and staff, followed by journalists, were reportedly escorted down the stairs on the west side of the chamber to the basement of the Capitol, past a group of people in police custody lying on the ground. Members of Congress on the third floor were reportedly taken to a room in the Longworth House Office Building.

"(Last Wednesday) was an event I never thought I'd see — combat troops having to take back the United States Capitol," said Sen. Chris Coons, D-Del. "This is a tragic moment in our nation's history.

"That our Capitol was overwhelmed by rioters and that Officer (Brian D.) Sicknick ultimately died because of injuries he suffered in the line of duty, is unacceptable. We must seek accountability for those who participated in and incited this attack, investigate how this happened and take steps to ensure it never happens again. This must be a priority."

A second Capitol police officer, Howard Liebengood, also died, it was announced Sunday.

Mr. Durney said that since the terrorist attacks of Sept. 11, 2001, there has been an ever-increasing demand for civilian escape masks that are capable of protecting untrained users from chemical, biological, radiological and nuclear inhalants.

He added that hazardous conditions may be caused by spills of toxic gases or liquids from trucks, rail cars or industrial plants or could be the result of terrorist attacks or protests. Since the introduction of the original SCape NBC in 2004, numerous government agencies have chosen to make ILC Dover escape respirators a key component of their emergency response plan.

Mr. Durney said lawmakers were provided with the SCape CBRN 30 escape mask, which are identical to ILC's SCape CO/CBRN, except that they don't handle carbon monoxide.

"We sell two of those (escape masks), and they handle all of the same broad range of chemicals, as well as biologicals, and the only difference is the SCape CO/CBRN handles carbon monoxide," he said. "I don't know exactly when these were purchased (by the government). They were purchased from a distributor. The (government) started their escape program following 9/11."

Unlike other escape masks, the SCape CBRN 30 can be used by people with glasses and/or facial hair, has no securing straps, nose cup or mouth bit and utilizes a positive-flow ventilation system that automatically activates when removed from the package.

Its clear hood with large visor is designed to allow the user to perform a wide range of tasks, such as using a cellphone or other communication device, and to be more easily recognized while reducing the feelings of claustrophobia. Other features include a comfortable neck seal and blower indicator light.
"ILC Dover has a long history of protecting people from extremely dangerous toxins and elements in some of the most demanding environments — including space and the battlefield," Mr. Durney said. "This unsurpassed expertise is leveraged when creating and manufacturing all of our personal protective products, including the SCape CO/CBRN 30, which offers the highest level of protection available and is the most user-friendly escape mask available today."
ILC Dover has been serving the aerospace, personal protection and pharmaceutical industries since 1947.
Mr. Durney said ILC's innovative products have been used on the moon, on Mars and around the globe, including now in the Capitol building.

EDITOR'S COMMENT: What an odd article! (1) What was the CBRN environment to escape from? (2) No protection from carbon monoxide – the gas that together with hydrogencyanide are produced in building fires (but I did not see any smoke). It was not the good model for the representatives of the American people. (3) "*Unlike other escape masks …*" but as far as I know all escape hoods follow the same philosophy that is to be used by lay people without any training and knowledge, with long hair, beards, glasses and different shapes of faces – men; women and children. ILC Dover is a respectable company with very good products and does not need cheap advertisement (*… the most user-friendly escape mask available today*) in order to promote its products.

Toxic: A History of Nerve Agents

Source: https://play.acast.com/s/dansnowshistoryhit/toxis-ahistoryofnerveagents

In 2018, the British city of Salisbury crashed into newspaper headlines worldwide when former Russian military officer Sergei Skripal and his daughter, Yulia, were poisoned with nerve agents there. This was the first time that many people had heard of these deadly, yet invisible and odourless weapons being used, but the history of nerve agents goes much further back, to the interwar period and an unprofitable discovery in pesticide production. In this engrossing discussion with James Rogers, Dan Kaszeta explores the development of nerve agents under the Nazi Regime, the figures and institutions pushing them, and the reasons behind the Third Reich's restraint from using these chemicals, despite being the only country to possess them. He also reveals the post-war continuation of nerve agent research on both sides of the Iron Curtain, and the weapon's gradual dissipation around the world. Dan Kaszeta is a securities specialist and world expert on chemical weapons. His book, 'Toxic: A History of Nerve Agents from Nazi Germany to Putin's Russia', is out now.


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

USA (vaccination): Caught on camera

Source: https://www.youtube.com/watch?v=CWYlbW38QDU&feature=emb_logo

EDITOR'S COMMENT: Watch the video and make your own conclusions. The proceed with your jab.

Professor of Engineering Harris Makatsoris awarded President's Special Award for Pandemic Service by the Royal Academy of Engineering

Source: https://www.kcl.ac.uk/news/professor-of-engineering-harris-makatsoris-awarded-presidents-special-award-for-pandemic-service-by-the-royal-academy-of-engineering

Aug 2020 – Harris Makatsoris, Professor of Sustainable Manufacturing Systems in the Department of Engineering, has been awarded for his work on the production of synthetic RNA vaccines against the Coronavirus pathogen with advanced manufacturing intensification technology.

Granted for exceptional engineering achievements in tackling the challenges of the COVID-19 pandemic, this award from the Royal Academy of Engineering has been made to 19 winners across the UK's engineering community.

Harris' research has led to the development of a 'factory-in-a-box' that allows the rapid manufacture of synthetic RNA vaccines against the SARS-CoV-2 virus, thus minimising the space required for high-volume vaccine production.

Harris described the way his research will impact COVID-19 efforts:

This research adds a new tool in the manufacturing toolbox for vaccines and other RNA based therapeutics. A conventional vaccine manufacturing plant requires several months and a significant multi-million-pound investment to be built. There is therefore an urgent need for a dramatic and rapid increase in manufacturing capacity and this can be addressed with new thinking and technology that pushes convention and current boundaries. We work precisely to achieve that with research that combines flow technologies with computer control, delivers compact, reproducible manufacturing environments to make these therapeutics reliably and continuously, and ultimately at the point-of-use. The result is

manufacturing capability that can scale rapidly to meet the needs of the population, reducing dependency on overseas supply and at a small fraction of the investment required for a typical biopharmaceutical plant.

At King's, Harris' research interests include a focus on Artificial Intelligence for process automation, Circular Manufacturing Systems enabled by bioprocessing, and flow technologies for vaccines manufacturing.

On this recognition from the Royal Academy of Engineering, Professor Barbara Shollock - Head of the Department of Engineering - commented:

The President's Special Award for Pandemic Service is just one way to highlight the diversity of contributions in this public health crisis. Engineering expertise, working alongside other disciplines, is key to developing innovative solutions, and Harris's research is an excellent example of this. We at King's College Department of Engineering are delighted that he has been recognised with this award.

▶▶ Watch Harris' Spotlight on COVID interview to find out more about his' 'factory-in-a-box' solution to vaccine manufacturing.

Great News: Latest Research Shows Immunity to COVID-19 Lasts at Least 8 Months

Source: https://www.sciencealert.com/latest-research-adds-to-evidence-immunity-covid-19-could-last-8-months-or-more

Dec 23 – Fears that our immune system could swiftly forget its encounter with the SARS-CoV-2 virus are increasingly unfounded with an Australian study revealing our blood is still capable of mounting a strong response eight months post-infection.

This is good news for those concerned that COVID-19 vaccines won't deliver the period of protection needed to manage the virus's spread throughout the population.

"This has been a black cloud hanging over the potential protection that could be provided by any COVID-19 vaccine and gives real hope that, once a vaccine or vaccines are developed, they will provide long-term protection," says Monash University immunologist Menno van Zelm.

While it's still too early to tell just how long immunity to this specific coronavirus might last, we can be confident time will probably be on our side.

In a collaboration between Monash University, The Alfred Hospital, and the Burnet Institute in Melbourne, researchers analysed blood samples taken from 25 volunteers diagnosed with COVID-19.

Each sample provided a snapshot of the immune system's status, from just four days after infection to as long as eight months.

A further 36 individuals with no history of the disease also provided one or two blood samples for comparison.

The COVID-positive samples suggest concentrations of free-floating SARS-CoV-2 antibodies begin to fade just 20 days after symptoms appear, a finding that falls in line with previous studies suggesting antibody levels drop quickly, especially in mild cases of COVID-19.

While this isn't in itself surprising, it has caused consternation among immunologists over whether we should expect waves of reinfections in coming years.

Antibodies are like mug-shots for the immune system, allowing it to pounce readily on past offenders who dare to show their face again. Without them, it's far too easy for a past infection to waltz right back in.

In the case of some pathogens, these chemical 'wanted' posters stick around for years. Measles, for example, provokes an antibody response that barely drops throughout your lifetime.

Other agents of disease fade from memory a little faster. For tetanus this vanishing act takes just over a decade, requiring frequent reminders in the form of booster vaccines to nudge the system into printing out a fresh batch of antibody 'mug shots' all over again.

The key to this antibody-printing service are white blood cells called memory B cells. Formed during an infection to print out antibodies specific to an invader, these cells can hide away for decades once the heat dies down, ready to generate a fresh supply of antibodies at a moment's notice if the pathogen were to reappear.

To see whether a COVID-acquainted immune system still had sufficient B cells to do the job after just a few months, the researchers introduced fluorescently labelled pieces of SARS-CoV-2 to the once-infected blood samples.

The analysis not only revealed a significant response in each of the COVID-19 blood samples, but allowed the team to determine which kinds of B memory cells were reacting to which particular chunk of the virus's body.

"These results are important because they show, definitively, that patients infected with the COVID-19 virus do in fact retain immunity against the virus and the disease," says van Zelm.

And since the proteins analysed by the study are considered prime sites to target, we can expect most vaccines will also convey a good level of immunity for at least eight months.
Beyond that? Time will tell. Hopefully we can bring news in coming years of continued immunity that lasts well beyond expectations. For the pandemic to be brought well under control, if not eradicated altogether, we'll need at least 70 percent of a population to be immune within the same window of time. Only then can we be sure the virus will have so few places to hide, it just might vanish. Right now, we can be fairly sure that window is eight months wide. Let's hope it's enough.

▶▶ **This research was published in** *Science Immunology*.

EDITOR'S COMMENT: OK for natural immunity; but is it the same with vaccine-induced immunity? The thing is that only at the end of 2021 or early 2022 we will be confident about the real immunity provided. Both authorities and population should accept this fact that unfortunately affects their perception on vaccination.

Scientists Develop Novel Class of Antibiotic against Wide Range of Bacteria

Source: https://www.genengnews.com/news/scientists-develop-novel-class-of-antibiotic-against-wide-range-of-bacteria/

Dec 23 – Wistar Institute scientists have designed a new class of antimicrobial compound, which, they claim, uniquely combines direct antibiotic killing of pan drug-resistant pathogenic bacteria, with a simultaneous rapid immune response for combating antimicrobial resistance (AMR). The team claims the **dual-acting immuno-antibiotics (DAIA)** strategy could represent a "landmark" in the fight against AMR.
"We took a creative, double-pronged strategy to develop new molecules that can kill difficult-to-treat infections while enhancing the natural host immune response," said Farokh Dotiwala, MBBS, PhD, assistant professor in the Vaccine & Immunotherapy Center and lead author of the team's work, which is reported in *Nature*, in a paper titled, "IspH inhibitors kill Gram-negative bacteria and mobilize immune clearance."
The World Health Organization (WHO) has declared AMR to be one of the top 10 global public health threats against humanity, and it is estimated that by 2050, antibiotic-resistant infections could claim 10 million lives each year and impose a cumulative $100 trillion burden on the global economy. The list of bacteria that are becoming resistant to treatment with all available antibiotic options is growing and few new drugs are in the pipeline, creating a pressing need for new classes of antibiotics to prevent public health crises. Existing antibiotics target essential bacterial functions, including nucleic acid and protein synthesis, building the cell membrane, and metabolic pathways. However, bacteria can acquire drug resistance by mutating the bacterial target that the antibiotic is directed against, inactivating the drugs or pumping them out. "We reasoned that harnessing the immune system to simultaneously attack bacteria on two different fronts makes it hard for them to develop resistance," said Dotiwala.
The team centered their studies on a metabolic pathway that is essential for most bacteria, but which is absent in humans, making it an ideal target for antibiotic development. "We focus on the methyl-d-erythritol phosphate (MEP) pathway for isoprenoid biosynthesis, which is essential for the survival of most Gram-negative bacteria and apicomplexans (malaria parasites) but is absent in humans and other metazoans," the team wrote.
MEP—or non-mevalonate—pathway, is responsible for biosynthesis of isoprenoids, molecules that are required for cell survival in most pathogenic bacteria. The lab targeted the IspH enzyme, an essential enzyme in isoprenoid biosynthesis, as a way to block this pathway and kill the microbes. Given the broad presence of IspH in the bacterial world, this approach might target a wide range of bacteria.
Researchers used computer modeling to screen several million commercially available compounds for their ability to bind with the enzyme, and selected the most potent inhibitors of IspH function as starting points for drug discovery. Previously available IspH inhibitors could not penetrate the bacterial cell wall, so Dotiwala collaborated with Wistar's medicinal chemist Joseph Salvino, PhD, professor in The Wistar Institute Cancer Center and a co-senior author on the study, to identify and synthesize novel IspH inhibitor molecules that were able to get inside the bacteria.
The team demonstrated that the IspH inhibitors stimulated the immune system with more potent bacterial killing activity and specificity than current best-in-class antibiotics when tested in vitro on clinical isolates of antibiotic-resistant bacteria, including a wide range of pathogenic gram negative and gram positive bacteria. In preclinical models of gram negative bacterial infection, the bactericidal effects of the IspH inhibitors outperformed traditional pan antibiotics. "Immune activation represents

the second line of attack of the DAIA strategy," said Kumar Singh, PhD, Dotiwala lab postdoctoral fellow and first author of the study. The researchers further pointed out that bacteria will likely not have developed resistance mechanisms to the mechanism of action of their DAIAs. "Unlike antibiotics derived from natural sources, no IspH inhibitors have been discovered in microorganisms, so it is less likely that resistance mechanisms—such as β-lactamases and macrolide esterases in the case of β-lactam and macrolide antibiotics—have evolved specifically against our prodrugs," they wrote. "The family of antibiotics and the antimicrobial strategy that we report here synergize direct antibiotic action with rapid immune response … This dual mechanism of action, an inherent feature of these compounds, could delay the emergence of drug resistance."
"We believe this innovative DAIA strategy may represent a potential landmark in the world's fight against AMR, creating a synergy between the direct killing ability of antibiotics and the natural power of the immune system," said Dotiwala.

The nagger Editor …

UAE – Abu Dhabi Health Services Company (SEHA) will maintain a wide variety of safety measures across their facilities to allay people's fear of contracting Covid-19 – this photo comes together with the article below.

EDITOR'S COMMENT: What is this?

We can't let fear become the new pandemic

By Dr Marwan Al Kaabi
Source: https://www.thenationalnews.com/opinion/comment/we-can-t-let-fear-become-the-new-pandemic-1.1133260

Dec 23 – It has become something of a cliche to say that we live in unprecedented times. Yet sometimes cliches are true for good reasons.
Covid-19 has forced upon us a new normal. This is especially true for the healthcare sector, which quickly had to adapt its facilities, how its professionals worked and how patients

accessed treatment. Similar to the rise of video-conferencing technology, an increase in the use of telemedicine has been underway in the medical world.

Much like our new reliance on food delivery services, now my sector is having to embrace remote drug delivery, as well as socially distanced, drive-through vaccinations. These innovations are vital. But there are many things in healthcare that cannot be replaced by digitisation.

The government, Seha and the healthcare industry have put huge effort into the fight against Covid-19. Our communities have sacrificed much and shown real solidarity. After all this hard work, the last thing we want is for a new and harder-to-spot "hidden pandemic" to scupper our achievements.

This is so important because we know that prevention is far better than cure. We need people to be proactive, to get that check-up and seek treatment as early as possible. Time and prompt intervention are our biggest weapons against all illnesses, particularly serious ones such as cancer.

We know that some people are apprehensive about coming back to hospitals and clinics. This is understandable. However, not only are the majority of our hospitals free of Covid-19, but we also have vast precautionary measures in place to ensure patients, their families and our staff are safe.

This includes going above and beyond to meet globally recognised sterilisation standards, as well as steps such as controlled entry protocols involving disinfection and temperature screening. Glass barriers between reception staff and patients are now in place and our waiting rooms have been redesigned to enable social distancing. To reduce high footfalls in our clinics, we are re-scheduling appointments to avoid overbooking. And these are just some of the measures.

The last thing we want is for a new and harder-to-spot "hidden pandemic" to scupper our achievements

It is well documented that the pandemic poses a greater risk to those with underlying health conditions. Despite this, more and more people are delaying seeking medical treatment. By presenting late to professionals, patients are denying themselves the best outcomes.

Combating this trend requires a narrative shift as we emerge from the pandemic and see the green shoots of recovery across the UAE. Fear from Covid-19 cannot become fear of accessing healthcare. Our message is loud and clear: people must not postpone medical visits due to anxiety about the virus. Doing so comes at a cost, which is both human and financial.

The longer you wait to get assessed, the more likely the health challenges will worsen, requiring more complex and costly treatments further down the road. Heart disease, cancer and diabetes, to name just a few, are not taking a break because of Covid-19. But nor are we. No matter what kind of medical attention you require, clinicians remain ready to help. We continue to prioritise healthcare access for all patients in need, while delivering the very highest quality of care.

There is good news though. The success of the UAE's phase-3 trials for the Sinopharm CNBG Covid-19 jab, in addition to recent global progress on vaccine development, are all indicators of the world's efforts to find a solution. Developed by Sinopharm CNBG and G42 Healthcare, a subsidiary of G42 Group, the vaccine's clinical trials are a collaboration between Department of Health – Abu Dhabi and Seha.

But even as we gain a better understanding of the virus, we cannot and will not dilute our safety measures. Equally, people must not put off treatment in the hope that the virus will soon recede. Even though we may be entering the end-game of the pandemic, the same advice applies: if you feel you need to see your doctor, go. If you feel you need to go to the emergency department, go now.

Let's not squander our massive achievements by neglecting health conditions that need attention. If we do that, while we may win the battle, the virus will win the war.

Dr Marwan Al Kaabi *is acting group chief operations officer at the Abu Dhabi Health Services Company (Seha).*

After COVID Infection, Antibodies Highly Protective for Months, Prospective Study Shows

Source: https://www.medscape.com/viewarticle/943154

Dec 23 – **After infection with SARS-CoV-2, antibodies protect most healthcare workers from reinfection for up to 6 months**, results of the first prospective study of the subject reveal.

The main message for healthcare workers is, "if you've had COVID, at least in the short term, you are unlikely to get it again," David Eyre, senior author, associate professor at the Big Data Institute and infectious diseases clinician at the University of Oxford, Oxford, United Kingdom, told *Medscape Medical News*.

Eyre and colleagues assessed for the presence of two antibodies to SARS-CoV-2 among 12,541 healthcare workers in the United Kingdom, including about 10% who had a history of polymerase chain reaction (PCR)–confirmed infection. Of those, 223 who did not have antibodies tested positive on PCR for the virus during 31 weeks of follow-up; two participants who did not have antibodies at baseline tested positive.

"It's great news because there have been so many questions regarding whether or not you can be protected against reinfection, and this healthcare worker study is really an elegant way to address that question," Mark Slifka, PhD, told *Medscape Medical News* when asked to comment on the findings.

Although "there are millions of people in the US who have been infected with COVID, we don't know how common reinfection is," said Slifka, a researcher at the Oregon National Primate Research Center and professor at Oregon Health Sciences University School of Medicine, Portland, Oregon.

The likelihood of a subsequent positive PCR test result was 1.09 per 10,000 days at risk among those without antibodies, compared with 0.13 per 10,000 days among those with anti-spike antibodies.

The investigators also assessed for the presence of anti–nucleocapsid IgG antibody titers. They found a significant trend for increasing PCR-positive test results with increasing antibody levels. Similar to the anti-spike antibody findings, 226 of 11,543 healthcare providers who did not have anti–nucleocapsid IgG antibodies subsequently tested positive on PCR; by contrast, two of 1172 participants who did not have antibodies tested positive. Adjusted for age, sex, and calendar time, this finding translates to a 0.11 incidence rate ratio (0.13 per 10,000 days at risk; 95% CI, 0.03 – 0.45; *P* = .002).

"This is a study a number of us have been trying to do," said Christopher L. King, MD, PhD, professor of pathology and associate professor of medicine at Case Western Reserve University School of Medicine, Cleveland, Ohio.

"To really follow a group like this longitudinally like they've done, with a large population, and to see such a big difference — it really confirms our suspicion that those who do become infected and develop an antibody response are significantly protected from reinfection.

"What's great about this study is it's nearly a 10-fold reduction in risk if you've recovered from COVID and have antibodies," said King, who was not involved with the research. "That's what a lot of us have been wanting to know."

Unanswered Questions Remain

"How long this immunity lasts, we don't know," King said. He predicted that antibody protection could last a year to a year and a half. The duration of protection could vary. "We know some people lose their antibodies pretty quickly, and other people don't," he said.

Slifka said the suggestion of "a substantially reduced risk for at least 6 months...is great news, and the timing couldn't be better, because we're rolling out the vaccines."

Interestingly, not all antibody responses are alike. For example, data indicate that **antibody levels following immunization with the Pfizer/BioNTech or Moderna vaccines are higher on average than those of people who've had a natural infection,** King said. He added that initial data on the AstraZeneca COVID-19 vaccine in development showed lower antibody levels compared with natural immunity.

The Centers for Disease Control and Prevention recommends immunization for those with a history of infection. "People who have gotten sick with COVID-19 may still benefit from getting vaccinated," the CDC notes on its Facts About COVID-19 Vaccines website. "Due to the severe health risks associated with COVID-19 and the fact that re-infection with COVID-19 is possible, people may be advised to get a COVID-19 vaccine even if they have been sick with COVID-19 before," the CDC states.

The agency also notes that people appear to become susceptible to reinfection approximately 90 days after onset of infection. However, the new evidence from the UK study that persons have up to 6 months of immune protection might lead to a modification of recommendations, especially at a time when vaccine supplies are limited, Slifka said.

Another unanswered question is why the two study participants with antibodies subsequently tested positive for reinfection. "There are a lot of things that could have made these people more susceptible," King said. For example, they could have been heavily exposed to SARS-CoV-2 or been immunocompromised for another reason.

Furthermore, the immune response involves more than antibody levels, King noted. Research in rhesus monkeys suggests that T cells play a role, but not as prominent a part as antibodies. "What I think is protecting us from infection is primarily the antibodies, although the T cells are probably important. Once you get infected, the T cells are probably playing a more important role in terms of whether you get very sick or not," he said.

Multiplication + Addition = More Protected?

The 90% natural immunity protection in the study approaches the 95% efficacy associated with the Pfizer and Moderna vaccines, Slifka noted. Even without immunization, this could mean a portion of the US population is already protected against future infection.

Furthermore, the **CDC estimates that there are about 7.7 cases of COVID-19 for every case reported.**

As of September 30, the CDC reported that there were 6,891,764 confirmed cases. The agency estimated that overall, approximately 53 million people in the United States have been infected. More recent numbers from Johns Hopkins University School of Medicine's Coronavirus Resource Center indicate that there were 18.2 million cases in the United States as of December 22. If that tally is multiplied by 7.7, the total number protected could approach 140 million, Slifka said.

"That could really be a boost in terms of knocking this pandemic down in the next couple of months," Slifka said.

"Now, if we were to modify the current recommendations and briefly defer vaccination of people with confirmed cases of COVID-19 until later on, we could start reaching herd immunity pretty quickly," he added.

Real-Life Implications

"There is no such thing as 100% protection, even from the infection itself. So, when you're dealing with someone with possible exposure to COVID-19, you still need to follow the proper precautions," Slifka said.

Nonetheless, he said, "This is great news for those on the front lines who are wondering whether or not they would have any protection if they had COVID-19 before. And the answer is yes — there is a very good chance they will have protection, based on this quite large study."

One limitation of the study is that the population consisted predominantly of healthy adult healthcare workers aged 65 years or younger. "Further studies are needed to assess post-infection immunity in other populations, including children, older adults and persons with coexisting conditions, including immunosuppression," the researchers note.

Eyre plans to continue following the healthcare workers in the study, some of whom have been vaccinated for COVID-19. This ongoing research will allow him and coinvestigators to "confirm the protection offered by vaccination and investigate how post-vaccine antibody responses vary by whether you have had COVID-19 before or not. We also want to understand more about how long postinfection immunity lasts."

►► ***N Engl J Med*. Published online December 23, 2020.** Full text

Global Virus Rules for Christmas: Tough, Mild or None at All

Source: http://www.naharnet.com/stories/en/277929-global-virus-rules-for-christmas-tough-mild-or-none-at-all

Dec 23 – In Peru, you can't drive your car on Christmas. In Lebanon, you can go to a nightclub, but you can't dance. In South Africa, roadblocks instead of beach parties will mark this year's festive season.

How many people can you share a Christmas meal with? France recommends no more than six, in Chile it's 15, and in Brazil it's as many as you want. Meanwhile, Italy's mind-boggling, color-coded holiday virus rules change almost every day for the next two weeks.

Countries around the world are trying to find the right formulas to keep their people safe for Christmas, especially as new virus variants prompt renewed travel bans and fuel resurgent infections, hospitalizations and deaths at the end of an already devastating year.

Here's a look at some of the restrictions around the world for the holiday season:

UK

It was meant to be a time when families across the U.K. could enjoy something like a normal Christmas despite the pandemic. Authorities planned to relax restrictions, allowing up to three households to mix in the days around Dec. 25.

The emergence of a new, more contagious variant of the coronavirus changed that.

The four nations of the U.K. – England, Scotland, Wales and Northern Ireland – are all in various states of shutdown and have ditched their Christmas plans. No indoor mixing of households is allowed in London and southeast England.

Instead of Christmas joy, a sense of dread and isolation is looming. Dozens of countries have limited flights from Britain, and daily new infections are running at record highs. Hospitals across the U.K., which has Europe's second-highest virus-related death toll at over 68,000, are heading towards capacity at a time of year when other illnesses abound.


Brazil beat Covid-19 ...

BRAZIL

In Brazil, Christmas 2020 will look much like normal – even though the country has been among the world's hardest-hit by the pandemic and new COVID-19 infections are now on track to match the peak of the first surge.

Many beaches and restaurants in Rio de Janeiro were packed last weekend, despite a city measure forbidding drivers to park along the shore.

No national restrictions have been imposed ahead of Christmas, though the governor of São Paulo ordered that only essential services such as public transport, supermarkets and pharmacies remain open around Christmas and New Year's Eve.

Sao Paulo, Rio de Janeiro and Salvador have also called off their Dec. 31 firework displays.

SOUTH AFRICA

South Africa is targeting beaches and booze as it imposes new restrictions for the Christmas season amid resurgent infections.

Alcohol can only be sold Monday through Thursday, and a nighttime curfew is in place. Beaches — major tourist attractions this time of year — will be closed on Christmas Eve, Christmas Day and New Year's Day.

The government is urging people to avoid crowded Christmas celebrations, but indoor gatherings of up to 100 people are still allowed; outdoors up to 250 people can congregate.

Police are setting up roadblocks to slow a second surge of infections that authorities and scientists say is being fueled by another variant of the virus, one distinct from the variant affecting England. Some countries are banning flights from South Africa, where the weekly infections and deaths have doubled over the past two weeks.

LEBANON

Unlike much of the world, Lebanon eased restrictions during the holidays, hoping to inject foreign currency into a tanking economy.

Tens of thousands of Lebanese expats have arrived home for the holidays, leading to fears of an inevitable surge in infections.

Last week, the Interior Ministry allowed nightclubs to reopen — but said dancing will be prohibited. That triggered a debate on social media about what constitutes dancing.

Lebanon's health sector has been challenged by the pandemic that struck amid an unprecedented financial crisis. The massive Aug. 4 explosion in Beirut's port only increased pressure on the city's hospitals, knocking out at least three of them.

ITALY

Newspapers in Italy are running color-coded graphics that resemble children's board games to help people keep track of the rules aimed at limiting new infections over the holidays. Travel between regions is banned for 16 days, and a curfew begins at 10 p.m.

From Dec. 24-27, "red" rules kick in, closing all shops except food stores, pharmacies and hairdressers – since looking one's best is essential in Italy. Two people can visit the home of another family member and bring children younger than 14 with them. Restaurants and cafes can't serve customers, although takeout and home delivery are allowed.

From Dec. 28-30, Italians segue into "orange" rules, when non-essential shops can re-open, although dining out is still banned. Things turn red again for Dec. 31-Jan. 3, orange for Jan. 4, then red again on Jan. 5-6 for the national holiday on Epiphany.

SOUTH KOREA

South Korea is clamping down on private social gatherings of five or more people and closing tourist spots from Christmas Eve through at least Jan. 3.

National parks and coastal tourist sites, where thousands travel to watch the sun rise on the new year, will close. So, will churches and skiing, sledding and skating venues. Restaurants could face fines of up to 3 million won ($2,700) if they serve groups of five or more.

The greater Seoul area, home to half of the country's 51 million people, has been at the center of a viral resurgence in past weeks that has overwhelmed hospitals, increased death tolls and raised questions as to how the government is handling the outbreak, after winning global praise for its response earlier in the year.

Forty-eight COVID-19 patients have died in the deadliest two days since the pandemic began.

THE UNITED STATES

The U.S. has issued no nationwide restrictions on travel, a decision left to state governments, but a federal agency is advising against criss-crossing the country for the Christmas season.

Still, millions of people have passed through airport security in recent days. The travel company AAA predicted that nearly 85 million Americans would be journeying during the holidays – a 29% decline from last year.
The U.S. has reported by far the most virus infections and deaths in the world, over 18 million cases and 322,800 deaths, according to a tally by Johns Hopkins University. Even before Christmas, new cases have been rising over the past two weeks.

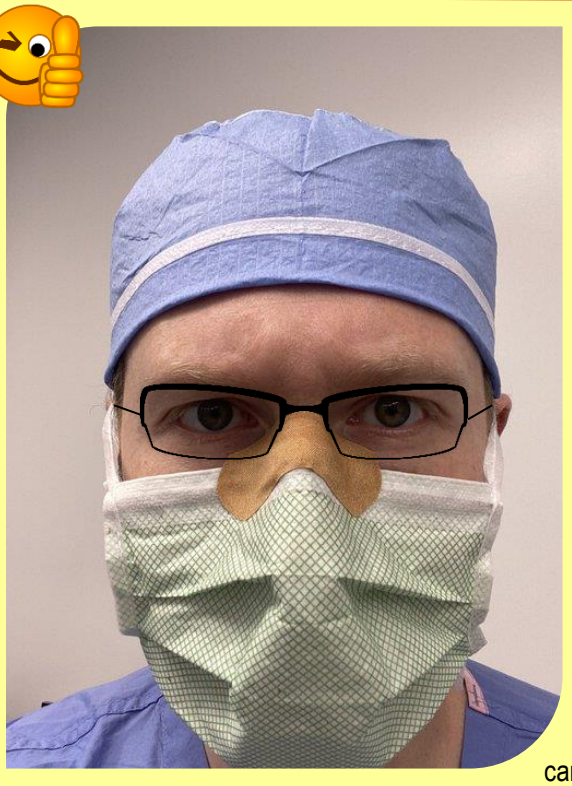
The inside story behind Pfizer and BioNTech's new vaccine brand name, Comirnaty

Source: https://www.fiercepharma.com/marketing/pfizer-biontech-select-comirnaty-as-brand-name-for-covid-19-vaccine

Dec 23 – Comirnaty. It's a name we'll all know soon.
The new brand name for Pfizer and BioNTech's COVID-19 vaccine, Comirnaty mashes up community, immunity, mRNA and COVID—pretty much everything that could fit into the moniker for the world's most high-profile product at the moment.
How did those concepts become a brand? We asked the naming agency behind both Comirnaty and its non-proprietary name, tozinameran—industry heavyweight Brand Institute, which began working with BioNTech in April. Pfizer joined the effort shortly after, when the duo's vaccine collaboration was announced.
"The name is coined from Covid-19 immunity, and then embeds the mRNA in the middle, which is the platform technology, and as a whole the name is meant to evoke the word community," Scott Piergrossi, Brand Institute president of operations and communications, said.
The goal in naming drugs is to overlap ideas and layer meaning into a name, he said. In this case, the high-priority concepts the teams started with were COVID immunization and the mRNA technology. The clients themselves came up with community as an image and association they wanted to elicit, Piergrossi said.
So that's the Co- prefix, followed by the mRNA in the middle, and ending with the -ty suffix, which nods to both community and immunity. Plus, community and immunity are conceptually mnemonic across the entire name.
"Identifying those word parts and plugging into the community concept really executed nicely at the end of the day," Piergrossi said.
Comirnaty is pronounced phonetically as koe mir' na tee, while tozinameran is toe zi na' mer an.
The tozinameran generic name was established in two parts, Piergrossi explained. The first half, tozina-, is the invented prefix required by the World Health Organization, while the second half -meran is the required suffix for new mRNA vaccines.
Comirnaty has been officially approved by Swiss and European regulators, and the nonproprietary tozinameran has been approved by the WHO. While the Pfizer and BioNTech vaccine has been approved for emergency use in the U.S., the brand name awaits FDA approval.
Of course, Comirnaty was not the only name BioNTech and Pfizer considered. The list of also-rans include Covuity, RnaxCovi, Kovimerna—all names BioNTech filed in June with the U.S. Patent and Trademark Office. Another possible, RNXtract, was filed in August.
Along with the short timeline, Brand Institute realized the weight of the vaccine's name, even as it juggled the trademark, safety, linguistic, marketing and legal issues that come with every drug name's development and eventual approval.
"It was a challenging project relative to other projects because there's so much invested in this product—from a global economy standpoint, from a health and emotion standpoint," Piergrossi said, adding that the agency was "humbled by the scale of the project and the implications of the name."

Other vaccine candidates yet to be officially named include **Moderna**'s, which the FDA authorized for emergency use last Friday, and **Johnson & Johnson's**, which is expected to report its first late-stage data in January and file for approval shortly thereafter.
What might those names be? Moderna's trademark requests include Spykevax, filed in September, and Spikevax, submitted in October. Earlier filings with the trademark office include Mnravax and Mvax—both filed in January—along with Covid Mvax and Covidvax in April.

The PTO database shows all filings in capital letters, so there is room for additional creativity or distinction with letters in the middle capitalized. SpikeVax, for instance.
Moderna initially filed in January four variations that included the city name "Wuhan," including Wuhan Vax and Wuhan Corona MVax, but those are now listed in the database as "abandoned."



J&J, on the other hand, filed for a handful of likely candidates—Rezymnav, Rezymden, Fampelsen, Aqcovsen, Evcoyan, Abfivden, Jcovden, Ovcinden and Jcovav—as vaccine trademarks on Oct. 9.

"Ultimately the formula for success in naming is a strong distinctive name with meaning that over time will hopefully [come to] stand for or symbolize the hope and innovation that the underlying product itself is for," Piergrossi said.

◀ Practical anti-fog advice from a neurosurgeon

[Daniel M. Heiferman, MD]

Russia set to roll out second coronavirus vaccine 'EpiVacCorona'

Source: https://meduza.io/en/news/2020/12/11/russia-set-to-roll-out-second-coronavirus-vaccine-epivaccorona

Dec 11 – Russia's second coronavirus vaccine, "EpiVacCorona," is about to be made available to the general public, announced Rospotrebnadzor head Anna Popova, on Friday, December 11.

It has entered civilian circulation and Phase III, post-registration clinical trials of the vaccine that was produced by our Vector Research Center are being carried out, this vaccine is called EpiVacCorona.

According to *TASS,* Popova said that doses of the EpiVacCorona vaccine have been sent to Moscow, St. Petersburg, Tula, Novosibirsk, and Rostov-on-Don.

The Rostov, Tula, and Novosibirsk regions were selected for the vaccine roll out based on the fact that they are currently experiencing the most active spread of COVID-19 "on territory outside of central cities," Popova explained. EpiVacCorona can be stored at temperatures ranging from two to eight degrees Celsius (35.6–46.4 degrees Fahrenheit), which allows for it to be delivered even to remote settlements, she underscored.

Popova emphasized that teachers, paramedics, and doctors in remote settlements need to be vaccinated first and foremost — "people on whom the provision of healthcare and education services depend."

According to *Interfax*, 50,000 doses of EpiVacCorona are set to be released by the end of the year, 5,000 of which will be allocated for research, while the rest will be put into general circulation. Mass production of the vaccine is scheduled for early 2021.

In early December, the Russian authorities announced the start of a large-scale vaccination campaign against COVID-19. In Moscow, the "Sputnik V" vaccine, developed by the Gamaleya Research Institute, became available for high-risk groups beginning on December 5.

About 85% of those vaccinated with Russia's Sputnik V have no side effects

Head of the Gamaleya Research Center for Epidemiology and Microbiology Alexander Ginzburg added that 15% of that vaccinated report redness in the area of the vaccine shot and a slight headache that goes away within 24 hours.

Dec 26 – Boston Geriatric Oncology Fellow Had (immediated) Allergic Reaction to Moderna's COVID Vaccine, Uses Own EpiPen (history of shellfish allergy).

AstraZeneca's biologic combo AZD7442 for COVID-19 moving ahead

Source: https://www.thepharmaletter.com/article/astrazeneca-s-biologic-combo-azd7442-for-covid-19-moving-ahead

Dec 26 – British scientists are trialling a new drug that could prevent people who have been exposed to the novel coronavirus from going on to develop COVID-19, which experts say could save many lives, the UK Guardian newspaper reported today (December 26).
The drug involves a **long-acting antibody [LAAB] combination known as AZD7442**, which has been developed by AstraZeneca (LSE: AZN), the UK pharma major that has mostly made headlines for its leading coronavirus vaccine, under development with Oxford University.

LAABs mimic natural antibodies and have the potential to treat and prevent disease progression in patients already infected with the virus, as well as to be given as a preventative intervention prior to exposure to the virus. A LAAB combination could be complementary to vaccines as a prophylactic agent, e.g., for people for whom a vaccine may not be appropriate or to provide added protection for high-risk populations. It could also be used to treat people who have been infected.

The UK's Medicines and Healthcare products Regulatory Agency (MHRA is expected the announce its decision on the COVID-19 vaccine, dubbed AZD1222, within the next few days.
Rather than antibodies produced by the body to help fight an infection, AZD7442 uses **monoclonal antibodies**, which have been created in a laboratory.

'Would be an exciting addition' in the fight against the virus
Dr Catherine Houlihan, a virologist at University College London Hospitals NHS trust (UCLH), who is leading a study called Storm Chaser into the AZD7442 drug, said: "If we can prove that this treatment works and prevent people who are exposed to the virus going on to develop COVID-19, it would be an exciting addition to the arsenal of weapons being developed to fight this dreadful virus."
In a separate trial, dubbed Provent, the UCLH is investigating whether the drug could also protect people with compromised immune systems, such as those undergoing chemotherapy for cancer, who have recently been exposed to the virus but have either not had a vaccine or in whom it has not resulted in immunity because of their underlying condition. Both the Provent and Storm Chaser trials are now in Phase III.
The combination production could be available as soon as March or April if it is approved by the medicines regulator after it has reviewed evidence from the study, the newspaper said.
Discovered by Vanderbilt University Medical Center and licensed to AstraZeneca in June 2020, the antibodies were optimized by AstraZeneca with half-life extension and reduced Fc receptor binding.
In October, to meet the Trump Administration's Operation Warp Speed goals, the US Department of Health and Human Services (HHS) and Department of Defense (DoD) announced an agreement with AstraZeneca for late-stage development and large-scale manufacturing of AZD7442 that may help treat or prevent infection with SARS-CoV-2, the coronavirus that causes COVID-19.

New Fast-Spreading Coronavirus Strain in the UK: Here's Everything You Need to Know

Source: https://www.sciencealert.com/new-fast-spreading-coronavirus-strain-in-the-uk-here-s-everything-you-need-to-know

Dec 26 – A scary new strain of coronavirus, innocuously named B.1.1.7, has recently exploded across southeast England, prompting the government to tighten lockdowns on the region. Though we don't know all the details, experts are increasingly confident it is more easily transmitted than other strains. Here's everything we know so far about this novel strain.

What is it?

The B.1.1.7 strain of SARS-CoV-2 is a version of the virus with **23 mutations, eight of which are in the spike protein** the virus uses to bind to and enter human cells, *Science Magazine* reported.

Where did it come from?

It was first detected September 21 in Kent County in England, then took off and spread in November, according to the World Health Organization.

Since then, it has become the most common variant in England, representing more than 50 percent of new cases diagnosed between October and December 13 in the UK, according to the WHO.

However, some scientists now believe that the virus may have mutated in a person who was immunocompromised, according to *Science Magazine*. That's because, unlike the flu, the novel coronavirus can correct mistakes when it replicates, and so tends to have a fairly stable genome, Live Science previously reported.

However, studies have shown that people who have weakened immune systems — because they are taking immunosuppressant drugs or are being treated with chemotherapy, for instance — may harbor infectious virus for months. That, in turn, would give the virus many chances to acquire mutations that help it replicate or evade the immune system.

What do these mutations do?

We don't know for sure. Viruses mutate all the time, and most of these changes don't affect how deadly or infectious the virus is. In this case, some of these mutations may have arisen purely by chance and may not affect the function of the virus.

But three mutations in particular have worried experts.

One, a two amino-acid deletion known as **69-70Delta**, was first detected separately in a patient being treated with immunosuppressants who developed COVID-19.

The patient received remdesevir, convalescent plasma and neutralizing antibodies, but died months later. Though the virus did not initially have this deletion, it acquired it over months, researchers reported in a preprint article published December 19 to the medRiv database. (It has not been peer-reviewed.)

The authors suspect it evolved to evade the immune system. Another wrinkle associated with this deletion is that it can make one of the targets of SARS-CoV-2 PCR tests — known as the S gene — falsely test negative. Some tests only look for positives in this S gene and would therefore miss the new variant. Most PCR assays, however, look for three separate regions of the spike protein, so those assays won't be affected, the WHO said.

Another mutation, known as **N501Y**, alters the key amino acids that make up the so-called receptor-binding domain of SARS-CoV-2, where amino acid asparagine (N) has been replaced with tyrosine (Y) in the part of the virus that latches onto the ACE2 receptor on human cells, according to the Centers for Disease Control and Prevention. A September study in the journal Cell found this variant binds more tightly to the ACE2 receptor than other versions of the coronavirus — at least in a lab dish.

Dozens of samples of SARS-CoV-2 from South Africa and Australia have tested positive for this mutation, but lab tests suggest the South African and UK variants separately evolved the same mutation. That suggests it may provide an evolutionary advantage to the virus.

The third suspicious mutation is **P681H**, which is also in the receptor-binding domain of the virus. According to preliminary information posted by the COVID-19 Genomics Consortium UK, this mutation sits next to the "furin cleavage site," which is where the spike protein must be cleaved in order for the virus to enter cells, according to *Science Magazine*.

Does it spread more easily?

Yes. Experts now think the new variant is between 50 percent and 74 percent more transmissible than other dominant strains, according to a study by the Center for Mathematical Modeling and Infectious Diseases (CMMID) that has not yet been peer-reviewed. The WHO estimates this would tack on 0.4 to the basic reproductive number R, which dictates how many people each infected person would spread the virus to.

Based on models of that growth, the new variant could be responsible for 90% of all new COVID-19 cases in London and East and South England by mid-January, that study found.

Is it more deadly?

We don't know, but experts suspect it is not. However, if it spreads much more easily, that means more people will be hospitalized. Once hospitals become overwhelmed, the quality of care of the sickest patients drops, which can lead to higher death rates than would otherwise be expected.

The CMMID study found that the new variant could explain an uptick in hospitalizations in southeast England, largely due to increased spread, not necessarily because the virus is more dangerous.

Another study, also not peer-reviewed, by CMMID, used a mathematical model to see whether the virus' rapid growth in London was due to increased infectiousness, or due to it being more severe. The latter didn't fit the data well, whereas the former fit nicely.

Has the variant spread to the US?

So far, scientists haven't detected this strain anywhere in the US, though America has not done nearly as much genetic sequencing on viral samples as the UK has. For instance, as of December, the US had sequenced 51,000 viral samples out of 17 million identified cases of SARS-CoV-2, according to the CDC. The UK has sequenced more than twice as many viral samples as the US, despite having slightly more than a tenth of the diagnosed cases.

Dr. Stanley Perlman, an immunologist and pediatric infectious diseases specialist at the University of Iowa told the Center for Infectious Disease Research and Policy (CIDRAP) that he suspects the variant is already in the US. "I'd be surprised if it weren't," he said.

Can kids catch it more easily?

Several lines of evidence in the past have suggested kids might be less susceptible to the novel coronavirus. If this new variant sticks more easily to cells, there's the chance it could spread more readily amongst children than it did before. However, further studies will be needed to see whether that's the case.

There has been an uptick in cases in children in England at the same time that this virus has increased its prevalence. That uptick was not seen when kids first returned to schools in early fall. But schools were open while many other things were closed at this time, so it's possible schools represented one of relatively few chances the virus had to spread. We can't yet say that kids will catch and spread this variant more readily.

Will vaccines work against the new virus?

Most experts think the newly developed vaccines will still work against the novel UK variant. When vaccines stimulate the immune system, the body builds an arsenal of cells to bind to many different parts of the virus. Mutations in a handful of spots will likely not be enough to make the vaccine less effective, according to the CDC.

Given that 99 percent of the proteins on the new variant are identical to the strain the Pfizer-BioNtech mRNA vaccine targets (the Moderna vaccine is very similar), it is highly likely that the vaccine will work, BioNTech CEO Uğur Şahin said at a news briefing.

It's possible that over time a variant could emerge that will evade some of our vaccines, similar to how the flu vaccine needs to be updated every year. However, the new mRNA vaccines could be updated to reflect new mutations in about six weeks, Şahin told the Financial Times.

What can we do to stop this?

The new variant still spreads the same way as the ordinary form of the coronavirus. That means the same things everyone has been doing to prevent the spread of the virus since March will also work for the new UK variant: washing hands, physical distancing, masks and good ventilation. Adhering strictly to those rules and avoiding unnecessary outings will help prevent its spread.

On average, the chance of developing anaphylaxis after receiving a vaccine is about 1.31 in one million, according to a 2015 study published in the *Journal of Allergy Clinical Immunology*.

EDITOR'S COMMENT: 1 anaphylaxis; 999,999 without any adverse reaction; The name of the one (1) with severe adverse reaction is John, Mary, George or Helen. In other words, it could be YOU. Damn statistics and math (1=100)!

Vaccines comparison – AGAIN!

Source: https://www.globalresearch.ca/warning-covid-vaccines-huge-risks-huge-injuries-huge-compensations/5732807

The mRNA-based vaccines – Ribonucleic acid (RNA) is a polymeric molecule essential in various biological roles in coding, decoding, regulation and expression of genes. RNA and DNA are nucleic acids. Along with lipids, proteins, and carbohydrates, nucleic acids constitute one of the four major macromolecules essential for all known forms of life. RNA is found in nature as a single strand folded onto itself, rather than a paired double-strand, like DNA.

Cellular organisms use **messenger RNA** (*mRNA*) to convey genetic information that directs synthesis of specific proteins. Many viruses encode their genetic information using an RNA genome. In the case of the Covid-19 vaccine, the injected mRNA is expected to modify the RNA in human cells so that they become like antibodies against Covid-19. The risk is, whether and what kind of short- medium and long-term impact on the modified human

genome the mRNA injection may have. All the official science tells you, the vaccines are safe, without even mentioning the risks of the unknown.

DNA-based vaccines – The AstraZeneca (Sweden-Oxford) vaccine uses **double-stranded DNA**. Researchers added the gene for the coronavirus spike protein to another virus called an adenovirus. Adenoviruses are common viruses that typically cause colds or flu-like symptoms. The Oxford-AstraZeneca team used a modified version of a chimpanzee adenovirus, known as ChAdOx1. It can enter cells, but it can't replicate inside them. Research for a DNA-based vaccine has been going on for years. Currently, advanced clinical trials are underway for other diseases, including H.I.V. and Zika. – The Oxford-AstraZeneca vaccine for Covid-19 is said to be more rugged than the mRNA vaccines from Pfizer and Moderna. DNA is not as fragile as RNA, and the adenovirus's tough protein coat helps protect the genetic material inside.

However, like the mRNA-type vaccine, the DNA-based Covid-vaccine has not been seriously and long enough tested to be devoid of risks, or even to know the short- medium and long-term dangers.

The AstraZeneca covid vaccine (AZD1222) is also modifying the human genome, and precisely what this may mean for human health and reproduction is unknown – and negative impacts cannot – ever – been corrected. Rather they are passed on to future generations.

The Russian Sputnik V – is based on a viral vector type, where **weakened forms of a human adenoviruses** (viruses that cause the common cold) are genetically modified to carry protein codes from SARS CoV-2 to trigger an immune response in the body. This vaccine uses two different strains of human adenoviruses (rAd26 and rAd5) for the first and second vaccination dose, to boost the effectiveness of the vaccine. Since they are based on human adenoviruses, they do not modify the human genome. Combined with AstraZeneca vaccine might protect for two years.

The Chinese CanSino Biologics – in partnership with the Chinese Academy of Military Medical Sciences developed the Covid-19 vaccine ***"Ad5-nCoV".*** This vaccine uses a **weakened form of a common cold virus**, adenovirus type 5, which infects humans easily but does not cause Covid. The adenovirus is only used as a delivery system. It carries the genetic material that helps the cells to create spike protein of the SARS CoV-2. These cells then trigger the immune system to create antibodies that can fight off the infection. The Chinese government approved this vaccine for military use in June, considering the promising results of the initial phase I and II trials.

The Chinese SinoVac Biotech company – developed the COVID-19 vaccine, *CoronaVac*. It passed 2 trial phases in China and is now undergoing Phase 3 trials in Brazil and Indonesia. This vaccine uses **an inactivated virus**, a traditional and proven methodology that has been found safe and effective and used for influenza and polio. For this type of vaccine, the specific virus is killed or inactivated, and its dead cells are introduced into the body. Even though the pathogen is dead, the immune system can still learn from its antigens how to fight its live versions in the future. The Chinese government has already approved this vaccine for emergency use in July.

Death by Ventilator – A Personal Story – for the World to Know

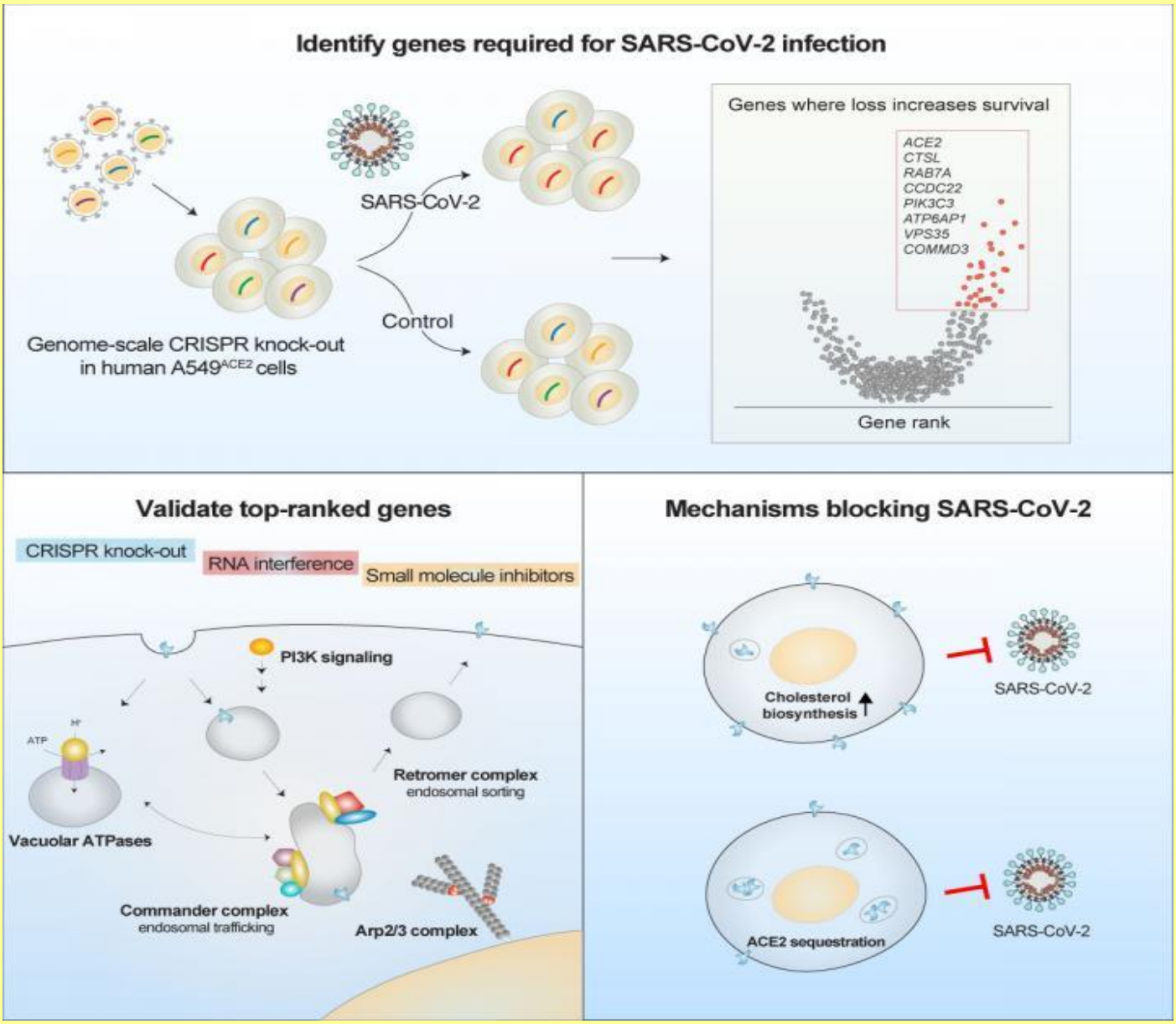
CRISPR-Based Screen Identifies Host Factors for SARS-CoV-2 Infection

Source: https://www.genengnews.com/news/crispr-based-screen-identifies-host-factors-for-sars-cov-2-infection/

Oct 27 – Antiviral treatments can interfere with multiple, different, targets that are important for the virus to set up an infection and replicate. Since the start of the pandemic, many researchers have been searching for those targets for the SARS-CoV-2 virus. Now, to identify new potential therapeutic targets for SARS-CoV-2, a team of scientists from multiple institutions in New York City, performed a genome-scale, loss-of-function CRISPR screen to systematically knockout all genes in the human genome. The team examined which genetic modifications made human lung cells more resistant to SARS-CoV-2 infection. Their findings revealed individual genes and gene regulatory networks in the human genome that are required by SARS-CoV-2 and that confer resistance to viral infection when suppressed. The collaborative study described a wide array of genes that have not previously been considered as therapeutic targets for SARS-CoV-2.

The study is published in *Cell* in a paper titled, "Identification of required host factors for SARS-CoV-2 infection in human cells."

In order to better understand the complex relationships between host and virus genetic dependencies, the team used a broad range of analytical and experimental methods to validate their results. This integrative approach included genome editing, single-cell sequencing, confocal imaging, and computational analyses of gene expression and proteomic datasets. The researchers found that these new gene targets, when inhibited using small molecules (drugs), significantly reduced viral load, and with some drugs, up to



1,000-fold. Their findings offer insight into novel therapies that may be effective in treating COVID-19 and reveal the underlying molecular targets of those therapies.

Graphical abstract of the Cell study [Sanjana Lab of New York Genome Center/New York University]

"Seeing the tragic impact of COVID-19 here in New York and across the world, we felt that we could use the high-throughput CRISPR gene editing tools that we have applied to other diseases to understand what are the key human genes required by the SARS-CoV-2 virus," said the study's co-senior author, Neville Sanjana, PhD, core faculty member at the New York Genome Center and assistant professor of neuroscience and physiology at NYU Grossman School of Medicine. Previously, Sanjana has applied genome-wide CRISPR screens to identify the genetic drivers of diverse diseases, including drug resistance in

melanoma, immunotherapy failure, lung cancer metastasis, innate immunity, inborn metabolic disorders, and muscular dystrophy.
For this project, genome editing was only one-half of the equation. "We previously developed a series of human cell models for coronavirus infection in our work to understand immune responses to the virus. It was great to team up with Neville's group to understand and comprehensively profile host genes from a new angle," said co-senior author Benjamin tenOever, PhD, professor of medicine at the Icahn School of Medicine at Mount Sinai.
The team discovered that the top-ranked genes—those whose loss reduces viral infection substantially—clustered into a handful of protein complexes, including vacuolar ATPases, Retromer, Commander, Arp2/3, and PI3K. Many of these protein complexes are involved in trafficking proteins to and from the cell membrane.
"We were very pleased to see multiple genes within the same family as top-ranked hits in our genome-wide screen. This gave us a high degree of confidence that these protein families were crucial to the virus lifecycle, either for getting into human cells or successful viral replication," said Zharko Daniloski, PhD, a postdoctoral fellow in the Sanjana Lab and co-first author of the study.
While researchers performed the CRISPR screen using human lung cells, the team also explored whether the expression of required host genes was lung-specific or more broadly expressed. Among the top-ranked genes, only ACE2, the receptor known to be responsible for binding the SARS-CoV-2 viral protein Spike, showed tissue-specific expression, with the rest of the top gene hits broadly expressed across many tissues, suggesting that these mechanisms may function independent of cell or tissue type. Using proteomic data, they found that several of the top-ranked host genes directly interact with the virus's own proteins, highlighting their central role in the viral lifecycle. The team also analyzed common host genes required for other viral pathogens, such as Zika or H1N1 pandemic influenza.
After completing the primary screen, the group of researchers used several different techniques to validate the role of many of the top-ranked genes in viral infection. Using human cell lines derived from the lung and other organs susceptible to SARS-CoV-2 infection, they measured viral infection after gene knockout by CRISPR, gene suppression using RNA interference, or drug inhibition. After validating that these manipulations reduced viral infection, they next sought to understand the mechanisms by which loss of these genes block coronavirus infection.
Using a recently-developed technology that couples large-scale CRISPR editing with single-cell RNA-sequencing (ECCITE-seq), the team identified that loss of several top-ranked genes results in upregulation of cholesterol biosynthesis pathways and an increase in cellular cholesterol. Using this insight, they studied the effects of amlodipine, a drug that alters cholesterol levels.
"We found that amlodipine, a calcium-channel antagonist, upregulates cellular cholesterol levels and blocks SARS-CoV-2 infection. Since recent clinical studies have also suggested that patients taking calcium-channel blockers have a reduced COVID-19 case fatality rate, an important future research direction will be to further illuminate the relationship between cholesterol synthesis pathways and SARS-CoV-2," said Tristan Jordan, PhD a postdoctoral fellow in the tenOever lab and co-first author of the study.
Building on previous work on mutations in the Spike protein and viral entry through the ACE2 receptor, the research team also asked whether loss of some genes might confer resistance to the coronavirus by lowering ACE2 levels. They identified one gene in particular, RAB7A, which has a large impact on ACE2 trafficking to the cell membrane. Using a combination of flow cytometry and confocal microscopy, the team showed that RAB7A loss prevents viral entry by sequestering ACE2 receptors inside cells.
"Current treatments for SARS-CoV-2 infection currently go after the virus itself, but this study offers a better understanding of how host genes influence viral entry and will enable new avenues for therapeutic discovery and hopefully accelerate recovery for susceptible populations," said Sanjana.

A New Therapy to Prevent People With SARS-CoV-2 From Getting Sick Just Started Trials

Source: https://www.sciencealert.com/scientists-are-trailing-a-new-covid-19-antibody-therapy-to-prevent-people-getting-sick

Dec 29 – Scientists in the UK have just recruited the first participants in the world to be part of a new **long-acting antibody** study. If the treatment is effective, it could give those who have already been exposed to SARS-CoV-2 protection from developing COVID-19.
"We know that this antibody combination can neutralise the virus," explains University College London Hospitals (UCLH) virologist Catherine Houlihan.
"So we hope to find that giving this treatment via injection can lead to immediate protection against the development of COVID-19 in people who have been exposed – when it would be too late to offer a vaccine."

This might not be the first antibody treatment for COVID-19 you've heard of. Outgoing US President Donald Trump was given monoclonal antibodies when he came down with the disease, and in the US two different antibody treatments - casirivimab and imdevimab – received emergency approval back in November.
But those antibody treatments are given to patients with mild or moderate COVID-19, who risk progressing to a severe version of the disease.
"In a clinical trial of patients with COVID-19, casirivimab and imdevimab, administered together, were shown to reduce COVID-19-related hospitalisation or emergency room visits in patients at high risk for disease progression within 28 days after treatment when compared to placebo," the FDA explained in a press statement when the drugs were approved.
This new antibody therapy, called AZD7442 and developed by UCLH and AstraZeneca, is a little different.
AZD7442 is a combination of two monoclonal antibodies AZD8895 and AZD1061, which both target the receptor binding domain of the SARS-CoV-2 spike protein.
"By targeting this region of the virus's spike protein, antibodies can block the virus's attachment to human cells, and, therefore, is expected to block infection," the team wrote on the US ClinicalTrials.gov website.
"Amino acid substitutions have been introduced into the antibodies to both extend their half-lives, which should prolong their potential prophylactic benefit, and decrease Fc effector function in order to decrease the potential risk of antibody-dependent enhancement of disease."
Antibodies are little Y-shaped proteins that lock on to a particular section - called an antigen - of a virus, bacterium or other pathogen, and either 'tag' it to be attacked by the immune system, or directly block the pathogen from invading our cells.
Normal antibodies are produced by your body after an infection, while monoclonal antibodies are cloned in a lab and can be injected into a person already infected, to give the immune system a hand in the fight.
The researchers are hoping that AZD7442 – which is just starting the Storm Chaser study (the name for its phase 3 trial) – provides protection for those that have been exposed to the virus but do not yet have symptoms. Effectively, they're trying to stop COVID-19 happening in the first place.
"If you are dealing with outbreaks in settings such as care homes, or if you have got patients who are particularly at risk of getting severe COVID, such as the elderly, then this could well save a lot of lives," University of East Anglia infectious disease expert Paul Hunter told *The Guardian*.
"If you live with your elderly grandmother and you or someone else in the house gets infected, then you could give her this to protect her."
But they're also hoping it might be effective longer term, over a 6-12 month period, meaning people who can't receive the vaccine for medical reasons have another option to keep themselves safe from the disease.
The researchers are looking at how this could work for people with compromised immune systems in a second trial called PROVENT.
"We will be recruiting people who are older or in long-term care, and who have conditions such as cancer and HIV which may affect the ability of their immune system to respond to a vaccine," UCLH infectious diseases consultant Nicky Longley told *The Guardian.*
"We want to reassure anyone for whom a vaccine may not work that we can offer an alternative which is just as protective."
We're looking forward to seeing where this lead.

Centuries-Long Timeline of Smallpox Records Shows How a Fatal Disease Is Eliminated

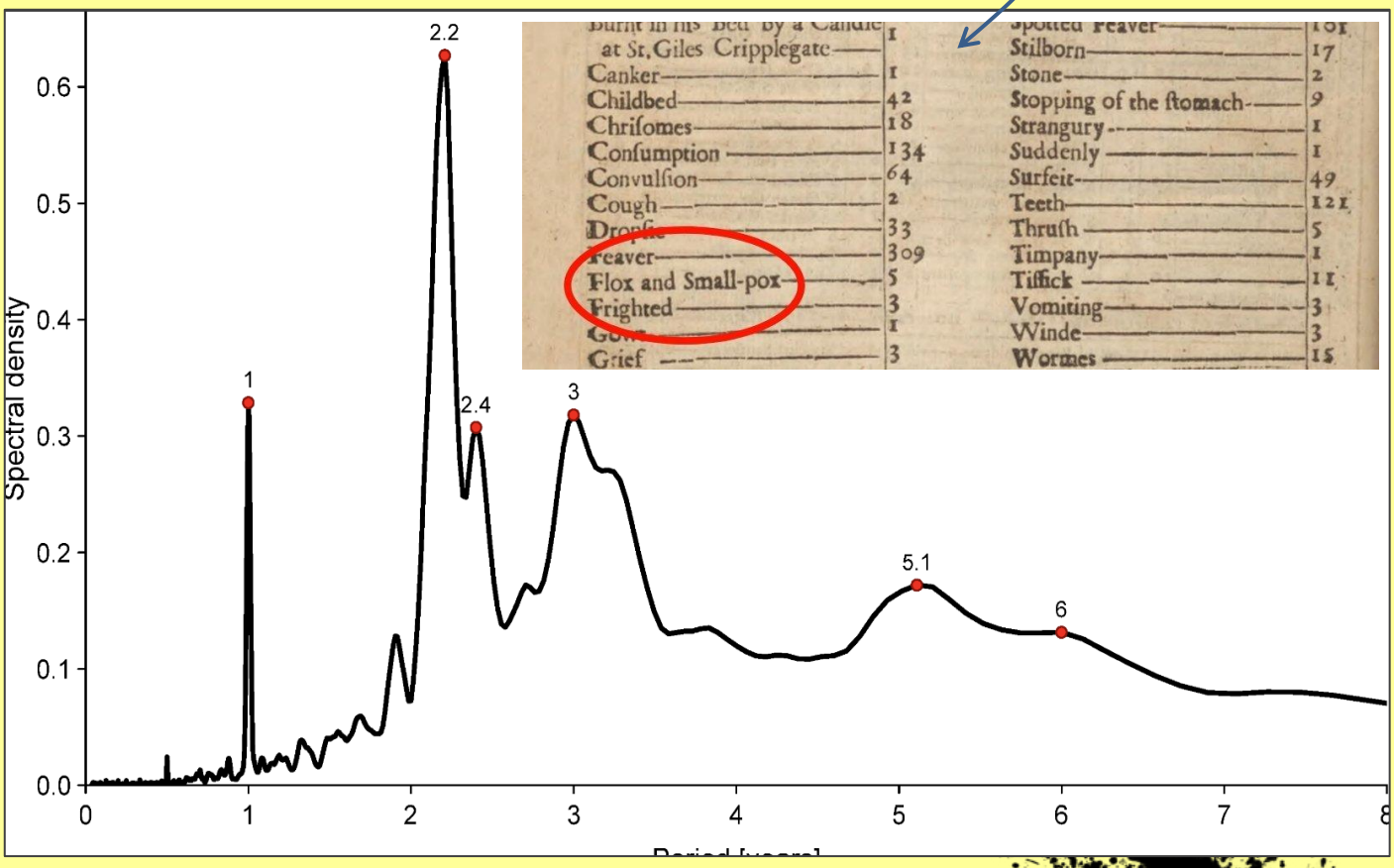
Source: https://www.sciencealert.com/centuries-long-timeline-of-smallpox-records-shows-how-a-fatal-disease-is-eliminated

Dec 27 – Amidst a global pandemic, researchers are looking back in time at the only human disease we've ever successfully eradicated.
Even today, four decades after smallpox stopped circulating in the public, the disease is still regarded as one of history's greatest killers, taking more lives for more centuries than any other single infectious disease, even plague and cholera.
In the 18th century, 400,000 Europeans died each year from smallpox. In London alone, more than 321,000 people died from the disease post 1664.
A third of those who survived were left blind, and many more were disfigured by scars.
"The current COVID-19 pandemic has caused a surge of interest in the study of infectious disease transmission and how public health interventions could change the course of the pandemic," says David Earn, who models infectious disease transmission at the McMaster University in Ontario.

"Our goal was to describe and make publicly available the weekly time series of smallpox mortality in London and to identify historical events that might have influenced smallpox dynamics over the centuries."
For nearly 300 years, between 1664 and 1930, officials in London kept careful records of smallpox deaths. Digitising more than 13,000 of these weekly reports, researchers have created a major timeline of smallpox mortality and prevention, tracking the virus' movements in London and the ways in which it was influenced by seasons, public health policies and historical events.
Over time, the results clearly show that better control of the virus led to fewer smallpox deaths.
Outbreaks appeared sporadically in earlier records, settling into regular tides of infection by 1770 as a crude form of smallpox inoculation called variolation gained popularity.
Only in 1810, coinciding with the introduction of the far safer practice of vaccination, does the data show a dramatic reduction in the amplitude of epidemics, though outbreaks were more frequent and the data are noisier."
A particularly large epidemic in 1830s London, which ultimately spread to Europe, was actually the impetus for England's first Vaccination Act in 1840, giving free shots to anyone who wanted them and banning more dangerous practices like variolation. Only then did vaccination levels increase, with fatalities taking a downward plummet.
Other impacts like the seasonal structure of epidemics and the seasonal timing of outbreaks were more challenging to untangle, and the authors admit their data will need more investigation.
That said, the timeline is, to their knowledge, the longest weekly series of infectious disease mortality ever put together. As such, it helps illustrate how a virus can go from being "a terrifying and unavoidable danger" - killing roughly one out of every three people infected - to an extremely unusual cause of death.

From killer to rarity

In the years leading up to the last smallpox death in London, circa 1934, only a handful of deaths were reported from the virus.
"It is clear that the introduction of smallpox control measures - [inoculation] and later vaccination - made eradication possible," says Olga Krylova, who worked on the project while studying mathematics and statistics at McMaster.
"Our analysis also suggests that greater use of control measures and changes in public health policies were correlated with changes in the frequency of the epidemics." - 1665 burial records for London. (London: E. Cotes, 1665)



Weekly smallpox mortality time series for London, England, 1664–1930. (Krylova and Earn, PLOS Biology, 2020)

Smallpox has a long and rich history, with current thinking associating it with a rodent disease that made the leap in Africa a few thousand years ago. Over millennia, as the world became more globalised, it appears this virus took off, spreading and growing alongside human civilisations and their trade routes.
In the Middle Ages of Europe, the virus frequently caused epidemics. Colonisation then spread it to Africa, Australia and North America.
Before the development of vaccines, people in Africa, India and China began relying on variolation to control the spread of smallpox. This entailed a small cut on the arm or leg, in which a tiny amount of the smallpox virus was introduced, taken from the pustules or scabs of those already infected.
The remarkable idea ultimately came to Europe in the 18th Century through trade with Turkey, and it was quickly taken up by physicians.
In 1796, a scientist by the name of Edward Jenner figured out that cowpox, which is born from a similar virus to smallpox, could protect humans against epidemics of this infectious disease. When he inoculated patients with this animal virus, it provided immunity in a safer, cheaper and more effective way than inoculation with the human virus.
By 1800, his work helped produce a smallpox vaccine in England. By 1840, inoculation was a thing of the past.
But that wasn't the end of smallpox. It wasn't until the late 19th century that scientists realised vaccine immunity was not lifelong and that people needed to be re-vaccinated.
After that, a global campaign from the World Health Organisation was able to successfully eradicate the virus in a decade. The last remaining samples are now stored in the US and Russia.
Throughout this long timeline, London was going through its own set of major cultural and historic changes. The Industrial Revolution, for instance, may have played a role in smallpox epidemics as urbanisation spread and social demographics changed. Wars were also another possible mechanism for spread.
"Further research using mathematical models is needed to quantify the impacts of interventions and historical events on the smallpox outbreaks," says Krylova.
This extensive timeline can hopefully allow scientists to do just that. By honing in on specific events and their effects, we might come to better understand how contagious infections can fluctuate over time, and what we can do to beat them back in the end.
"The long history of documenting smallpox mortality in London provides an extraordinary opportunity to learn from the past about changing patterns in infectious disease transmission," the authors conclude.
Now it's time to dig into the data.

▶▶ **The study was published in** *PLOS Biology*.

COVID-19 Drug & Vaccine Candidate Tracker

By Alex Philippidis
Source: https://www.genengnews.com/covid-19-candidates/covid-19-drug-and-vaccine-tracker/

Total Drug & Vaccine Candidates: 297 (as of September 2)
The goal of this resource is to provide a comprehensive collection of news, milestones, and updates on drug and vaccine candidates currently being developed for the COVID-19 pandemic.
This resource is based on the reporting of *GEN* senior news editor Alex Philippidis, who began compiling information on drug and vaccine candidates in the early weeks of the pandemic. The numbers of verified candidates ballooned rapidly from 35 in February 2020, to 60 in March, to 160 in April.
Since then, biopharmas, regulators, and academic researchers have ramped up efforts to develop and evaluate COVID-19 drug and vaccine candidates designed to vanquish the virus. The number of legitimate COVID-19 candidates is approximately divided between vaccines and drugs, with 10 vaccines now in clinical trials.
To help navigate through the potential therapeutic options for COVID-19, *GEN* had divided this list of candidates into four broad categories based on their developmental and (where applicable) clinical progress:
● **FRONT RUNNER – the most validated or touted therapeutics in development, based on advanced stages of activity, favorable data or both.**

● **DEFINITELY MAYBE – candidates in earlier phases with the most promising partners, or more advanced candidates well under way in development that have generated uneven data.**
● **KEEPING AN EYE ON… – interesting technology, attracting notable partners, or both, but still early days.**
● **TOO SOON TO TELL – longshots or new entries pending additional details from their developers and/or clinical progress.**
GEN categorizes the most common treatment categories by color, including **antibodies**, **antivirals**, **RNA-based treatments**, **and vaccines**. Please click any category to see the full list of candidates and information on each therapy/vaccine.
On the therapeutic side, many institutions have even studied familiar blockbuster drugs with success outside virology, in hopes that they would also prove effective against COVID-19. Among clinical trials progressing in recent months have been studies assessing Novartis' Gilenya® (fingolimod), one examining Celebrex® (celecoxib), and even a study evaluating sildenafil citrate, the phosphodiesterase-5 (PDE5) inhibitor better known as Viagra®.
The top vaccines are among 34 candidates that had advanced to clinical trials as of May 11, according to the World Health Organization.
"We hope as we go along that by the end of this year, or the beginning of 2021, we will at least have an answer whether the vaccine, or vaccines plural, are safe and effective," said Anthony S. Fauci, MD, Director of the NIH's National Institute of Allergy and Infectious Disease in a "conversation" with NIH Director Francis S. Collins, MD, PhD, posted on NIH's website in August. "We are now working with the companies… to start making doses before we even know whether it works or not. So that when we get to the winter in the early part of 2021, we will start to have a large number of doses that people will be able to use if it turns out to be safe and effective–the big if."
The vaccine or vaccine that succeeds in clinical trials will still need to surmount manufacturing, distribution, cost and payer challenges before the first doses reach the market, and a world of patients waiting for them.
To accelerate development of vaccines and drugs, the NIH has launched Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV), a public-private effort through which U.S. regulators, the European Medicines Agency, and more than a dozen biopharma giants are prioritizing and accelerating clinical study of drug and vaccine candidates deemed to have short-term potential for success.

COVID-19 Research: Women Are Changing the Face of the Pandemic

Source: https://www.genengnews.com/insights/covid-19-research-women-are-changing-the-face-of-the-pandemic/

The pristine X-ray crystallography data gathered by Rosalind Franklin played a crucial role in the discovery of DNA's structure. Yet when the discovery was recognized by the Nobel Committee in 1962, the winners of the Nobel Prize did not include Franklin, who had died in 1958. Only recently has Franklin received some of the recognition that she deserves for her essential contribution to one of the biggest discoveries of the past century.

Akiko Iwasaki, PhD

"We still have a lot of work to do, unfortunately," notes Akiko Iwasaki, PhD, an immunologist at Yale School of Medicine and a fierce advocate for women in science. "Things have definitely gotten better since [Franklin's] days" she tells *GEN*. But we still have a huge disparity in women representation—especially at the senior level. Iwasaki adds that we have to address what she thinks is the root cause of the problem—the academic culture and the unconscious (or conscious) bias against women and people of color that prevents these brilliant people from moving up the academic ladder.
To mark the centenary of Franklin's birth, *GEN* sought to highlight scientists at the forefront of COVID-19 research—some of the most influential research currently being conducted—who are women. In this article, *GEN* speaks with researchers who are leading efforts to track SARS-CoV-2 genomes, to uncover host factors influencing COVID-19 progression, to develop saliva-based COVID-19 tests, and more.

▶▶ Read the entire articleat source's URL.

Novavax Candidate COVID-19 Vaccine Moves into Phase III Trial

Source: https://www.genengnews.com/news/novavax-candidate-covid-19-vaccine-moves-into-phase-iii-trial/

Dec 29 – The National Institute of Allergy and Infectious Diseases (NIAID) announced the commencement of the Phase III trial (NCT04611802) of the Novavax investigational COVID-19 vaccine, in a press release issued on Monday, December 28, 2020. The trial will evaluate the effectiveness, immune response, and safety of a COVID-19 vaccine candidate developed by Novavax, Inc., of Gaithersburg, Maryland, called NVX-CoV2373, and is estimated to complete data collection by March 31, 2021.

"Addressing the unprecedented health crisis of COVID-19 has required extraordinary efforts on the part of government, academia, industry and the community," said NIAID Director Anthony S. Fauci, MD "The launch of this study–the fifth investigational COVID-19 vaccine candidate to be tested in a Phase III trial in the United States–demonstrates our resolve to end the pandemic through development of multiple safe and effective vaccines."

This NIH (National Institutes of Health) and BARDA (Biomedical Advanced Research and Development Authority)-funded, randomized, placebo-controlled trial is set to enroll up to 30,000 volunteers, at approximately 115 sites in Mexico and the U.S., including the NIAID-supported COVID-19 Prevention Network (CoVPN), headquartered at the Fred Hutchinson Cancer Research Center, that was designed to evaluate vaccine candidates and monoclonal antibodies for COVID-19.

The trial is being conducted in collaboration with Operation Warp Speed (OWS) a multi-agency collaboration overseen by the Department of Health and Human Services (HHS) and the Department of Defense with the aim of accelerating the development, manufacture, and distribution of of COVID-19 vaccines, therapeutics, and diagnostics. All Phase III clinical trials of candidate vaccines supported through OWS are overseen by a common DSMB (Data and Safety Monitoring Board), developed in consultation with the NIH Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) initiative, that will ensure the safe and ethical conduct of the study.

Participants in the trial will be grouped into two cohorts based on age: 18 to 64 years old, and 65 and older. The organizers aim to prioritize enrollment of individuals at higher risk of COVID-19 disease, including people of African American, Native American, Latino or Hispanic ethnicity, people with health conditions such as obesity, chronic kidney disease or diabetes, and people 65 years and older.

"We've come this far, this fast, but we need to get to the finish line," said NIH Director Francis S. Collins, MD, PhD. "That will require multiple vaccines using different approaches to ensure everyone is protected safely and effectively from this deadly disease."

Each participant enrolled in the study upon informed consent, will receive two intramuscular injections over the course of the study. After providing a baseline nasopharyngeal and blood sample, participants will be assigned at random to receive an intramuscular injection of either the investigational vaccine or a saline placebo. For every two volunteers who receive the investigational vaccine one volunteer will receive the placebo control.

To eliminate bias, the intervention is quadruple masked with the participant, care provider, investigator, and outcomes assessor unaware of who is receiving the candidate vaccine or the placebo. A second injection will be administered 21 days after the first.

Data will be collected from participants for two years following the second injection. Participants will be monitored for side effects of the vaccine and blood samples will be collected at specified time points to detect and quantify immune responses to SARS-CoV-2, the virus that causes COVID-19. Immune responses resulting from natural infection will be distinguished from vaccine-induced immune responses using specialized assays. The trial's primary purpose is to determine whether NVX-CoV2373 can prevent symptomatic COVID-19 disease seven or more days after the second injection relative to placebo.

NVX-CoV2373 is made from a stabilized form of the coronavirus spike protein using Novavax' recombinant protein nanoparticle technology. The purified protein antigens in the vaccine cannot replicate and cannot cause COVID-19. The vaccine also contains a proprietary adjuvant, MatrixMT, that is designed to enhance immune response to the vaccine. NVX-CoV2373 is administered in liquid form and can be stored, handled and distributed above freezing temperatures (35° to 46°F.) A single vaccine dose contains 5 micrograms of protein and 50 micrograms of adjuvant.

Preclinical testing of NVX-CoV2373 vaccination in animals has validated the production of antibodies that block the coronavirus spike protein from binding to the cell surface receptors targeted by the virus, preventing viral infection. Phase I clinical trial results published in the New England Journal of Medicine, show NVX-CoV2373 is generally well-tolerated and elicits higher levels of antibodies than those seen in blood samples drawn from people who had recovered from clinically significant COVID-19.

NVX-CoV2373 is also being evaluated in a Phase IIb trial in South Africa on 4,422 enrolled volunteers; a Phase I/II continuation trial in the United States and Australia that is expected to report results in the first quarter of 2021; and a Phase III trial in the United Kingdom, with more than 15,000 volunteers which is testing the candidate vaccine at the same dosage as this Phase III trial.

UK Just Authorized the 'Oxford Vaccine'. Here's Why That's Incredibly Good News

Source: https://www.sciencealert.com/uk-has-now-authorised-the-oxford-vaccine-for-public-use-at-start-of-2021

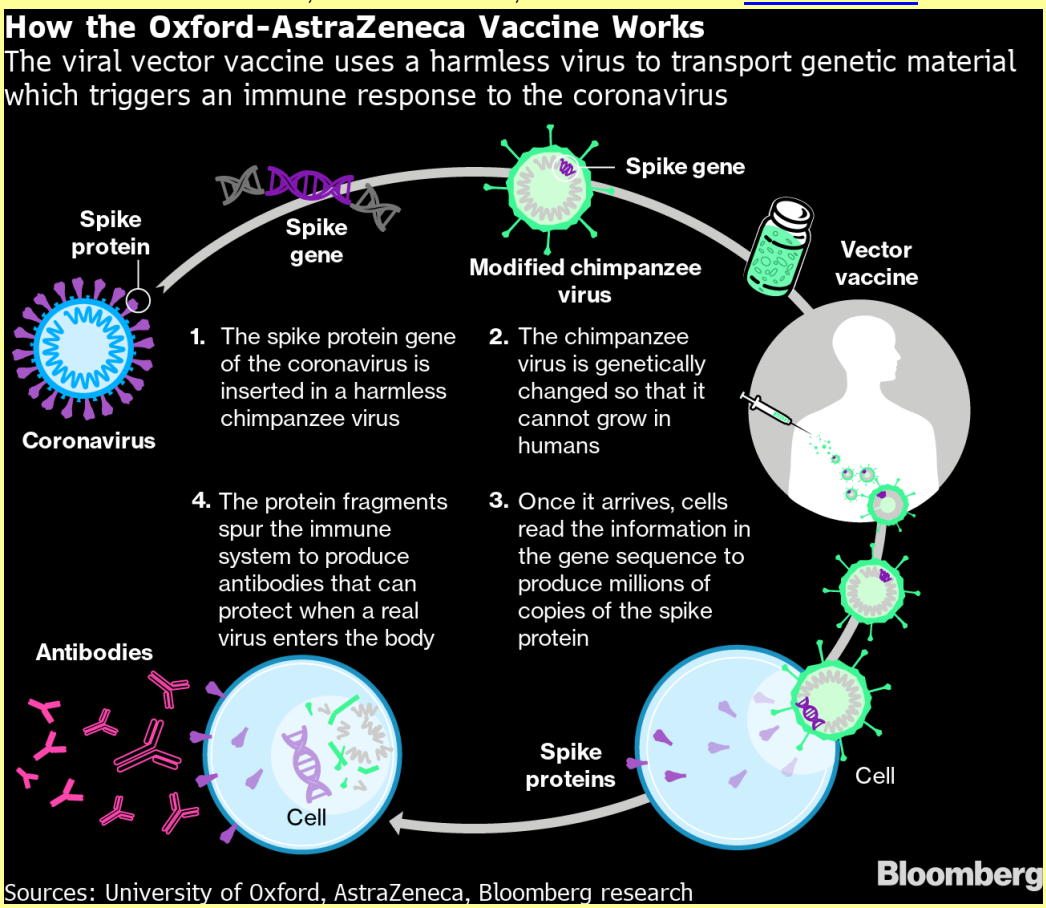
Dec 30 – The UK has become the first country to authorise the Oxford-AstraZeneca COVID-19 vaccine for public use, with roll-out to start in the first week of 2021. This vaccine is the second to be authorised in the UK – following the Pfizer vaccine.

The British government has ordered 100 million doses of the Oxford vaccine, enough to vaccinate 50 million people. Other countries will be watching closely: Australia has ordered over 50 million doses, Canada 20 million, and worldwide over 2.5 billion doses have been preordered.

AstraZeneca expects to be able to supply large numbers of doses within the first quarter of 2021.

Notably, British people will receive two full doses of the vaccine, which in trials prevented people from falling ill with COVID-19 62 percent of the time. This is despite trials initially suggesting that an alternative dosing strategy – using half a dose followed by a full dose – could be much more effective, preventing illness with 90 percent efficacy.

What is the significance of the Oxford vaccine now being available? The Conversation asked Michael Head, an expert in global health at the University of Southampton, some key questions about why its authorisation is important.



Why is this vaccine needed?

The least merry Christmas in recent memory has at least had the silver lining of a highly effective vaccine – Pfizer's – being available and licensed for use in the UK. But despite the brilliance of this magic bullet, there are limiting factors – particularly around the scale of production required to meet demand.

The multi-country demand for the Pfizer vaccine is akin to a highly intense hour where the local supermarket has just released some new delivery slots during lockdown, and you're racing to get the order booked before any of your neighbours notice. Everyone wants to get in first to ensure delivery of that last pack of toilet roll – or in this case, that next batch of vaccines.

The difficult logistics of storing and transporting the Pfizer vaccine at ultra-low temperatures are also restricting the speed of the national vaccine roll-out.

So we need multiple vaccine candidates to get anywhere near meeting demand, and we need them fast.

Having the Oxford vaccine available could be seriously helpful for accelerating coverage – particularly as in the UK, priority has shifted to getting a first vaccine dose to as many people as possible.

However, there are still gaps in our knowledge, for example around the effectiveness of this vaccine in the elderly, and also whether leaving a longer gap between the doses increases overall effectiveness, as has been suggested.

How is this vaccine different?

The three leading vaccines all deliver part of the coronavirus's genetic material into the body's cells, leading the cells to produce copies of part of the virus – the spike protein – that the body can then mount an immune response against.
The Oxford vaccine makes this delivery using an adenovirus vector, whereas vaccines from Pfizer and Moderna use an mRNA platform.
Data published previously indicated an overall efficacy of 62 percent if two doses of the Oxford vaccine are given, which is lower than the 94 percent of Moderna's vaccine and 95 percent of Pfizer's.
But it was thought that administering a small dose first up and then a full second dose could be more effective. Using this dosing strategy, limited data from the phase 3 trial indicated an efficacy in younger populations of around 90 percent.
However, the UK Medicines and Healthcare Products Regulatory Agency has said the results of this half-dose full-dose regimen were "not borne out by full analysis" when it conducted its review, so further investigation of this regimen will be needed.
But the UK's Commission on Human Medicines is now suggesting that one dose gives 70 percent protection after 21 days, and that a second dose potentially increases effectiveness to around 80 percent – but that the second dose needs to be given 12 weeks after the first. However, the data showing this has yet to be released.
As has been documented, the Oxford vaccine only needs to be kept at a chilled temperature, whereas Pfizer's requires -75°C storage and Moderna's to be kept at around -20°C. This would make it easier for all countries to manage and distribute, but particularly for low- and middle-income nations.
Across sub-Saharan Africa or South-east Asia, healthcare colleagues are very adept at taking vaccines to hard-to-reach populations but simply don't have existing infrastructure to ensure ultra-low temperatures can be maintained.

What does this mean for the world?

At US$2-3 per shot, the cost per dose of the Oxford vaccine is much cheaper than the other leading vaccines, making it a potential long-term option for governments when the world is past the point of spending whatever it takes to get the coronavirus under control. Global orders for this vaccine far outstrip those for the others.
The Oxford vaccine is being manufactured in Europe and also in large numbers in India, and is part of the COVAX initiative – led by Gavi, the Vaccine Alliance – so it may be the first western-developed vaccine that is rolled out in large numbers in low- and middle-income countries at some point in 2021.
However, it will be interesting to see how vaccines developed by Russia and China are distributed internationally.
China has provided huge amounts of investment for healthcare assistance across the African continent, with the balance of altruism or opportunism being unclear.
While we'd love to see this global public health problem treated purely as a public health problem, we may well see vaccines being used as capital to develop new or reaffirm existing political relationships. Certain vaccines may be favoured ahead of others in some parts of the world due to political influence.
Global vaccine roll-out will be incredibly complex, with a variety of factors inevitably contributing to the extent of its success.
To know the impact of the Oxford vaccine, we'll have to wait and see. However, amid the intense doom and gloom of 2020, having multiple effective vaccine candidates available bodes well for 2021.

***Michael Head**, Senior Research Fellow in Global Health, University of Southampton.*

You've Finally Received a COVID-19 Vaccine. Now What?

Source: https://www.sciencealert.com/you-ve-received-a-covid-19-vaccine-now-what

Dec 30 – By now, more than 5.1 million people across 22 countries have been given a dose of one of several COVID-19 vaccines independently sanctioned by national authorities.
Putting aside China's and Russia's early administration of their own vaccines, achieving such a wide reach in just a few weeks across so many nations is an encouraging sign of what might be achieved in coming months.

While it's tempting to think of this as the end-game of the worst pandemic humanity has seen in generations, vaccination is a team sport. And that clock is still ticking, folks.
Here's the winning strategy for the game's next half.

I haven't had a vaccine yet. What should I expect?

As is the case with any vaccine, stimulating the body's immune system comes with it a risk of unwanted side effects. In the very least, this is likely to include tenderness at the site of injection that is at its worst a day or so after vaccination.
Your body will also mount a rather lacklustre fever response as if you're getting sick. This could include aching joints, a headache, and lethargy.
While you might feel warm, an actual temperature isn't on the cards – if your thermometer climbs to fever-pitch, you might have some other infection. None of these symptoms should last more than a week, either. In either case, these side effects might warrant a chat with your family doctor.
In several cases, the Pfizer-BioNTech vaccine has been found to produce an anaphylactic response in individuals who have existing sensitivities to materials in the vaccine. It's looking like an exceedingly rare reaction, but worth keeping in mind.
If you're at all concerned about allergies, or any side effects, your family doctor can sort those worries out for you as well.

I've had my first of two doses of the Pfizer vaccine. Is there a chance I'm immune to COVID-19 now?

There is. But this might not mean what you think it means.
Clinical evidence from the Pfizer-BioNTech vaccine trials suggested there was a strong degree of protection against COVID-19 around 10 days after the first of two doses, equalling around 52 percent.
The figures are based on a comparison of COVID-19 cases among more than 44,000 volunteers earlier this year. In total, 82 volunteers presented with COVID-19 symptoms after receiving a single placebo jab, compared with 39 who got a single vaccine dose.
While well short of the 92 percent provided by two doses, it's still a solid gamble, right?
This is where it's important to know the difference between COVID-19 – the disease – and SARS-CoV-2 – the virus.
Even in light of such positive clinical results, there's a distinct possibility that the virus can still invade surface-layer tissues in your nasal cavity and reproduce before the immune system gets wind of its presence and kicks it out.
A brief stopover in your mucosal membrane may not be long enough to generate COVID-19 symptoms in the rest of your body, but it might be just enough time for the virus to pump out a quick generation or two and be on its way to a new host on the next sneeze.
This means we don't know how easy it will be for SARS-CoV-2 to fly under the radar and continue to spread through milder asymptomatic cases.

Can I stop wearing a mask after receiving both of my vaccine doses?

Hold onto that mask. They're not about to go out of fashion any time soon.
Researchers might be confident that these vaccines will reduce a population's susceptibility to the disease COVID-19, but as outlined above, we have little reason to think it will leave the virus nowhere to hide.
As more people become vaccinated, we can hope that fewer individuals will end up in hospital. Or worse, in the morgue. Saving lives should be considered a primary goal of the vaccination program.
Eliminating the virus would be a welcome consequence of vaccinating an entire population. But there simply isn't enough evidence that vaccines will do this, at least not yet.
Until then, masks are one action we can all take that certainly makes a difference.
Need more reasons? Making masks fashionable is a cultural obligation. You might not think of yourself as any great trendsetter, but this is one case where some peer pressure will save lives.
Do it for the team.

Do I still need to go into quarantine if I've had both of my vaccine doses?

For the same reason we need to hold onto our masks after receiving vaccines, we must also continue to adhere to strict isolation and quarantine procedures.
Having immunity to COVID-19 isn't the same as being clear of SARS-CoV-2, and quarantine is still one of our most effective means of keeping communities free of those virus particles.
"I think until we know more, we need to assume that people who have been vaccinated also need to take the same precautions until there is a certain level of herd immunity that's been

built in the population," World Health Organisation chief scientist Soumya Swaminathan advised recently.

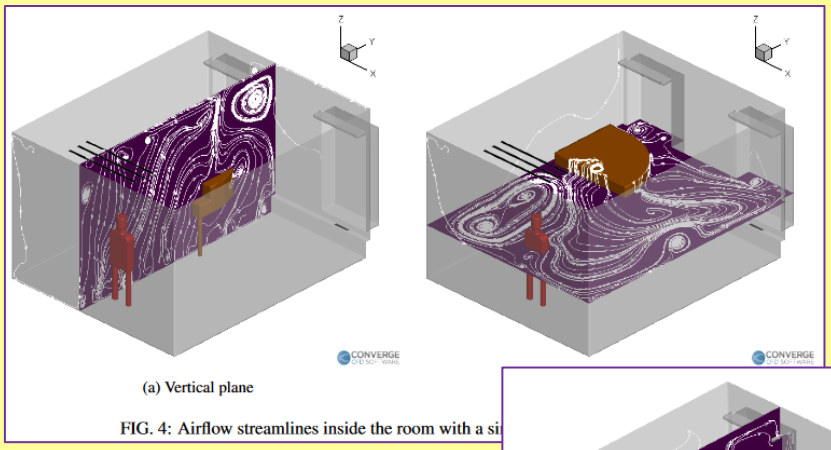
When will we hit that level of herd immunity through vaccination?
Unfortunately, this is one of those big questions with no simple answer.
There's no denying we're off to a flying start. Still, a community can only be confident that the virus will be locally eradicated if around 70 percent of its population is immune for a period long enough to prevent its ongoing replication.
The first stages of the rollout will be easy compared to reaching those who are isolated, doubtful, or downright opposed to being vaccinated.

Will we need booster shots in the future?
The most recent studies on just how long our body can remember encounters with SARS-CoV-2 infections suggest we're good for at least eight months. Optimistically, we might expect possible future studies might show this immunity lasts a year, if not several.
This bodes well for vaccination programs, which will take time to deliver both doses to a country's population. But at some point, bodies have a habit of losing track of the cells that preserve those antibody reminder notices.
Whether we'll all need another round of shots is impossible to say. But when the time comes, there's one thing we can't forget – the loss of lives, health, and livelihoods caused by the spread of a virus nobody had even heard of before January 2020.

Airborne Transmission of Virus-Laden Aerosols inside a Music Classroom: Effects of Portable Purifiers and Aerosol Injection Rates

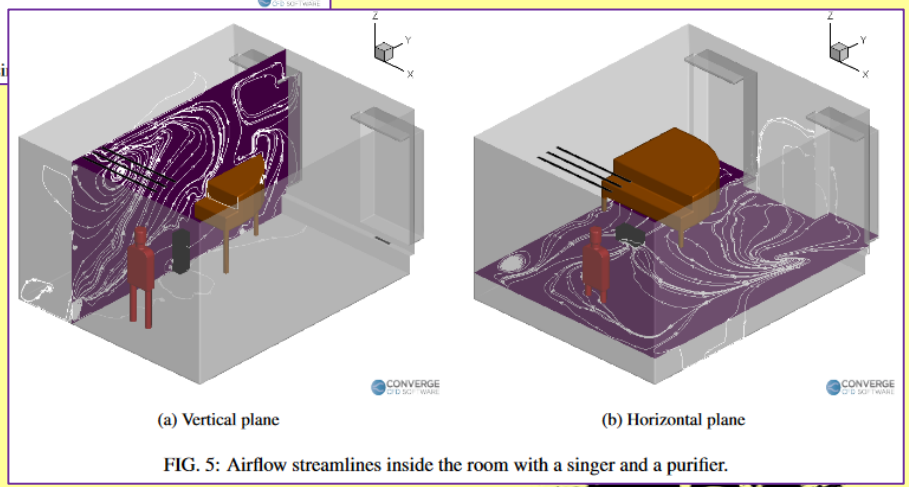
By Sai Ranjeet Narayanan and Suo Yang
Department of Mechanical Engineering, University of Minnesota – Twin Cities, Minneapolis, MN
Source: https://www.medrxiv.org/content/10.1101/2020.12.19.20248374v3.full.pdf

Dec 31 – The ongoing COVID-19 pandemic has shifted attention to the airborne transmission of exhaled droplet nuclei within indoor environments. The spread of aerosols through singing and musical instruments in music performances has necessitated the need for utilizing precautionary methods such as masks and portable purifiers. This study investigates the effects of placing portable air purifiers at different locations inside a classroom, as well as the effects of different aerosol injection rates (e.g., with and without masks, different musical instruments etc.). The time varying deposition of aerosols on the walls and the airborne aerosol concentration are analyzed in this study. It was found that using purifiers could help in achieving ventilation rates close to the prescribed values by WHO, while also achieving aerosol removal times within the CDC recommended guidelines. This could help in deciding break periods between classroom sessions, which was around 25 minutes through this study. Moreover, it was observed that proper placement of purifiers could offer significant advantages in reducing airborne aerosol numbers (offering orders of magnitude higher aerosol removal when compared to nearly zero removal when having no purifiers), and improper placement of the purifiers could worsen the situation. The study suggests the purifier to be placed close to the injector to yield a benefit, and



(a) Vertical plane

FIG. 4: Airflow streamlines inside the room with a si



(a) Vertical plane (b) Horizontal plane

FIG. 5: Airflow streamlines inside the room with a singer and a purifier.

away from the people to be protected. The injection rate was found to have an almost linear correlation with the average airborne aerosol suspension rate and deposition rate, which could be used to predict the trends for scenarios with other injection rates.

Moderna COVID-19 vaccine may cause side effects in people with facial fillers

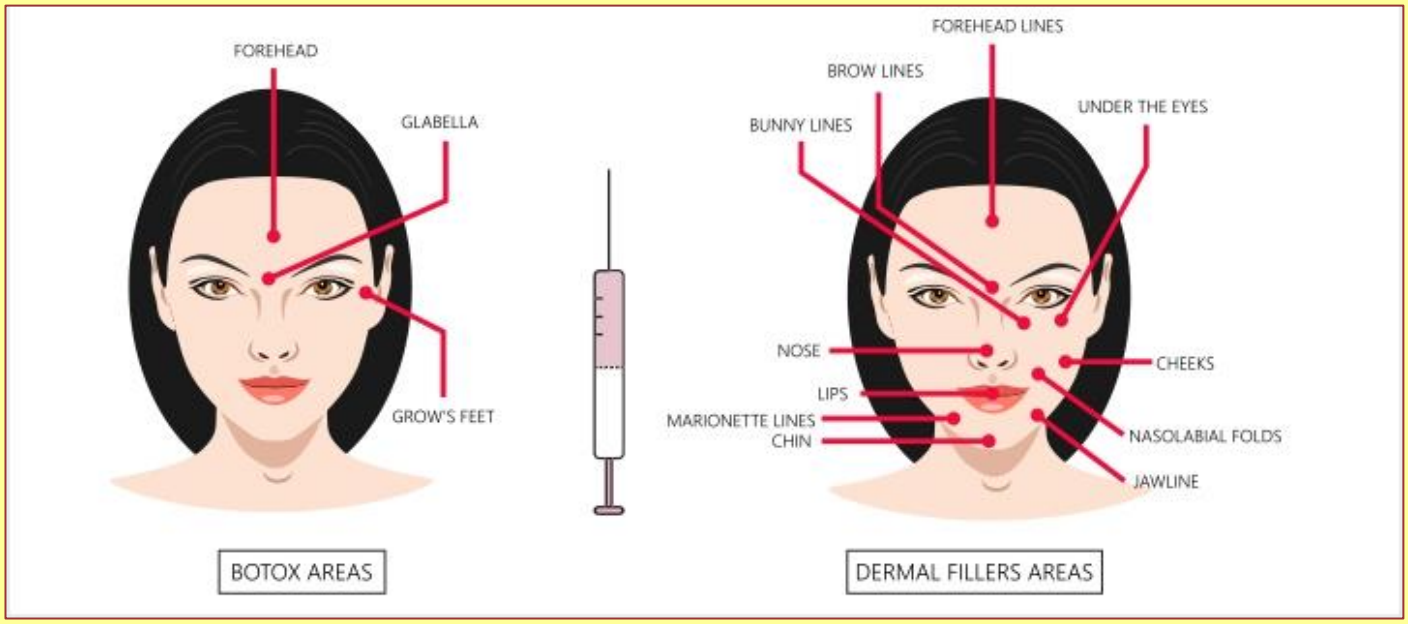
Source: https://www.nbc12.com/2020/12/30/moderna-covid-vaccine-may-cause-side-effects-people-with-facial-fillers/

Dec 30 – Alarming new information from the FDA, regarding side effects of the Moderna vaccine. Two people have developed facial swelling after vaccination during Moderna's phase 3 trial. One person had dermal fillers injected about 6 months before getting the vaccine.

"You don't have to rush to your doctor and say oh my god I got this vaccine because it doesn't happen to everybody. It might not happen," says Dr. Joe Niamtu, DMD, a cosmetic facial surgeon.

While dermal filler patients should be aware of the possibility of localized swelling in response to the Moderna Covid-19 vaccine, it's important to remember that these cases are rare and the effects are easily treatable.

"These do not appear to be threatening situations. We see these granulomas or these late growing areas of hardness and some people are just allergic to filler too," Niamtu says.



He adds that the chance for side effects should not deter those with facial fillers from getting a vaccine.

"Don't be alarmed, this is not a reason to avoid that vaccine," Niamtu tells NBC12.

If you have facial fillers and do get the vaccine, be sure to monitor yourself.

"Get your vaccine even if you've had filler, if you feel lumps and bumps then talk to your doctor who injected you or your family doctor," Naimtu finishes.

The covid-19 vaccine is not the only vaccine that might trigger this reaction. Viruses like the common cold and influenza are also known to trigger swelling.

Public Health England (PHE) has said it does NOT recommend mixing the two different Covid-19 vaccines currently available.

COVID-19 vaccine: 'Halal certification' a concern for Muslims

Source: https://www.businesstoday.in/coronavirus/covid-19-vaccine-halal-certification-a-concern-for-muslims/story/425472.html

Dec 20 – In October, Indonesian diplomats and Muslim clerics stepped off a plane in China. While the diplomats were there to finalize deals to ensure millions of doses reached

Indonesian citizens, the clerics had a much different concern: Whether the COVID-19 vaccine was permissible for use under Islamic law.

As companies race to develop a COVID-19 vaccine and countries scramble to secure doses, questions about the use of pork products - banned by some religious groups - has raised concerns about the possibility of disrupted immunisation campaigns.

Pork-derived gelatin has been widely used as a stabilizer to ensure vaccines remain safe and effective during storage and transport.

Some companies have worked for years to develop pork-free vaccines: Swiss pharmaceutical company Novartis has produced a pork-free meningitis vaccine, while Saudi- and Malaysia-based AJ Pharma is currently working on one of their own.

But demand, existing supply chains, cost and the shorter shelf life of vaccines not containing porcine gelatin means the ingredient is likely to continue to be used in a majority of vaccines for years, said Dr Salman Waqar, general secretary of the British Islamic Medical Association.

Spokespeople for Pfizer, Moderna and AstraZeneca have said that pork products are not part of their COVID-19 vaccines. But limited supply and preexisting deals worth millions of dollars with other companies means that **some countries with large Muslim populations, such as Indonesia, will receive vaccines that have not yet been certified to be gelatin-free.**

This presents a dilemma for religious communities, including Orthodox Jews and Muslims, where the consumption of pork products is deemed religiously unclean, and how the ban is applied to medicine, he said.

"There's a difference of opinion amongst Islamic scholars as to whether you take something like pork gelatin and make it undergo a rigorous chemical transformation," Waqar said. "Is that still considered to be religiously impure for you to take?"

The majority consensus from past debates over pork gelatin use in vaccines is that it is permissible under Islamic law, as "greater harm" would occur if the vaccines weren't used, said Dr Harunor Rashid, an associate professor at the University of Sydney.

There's a similar assessment by a broad consensus of religious leaders in the Orthodox Jewish community as well.

"According to the Jewish law, the prohibition on eating pork or using pork is only forbidden when it's a natural way of eating it," said Rabbi David Stav, chairman of Tzohar, a rabbinical organization in Israel.

If "it's injected into the body, not (eaten) through the mouth", then there is "no prohibition and no problem, especially when we are concerned about sicknesses," he said.

Yet there have been dissenting opinions on the issue - some with serious health consequences for Indonesia, which has the world's largest Muslim population, some 225 million.

In 2018, the Indonesian Ulema Council, the Muslim clerical body that issues certifications that a product is halal, or permissible under Islamic law, decreed that the measles and rubella vaccines were "haram," or unlawful, because of the gelatin. Religious and community leaders began to urge parents to not allow their children to be vaccinated.

"Measles cases subsequently spiked, giving Indonesia the third-highest rate of measles in the world," said Rachel Howard, director of the health care market research group Research Partnership.

A decree was later issued by the Muslim clerical body saying it was permissible to receive the vaccine, but cultural taboos still led to continued low vaccination rates, Howard said.

Governments have taken steps to address the issue. In Malaysia, where the halal status of vaccines has been identified as the biggest issue among Muslim parents, stricter laws have been enacted so that parents must vaccinate their children or face fines and jail time. In Pakistan, where there has been waning vaccine confidence for religious and political reasons, parents have been jailed for refusing to vaccinate their children against polio.

But with rising vaccine hesitancy and misinformation spreading around the globe, including in religious communities, Rashid said community engagement is "absolutely necessary."

In Indonesia, the government has already said it will include the Muslim clerical body in the COVID-19 vaccine procurement and certification process.
"Public communication regarding the halal status, price, quality and distribution must be well-prepared," Indonesian President Joko Widodo said in October.
While they were in China in the fall, the Indonesian clerics inspected China's Sinovac Biotech facilities, and clinical trials involving some 1,620 volunteers are also underway in Indonesia for the company's vaccine. The government has announced several COVID-19 vaccine procurement deals with the company totaling millions of doses.
Sinovac Biotech, as well as Chinese companies Sinopharm and CanSino Biologics - which all have COVID-19 vaccines in late-stage clinical trials and deals selling millions of doses around the world - did not respond to Associated Press requests for ingredient information.
In China, none of the COVID-19 vaccines has been granted final market approval, but more than 1 million health care workers and others, deemed at high risk of infection, have received vaccines under emergency use permission. The companies have yet to disclose how effective the vaccines are or possible side effects.

Long Covid: what is POTS and could understanding it help us better treat suffering survivors?

Source: https://www.thenationalnews.com/uae/health/long-covid-what-is-pots-and-could-understanding-it-help-us-better-treat-suffering-survivors-1.1139560

Jan 03 – Some patients with long Covid-19 symptoms could be suffering from a rare disorder that affects the nervous system, scientists now believe.
Postural orthostatic tachycardia syndrome (POTS) can cause dizziness, extreme fatigue and a rocketing heart rate.
Much remains unknown about Pots but doctors can treat it and the discovery sheds more light on the long-term implications of coronavirus.
Female Covid patients aged between 15 and 50 appear to be worst affected.
Doctors told *The National* that Pots has not been formally diagnosed in many recovering Covid-19 patients in the UAE, but most recognized the symptoms.
I am losing my hair. The other doctors I have spoken with said this is common. It is likely I have Pots, but there is not much more that I can do
Dr Nezar Bahabri, Soliman Fakeeh Hospital, Jeddah
Dr Elhadi Abbas, a senior consultant and head of internal medicine at RAK Hospital, spent two weeks in the intensive care unit after contracting the virus on September 3.
While he has made a full recovery, Dr Abbas, 70, said others remain blighted by long lasting symptoms that could be explained by the under-reported syndrome.
“Pots generally follows infections in patients who have been in hospital for some time,” said Dr Abbas, from Sudan.
“I have seen Covid patients who have reported similar symptoms of fatigue and dizziness, so I would not be at all surprised that they will have undiagnosed Pots.”
Symptoms can be debilitating, and include dramatically elevated heart rates from small movements, dizziness and extreme fatigue after even minor physical exertion.
“As a syndrome, it may be unrecognized but as a symptom seen in recovering patients, it is very common,” said Dr Abbas.
He said viral infections generally cause increased heart beats, dizziness and fatigue, which are considered part of the recovery.
“Some people can fall over, and we usually see this in patients in hospital with any viral infection.
“Older people are, of course, more at risk from fractures and other trauma as a result.”
While the diagnosis of Pots is relatively common in the US, with as many as three million recorded cases, its association with recovering Covid-19 patients is less conclusive.
Brain fog, nausea, blurred vision and palpitations have also been reported in patients with the condition.
It is diagnosed using a 10-minute standing test to see if symptoms appear, or a head-up tilt table test if the patient is bedridden.
Treatment involves adding sodium and extra fluid to the diet, or beta-blockers to control the heart rate.

Leg stockings can also help increase blood flow to the heart, to reduce the effects of dizziness.
“I needed oxygen and was in ICU for two weeks,” said Dr Abbas, of his own recovery.
“Covid is an experience you would not wish on anyone. The psychological effect is as damaging, as we know so little about it.”

A medical worker tends to a Covid-19 patient in the sub-intensive care unit of the Tor Vergata hospital in Rome. Filippo Monteforte / AFP

He said the virus had symptoms that could continue for a long time but people usually recovered quickly.
“Those with severe symptoms seem to suffer for a long time, they lose weight and get tired and short of breath easily. That could continue for four months or so,” he said.
In August, RAK Hospital was one of the first to launch a free Covid-19 rehabilitation program.
Nurses developed specialist rehabilitation programs for recovering coronavirus patients.
Many patients who spent time in hospital reported difficulty readjusting to everyday life, with even basic tasks such as washing, dressing and walking becoming a challenge.
Long-Covid has become a familiar diagnosis, with a fifth of people in the UK reporting continuing symptoms, five weeks after recovery.
Danny Altmann, an immunology professor at Imperial College London, said the figures were worrying and could indicate as many as 10 million people in the UK have a long-term health condition with no current explanation or treatment plan.
Dr Nezar Bahabri, an infectious diseases consultant at Dr Soliman Fakeeh Hospital in Jeddah, tested positive for the virus six months ago.

The 49-year-old treated hundreds of patients during the pandemic, and continues to suffer from symptoms, including breathlessness and dizzy spells.
"I have some kind of lung fibrosis too," he said.
"No one knows if it can be treated effectively, but more than likely the damage is irreversible."
Dr Bahabri also reported tachycardia, the rocketing heart rate seen in those with a Pots diagnosis.
"Whenever I move, I have a very fast heart rate," he said.
"I am taking medication for that, but I am also losing my hair. The other doctors I have spoken with said this is common.
"While I am back at work, it is difficult.
"It is likely I have Pots, but there is not much more that I can do."
The condition is estimated to affect only 1 per cent of the world's population, according to a 2018 study published in the *Journal of Internal Medicine*.
John Hopkins University in Baltimore, America, runs a Pots clinic dedicated to treating an increasing number of recovering coronavirus patients.
Its director, Dr Tae Chung told *The National* the condition was also likely to become more prevalent in the UAE.
"It is not clear at this point, but I personally think that Pots after Covid-19 can develop into an issue in the UAE as well," he said.
"We see patients from almost all ethnic backgrounds in our clinic.
"Unfortunately, no one knows about the long-term impact of the condition.
"It is believed to be non-fatal, but Pots can be significantly debilitating for some patients."
Dr Chung said it remains unclear if the syndrome results in permanent damage to a patient's heart or nervous system.
A reason for under reporting could be that symptoms need to be present for about six months before a diagnosis is made.
"Given that the pandemic started early this year, we only began to see Pots after [diagnosing] Covid-19 infections," Dr Chung said.
"We will need more research to better understand Pots after infection and its long-term impact."

What to expect from the next generation of Covid-19 vaccines

Source: https://www.thenationalnews.com/uae/health/what-to-expect-from-the-next-generation-of-covid-19-vaccines-1.1139135

Jan 03 – Organizations behind the most advanced coronavirus vaccines, unknown to many a year ago, have fast become familiar: BioNTech, the Gamaleya Institute and Sinopharm, to name but three.
Aside from these, universities, biotechnology firms and well-known pharmaceutical companies are working on yet-to-be-released vaccines that could be approved over the coming year.
Many of the 200-plus coronavirus vaccines listed by the World Health Organization as under development are based on alternative technology to those now being rolled out, raising the prospect of a very different vaccine landscape emerging in 2021.
A diversity of vaccines is seen as beneficial because, among other things, it means the manufacturing and distribution capabilities of multiple companies can be engaged.
The Pfizer-BioNTech and Moderna vaccines, both based on messenger RNA (mRNA) and approved for use, are as much as 95 per cent effective, so there may be limited opportunity for later vaccines to achieve better clinical performance. There are, however, other benefits they could offer.

Cheaper vaccines

"The principal improvement would be cost," said Prof Ian Jones, a virologist at the University of Reading in the UK.
"The best current vaccines, the RNA vaccines, already provide effectively 100 per cent immunity, so there is no further improvement possible.
"However, they are expensive so to provide the same level of protection at a cheaper unit cost would be an advantage."
Reports indicate Moderna charges about $35 (Dh128.6) per dose, while the Pfizer-BioNTech vaccine costs around $20 (Dh73.5) per dose, although prices paid by different authorities vary.
Much cheaper is the Oxford-AstraZeneca vaccine, said to cost just $3 to $4 per dose, but in clinical trials it was less effective than other vaccines that have released data so far, preventing 70.4 per cent of Covid-19 cases on average,
although this reaches 90 per cent if a half-dose is given initially.
Altering the length of time between the two doses, or combining the vaccine with the Sputnik V jab from Russia, may offer further improvements.

These jabs are both known as adenoviral vector vaccines because they employ types of viruses called adenoviruses with coronavirus genetic material added. Once injected into patients, the coronavirus genes cause human cells to produce coronavirus spike proteins, and the immune system's reaction against these offers protection against the pathogen.

Easier distribution

Aside from looking to improve clinical performance, researchers want to make vaccine distribution easier. The Pfizer-BioNTech vaccine must be stored at -70 to -80°C, so the companies are developing a version, possibly in powdered form and likely to be released in 2021, that does not deteriorate at higher temperatures.

"In theory, a single dose vaccine would also be an improvement as all the current need two doses, but for technical reasons it is probably not possible while maintaining the same levels of protection," said Prof Jones.

Pharmaceutical giant Johnson and Johnson is, though, trialing an adenovirus-based vaccine that it hopes could be given as a single shot. Current clinical trials will indicate if just a single dose is enough.

Other ways in which the current crop of vaccines could be improved on will emerge over time, according to Prof John Oxford, professor emeritus at the University of London and co-author of the textbook *Human Virology*.

"We'll learn from some of the weaknesses of the first generation," he said. "There will be weaknesses. People raise questions: will they stop transmission? Can a person who's been vaccinated still carry the virus and infect other people?"

One vaccine for all variants?

Scientists are analyzing how the current vaccines will cope with emerging variants, including the more transmissible types first identified in South Africa and the UK.

Multiple alterations to the spike protein, the part of the virus that attaches to human cells, and which antibodies recognize, may necessitate changes to the vaccine. BioNTech has suggested it could develop an amended version of its mRNA vaccine in just six weeks.

"At some point in the future they may have to change the vaccines a little bit, but so far they're still effective against the predominant variants," said Prof Paul Hunter, an infectious diseases specialist at the University of East Anglia in the UK.

"Pretty much every year the influenza vaccines change because there are new strains. With coronaviruses, they don't mutate as rapidly. We may not have to [change] it for a while."

Different approaches

Including those already authorized by various authorities, 61 vaccines are in clinical trials and 172 in preclinical development, according to WHO.

As well as mRNA vaccines and adenoviral vector vaccines, some jabs, like the Sinopharm vaccine being used in the UAE, are based on inactivated viruses that stimulate an immune response that provides protection against the coronavirus.

Others that could be approved soon are made from purified coronavirus proteins. The immune response to these "protein subunits" – purified sections of the coronavirus incapable of causing disease – protects against the coronavirus.

The adenoviral vectors approved so far, such as the Oxford-AstraZeneca jab, do not replicate inside the patient, but other vaccines coming on stream involve vectors that do multiply.

Others being trialed are based on DNA rather than the mRNA of the Pfizer-BioNTech and Moderna vaccines.

Of the large numbers under development, especially those at an earlier stage of the process, Prof Hunter said "most of them will fall by the wayside" because effective vaccines have already been created.

"I would suggest many of these vaccines that are likely to fall by the wayside will work really well," he said.

Ethical trials

One factor that may limit the development of additional vaccines is ethical approval for clinical trials, which typically compare one group who have the vaccine with another given a placebo. It is harder to justify giving vulnerable individuals a placebo when effective vaccines are already available. "If you have not done your randomized control trials by the middle of next year, you're probably not going to get it through ethics," said Prof Hunter.

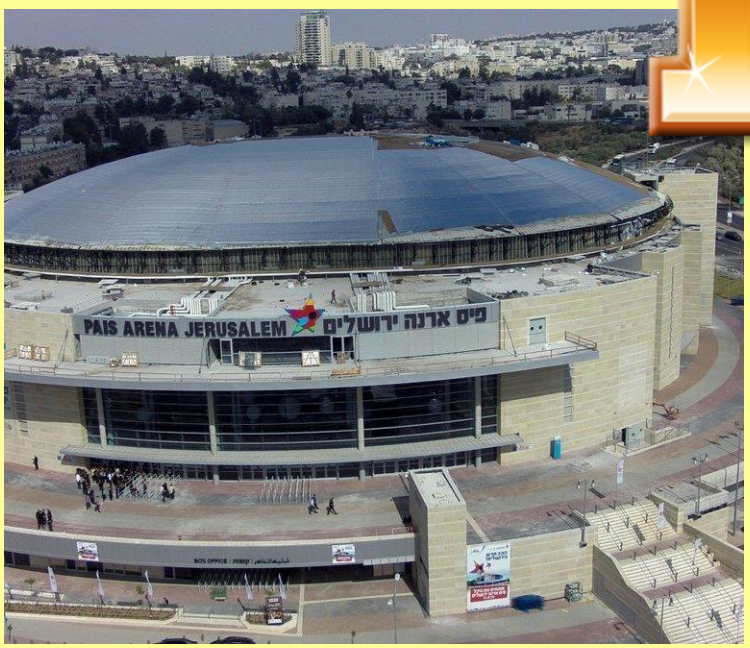
The Wave 2 program

Nonetheless, the Coalition for Epidemic Preparedness Innovations (Cepi), a foundation formed in 2017 and supported by governments, philanthropists and organizations such as

the Bill and Melinda Gates Foundation, has said funds are needed to develop "Wave 2" vaccines.
Such vaccines may be easier to deliver – eliminating extreme cold-storage requirements, for example – and more suitable for particular groups, such as pregnant women, older people or people with weak immune systems.
Cepi has nine candidate vaccines for its Wave 2 program, each of which would ideally be protective after a single dose, easy to manufacture in large quantities and not require extreme cold storage.
Cepi said in November it had raised $1.3bn to fund further coronavirus vaccine research, but needs a further $800m (Dh2.94bn) to fund the development of three vaccines that could be developed and made available by the end of 2021. The ultimate aim is to produce one billion doses by the end of 2022.
In December, as part of the Wave 2 program, Cepi announced it was contributing up to $10m to a South Korean company, SK Bioscience, for its genetically engineered protein vaccine. It consists of two components, a section of the coronavirus spike protein and a "core" particle to which it attaches.
So, while immunization has already started, the coronavirus vaccine landscape may change in the coming year as researchers look to overcome clinical, cost and distribution drawbacks of the current medicines.
"You're looking for greater stability, even higher efficacy and ease of storage," said Prof David Taylor, a professor emeritus of pharmaceutical and public health policy at University College London, while acknowledging "it's not very easy" for later vaccines to improve upon those coming to market now.

How Israel Became a World Leader in Vaccination

By Seth Frantzman
Source: https://www.meforum.org/61901/how-israel-became-a-world-leader-in-vaccination



Jan 01 – On a cold night three days before the end of the 2020 I drove down to Jerusalem's Pais Arena. The area is usually a sports venue, next to Jerusalem's stadium and mall, but in December it was transformed into a center for mass vaccinations, open from morning till ten in the evening. By the first day of 2021 Israel had vaccinated more than 1 million people in two weeks, the world's highest number per capita, making the country a global leader in vaccinating against Covid-19. I was one of those who received the first jab of the Pfizer vaccine. ...
Israel's unique approach has been to use a national security apparatus that is usually used to confront terrorists to fight against the virus. This was only possible because of a solidarity among Israelis. This wasn't always the case – some communities continued to hold weddings and funerals in breach of the guidelines and some officials violated the rules by inviting family members for holidays – but in general Israel was able to mobilize nationally against Covid because it has a citizen's army and national security ethos that is used to fighting wars. Israel's 'home front command' for instance often carries out drills to deal with earthquakes and national disasters, and has been tasked with distributing gas masks in past wars.
But the government of Prime Minister Benjamin Netanyahu, now in his 12th year in power and heading for his fourth election campaign in two years, had to balance lockdown with the destruction it wrought on the economy. After restricting travelers from entering the country, Israel's tourism industry was crushed and hundreds of thousands have lost work this year. Unemployment reached 26 per cent in May but by September the relaxed restrictions led to the highest infection rate in the world for Covid.
Israel's government gambled on acquiring masses of vaccines to try to right the ship in the fall of 2020. It acquired 8 million doses of the Pfizer vaccine in November, with some 4 million doses arriving in early December. Israel also scrambled to acquire Moderna's vaccine, purchasing 6 million doses in December. Israel's population is just under 9 million. After the Pfizer vaccine was approved in line with the US in mid-December, the rollout of the vaccine began

on December 20, two weeks after the UK kicked off its own vaccine program. The Israeli health authorities set a goal of 150,000 vaccinations a day, beginning with those over 60 years old, as well as soldiers, police and medical staff.

When mass vaccinations began people received text messages to go to their health insurance provider to get vaccinated. Israel has several large state-mandated semi-private healthcare providers and every citizen is registered with one of them.

For selected countries. Total doses given per 100 population*

	Latest data	Total doses given	Doses per 100 population
Israel	02 Jan	1,090,000	12.59
Bahrain	03 Jan	60,689	3.57
Iceland	30 Dec	4,875	1.43
United Kingdom	27 Dec	944,539	1.39
United States	02 Jan	4,225,756	1.28
Russia	02 Jan	800,000	0.55
China	31 Dec	4,500,000	0.31
Germany	02 Jan	238,809	0.29
Portugal	30 Dec	26,850	0.26
Croatia	30 Dec	7,864	0.19
Italy	03 Jan	114,349	0.19
Luxembourg	30 Dec	1,200	0.19
Argentina	31 Dec	32,013	0.07
Ireland	31 Dec	1,800	0.04
Finland	31 Dec	1,767	0.03
Greece	02 Jan	3,001	0.03
France	01 Jan	516	0.00

Even foreigners without health providers have been able to get vaccinated at the mass vaccination points in some cases. At the Arena in Jerusalem two of the providers, Clalit and Maccabi, set up mass vaccination centers. Those arriving, like I did in late December, queued to see if we could enter. Those under 60 were told that if there were leftover vaccines at the end of the day they would be let in. This is because Pfizer's vaccine needs to be at minus 70 degrees Celsius and extra doses would otherwise be disposed of. Standing in the long, cavernous halls that circle the arena I waited to receive the vaccine. One by one we were let in, like being on standby for a flight. A short walk took me to a series of divided stations where medical staff logged my name and jabbed me with a shot. They said 'wait 15 minutes and register for your second dose.' If all goes as planned, I'll be back in late January.

While Israel quickly vaccinated a million people it now needs to pause some of its phenomenal progress to make sure that everyone is able to receive the second dose on time. The country has sought to get its Moderna shipments early with 1 million new doses coming in early January. The roll-out has been impressive so far, with Israel vaccinating around eight times more per capita than the UK. Nevertheless, Israel is still in its third national lockdown and is preparing for yet another round of elections. Officials are concerned that the latest lockdown isn't tough enough.

Many Israelis have had to forego vacations this year and the country has felt cut off from much of the world. One exception was Israel's peace deal with the United Arab Emirates and the rapid expansion of flights to Dubai that saw 50,000 Israelis jet off to enjoy the Gulf in early December. It was a strange year. In March the streets were deserted and soldiers were deployed outside our house at a checkpoint. Restaurants have been closed since September, with only a few bars operating like secretive speakeasies. Constant uncertainty over flights and the need to get tested before travel makes it hard to go anywhere. People are hopeful the vaccine will mean a kind of 'travel health passport' will be put in place. In the meantime, the spread of the virus continues to shutter schools and force people into quarantine, as our family has had to do twice this year. Hopefully the new year will bring new hope.

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

People With 'Dark' Personality Traits Responded to The Pandemic with Key Differences

Source: https://www.sciencealert.com/people-with-dark-personality-traits-responded-to-the-pandemic-with-key-differences

Jan 04 – While we've all lived through the same pandemic the past few months, not all of us have responded to the fallout in the same way.

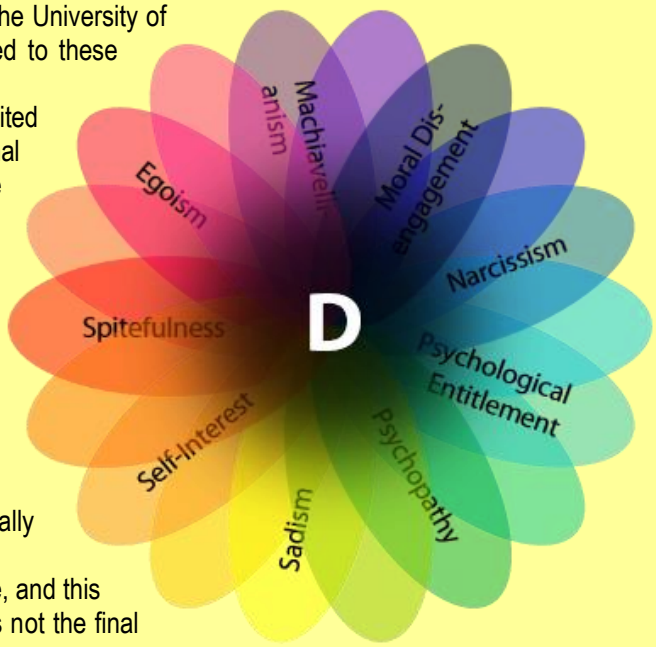
A recent small study suggests that there are some distinct differences in the way people with 'dark' personality traits have reacted to COVID-19 .

These dark personality traits include narcissism, psychopathy, sadism and Machiavellianism, and are often linked to negative social outcomes - they're referred to in psychology as the 'dark tetrad'.

But can these personality traits predict how individuals respond to a global crisis?

Looking at 402 individuals in the US aged from 18 to 78, researchers from the University of Mississippi found there were some subtle, but noticeable, differences linked to these personality traits - from cleaning behaviors to mood.

"Our findings indicate that during the initial stages of the pandemic in the United States, dark personality differentially predicted cognitive and emotional responses to the pandemic," the authors write in their paper, published online ahead of print in November 2020.



Recruiting participants online, the researchers had individuals fill out a questionnaire about their feelings, thoughts, and behaviors during the pandemic - and their dark personality traits were ranked using the Dirty Dozen measure and the Assessment of Sadistic Personality test.

Interestingly, people with narcissistic and Machiavellian traits struggled emotionally with the social upheaval that came with the pandemic. But the research found that those who rated themselves as having sadistic traits reported great positive affect in response to COVID-19.

"It may be that these individuals derive pleasure from events that are generally perceived as having a negative impact on society," the authors write.

To be clear, these differences were statistically significant but still fairly subtle, and this is a study that involved self-reporting and simple 'yes' or 'no' answers, so it's not the final word on this issue by any means.

It's also not to say that the people involved in the study were clinical narcissists or sadists - simply that they expressed having some of those traits.

But it's an important and interesting insight into how different personality types respond to large-scale social upheaval, like the one we're currently living through.

On top of the emotional responses, the researchers looked into how the personality types changed their behavior in response to the pandemic.

The results showed that none of the dark personality traits were predictors of hoarding behavior. But those with narcissistic or psychopathic traits were less likely to engage in regular cleaning behaviors, such as wiping down frequently touched areas.

In fact, the higher they scored in terms of narcissism and psychopathy, the more their cleanliness behavior decreased.

While individuals with Machiavellian traits were more fearful of contracting COVID-19, those with narcissistic traits reported taking part in behaviors that helped those affected by the pandemic.

That might sound counter intuitive, but the researchers say this is backed up by previous research that found narcissists may take part in prosocial behaviors to get approval from others.

Two earlier studies published in July and November found that some of the dark personality traits could predict how likely people were to follow public health advice, such as social distancing and wearing a mask.

But this research didn't find that was the case - on a positive note, most of the participants said they were already engaging in social distancing, frequent handwashing, and avoiding travel and in-person gatherings.

This difference in results could be due to the fact the pandemic is a "'strong situation' in which situational cues overpower the role of personality" in predicting people's behavior, the researchers suggest.
While the study only looked at links, not what was causing these differences, the researchers suggest that how the dark tetrad responds to crises may have something to do with how important social stability is to each of the personality traits.
Narcissists rely on social feedback to support their self-image, and Machiavellians are known to exploit others in the social system to meet their own goals.
The fact that these two personality traits were particularly likely to perceive the pandemic as a threatening situation and experience negative emotions hints "that these individuals depend on stable social structures to attain their goals and react negatively to perceived social instability," the researchers write.
"Individuals with more antisocial traits (psychopathy and sadism) were not as threatened by the pandemic."
Importantly, researchers in the past have questioned whether psychopathy and Machiavellianism are actually separate constructs at all - but this research suggests that the difference in the degree to which people with these traits rely on stable social environments may be a key distinguishing point.
Of course, the team also notes the limitations of the work - given the questionnaires were all self-reported and conducted unsupervised. Some of the measures they used are also not validated by previous research.
And while the sample size was representative of the broader US population, it only captured them in one moment in time. Further research needs to be done over a longer time period in order to fully understand how different personalities have responded to this ongoing crisis.
But as the world braces itself for more upheaval in the coming decades, thanks to climate change and resource scarcity, knowing more about how personality types may respond to social strife is crucial. And this is a good starting point.
"The results of the current study represent an important addition to our understanding of how dark personality traits function in uncertain times," the researchers write, "and to our general understanding of the psychological experiences of people living through a global pandemic."

▶▶ **The research has been published in** *Personal and Individual Differences*.

Model Used to Evaluate Lockdowns Was Flawed

Source: http://www.homelandsecuritynewswire.com/dr20210104-model-used-to-evaluate-lockdowns-was-flawed

Jan 04 – In a recent study, researchers from Imperial College London developed a model to assess the effect of different measures used to curb the spread of the coronavirus. However, the model had fundamental shortcomings and cannot be used to draw the published conclusions, claim Swedish researchers from Lund University, and other institutions, in the journal *Nature*.
The results from Imperial indicated that it was almost exclusively the complete societal lockdown that suppressed the wave of infections in Europe during spring.
The study estimated the effects of different measures such as social distancing, self-isolating, closing schools, banning public events and the lockdown itself.
"As the measures were introduced at roughly the same time over a few weeks in March, the mortality data used simply does not contain enough information to differentiate their individual effects. We have demonstrated this by conducting a mathematical analysis. Using this as a basis, we then ran simulations using Imperial College's original code to illustrate how the model's sensitivity leads to unreliable results," explains Kristian Soltesz, associate professor in automatic control at Lund University and first author of the article.
The group's interest in the Imperial College model was roused by the fact that it explained almost all of the reduction in transmission during the spring via lockdowns in ten of the eleven countries modelled. The exception was Sweden, which never introduced a lockdown.
"In Sweden the model offered an entirely different measure as an explanation to the reduction – a measure that appeared almost ineffective in the other countries. It seemed almost too good to be true that an effective lockdown was introduced in every country except one, while another measure appeared to be unusually effective in this country", notes Soltesz.
Soltesz is careful to point out that it is entirely plausible that individual measures had an effect, but that the model could not be used to determine how effective they were.

"The various interventions do not appear to work in isolation from one another, but are often dependent upon each other. A change in behaviour as a result of one intervention influences the effect of other interventions. How much and in what way is harder to know, and requires different skills and collaboration", says Anna Jöud, associate professor in epidemiology at Lund University and co-author of the study.

Analyses of models from Imperial College and others highlight the importance of epidemiological models being reviewed, according to the authors.

"There is a major focus in the debate on sources of data and their reliability, but an almost total lack of systematic review of the sensitivity of different models in terms of parameters and data. This is just as important, especially when governments across the globe are using dynamic models as a basis for decisions", Soltesz and Jöud point out.

The first step is to carry out a correct analysis of the model's sensitivities. If they pose too great a problem then more reliable data is needed, often combined with a less complex model structure.

"With a lot at stake, it is wise to be humble when faced with fundamental limitations. Dynamic models are usable as long as they take into account the uncertainty of the assumptions on which they are based and the data they are led by. If this is not the case, the results are on a par with assumptions or guesses", concludes Soltesz.

COVID-19 is not a pandemic

By Richard Horton

The Lancet | Vol 396 September 26, 2020; p. 874

Source: https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(20)32000-6.pdf

As the world approaches 1 million deaths from COVID-19, we must confront the fact that we are taking a far too narrow approach to managing this outbreak of a new coronavirus. We have viewed the cause of this crisis as an infectious disease. All of our interventions have focused on cutting lines of viral transmission, thereby controlling the spread of the pathogen. The "science" that has guided governments has been driven mostly by epidemic modellers and infectious disease specialists, who understandably frame the present health emergency in centuries-old terms of plague. But what we have learned so far tells us that the story of COVID-19 is not so simple. Two categories of disease are interacting within specific populations—infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and an array of non-communicable diseases (NCDs). These conditions are clustering within social groups according to patterns of inequality deeply embedded in our societies. The aggregation of these diseases on a background of social and economic disparity exacerbates the adverse effects of each separate disease. **COVID-19 is not a pandemic. It is a syndemic.** The syndemic nature of the threat we face means that a more nuanced approach is needed if we are to protect the health of our communities.

The notion of a syndemic was first conceived by Merrill Singer, an American medical anthropologist, in the 1990s. Writing in The Lancet in 2017, together with Emily Mendenhall and colleagues, Singer argued that a syndemic approach reveals biological and social interactions that are important for prognosis, treat-ment, and health policy. Limiting the harm caused by SARS-CoV-2 will demand far greater attention to NCDs and socioeconomic inequality than has hitherto been admitted. A syndemic is not merely a comorbidity. Syndemics are characterised by biological and social interactions between conditions and states, interactions that increase a person's susceptibility to harm or worsen their health outcomes. In the case of COVID-19, attacking NCDs will be a prerequisite for successful containment. As our recently published NCD Countdown 2030 showed, although premature mortality from NCDs is falling, the pace of change is too slow. The total number of people living with chronic diseases is growing. Addressing COVID-19 means addressing hypertension, obesity, diabetes, cardiovascular and chronic respiratory diseases, and cancer. Paying greater attention to NCDs is not an agenda only for richer nations. NCDs are a neglected cause of ill-health in poorer countries too. In their Lancet Commission, published last week, Gene Bukhman and Ana Mocumbi described an entity they called NCDI Poverty, adding injuries to a range of NCDs—conditions such as snake bites, epilepsy, renal disease, and sickle cell disease. For the poorest billion people in the world today, NCDIs make up over a third of their burden of disease. The Commission described how the availability of affordable, cost-effective interventions over the next decade could avert almost 5 million deaths among the world's poorest people. And that is without considering the reduced risks of dying from COVID-19.

The most important consequence of seeing COVID-19 as a syndemic is to underline its social origins. The vulnerability of older citizens; Black, Asian, and minority ethnic communities; and key workers who are commonly poorly paid with fewer welfare protections points to a truth so far barely acknowledged—namely, that no matter how effective a treatment or protective a vaccine, the pursuit of a purely biomedical solution to COVID-19

will fail. Unless governments devise policies and programmes to reverse profound disparities, our societies will never be truly COVID-19 secure. As Singer and colleagues wrote in 2017, "A syndemic approach provides a very different orientation to clinical medicine and public health by showing how an integrated approach to understanding and treating diseases can be far more successful than simply controlling epidemic disease or treating individual patients." I would add one further advantage. Our societies need hope. The economic crisis that is advancing towards us will not be solved by a drug or a vaccine. Nothing less than national revival is needed. Approaching COVID-19 as a syndemic will invite a larger vision, one encompassing education, employment, housing, food, and environment. Viewing COVID-19 only as a pandemic excludes such a broader but necessary prospectus.

The Plague Year

The mistakes and the struggles behind America's coronavirus tragedy

By Lawrence Wrigh

(Dec 28, 2020)

Source: https://www.newyorker.com/magazine/2021/01/04/the-plague-year

1. "An Evolving Situation"

There are three moments in the yearlong catastrophe of the *COVID*-19 pandemic when events might have turned out differently. The first occurred on January 3, 2020, when Robert Redfield, the director of the Centers for Disease Control and Prevention, spoke with George Fu Gao, the head of the Chinese Center for Disease Control and Prevention, which was modelled on the American institution. Redfield had just received a report about an unexplained respiratory virus emerging in the city of Wuhan.

The field of public health had long been haunted by the prospect of a widespread respiratory-illness outbreak like the 1918 influenza pandemic, so Redfield was concerned. Gao, when pressed, assured him that there was no evidence of human-to-human transmission. At the time, the theory was that each case had arisen from animals in a "wet" market where exotic game was sold. When Redfield learned that, among twenty-seven reported cases, there were several family clusters, he observed that it was unlikely that each person had been infected, simultaneously, by a caged civet cat or a raccoon dog. He offered to send a C.D.C. team to Wuhan to investigate, but Gao said that he wasn't authorized to accept such assistance. Redfield made a formal request to the Chinese government and assembled two dozen specialists, but no invitation arrived. A few days later, in another conversation with Redfield, Gao started to cry and said, "I think we're too late."

Perhaps Gao had just been made aware that the virus had been circulating in China at least since November. Certainly, Redfield didn't know that the virus was already present in California, Oregon, and Washington, and would be spreading in Massachusetts, Wisconsin, Iowa, Connecticut, Michigan, and Rhode Island within the next two weeks—well before America's first official case was detected.

Redfield is convinced that, had C.D.C. specialists visited China in early January, they would have learned exactly what the world was facing. The new pathogen was a coronavirus, and as such it was thought to be only modestly contagious, like its cousin the *SARS* virus. This assumption was wrong. The virus in Wuhan turned out to be far more infectious, and it spread largely by asymptomatic transmission. "That whole idea that you were going to diagnose cases based on symptoms, isolate them, and contact-trace around them was not going to work," Redfield told me recently. "You're going to be missing fifty per cent of the cases. We didn't appreciate that until late February." The first mistake had been made, and the second was soon to happen.

Matthew Pottinger was getting nervous. He is one of the few survivors of Donald Trump's White House, perhaps because he is hard to categorize. Fluent in Mandarin, he spent seven years in China, reporting for Reuters and the *Wall Street Journal*. He left journalism at the age of thirty-two and joined the Marines, a decision that confounded everyone who knew him. In Afghanistan, he co-wrote an influential paper with Lieutenant General Michael Flynn on improving military intelligence. When Trump named Flynn his national-security adviser, Flynn chose Pottinger as the Asia director. Scandal removed Flynn from his job almost overnight, but Pottinger stayed, serving five subsequent national-security chiefs. In September, 2019, Trump appointed him deputy national-security adviser. In a very noisy Administration, he had quietly become one of the most influential people shaping American foreign policy.

At the *Journal*, Pottinger had covered the 2003 *sars* outbreak. The Chinese hid the news, and, when rumors arose, authorities minimized the severity of the disease, though the fatality rate was approximately ten per cent. Authorities at the World Health Organization were eventually allowed to visit Beijing hospitals, but infected patients were reportedly loaded into ambulances or checked into hotels until the inspectors left the country. By then, *sars* was spreading to Hong Kong, Hanoi, Singapore, Taiwan, Manila, Ulaanbaatar, Toronto, and San Francisco. It ultimately reached some thirty countries. Because of heroic

efforts on the part of public-health officials—and because *sars* spread slowly—it was contained eight months after it emerged.
The National Security Council addresses global developments and offers the President options for responding. Last winter, Pottinger was struck by the disparity between official accounts of the novel coronavirus in China, which scarcely mentioned the disease, and Chinese social media, which was aflame with rumors and anecdotes. Someone posted a photograph of a sign outside a Wuhan hospital saying that the E.R. was closed, because staff were infected. Another report said that crematoriums were overwhelmed.
On January 14th, the N.S.C. convened an interagency meeting to discuss the virus. Early that morning, the W.H.O.—relying on China's assurances—tweeted that there was no evidence of human-to-human transmission. The N.S.C. recommended that screeners take the temperatures of any passengers arriving from Wuhan.
The next day, President Trump signed the first phase of a U.S.-China trade deal, declaring, "Together, we are righting the wrongs of the past and delivering a future of economic justice and security for American workers, farmers, and families." He called China's President, Xi Jinping, "a very, very good friend."
On January 20th, the first case was identified in the U.S. On a Voice of America broadcast, Dr. Anthony Fauci, the head of the National Institute of Allergy and Infectious Diseases, said, "This is a thirty-five-year-old young man who works here in the United States, who visited Wuhan." Trump, who was at the World Economic Forum, in Davos, Switzerland, dismissed the threat, saying, "It's one person coming in from China. It's going to be just fine."
On January 23, 2020, all the members of the U.S. Senate gathered for the second day of opening arguments in President Trump's impeachment trial. It was an empty exercise with a foreordained result. Mitch McConnell, the Majority Leader, had already said that he would steamroll Democratic attempts to introduce witnesses or new evidence. "We have the votes," he decreed.
The trial posed difficulties for the four Democratic senators still running for President. As soon as the proceedings recessed, on Friday evenings, the candidates raced off to campaign for the weekend. One of them, Amy Klobuchar, of Minnesota, recalled, "I was doing planetariums in small towns at midnight." Then it was back to Washington, to listen to an argument that one side would clearly win. In the midst of this deadened theatre, McConnell announced, "In the morning, there will be a coronavirus briefing for all members at ten-thirty." This was the first mention of *COVID* in Congress.
The briefing took place on January 24th, in the hearing room of the Health, Education, Labor, and Pensions Committee, which Lamar Alexander, Republican of Tennessee, chaired. Patty Murray is the ranking Democratic member. A former preschool teacher, she has been a senator for twenty-seven years. Her father managed a five-and-dime until he developed multiple sclerosis and was unable to work. Murray was fifteen. The family went on welfare. She knows how illness can upend people economically, and how government can help.
A few days earlier, she had heard about the first confirmed *COVID* case in the U.S.—the man had travelled from Wuhan to Washington, her state. Murray contacted local public-health officials, who seemed to be doing everything right: the man was hospitalized, and health officials were tracing a few possible contacts. Suddenly, they were tracking dozens of people. Murray said to herself, "Wow, this is kinda scary. And this is in my back yard."
But in the outbreak's early days, when decisiveness mattered most, few other politicians were paying attention. It had been a century since the previous great pandemic, which found its way from the trenches of the First World War to tropical jungles and Eskimo villages. Back then, scientists scarcely knew what a virus was. In the twenty-first century, infectious disease seemed like a nuisance, not like a mortal threat. This lack of concern was reflected in the diminished budgets given to institutions that once had led the world in countering disease and keeping Americans healthy. Hospitals closed; stockpiles of emergency equipment weren't replenished. The spectre of an unknown virus arising in China gave certain public-health officials nightmares, but it wasn't on the agenda of most American policymakers.
About twenty senators showed up to hear Anthony Fauci and Robert Redfield speak at an hour-long briefing. The health authorities were reassuring. Redfield said, "We are prepared for this."
That day, Pottinger convened forty-two people, including N.S.C. staffers and Cabinet-level officials, for a meeting. China had just announced a lockdown of Wuhan, a city of eleven million, which could mean only that sustained human-to-human transmission was occurring. Indeed, Pottinger's staff reported that another city, Huanggang, was also locked down. The previous day, the State Department had heightened its travel advisory for passengers to the Wuhan region, and the meeting's attendees debated how to implement another precaution: sending all passengers coming from Wuhan to five U.S. airports, where they could be given a health screening before entry.
The next day, Pottinger attended a Chinese New Year party on Capitol Hill. Old diplomatic hands, émigrés, and Chinese dissidents relayed stories about the outbreak from friends and family members. People were frightened. It sounded like *sars* all over again.
Pottinger went home and dug up files from his reporting days, looking for phone numbers of former sources, including Chinese doctors. He then called his brother, Paul, an infectious-

disease doctor in Seattle. Paul had been reading about the new virus on Listservs, but had assumed that, like *sars*, it would be "a flash in the pan."
If flights from China were halted, Matt asked, could America have more time to prepare?
Paul was hesitant. Like most public-health practitioners, he held that travel bans often have unintended consequences. They stigmatize countries contending with contagion. Doctors and medical equipment must be able to move around. And, by the time restrictions are put in place, the disease has usually infiltrated the border anyway, making the whole exercise pointless. But Matt spoke with resolve. Little was known about the virus *except* for the fact that it was spreading like wildfire, embers flying from city to city.
Paul told Matt to do whatever he could to slow the virus's advance, giving the U.S. a chance to establish testing and contact-tracing protocols, which could keep the outbreak under control. Otherwise, the year ahead might be calamitous.
No one realized how widely the disease had already seeded itself. Fauci told a radio interviewer that *COVID* wasn't something Americans needed to "be worried or frightened by," but he added that it was "an evolving situation."

2. The Trickster

In October, 2019, the first Global Health Security Index appeared, a sober report of a world largely unprepared to deal with a pandemic. "Unfortunately, political will for accelerating health security is caught in a perpetual cycle of panic and neglect," the authors observed. "No country is fully prepared." Yet one country stood above all others in terms of readiness: the United States.
During the transition to the Trump Administration, the Obama White House handed off a sixty-nine-page document called the Playbook for Early Response to High-Consequence Emerging Infectious Disease Threats and Biological Incidents. A meticulous guide for combatting a "pathogen of pandemic potential," it contains a directory of government resources to consult the moment things start going haywire.
Among the most dangerous pathogens are the respiratory viruses, including orthopoxviruses (such as smallpox), novel influenzas, and coronaviruses. With domestic outbreaks, the playbook specifies that, "while States hold significant power and responsibility related to public-health response outside of a declared Public Health Emergency, the American public will look to the U.S. Government for action." The playbook outlines the conditions under which various federal agencies should become involved. Questions about the severity and the contagiousness of a disease should be directed to the Department of Health and Human Services, the Federal Emergency Management Agency, and the Environmental Protection Agency. How robust is contact tracing? Is clinical care in the region scalable if cases explode? There are many such questions, with decisions proposed and agencies assigned. Appendices describe such entities as the Pentagon's Military Aeromedical Evacuation team, which can be assembled to transport patients. Health and Human Services can call upon a Disaster Mortuary Operational Response Team, which includes medical examiners, pathologists, and dental assistants.
The Trump Administration jettisoned the Obama playbook. In 2019, H.H.S. conducted Crimson Contagion, a simulation examining the government's ability to contain a pandemic. Among the participants were the Pentagon, the N.S.C., hospitals, local and regional health-care departments, the American Red Cross, and twelve state governments. The scenario envisioned an international group of tourists visiting China who become infected with a novel influenza and spread it worldwide. There's no vaccine; antiviral drugs are ineffective.
The Crimson Contagion exercise inspired little confidence that the government was prepared to handle such a crisis. Federal agencies couldn't tell who was in charge; states grew frustrated in their attempts to secure enough resources. During the simulation, some cities defied a C.D.C. recommendation to close schools. Government policies, the report concluded, were inadequate and "often in conflict." The Public Health Emergency Fund and the Strategic National Stockpile were dangerously depleted; N95 masks and other medical essentials were in short supply, and domestic manufacturing capacity was insufficient. Congress was briefed on the findings but they were never made public. By the time *COVID* arrived, no meaningful changes had been made to address these shortcomings.
"I just love infectious diseases," John Brooks, the chief medical officer of the *COVID* response team at the C.D.C., admitted to me. "I know diseases are terrible—they kill people. But something about them just grabs me."
Each generation has its own struggle with disease. In 1939, Brooks's mother, Joan Bertrand Brooks, developed polio. Her legs were covered with surgical scars, and her right leg was noticeably shorter than her left. "She spoke about that experience often—how she was teased, stigmatized, or blatantly discriminated against," Brooks recalled.
For Brooks, who is gay, the disease of his generation was H.I.V./*AIDS*. He grew up near the Dupont Circle neighborhood of Washington, D.C., which had a large gay population, and watched men he knew disappear: "Guys would get thin and develop lesions and then be gone. It was scary." Science offered no solution, and that was on Brooks's mind when he

decided to become a doctor. The day he was accepted at Harvard Medical School, he and his mother went to lunch to celebrate. "Afterward, we dropped into a ten-dollar palm reader, who said she saw me marrying a tall Swedish woman and owning a jet with which I flew around the world with our three children," he told me. "We had a good laugh. I should have asked for a refund."

In 2015, Brooks became the chief medical officer of the H.I.V./*AIDS* division at the C.D.C. Every H.I.V. researcher has been humbled by the various manifestations of this disease. "At every turn, there was something different," Brooks said. "All these opportunistic infections show up. What in the world is this all about? Very cool." The experience of studying H.I.V. helped prepare him for the myriad tricks that *COVID* would present.

The C.D.C. was founded in 1946, as the Communicable Disease Center. Atlanta was chosen as its home because the city was in the heart of what was called "the malaria zone." Five years later, America was declared malaria-free. The C.D.C.'s mission expanded to attack other diseases: typhus, polio, rabies. In 1981, the organization, by then renamed the Centers for Disease Control, reported the first known cases of *AIDS*, in Los Angeles. Until this year, the C.D.C. maintained a reputation as the gold standard for public health, operating above politics and proving repeatedly the value of enlightened government and the necessity of science for the furthering of civilization. During the twentieth century, the life span of Americans increased by thirty years, largely because of advances in public health, especially vaccination.

The C.D.C. campus now resembles a midsize college, with more buildings under construction, including a high-containment facility for the world's most dangerous diseases. Lab animals—mice, ferrets, monkeys—inhabit cages inside Biosafety Level 4 chambers. Humans move around them like deep-sea divers in inflated suits, tethered to an overhead airflow system.

The Emergency Operations Center is a large, bright room, with serried rows of wooden desks facing a wall of video screens. The place exudes a mixture of urgency and professional calm. On one side of the room, operators triage incoming phone calls. In 2014, during the Ebola crisis, Brooks received a call from Clay Jenkins, a county judge in Dallas. A Liberian citizen visiting the city, Thomas Eric Duncan, had contracted the disease. Jenkins wanted advice about how to safely approach Duncan's fiancée and her family members. On a monitor, Brooks could see the fiancée's apartment complex, shot from above by cameras on helicopters. Brooks told Jenkins that he could safely enter the apartment as long as the family had no symptoms: it would be an important public gesture for him to choose compassion over fear. Brooks watched footage of Jenkins escorting the family out of the complex. (Thomas Duncan eventually died; two nurses who had cared for him were infected but survived.)

Brooks was working on the *COVID* response team with Greg Armstrong, a fellow-epidemiologist. Armstrong oversaw the Advanced Molecular Detection program, which is part of the C.D.C.'s center for emerging and zoonotic infectious diseases. (Zoonotic diseases come from animals, as coronaviruses typically do.) Humanity's encroachment into formerly wild regions, coupled with climate change, which has forced animals out of traditional habitats, has engendered many new diseases in humans, including Ebola and Zika. At first, *SARS*-CoV-2—as the new virus was being called—presented itself as a less mortal coronavirus, like the common cold, spreading rapidly and sometimes asymptomatically. In fact, *SARS*-CoV-2 was more like polio. Most polio infections are asymptomatic or very mild—fever and headaches. But some are deadly. The polio cases that doctors actually see are about one in every two hundred infections. Stealth transmission is why polio has been so hard to eradicate.

Armstrong was in Salt Lake City, conducting a training session, when he noticed an article on the Web site of *The New England Journal of Medicine:* "Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia." The article was one of the first to describe the virus's spread among humans, a development that didn't surprise Armstrong: "Anybody with any epidemiology experience could tell you it was human-to-human transmission." Then he noticed Table 1, "Characteristics of Patients," which noted the original source of their infection. Of the Chinese known to have contracted the virus before January 1st, twenty-six per cent had no exposure either to the Wuhan wet market or to people with apparent respiratory symptoms. In subsequent weeks, the number of people with no obvious source of infection surpassed seventy per cent. Armstrong realized that, unlike with *sars* or *mers*—other coronavirus diseases—many infections of *SARS*-CoV-2 were probably asymptomatic or mild. Contact tracing, isolation, and quarantine would likely not be enough. These details were buried in Table 1.

Other reports began to emerge about possible asymptomatic spread. Although *SARS*-CoV-2 was genetically related to the *sars* and *MERS* viruses, it was apparently unlike them in two key ways: people could be contagious before developing symptoms, and some infected people would never manifest illness. In late February, University of Texas scientists, led by Lauren Ancel Meyers, reported that it could have a "negative serial interval," meaning that some infected people showed symptoms *before* the person who had given it to them.

The C.D.C.'s early guidance documents didn't mention that possibility, because the evidence of asymptomatic spread was deemed insufficient. "In the beginning, for every mathematical analysis that indicated a shorter serial interval than incubation period, others reported no difference," Brooks said. "When the science changed, we changed. And our

recommendations changed, too." But, by that time, the C.D.C. had been muzzled by the Trump Administration.
"There are three things this virus is doing that blow me away," Brooks told me. "The first is that it directly infects the endothelial cells that line our blood vessels. I'm not aware of any other human respiratory viruses that do this. This causes a lot of havoc." Endothelial cells normally help protect the body from infection. When *SARS*-CoV-2 invades them, their powerful chemical contents get dumped into the bloodstream, resulting in inflammation elsewhere in the body. The rupture of individual endothelial cells coarsens the lining in the blood vessels, creating breaks and rough spots that cause turbulent blood flow.
The second surprise was hypercoagulability—patients had a pronounced tendency to develop blood clots. This reminded Brooks of Michael Crichton's 1969 novel, "The Andromeda Strain," in which a pathogen causes instant clotting, striking down victims in mid-stride. "This is different," Brooks said. "You're getting these things called pulmonary embolisms, which are nasty. A clot forms—it travels to the lung, damaging the tissues, blocking blood flow, and creating pressures that can lead to heart problems." More puzzling was evidence that clots sometimes formed in the lungs, leading to acute respiratory distress. Brooks referred to an early report documenting autopsies of victims. Nearly all had pulmonary thromboses; until the autopsy, nobody had suspected that the clots were even present, let alone the probable cause of death.
"The last one is this hyperimmune response," Brooks said. Most infectious diseases kill people by triggering an excessive immune-system response; *COVID*, like pneumonia, can unleash white blood cells that flood the lungs with fluid, putting the patient at risk of drowning. But *COVID* is unusual in the variety of ways that it causes the body to malfunction. Some patients require kidney dialysis or suffer liver damage. The disease can affect the brain and other parts of the nervous system, causing delirium, strokes, and lasting nerve damage. *COVID* could also do strange things to the heart. Hospitals began admitting patients with signs of cardiac arrest—chest pains, trouble breathing—and preparing emergency coronary catheterizations. "But their coronary vessels are clean," Brooks said. "There's no blockage." Instead, an immune reaction had inflamed the heart muscle, a condition called myocarditis. "There's not a lot you can do but hope they get through it." A German study of a hundred recovered *COVID* patients with the average age of forty-nine found that twenty-two had lasting cardiac problems, including scarring of the heart muscle.
Even after Brooks thought that *COVID* had no more tricks to play, another aftereffect confounded him: "You get over the illness, you're feeling better, and it comes back to bite you again." In adults, it might just be a rash. But some children develop a multi-organ inflammatory syndrome. Brooks said, "They have conjunctivitis, their eyes get real red, they have abdominal pain, and then they can go on to experience cardiovascular collapse."

3. Spike

When I was around six, I woke up one morning and couldn't get out of bed: I was paralyzed from the waist down. It was during the polio era, in the early fifties, before there was a cure. I remember the alarm in my mother's eyes. Our family doctor made a house call. He sat on the edge of the bed, and took my temperature and pulse; there was little else he could do. The terror of polio haunted children and parents everywhere.
I was lucky. After a day or so, I could move my legs again. I was never certain what had caused my brief paralysis, but the memory was searing. Soon after the polio vaccine, invented by Jonas Salk, became available, in 1955, I was inoculated, along with millions of other children.
So I had a personal interest when I entered Building 40 of the main campus of the National Institutes of Health, in Bethesda, Maryland, which houses the National Institute of Allergy and Infectious Diseases. Dr. Barney S. Graham, the deputy director of the Vaccine Research Center and the chief of the Viral Pathogenesis Laboratory and Translational Science Core, works on the second floor. He studies how viruses cause disease, and he designs vaccines.
The first thing you notice about Graham is that there's a lot of him: he's six feet five, with a gray goatee and a laconic manner. Graham's boss at *niaid*, Anthony Fauci, told me, "He understands vaccinology better than anybody I know."
Bookshelves in Graham's office hold colorful 3-D printouts of viruses that he has worked with, including Ebola, Zika, and influenza. While I was researching "The End of October," a novel that I published earlier this year, about a deadly pandemic, Graham helped me design a fictional virus, and then concocted a vaccine for it. As we collaborated, I came to understand that researchers like Graham are essentially puzzle solvers. This past year, he solved one of the most consequential puzzles in modern science. He is the chief architect of the first *COVID* vaccines authorized for emergency use. Manufactured by Moderna and Pfizer, they differ only in their delivery systems.
On Graham's wall is a map of Kansas, where he grew up. His father was a dentist and his mother was a teacher. For part of his childhood, they lived on a hog farm. Barney and his brother did much of the farming. Working with the animals, he learned a lot about veterinary medicine. At Rice University, he majored in biology. He earned a medical degree at the University of Kansas, where he met his wife, Cynthia Turner-Graham, a psychiatrist. In 1978,

on an infectious-disease rotation in medical school, he spent time at the N.I.H., where he first encountered Fauci. “Cynthia noticed when I came back how excited I was,” Graham recalled. “People were willing to battle each other’s ideas. She thought I would end up here.”

First, he and Cynthia had to complete residencies. They wanted to be in the same town, a problem many professional couples face, but additionally complicated in their case because Cynthia is Black. She suggested Nashville: he could apply to Vanderbilt School of Medicine and she to Meharry Medical College, a historically Black institution. Tennessee had only recently repealed a ban on interracial marriage.

Driving back to Kansas from Maryland on Christmas Eve, Graham stopped in at Vanderbilt. To his surprise, the director of the residency program, Thomas Brittingham, was in his office and willing to meet with him immediately. When the interview was over, Graham told Brittingham, “I know this is the South. I’m going to marry a Black woman, and if that makes a difference I can’t come here.” Brittingham said, “Close the door.” He welcomed Graham on the spot. Cynthia was accepted at Meharry, and so they moved to Nashville.

By 1982, Graham had become the chief resident at Nashville General Hospital. That year, he saw a patient suffering from five simultaneous infections, including cryptococcal meningitis and herpes simplex. It was a mystery: most infections are solitary events. The medical staff was terrified. Graham realized that he was treating Tennessee’s first *AIDS* patient. “We kept him alive for three weeks,” he said.

Millions of lives would be changed, and so many ended, by this remorseless, elusive disease. Immunology, then a fledgling field, was transformed by the battle. “It took us a couple years just to figure out that H.I.V. was a virus,” Graham said. He started running vaccine trials. “It was not till the mid-nineties that we had decent treatments. There were some really hard years. Almost everyone died.”

In 2000, the N.I.H. recruited Graham to create a vaccine-evaluation clinic. He insisted on keeping a research lab. With space for two dozen scientists, his lab focusses on vaccines for three categories of respiratory viruses: influenza, coronaviruses, and a highly contagious virus called respiratory syncytial virus (RSV), which ended up playing a key role in the development of a *COVID* vaccine. RSV causes wheezing pneumonia in children, and sends more kids under five years old to the hospital than any other disease. One of the last childhood infectious diseases without a vaccine, RSV also kills about as many of the elderly as seasonal influenza. It’s wildly infectious. In order to stop its spread in a hospital pediatric ward, staff must wear gloves, masks, and goggles; if any of these items is omitted, RSV will surge. Like *COVID*, it is dispersed through particle droplets and contaminated surfaces. In the nineteen-sixties, a clinical trial of a potential RSV vaccine made children sicker and led to two deaths—a syndrome called vaccine-enhanced disease. Graham spent much of two decades trying to solve the riddle of what causes RSV, but the technology he needed was still being developed.

In 2008, he had a stroke of luck. Jason McLellan, a postdoc studying H.I.V., had been squeezed out of a structural-biology lab upstairs. H.I.V. has proved invulnerable to a vaccine solution, despite extraordinary technological advances and elegant new theories for designing one. “I thought, Let’s try things out on a more tractable virus,” McLellan recalled. “Barney thought RSV would be perfect for a structure-based vaccine.”

A vaccine trains the immune system to recognize a virus in order to counter it. Using imaging technology, structural biologists can intuit the contours of a virus and its proteins, then reproduce those structures to make more effective vaccines. McLellan said of his field, “From the structure, we can determine function—it’s similar to how seeing a car, with four wheels and doors, implies something about its function to transport people.”

The surface of an RSV particle features a protein, designated F. On the top of the protein, a spot called an epitope serves as a landing pad for antibodies, allowing the virus to be neutralized. But something extraordinary happens when the virus invades a cell. The F protein swells like an erection, burying the epitope and effectively hiding it from antibodies. Somehow, McLellan had to keep the F protein from getting an erection.

Until recently, one of the main imaging tools used by vaccinologists, the cryogenic electron microscope, wasn’t powerful enough to visualize viral proteins, which are incredibly tiny. “The whole field was referred to as blobology,” McLellan said. As a work-around, he developed expertise in X-ray crystallography. With this method, a virus, or even just a protein on a virus, is crystallized, then hit with an X-ray beam that creates a scatter pattern, like a shotgun blast; the structure of the crystallized object can be determined from the distribution of electrons. McLellan showed me an “atomistic interpretation” of the F protein on the RSV virus—the visualization looked like a pile of Cheetos. It required a leap of imagination, but inside that murky world Graham and McLellan and their team manipulated the F protein, essentially by cloning it and inserting mutations that kept it strapped down. McLellan said, “There’s a lot of art to it.”

In 2013, Graham and McLellan published “Structure-Based Design of a Fusion Glycoprotein Vaccine for Respiratory Syncytial Virus,” in *Science*, demonstrating how they had stabilized

the F protein in order to use it as an antigen—the part of a vaccine that sparks an immune response. Antibodies could now attack the F protein, vanquishing the virus. Graham and McLellan calculated that their vaccine could be given to a pregnant woman and provide enough antibodies to her baby to last for its first six months—the critical period. The paper opened a new front in the war against infectious disease. In a subsequent paper in *Science*, the team declared that it had established "clinical proof of concept for structure-based vaccine design," portending "an era of precision vaccinology." The RSV vaccine is now in Phase III human trials.

In 2012, the *mers* coronavirus emerged in Saudi Arabia. It was extremely dangerous to work with: a third of infected people died. Ominously, it was the second novel coronavirus in ten years. Coronaviruses have been infecting humans for as long as eight centuries, but before *sars* and *mers* they caused only the common cold. It's possible that, in the distant past, cold viruses were as deadly as *COVID*, and that humans developed resistance over time.

Like RSV, coronaviruses have a protein that elongates when invading a cell. "It looks like a spike, so we just call it Spike," Graham said. Spike was large, flexible, and encased in sugars, which made it difficult to crystallize, so X-ray crystallography wasn't an option. Fortunately, around 2013, what McLellan calls a "resolution revolution" in cryogenic electron microscopy allowed scientists to visualize microbes down to one ten-billionth of a metre. Finally, vaccinologists could truly see what they were doing.

Using these high-powered lenses, Graham and McLellan modified the *mers* spike protein, creating a vaccine. It worked well in mice. They were on the way to making a version for humans, but, after *mers* had killed hundreds of people, it petered out as an immediate threat to humans—and the research funding petered out, too. Graham was dismayed, realizing that such a reaction was shortsighted, but he knew that his energies hadn't been wasted. About two dozen virus families are known to infect humans, and the weapon that Graham's lab had developed to conquer RSV and *mers* might be transferrable to many of them.

What was the best way to deliver a modified protein? Graham knew that Moderna, a biotech startup in Cambridge, Massachusetts, had encoded a modified protein on strips of genetic material known as messenger RNA. The company had never brought a vaccine to market, concentrating instead on providing treatments for rare disorders that aren't profitable enough to interest Big Pharma. But Moderna's messenger-RNA platform was potent.

In mice, Graham had proved the effectiveness of a structure-based vaccine for *mers* and also for Nipah, a particularly fatal virus. In 2017, Graham arranged a demonstration project for pandemic preparedness, with *mers* and Nipah serving as prototypes for a human vaccine using Moderna's messenger-RNA platform. Almost three years later, as he was preparing to begin human trials for the Nipah vaccine, he heard the news from Wuhan.

Graham called McLellan, who happened to be in Park City, Utah, getting snowboard boots heat-molded to his feet. McLellan had become a star in structural biology, and was recruited to the University of Texas at Austin, where he had access to cryogenic electron microscopes. It took someone who knew Graham well to detect the urgency in his voice. He suspected that China's cases of atypical pneumonia were caused by a new coronavirus, and he was trying to obtain the genomic sequence. It was a chance to test their concept in a real-world situation. Would McLellan and his team like to get "back in the saddle" and help him create a vaccine?

"Of course," McLellan said.

"We got the sequences Friday night, the tenth of January," Graham told me. They had been posted online by the Chinese. "We woke up on the eleventh and started designing proteins."

Nine days later, the coronavirus officially arrived in America.

Within a day after Graham and McLellan downloaded the sequence for *SARS*-CoV-2, they had designed the modified proteins. The key accelerating factor was that they already knew how to alter the spike proteins of other coronaviruses. On January 13th, they turned their scheme over to Moderna, for manufacturing. Six weeks later, Moderna began shipping vials of vaccine for clinical trials. The development process was "an all-time record," Graham told me. Typically, it takes years, if not decades, to go from formulating a vaccine to making a product ready to be tested: the process privileges safety and cost over speed.

Graham had to make several crucial decisions while designing the vaccine, including where to start encoding the spike-protein sequence on the messenger RNA. Making bad choices could render the vaccine less effective—or worthless. He solicited advice from colleagues. Everyone said that the final decisions were up to him—nobody had more experience in designing vaccines. He made his choices. Then, after Moderna had already begun the manufacturing process, the company sent back some preliminary data that made him fear he'd botched the job.

Graham panicked. Given his usual composure, Cynthia, his wife, was alarmed. "It was a crisis of confidence that I just never see in him," she said. So much depended on the prompt development of a safe and effective vaccine. Graham's lab was off to a fast start. If his vaccine worked, millions of lives might be spared. If it failed or was delayed, it would be Graham's fault.

After the vaccine was tested in animals, it became clear that Graham's design choices had been sound. The first human trial began on March 16th. A week later, Moderna began scaling up production to a million doses per month.

4. "It's more like 1918"

Since 2016, Dr. Rick Bright has run the Biomedical Advanced Research and Development Authority. A division of H.H.S., the authority is responsible for medical countermeasures in the event of bioterrorism or a pandemic. According to a whistle-blower complaint, on January 22nd Bright received an e-mail from Mike Bowen, an executive at the Texas-based firm Prestige Ameritech, the country's largest maker of surgical masks. Bowen wrote that he had four "like new" N95 manufacturing lines, which weren't in use. He added, "Reactivating these machines would be very difficult and very expensive but could be achieved in a dire situation and with government help." In another message, Bowen wrote, "We are the last major domestic mask company. . . . My phones are ringing now, so I don't 'need' government business. I'm just letting you know that I can help you preserve our infrastructure if things ever get really bad. I'm a patriot first, businessman second."

Bright had already been worried about the likely shortage of personal protective equipment in the Strategic National Stockpile. He also felt that not enough was being done to develop diagnostics for the virus from Wuhan. On January 23rd, at an H.H.S. leadership meeting with Secretary Alex Azar, he warned that the "virus might already be here—we just don't have the tests to know." Many Trump Administration officials seemed determined to ignore scientists who shared bad news.

On January 25th, Bowen wrote Bright again, saying that his company was getting "lots of requests from China and Hong Kong" for masks—a stunning piece of intelligence. About half the masks used in the U.S. come from China; if that supply stopped, Bowen said, American hospitals would run out. Bright continued pushing for immediate action on masks, but he found H.H.S. to be unresponsive. On January 27th, Bowen wrote, "I think we're in deep shit. The world."

The same day, at the White House, Matt Pottinger convened an interagency meeting of Cabinet officers and deputies. Attendees fell into four camps. There was the public-health establishment—Redfield, Fauci, Azar—data-driven people who, at the moment, had no data. Another group—the acting White House chief of staff, Mick Mulvaney, along with officials from the Office of Management and Budget and the Transportation Department—was preoccupied with the economic damage that would result if drastic steps were taken. A State Department faction was concerned mainly with logistical issues, such as extracting Americans from Wuhan. Finally, there was Pottinger, who saw the virus not just as a medical and economic challenge but also as a national-security threat. He wanted dramatic action now.

For three weeks, the U.S. had been trying unsuccessfully to send medical experts to China. The public-health contingent didn't want to make decisions about quarantines or travel bans without definitive intelligence, but the Chinese wouldn't supply it. When Pottinger presented a proposal to curtail travel from China, the economic advisers derided it as overkill. Travel bans upended trade—a serious consideration with China, which, in addition to P.P.E., manufactured much of the vital medicine that the U.S. relied on. Predictably, the public-health representatives were resistant, too: travel bans slowed down emergency assistance, and viruses found ways to propagate no matter what. Moreover, at least fourteen thousand passengers from China were arriving in the U.S. every day: there was no way to quarantine them all. These arguments would join other public-health verities that were eventually overturned by the pandemic. Countries that imposed travel bans with strict quarantines, such as Vietnam and New Zealand, kept the contagion at a manageable level.

The State Department's evacuation of Americans, particularly diplomatic staff in Wuhan, outraged the Chinese; Tedros Adhanom Ghebreyesus, the director-general of the W.H.O., said that the U.S. was overreacting. In part to placate the Chinese, the 747s that were sent to collect Americans were filled with eighteen tons of P.P.E., including masks, gowns, and gauze. It was a decision that many came to regret—especially when inferior substitutes were later sold back to the U.S., at colossal markups.

The morning after the meeting, Pottinger spoke to a doctor in China who was treating patients. People were getting infected and there was no way to know how and where it happened—a stage of contagion called community spread.

Pottinger asked, "Is this going to be as bad as *sars*?"

"Don't think 2003—it's more like 1918," the doctor said. That flu lasted two years, and killed between forty and a hundred million people.

On January 28th, the national-security adviser, Robert O'Brien, brought Pottinger into the Oval Office, where the President was getting his daily intelligence briefing. According to contemporaneous notes from someone present at this meeting, the briefer mentioned the virus, but didn't present it as the top threat. O'Brien warned the President, "This will be the biggest national-security threat you will face." Trump asked if the outbreak posed as big a danger as *sars*, and the briefer responded that it wasn't clear yet.

Pottinger leaped to his feet and recounted what he'd heard from his sources—most shockingly, that more than half the disease's spread was attributed to asymptomatic carriers. Yet, every day, thousands of people were flying from China to the U.S.

"Should we shut down travel?" Trump asked.

"Yes," Pottinger advised.

Pottinger left the Oval Office and walked to the Situation Room, where a newly formed Coronavirus Task Force was meeting. People were annoyed with him. "It would be unusual for an asymptomatic person to drive the epidemic in a respiratory disorder," Fauci said. That certainly had been true of *sars*. He still wanted U.S. scientists to report from China, in order to get more data. Redfield, of the C.D.C., considered it too early for disruptive actions. He said that there were only a handful of cases outside China, and that in the U.S. the pathogen wasn't moving that fast. The public-health contingent was united. "Let the data guide us," they advised.
Pottinger pointed out that the Chinese continued to block such efforts: "We're not getting data that's dependable!"
The economic advisers, meanwhile, were frantic—a travel ban would kill the airline industry and shut down the global supply chain. Larry Kudlow, the President's chief economic adviser, had been questioning the seriousness of the situation. He couldn't square the apocalyptic forecasts with the stock market. "Is all the money dumb?" he wondered. "Everyone's asleep at the switch? I just have a hard time believing that." (Kudlow doesn't recall making this statement.)
Pottinger, sensing that he'd need backup, had brought along Peter Navarro, an abrasive economic adviser who had been part of the trade negotiations with China. Many White House officials considered Navarro to be a crackpot, but he was known to be one of the President's favorites because he advocated tariff wars and other nationalist measures. Navarro warned the group, "We have got to seal the borders now. This is a black-swan event, and you're rolling the dice with your gradualist approach."
Within minutes, Navarro was at odds with everyone in the room. He pointed out that the new virus was spreading faster than the seasonal flu or *sars*. The possible economic costs and loss of life were staggering. Azar argued that a travel ban would be an overreaction. No progress was made in that meeting, but Navarro was so strident that Mulvaney barred him from future sessions.
Then data surfaced that shifted the argument. In mid-January, a Chicago woman returned from a trip to China. Within a week, she was hospitalized with *COVID*. On January 30th, her husband, who hadn't been to China, tested positive. Fauci, Redfield, and others in the public-health contingent changed their minds: human-to-human transmission was clearly happening in America.
Trump was told the news. The timing couldn't have been worse for him. The bitter trade war he had initiated with China had reached a tentative pause. Since then, he had been praising Xi Jinping's handling of the contagion, despite evidence of a coverup. A travel ban would reopen wounds. Nevertheless, Trump agreed to announce one the next day.
It was a bold gesture, but incomplete. The Administration blocked non-Americans coming from China, but U.S. citizens, residents, and their family members were free to enter. A two-week quarantine was imposed on travellers coming from the Wuhan region, but, unlike Taiwan, Australia, Hong Kong, and New Zealand, which rigidly enforced quarantines, the U.S. did little to enforce its rules, and the leaks soon became apparent.

5. Flattening the Curve

In 1989, Dr. Howard Markel was in graduate school at Johns Hopkins, specializing in both pediatrics and the history of medicine. He had just lost his wife to cancer, a month after their first anniversary. Markel began volunteering at a local *AIDS* clinic. He found that helping men his own age who were facing their mortality, or their partner's, was immensely consoling—"the most spiritually uplifting work I did in my entire clinical career."
Markel's patients often asked him, "Doc, do you think I'll be quarantined because I have H.I.V.?" He'd reply that it wasn't appropriate for the disease. But, realizing that these men feared being shut away, like victims of leprosy, he began studying "the uses and misuses of quarantine." His first book was about two epidemics in New York City in 1892, one of typhus and one of cholera, in which Jewish immigrants were blamed for the outbreak and many were sent to quarantine islands.
In the early two-thousands, Markel studied "escape" communities that had essentially closed their doors during the 1918 flu pandemic—among them Gunnison, Colorado, and a school for the blind in Pittsburgh. All had survived the contagion virtually unscathed. In 2006, Markel continued his work on the 1918 flu with Martin Cetron, who now directs the Division of Global Migration and Quarantine, at the C.D.C. For an initiative undertaken by the George W. Bush Administration, Cetron and Markel were asked to help identify the best way to manage the early waves of a pandemic that had no vaccine or treatments. They considered school closures, public-gathering bans, business shutdowns—traditional tools of public health. Markel assembled a dozen researchers—"the Manhattan Project for historians," he jokes—who combed through more than a hundred archives.
In 1918, Americans faced the same confounding choices as today. Twenty-five cities closed their schools once; fourteen did so twice, and Kansas City three times. More than half the cities were "double-humped"—suffering two waves of the flu. "They raised the bar too early because the natives got restless," Markel, who is now a professor at the University of Michigan, told me. "They each acted as their own control group. When the measures were on, the cases went down. When the measures were off, the cases went up." After Philadelphia permitted a Liberty Loans parade, there was a huge uptick in cases. St. Louis, by contrast, cancelled all parades, and local officials broadcast a unified message. The city's health commissioner published an op-ed alerting citizens to the threat, immediately closing entertainment venues and banning public

gatherings. St. Louis's death rate was half of Philadelphia's. By quickly imposing several nonpharmaceutical interventions, a city could dramatically lower the peak of infection—on a graph, it would look more like a rainbow than like a skyscraper. Markel compared each intervention to a slice of Swiss cheese; one layer by itself was too riddled with holes to be effective, but multiple layers made a profound difference. "Early, layered, and long" was the formula.

JAMA published the study in 2007. The authors declared, "We found no example of a city that had a second peak of influenza while the first set of nonpharmaceutical interventions were still in effect." In the century since 1918, technology has transformed so much, but the tools for curbing a novel pandemic haven't changed. Masks, social distancing, and frequent hand washing remain the only reliable ways to limit contagion until treatments or vaccines emerge.

One night, Markel and Cetron were in Atlanta, talking over their study, and they ordered Thai food. When their dinner arrived, Markel opened his Styrofoam container: instead of a fluffy mound of noodles, he gazed on a level, gelatinous mass. "Look," Markel said. "They've flattened the curve, just like we're trying to do." A slogan was born.

6. The Lost February

By January 20th, ten days after the Chinese posted the genetic sequence of *SARS*-CoV-2, the C.D.C. had created a diagnostic test for it. Secretary Azar reportedly boasted to Trump that it was "the fastest we've ever created a test" and promised to have more than a million tests ready within weeks. (Azar denies this.) But the F.D.A. couldn't authorize it until February 4th. And then everything really went to pieces.

The testing fiasco marked the second failed opportunity America had to control the contagion. The C.D.C. decided to manufacture test kits and distribute them to public-health labs, under the Food and Drug Administration's Emergency Use Authorization provision. According to Redfield, the C.D.C. published the blueprint for its test, and encouraged the labs to ask the F.D.A. for permission to create their own tests. But Scott Becker, the C.E.O. of the Association of Public Health Laboratories, told me that the labs weren't made aware of any change in protocol. They kept waiting for the C.D.C. to supply tests, as it had done previously.

At a Coronavirus Task Force meeting, Redfield announced that the C.D.C. would send a limited number of test kits to five "sentinel cities." Pottinger was stunned: why not send them everywhere? He learned that the C.D.C. makes tests, but not at scale. For that, you have to go to a company like Roche or Abbott—molecular-testing powerhouses that have the experience and the capacity to manufacture millions of tests a month. The C.D.C., Pottinger realized, was "like a microbrewery—they're not Anheuser-Busch."

At the time, Azar, a former top executive at the pharmaceutical firm Eli Lilly, led the Coronavirus Task Force. He agreed with Pottinger that test kits needed to be broadly distributed, yet nothing changed. Everyone on the task force understood the magnitude of the crisis; they attended meetings every weekday, with conference calls on weekends. North Korea and Iran didn't receive such concentrated attention. Yet the Administration was simply not accomplishing tasks crucial to limiting the pandemic. There was a telling disparity between what Azar said in private, or in the task-force meetings, and what he told the President. He was hammering Redfield and the C.D.C. on testing delays while assuring Trump that the crisis was under control.

A bottleneck of constraints imposed by the C.D.C. meant that testing was initially limited to symptomatic patients who had come from China or had been in close contact with an infected person. Even health-care workers who'd developed *COVID*-like symptoms while treating patients had trouble getting tests, because the C.D.C.'s capacity was so limited.

Pottinger kept in frequent touch with his brother, Paul, the infectious-disease doctor in Seattle.

"You getting enough test kits?" Matt asked him.

"We use none of the C.D.C. kits," Paul responded. "They have been way too slow in coming." They also hadn't been approved for screening asymptomatic patients. Seattle doctors had instead devised a "homemade" diagnostic platform, but their testing capacity was "way less than demand." Paul was frantically setting up triage procedures—guessing which cases were *COVID*, and trying to sequester those patients, in order to prevent them from infecting everyone at the hospital.

But there was an even bigger problem.

Microbiologists are acutely aware of the danger of contamination. Viral DNA can linger for hours or days on surfaces, adulterating testing materials. C.D.C. scientists wipe down their instruments every day. Chin-Yih Ou, a Taiwanese microbiologist who retired from the C.D.C. in 2014, told me that while he was creating a test for H.I.V. in infants he refused to let janitors into his lab, mopping the floor himself. In some labs, the last person to leave at night turns on ultraviolet lamps, to kill DNA that might be on the floor or a lab bench. A new pathogen is like an improvised bomb: one wrong decision can be fatal.

The development of the C.D.C.'s test kits was overseen by Stephen Lindstrom, a microbiologist from Saskatchewan, who was known for his ability to function under pressure. C.D.C. scientists began working sixteen-hour days. The C.D.C.'s Biotechnology Core Facility is in charge of producing the components used to detect such pathogens as flu, H.I.V., and *sars*. To save time, Lindstrom asked the Core Facility to produce both the components and

a template of a coronavirus fragment, which would be used to generate the positive control for the C.D.C. test. But, just as the kits were being boxed up to be mailed, a last-minute quality-control procedure found a problem that could cause the tests to fail thirty-three per cent of the time. A decision was made—perhaps by Lindstrom, perhaps by his superiors—to send the kits anyway. According to ProPublica, Lindstrom told colleagues, "This is either going to make me or break me." (The C.D.C. did not make Lindstrom available for comment.)

Almost immediately, public-health labs realized that something was wrong with the kits. The labs are required to do a negative control on the test—for instance, using sterile water—and the tests kept showing false positives.

The C.D.C. test kit had three sets of primers and probes, which are tiny bits of nucleic acid that find a segment of RNA in the virus and replicate it until it gets to a detectable level. Two were aimed at *SARS*-CoV-2 and a third would detect any coronavirus, in case the virus mutated. The third component failed. Public-health labs figured this out quickly. On their behalf, Scott Becker communicated with the C.D.C. on February 9th, seeking permission to use the test without the third component. "I got radio silence," he told me. Later, he learned that an internal C.D.C. review showed that it hadn't passed the quality-control check before the test kit was sent out. "That was a gut punch," Becker said.

In 2009, Matt Pottinger was in Kabul, in his final deployment as a marine. While walking through a tunnel connected to the U.S. Embassy, he passed a young woman, and then suddenly wheeled around. Her name was Yen Duong. She was working with the Afghan government on improving its H.I.V. testing. "It was, like, seven o'clock at night," Yen remembers. "He came up to me and asked if I knew where so-and-so's office was. I was thinking that I'm pretty sure so-and-so's office is closed right now. It was just a ploy to talk." Matt and Yen married in 2014.

They have lived very different American lives. He grew up in Massachusetts. His parents divorced when he was young, and he lived mostly with his mother and stepfather. His father, J. Stanley Pottinger, was a lawyer in the Nixon Administration. Matt had an ear for languages, and majored in Mandarin and Japanese at the University of Massachusetts, Amherst, and that is how he found his way to China as a reporter.

Yen was six months old when her family left Vietnam, in 1979, in a boat that her father had secretly built in his sugar factory. At sea, the Duong family—sixty-eight in all—were shot at. A storm nearly capsized the vessel. Pirates robbed them. Finally, the family reached a refugee camp in Indonesia. Six months later, the Duongs were sponsored by four American churches on Long Island, and ended up living in the Hamptons. Yen's mother cleaned houses and took in sewing, and then found a job in a bakery. Her father painted houses and worked in construction. Eventually, they saved enough money to send Yen to boarding school.

Yen, drawn to science, fell in love with studying viruses. She got a doctorate in pharmacology at the University of California, Davis. In 2007, she became a virologist at the C.D.C., where she developed the global-standard test to measure H.I.V. incidence. None of this would have happened if the family had stayed in Vietnam, if the boat had sunk in the storm, if the pirates had murdered them, or if they hadn't been taken in by Americans who wanted to help them achieve the opportunities that freedom allowed.

Yen Pottinger, who is now a senior laboratory adviser at Columbia University, told her husband what she thought had gone awry with the test kits. Once the Chinese had posted online the genetic sequence for the virus, Yen explained to Matt, primers would have been easy to design. "It's a pretty standard task," she told him. But *SARS*-CoV-2 is an RNA virus, which is "sticky"—tending to cling to any surface. Contamination was the only plausible explanation for the test kit's failure. Perhaps a trace amount of the virus template had found its way into the primers and probes. "Contamination has felled many a great scientist," she said, which is why a pristine lab environment is essential.

On February 10th, the F.D.A. learned that ten labs working with C.D.C. test kits were reporting failures. The C.D.C. assured the F.D.A. that it could quickly fix the problem with the third component. The Trump Administration—in particular, Azar—insisted on continuing with the C.D.C. test kits. Although F.D.A. rules generally require that any procedure granted an Emergency Use Authorization be used exactly as designed, the agency could have allowed public-health labs to use the C.D.C. test kits without the third component, as they were pleading for. The test kits largely worked, even without it, but the F.D.A. says that it didn't have the data from the C.D.C. to justify that simple solution. The C.D.C. wanted to stick with its original design. Moreover, university scientists, hospital researchers, and commercial labs were eager to develop their own tests, but they were hampered by the bureaucratic challenge of obtaining an Emergency Use Authorization.

On February 12th, the C.D.C. estimated that it would take a week to remanufacture the third component. Six days later, Redfield informed Azar that doing so might take until mid-March. By February 21st, only seven labs in the country could verify that the test worked. Redfield admitted that he had no idea when new test kits might be ready.

On Saturday, February 22nd, the F.D.A. sent Dr. Timothy Stenzel, the director of the Office of In Vitro Diagnostics and Radiological Health, to the C.D.C. to investigate what had gone wrong with the test. When he arrived, there was no one there to receive him, and he was turned away. The next day, he was allowed in the building but forbidden to enter any labs. It

was still the weekend. Stenzel made some calls. After he was finally permitted to visit the labs where the test kits were manufactured, he spotted a problem: in one lab, researchers were analyzing patient samples in the same room where testing ingredients were assembled. The tests are so sensitive that even a person walking into the room without changing her lab coat might carry viral material on her clothing that would confound the test. According to the *Wall Street Journal*, an F.D.A. official described the C.D.C. lab as "filthy." It was the lowest point in the history of a proud institution.

According to an internal F.D.A. account, C.D.C. staff "indicated to Dr. Stenzel that Dr. Stephen Lindstrom—who oversaw a different lab in the manufacturing process—directed them to allow positive and negative control materials to occupy the same physical space of the lab, even though this is a violation of their written protocols." The clear remedy was to hand over part of the test's manufacture to two outside contractors. Within a week, tens of thousands of tests were available. But America never made up for the lost February.

I recently asked Redfield, a round-faced man with a white Amish-style beard, how the contamination had occurred and if anyone had been held accountable for the corrupted kits. He replied, vaguely, "One of the newer individuals hadn't followed protocol." It also could have been a design flaw that mangled results. Both mistakes might have happened, he conceded. "I wasn't happy when we did our own internal review," he said, and acknowledged that the C.D.C. shouldn't have mass-produced the test kits: "We're not a manufacturing facility." He insisted, "At no moment in time was a *COVID* test not available to public-health labs. You just had to send it to C.D.C." But the C.D.C. couldn't process tens of thousands of tests.

The C.D.C. wasn't entirely responsible for the delay. The F.D.A. might have authorized a version of the test kit without the problematic third component, and loosened the reins on tests developed by other labs. Not until February 26th did the F.D.A. permit public-health labs to use the C.D.C. test kit without the third component. Only on February 29th could other labs proceed with their own tests.

Secretary Azar held the F.D.A. responsible for the absence of alternative tests. A senior Administration official told me, "Instead of being more flexible, the F.D.A. became more regulatory. The F.D.A. effectively outlawed every other *COVID* test in America." Stephen Hahn, the F.D.A.'s commissioner, says, "That's just not correct," and notes that more than three hundred tests are currently authorized. But there was only one other test by the end of February. Whether the delay was caused mainly by the C.D.C. or the F.D.A., Azar oversaw both agencies.

Without the test kits, contact tracing was stymied; without contact tracing, there was no obstacle in the contagion's path. America never once had enough reliable tests distributed across the nation, with results available within two days. By contrast, South Korea, thanks to universal public insurance and lessons learned from a 2015 outbreak of *MERS*, provided free, rapid testing and invested heavily in contact tracing, which was instrumental in shutting down chains of infection. The country has recorded some fifty thousand cases of *COVID*. The U.S. now reports more than four times that number per day.

7. "This is Coming to You"

"One day, it's like a miracle, it will disappear," the President told the American people on February 27th. At the time, there were only fifteen known cases of *COVID* in the U.S., and nearly all involved travellers or people close to them.

As Trump made his promise, a hundred and seventy-five employees of the biotech firm Biogen were heading home from a conference held at a Marriott in Boston. The attendees, many of whom had travelled from other states or foreign countries, had gathered for two days in banquet rooms, shared crowded elevators, and worked out in the gym. Soon, many fell ill.

Researchers affiliated with Massachusetts General Hospital and the Broad Institute of M.I.T. and Harvard believe that *sars*-CoV-2 was probably introduced to the conference by a single individual. About a hundred people associated with the conference eventually tested positive. The viral strain that they contracted had unusual mutations, allowing researchers to track its spread. In a recent study published in *Science*, the researchers reported that the Biogen outbreak may have been responsible for three hundred thousand cases in the U.S. alone.

During the study's initial stages, in February and March, the researchers were discomfited by the implications of their data. "The rapidity and degree of spread suggested it wasn't a series of one-to-one-to-one transmissions," Dr. Jacob Lemieux, a lead author, told me. Rather, it was "one-to-*many* transmission events." That raised the question of airborne transmission. "At the time, the idea was heretical," Lemieux said. "We were afraid to consider it, because it implied a whole different approach to infection control"—one in which masks played a central role, especially indoors. But the W.H.O. had repeatedly proclaimed that large respiratory droplets—as from a sneeze or a cough—drove the spread. This wasn't based on data about the new virus, Lemieux said: "It was received wisdom based on how previous respiratory viruses had behaved. The global public-health infrastructure has egg on its face. There's a component of human nature that, until you get burned, you don't know how hot the fire is."

Vaccines were in development around the world, but Pottinger was hearing that they wouldn't be available for eighteen months at the earliest. Even that would be a record. A vaccine must be subjected to three trials of increasing size, to determine safety,

effectiveness, and proper dosage. Pharmaceutical companies then invest in production, ramping up from thousands of doses to millions.

Pottinger and Navarro, the China-trade adviser, advocated for a way to radically shorten the time frame: companies would be paid to manufacture vaccine candidates that were still in trials and might never be used. If any ended up being successful, Americans could be inoculated in less than a year.

At the end of February, Navarro wrote a memo proposing a three-billion-dollar supplemental budget appropriation to cover the cost of an accelerated vaccine process, P.P.E. for frontline workers, and effective therapeutics. Azar recognized the need for a major budget supplement, but after he met with Mulvaney, Trump's acting chief of staff, he declared that eight hundred million dollars was enough for now.

Pottinger was apoplectic. The Administration was in denial. There were now more cases outside China than within. Italy and Iran were exploding. And yet Mulvaney and the Office of Management and Budget insisted on viewing the contagion as a kind of nasty influenza that could only be endured. At home, Pottinger fumed to Yen that eight hundred million dollars was half the sum needed just to support vaccine development through Phase III trials.

"Call Debi," Yen suggested.

Debi was Deborah Birx, the U.S. global *AIDS* coördinator. In the mid-eighties, as an Army doctor, Birx studied immunology and *AIDS* at Fauci's clinic. They walked the hallways together, watching their patients die. Birx then moved to Walter Reed Army Medical Center, where she worked on an H.I.V./*AIDS* vaccine. At Walter Reed, Birx worked with Redfield. From 2005 to 2014, she led the C.D.C.'s Division of Global H.I.V./*AIDS* (making her Yen Pottinger's boss). Birx was known to be effective and data-driven, but also autocratic. Yen described her as "super dedicated," adding, "She has stamina and she's demanding, and that pisses people off." That's exactly the person Pottinger was looking for.

Birx was in Johannesburg when Pottinger called and asked her to join the Coronavirus Task Force, as its coördinator. She was ambivalent. When she had started her job at the C.D.C., some African countries had H.I.V.-infection rates as high as forty per cent. Through the steady application of public-health measures and the committed collaboration of African governments, the virus's spread had been vastly reduced. What if she turned her attention and the numbers skyrocketed? Then again, *COVID* would likely run rampant through the same immune-compromised population she was devoted to protecting. She went to Washington.

As March approached, Secretary Azar had to defend his supplemental budget request before a Senate appropriations subcommittee. Earlier, the senators had been briefed that a grave coronavirus outbreak in the U.S. was likely. Patty Murray, the Democrat from Washington State, was on the committee. "You've had a month now to prepare," she said. "Is our country ready?"

"Our country is preparing every day," Azar responded.

"You sent over a supplemental that wasn't clear to me at all," Murray said. She listed actions that Azar had said were necessary. None were listed in the budget on the table. "Did you stockpile *any* of these critical supplies that we are told we need—masks, protective suits, ventilators, anything?"

"We do have in the Strategic National Stockpile ventilators, we have masks, we have—"

When the call comes to ventilate a COVID patient, a doctor explained, "it's already a situation where somebody is dying."Photo illustration by Tyler Comrie; source Go Nakamura / Getty

"Enough?"

"Of course not, or we wouldn't be asking for a supplemental," Azar said.

"I didn't see any numbers in your request," Murray said.

Azar said that the details were being worked out. Murray persisted: "I'm very concerned about this Administration's attitude. We're not stockpiling those things right now that we know we might possibly need." She concluded, "We are way behind the eight ball."

On February 27th, the C.D.C. began allowing tests for people who hadn't been to China or in close contact with someone known to be infected. The next day, doctors in Washington State tested two people from a nursing home, in the Seattle suburb of Kirkland, that was overrun with pneumonia. Both tested positive. America's blindfold was finally coming off.

Trump, however, continued offering false assurances. "We're testing everybody that we need to test," he proclaimed. "We're finding very little problem."

On February 29th, Washington's governor, Jay Inslee, reported that someone in his state had died of *COVID*. It was the first official death from the disease in the U.S., although it was later established that two Californians had died from it weeks earlier. Many others may have as well.
Inslee declared a state of emergency. One of Senator Murray's relatives had been in the Kirkland facility a few years earlier. "I knew how many people came in and out of it, visitors and staff," she told me. She said to herself, "Wow, this contagious virus, it can't have just stayed in a nursing home." Soon, friends of Murray's got sick. She urged them to get tested, but they said, "I've asked my doctor, I've asked the public-health people in the county, I've called the state health people—*nobody* has these tests." Her state was in turmoil. In Senate hearings and briefings, though, she sensed a lack of coördination and urgency.
The Democratic caucus went on a retreat in Baltimore. Murray received a text from her daughter, whose children attended school near the nursing home. "They closed the schools," her daughter said. She added, "Kids are sick, teachers are sick. This is really frightening."
Murray told her colleagues, "My daughter's school closed. This is coming to you."

8. "Just Stay Calm"

While this was happening, I was in Houston, in rehearsals for a play I'd written about the 1978 Camp David summit. Oskar Eustis, of New York's Public Theatre, was directing. I have a memory of the preview performances which later came back to me, charged with significance. The actors were performing in the round, and slanted lighting illuminated their faces against the shadowy figures of audience members across the way. When one actor expostulated, bursts of saliva flew from his mouth. Some droplets arced and tumbled, but evanescent particles lingered, forming a dim cloud. At the time, I found this dramatic, adding to the forcefulness of the character. Later, I thought, This is what a superspreader looks like.
I have no idea how Eustis got sick. But when he abruptly flew back to New York and missed opening night, on February 20th, I knew that something was wrong. Texas was thought to be outside the danger zone that month, but retrospective modelling suggested that the virus likely had been infecting at least ten people a day since the middle of the month. The same was true for New York, California, Washington, Illinois, and Florida. By the end of February, there was probable local transmission in thirty-eight states.
The virus continued hitchhiking with passengers coming from other hot spots. Between December and March, there were thirty-two hundred direct flights from China to the U.S., many of them landing in New York. More consequentially, sixty per cent of flights from Italy to the U.S. landed in the New York area. Some of these passengers carried a more contagious mutation of *SARS*-CoV-2. On March 10th, Italy entered lockdown, and the next day the W.H.O. finally declared a pandemic. By that time, there were more than a hundred thousand cases in a hundred and fourteen countries.
"Just stay calm," Trump remarked. "It will go away."
Weeks had passed from the point when containment was possible. On February 25th, Nancy Messonnier, a senior director at the C.D.C., warned, "We will see community spread in this country. It's not so much a question of if this will happen anymore but rather more a question of exactly when." Without vaccines or treatments, communities needed to rely on such measures as school closures, social distancing, teleworking, and delaying elective surgeries. People should expect missed work and loss of income. Parents needed a child-care plan. "I understand this whole situation may seem overwhelming," she said. "But these are things that people need to start thinking about now."
A steep drop in the stock market followed Messonnier's blunt assessment. The President, who had encouraged Americans to judge his performance by market indicators, was enraged. The next time Messonnier spoke in public, she was quick to praise Trump, saying that the country had acted "incredibly quickly."
Amy Klobuchar dropped out of the Presidential race on March 2nd and flew to Dallas to endorse Joe Biden. The stage was filled with supporters. As the crowd cried, "Let's go, Joe!," she embraced Biden. But as she did so she said to herself, "Joe Biden shouldn't get *COVID*." She warned his advisers to begin taking greater precautions.
On the first Friday in March, she attended a Biden rally in Detroit. That night, employees in the Wayne County sheriff's office gathered for an annual party at Bert's, a soul-food and jazz venue. Most of the officers were Black; some had retired. At the time, there were no known cases of *COVID* in Michigan. Three weeks later, seven of the attendees had *COVID,* and dozens more in the sheriff's office were ill. By the end of March, three law-enforcement officials had died.
At the rally, Klobuchar noticed that people had become more careful. "I put on gloves," she said. "We didn't know about masks at the time."
Democratic rallies soon came to a halt.
Bellevue Hospital, on First Avenue in Manhattan, is "the grande dame of America's public hospitals," the historian David Oshinsky told me. Since it opened, as an almshouse, in the eighteenth century, nobody has been turned away, whether the patient can afford treatment

or not. Bellevue has endured epidemics of cholera and yellow fever, diseases that sent untold thousands to their graves in the potters' fields that are now Washington Square and Bryant Park. In the nineteen-eighties, Bellevue treated more *AIDS* patients than any other American hospital.

In 1983, Nate Link began an internship at Bellevue, and almost immediately pricked himself, by accident, with a contaminated needle. He thought it was a death sentence, but he escaped infection. The work was both harrowing and thrilling. "I felt like I was in the epicenter of the universe," he told me. He is now Bellevue's chief medical officer.

During the 2014 Ebola outbreak in Africa, Link and his colleagues knew that, if Ebola spread to New York, the patients would end up at Bellevue. The hospital built an Ebola unit and a dedicated laboratory, training hundreds of staff and storing additional personal protective equipment. The instant they finished their preparations, a patient appeared. He survived. Bellevue then sent emissaries across the country to help hospitals prepare special facilities, develop protocols, and train their staffs for novel infections. Had it not been for the foresight of Link and his colleagues, America would be far less prepared for the *COVID* onslaught.

Once the coronavirus emerged, Bellevue's special-pathogens team began preparing a protocol. "We thought we'd get one or two cases, just like Ebola," Link recalled. But by early March the hospital was admitting a stream of patients with fever and unexplained respiratory problems. They were labelled P.U.I.: patients under investigation. Tests weren't available. "We had this sense that there was this invisible force out there," Link recalled. He believes that the city already had tens of thousands of cases, but, "without testing, there was just no way to know—it was a sneak attack." When the city reported its first positive case, on March 1st, only thirty-two tests had been conducted. Asymptomatic carriers and people with mild symptoms slipped through the nets. The testing guidelines almost seemed designed to undercount the spread.

On March 10th, Eustis, the theatre director, walked half a mile from his home, in Brooklyn, to an emergency clinic on Amity Street. His muscles ached. Twice he had to stop and catch his breath, sitting for a while on a fire hydrant. He was too exhausted to be afraid. His vital signs showed dangerously low potassium levels, and his heart kept skipping beats. An ambulance ferried him to a Brooklyn hospital. An antibody test eventually showed that he had the coronavirus. Despite his condition, there was no room for Eustis. He was placed on a gurney with an I.V. potassium drip and left in a corridor overnight. He soiled himself, but nobody came to change him. He was given no food for thirty-six hours. The *COVID* surge had begun.

On March 11th, Dr. Barron Lerner was at his office in Bellevue. The hospital had begun implementing triage at the front desk for patients with respiratory problems. That morning, at a staff conference, doctors were told, "If you're talking to a patient you think might have *COVID*, you excuse yourself from the room. You say, 'O.K., I need to leave now. A nurse is going to come in and give you a mask.' "

Lerner met with a regular patient, an Asian immigrant who didn't speak English. Bellevue maintains a staff of a hundred translators, and one of them connected to a dual telephone system. "About ten days ago, she had a fever," the translator told Lerner. "Then she was coughing, and she's been really short of breath since then."

"I thought, I can't believe this just happened," Lerner recalled. "I was probably the first staff member to be exposed." He was sent home and told to monitor his temperature. He and his wife began sleeping in separate bedrooms. Five days later, the fever struck.

Meanwhile, Eustis was released after four days, still shaky. Upon returning home, he immediately went to bed. He turned out to have "long haul" *COVID*. "It comes in waves," he told me. "I'm struggling with extreme fatigue and continued muscle pain." Working wasn't an option in any case: every theatre in New York had gone dark.

9. The Doom Loop

Vice-President Mike Pence was now in charge of the task force, but Azar remained a member. Meetings were often full of acrimony. Olivia Troye, a former homeland-security adviser to Pence, told me, "I can't even begin to describe all these insane factions in the White House. I often thought, If these people could focus more on doing what's right for the country rather than trying to take each other down, we'd be in a much different place." Fauci, she recalled, was considered too "outspoken and blunt" with the media, which led such Trump Administration officials as Jared Kushner and Peter Navarro to complain that he was "out of control." Troye summed up the Administration's prevailing view of Birx crisply: "They hate her." At task-force briefings, Birx typically presented a slide deck, and Troye once caught White House staff members rolling their eyes. Marc Short, Pence's chief of staff, remarked, "How long is she going to instill fear in America?"

On March 11th, members of the Coronavirus Task Force crowded into the Oval Office, where they were joined by Kushner, Ivanka Trump, Secretary of State Mike Pompeo, and a dozen others. According to the official who kept contemporaneous notes, Birx and Fauci pushed for shutting down European travel. "Every seed case you prevent is a cluster of cases you prevent," Birx explained. Redfield and Azar had swung around to the idea that cutting off European travel might buy time, but Steven Mnuchin, the Treasury Secretary, heatedly insisted that doing so would cripple the

U.S. economy and trigger a global depression. The markets would crater. “Forget about ballgames!” he said, pointedly adding, “Forget about campaign rallies!”

After an hour, the President had another obligation, and he asked Pence to keep the discussion going. The group adjourned to the Cabinet Room. Mnuchin argued that there must be ways to curb viral spread without banning travel. The elderly were at high risk—why not sequester the most vulnerable?

“It’s twenty-five per cent of the population!” Robert O’Brien, the national-security adviser, observed. “You’re not going to be able to stick them all in hotels.”

Fauci had recently warned the group that the outbreak was going to get far worse, saying, “There’s no place in America where it’s business as usual. By the time you mitigate today, we’re three weeks late.” Colleges were sending students home, further contributing to the spread.

Another member of the task force noted that, in a bad flu season, sixty thousand Americans might die. What was the difference?

“This is *twenty* times that,” Pottinger argued. “This is two per cent dead, where the flu is .1 per cent.”

“If we just let this thing ride, there could be two million dead,” Birx said. “If we take action, we can keep the death toll at a hundred and fifty to two hundred and fifty thousand.” It was surreal hearing such numbers laid out so nakedly.

Mnuchin demanded data. He felt that the U.S. just had to live with the virus. It wasn’t worth sacrificing the airlines, the cruise ships, the hotels. “This is going to bankrupt everyone,” he said. “Boeing won’t sell a single jet.”

“You keep asking me for my data,” Birx said, sharply. “What data do *you* have? Does it take into account hundreds of thousands of dead Americans?” In the end, her side won.

That evening, in an unusually formal speech from the White House, the President announced that he was suspending travel from Europe for the next month. “We are marshalling the full power of the federal government and the private sector to protect the American people,” he promised. He had also signed a bill providing $8.3 billion to help the C.D.C. and other government agencies fight the virus. He highlighted the danger the elderly faced and urged nursing homes to suspend unnecessary visits. He advised social distancing and not shaking hands—practices that he hadn’t yet adopted himself.

Trump’s speech included his usual distortions. He claimed that insurance companies had agreed to “waive all co-payments for coronavirus treatments,” though they’d agreed only to waive fees for tests. But, for perhaps the first time, he was presenting himself as a unifier—as a take-charge Consoler-in-Chief. If he had continued playing that role, America would have had a different experience with the contagion.

Glenn Hubbard is a conservative economist who served as the chairman of President George W. Bush’s Council of Economic Advisers. Soon after the pandemic began, he became involved in discussions in Washington about how to handle the financial impact. Hubbard told me, “I and other economists had been worried about a doom loop”—a cycle of negative economic feedback. When the pandemic hit, the world suffered a supply shock: trade was disrupted, factories and stores closed. If workers didn’t start earning again soon, the supply shock could turn into a demand shock, and that would further weaken supply, which would increase unemployment and further diminish demand. A doom loop.

In mid-March, Hubbard spoke with the Republican senators Marco Rubio, of Florida; Susan Collins, of Maine; and Roy Blunt, of Missouri. The N.B.A. had just suspended its season. Economic forecasts were terrifying. The senators were getting panicked reports from business owners back home.

Only Collins had been in office during the 2008 financial crisis, when Congress had passed a seven-hundred-billion-dollar bill to bail out troubled assets—the outer limit of what these conservatives had ever imagined spending. Now they were talking about trillions. Enlarging the deficit and expanding the federal government’s reach were anathema to the Republican caucus; to some members, it smacked of socialism. Rubio indicated that he would never support such spending in normal times.

“You need to do something,” Hubbard warned. “We’ve been having a debate for decades now about the size of government. The more interesting debate is the *scope* of government.” He spoke of the first Republican President, Abraham Lincoln: “He decided to do the Homestead Act, land-grant colleges, and to lay the foundation for the transcontinental railroad. If Lincoln, in the middle of the Civil War, had the idea of using government as a battering ram for opportunity, why can’t we do that today? Instead of focussing on how big government is, think about what you want it to do.”

Rubio, who is the chairman of the Small Business Committee, thought about the restaurants, the travel companies, the hair salons—all of them service businesses “with the least ability to survive.” The action that Congress was contemplating was heresy from a fiscal-conservative perspective, but the alternative—failing businesses, deepening poverty, boundless unemployment—was worse.

Action was necessary, the senators agreed. As it turned out, there was a surprising logistical problem: the Treasury Department had previously bailed out corporations and given checks to individuals, but it wasn’t clear how to give assistance to small businesses. Collins was

working on a loan-forgiveness program, and Rubio was trying to figure out how to create a new loan program through the Small Business Administration's existing network of lenders. "That's when the Paycheck Protection Program arose as an idea," Rubio told me. Loans taken out to keep people on the payroll could be forgiven, offering employees assurance that their jobs would still be there when the clouds cleared.
The Democrats were fully on board, and Congress soon approved three hundred and fifty billion dollars' worth of forgivable loans to small businesses. The over-all relief package was even larger. Chris Coons, a Democratic senator from Delaware, told me, "We went from 'We don't know what to do' to nine hundred pages and $2.2 trillion in about ten days. I've never seen anything like it."
Hubbard said, "Nothing like a big shock to help people become more bipartisan."

10. Reinforcements Arrive

On March 12th, Amy Klobuchar was back in Minnesota. Her husband, John Bessler, who teaches law at the University of Baltimore, remained in Washington. He awoke that morning feeling ill. "He was going to take my place at my constituent breakfast in D.C.," Klobuchar recalled. "It was when he would have been most contagious, as we now know. There would have been around fifty people, in a small room. And then he was going to a faculty meeting—about sixty people, in a small room. Then he was going to get on an airplane and fly to Minnesota, with a bunch of people packed in. I was having some minor surgery at Mayo, and he was going to come there! He really would have had quite a day of infecting people." They had no idea how he'd caught the virus. He was fifty-two and, until then, in excellent health.
Bessler stayed home, and steadily grew worse. For more than a week, Klobuchar kept calling, anxiously asking what his temperature was. Their only thermometer was in centigrade, so Klobuchar had to Google the conversion. Each time, it exceeded a hundred degrees. Hearing that he was short of breath, she urged him to see a doctor, worrying that "it was one of those cases where people are underestimating how sick they are, and then they die the next day." After Bessler coughed up blood, he went to the hospital to get tested. He had severe pneumonia. Doctors kept telling Klobuchar, "The oxygen is getting worse." She couldn't visit him, making the ordeal even more frightening.
Bessler spent five days in the hospital. He recuperated, and was back in the couple's D.C. apartment when his test finally came back positive.
Dr. Lerner's *COVID* case was mild. He returned to work at Bellevue after twelve days, on March 23rd. The city had become weirdly quiet: First Avenue resembled an abandoned set on a studio back lot. During his absence, a tent had been erected in the courtyard, for screening patients. Everyone now wore a mask.
Non-*COVID* patients in intensive care were shuttled to the postoperative surgical unit, which was available because all surgeries had been cancelled. This freed up fifty-six I.C.U. beds. Workers installed *hepa* filters in each room, creating negative pressure that prevented infected air from escaping. Offices were turned into more patient units; as soon as carpenters walked out of a converted room, a patient was wheeled in. Twenty-five more spaces for ventilator patients were added in the E.R. When all the beds filled, the I.C.U. cubicles were doubled up. Lerner, still recovering, tended to his patients through televisits, taking hour-long naps as Bellevue whirled around him.
In mid-March, Bellevue had its first *COVID* death: a middle-aged patient with no preëxisting conditions, who had been hospitalized for two weeks. Dr. Amit Uppal, the director of critical care, recalled, "Among our staff, we just looked at each other and said, 'O.K., here we go.' And from there it just exponentially ramped up."
Uppal, the son of Indian immigrants, grew up in Northern California and did his medical training at Ohio State. He was drawn to Bellevue because he wanted to serve the disadvantaged, but also because of the staff—"people that could work anywhere in the country and chose to defend this population." Uppal wanted to specialize in critical care so that he could handle the most extreme diseases. He was prepared to face the knotty ethical dilemmas at the limits of medical knowledge.
Part of the mission at Bellevue is helping patients die well. "It provides you a rare perspective on your own life," Uppal said. "Many laypeople who don't do medicine, and aren't exposed to end-of-life issues, may not have the opportunity to reflect on what's really important to them until the end of their own life." But *COVID* seemed cruelly designed to frustrate the rituals of death.
Just as Bellevue's first patients began dying, the hospital was flooded with new admissions. The I.C.U.'s typical mortality rate was far lower than *COVID*'s, so even critical-care staff like Uppal were unsettled. Such doctors knew how to click into emergency mode. Before *COVID,* that might last thirty or forty minutes—say, with a heart-attack patient. After a bus wreck or a mass-casualty event, emergency mode could last a full day. With *COVID*, it lasted weeks on end.
During rounds, Uppal passed each of the I.C.U.'s fifty-six cubicles. The patients were all on ventilators, the distinctive gasping sound unvaried. I.V. lines extended outside each cubicle, so attendants didn't have to enter to administer medication. In the antiseptic gloom, the

patients appeared identical. It was too easy to overlook their humanity. Uppal forced himself to examine their charts. He needed to recapture "what made them unique."
Overwhelmed hospitals in New York's outer boroughs transferred more than six hundred patients to Bellevue, knowing that nobody would be turned away. The E.R. became a hot zone where many people coming off the street required immediate intubation. Before *COVID*, the E.R. was always jammed, and nobody wore P.P.E. Nate Link told me, "When *COVID* hit, we made a promise to ourselves that we would not let the emergency rooms back up, and that we would keep them pristine." Staffers had to remain swathed in P.P.E., Link said, adding, "In the end, only fifteen per cent of the staff in the emergency department tested positive. That's lower than the hospital in general. It's even a bit less than the city average. The message is that P.P.E. works."
Some doctors needed new roles to play. Orthopedic surgeons began devoting their shifts to turning patients—"proning"—to facilitate breathing. Ophthalmologists helped in the I.C.U.; general surgeons treated non-*COVID* patients. "Everybody found a niche," Link said. "We were a completely different hospital for three months."
More than twenty thousand New Yorkers died from *COVID* in the spring. As the numbers mounted, Link noticed that employees were practicing "psychological distancing." He said, "Our staff had never seen so much death. Normally, a patient dying would be such a big deal, but, when you start having a dozen patients die in a day, you have to get numb to that, or you can't really cope." This emotional remove was shattered when the first staff member died: a popular nurse, Ernesto (Audie) De Leon, who'd worked at Bellevue for thirty-three years. Link said, "His death was followed by a *COVID*-style 'wake,' as many of his colleagues approached his I.C.U. cubicle in full P.P.E., put their hands on the glass door, and read Scripture, prayed, and wept. Because of the infection-control restrictions, staff consoled each other without touching or hugging. It was very unnatural."
When Bellevue's doctors were at their lowest ebb, reinforcements arrived: hospital workers from other states flooded into New York to help. According to Governor Andrew Cuomo, thirty thousand people responded to the city's call for aid. It was a rare glimpse of national unity. "Half the people in the I.C.U. had Southern accents," Link told me. "That's what saved us."

11. The No-Plan Plan

In mid-March, America began shutting down. The Coronavirus Task Force urged Americans to work from home. Education would be virtual. Travel and shopping would stop. Restaurants and bars would close. The goal was to break the transmission of the virus for fifteen days and "flatten the curve." Trump's impatience flared. At a press briefing, he said of the virus, "It's something we have *tremendous* control over." Fauci corrected him, observing that the worst was ahead, and noting, "It is how we respond to that challenge that's going to determine what the ultimate end point is."
Trump held a conference call with governors. "We're backing you a hundred per cent," he said. Then he said, "Also, though, respirators, ventilators, all the equipment—try getting it yourselves."
Most governors had assumed that, as in the event of a hurricane or a forest fire, the federal government would rush to help. Storehouses of emergency equipment would be opened. The governors, faced with perilous shortages of ventilators, N95 masks, and nasal swabs, expected Trump to invoke the Defense Production Act, forcing private industry to produce whatever was needed. Surely, there was a national plan.
Governor Inslee, of Washington, was flabbergasted when he realized that Trump didn't intend to mobilize the federal government. Inslee told him, "That would be equivalent to Franklin Delano Roosevelt, on December 8, 1941, saying, 'Good luck, Connecticut, *you* go build the battleships.' "
Trump responded, "We're just the backup."
"I don't want you to be the backup quarterback," Inslee said. "We need you to be Tom Brady here."
Larry Hogan, the Republican governor of Maryland, was incensed. "You're actively setting us up!" he told Trump.
Matt Pottinger's brother, Paul, kept sending desperate e-mails from Seattle. He had heard about medical workers fashioning P.P.E. out of materials from the Home Depot. Industrial tape and marine-grade vinyl were being turned into face shields. Garbage bags were serving as surgical gowns. A local health official wrote him, "We are currently drafting up guidelines for how to make homemade masks from cloth and I've asked other innovators in the community to see if they can figure out if we can do ANYTHING that would be better than nothing." Matt wrote to Paul, "Help is on the way, but it probably won't be in time—so start tearing up bedsheets and turning them into lab coats, raid the Salvation Army for garments, wrap bras around your faces in place of facemasks if you have to."
The Strategic National Stockpile existed for such emergencies, but Secretary Azar had recently testified to the Senate that it had only twelve million N95 masks—a fraction of what was needed. The storehouse had once held more than a hundred million masks, but many were used during the 2009 H1N1 flu pandemic, and the supply wasn't replenished.
After Trump made clear that the states were on their own, Ned Lamont, the gregarious governor of Connecticut, called other governors in his region: Phil Murphy, of New Jersey;

Charlie Baker, of Massachusetts; Gina Raimondo, of Rhode Island; and Cuomo. The states needed to act together, Lamont said. "If I close down bars and Andrew keeps them open, that doesn't solve any problems," he said. "Everybody's going to go down there to drink, and bring back the infection."

The governors were daunted by the task facing them. Lamont imagined furious constituents: "You're going to close down the schools? My God!" Acting in concert provided political cover and a sense of solidarity.

The governors closed gyms, restaurants, and bars at the same time. Lamont, Murphy, and Cuomo prohibited gatherings exceeding fifty people. Baker and Raimondo limited them to twenty-five. Cuomo announced, "If you were hoping to have a graduation party, you can't do it in the state of New York, you can't go do it in the state of New Jersey, and you can't do it in the state of Connecticut."

Governors discovered that the Trump Administration was sabotaging their efforts to protect citizens. Charlie Baker arranged to buy three million N95 masks from China, but federal authorities seized them at the Port of New York, paying the supplier a premium. In another group call with Trump, Baker, a Republican, complained, "We took seriously the push you made not to rely on the stockpile. I got to tell you, we lost to the Feds. . . . I've got a feeling that, if somebody has to sell to you or me, I'm going to lose every one of those."

"Price is always a component," Trump replied coldly.

Baker quietly secured a cache of 1.2 million masks from China, and enlisted the help of Robert Kraft, the owner of the New England Patriots, who used the team plane to fly the shipment to Logan Airport, where it was received by the Massachusetts National Guard and spirited away.

At a briefing, Cuomo fumed, "You have fifty states competing to buy the same item. We all wind up bidding up each other." He threw up his hands. "What sense does this make? The federal government—*fema*—should have been the purchasing agent."

Gina Raimondo pressed *FEMA*, saying, "Can we tap into our national stockpile?" After days of giving her the runaround, the agency promised that a truckful of P.P.E. was on its way. At 9 *P.M.*, she got a text saying that the truck had arrived. Raimondo told Politico, "I called my director of health. 'Great news, the truck is finally here!' She says, 'Governor, it's an empty truck.' They sent an empty truck."

Inslee told me, "Only eleven per cent of the P.P.E. we've obtained has come from the federal government."

Governors who got more had to show obeisance to Trump. Gavin Newsom, of California, praised the President fulsomely after being promised a shipment of swabs. Around this time, a reporter asked Trump, "You've suggested that some of these governors are not doing everything they need to do. What more, in this time of a national emergency, should these governors be doing?"

"Simple," Trump said. "I want them to be *appreciative*."

In the spring, Trump pressed the F.D.A. to fast-track authorization of a malaria treatment, hydroxychloroquine, for *COVID* patients. Fox News touted the drug as a "game changer." Tucker Carlson and Laura Ingraham aired breathless interviews with Gregory Rigano, who had co-written a "paper"—a self-published Google Doc—calling the drug an effective treatment. Rigano, a lawyer, had recently started blockchain funds that aimed to "cheat death" and "end Alzheimer's." Between March 23rd and April 6th, hydroxychloroquine was mentioned on Fox News nearly three hundred times. White House officials, including Peter Navarro, heavily promoted it.

At a task-force briefing, Fauci was asked if hydroxychloroquine curbed the coronavirus. "The answer is no," he said.

The President glowered and stepped toward the mike. "I'm a big fan," he said.

Three months later, the F.D.A. withdrew its authorization. The drug was ineffective and caused "serious cardiac adverse events" and other side effects, including kidney disorders and death. When hydroxychloroquine was paired with azithromycin—a combination that Trump had publicly championed—patients were twice as likely to suffer cardiac arrest as those who took neither drug.

Fox News stopped hyping hydroxychloroquine, but Trump still wanted a quick fix. While cases in New York were doubling every three days, and doctors were treating patients in tents in Central Park, he declared that he wanted America "raring to go" by Easter.

Over all, the case fatality rate for *COVID* is two per cent. But for people over seventy-five the risk of death is hundreds of times greater than it is for those under thirty. The devaluation of elderly lives was evident in the low standard of care in many nursing homes, where forty per cent of U.S. deaths have occurred, despite accounting for only eight per cent of cases. In March, two hundred and thirty-five military veterans were living at the Soldiers' Home in Holyoke, Massachusetts. Some had served in the Second World War. Now they were captives to a system that was failing to protect them.

According to an independent investigation commissioned by the state, family members and workers had long complained about understaffing, in part because of a 2015 hiring freeze ordered by Governor Baker. On March 17th, a veteran who had been showing symptoms for weeks was tested for *COVID*. He lived in one of two dementia units; he wasn't isolated, not even after his test came back positive, four days later. Contagion took hold, and overburdened employees made the fateful decision to combine the two units, with beds placed in tight rows. Many disoriented veterans climbed

into the wrong beds, accelerating the spread. A recreational therapist said that she felt as if she were leading her patients "to their death."

On Friday, March 20th, Michael Miller, who is retired from the Army National Guard, got a call from his two sisters, Linda McKee and Susan Perez. "They're not thinking Dad's gonna make it through the night," they said. Their father, James L. Miller, was ninety-six, and had been at the Soldiers' Home since 2015. The siblings drove to the facility. Only one family member could enter at a time. Mike went in while his sisters waited in the car. His father "looked like a corpse," he recalled. "He had been in that state of decay for a week, and nobody called us."

Jim Miller had landed at Normandy Beach on D Day. He had helped liberate a concentration camp near Nordhausen, Germany. After mustering out, he became a postal worker and a firefighter. He was a taciturn man who had rarely discussed his military service with his children.

Now this quiet old veteran was dying in the midst of bedlam. "Men were just wandering around," Mike said. "They were in various states of dress. There was a curtain drawn for my dad—other veterans would open the curtain and stand there. And these gentlemen I knew. They meant no disrespect." A man on a nearby bed was "just moaning—he couldn't breathe. He ended up passing away that night."

Staffers couldn't offer the dying residents anything but "comfort measures"—morphine under the tongue. Jim was so dehydrated that he couldn't swallow. "Give him an I.V.!" Mike pleaded. But staffers weren't authorized to do this; nor could they transport him to a hospital. Mike moistened his dad's mouth with a foam swab. Nurses broke down, Mike recalled: "They loved my dad. But they couldn't do anything." He never saw any administrators.

Mike returned each day as his sisters kept vigil in the parking lot. On Saturday, they witnessed the arrival of a refrigerated truck that had been sent to store bodies. On Monday, Jim Miller passed away. Before it was all over, at least seventy-five other veterans had died.

12. Little Africa

In the *COVID* world, everyone is in disguise. When Dr. Ebony Hilton enters a room, patients see wide-set, lively eyes above her surgical mask. Her hair and body are hidden by a bonnet and a gown. Her accent marks her as a Southerner. She calls herself a "country girl," which is at odds with her assured manner. When the call comes to intubate a *COVID* patient, "it's already a situation where somebody is dying," she told me. "The only reason I'm placing this breathing tube is because your body is shutting down, so if I don't touch you you're dead." She added, "If I do touch you, *I* could die."

Hilton, who is thirty-eight, is a professor and an anesthesiologist at the University of Virginia School of Medicine, in Charlottesville. U.Va.'s hospital has some six hundred beds, but at night Hilton often works alone: "I'm literally the only anesthesiologist attending for the entire hospital. At that moment, I can't shut down, I can't go to my room and let fear stop me." She continued, "I don't think any of us have slowed down to think that this could be the one that gets me sick. You don't have time to consider options A, B, C, and D. You've got to gown up and go."

One day in early March, Hilton got a page. A patient was septic, meaning that an infection had entered her bloodstream and was raging through her body. Her kidneys were starting to fail. Ordinarily, doctors would suspect bacteria as the cause, but the infection's spread had been alarmingly rapid, and the symptoms matched what doctors were reporting about *COVID* patients in China and Italy. Many health-care workers had noted the speed with which the infection killed when it made its move.

Hilton entered the room, wearing an N95 mask. The patient had no blood pressure; without intervention, her oxygen-starved brain would start dying within seconds. The procedure for intubation requires a pillow to be placed under the patient's shoulder blades, so that the head is tilted back in the "sniffing position." Hilton made sure that the patient was oxygenated and given a sedative and a muscle relaxant; then she pried her mouth open, pushed her tongue aside, and inserted a laryngoscope—a curved blade attached to a handle, which looks like the head of a walking cane. The device lifts the epiglottis, exposing the vocal cords. If the vocal cords don't readily appear, pressure on the larynx can bring them into view. Hilton slowly inserted a plastic tube through the narrow portal between the vocal cords, down into the trachea. Once the tube was secured, the patient was connected to a ventilator.

That was probably Hilton's first *COVID* patient, but there was no way to know. Virginia had barely any tests in early March.

Hilton comes from a community near Spartanburg, South Carolina, called Little Africa. After the Civil War, Simpson Foster, a formerly enslaved man, and a Cherokee named Emanuel Waddell founded the community as an agrarian refuge. "It's tiny," Hilton said. "We don't have a red light. We only have my great uncle Hobbs's store—he keeps snacks and stuff for us."

Little Africa is in the foothills of the Blue Ridge Mountains. "When you're sitting on the porch, you can see the skyline of the peaks," Ebony's mother, Mary Hilton, told me. "We have doctors, lawyers, judges—we have so many professions coming out of the Little Africa

community, because we put so much emphasis on education, taking care of each other," she said. "Eb is coming from a very powerful place."

When Ebony was eight, her little sister asked Mary if they could have a brother. Mary was caught by surprise but answered honestly: her first child had been a boy. "I was seventeen," she recalled. "I had never heard of an ob-gyn. We always went to the clinic." She went alone; her mother was picking cotton. Mary suspects that, during a pregnancy exam, a technician punctured her amniotic sac. The boy was born prematurely and died after three days. "I told Eb that story, not knowing it would change her life," Mary said. The moment Ebony heard it, she announced that she was going into medicine. Her resolve must have been evident: right then, Mary began calling her Dr. Hilton.

Not long ago, Ebony and her sisters, Brandi and Kyndran, placed a tombstone for the brother they never knew. They erected it in the churchyard of the New Bedford Baptist Church, in Little Africa. "He was a fighter," Ebony told me. "He tried to beat the odds. So I try to finish out that mission for him."

Hilton's image of her future was formed by watching "Dr. Quinn, Medicine Woman." She attended the Medical University of South Carolina, intending to become an obstetrician-gynecologist. "One night, when I was on my OB rotation, there was a lady having a seizure—she actually had eclampsia—and this guy ran into the room and started shouting orders, like, 'I'm going to do the A-line,' 'You start a magnesium.' I leaned over and asked, 'Who is *that* guy?' One of the OBs said, 'Oh, that's the anesthesia resident.' " Hilton told herself, "I want to be the person that, when there's utter chaos, you know what to do."

In 2013, she became the first Black female anesthesiologist to be hired by the Medical University of South Carolina, which opened in 1824. U.Va. hired her in 2018. "Growing up in medicine, what I've come to realize is that, should I have a child, it would actually be at more risk of dying than my mom's child was," she said. She cited a Duke University study that correlated race and education levels: "If you look at white women with my same level of degrees, my child is five to seven times more likely to die before his first birthday than theirs. It's been that way historically for Black women. Our numbers haven't really changed, as far as health outcomes, since slavery times."

Many minorities suffer from co-morbidities. "That's where the social determinants of health kick in," Hilton said. Asthma and chronic respiratory disease can be the result of air pollution—say, from an industrial plant in a low-income neighborhood. "If you're in a gated community, you don't see smoke billowing out of these industries, because you have the money and power to influence the policymakers to say, 'You can't put that here.' " Heart failure, obesity, and diabetes are tied to whether or not there are nearby restaurants and grocery stores with healthy options. She pointed out that, in South Carolina, one in every five counties doesn't have a hospital; eleven counties don't have any ob-gyns.

The moment the first American *COVID* death was announced, in February, Hilton said, she "started doing a tweetstorm to C.D.C. and W.H.O., saying, 'We know racial health disparities exist, and they existed before *COVID*—and we know where this will end up.' "

When COVID inundated New York, Lorna Breen, an emergency-room physician, worked twelve-hour shifts that often blurred into eighteen. So many doctors fell ill that, at one point, she supervised the E.R.s in two hospitals simultaneously.Photograph courtesy Jennifer Feist

She demanded, "Tell us who you're testing and who you're not." The C.D.C. didn't release comprehensive data until July, after the *Times* sued for it. The country, it turned out, was experiencing wildly different pandemics. For every ten thousand Americans, there were thirty-eight coronavirus cases. But, for whites, the number was twenty-three; for Blacks, it was sixty-two; for Hispanics, it was seventy-three. At Hilton's hospital, seven of the first ten *COVID* fatalities were people of color.

Hilton and her colleagues went to minority communities in and around Charlottesville to provide testing at churches and shopping centers. "Minorities are less likely to be tested, which means they might go back home, where they have the capability to infect their entire community," she said. People of color are more likely to be exposed because so many are essential workers. "Only one in five African-Americans can work remotely," she said. "Only one in six Hispanics can."

Staffers at U.Va.'s hospital prepared their wills. Hilton realized that she would be spending long hours away from her dog, Barkley, so she bought a puppy—"a dog for my dog"—that she named Bentley. "They barely get along," she admitted. Hilton's neighbor, a nurse in the *COVID* unit, has two children, and feared exposing them. The woman began living in her basement.

One of the hardest moments at Hilton's hospital came when Lorna Breen, a forty-nine-year-old doctor, was admitted to the psych unit. Her father, Philip Breen, is a retired trauma

surgeon; her mother, Rosemary Breen, had been a nurse on the ward where Lorna was admitted. Lorna had been living in Manhattan, overseeing the E.R. at NewYork-Presbyterian Allen Hospital.
When *COVID* inundated New York, she worked twelve-hour shifts that often blurred into eighteen. She barely slept. Within a week, Breen caught *COVID* herself. She sweated it out in her apartment while managing her department remotely. After her fever broke, she returned to work, on April 1st.
Breen was defined by her vitality. She was a salsa dancer and a cellist in an amateur orchestra. She ran marathons; she drove a Porsche convertible; in her spare time, she was pursuing an M.B.A. "She never left the party," her sister, Jennifer Feist, told me.
Breen told Feist that a trauma nurse was walking through the E.R. triaging patients based on how blue their faces were. So many doctors in New York fell ill that, at one point, Breen supervised the E.R.s in two hospitals simultaneously. It became too much. As her father put it later, Breen was "like a horse that had pulled too heavy a load and couldn't go a step further and just went down."
Breen called her sister one morning and said that she couldn't get out of a chair. "She was catatonic," Feist told me. "*COVID* broke her brain."
Feist and her husband, Corey, decided that Breen needed to come home to Virginia. A friend in Connecticut drove Lorna to Philadelphia; another friend took her to Baltimore. Feist was waiting on the side of the road to drive her to Charlottesville.
During the eleven days that Breen spent in U.Va.'s hospital, she was terrified that her career was over. Licensing boards, she knew, might flag evidence of mental illness. Before *COVID*, Breen had never had a trace of instability. Feist and her husband, both attorneys, assured her that she wouldn't lose her license. Breen seemed to improve: she even tried to do her M.B.A. homework on her phone. Feist took Breen home with her on the last Saturday in April. The next day, Breen killed herself.
The pandemic has added immeasurable stress to a public-health workforce already suffering from burnout. Feist told me, "She got crushed because she was trying to help other people. She got crushed by a nation that was not ready for this. We should have been prepared for this. We should have had some sort of plan."

13. The Mission of Wall Street

Goldman Sachs is a controversial name in high finance. Its influence pervades American economic policy. Three of the twelve presidents of the Federal Reserve have worked there. Steven Mnuchin, the Treasury Secretary, is a Goldman alum. The company's many critics see it as the pinnacle of avarice. They hold it responsible for contributing to the vast income disparities in America and see its alumni as manipulating government policy to further enrich the wealthy. But, in the upper chambers of power, Goldman's culture of success is revered.
In the first quarter of 2020, the Goldman view of the economy was exuberant. Jan Hatzius, its chief economist, told me, "We had come fully out of the deep downturn post-2008." Unemployment was near historically low levels; wages were creeping up. Sure, median incomes hadn't risen substantially since the seventies; the gap between the rich and the poor appeared unbridgeable. But those weren't *Goldman* problems. The company exists to make wealthy clients wealthier.
When the Wuhan outbreak began, the economic risk to America seemed low. Previous pandemics, such as H1N1 and *SARS*, had negligible economic impact on the U.S. On February 12th, with *COVID* already rooted in this country, the Dow Jones closed at 29,551—a record high at the time. Three weeks later, Hatzius said, "we began the deepest contraction in the global economy on record."
Hatzius compiled data for quarterly Goldman G.D.P. forecasts. Normally, he said, "you estimate the ups and downs of a business cycle by, say, relating people's propensity to spend on consumer goods to their labor income or tax changes, or the effect of interest-rate changes on the willingness or ability to buy homes." This situation was different. "It wasn't the case that people didn't have the money to go to restaurants—they *couldn't* go to restaurants." Airlines stopped flying. Car production ceased. Entire sectors had to be subtracted from the economy: "It was more arithmetic than econometrics."
On March 27th, the *Times* ran an apocalyptic headline: "*job losses soar; u.s. virus cases top world*." Curiously, by that time, the Dow had reversed its plunge and begun a long climb that was strikingly at odds with the actual economy. In November, it once again reached record highs.
Steve Strongin is a senior adviser at Goldman. Sixty-two, he wears rimless glasses that lend him the aspect of a nineteenth-century European intellectual: Ibsen without the sideburns. "Markets very often get talked about as though they're some kind of giant casino," he told me. "But they actually have a deep economic function, which is to move capital, both equity and debt, from businesses that no longer serve a purpose to businesses we need *today*."
The market's initial reaction, Strongin said, was "Somehow we are going to freeze in place, the virus will pass, and then we'll unfreeze." During that phase, Wall Street's function was to provide liquidity as clients turned to preservation strategies—raising cash, drawing on lines

of credit—while waiting out the contagion. But the pandemic settled in like a dinner guest who wouldn't leave and was eating everything in the pantry.
"The moment when everybody was forced to reassess the severity and longevity of the crisis is when people realized that asymptomatic carriers were important," Strongin said. "That meant that all the prior controls were going to fail." Thousands of businesses would close. Nobody alive had seen a catastrophe of such scale. The rules had to change. The pandemic was a historic disrupter, forcing a shift from short-term to long-term thinking. Strongin, who once wrote a paper called "The Survivor's Guide to Disruption," said, "Once that realization came into place, you saw the rush to opportunity."
Investors pivoted to a consolidation phase: going with the winners. The market recovery was led by five stocks—Facebook, Apple, Microsoft, Google, and Amazon—accounting for more than twenty per cent of the S. & P. However, "the Darwinian reality of capitalism is not about this brilliant insight into the five winners," Strongin said. "It's about taking money *away* from the fifty thousand losers. It's the core of the economic system—we don't prop up failures."
The most useful thing the government can do, he said, is help people start new small businesses: "The current split between the stock market and the employment numbers is a flashing warning that the economy and the people are not the same. If we don't spend real money, the pain will be very real, and the political consequences dangerous at best."

14. The Man without a Mask

The third and final chance to contain the infection—masks—was the easiest, the cheapest, and perhaps the most effective. But the Administration, and the country, failed to meet the challenge.
On March 4th, as Matt Pottinger was driving to the White House, he was on the phone with a doctor in China. Taking notes on the back of an envelope while navigating traffic, he was hearing valuable new information about how the virus was being contained in China. The doctor mentioned the antiviral drug remdesivir—which was just emerging as a possible therapy in the U.S.—and emphasized that masks were extremely effective with *COVID*, more so than with influenza. "It's great to carry around your own hand sanitizer," the doctor said. "But masks are going to win the day."
Still on the phone when he parked his stick-shift Audi, on West Executive Avenue, next to the West Wing, Pottinger forgot to put on the parking brake. As he rushed toward his office, the car rolled backward, narrowly missing the Vice-President's limo, before coming to rest against a tree.
While the Secret Service examined the errant Audi, Pottinger kept thinking about masks. America's pandemic response had already been handicapped by China's withholding of information about human-to-human and asymptomatic transmission. The testing imbroglio would set the country back for months. But masks offered a ready solution.
Deborah Birx had told Pottinger that, whereas mask wearing is part of Asian culture, Americans couldn't be counted on to comply. Pottinger began to see America's public-health establishment as an impediment. The Surgeon General, Jerome Adams, had tweeted, "*STOP BUYING MASKS*! They are *NOT* effective in preventing general public from catching #Coronavirus." Such messages were partly aimed at preventing the hoarding of hospital-grade masks, but they dissuaded people from adopting all forms of face covering. In those early days, the U.S. medical establishment looked at *SARS*-CoV-2 and flatly applied the algorithm for *sars*: sick people should wear masks, but for others they weren't necessary. Redfield, of the C.D.C., told me, "We didn't understand until mid-March that many people with *COVID* weren't symptomatic but were highly infectious."
Pottinger, however, thought it was evident that, wherever a large majority of people wore masks, contagion was stopped "dead in its tracks." Hong Kong was one of the world's densest cities, but there was no community spread of the virus there, because nearly everyone wore masks. Taiwan, which was manufacturing ten million masks per day for a population of twenty-three million, was almost untouched. Both places neighbored China, the epicenter. Pottinger's views stirred up surprisingly rigid responses from the public-health contingent. In Pottinger's opinion, when Redfield, Fauci, Birx, and Hahn spoke, it could sound like groupthink, echoing the way that their public messaging was strictly coördinated.
Nobody in the White House wore a mask until Pottinger donned one, in mid-March. Entering the West Wing, he felt as if he were wearing a clown nose. People gawked. Trump asked if he was ill. Pottinger replied, "I just don't want to be a footnote in history—the guy who knocked off a President with *COVID*."
Many N.S.C. staffers work in the Situation Room, monitoring news and global developments. They are crammed together like workers in a call center. Pottinger asked the staff virologist to teach everyone how to mask up. Some people were annoyed. Masks had become a political litmus test, with many conservatives condemning mask mandates as infringements on liberty, and to wear one in Trump's White House seemed borderline treasonous. Pottinger was shocked to learn that, in any case, the White House had no ready supply of masks.

He called an official in Taiwan and asked for guidance about controlling the virus. Masks, he was told again. Soon after that call, Taiwan's President donated half a million masks to the U.S., via diplomatic pouch. Pottinger took thirty-six hundred, for the N.S.C. staff and the White House medical unit, and sent the rest to the national stockpile.
In early April, new studies showed substantial reductions in transmission when masks were worn. Pottinger put copies of the studies into binders for key task-force members. A Chinese study reported on an infected traveller who took two long bus rides. He began coughing on the first ride, then bought a face mask before boarding a minibus. Five passengers on the first ride were infected, and no one on the second. Another study failed to detect any viral particles in aerosol or droplets from subjects wearing surgical masks.
On April 3rd, the C.D.C. finally proclaimed that masks were vital weapons. It was the last opportunity to do something meaningful to curb the pandemic.
The C.D.C.'s sudden reversal, Redfield admitted to me, was awkward: "When you have to change the message, the second message doesn't always stick." Worse, when the President announced the new mask advisory, he stressed, "This is voluntary," adding, "I don't think I'm going to be doing it."
Trump is a notorious germophobe. He hates shaking hands and recoils when anyone near him sneezes. He once chastised Mick Mulvaney, on camera in the Oval Office, "If you're going to cough, please leave the room." Years before *COVID*, Trump told Howard Stern that he had a hand-washing obsession, which "could be a psychological problem." It's one of the only frailties he acknowledges. He seems fascinated by his horror of contamination.
How could such a man refuse to wear a mask in a pandemic? It wasn't just Trump, of course; the people around him followed his example. Pence visited the Mayo Clinic without a mask, violating hospital policy. Many Republican legislators shunned masks even after members of their caucus became infected. It wasn't just Republicans, but Democrats were twice as likely to say that masks should always be worn. It wasn't just men, but women were more in favor of masks. It wasn't just white people, but they were much more averse to mask wearing than Blacks and Latinos were. If you name each of the groups least likely to wear a mask, the result roughly correlates with the average Trump voter.
Some anti-maskers called the coronavirus a hoax; others believed that it wasn't all that dangerous. But the image of the maskless President spoke to people, especially his base. He appeared defiant, masculine, invulnerable. He knew that the virus was dangerous—"more deadly than even your strenuous flus," as he told Bob Woodward, in a February interview that surfaced months later. Yet he dared the virus to touch him, like Lear raging against the storm.
Tens of millions of Americans emulated the President's bravado, and the unchecked virus prolonged unemployment, upended efforts to reopen the economy, and caused many more fatalities. "I'm not buying a fucking mask," Richard Rose, a thirty-seven-year-old Army veteran from Ohio, posted on Facebook. "I've made it this far by not buying into that damn hype." He tested positive on July 1st and died three days later. There are many similar stories.
It's dispiriting to think that, had such a simple precaution been broadly implemented from the start, America could have avoided so much suffering, death, impoverishment, and grief. The starkest example occurred in Kansas, when the governor issued an executive order to wear masks in public but allowed counties to opt out. It was as if Kansas were performing a clinical trial on itself. Within two months, infections in mask-wearing counties had fallen by six per cent; elsewhere, infections rose a hundred per cent.
Of course, wearing a mask was a much smaller burden than self-isolating. Although CNN repeatedly ran alarming footage of people who refused to stop going to bars or malls, a far greater number of Americans had listened to the experts, sequestering themselves for months, at tremendous financial and emotional cost. My wife and I live in Austin, and, as the quarantine dragged on, we forced ourselves to take an occasional drive, partly to keep our car battery alive. We'd snake through vacant streets downtown, grimly taking note of which businesses had boarded up since the previous drive.
One April afternoon, I went for a jog on a school track near my home. A group of young women were running time trials in the hundred-metre dash. They were the fastest people I had ever seen. Occasionally, as I came around a curve, I'd pull even with one of the women just as she was taking off. It was like Wile E. Coyote eating the Road Runner's dust.
"What school do you guys run for?" I asked one of them, who was cooling off.
"Oh, it's not a school," she said. "We're Olympians."
Instead of competing in Tokyo, here they were, on a middle-school track in Austin, isolating together and trying to maintain peak condition as they waited for the rescheduled Games. So many dreams have been deferred or abandoned.

15. "I Can't Breathe"

The corpse on the autopsy bench was a middle-aged Black man with *COVID*-19. Six feet four and two hundred and twenty-three pounds, he had suffered from many of the co-morbidities that Ebony Hilton had described to me. The medical examiner identified signs of heart disease and hypertension. The autopsy noted the presence of fentanyl and

methamphetamine, which could be considered co-morbidities, although they didn't really factor into this case. The cause of death was a police officer's knee on the neck. The victim was George Floyd.
On a video seen worldwide, four Minneapolis policemen killed Floyd as he was handcuffed and lying face down in the street. It was Memorial Day. One cop stood watch as two knelt on Floyd's back and held his legs while the fourth, Derek Michael Chauvin, pressed his knee into Floyd's neck for more than nine minutes.
At a time when health officials were begging people to stay home and avoid groups, protests arose in Minneapolis, then spread across America. They called to mind the Liberty Loans parades in 1918—the ones that had served as potent vectors for the killer flu. Nevertheless, thirteen hundred public-health officials signed a letter supporting the demonstrations.
Hilton joined a protest in Charlottesville on June 7th. Hundreds of people marched to the rotunda at the University of Virginia, carrying Black Lives Matter signs and placards saying "Let My People Breathe." I asked Hilton if she was worried about the mass gatherings. She said that she expected a rise in infections. Then she added, "For Black men, one in every thousand is at risk of dying in his lifetime from an encounter with a police officer. If you think about that number, that's what leads Black people to say it's worth me dying and going out to this protest and saying enough is enough. Police brutality is almost like a pandemic, a generational pandemic. It's a feeling—I'm going to die anyway, so I might as well risk this virus that I can't see, to speak about the virus of systemic racism that I *can* see."
Surprisingly, the marches did not appear to be significant drivers of transmission. "We tested thousands of people," Michael Osterholm, the director of the Center for Infectious Disease Research and Policy, at the University of Minnesota, said. "We saw no appreciable impact." One study found lower rates of infection among marchers than in their surrounding communities. Epidemiologists concluded that mask wearing and being outdoors protected the protesters. Moreover, demonstrators were on the move. Osterholm said that people in stationary crowds are more likely to become infected. In other words, joining a protest march is inherently less dangerous than attending a political rally.

16. Thelma and Louise

The President hadn't gathered with supporters since March, and was eager to dive back into the pool of adulation. An event was scheduled for June 20th. "It's going to be a hell of a night," he promised. He tweeted, "Almost One Million people request tickets for the Saturday Night Rally in Tulsa, Oklahoma!"
Only sixty-two hundred showed up. Trump was enraged by the dismal turnout but delivered his usual blustery speech. Because Oklahoma had just seen a record increase in *COVID* cases, attendees were required to release the Trump campaign from responsibility for any exposure. Just before Trump went onstage, two Secret Service officers and six campaign staffers tested positive.
In the audience was Herman Cain, the former C.E.O. of Godfather's Pizza and an erstwhile Presidential candidate, who had become one of Trump's most prominent Black supporters. Like nearly everyone else, he was unmasked. He flew home to Atlanta the next day, feeling exhausted—"from his travels," his daughter, Melanie Cain Gallo, believed. It was Father's Day, and she stopped by to give him a gift. They embraced. She had seen a photograph of him at the rally and wondered why he hadn't worn a mask. Cain had preached the virtue of social distancing and hand washing on "The Herman Cain Show," a Web series that he hosted, and he had usually worn a mask in public. He told her that everyone entering the Tulsa auditorium had passed a fever check—an insufficient gauge.
Gallo worked with her dad all week on his show. By Friday, they were both feeling ill, but Cain filmed another episode. Flanked by the American flag and a painting of Ronald Reagan, he looked wan, his eyes rheumy. He quoted a newspaper headline: "*U.S. DEATH RATE FALLS FOR THIRD DAY IN A ROW*." Other newscasts had hyped rising case counts, he complained, adding, "They never get to the death rate is *falling*."
On Monday, both were sick enough to go to a clinic for a test. Cain was feeling weak, so he waited by the car while Gallo stood in a long line. Suddenly, he passed out. An E.M.S. truck took him to the E.R. "They checked him out and said he was fine," Gallo recalled. They returned to the testing clinic. Both were positive.
Her case was mild. On July 1st, Cain was hospitalized. That day, he tweeted an article about a forthcoming Trump rally at Mt. Rushmore. "Masks will not be mandatory," Cain tweeted, adding approvingly, "*PEOPLE ARE FED UP*!" It was a defiant nod to Trump's base. Cain died on July 30th. He was seventy-four.
For some public-health officials, Deborah Birx had become an object of scorn. "She's been a disaster," a former head of the C.D.C. told me. The Yale epidemiologist Gregg Gonsalves tweeted, "Dr. Birx, what the hell are you doing? What happened to you? Your HIV colleagues are ashamed." Birx was accused of enabling an incompetent and mendacious President. The mortified look on her face at the press briefing when he suggested injecting disinfectant

or using powerful light—"inside the body, which you can do either through the skin or in some other way"—became a meme, underscoring how much Trump had compromised scientists. The public didn't know what she was saying in private.

Birx confided to colleagues that she'd lost confidence in the C.D.C. She disparaged the agency's hospital reports on *COVID*, which relied on models, not hard data. A C.D.C. staffer told *Science* that compiling precise totals daily in a pandemic was impossible. But hospitals quickly complied after Birx said that supplies of remdesivir could be portioned out only to hospitals that provided inpatient *COVID* data.

In August, Dr. Scott Atlas, a neuroradiologist, a fellow at Stanford University's Hoover Institution, and a Fox News regular, joined the task force. He was adamant that children should return to school—as was the American Academy of Pediatrics, which urged a "safe return" to schools in the fall, warning of learning deficits, physical or sexual abuse at home, and depression. That was a debate worth having, but most of Atlas's views on *COVID* seemed reckless. He insisted that masks did little to stop the spread, and he advocated creating "herd immunity" by allowing the virus to be passed freely among people at lower risk. Herd immunity is gained when roughly seventy per cent of a population has effective antibodies to the disease, through either infection or vaccination.

Once Atlas got to the White House, Trump stopped speaking to other health advisers. Herd immunity could be achieved by doing nothing at all, which became the President's unspoken policy. Atlas encouraged Trump and others to believe that the pandemic was waning. "His voice is really very welcome combatting some of the nonsense that comes out of Fauci," Stephen Moore, a White House economic adviser, reportedly said. (The White House denies that "the President, the White House, or anyone in the Administration has pursued or advocated for a strategy of achieving herd immunity.")

Birx and Atlas had it out in the Oval Office, in front of Trump. Birx accused Atlas of costing American lives with his unfounded theories. Atlas cursed her. Birx, who spent twenty-eight years in the Army, gave it right back. Atlas said that young, asymptomatic people shouldn't be tested, adding, "She just wants to lock them down and not let them live their lives." They kept shouting at each other, but Trump was undisturbed and didn't take either side. "It's all reality TV to him," one of Birx's colleagues said.

After the confrontation, Birx demanded that Pence remove Atlas, but Pence declined. The task force began to dissolve after Atlas took a seat.

When Birx was working in Africa, she and her chief epidemiologist, Irum Zaidi, had met with Presidents and village elders across the continent, learning the value of personal diplomacy. The two scientists decided to take an American road trip together. The contagion had moved from the coasts to the heartland. In June, when the virus suddenly gripped Texas, Birx and Zaidi travelled to Dallas to meet with Governor Greg Abbott. Abbott's dithering response to the pandemic had led to attacks by Democrats—who noted that the death rate soared when he lifted restrictions too soon—and by Republicans, who called him a tyrant for imposing any restrictions at all. At a press conference, Birx urged Texans to mask up, especially young people. "If they're interacting with their parents and grandparents, they should wear a mask," she said. "No one wants to pass the virus to others." She praised Abbott for closing bars, knowing that he was being pressured to fully open the economy. Abbott soon issued a mask mandate.

Zaidi grew up in Atlanta, and her father was a C.D.C. statistician. On vacations, they took long car trips, a passion passed along to Zaidi. She loves to drive—fast. As they were leaving Dallas, a state trooper pulled her over. She'd been doing a hundred and ten.

"Little lady, what's the hurry?" he asked.

Zaidi explained that they'd just met Governor Abbott, and New Mexico's governor was next. "Surely you recognize Dr. Birx," she said.

The trooper let them off.

Soon after their visit to New Mexico, Governor Michelle Lujan Grisham announced a hundred-dollar fine for going maskless in public. Birx and Zaidi proceeded to Arizona and met with Governor Doug Ducey. Birx explained that even a small increase in the percentage of positivity—going from 3.5 to five per cent—could spark an unmanageable crisis. Ducey soon declared, "If you want to participate in *any* good or service in Arizona, you're going to wear a mask."

Birx and Zaidi racked up twenty-five thousand miles as they crossed the country eight times, visiting forty-three states, many more than once. They saw the rural areas and the cities, red America and blue America. They drove past cotton farms and soybean fields, but they also saw derelict oil rigs and abandoned factories, remnants of a vanishing industrial age. There were gleaming cities, bold and glassy, with construction cranes crowning the skyline, and broken towns, tumbling in decay, with all the promise bled out of them.

The women, who got regular *COVID* tests, established their own protocols. They cleaned rental cars and motel rooms with Clorox Wipes. In the morning, early, they'd pick up coffee and pastries at Starbucks. Lunch was often peanut butter spread on bread with a plastic knife. Dinner was served at a drive-through window. Baristas and gas-station attendants were useful informants of community outbreaks and served as indicators of local mask compliance. Birx and Zaidi met mayors and community organizers; they visited hospitals and nursing homes; they turned H.I.V. activists

into *COVID* activists. In Atlanta, they urged officials to test migrants working on chicken farms. They visited more than thirty universities. Those which conducted mandatory weekly testing of students had positivity rates below one per cent; at schools where only symptomatic people were tested, positivity rates were twelve to fifteen per cent. Republican and Democratic governors made the same complaint: many people wouldn't listen as long as Trump refused to set an example.

One of the most effective governors Birx and Zaidi encountered was Jim Justice, of West Virginia. He issued a mask mandate, and in press briefings he read out the names of West Virginians who had died of *COVID*. He urged residents to "be great, loving neighbors." The state developed a plan to safely reopen schools by constantly assessing the level of risk in every county and presenting these data on a color-coded map. "It's something that every county and every state can do," Birx said. "West Virginia represents exactly what we want to see across the country—a commonsense approach based on the data."

A pandemic lays bare a society's frailties. Birx and Zaidi saw a nation that was suffering from ill health even before *COVID* attacked, where forty per cent of adults are obese, nearly half have cardiovascular disease, and one in thirteen has asthma. They visited reservations and met with Native Americans, who have been particularly ravaged by *COVID*. The Salt River Pima-Maricopa Indian Community, in Arizona, gave Birx a mask inscribed with the Salt River tribe's shield. When North Dakota recorded the nation's highest rate of infection, Birx met with the governor, Doug Burgum, and with local, state, and tribal officials. Birx scolded them: "This is the *least* use of masks that we have seen in retail establishments of any place we have been." She added, "It starts with the community, and the community deciding that it's important for their children to be in school, the community deciding that it's important not to infect the nursing-home staff who are caring for their residents." Burgum eventually agreed to a mask mandate. In South Dakota, Governor Kristi Noem couldn't find the time to meet with Birx.

For nearly six months, Birx corralled politicians, hospital executives, and public-health officials, often bringing such leaders together for the first time. She took charts and slides from state to state, promoting a simple, consistent message about masks, social distancing, transparency, and responsible leadership. She was the only federal official doing so.

One day in October, Birx and Zaidi were eating lunch at a roadside stop in Utah, beside the Bonneville Salt Flats, where land speed records are often set. The salt stretched out like a frozen sea.

They'd rented a blue Jeep Wrangler. "We have to go off-road, for just a minute," Zaidi said. Birx gazed at the great white emptiness. "As long as you don't hit anybody," she said.

17. Dark Shadows

I asked Dr. Fauci about the global-preparedness study calling America the nation best prepared for a pandemic. What happened? He emitted a despairing laugh and said, "We never got back to baseline"—the point when the contagion had been reduced enough to allow contact tracing to minimize spread. "It could be the fact that we didn't have a uniform strategy," he went on. "It could be our own culture right now, of people not wanting to be told what to do. The guidelines say 'Don't go to bars. Wear a mask.' And you look at the pictures in the newspaper and on TV and you see large crowds of mostly young people, not wearing masks."

Fauci, who has led *niaid* through six Administrations, has never seen this level of distrust and anger in the country. "Political divisiveness doesn't lend itself to having a coördinated, coöperative, collaborative response against a common enemy," he said. "There is also this pushback in society against anything authoritative, and scientists are perceived as being authority, so that's the reason I believe we have an anti-science trend, which leads to an anti-vaccine trend." Even with an effective vaccine—or several of them—social resistance could delay the longed-for herd immunity.

I asked Fauci if he'd been threatened. "Oh, my goodness," he said. "Harassing my wife and my children. It's really despicable. It's this dark-Web group of people who are ultra-ultra-ultra-far-right crazies. They somehow got the phone numbers of my children, they've tracked them where they work, they've harassed them with texts, some threatening, some obscene. We have gotten multiple death threats, my wife and I." He sighed and said, "It is what it is."

"Buy ammunition, ladies and gentlemen, because it's going to be hard to get," Michael Caputo warned, in a rambling Facebook Live event on September 13th. Caputo is an Assistant Secretary of Health and Human Services, and focusses on public affairs. He controls the flow of information from America's public-health establishment: the C.D.C., the F.D.A., and the N.I.H. Trump appointed Caputo to the post in April, when *COVID* was out of control; competence and transparency were needed to restore public trust. Caputo had no public-health expertise, and he claimed that his best friend was the notorious political operative Roger Stone.

Evidently, all the President wanted Caputo to do was reinforce his message that the virus wasn't as dangerous as scientists claimed, and that the crisis was under control. Caputo presided over interventions by H.H.S. that meddled with the C.D.C.'s guidelines—apparently, to get case numbers down and stanch the flow of bad news. Trump asked Caputo to lead a campaign to "defeat despair," which encouraged celebrities to endorse the Administration's laissez-faire approach. To fund the campaign, Caputo snatched three hundred million dollars from the C.D.C.'s budget.

Meanwhile, his science adviser, Paul Alexander, a part-time professor at a Canadian university, pushed an alternative plan: herd immunity. "It only comes about allowing the non-high risk groups to expose themselves to the virus," Alexander wrote to Caputo, in an e-mail obtained by Politico. "We want them infected."

Caputo's efforts met with resistance from Fauci and others, and he felt under siege. In the Facebook video, he was unshaven, sitting outside his house in Buffalo. "There are scientists working for this government who do not want America to get better," he said. "It must be all bad news from now until the election." He stared into space. "This is war. Joe Biden is *not going to concede*. The Antifa attacks, the murders that have happened, the rallies that have turned into violence—this is all practice."

Such embattled thoughts were shared by Adam Fox. A powerfully built man with a trim brown beard and a square face, he helped lead a militia called the Michigan Three Percenters—a reference to their belief that only three per cent of American colonists took up arms against Britain in the Revolutionary War.

In a strip mall in Grand Rapids, a shop called the Vac Shack sells and services vacuum cleaners. Fox, a former employee, had been kicked out of his girlfriend's house and was homeless. The shop's owner let Fox sleep in the basement. That's where he allegedly began plotting to kidnap Gretchen Whitmer, Michigan's governor, who had enforced tough lockdown measures.

In June, at a gun-rights rally in Lansing, Fox met with members of a militia, the Wolverine Watchmen, who planned to kill police officers. They were infuriated by Whitmer's *COVID* restrictions, but, even before the pandemic, they'd been prone to anger. "I'm sick of being robbed and enslaved by the state," one of the conspirators complained, after receiving a ticket for driving without a license. Fox allegedly told the Watchmen that he was recruiting for an operation targeting the state capitol. He needed two hundred men to storm the building and abduct politicians, including Whitmer, whom Fox called a "tyrant bitch." Although the plotters were mostly unemployed or in low-paying jobs, they spent thousands of dollars on a Taser and night-vision goggles, and were planning to spend thousands more on explosives. They were plainly inspired by Trump's disparaging of Whitmer for shutting down her state. "*liberate michigan*!" the President had once tweeted.

The F.B.I. learned of the scheme, and arrested the conspirators in October. In a statement, Whitmer singled out Trump, who, in a recent debate with Biden, had refused to explicitly condemn right-wing, white-supremacist violence. "Words matter," she said. "When our leaders meet with and encourage domestic terrorists, they legitimize their actions and they are complicit."

Trump tweeted that "My Justice Department and Federal Law Enforcement" had foiled the plot, adding, "Rather than say thank you, she calls me a White Supremacist." He commanded Whitmer, "Open up your state."

On Michael Caputo's Facebook video, he sighed deeply. "I don't like being alone in Washington," he said. "The shadows on the ceiling in my apartment, there alone, those shadows are so long."

Soon afterward, he went on medical leave.

18. The Rose Garden Cluster

On September 26th, eight days after the death of Supreme Court Justice Ruth Bader Ginsburg, Trump nominated her successor, Amy Coney Barrett, in a White House ceremony. The Reverend John Jenkins, the president of the University of Notre Dame, where Barrett had taught law, recalled, "We were required to wear a mask at entry and, after going through security, were immediately taken to a room and administered a nasal swab for a *COVID* test." Once a negative result came back, guests could remove their masks. "I assumed that we could trust the White House health protocols," Jenkins said. He regretted his decision: "I unwittingly allowed myself to be swept up very publicly into the image of a White House that sometimes seemed to disregard scientific evidence and minimize the threat of the pandemic."

Guests were ushered to the Rose Garden, where there were two hundred assigned seats. Barrett spoke briefly. "Movement conservatives were very happy," Mike Lee, the Republican senator from Utah, recalled. Friends who hadn't seen one another for months reunited, he said, which "added to the jovial atmosphere." Afterward, dozens gathered in the Diplomatic Reception Room to meet the Barrett family.

That day, seven hundred and sixty-nine American deaths from *COVID* were recorded—down from the spring peak, on April 15th, of twenty-seven hundred and fifty-two. Despite the absence of miracle drugs, the death rate for hospitalized patients had fallen significantly. In part, this was because the average age of patients was lower, but the improved chances of survival were also the result of flattening the curve, which gave doctors and scientists the time to devise more effective treatments, such as proning. The infection rate, however, was harder to slow. The number of cases per day, which had topped seventy-five thousand in mid-July, had faded a bit in the late summer, but it was again rounding upward. After months of being more careful, Americans had apparently let down their guard.

The White House refused to say when the President had last been tested before the Rose Garden event. He had just made multiple campaign stops, in Florida, Georgia, and Virginia. More than a dozen guests—including Reverend Jenkins, Senator Lee, the former New

Jersey governor Chris Christie, and the former Presidential adviser Kellyanne Conway—soon tested positive. Without knowing Trump's testing history, no one can say when he contracted the disease or how many people he might have infected. The full extent of the Rose Garden cluster will never be known. Fauci labelled it a superspreader event.

Despite his germophobia, Trump is proud of his immune system, boasting on multiple occasions that he never gets the flu. But *COVID* hit him hard. According to *New York*, he told a confidant, "I could be one of the diers." A friend from the real-estate world, Stanley Chera, had died from it. "He went to the hospital, he calls me up," Trump recounted after Chera's death. "He goes, 'I tested positive.' I said, 'Well, what are you going to do?' He said, 'I'm going to the hospital. I'll call you tomorrow.' He didn't call." *Vanity Fair* reported that Trump developed heart palpitations. He asked aides, "Am I going out like Stan Chera?"

Hospitals are often portals to the graveyard, and that has been especially true during the pandemic. But Trump, who received a series of cutting-edge therapies, including monoclonal antibodies, was ready to return to the White House after three days. According to the *Times*, he considered hobbling out of the hospital and then yanking open his shirt to reveal a Superman logo. In the event, he saved his drama for the moment he stood again on the Truman Balcony and ripped off his surgical mask.

"Don't be afraid of *COVID*," he tweeted afterward. "Don't let it dominate your life."

19. Survivors

After Amy Klobuchar dropped out of the Presidential race, she was on Biden's shortlist for his running mate. George Floyd's death put an end to that. She had begun her career twenty years earlier as the district attorney in Minneapolis, earning a reputation for being tough on crime but light on police misconduct. On June 18th, she asked Biden to take her name off his list and urged him to select a woman of color as his running mate.

That day, she learned that her ninety-two-year-old father, Jim Klobuchar, had *COVID*. He was a retired newspaper columnist, and known to everyone in Minneapolis, especially cops and bartenders. Full of adventure, he was also often full of alcohol. When Amy was a young lawyer, her father was arrested for drunk driving. In a closed hearing, she encouraged him to take responsibility and plead guilty. He did so, and finally got sober. Now this vigorous old man, so troubled and so beloved, had *COVID*—and Alzheimer's. When Klobuchar visited him, at an assisted-living facility, they were separated by a window, and she believed that it would be her final glimpse of him alive. He recognized her, but couldn't understand why they had to remain separated. He sang to her: "Happy Days Are Here Again." He has since recovered.

Among the many awful legacies that *COVID* will leave, one blessing is that our understanding of coronaviruses, and the tools to counter them, has been transformed. Much of that progress will be because of Barney Graham, Jason McLellan, and other scientists who have spent their careers building to this moment.

There has never been such an enormous, worldwide scientific effort so intently focussed on a single disease. More than two hundred vaccines are in various stages of development. On December 11th, the F.D.A. granted its first Emergency Use Authorization for a *COVID* vaccine. Created by Pfizer, in partnership with the German firm BioNTech, it uses the modified protein that Graham and McLellan designed. In its third and final human trial, it was deemed ninety-five per cent effective. Giant quantities of the vaccine had been prepared in advance of F.D.A. approval. "Our goal is more than a billion doses by the end of 2021," Philip Dormitzer, Pfizer's chief scientific officer for viral vaccines, told me. The first employee at U.Va.'s hospital to get the Pfizer inoculation was Ebony Hilton. Operation Warp Speed, the government initiative to accelerate vaccine development, may prove to be the Administration's most notable success in the pandemic.

Moderna's vaccine secured approval next. Its formulation proved to be 94.1 per cent effective in preventing infection and, so far, it has been a hundred per cent effective in preventing serious disease. Graham is happy that he chose to work with Moderna. In 2016, his lab developed a vaccine for Zika, a new virus that caused birth defects. His department did everything itself: "We developed the construct, we made the DNA, we did Phase I clinical trials, and then we developed the regulatory apparatus to take it into Central and South America and the Caribbean, to test it for efficacy." The effort nearly broke the staff. Moderna was an ideal partner for the *COVID* project, Graham told me. Its messenger-RNA vector was far more potent than the DNA vaccine that Graham's lab had been using.

In another major development, Eli Lilly recently received an Emergency Use Authorization for a monoclonal antibody that is also based on the spike protein that Graham and McLellan designed. It is similar to the treatment that President Trump received when he contracted *COVID*.

Graham had been in his home office, in Rockville, Maryland, when he got a call telling him that the Pfizer vaccine was breathtakingly effective—far better than could have been hoped for. "It was just hard to imagine," he told me. He walked into the kitchen to share the news with his wife. Their son and grandchildren were visiting. "I told Cynthia, 'It's working.' I could barely get the words out. Then I just had to go back into my study, because I had this major

relief. All that had been built up over those ten months just came out." He sat at his desk and wept. His family gathered around him. He hadn't cried that hard since his father died.

Graham and his colleagues will not become rich from their creation: intellectual-property royalties will go to the federal government. Yet he feels amply rewarded. "Almost every aspect of my life has come together in this outbreak," he told me. "The work on enhanced disease, the work on RSV structure, the work on coronavirus and pandemic preparedness, along with all the things I learned and experienced about racial issues in this country. It feels like some kind of destiny."

More than a thousand health-care workers have died while taking care of *COVID* patients. Nurses are the most likely to perish, as they spend the most time with patients. On June 29th, Bellevue held a ceremony to memorialize lost comrades. Staff members gathered in a garden facing First Avenue to plant seven cherry trees in their honor.

As the coronavirus withdrew from Bellevue, it left perplexity behind. Why did death rates decline? Had face masks diminished the viral loads transmitted to infected people? Nate Link thinks that therapeutic treatments such as remdesivir have been helpful. Remdesivir cuts mortality by seventy per cent in patients on low levels of oxygen, though it has no impact on people on ventilators. Amit Uppal told me that the hospital has improved at managing *COVID*. "We now understand the potential courses of the disease," he said. Doctors have become more skilled at assessing who requires a ventilator, who might be stabilized with oxygen, who needs blood-thinning medication. Then again, the main factor behind superior outcomes may be that patients now tend to be younger.

When a patient is discharged, the event offers a rare moment for the staff to celebrate. On August 4th, a beaming Chris Rogan, twenty-nine years old, was wheeled by his wife, Crystal, through a gantlet of cheering health-care workers, in scrubs and masks. There were balloons and bouquets. After so much death, a miracle had occurred.

Rogan was an account manager for a health-insurance firm in midtown. Crystal was a teaching assistant. In late March, he developed a low-grade fever and stomach discomfort, but he wasn't coughing. His doctor said that he probably had the flu. Rogan grew increasingly lethargic. He developed pneumonia. An ambulance took him to Metropolitan Hospital, on the Upper East Side. He still felt O.K., even when his oxygen level fell to sixty-four per cent. An hour after he checked in, he couldn't breathe. He was placed in a medically induced coma and intubated for nine days. During that time, the ventilator clogged and Rogan's heart stopped for three minutes. When he was brought back to consciousness, a doctor asked, "Did you see anything while you were dead?"

"No," Rogan said. "I don't even remember being resuscitated."

He began experiencing what hospital staffers told him was I.C.U. psychosis. He told Crystal that he'd been stabbed as a child. He began conversing with God. Just before he was intubated again, on April 15th, he felt certain that he would die in the hospital. He didn't wake up for sixty-one days.

During that time, he was transferred to Bellevue, which was better equipped to handle him.

It's a mistake to think that a patient in a coma is totally unaware. Rogan swam in and out of near-consciousness. When his doctor came in, he tried to talk to him: "Why am I awake? Why can't I move?" He couldn't sleep, because his eyes were partly open. "It's like being buried alive," he told me.

His tenth wedding anniversary passed. Sometimes he heard Crystal's voice on video chat. "I hear you," he'd say, but she couldn't hear him. "I feel the tube down my throat, tell them to take me off the vent." A machine kept pumping oxygen into his lungs: *psht! psht! psht!* The sound pounded in his head. He would dream that he had left the hospital, then wake to find himself still there, the ventilator pumping away. "It was fucking torture," he said.

He developed internal bleeding. Clots formed in his legs. He told God that he didn't want to die—that he had too much left to do. God assured him that he was going to make it.

Crystal was charged with making choices for Rogan's care. The hardest one was the decision to amputate his right leg. It took three days to get him stable enough to perform the operation, which had to be done at his bedside, because he was too fragile to move. The doctors performed a guillotine amputation, just below the knee. Eight days later, they had to take off the knee.

Rogan doesn't remember any of that. Some days, he is elated to be alive; other times, he asks himself, "What kind of quality of life is this?" Whether or not it was I.C.U. psychosis, he's clung to the experience of talking with God.

When he emerged from the coma, he couldn't move his arms, but now his right hand is functional. After several weeks of rehab, he can walk a bit with a prosthetic leg.

When he fell ill, there were only a hundred and fifty thousand cases in the U.S. When he left the hospital, there were more than four million.

The death toll kept mounting, surpassing three hundred thousand at year's end. Some victims were famous. The playwright Terrence McNally was one of the first. The virus also killed Charley Pride, the first Black singer in the Country Music Hall of Fame, and Tom Seaver, one of the greatest pitchers in baseball history. Eighty per cent of fatalities have been in people aged sixty-five or older, and most victims are male. It's been strange to find

myself in the vulnerable population. I'm a year younger than Trump, so his adventure with *COVID* was of considerable interest to me. If I get ill, I'm not likely to receive the kind of treatment the President did, but I'm in better physical condition, despite a bout of cancer. My wife, though, has compromised lungs. Even before the coronavirus put a target on our age group, mortality was much on my mind. Sometimes I'm dumbstruck by how long I've lived; when I'm filling out a form on the Internet, and I come to a drop-down menu for year of birth, the years fly by, past the loss of parents and friends, past wars and assassinations, past Presidential Administrations.

On September 9th, our grandchild Gioia was born. She is the dearest creature. We stare into each other's eyes in wonder. Even in this intimate moment, though, the menace of contagion is present: we are more likely to infect the people we love than anyone else. Deborah Birx has recalled that, in 1918, her grandmother, aged eleven, brought the flu home from school to her mother, who died of it. "I can tell you, my grandmother lived with that for eighty-eight years," she said.

Even before the election, Matt and Yen Pottinger had decided that they were tired of Washington. He was burned out on the task force, which had drifted into irrelevance as the Administration embraced magical thinking. They drove west, looking for a new place to live, and settled on a ski town in Utah. Matt will join Yen there once he wraps up his job in Washington.

Pottinger's White House experience has made him acutely aware of what he calls "the fading art of leadership." It's not a failure of one party or another; it's more of a generational decline of good judgment. "The élites think it's all about expertise," he said. It's important to have experts, but they aren't always right: they can be "hampered by their own orthodoxies, their own egos, their own narrow approach to the world." Pottinger went on, "You need broad-minded leaders who know how to hold people accountable, who know how to delegate, who know a good chain of command, and know how to make hard judgments."

At the end of October, before returning to D.C., Pottinger went on a trail ride in the Wasatch Range. As it happened, Birx was in Salt Lake City. Utah had just hit a record number of new cases. On the ride, an alarm sounded on Pottinger's cell phone in the saddlebag. It was an alert: "Almost every single county is a high transmission area. Hospitals are nearly overwhelmed. By public health order, masks are required in high transmission areas."

Pottinger said to himself, "Debi must have met with the governor."

C*ovid* has been hard on Little Africa. "Some of our church members have passed, and quite a few of our friends," Mary Hilton, Ebony's mother, told me recently. "We just buried one yesterday. They're dropping everywhere. It's so scary." A cousin is in the hospital.

"One out of eight hundred Black Americans who were alive in January is now dead," Hilton told me. "There would be another twenty thousand alive if they died at the same rate as Caucasians." She added, "If I can just get my immediate family through this year alive, we will have succeeded." She and two colleagues have written a letter to the Congressional Black Caucus proposing the creation of a federal Department of Equity, to address the practices that have led to such disparate health outcomes.

Infected people keep showing up at U.Va.'s hospital at a dismaying pace. Hilton recently attended the hospital's first lung transplant for a *COVID* patient. He survived. Lately, more young people, including children, have populated the *COVID* wards. Hospitals and clinics all over the country have been struggling financially, and many health-care workers, including Hilton, have taken pay cuts.

Thanksgiving in Little Africa is usually a giant family reunion. Everyone comes home. There's one street where practically every house belongs to someone in Hilton's family; people eat turkey in one house and dessert in another. Hilton hasn't seen her family for ten months. She spent Thanksgiving alone in Charlottesville, with her dogs.

Thanksgiving was Deborah Birx's first day off in months. She and her husband have a house in Washington, D.C., and her daughter's family lives in nearby Potomac, Maryland. During the pandemic, they have been a pod. Recently, Birx bought another house, in Delaware, and after Thanksgiving she, her husband, and her daughter's family spent the weekend there.

Her access to the President had been cut off since the summer, and, with that, her ability to influence policy. She had become a lightning rod for the Administration's policies. Then, in December, a news report revealed that she had travelled over the Thanksgiving weekend, counter to the C.D.C.'s recommendation. She was plunged into a cold bath of Schadenfreude. Old photographs resurfaced online, making it look as if she were currently attending Christmas parties.

Birx indicated that she might soon leave government service.

20. Surrender

Austin bills itself as the "Live Music Capital of the World," but the bars and dance halls are largely closed. Threadgill's, the roadhouse where Janis Joplin got her start, is being torn down. The clubs on Sixth Street, Austin's answer to Bourbon Street, haven't been open for months. A band I play in has performed in many of them, but for the past several years we had a regular gig at the Skylark Lounge, a shack tucked behind an auto-body shop. Johnny LaTouf runs the place with his ex-wife, Mary. It's been shut since March 15th.

"All small businesses have been affected, but music venues around the country were already in a struggle," Johnny told me. He's had to let go his ten employees—including three family members. That's only part of the damage. "When the musicians get laid off and the bands disperse and go their separate ways, then you've actually broken up *their* business." He added, "*COVID* killed off more than people with preëxisting conditions. Lots of businesses have preëxisting conditions."

Lavelle White, born in 1929, was still singing the blues at Skylark until the doors closed. "Some of our greater musicians are older, because it takes a lifetime to master the craft," Johnny said. Skylark was a mixing bowl where younger musicians learned from their elders. "Now that pathway is broken."

When Congress passed the *CARES* Act, which included money to support small businesses, local bars were not a priority. "There's no money," Johnny said Wells Fargo told him. He helps several older musicians with groceries, but he doesn't know how many in that crowd will ever return. Some have died from *COVID*.

Two qualities determine success or failure in dealing with the *COVID* contagion. One is experience. Some places that had been seared by past diseases applied those lessons to the current pandemic. Vietnam, Taiwan, and Hong Kong had been touched by *sars*. Saudi Arabia has done better than many countries, perhaps because of its history with *mers* (and the fact that many women routinely wear facial coverings). Africa has a surprisingly low infection rate. The continent's younger demographic has helped, but it is also likely that South Africa's experience with H.I.V./*AIDS*, and the struggle of other African countries with Ebola, have schooled the continent in the mortal danger of ignoring medical advice.

The other quality is leadership. Nations and states that have done relatively well during this crisis have been led by strong, compassionate, decisive leaders who speak candidly with their constituents. In Vermont, Governor Phil Scott, a Republican, closed the state early, and reopened cautiously, keeping the number of cases and the death toll low. "This should be the model for the country," Fauci told state leaders, in September. If the national fatality rate were the same as Vermont's, some two hundred and fifty thousand Americans would still be alive. Granted, Vermont has fewer than a million people, but so does South Dakota, which was topping a thousand cases a day in November. Scott ordered a statewide shutdown in March, which caused an immediate economic contraction. Governor Noem opposed mandates of any sort, betting that South Dakotans would act in their best interests while keeping the economy afloat. Vermont's economy has recovered, with an unemployment rate of 3.2 per cent—nearly the same as South Dakota's. But South Dakota has seen twelve times as many deaths.

In Michigan, the state's chief medical officer, Joneigh Khaldun, is a Black emergency-room doctor. "She was one of the first to look at the demographics of *COVID* and highlight that we have a real racial disparity here," Governor Whitmer told me. "Fourteen per cent of our population is Black, as were forty per cent of the early deaths." The state launched an aggressive outreach to Black communities. By August, the rates of both cases and fatalities for Blacks were the same as—or lower than—those for whites. The vast differences in outcomes among the states underscore the absence of a national plan. The U.S. accounts for a fifth of the world's *COVID* deaths, despite having only four per cent of the population.

In August, the Pew Research Center surveyed people from fourteen advanced countries to see how they viewed the world during the pandemic. Ninety-five per cent of Danish respondents said that their country had handled the crisis capably. In Australia, the figure was ninety-four per cent. The U.S. and the U.K. were the only countries where a majority believed otherwise. In Denmark, seventy-two per cent said that the country has become more unified since the contagion emerged. Eighteen per cent of Americans felt this way.

On March 16th, Trump issued nationwide guidelines for closing schools, shutting down bars and restaurants, and limiting unnecessary travel and social gatherings. But that day marked a turning point. In his conversation with governors, he abandoned any effort to coalesce a national plan, and his Administration began undercutting governors' attempts to acquire P.P.E. Then, on April 3rd, Trump undermined the C.D.C.'s guidance on wearing masks: "You don't have to do it. *I'm* choosing not to do it. But some people may want to do it."

Trump, by his words and his example, became not a leader but a saboteur. He subverted his health agencies by installing political operatives who meddled with the science and suppressed the truth. His crowded, unmasked political rallies were reckless acts of effrontery. In his Tulsa speech, he said that he'd asked his health officials to "slow the testing down"—impeding data collection just to make his Administration look better. When the inevitable happened, and he contracted the disease, he almost certainly spread it. Every guest at the Barrett reception tested negative for the virus before entering. Trump may well have been the superspreader at the Rose Garden event.

The President could have tried to bring the country together. In the press conference where he said that he wouldn't wear a mask, he praised the efforts of the Democratic governors of New York and New Jersey; he expressed sympathy for Michiganders, who were "getting hit very, very hard." He announced federal efforts to aid New York City. "America is engaged in a historic battle to safeguard the lives of our citizens," he said. "Our greatest weapon is the

discipline and determination of every citizen to stay at home and stay healthy." The man who said those words might have been the President the country needed. But he was not that man.

He campaigned against Biden, but mainly he campaigned against the disease. "When the year started, he appeared unbeatable," Senator Lee told me. "My Democratic colleagues were discouraged about their chances. By the end of the impeachment trial, when we began hearing about the virus, we were not sure it would be a big deal. But it put an end to one of the things the President is best at—those big rallies." When Trump finally resumed them, defying medical advice, his fury was volcanic. "People are tired of hearing Fauci and all these idiots," he grumbled on October 19th, when the number of new cases exceeded sixty-five thousand. "*COVID*, *COVID*, *COVID*, *COVID*, *COVID*, *COVID*!" he said at a rally in North Carolina, five days later. "We're doing great. Our numbers are incredible." That day, nearly eighty thousand new cases were reported, overshadowing the highest levels of the summer. In Omaha, on October 27th, he said of *COVID*, "I'm here, right? . . . I had it." Hospitalizations were up forty-six per cent that month. He ignored the fever sweeping through the Mountain West and the Great Plains—Trump country. His slogan was both cynical and fatuous: "If I can get better, *anybody* can get better."

Infections often rose in counties where Trump held a rally. The surge in infections and deaths mocked his assertions that we were "rounding the turn." The disease stalked him; it encircled him. On October 25th, Trump's chief of staff, Mark Meadows, declared, "We are not going to control the pandemic." The Administration had given up.

COVID couldn't kill Donald Trump, but it could defeat him.

Five days before the election, Biden spoke at a drive-in rally in Tampa. "So much suffering, so much loss," he said. "Donald Trump has waved the white flag, abandoned our families, and surrendered to the virus." Honking cars punctuated his remarks. That day, new confirmed cases topped ninety thousand.

The next day, Fauci said, "All the stars are aligned in the wrong place as you go into the fall and winter season, with people congregating at home indoors. You could not possibly be positioned more poorly."

Halloween night in Austin was beautiful, graced with a blue moon. My wife and I set out a bowl of chocolate bars and Dum Dums, but there were scarcely any trick-or-treaters. As dusk settled over the city, when our neighborhood would normally be filled with fairies and vampires, a deer galloped down the street.

21. "GET HERE NOW"

America is full of strivers whose dreams seem just out of reach. Iris Meda was one of them. She had a big smile but sad eyes. She grew up in Harlem, the oldest of six children. Her mother was a domestic who was home only one day a week; her stepfather was a longshoreman. Meda's first bed was an ironing board.

Iris Meda had retired in January, after nearly four decades as a nurse, but couldn't stand being idle during the crisis.Photograph courtesy Selene Meda-Schlamel

For most of her childhood, she was the family caretaker, walking her siblings to school before she went herself. Like many of her high-school friends, she dropped out after a bout of depression. She married and had two daughters. Meda eventually got a G.E.D. and surprised herself by graduating at the top of her class from Bronx Community College. In 1984, she earned a nursing degree from City College. Medicine fascinated her. She would go home and talk about watching a surgeon massage a patient's heart. She was drawn to those who were wounded or hurting—people who felt that the world wasn't big enough for them. For years, she was a nurse at the Rikers Island jail. She cared about the prisoners, and they knew it. When her husband was transferred to Dallas, she gave notice, and on her last day the inmates clapped her out. "She was always looking for an underdog to pull up, because she was an underdog," her daughter, Selene Meda-Schlamel, said.

Meda retired in January, after two years in the North Texas Job Corps. She had been in charge of on-site care, meaning that she was on call nights and weekends, and when she turned seventy she decided that she'd had enough. She and Selene had big plans. Meda wanted to travel; she wanted to ride in a convertible for the first time; she talked about writing a book. "In March, it all came to a screeching halt," Selene told me. Her mother was still a proud New Yorker, so she spent a lot of time in front of the TV watching Dr. Fauci and Governor Cuomo. "Her knowledge of science kept her ahead of the news reports," Selene said. Meda, having worked in nursing homes, hospitals, and jails, knew that *COVID* would be devastating for people who were confined, and for those who took care of them.

Meda couldn't stand being idle during the crisis. "She wanted to teach," Selene said. "She wanted to encourage younger nurses to continue their education. She wanted them to reach their full potential in a way she almost didn't." Meda successfully applied for a job at Collin

College, in Allen, Texas. At the time, courses were being offered virtually, and Meda imagined that she would be teaching online in the fall. When the semester began, she learned that many classes were in-person. According to the local NPR station, the college's president, H. Neil Matkin, had made his views of the virus known in an e-mail to trustees: "The effects of this pandemic have been blown utterly out of proportion across our nation."

Meda hoped to be in a large classroom where students could be widely spaced, but she was assigned to teach a lab for a nurse's-aide course. There was no social distancing. On October 2nd, a student was coughing and sneezing, complaining of allergies. That day, Trump announced that he had *COVID*. Meda was repulsed when he insisted on taking a car ride to wave at his supporters outside the hospital, with Secret Service agents in the car with him. Meda texted Selene, "He's putting all those people at risk just for a photo."

On October 7th, Meda learned that the student had tested positive. The college chose to continue in-person classes even after one student died. By this time, Trump was out of the hospital, saying he felt "better than twenty years ago."

Meda became feverish on October 12th. Two days later, she tested positive and went to the E.R., but her oxygen level was not low enough for her to be admitted. On October 17th, Selene took her mom back to the hospital. Meda was seriously ill, but the staff, worried about *COVID*, kept her waiting outside, slumped over on a bench in the E.R. drive-through. When the triage nurse finally waved Meda in, Selene wasn't permitted to join her, because she had been exposed. Meda's oxygen level was now so low that she couldn't speak. Selene didn't see her again for thirty days.

During that period, Meda was able to speak only once on the phone. Most days, she texted with Selene. One day, she asked Selene to call a nurse who she thought was doing an excellent job. "She's having a hard day," Meda texted. She worried about her students and wondered if anyone else had caught the virus. (None showed symptoms.)

The disease progressed inexorably. Selene could tell that doctors were doing everything they could, but her mother's lungs wouldn't rebound. Selene wondered if things would be turning out differently had her mother received treatment earlier.

On November 14th, Selene got a call advising that her mother's blood pressure was plummeting. "Based on how she's declining, how long do we have?" Selene asked, thinking that she would pick up her father, so that he could say goodbye. "A couple hours," the doctor said. Ten minutes later, a nurse called and said, "Get here now."

"They put me in a helmet," Selene recalled. "There was a plastic flap that closed around my neck. Inside the helmet there was a fan at the top that blew air down, so that any air that got in would be flushed away. And they put a gown on me, and double gloves, and they let me go in and say goodbye to her. That was the biggest shock, to see her, and to see how she looked. She was twice her size, because she was swollen from steroids. Her tongue was swollen and hanging out the side of her mouth because she was on the ventilator—she'd been intubated. They had to brace her head to keep it straight on the pillow, and they had tape around her mouth to keep the tube in. I'll never forget it. But I think the thing that will haunt me is the smell. It's like the smell of decay, like she had already started to die.

"The thing that made it so hard to see that was to juxtapose it against President Trump out there, saying he felt like he was twenty-eight years old again and he never felt better. So how could the same thing that did this to her, how could someone ever take it for granted that this was nothing, you have nothing to be afraid of?"

Selene gathered her mother in her arms as the machines went silent.

My wife and I voted early, in a drop-off location in Travis County, where ninety-seven per cent of eligible voters were registered. It was a new way of voting—swift, efficient, and rather exhilarating. And yet the vote came amid a crescendo of bad news. The week before November 3rd, the country added half a million new *COVID* cases, reaching record highs in half the states. The stock market had its worst week since the swan dive in March. Eight million Americans had fallen into poverty since the summer. At least five members of Vice-President Pence's staff had been infected with *COVID*, as the virus continued to roam the White House.

In Texas, as in many Republican states, there were naked attempts to suppress the vote. Governor Abbott restricted the number of drop-off sites to one per county, including in Harris County, which has more than four million people. The attorney general, Ken Paxton, went to court to block the enforcement of a mask requirement at the polls, endangering voters as well as poll workers, who tend to be older. For the election, Abbott readied a thousand National Guard troops in major Texas cities, in anticipation of violence. Store owners in Dallas boarded up their windows, like beach communities awaiting a hurricane.

But there was no violence in Texas on Election Day. Voting is a simple act, and an act of faith. It is a pledge of allegiance to the future of the country. Across America, people waited in long lines to vote—despite the disease, despite attempts to discredit or invalidate their vote, despite postal delays, despite Russian or Iranian meddling, despite warnings from the White House that the President would not go quietly if he lost. They voted as if their country depended on it. ♦

***Lawrence Wright** has been a staff writer at The New Yorker since 1992. His most recent book is "The End of October."*

Who Is at Risk of Long COVID? Here's What Scientists Know So Far

By Frances Williams

Source: https://www.sciencealert.com/who-is-at-risk-of-long-covid-here-s-what-scientists-know-so-far

Jan 05 – For most people, infection with SARS-CoV-2 – the virus that causes COVID-19 – leads to mild, short-term symptoms, acute respiratory illness, or possibly no symptoms at all. But some people have long-lasting symptoms after their infection – this has been dubbed "long COVID".

Scientists are still researching long COVID. It's not well understood, though our knowledge about it is growing. Here I take a look at what we've learned about it so far – who is at risk, how common it is and what its effects are.

In defining who is at risk from long COVID and the mechanisms involved, we may reveal suitable treatments to be tried – or whether steps taken early in the course of the illness might ameliorate it.

Broad vulnerability

Long COVID is characterised by a constellation of symptoms, including – variably – shortness of breath, marked fatigue, headache, and loss of ability to taste and smell normally.

A relatively large study of 384 individuals ill enough to be admitted to hospital with COVID-19 showed that 53 percent remained breathless at a follow-up assessment one to two months later, with 34 percent having a cough and 69 percent reporting fatigue.

Indeed, early analysis of self-reported data submitted through the COVID Symptom Study app suggests that 13 percent of people who experience COVID-19 symptoms have them for more than 28 days, while 4 percent have symptoms after more than 56 days.

Perhaps unsurprisingly, people with more severe disease initially – characterised by more than five symptoms – seem to be at increased risk of long COVID. Older age and being female also appear to be risk factors for having prolonged symptoms, as is having a higher body mass index.

Those using the app tend to be at the fitter end of the population, with an interest in health matters. So it is surprising that such a high proportion have symptoms one to two months after the initial infection. Generally, these aren't people who are highly vulnerable to COVID-19.

Another piece of early research (awaiting peer review) suggests that SARS-CoV-2 could also have a long-term impact on people's organs. But the profile of those affected in this study is different to those reporting symptoms via the app.

This research, which looked at a sample of 200 patients who had recovered from COVID-19, found mild organ impairment in 32 percent of people's hearts, 33 percent of people's lungs and 12 percent of people's kidneys. Multiple organ damage was found in 25 percent of patients.

Patients in this study had a mean age of 44 years, so were very much part of the young, working-age population. Only 18 percent had been hospitalised with COVID-19, meaning organ damage may occur even after a non-severe infection. Having a disease known to lead to more severe COVID-19, such as type 2 diabetes and ischaemic heart disease, wasn't a prerequisite for organ damage either.

Finding out what's going on

There are many reasons why people may have symptoms months after a viral illness during a pandemic. But getting to the bottom of what's going on inside people will be easier for some parts of the body than others.

Where symptoms point to a specific organ, investigating is relatively straightforward. Clinicians can examine the electrical flow around the heart if someone is suffering palpitations. Or they can study lung function – tissue elasticity and gas exchange – where shortness of breath is the predominant symptom.

To determine whether kidney function has deteriorated, components in a patient's blood plasma are compared to those in their urine to measure how well the kidneys are filtering waste products.

Rather harder to explore is the symptom of fatigue. Another recent large-scale study has shown that this symptom is common after COVID-19 – occurring in more than half of cases – and appears unrelated to the severity of the early illness.

What's more, tests showed that the people examined didn't have elevated levels of inflammation, suggesting that their fatigue wasn't caused by continued infection or their immune system working overtime.

Risk factors for long-lasting symptoms in this study included being female – in keeping with the COVID Symptom App study – and, interestingly, having a previous diagnosis of anxiety and depression.

While men are at increased risk of severe infection, that women seem to be more affected by long COVID may reflect their different or changing hormone status. The ACE2 receptor that SARS-CoV-2 uses to infect the body is present not only on the surface of respiratory cells, but also on the cells of many organs that produce hormones, including the thyroid, adrenal gland and ovaries.
Some symptoms of long COVID overlap with menopausal symptoms, and hormone replacement using medication may be one route to reducing the impact of symptoms. However, clinical trials will be essential to accurately determining whether this approach is both safe and effective. Applications to launch such research have been made.
With so much having happened over the last year, we will need to tease apart which impacts stem from the virus itself versus which might be the consequence of the massive social disruption wrought by this pandemic.
What is clear, however, is that long-term symptoms after COVID-19 are common, and that research into the causes and treatments of long COVID will likely be needed long after the outbreak itself has subsided.

Frances Williams *is Professor of Genomic Epidemiology and Hon Consultant Rheumatologist @ King's College London.*

Experts Worry COVID-19 Vaccines May Not Work as Well Against The South African Variant

Source: https://www.sciencealert.com/experts-worry-that-the-covid-19-vaccine-may-not-work-as-well-against-south-african-variant

Jan 06 – A coronavirus variant identified in South Africa may not be as vulnerable to COVID-19 vaccines as other strains, some scientists say.
Studies are now underway to find out if that's actually the case.
If the variant, known as 501.V2, is resistant to available vaccines, the shots could be tweaked to boost their effectiveness — adjustments that would take about six weeks to make, vaccine developers told Reuters.
These developers included BioNTech CEO Dr Uğur Şahin and John Bell, Regius Professor of Medicine at the University of Oxford, who are currently running experiments with both 501.V2 and the new coronavirus variant identified in the UK, named B.1.1.7.
These experiments are so-called neutralizing assays — experiments in which they incubate the viruses with antibodies and human cells, to see if the antibodies prevent infection, The Associated Press (AP) reported.
They are running the tests with blood from vaccinated people and those who caught the virus and developed antibodies naturally, Dr. Richard Lessells, an infectious diseases expert who is working on South Africa's genomic studies of 501.V2, told the AP.
In general, it's not surprising that variants like 501.V2 and B.1.1.7 have emerged; all viruses pick up mutations as they make copies of themselves, and the novel coronavirus called SARS-CoV-2 is no exception.
However, while the two recently identified variants share a few similar mutations, and 501.V2 "has a number additional mutations ... which are concerning," Simon Clarke, an associate professor in cellular microbiology at the University of Reading, told Reuters.
Specifically, the variant found in South Africa has more mutations in its spike protein — which sticks out from the virus's surface and is used to invade human cells — than B.1.1.7 does, Lawrence Young, a virologist and professor of molecular oncology at Warwick University, told Reuters.
Most available vaccines train the immune system to recognize this spike protein. If the spike protein accumulates too many mutations, it may become unrecognizable to the immune system, allowing the virus to avoid detection in the body; this is the potential concern with the new variant 501.V2, Young said.
That said, neutralizing assays should soon reveal whether or not we need to worry. As of now, Public Health England, an executive agency of the Department of Health and Social Care, said that there is currently no evidence to suggest COVID-19 vaccines won't protect against both B.1.1.7 and 501.V2, Reuters reported.
In addition, several experts told *The New York Times* that it would likely take years, not months, for the coronavirus to mutate enough to outwit available vaccines.
"It is going to be a process that occurs over the time scale of multiple years and requires the accumulation of multiple viral mutations," Jesse Bloom, an evolutionary biologist at the Fred Hutchinson Cancer Research Center in Seattle, told *The Times*.
"It's not going to be like an on-off switch," in terms of how quickly new variants become resistant to current vaccines, he said.
In other words, vaccines might become gradually less effective over time, rather than suddenly not working.

Deaf, Blind & Dumb: COVID-19 & Lack of Reconnaissance

By Christopher Tantlinger

Source: https://www.domesticpreparedness.com/healthcare/deaf-blind-dumb-covid-19-lack-of-reconnaissance/

Jan 06 – The word "reconnaissance" conjures the image of sizing up the enemy and making a plan. Behind medieval history and WWII films about military battles across seas and foreign lands, military forces and commands strategized the battle with efforts revolving around reconnaissance. For many of those who diligently formulate and coordinate emergency response, planning, preparedness, mitigation, and recovery, and those who came out of the Civil Defense Era to build and mold modern emergency management, this pandemic response has elicited feelings of anger and a struggle between opinions and facts.

Pandemics are nothing new and yet lessons have still not been learned. Pandemics have profoundly affected communities, which have inevitably lived through them, albeit at great cost. Each of these has had devastating effects on humanity, lessons were supposedly learned, and preparations for the next pandemic began. At the end of each of these events, communities found a root cause mitigation, identified a measure of medicine or technology, or gained enlightenment on how to deal with the virus by advancing the human condition. Despite significant loss of life, extraordinary advancements have been made in healthcare coordination to manage future events.

Deaf

Somehow though certain stakeholders have not heeded the call to do better. Those in emergency management strive to learn from the devastation of past disasters and ensure a better response in the future. They bridge the disciplinary gaps and encourage collaboration. However, some agencies have become deaf to emergency management's calls to integrate healthcare and the basic tenets of incident command into coordination efforts during an emergency. Those who have been responding to devastating wildfires have efficiently and effectively used incident command for 50 years and the fire service and emergency management have implemented and used this effective system. It works because the stakeholders and response agencies coordinate on vision, determination, and a common pathway to recovery.

Forest fires require rapid decisions as the flames spread with a virulence, force, destruction, devastation to life, environmental ravages, etc. that can happen in minutes. Scientists and epidemiologists in the throes of a pandemic must also make rapid decisions, although not necessarily at the same speed as other disasters. Even so, much can be learned about incident command and applied to any disaster, including pandemics.

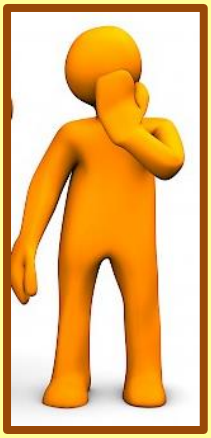
For months, the highest levels of decision making at the state health care level conducting pandemic status briefings have handed down orders that have left communities of dedicated healthcare providers at the local level devastated. The simplest of duties in an all-hazards situation is to communicate and understand that all disasters happen locally, and resolutions made by conversation can actually solve problems. In many healthcare settings, there has been a lack of understanding those affected and their needs: the bed count, those clinically fighting the virus, the personal protective equipment (PPE) needs, the resources available, the unused communication networks, the extended wait for information, the ideas for efficiency, local defined programming, and requests for just a simple answer. For many, the efforts felt futile and requests fell on deaf ears. Effective communication and a multi-level governance are necessary for navigating emergencies.

Blind

Data, technology, information, and towering display screens (some in high definition) all draw clear pictures when, and only when, it is scientifically populated with scholarly prescience and are used to represent the threat. This invaluable visual can be used to create a dashboard and summarize a threat matrix of the hazard and risk analysis to help prioritize the decision and create a clear vision of the path forward.

Unfortunately, some academics and agencies around the world utilized what is akin to a theatrical digital "apocalypse" showing the virus globally blotting out civilization. These visuals that promote situational awareness are nothing more than a representation of life imitating art. Pandemic movies and series show this virus spreading cinematically for effect in 102 minutes or less. However, portraying COVID-19 through this lens is wrong. True representations of the spread should not be used to create fear. Emergency management is not about fear, but rather about plans and recovery – making

communities whole again and returning life to or better than pre-disaster conditions.
When there is an earthquake, flood, forest fire, hurricane, or other manmade or natural hazard where damage assessments are immediately happening, the worst and hardest hit areas are identified and illustrated in emergency operation centers (EOC) or command posts. The number of casualties – real casualties – and those who may be affected and need care or assistance are all carefully defined, and resources are acquired and dispatched accordingly. Emergency managers can quickly draw an intimate map of what they know, what they think they know, and what they still need to know. Each EOC offers stakeholders a view of the true crisis map and consequential decision-making process for the event: the current situation, the next operational strategy, identified gaps, unmet needs, etc.
In contrast, for COVID-19, decisions have often been dictated by public health professionals engaging elected officials who have never sat in a strategy or planning meeting. These decisions have not been based on ground truths from the disaster and do not delineate between operations, planning, and oversight. Communities need those who know how to heal sick people and make policy decisions, but those subject matter specialists should use that expertise to unify in helping to mitigate the disaster but should not necessarily be the ones to direct the response.
So many graphs, pie charts, trajectories, formularies, spreadsheets, social media graphics, memes, overlays, spread factors, surge charts, threshold limiting, and condition postures have created a blindness to situational awareness. Emergency managers do not have consistent health department charts and diagrams for gaining clarity on the current status of the pandemic. This disaster/pandemic demonstrates a proximity blindness. Emergency managers have been conditioned to take an objective approach to properly display the current condition and subject threat. It is time to shed some light on this darkness.



Dumb (Taciturn)
The official definition of the word "dumb" is lacking intelligence, showing a lack of intelligence, or requiring no intelligence. Most will agree that many of the people dealing with this pandemic have, in fact, brilliant, passionate minds with thought-provoking ideas that hopefully will help guide future pandemic response and right any wrongs. As such, a more appropriate word would be "taciturn," which is defined as being reserved or uncommunicative.
Some academics and agencies around the world utilized what is akin to a theatrical digital "apocalypse" showing the virus globally blotting out civilization.
During the pandemic response, some elected officials, public health professionals, and emergency management bureaucrats have clearly been taciturn with regards to communicating locally on the disaster. This is not the time for reserved or talking heads who are uncommunicative, say little when questions or strategies are asked of them, share tactics that are nonexistent or poor at best, are non-committal, or lack the ability to make decisions. It should have been time for doubling down on collaboration, communication, and constructive conversations with diligent planning. The time to shine for emergency coordination fell flat. Everyone has to do better and realize that to do good means to do something. However, to do something means being smart and sticking within areas of strength and expertise. Emergency management, elected officials, and public health officials need to understand each other and be force multipliers rather than build a fortress that is deaf and blind to the threat. These leaders should combine forces to develop best practices in order to strike the threat and fight together.

COVID Reconnaissance
Reconnaissance can be defined in using the structure and breadth of the Planning P. Illustrated here, it can be called the Pandemic Planning P.

- *Incident threat* – January 2020, Center for Disease Control and Prevention announced the threat from Wuhan, China.
- *Notification* – Make the healthcare universe aware of the situation and begin reconnaissance.
- *Agency briefing* – After identifying a potential threat and doing reconnaissance, all key stakeholders should be brought together for an incident threat briefing. Provide briefing to health departments, government, and those that are adept at coordinating emergencies to set the stage for a unified command, including who the subject matter experts will be and what this will mean to those that affected.
- *Unified command* – This provides the foundation for the response, including the profound development of thought, the course forward, and setting the objectives.
- *Objectives* – In order to stop the pandemic, define objectives that are simple, manageable, achievable, realistic, and timely (SMART). Rather than directives and

cinematic references to the apocalypse, health departments should develop SMART objectives.

- *Initial strategy* – Formulate operations and resources and coordinate under the collective decision making of all key stakeholders. During the current pandemic response, a lack of defined objectives, strategy development, and decision-making exacerbated supply chain shortages. Local stakeholders recognized immediately that they must act and, when faced with roadblocks, had to find innovative ways to make their own PPE or repurpose PPE as necessary.
- *Coordination* – The critical next step in the cycle of emergency management is to perpetuate coordination and lead the scope and scale of the disaster response.
- *Tactics meeting* – Borne out of information sharing and gathering, the tactics meeting is the keystone to properly manage a disaster using continuous, relentless, coordinated, and collaborative information gathering and sharing.
- *Information gathering and sharing* – This represents the vessels, the skin, the bone, the blood, the fiber of every incident. It creates life to all strategies, plans, tactics, and operations for effectively navigating through the crisis. Information gathering and sharing must reach all levels, including the local level, which has been lacking in the COVID response.

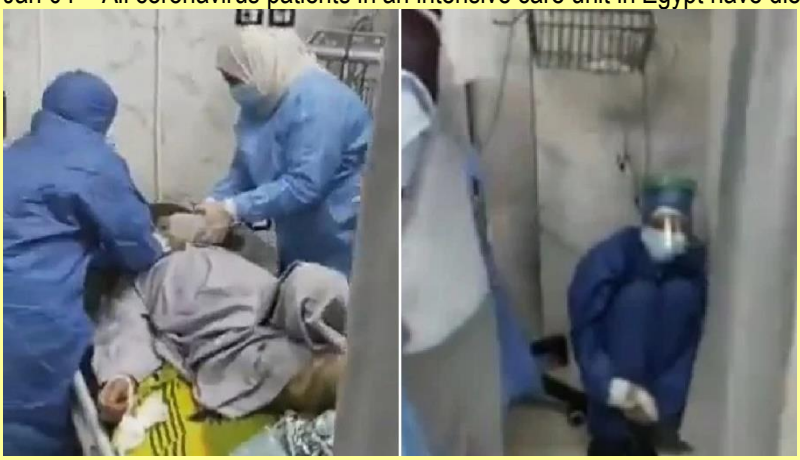
When governments, health departments, bureaucrats, and subject matter experts stand before those that they are committed to protect and simply denied to or did not understand how to manage a disaster, then the failure is compounded and recovery will be long and arduous. Emergency managers are complicit and need to stress at every opportunity that disasters will happen. It is not necessary to plan for an implicit disaster, but rather be students of all hazards and pioneers of resources. Reconnaissance is information gathering and sharing and the path for responding more effectively for the next pandemic. No key stakeholder can be deaf, blind, or dumb anymore.

Christopher Tantlinger *is the deputy emergency management coordinator, Westmoreland County Department of Public Safety, Pennsylvania. He serves as chief of the county HAZMAT team. He has 27 years in the fire service, is past president of the Fire Chief's Association of Westmoreland County, and is a proboard-certified HAZMAT technician. He serves as a rescue technician instructor for a rescue tool manufacturer. Activities include serving on the board of the Pennsylvania Association of Hazardous Materials Technicians. He is a cum laude honors graduate of Saint Francis University in Loretto, PA with a BS in criminal justice and holds a professional certification from the Pennsylvania Emergency Management Agency.*

Egypt: Entire ICU ward dies after oxygen supply fails

Source: https://www.middleeastmonitor.com/20210104-egypt-entire-icu-ward-dies-after-oxygen-supply-fails/

Jan 04 – All coronavirus patients in an intensive care unit in Egypt have died after the oxygen supply to the ward failed.



Footage captured by one of the patient's relatives taken at El Husseineya Central Hospital in Ash Sharqia province has gone viral online.

The cameraman's aunt, Fatima Al-Sayed Mohamed Ibrahim, 66, was among the patients being treated at the quarantine centre.

The incident happened after the oxygen level was almost below two per cent and there was neither enough pressure nor enough oxygen to save the patients' lives.

It is the second such incident to occur after patients in the ICU at Zefta General Hospital suffered the same fate.

The tragedy has underscored the corruption and negligence at the heart of Egypt's ruling government.

Egypt's Heath Minister Hala Zayed claimed that the patients didn't die due to lack of oxygen and accused the Muslim Brotherhood of spreading rumours.

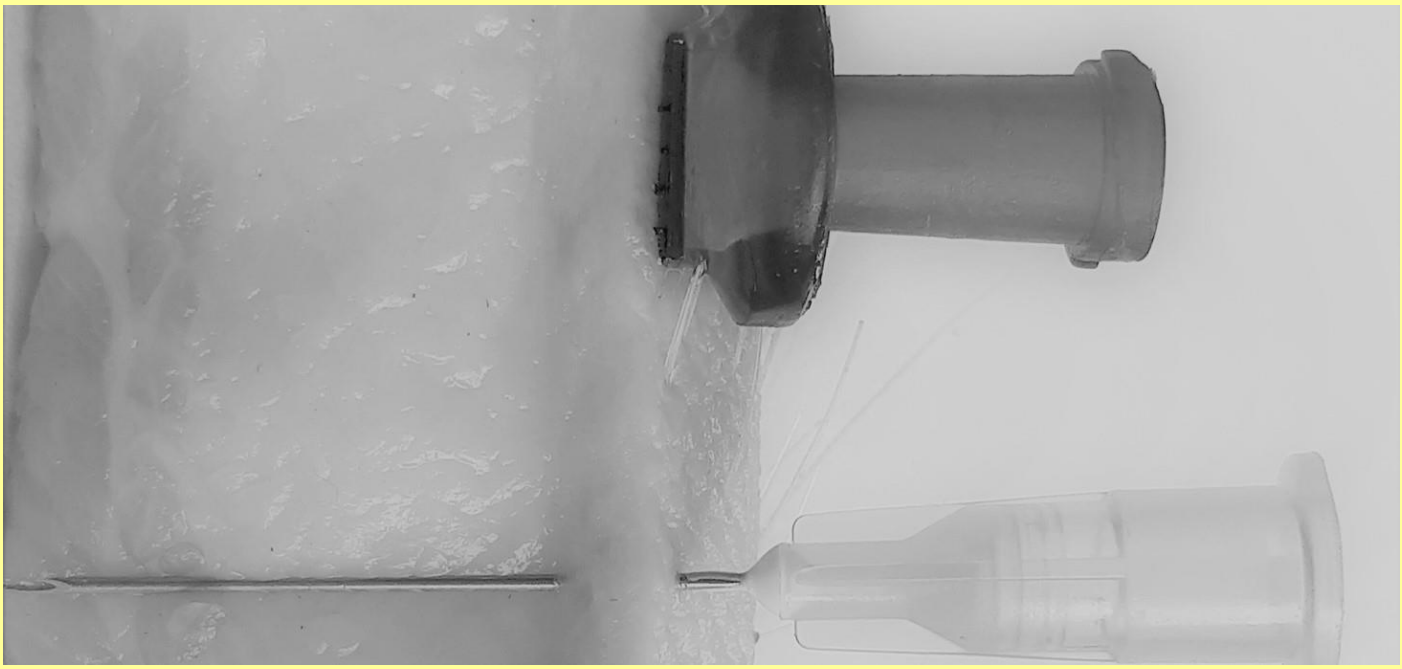
The Director of the hospital, Dr Muhammad Sami Al-Najjar, spoke in another video claiming that the situation was normal. He denied that there was a lack of oxygen. He said the patients had died from natural causes, from old age or other chronic diseases.

The Governor of Ash Sharqia, Dr Mamdouh Gorab, said four patients, rather than the whole ward, died.
There are unconfirmed reports on Facebook that the man who filmed the scene has been arrested after Gorab asked security forces to arrest those responsible for taping the incident.
Also trending was a picture of a nurse wearing her full scrubs, sitting on the floor in the corner of the unit, in shock at what was happening.
Reports have stated that the nurse was fined for "not working during hard times."

EDITOR'S COMMENT: It might happen even in the most modern hospital. The point is that there should always be a Plan B able to deal with such an emergency. We do that for electricity; let's keep oxygen in mind as well!

Swansea University developing world's first COVID-19 'smart-patch' vaccine that will measure effectiveness

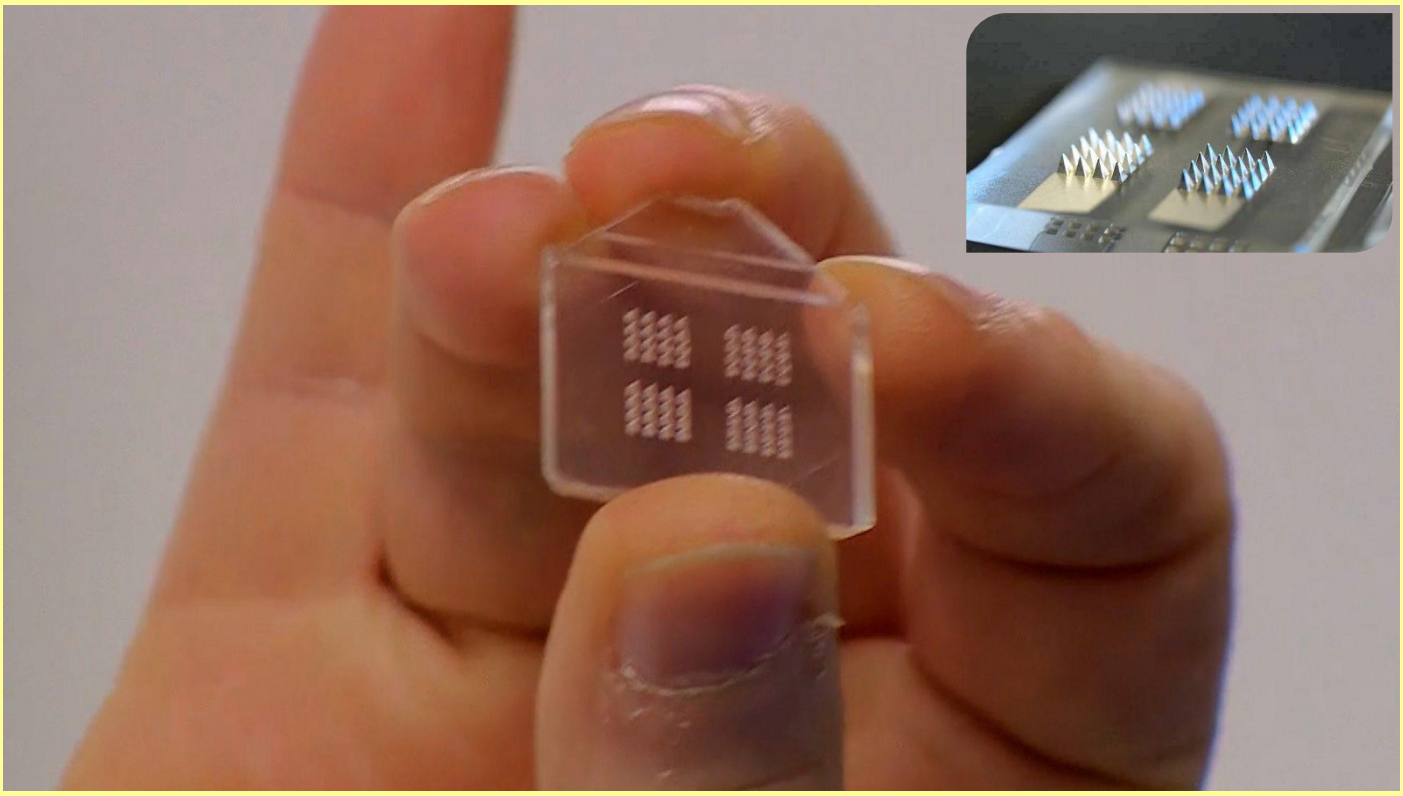
Source: https://www.swansea.ac.uk/press-office/news-events/news/2021/01/swansea-university-developing-worlds-first-covid-19-smart-patch-vaccine-that-will-measure-effectiveness.php



Close-up of a microneedle (top) compared to a hypodermic needle, showing how microneedles are far less invasive

Jan 06 – Researchers at Swansea University are developing the world's first smart vaccine device that will both deliver the COVID-19 vaccine and measure its efficacy through monitoring the body's associated response.
The research, from the Institute for Innovative Materials, Processing and Numerical Technologies (IMPACT), will produce the vaccine through the use of microneedles (MNs) to create a 'smart-patch'. This device will simultaneously measure a patient's inflammatory response to the vaccination by monitoring biomarkers in the skin.
Microneedles are tiny needles - their tips are measured in millionths of a metre (micrometer) - designed to break the skin barrier and deliver medicines in a minimally invasive manner. A classic example is the transdermal nicotine patch that delivers nicotine through skin to help people give up smoking.
Microneedles provide a safe and effective method to deliver vaccines with added attributes of requiring lower vaccine doses, permitting low-cost manufacturing, and enabling simple distribution and administration. A microneedle delivery patch is easy to apply and minimally invasive – combined with the proposed measurement capabilities, this new vaccine system would enable a personalised vaccination approach.
Project lead Dr Sanjiv Sharma of Swansea University comments: "Measuring vaccine efficacy is extremely important as it indicates the protective effects of vaccination on an individual via the level of reduction of infection risk in a vaccinated person relative to that of

a susceptible, unvaccinated individual. This measure of vaccination effectiveness will address an unmet clinical need and would provide an innovative approach to vaccine development."
The project, titled Smart vaccine devices for delivery of COVID-19 vaccination, will be led by a team of researchers with expertise in the use of microneedle arrays for transdermal therapeutic drug delivery and diagnostic applications.



The team will build on these distinct technologies by developing the first dual functionality microneedle-based COVID-19 smart-patch, capable of delivering a vaccine and measuring the immune response in the form of protein biomarkers thus establishing the efficacy of vaccination.

Dr Sharma continues:
"Skin vaccination using MNs has been described as a superior immunization approach due to its potential to overcome immune tolerance observed in pregnancy, and lower vaccination costs through antigen dose-sparing, which is especially relevant in underserved countries.
The primary goal of this project is to create a prototype of smart vaccine delivery device that can not only deliver the COVID-19 vaccine transdermally but also monitor biomarkers in the skin compartment in a minimally invasive way, offering real-time information on the efficacy of the vaccination. The new method would change the way in which vaccine efficacy trials are performed from a statistical assessment to a scientific measurement of patient inflammatory response to vaccination.
The real-time nature of the platform will mean rapid results allowing faster containment of the COVID-19 virus. This low-cost vaccine administration device will ensure a safe return to work and management of subsequent COVID-19 outbreak waves. Beyond the pandemic, the scope of this work could be expanded to apply to other infectious diseases as the nature of the platform allows for quick adaptation to different infectious diseases.
We are currently getting the platform ready and we hope to do human clinical studies on transdermal delivery with our existing partners at Imperial College London, in preparation for final implementation."

The project is funded by the Welsh Government Sêr Cymru funding programme. The IMPACT operation is part-funded by the European Regional Development Fund through the Welsh Government and Swansea University.

Severe Allergic Reactions to Pfizer Vaccine Are 'Exceedingly Rare', Scientists Say

Source: https://www.sciencealert.com/severe-allergic-reactions-to-the-pfizer-vaccine-are-still-exceedingly-rare-scientists-say

Jan 07 – Roughly one in a hundred thousand people who received the Pfizer-BioNTech COVID-19 vaccine have had severe allergic reactions, US health officials said Wednesday while stressing that the benefits of immunization greatly outweigh the known risks.
The data comes from the Centers for Disease Control and Prevention (CDC), which documented 21 cases of anaphylaxis after administration of a reported 1,893,360 shots from December 14 to December 23.
"This averages out to a rate of 11.1 anaphylaxis cases per one million doses administered," senior CDC official Nancy Messonnier told reporters.
By comparison, flu vaccines cause about 1.3 anaphylaxis cases per million doses administered, and so the rate of anaphylaxis for the Pfizer vaccine is roughly ten times greater.
Messonnier added that anaphylaxis cases were still "exceedingly rare" and it remains in people's best interest to take the vaccine, particularly in the context of the COVID-19 pandemic that is a far greater danger to their health.
"A good value proposition for someone to get vaccinated is their risk from COVID and poor outcomes from COVID is still more than the risk of a severe outcome from the vaccine," she said.
"Fortunately, we know how to treat anaphylaxis, and we've put provisions in place to ensure that at immunization sites, the folks administering the vaccine are ready to treat anaphylaxis."

The 21 cases ranged in age from 27 to 60 years old, with a median age of 40, and all but two were treated with epinephrine. Nineteen of the cases (90 percent) occurred in females, and the median onset time of symptoms was 13 minutes, but ranged from two to 150 minutes.
Four (19 percent) of patients were hospitalized, including three in intensive care, and 17 (81 percent) were treated in an emergency department. All but one was known to have been discharged home or recovered at the time of the study, and there were no deaths.
Symptoms included rash, sensation of throat closure, swollen tongue, hives, difficulty breathing, hoarseness, swollen lips, nausea and persistent dry cough.

Investigations ongoing
The US has so far authorized two vaccines for emergency use – one developed by Pfizer and the other by Moderna.
Both are based on cutting-edge mRNA (messenger ribonucleic acid) technology and authorities have attached similar warning labels to both, which advise that people who have a known history of allergic reactions to the vaccines' ingredients avoid taking them.
People who have a severe reaction to the first dose are also asked to not take a second dose.
Messonnier said that investigations were underway to determine what may be the cause of the allergies.
There is not enough data yet to know what the rate of anaphylaxis is for the Moderna vaccine, which was authorized in the US a week after the Pfizer shot, or whether a significant difference between the two vaccines will emerge.
One preliminary hypothesis for the reactions is the presence of the compound **polyethylene glycol (PEG),** which has never before been used in an approved vaccine, but is found in everyday products including laxatives, shampoos and toothpastes.
Both the Pfizer and Moderna vaccines use PEG molecules as part of the protective casing around their main ingredient, the mRNA that carries genetic instructions to cells.

SARS-CoV-2 Immune Memory Measurable for Months Post-Infection

Source: https://www.genengnews.com/news/sars-cov-2-immune-memory-measurable-for-months-post-infection/

Jan 07 – A team of researchers sought to fill in the gaps in the understanding of immune memory after a SARS-CoV-2 infection by taking a deep dive into the immune response of patients recovered from COVID-19. To do this, they measured multiple components of the immune system, including circulating antibodies, memory B cells, and T cells specific for SARS-CoV-2, in patients with varying levels of disease, for up to eight months after infection. Their data suggests that each component of the immune system follows its own pattern post-infection.

The collaborative team from La Jolla Institute for Immunology (LJI) and the department of microbiology, Icahn School of Medicine at Mount Sinai, studied antibody and immune cell responses in more than 180 men and women who had recovered from COVID-19. They reported that these patients' immune memory to the virus—across all immune cell types studied—was measurable for up to eight months after symptoms appeared.

The results indicate "that durable immunity against secondary COVID-19 disease is a possibility in most individuals," the authors said. Indeed, the authors wrote: "Our data show immune memory in at least three immunological compartments was measurable in ~95% of subjects five to eight months post-symptom onset." As the number of daily COVID-19 cases worldwide continues to mount, whether an initial infection with SARS-CoV-2 leads to long-lasting protective immunity against COVID-19 remains a question.

Studying the nature of the humoral response to the virus, which includes an antibody response, and of the cellular immune response, which includes B cells and T cells, over periods of six months after symptoms start could help inform protective immunity's duration. To do this, Jennifer Dan, MD, PhD, clinical associate at LJI, and colleagues recruited more than 180 men and women from the United States who had recovered from the disease. The majority had had mild symptoms that did not require hospitalization, though 7% were hospitalized. Most subjects provided a blood sample at a single time point, between six days and eight months after symptoms took hold, though 43 samples were provided at six months or more following symptom onset.

In 254 total samples from 188 COVID-19 cases, Dan and colleagues tracked antibodies, B cells, and two types of T cells. IgG to the Spike protein was relatively stable over 6+ months and only exhibited modest declines at six to eight months after symptom onset. Spike-specific memory B cells were more abundant at six months than at one-month post symptom onset. T cells, meanwhile, showed only a slight decay in the body. More specifically, **SARS-CoV-2-specific CD4+ T cells and CD8+ T cells declined with a half-life of 3–5 months.**

While the authors caution that "direct conclusions about protective immunity cannot be made on the basis of [their findings] because mechanisms of protective immunity against SARS-CoV-2 or COVID-19 are not defined in humans," they also say that several "reasonable interpretations" can be made from their study. These include support for resting immune memory compartments potentially contributing "in meaningful ways to protective immunity against pneumonia or severe secondary COVID-19," the authors wrote.

▶▶ **The work is published in *Science* in the paper,** "Immunological memory to SARS-CoV-2 assessed for up to eight months after infection."

Arthritis drugs could help save lives of Covid patients, research finds

Source: https://www.theguardian.com/world/2021/jan/07/covid-arthritis-drugs-could-help-save-lives-of-seriously-ill--patients-research-finds

Jan 07 – Two drugs used to treat rheumatoid arthritis could help to save the lives of one in 12 intensive care patients with severe Covid, researchers have found.

The NHS will begin using tocilizumab to treat coronavirus patients from Friday, health officials said after results from about 800 patients confirmed the drug brings benefits, potentially cutting the relative risk of death by 24%.

Another arthritis drug, sarilumab, appears to do the same, not only saving lives but cutting the length of time patients spent in intensive care.

Early results from an international trial previously suggested tocilizumab might improve outcomes for those with life-threatening coronavirus infections. However, other trials reported mixed results.

Both tocilizumab and sarilumab are what are known as IL-6 receptor antagonists, which dampen down the effect of proteins that can cause an overreaction of the immune system. Severe Covid has previously been linked to dangerous levels of inflammation in the body.

The new results, which have not yet undergone peer review, come from a clinical trial known as Remap-Cap (the randomized embedded multifactorial adaptive platform for community-acquired pneumonia) that involves more than 3,900 Covid patients in 15 countries around the world.

The latest study reveals how researchers randomised adult Covid patients to receiving standard care, or an intravenous infusion of tocilizumab or sarilumab, within 24 hours of being put on organ support in intensive care.

Fewer patients were given sarilumab since the drug became available for use later than tocilizumab.

The researchers then monitored the patients' progress for at least 21 days.

The results from 792 patients across six countries reveal that tocilizumab and sarilumab reduced the risk of death.
While hospital mortality stood at 35.8% (142/397) for patients given standard care, it was 28.0% (98/350) for tocilizumab and 22.2% (10/45) for sarilumab. Combining the results for the two drugs gave a hospital mortality of 27.3% (108/395) – an 8.5 percentage point drop in absolute risk of death, or a 24% relative reduction – compared with the group who had standard care.
"Treat 12 patients and you save one life," said Prof Anthony Gordon, of Imperial College London, the UK's chief investigator on the trial behind the findings. "[That's] a big effect."
The team also found those given tocilizumab or sarilumab recovered more quickly, leaving intensive care about seven to 10 days earlier than those who had standard care.
Dr Lennie Derde, intensive care consultant and European coordinating investigator of the Remap-Cap trial, said the international nature of the trial was important, given the worldwide impact of the pandemic.
"The results are applicable not just in the UK but across the globe," she said.
Peter Horby, professor of emerging infectious diseases and global health at Oxford University, who leads the Recovery trial to test drugs for treating Covid patients but was not involved in Ramap-Cap, said the results were good news, noting that until now only the steroids dexamethasone and hydrocortisone have been found to save lives among Covid patients on ventilators. Such drugs also act to suppress inflammation and the immune system.
With about 80% of the patients in the Remap-Cap trial also given dexamethasone or another steroid, Horby said it appears that tocilizumab and sarilumab provide an addition benefit.
"We saw an absolute reduction in the risk of death in mechanically ventilated patients of about 12% with dexamethasone [in the Recovery trial], and here you are seeing an absolute reduction of about 8% – that would seem to be on top of the [effect of] dexamethasone," said Horby.
But Horby stressed the findings only applied to critically ill patients, while tocilizumab and sarilumab are far more expensive than dexamethasone: tocilizumab and sarilumab cost about £750 to £1,000 per patient, compared with about £5 for dexamethasone.
However, Gordon said the therapies were still cost-effective given the lives they would save and the impact on time spent in intensive care.
"A day in the intensive care unit can cost close to £2,000 a day," he said.
The deputy chief medical officer for England, Prof Jonathan Van-Tam, said: "This is a significant step forward for increasing survival of patients in intensive care with Covid-19. The data shows that tocilizumab, and likely sarilumab, speed up and improve the odds of recovery in intensive care, which is crucial for helping to relieve pressure on intensive care and hospitals and saving lives."
The Department of Health and Social Care said hospitals already had supplies of tocilizumab. "Updated guidance will be issued tomorrow by the government and the NHS to trusts across the UK, encouraging them to use tocilizumab in their treatment of Covid-19 patients who are admitted to intensive care units, effective immediately," it said.

Extra dose from vials of Comirnaty COVID-19 vaccine

Source: https://www.ema.europa.eu/en/news/extra-dose-vials-comirnaty-covid-19-vaccine

Jan 08 – EMA's human medicines committee (CHMP) has recommended updating the product information for Comirnaty to clarify that each vial contains 6 doses of the vaccine.
In order to extract six doses from a single vial, low dead-volume syringes and/or needles should be used. The low dead-volume syringe and needle combination should have a dead volume of no more than 35 microliters. If standard syringes and needles are used, there may not be enough of the vaccine to extract a sixth dose from a vial.
If the amount of vaccine remaining in the vial after the fifth dose cannot provide a full dose (0.3 ml), the healthcare professional must discard the vial and its contents. There should be no pooling from multiple vials to make up a full dose, and any unused vaccine should be discarded 6 hours after dilution. Further information on all the steps for using Comirnaty is available in the updated product information.

Bayer Joins CureVac to Develop mRNA-Based COVID-19 Vaccine

Source: https://www.genengnews.com/news/bayer-joins-curevac-to-develop-mrna-based-covid-19-vaccine/

Jan 07 – Bayer is joining CureVac to support its development of the messenger RNA (mRNA)-based COVID-19 vaccine CVnCoV, which advanced last month into a pivotal global Phase IIb/III trial that plans to enroll more than 35,000 patients, the companies said today.

Under the agreement, whose value was not disclosed, Bayer agreed to support the development, supply, and operations of CureVac within "key territory" markets that include the European Union (EU) and unspecified additional countries.

The EU agreed in November to purchase up to 405 million doses of CureVac's CVnCoV vaccine—an initial 225 million doses, with an option to buy another 180 million—for an undisclosed price.

"The need for vaccines against COVID-19 is enormous. We are therefore pleased to be able to provide significant support to CureVac, a leader in mRNA technology, in advancing the further development and supply of its COVID-19 vaccine candidate," Stefan Oelrich, Member of Bayer's Board of Management and President of Bayer's Pharmaceuticals Division, said in a statement. "We are highly committed to making our capabilities and networks available to help end this pandemic."

While CureVac will remain the EU Marketing Authorization Holder for CVnCoV, Bayer agreed to provide services for the vaccine that include clinical operations, regulatory affairs, pharmacovigilance, medical information, and supply chain performance.

Not covered by the agreement is manufacturing of CVnCoV, though Bayer is testing whether it can offer production capacity toward the vaccine, a CureVac spokesman told *The Wall Street Journal*.

"Several hundred million" doses

The companies said that Bayer's support services are intended to enable the supply of "several hundred million" doses of CVnCoV worldwide.

CureVac said in November it expected to have capacity to manufacture up to 300 million doses of CVnCoV in 2021 and up to 600 million doses in 2022, after announcing an expansion of its manufacturing network in Europe designed to deliver pandemic-scale volumes of the vaccine through agreements with Wacker, Fareva, and other contract development and manufacturing organization (CDMO) partners.

CureVac is also developing an additional large-scale production facility at its headquarters in Tübingen, Germany, supported by the European Investment Bank (EIB).

"We are very happy to join forces with Bayer, whose expertise and infrastructure will help us make our vaccine candidate CVnCoV even more rapidly available to as many people as possible," stated CureVac CEO Franz-Werner Haas, LLD, LLM.

CVnCoV is an mRNA-based vaccine encoding the full-length spike protein of SARS-CoV-2 and formulated with lipid nanoparticles (LNP). The vaccine uses nucleotides without chemical modifications in the mRNA, and is designed to provide a strong and balanced activation of the immune system.

CureVac has said that CVnCoV remains stable and within defined analytical specifications for at least three months when stored at a standard refrigerator temperature of 5° C (41° F), and for up to 24 hours at room temperature as a ready-to-use vaccine.

35,000-patient trial

CVnCoV is under study in the Phase IIb/III HERALD trial (NCT04652102), a randomized, observer blind, placebo-controlled study designed to assess the safety and efficacy of the vaccine in adults at a dose of 12 µg. The study is expected to include more than 35,000 participants in Europe and Latin America.

CureVac's vaccine is one of 28 "Definitely Maybe" candidates among the more than 300 COVID-19 therapeutics included in *GEN*'s "COVID-19 DRUG & VACCINE CANDIDATE TRACKER."

CureVac made news in March 2020 when it denied a report in the German newspaper *Welt am Sonntag* that President Donald Trump's administration sought to lure German-based CureVac to the U.S. with funding to produce its vaccine exclusively for the American market after then-CEO Dan Menichella visited the White House with other biopharma executives, while Germany's government pressed for the company to stay in Tübingen and produce its vaccine for Germany and Europe.

Menichella resigned that month, succeeded first by Ingmar Hoerr, a former CEO and founder who took a medical leave of absence, then by Haas.

Also in March 2020, the European Commission offered up to €80 million ($98 million) toward scaling up development and productions of the vaccine. The Coalition for Epidemic Preparedness Innovations (CEPI) awarded the company up to $8.3 million in January 2020 for accelerated vaccine development, manufacturing and clinical tests.

People Without COVID Symptoms Are Responsible For 50% of New Infections, Per Study

Source: https://www.sciencealert.com/people-without-covid-symptoms-are-responsible-for-50-of-new-infections-per-study

Jan 08 – Since the early days of the pandemic, researchers have known that people with COVID-19 can spread the disease before they develop symptoms and even if they never feel sick.

A study published in the *Journal of the American Medical Association* on Thursday quantifies just how many new cases are transmitted from people without symptoms: **at least 50 percent.**

The findings echo estimates that the Centres for Disease Control and Prevention provided in November, when the agency said people without symptoms were "estimated to account for more than 50 percent of transmissions."

Jay Butler, deputy director for infectious diseases at the CDC and a lead author of the new study, said the findings reinforce the importance of following public-health guidelines about mask wearing and distancing.

"There was still some controversy over the value to community mitigation – face masks, social distancing, and hand hygiene – to limit spread," Butler told Business Insider. "This study demonstrates that while symptom screening may have some value, mitigation, as well as strategically planned testing of persons in some setting, will be a significant benefit."

For the study, researchers modelled potential COVID-19 transmitters in three groups: pre-symptomatic (people who hadn't had symptoms yet), never symptomatic, and symptomatic.

The researchers then modelled how much each group would transmit COVID-19 depending on the day people were most infectious. At baseline, they assumed people in all groups would be most infectious five days after getting exposed to the coronavirus. That's what researchers have found to be the median incubation period – the length of time it takes for most people to develop symptoms after exposure.

The model initially assumed that 30 percent of people were asymptomatic, and that those individuals were 75 percent as infectious as people who were showing or would eventually show symptoms. Based on those assumptions, the results suggested that asymptomatic people alone were responsible for 24 percent of infections. But the researchers also modelled scenarios in which peak infectiousness occurred after three, four, six, and seven days, and they raised and lowered the percentage of asymptomatic people in the model, as well as their rate of infectiousness relative to other groups. Across most of these scenarios, people without symptoms (asymptomatic and presymptomatic) were found to transmit at least 50 percent of new infections. "The proportion of transmissions remained generally above 50 percent across a broad range of base values," Butler said, adding that the consistency of that finding was surprising. Even in the most conservative estimate, in which peak infectiousness came seven days after exposure and asymptomatic people accounted for 0 percent of transmission, the pre-symptomatic group still caused more than 25 percent of cases overall, according to the model.

Butler and his coauthors cautioned, however, that their model likely underestimates the real percentage of COVID-19 cases driven by people without symptoms, since they calculated the transmission rates if everyone were to move around at random. But in reality, many restaurants and other establishments screen for fevers and other symptoms to stop symptomatic people from entering. Additionally, many people with symptoms isolate at home, which also makes them less likely to spread COVID-19 than people who feel healthy.

Mother Nature is not 'the ultimate bioterrorist'

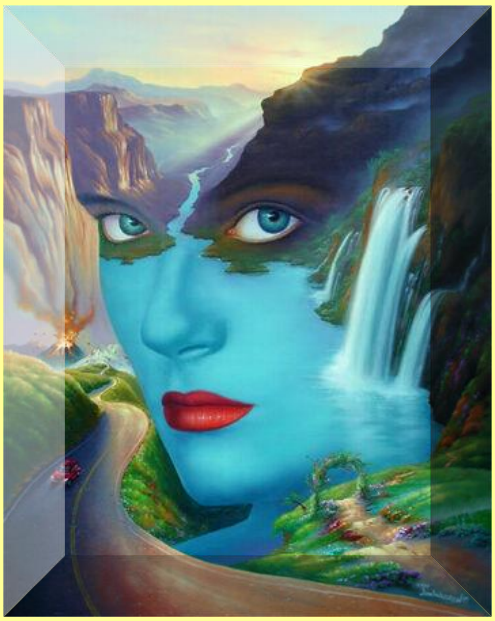
By Chris Bakerlee

Source: https://www.statnews.com/2021/01/08/mother-nature-is-not-the-ultimate-bioterrorist/

Jan 08 – Despite the menacing track record of emerging pathogens, "Mother Nature is the world's worst bioterrorist," a long-overused catchphrase of scientists and public health professionals, is **in urgent need of retirement.**

Born in the maelstrom of Sept. 11, 2001, and the anthrax attacks that followed, the saying was meant to warn against fixating on bioterrorism while neglecting the risks posed by naturally emerging pathogens. This warning proved prescient. In the next several years, the all-consuming "war on terror" waged by the U.S. would fuel a tenfold boost in biodefense spending, and the focus on bioterrorism would be so strong that, when SARS hit the world stage in 2003, the editorial board of the journal Nature felt the need to remind its audience that the pandemic was not just a "fire drill" for a terrorist attack, but also a trial run for a future pandemic.

Sobriety and disillusionment around the war on terror started to set in toward the middle of the decade. In concert with this transition in public opinion, the meaning of the popular refrain "world's worst bioterrorist" subtly shifted: Instead of admonishing people to pay due attention to naturally emerging pathogens, the phrase was increasingly used to downplay or dismiss the real — and growing — risks posed by bioterrorism and other human-engineered biological threats.



This new usage was on prominent display during the last decade's debates over controversial "gain-of-function" avian influenza experiments, in which scientists sought to study the emergence potential of this deadly virus by artificially enhancing its transmissibility between mammals. Proponents of the unusually risky research suggested that, since "nature is the real bioterrorist," the experiments' disputed benefits outweighed their potential harms. As Samuel Stanley, chair of the National Science Advisory Board for Biosecurity, affirmed in 2017, "I believe nature is the ultimate bioterrorist and we need to do all we can to stay one step ahead."

More recently, some leading biotechnologists have expressed similar sentiments. For example, while Twist Bioscience CEO Emily Leproust has written at length about how gene synthesis companies like Twist can better guard against the misuse of their technology by malevolent or reckless actors, she has also invoked the "ultimate bioterrorist" meme to downplay such risks. In a recently published interview, she noted, "I *am* concerned with the risks. There is potential for massive loss of life. But the risk isn't from some postdoc or high schooler. The largest risk is from nature. … Nature is the greatest bioterrorist. The biggest losses of life have been from nature."

Taken together, these examples show that this meme no longer serves us well. It is undoubtedly a mistake to underestimate the threats from natural pathogens. At the same time, it is equally unwise to wield this 19-year-old expression like a magic wand, intending to briskly banish concerns about people causing harm with biology. We can't afford to blind ourselves or others to the uncomfortable truth that, with each passing day, humans grow more capable of outdoing nature and harnessing biotechnology to cause harm on a staggering scale, by either cruelty or carelessness.

Nature has no interests, motives, or political goals. To the extent it can be said to "want" anything, it is to perpetually enhance populations' differential reproductive success, which only rarely aligns with causing greater harm to humans. Notably, the trillions of bacteria living in the average human's colon appear to have adapted toward a peaceful and often mutually beneficial coexistence with their host. And even deadly pathogens may theoretically evolve toward making humans less sick if doing so opens up more opportunities for transmission between hosts.

The process of natural selection, for all its power, is highly constrained in its ability to generate "superbugs" possessing a diabolical suite of traits. Like human bioengineers, natural selection must work around stubborn physiological trade-offs between traits, such as genome replication rate and mutation rate. But natural selection is also handicapped by near-sightedness, driving improvements in traits that enhance a population's fitness in its *current* environment with no attention to maintaining or improving traits that enhance fitness in *other* environments.

If creating an especially deadly pathogen were like winning a soccer match against a formidable opponent, natural selection would be competing with all the cunning of an especially persistent horde of 5-year-olds, glued to the ball and only ever capable of playing offense, defense, or goalie at any one time.

By contrast, modern biologists are gaining the ability to see the whole field, develop an intuition about where the ball will be next, and play multiple positions simultaneously. Through a combination of rational design, directed evolution, breeding, and brute force trial and error, they can increasingly engineer organisms that excel in multiple desired functions at once, such as the ability to grow quickly in a massive industrial fermenter while churning out commercially valuable biomolecules. This growing capability promises tremendous benefits for agriculture, industry, and human health, but its potential application to the creation of pathogens poses serious concerns.

It is worth emphasizing that trained biologists — let alone terrorists — still have difficulty one-upping natural selection's creative output. **Our understanding of biology is very much in its infancy.** Yet our knowledge and capabilities are maturing rapidly, as evidenced by Twist's prolific gene synthesis capabilities, along with recent feats in predicting protein structure, gene editing, and genome assembly. We are much closer to this exciting but frightening horizon today than we were in 2001, and this trend will likely persist.

It's also worth noting that, when it comes to weapons-grade biotechnology, states likely pose a greater risk than non-state terrorists. States have vastly more resources to support the development of biological weapons, and about 23 are known or suspected to have maintained biological weapons programs in the 20th century. Some programs, like North Korea's, likely persist to this day. As countries jockey for advantage, state biological weapons programs remain an ever-present danger, despite the treaties and export controls designed to rein them in. Covid-19, which has exposed countries' vulnerability to biological threats, has done little to mitigate this danger.

Accidental releases pose an additional source of anthropogenic biorisk. Thanks to the U.S. government's monitoring program, we know that dozens of agents and toxins with the potential to pose a severe threat to public health and agriculture are reported accidentally lost or released from U.S. labs every year. We also know that accidental releases around the world have already caused significant harm. Such risks increase as biotechnology expands across the world and gains in strength.

Biotechnology, with all its promise and peril, is moving fast. It's irresponsible of us to shrug off current and emerging biotechnological threats by reciting "Nature is the ultimate bioterrorist" like some article of faith. As with global warming, the cost of willful ignorance and inaction is high — and increasing.

Our health security requires that we engage cautiously but honestly with the full spectrum of evolving biological risks, striving toward solutions with open eyes and moral courage.

Chris Bakerlee *is a Ph.D. candidate studying evolutionary genetics at Harvard University and a fellow in the Council on Strategic Risks's Fellowship for Ending Bioweapons Programs.*

A Guide to Antiseptics

Source: https://www.healthline.com/health/what-is-antiseptic#safety

An antiseptic is a substance that stops or slows down the growth of microorganisms. They're frequently used in hospitals and other medical settings to reduce the risk of infection during surgery and other procedures.

If you've ever witnessed any type of surgery, you probably saw the surgeon rubbing their hands and arms with an orange-tinted substance. This is an antiseptic.

Different types of antiseptics are used in medical settings. These include hand rubs, hand washes, and skin preparations. Some are also available over the counter (OTC) for home use.

Read on to learn more about antiseptics, including how they compare to disinfectants, the different types, and safety information.

What's the difference between an antiseptic and a disinfectant?

Antiseptics and disinfectants both kill microorganisms, and many people use the terms interchangeably. Adding to the confusion, antiseptics are sometimes called skin disinfectants.

But there's a big difference between antiseptics and disinfectants. An antiseptic is applied to the body, while disinfectants are applied to nonliving surfaces, such as countertops and handrails. In a surgical setting, for example, a doctor will apply an antiseptic to the surgical site on a person's body and use a disinfectant to sterilize the operating table.

Both antiseptics and disinfectants contain chemical agents that are sometimes called biocides. Hydrogen peroxide is an example of a common ingredient in both antiseptics and disinfectants. However, antiseptics usually contain lower concentrations of biocides than disinfectants do.

How are antiseptics used?

Antiseptics have a variety of uses both in and out of medical settings. In both settings, they're applied to either the skin or mucous membranes.

Specific antiseptic uses include:

- **Hand washing.** Medical professionals use antiseptics for hand scrubs and rubs in hospitals.
- **Disinfecting mucous membranes.** Antiseptics can be applied to the urethra, bladder, or vagina to clean the area before inserting a catheter. They can also help to treat an infection in these areas.
- **Cleaning skin before an operation.** Antiseptics are applied to the skin before any kind of surgery to protect against any harmful microorganisms that might be on the skin.
- **Treating skin infections.** You can buy OTC antiseptics to reduce the risk of infection in minor cuts, burns, and wounds. Examples include hydrogen peroxide and rubbing alcohol.
- **Treating throat and mouth infections.** Some throat lozenges contain antiseptics to help with sore throats due to a bacterial infection. You can purchase these on Amazon.

What are some types of antiseptic?

Antiseptics are usually categorized by their chemical structure. All types disinfect skin, but some have additional uses.
Common types with varied uses include:

- **Chlorhexidine and other biguanides.** These are used on open wounds and for bladder irrigation.
- **Antibacterial dye.** These help to treat wounds and burns.
- **Peroxide and permanganate.** These are often used in antiseptic mouthwashes and on open wounds.
- **Halogenated phenol derivative.** This is used in medical-grade soaps and cleaning solutions.

Are antiseptics safe?

Some strong antiseptics can cause chemical burns or severe irritation if applied to skin without being diluted with water. Even diluted antiseptics can cause irritation if they're left on skin for long periods of time. This kind of irritation is called irritant contact dermatitis.
If you're using an antiseptic at home, don't use it for more than a week at a time.
Avoid using OTC antiseptics for more serious wounds, such as:

- eye injuries
- human or animal bites
- deep or large wounds
- severe burns
- wounds that contain foreign objects

These are all best handled by a doctor or urgent care clinic. You should also see a doctor if you've been treating a wound with antiseptic and it doesn't seem to be healing.

FDA regulations

The Food and Drug Administration (FDA) recently banned 24 ingredients in OTC antiseptics, effective December 20, 2018. This is due to concerns about how long these ingredients can remain in the body and a lack of evidence regarding their safety and effectiveness.
Aside from triclosan, most of these ingredients aren't present in common antiseptics, so the ban doesn't have much of an impact on currently available antiseptics. Manufacturers have already started updating their products to remove triclosan and any other banned ingredients.

The bottom line

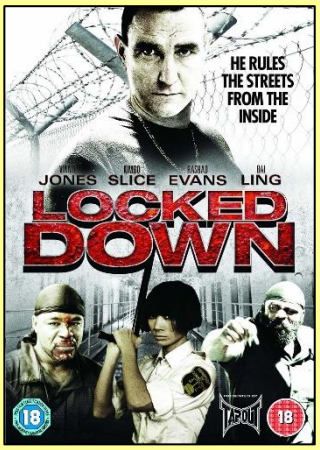
Antiseptics are substances that help to stop the growth of microorganisms on the skin. They're used daily in medical settings to reduce the risk of infection and stop the spread of germs. While they're generally safe, it's best to avoid using them for long periods of time.

Pfizer Vaccine Appears to Work Against Variant, Research Shows

Source: https://www.medscape.com/viewarticle/943834

Jan 08 – Laboratory experiments indicate the Pfizer/BioNTech vaccine will offer protection against the **two coronavirus variants found in the United Kingdom and South Africa.**

Scientists from Pfizer and the University of Texas Medical Branch created a version of the variant in the lab, CNN reported. They took blood samples from 20 people who'd been given the Pfizer vaccine and found that antibodies from those people successfully warded off the virus variant in the lab dishes.
The lab experiment offers hope that the people who received the Pfizer vaccine will be protected from the variants in real life — at least in the short term.
"There is a definite concern over the long period," epidemiologist and ABC News contributor John Brownstein, MD, told ABC News last week. "Over months and years, it could pose a problem with the vaccine … but I think in the coming six months, we'll be totally fine with the current vaccine."
The study which was published Thursday has not been peer reviewed and did not examine the full array of virus mutations.
Public knowledge of the coronavirus variants emerged in December as the United Kingdom began it vaccination program. From the beginning health experts have said they had no evidence to show that existing vaccines would not work against the variants.
The variants appear to be more transmissible than the original coronavirus, but no more deadly. The UK variant has been found in more than 30 nations and at least six states in the United States.
Moderna is also testing and company CEO Stephane Bancel recently said he thinks the company's vaccine, which is similar to Pfizer's, will prove effective against the UK variant.
Both the U.K. super strain and the super strain found in South Africa have the same mutation on their spike protein that makes them more transmissible — N501Y. But each strain developed the mutation independently, scientists say.



Locked Down (film)

Locked Down is an upcoming American romantic comedy heist film directed by Doug Liman and written by Steven Knight. The film stars Anne Hathaway, Chiwetel Ejiofor, Stephen Merchant, Mindy Kaling, Lucy Boynton, Dulé Hill, Jazmyn Simon, with Ben Stiller, and Ben Kingsley. A quarreling couple make peace in order to take advantage of the COVID-19 pandemic and pull off a jewellery heist at the Harrods department store. *Locked Down* is scheduled to be released in the United States on January 14, 2021, by HBO Max.

US and UK diverge over critical COVID-19 vaccine dose strategy

Source: https://newatlas.com/health-wellbeing/us-uk-disagree-critical-coronavirus-vaccine-dose-schedule/

Jan 06 – Health authorities in the United Kingdom have recommended extending dosing schedules for approved COVID-19 vaccines, suggesting one dose offers enough short-term protection despite clinical trials only testing two-dose regimes. Authorities in the United States, however, claim this dosing change is unproven, risky and premature.
Two COVID-19 vaccines have been approved for emergency use in the UK. Both were trialed using a two-dose schedule, with the second dose administered three to four weeks after the first.
New advice from the Joint Committee on Vaccination and Immunisation (JCVI) is now suggesting the second dose of both approved vaccines can be delayed for up to 12 weeks. While clinical trial data is not clear on how this change to the tested dosing schedule will affect long-term immunity, the JCVI advice presents a utilitarian solution to the current wave of virus transmission spreading across the UK.
"The four UK Chief Medical Officers agree with the JCVI that at this stage of the pandemic prioritising the first doses of vaccine for as many people as possible on the priority list will protect the greatest number of at risk people overall in the shortest possible time and will have the greatest impact on reducing mortality, severe disease and hospitalisations and in protecting the NHS and equivalent health services," declares a UK government statement.
In response to the UK government decision, the US Food & Drug Administration (FDA) released a statement claiming it does not recommend changes to currently approved COVID-19 vaccine dosing schedules, and called any changes to dosing schedules, "premature and not rooted solidly in the available evidence."
The FDA's statement claims there is no data from clinical trials to suggest anything definitive about the depth or duration of protection one would receive from a single vaccine dose.
"We know that some of these discussions about changing the dosing schedule or dose are based on a belief that changing the dose or dosing schedule can help get more vaccine to the public faster," the FDA statement notes. "However, making such changes that are not

supported by adequate scientific evidence may ultimately be counterproductive to public health."
Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, said in an interview with CNN the US will not be following the UK in delaying a second dose for COVID-19 vaccines. He added that while he understood the argument for delaying a second dose, there simply is no clear evidence from clinical trials that one dose generates effective protection.
A joint statement from Pfizer and BioNTech, the developers of one of the COVID-19 vaccines approved for use in the US and UK, affirms Fauci's sentiment. The statement says since the clinical trial investigated a two-dose schedule, there is no evidence as to whether a single dose offers any level of protection past three weeks.
"The safety and efficacy of the vaccine has not been evaluated on different dosing schedules as the majority of trial participants received the second dose within the window specified in the study design," the Pfizer/BioNTech statement says. "There is no data to demonstrate that protection after the first dose is sustained after 21 days."
Although it is true that no COVID-19 vaccine clinical trial investigating two-dose regimes can report clear data on the long-term protection generated by one dose, not all experts are against the idea of delaying the second dose. Stephen Evans, from the London School of Hygiene and Tropical Medicine, says the UK is currently in a crisis scenario due to its current wave of infections, and this factor must be taken into account when considering vaccine scheduling decisions.
"The trials did not compare different dose spacing or compare one versus two doses, so we simply do not know what is 'optimal'," says Evans. "So, the information directly from the trials is lacking. We have to utilize what we know from science generally. We know that vaccinating only half of a vulnerable population will lead to a notable increase in cases of COVID, with all which that entails including deaths. When resources of doses and people to vaccinate are limited, then vaccinating more people with potentially less efficacy is demonstrably better than a fuller efficacy in only half."
A trio of new articles published in the *Annals of Internal Medicine* all argue that single doses administered to many could be more effective at reversing infection rates in the short term. One analysis, from a team of Harvard and Yale researchers modeling the impact of one-dose vaccination schedules compared to two-dose schedules, concludes the US should at least consider one-dose vaccine candidates.
"Depending on the duration of protection conferred – and, of note, considering only a six-month time horizon – a single-dose vaccine with 55 percent effectiveness may confer greater population benefit than a 95 percent-effective vaccine requiring two doses," the new research notes. "This suggests that now that a highly effective, two-dose vaccine for COVID-19 has been authorized and vaccination programs have begun, sustained and aggressive investment in pursuit of faster-acting, more convenient, one-dose vaccine candidates remains justified."
So what's the harm in delaying the second vaccine dose? Paul Bieniasz, a virologist from Rockefeller University, expressed perhaps the biggest concern regarding the UK decision to change its vaccination schedule. Bieniasz described delaying the time between a first and second vaccine dose as the perfect way to "generate vaccine-resistant SARS-CoV-2 variants."
"Generating a pool of hosts with just the right amount of neutralizing antibody to apply selection pressure, but also maintain sufficient levels of partially antibody-resistant virus to allow onward transmission is key here," writes Bieniasz in a Twitter post entitled *Musings of an anonymous, pissed off virologist*. "We might not achieve this shortly after the first dose, but if we let immunity wane for a little while, say 4 to 12 weeks, we just might hit the sweet spot."
Florian Krammer, a microbiologist from Mount Sinai, echoes Bieniasz concerns. Krammer explains, in laboratory conditions when scientists want to generate virus variants that can escape immune targeting they will subject the virus to low antibody pressures and over time mutant strains will appear that can overcome those antibodies.
"I don't know if 12 weeks is going to be a huge issue, but that time frame should be minimized as much as possible," Krammer muses. "Also, there are good reasons for giving the second dose. It is likely that the second dose is needed to generate long lived and strong immunity."

EDITOR'S COMMENT: A matter of strategy? Really? It is as if you give drugs to a patients while instructing him/her to take them at will. The intervals between jabs are specific. Are they? How these intervals are defined? What the data shows? All these logical questions add more in the perception that the entire operation vaccination was not scientifically spoteless due to lack of time and political/societal pressure. We want answers and justifications!

Why Is The World Allowing Turkmenistan To Deny It Has The Coronavirus?

Source: https://www.rferl.org/a/turkmenistan-coronavirus-fiction-turkey/31029363.html

Jan 01 – Various media reports and independent sources indicate that Turkmenistan is being hit hard by the coronavirus pandemic. Yet Turkmen officials continue to say there have not been any incidents of COVID-19 in the country.

But the cases of two diplomats assigned to Turkmenistan suggest the virus is indeed there -- though in both cases their governments remain quiet. Such silence helps allow Turkmen authorities to continue spouting the official line that the country is somehow unaffected by the global pandemic.

Guzide Uchkun is the widow of Kemal Uchkun, a Turkish diplomat who died in a hospital in Turkmenistan on July 7.

She recently filed a lawsuit against Turkey's ambassador to Turkmenistan, Togan Oral, and several other government officials for their failure to transport her husband from Turkmenistan to Turkey for proper medical treatment.

Starting in January 2018, Kemal Uchkun was stationed at the Turkish Embassy in Turkmenistan as an adviser on religious affairs.

On June 27, 2020, Uchkun was admitted to a hospital. His symptoms were breathing problems, heavy coughing, and a fever, signs associated with the coronavirus. Doctors treated him for pneumonia.

Guzide Uchkun says Turkmen doctors treated her husband with antibiotics, which don't work against viruses.

Turkish doctors said the X-rays they received of Uchkun from Turkmenistan indicated there was a better than 90 percent chance he had COVID-19.

Guzide's lawyer, Ahmet Basci, told Azatlyk that the embalming of Uchkun's body was done in Turkmenistan, so a subsequent autopsy in Turkey was unable to determine if the diplomat's death was due to the coronavirus.

But Basci said Uchkun's family showed the chest X-rays to other Turkish forensic experts after his death. Basci said those experts had no doubt that Uchkun had died of COVID-19 and that he probably would have survived if he had been brought back to Turkey.

"I pleaded [with Turkish authorities] to send a medical transport plane or any kind of plane to bring my husband back to Turkey," Guzide told the Turkish newspaper Sozcu. "I filled out applications and provided all the necessary documents every day until his death."

Turkmen officials did not give official permission for a Turkish plane to come to Ashgabat, which has not been accepting international flights since March, until after Uchkun died on July 7.

Publicly, Turkish authorities have still not criticized Turkmenistan's reluctance to allow an ill diplomat to be evacuated home for treatment, although it seems cause for some outrage. Ankara has also not said anything that might question Turkmenistan's claim of being free of the coronavirus.

Guzide Uchkun also plans to file a lawsuit against Turkmen authorities, charging them with negligence and obstruction.

Britain's ambassador to Turkmenistan, Hugh Philpott, is known for promoting the culture of Central Asian countries where he has been stationed, sometimes through song.
Philpott performed a Tajik song when he was ambassador to Tajikistan and recently sang a Turkmen tune.
On December 16, Philpott tweeted that he was "recuperating from a virus trending in the 'physical world.'"
Philpott did not say where he was recuperating, but he has been in Turkmenistan since returning from a trip abroad in late September.
The British government has not publicly commented on Philpott's condition or where he contracted the virus.
The World Health Organization (WHO) has also not confirmed that the coronavirus is in Turkmenistan, despite making an official visit.
The WHO sent a team to Turkmenistan in July after more than two months of delays caused, apparently, by Turkmen authorities' procrastination in giving official permission.
The WHO team was guided around Turkmenistan and afterward could only say they had not seen any clear evidence of the coronavirus in Turkmenistan, though they did express concern at "reports of increased cases of acute respiratory disease or pneumonia of unknown cause" and advised "activating the critical public-health measures in Turkmenistan, as if COVID-19 was circulating."
The team also recommended that "surveillance and testing systems are scaled up, and that samples are sent to WHO reference laboratories for confirmed testing."
Eurasianet.org contacted the WHO about that and in December received a reply that "unfortunately, due to many travel restrictions currently in place, this has as yet not been possible."
Given the Turkmen government's penchant for exaggeration, if not outright lying, it is not surprising that officials there continue to cling to their narrative that the coronavirus has been prevented from entering Turkmenistan.
It is somewhat surprising that international organizations and individual governments are not challenging this claim by the Turkmen government, especially considering the heavy impact it is having on the citizens of Turkmenistan.

Outbreak: What a Real Bioterrorism Incident Would Look Like

By Alan S. Brown
Source: https://www.ehstoday.com/training-and-engagement/article/21905687/outbreak-what-a-real-bioterrorism-incident-would-look-like

The first day of a bioterrorism event would look like any other day. So would the second, and probably the third and fourth as well.
It might take a week or longer for the first symptoms to show. And because the early stages of many bioterror agents look like the flu, the true nature of the disease may go unrecognized. A community may not realize it is under siege until hospitals start filling up and patients begin dying.
First responders, used to manning the front lines of any emergency, would find their roles changed. Doctors, nurses and EMTs would be in the thick of any crisis. Fire and police would find themselves providing support. Fire crews may find their station houses converted into clinics, and those with EMT training pressed into medical service. Police may be asked to guard medical supplies from looting, or to enforce quarantines.
It's a chilling scenario. Although experts repeatedly underscore the difficulty of using disease as a weapon of terror, any intentional release would have the potential for great damage. What would such an event look like? What roles will first responders play? How should we prepare? Here are some answers:

The Threat
The Centers for Disease Control and Prevention (CDC) lists anthrax, smallpox, botulism, plague, tularemia and hemorrhagic fever as Class A bioterror threats. They are easily transmitted, have high mortality rates and might spark public panic.
Smallpox has attracted the most attention. It incubates quietly for 9-14 days before its distinctive lesions appear and it becomes contagious. Before 1977, when it was eradicated, it killed about one-third of its victims. Today it would enter a world where no one has natural immunity. Several nations likely retain samples of the virus, including Iraq, North Korea and France.
Just how a terrorist would release a virus is an open question. Worst-case scenarios visualize weaponized germs, highly potent viruses or bacteria treated so that they disperse readily in air. A terrorist could release them into the heating or cooling system of a stadium, convention center, auditorium or office building. This would infect thousands, who would spread the disease without knowing it.

Fortunately, weaponizing germs is not easy. Japan's religious cult Aum Shinrikyo, which killed 12 in a nerve agent attack on the Tokyo subway in March 1995, tried to do this. Despite a team of scientists and physicians and millions of dollars in equipment, it could not isolate, aerosolize or disperse bioterror agents.
This does not rule out the success of others. Terrorists might buy weaponized agents on the black market. They could disperse them through the mail like anthrax, or infect suicide volunteers to walk through crowded stadiums or airports.
Fortunately, bioterror diseases are usually treatable. But first, doctors have to correctly diagnose them.

Discovery/Diagnosis

Most biowarfare diseases look like the flu. They cause high fever, weakness, muscle pain, nausea and headaches. Victims are likely to take aspirin and stay in bed. Those who seek medical care may not raise a flag because doctors used to dealing with everyday cases are unlikely to look for or recognize nonspecific bioweapon symptoms.
Doctors might, for example, mistake smallpox for chicken pox. "The distribution, type and location of lesions, and their look and feel at different stages distinguish smallpox," says Dr. Howard Schwid, an anesthesiology professor at University of Washington (Seattle). "If a first responder could tell symptoms at a glance, that would be very valuable," he continues. "If I saw someone with a characteristic smallpox rash and high fever, I would immediately ask for a vaccination myself. I would have about three days after first exposure to receive that vaccination."

Schwid helped Anesoft Corp. (Issaquah, Wash.) develop software that trains health care workers to recognize and treat bioterrorism symptoms. Even so, he suspects that physicians would not diagnose an agent of terror until the first death.
One reason for delays is that doctors rely on laboratory tests to identify diseases that resist conventional treatments or cause unexpected deaths. These tests do not screen for bioterrorism threats. It may take days or even weeks before someone runs the right tests and understands the true nature of an outbreak. By then, those with the infection may have spread it to hundreds or thousands more.
The CDC and several states and cities hope to recognize a crisis earlier by monitoring EMS traffic, hospital admissions and patient symptoms. New York City, for example, samples flu-like symptoms and diarrhea cases at a series of "sentinel" hospitals and nursing homes for unusual upswings. Unusually heavy EMS traffic, a spike in school absences or even an increase in dead animals may also raise flags.
Statistical methods could provide a warning in the earliest phases of an outbreak, when only a handful of cases have appeared at each of a city's hospitals. Otherwise, health workers may not see the big picture until the sick and dying overwhelm them. Then it will become a race against time to contain the disease.

Plague

Experts have tried to understand how a plague would unfold by simulating bioterrorist attacks. Operation Topoff, a U.S. Department of Justice simulation held in Denver in May 2000, assumes a covert attack of aerosolized plague (Yersinia pestis) on 2,000 people at a concert.
Within four days, 16 city hospitals report 783 cases and 123 deaths. Two days later, this rises to 3,700 cases – at least 780 transmitted by those initially infected – and 950 deaths. Cases appear in at least six states outside Colorado.
Plague's short incubation time overwhelms local hospitals. So do demands for treatment from the walking worried; healthy people who fear they have symptoms. Although federal authorities send vaccines and antibiotics, the distribution system in Denver breaks down. The governor decides to use remaining stocks to treat health care workers rather than close contacts of infectious cases.
In the end, assessors conclude that Denver would require 2,000 outside medical personnel within 24 hours to keep its health care system from collapsing. Otherwise citizens, some plague-infected, would start to leave Denver to seek help elsewhere.
One year after this simulation, the Johns Hopkins Center for Civilian Biodefense Studies (Baltimore) held Dark Winter. It simulated the 13-day spread of smallpox after aerosolized release at shopping malls in Oklahoma City, Philadelphia and Atlanta.

The Dark Winter scenario assumes that 30 grams of smallpox causes 3,000 infections, and that each victim infects an average of 10 others. The first 20 cases are diagnosed nine days after exposure. By the end of the 13-day scenario, hospitals in 25 states report 16,000 smallpox cases – 14,000 in the past 24 hours – and 1,000 deaths.
Experts predict that 17,000 new cases will emerge over the next 12 days, leaving 10,000 dead. But this assumes successful mass vaccination and disease containment. A breakdown in the system could catapult the number of dead to 100,000 or more.

Medical Response
Once the first case has been diagnosed, the clock starts ticking. The community has to find enough medicine, hospital beds and health care professionals to treat the ill and vaccinate the well.
Everything starts with retaining medical personnel, says Amy E. Smithson of the Henry L. Stimson Center, a Washington, D.C., national security think tank. In her landmark report on U.S. bioterrorism preparedness, she interviewed several physicians who said that half their staff would "run for the hills" if an incident occurred. She advocates first immunizing doctors, nurses, EMTs and other health professionals – and their families – so they will feel safe enough to remain on the job. Police and fire should also receive preventive antibiotics so that they remain at their posts.
Bringing in outside medical help is more problematic. Military doctors are a possibility, and several organizations are seeking ways to create a voluntary response team of physicians and nurses that would fly to emergencies.
Until help arrives, stricken areas must fend for themselves. Tucson fire battalion chief Les Caid, who helped organize a bioterrorism exercise in Arizona in November 2002, expects to draft EMTs, pharmacists, veterinarians, and student nurses and doctors. Oklahoma State EMS director Shawn Rogers, who participated in the April 2002 Sooner Spring bioterrorism exercise, expects to use police and fire fighters with EMT training to dispense medication in an emergency.
Cities are also likely to run out of beds. Even seasonal flu outbreaks overtax the capacity of many hospitals, Smithson points out. A bioterror incident would quickly strip hospitals of their ability to house and isolate contagious patients.
To cope with the onslaught, hospitals must share the burden, Smithson continues. Some facilities must remain open and uncontaminated for ordinary medical emergencies. Others will need every available bed to treat disease. Some preexisting patients must be evacuated, while others will be too sick to move. Cities may need to quickly transform schools, heating/cooling centers and fire stations into clinics.
It will take a well-practiced plan to move fast enough to head off the crisis. "Most communities still don't have a collective game plan for burden sharing," says Smithson. "The front lines will be all around them, and in the midst of disaster there is no time to exchange business cards."

The Stockpile
Communities will also need enough medicine and supplies to treat the sick. Most hospitals now stock only a few days' supplies. They will vanish within hours as hospitals inoculate their staffs, first responders and their families. Local warehouses will empty nearly as quickly.
The National Pharmaceutical Stockpile was created for that contingency. It consists of three 94,000-lb caches of palletized, ready-to-ship pharmaceuticals and medical equipment in Denver, Los Angeles and Winston-Salem, N.C. (A fourth cache remains in Washington, D.C.)
Although the system relies on 35-member volunteer medical teams, it is designed to roll within 4 hours. "It takes 18 to 24 minutes from the time we arrive to receive the first patient," says Robert Cornish, who manages the program for the U.S. Office of Emergency Response.
However, plenty of things could go wrong during deployment. Arizona's exercise moved the stockpile to a warehouse without a loading dock. It took half an hour to unload each of the 18 trucks transporting the cache. Nor did the warehouse have the Internet connection needed for logistics control.
Vaccinating the public will also take logistics planning. In its bioterror exercise, Arizona opted for collection points where people boarded buses to dedicated dispensing sites. Sooner Spring authorities took over local drive-through restaurants. "We expect cars to line up for blocks and blocks, so this allows the easiest flow of traffic," says Shawn Rogers.

Control
Any emergency plan will call for rapid, highly coordinated responses from many different agencies. Lots can go wrong, and each new difficulty puts pressure on the system. "The health care system could collapse under pressure from the exposed and walking worried," says Smithson.

What would a collapse look like? "Hospitals shutting their doors because they can't treat any more patients," she replies. "People leaving the area in search of health care services in other areas. People breaking into pharmacies to get drugs. Panic."
That means a high police profile at hospitals, clinics, drug dispensing centers and even pharmacies. "Police will need to identify sites where citizens might go to take things into their own hands if things got bad," says Smithson. "Imagine how a panicked community would react if some reporter got on the air and said, 'You can get this at your local pharmacy.'"
Caid agrees. "There are going to be thousands of very anxious folks lined up at dispensing centers," says Caid. "What if someone starts a rumor about lack of medication? By the time it got to the back of the line, people would be going crazy. The potential for problems at dispensing sites is huge."
During Arizona's exercise, police manned clinics and dispensing stations. They also secured the National Pharmaceutical Stockpile landing site and warehouse, as well as routes used to distribute pharmaceuticals. "Pharmaceuticals would be more valuable than gold," says Caid. "We wanted to know who would be in charge. Local police? State? We wanted our plans to be really specific so we had no miscommunications."
"It's not just about manpower, but appropriate use of force," adds Smithson. "If someone breaks down a hospital door, what level of force do local police use? Are we talking about a bull horn? Pepper spray? Rubber bullets? Lethal force?"

Quarantines and Communications
Any discussion of quarantines raises similar questions. Oklahoma's Rogers is adamant: "You can't quarantine a city – it's not realistic unless you ring a city with troops and shoot to kill."
This raises sticky issues for first responders. Police would have to enforce any restrictions. Police, fire fighters and EMS would also have to enter the same isolated areas to provide food, medical care and other essential services. How would they fare in a city that spent its last supplies of medicine to treat first responders, then sent them into neighborhoods where disease was rampant?
Issues of force will cause many communities to shy away from quarantines. Others claim that modern forms of transportation make quarantines almost impossible to enforce. "You don't have enough police in an entire state to quarantine certain city areas," says Smithson.
Instead, governments must convince citizens to stay at home, says Michael Mair, a senior research assistant at Johns Hopkins Biodefense who participated in Dark Winter. "We think people are normally calm, rational and work together in these situations," he explains. "We always get a better response when we use the least restrictive means possible that prevents spread of disease. That shows more respect for people's civil liberties."
Public communication often takes the backseat in a crisis. A bioterror event would demand an extraordinary amount of clear communications. Citizens need to hear a single message so there is no doubt what steps they must take to keep the disease from spreading.
"The ways and speed at which information is communicated may be a major factor in limiting a terrorism attack," says John Sorensen, director of Oak Ridge National Laboratory's Emergency Management Center. He notes that the anthrax scare did not cause mass hysteria, and that people tend to be more apathetic than responsive. "People have a tendency to deny that something will happen to them, and think that it will happen to other people," he explains.
Yet he also admits that no one really knows how a city will react to a large-scale bioterrorist attack. His advice: Provide lots of information. Do not withhold information. Acknowledge where there are uncertainties and why they occur. Never cover up or sugarcoat things.
He also suggests engaging a wide variety of people, from scientists to community leaders, to discuss the situation. "Multiple sources of information are the key to reaching even impoverished areas without social support networks," he says.
Addressing this, Smithson suggests getting out early with frequent updates and making sure everyone is on the same page. Contradictory statements cause confusion and panic. Given the number of different local, regional, state and federal organizations that will be working together for the first time, this may be difficult.

The End?
What happens next? Assume for a moment that one or more U.S. cities have been attacked. We have identified the disease. We fly in the National Pharmaceutical Stockpile and press anyone with medical training into emergency service to treat and vaccinate the public. Everyone does a good job of communicating. Most people stay indoors, and EMS comes to get them if they call in sick.
What then?

The scariest thing about most simulations and exercises is not just the numbers, which are terrifying enough. It is that simulations are designed to last only a certain number of days. When they end, the disease is still spreading. Thousands are infected. Not all of them know it.
How does it stop? When does it stop?
No one knows the answer because nothing like this has ever happened before. And, because bioterrorism is so difficult to practice, it may never happen.
Meanwhile, the best option is to remain alert. Learn the symptoms. Look for unusual statistics. And know and practice the plan before we need it.

SARS-CoV-2 Pandemic: 12 Things to Do Yesterday

By the Editor

- Equipment autonomy and self-sufficiency – new technologies (e.g., 3-D printing);
- PPE training of front-line health professionals and volunteers' pool;
- Invest on field hospitals and dual usage mass gathering infrastructure;
- Invest on healthcare personnel;
- Establish anthropocentric crisis management;
- Define SMART[2] objectives;
- Regain governance from epidemiologists and intensivists;
- Invest on multi-virus vaccination technologies;
- Enhance collaboration and information exchange on issues of public health;
- Re-organize and modernize World Health Organization and its bodies and functions;
- Focus on medical intelligence and global exchange of accurate and timely information;
- Educate the population on issues related to public health emergencies.

6 Months After Infection, 76% of COVID-19 Patients Are Still Suffering Symptoms

Source: https://www.sciencealert.com/most-covid-19-patients-still-have-at-least-one-symptom-after-6-months

Jan 11 – More than three quarters of people hospitalised with COVID-19 still suffered from at least one symptom after six months, according to a study published Saturday that scientists said shows the need for further investigation into lingering coronavirus effects.
The research, which was published in the *Lancet* medical journal and involved hundreds of patients in the Chinese city of Wuhan, is among the few to trace the long-term symptoms of COVID-19 infection.
It found that fatigue or muscle weakness were the most common symptoms, while people also reported sleeping difficulties.
"Because COVID-19 is such a new disease, we are only beginning to understand some of its long-term effects on patients' health," said senior author Bin Cao, of the National Center for Respiratory Medicine.
The professor said the research highlighted the need for ongoing care for patients after they have been discharged from hospital, particularly those who have had severe infections.
"Our work also underscores the importance of conducting longer follow-up studies in larger populations in order to understand the full spectrum of effects that COVID-19 can have on people," he added.
The World Health Organization has said the virus poses a risk for some people of serious ongoing effects - even among young, otherwise healthy people who were not hospitalised.
The new study included 1,733 COVID-19 patients discharged from Jinyintan Hospital in Wuhan between January and May last year.

[2] Simple, Manageable, Achievable, Realistic, and Timely objectives

Patients, who had an average age of 57, were visited between June and September and answered questions on their symptoms and health-related quality of life.
Researchers also conducted physical examinations and lab tests.

The study found that 76 percent of patients who participated in the follow-up (1,265 of 1,655) said they still had symptoms. Fatigue or muscle weakness was reported by 63 percent, while 26 percent had sleep problems.
The study also looked at 94 patients whose blood antibody levels were recorded at the height of the infection as part of another trial.
When these patients were retested after six month, their levels of neutralising antibodies were 52.5 percent lower.

The authors said this raises concerns about the possibility of COVID-19 re-infection, although they said larger samples would be needed to clarify how immunity to the virus changes over time.
In a comment article also published in *The Lancet*, Monica Cortinovis, Norberto Perico, and Giuseppe Remuzzi, from Italy's Istituto di Ricerche Farmacologiche Mario Negri IRCCS, said there was uncertainty over the long-term health consequences of the pandemic.
"Unfortunately, there are few reports on the clinical picture of the aftermath of COVID-19," they said, adding the latest study was therefore "relevant and timely".
They said longer term multidisciplinary research being conducted in the United States and Britain would help improve understanding and help develop therapies to "mitigate the long-term consequences of COVID-19 on multiple organs and tissues".

COVID-19 severity linked to gut bacteria in first-of-its-kind study

Source: https://newatlas.com/health-wellbeing/gut-bacteria-microbiome-covid19-severity-coronavirus-inflammation/

Jan 11 – A first-of-its-kind study has investigated the relationship between COVID-19 severity and the gut microbiome. The observational research suggests specific microbial patterns correlate with disease severity and those bacterial imbalances may account for some cases of "long COVID".
A growing body of study is finding a relationship between our immune system and the massive population of bacteria living in our intestines, known as our gut microbiome. These links suggest our microbiome may influence, or be influenced by, inflammatory activity in the body. And this relationship could play a role in everything from depression and obesity to Alzheimer's.
In light of these recent microbiome discoveries it is reasonable to wonder what kind of influence gut bacteria has on perhaps the greatest acute health crisis of our time, COVID-19. A handful of preliminary studies published in late 2020 suggested patients suffering from COVID-19 may present with novel gut microbiome signatures.
One study found COVID-19 patients presented with unique microbial compositions compared to patients with influenza and healthy controls. Another small pilot study, investigating a cohort of just 15, suggested there may be signs microbiome alterations correlate with COVID-19 severity.
This new study, published in the BMJ journal *Gut*, offers the most detailed investigation to date into the relationship between COVID-19 severity, the gut microbiome, and general inflammatory biomarkers. The research looked at blood and stool samples from 100 COVID-19 patients admitted to hospital, compared to 78 healthy control subjects.

The study found significant microbial differences between COVID-19 patients and controls. Species including *Bifidobacterium adolescentis*, *Faecalibacterium prausnitzii* and *Eubacterium rectale*, which have previously been shown to play a role in immune system activity, were all seen in notably lower volumes in COVID-19 patients. COVID-19 patients also displayed unusually higher volumes of bacterial species including *Ruminococcus gnavus* (right photo), *Ruminococcus torques*, and *Bacteroides dorie*.

"Moreover, this perturbed composition exhibited stratification with disease severity concordant with elevated concentrations of inflammatory cytokines and blood markers such as C creative protein, lactate dehydrogenase, aspartate aminotransferase and gamma-glutamyl transferase," the researchers report in the study.

A smaller subset of COVID-19 patients in the study were followed for up to a month after recovery and discharge from hospital, revealing the disrupted microbiome signatures seemed to persist beyond the phase of acute disease. One hypothesis raised by the researchers suggests microbiome disruptions could play a role in the enduring symptoms many COVID-19 patients suffer from in the months following infection.
It is important to note these findings are very preliminary and cannot offer insight into causality. It's unclear, for example, whether these particular COVID-19 patients had irregular microbiome signatures before viral infection. And it is unclear whether these microbiome signatures directly influence the severity of the disease, or are merely a consequence of it.
"… the observed gut microbiota composition could simply be a response to patients' health and immune states rather than a direct involvement in disease severity, as such it may not be directly applicable to predicting disease susceptibility in non-COVID-19 subjects," the researchers note in the new study.
Perhaps the most interesting hypothesis to come out of this preliminary study is the proposition that some kind of personalized microbiome therapy could be a useful treatment for patients following the acute phase of COVID-19. A great deal of work is still needed, however, before any kind of real-world clinical application arises from this field of investigation.
"The dysbiotic gut microbiota that persists after disease resolution could be a factor in developing persistent symptoms and/or multi system inflammation syndromes that occur in some patients after clearing the virus," the researchers conclude. "Bolstering of beneficial gut species depleted in COVID-19 could serve as a novel avenue to mitigate severe disease, underscoring importance of managing patients' gut microbiota during and after COVID-19."

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

Herd Immunity Won't Happen in 2021, WHO Warns - Even With Vaccines

Source: https://www.sciencealert.com/who-warns-even-with-vaccines-we-re-unlikely-to-reach-herd-immunity-in-2021

Jan 12 – Scientists at the World Health Organization warned Monday that mass vaccinations would not bring about herd immunity to the coronavirus this year, even as one leading producer boosted its production forecast.
England meanwhile launched the first of its mass-inoculation sites in major cities, racing to get ahead of the rapid spread of a new strain of the disease there.
The pandemic has infected more than 90 million people and the death toll has passed 1.94 million since China confirmed the first death in the central city of Wuhan a year ago.
China has largely brought the virus under control, but is tackling a number of local infections.
More than half a million people were placed under lockdown in Beijing on Monday as the government imposed strict measures to stamp out a handful of cases.
Infection numbers were, however, surging across Europe, particularly as Britain coped with a new strain of the disease that could see hospitals being overwhelmed.
Russia on Sunday confirmed its first case of the new UK coronavirus strain, which scientists fear is significantly more contagious.
The virus has also exploded across the United States, the hardest-hit country, where US President-elect Joe Biden publicly received his second dose of the vaccine.

'Worst weeks' to come

German company BioNTech said it could produce millions more doses of its coronavirus doses than originally expected this year, boosting production forecast from 1.3 to two billion.
The announcement by BioNTech, which partnered with US firm Pfizer to produce the first vaccine approved in the West, was a boost to countries struggling to deliver the jabs.
But the company also warned that COVID-19 would "likely become an endemic disease", and said vaccines would need to fight against the emergence of new viral variants and a "naturally waning immune response".
Later Monday, the WHO's chief scientist Soumya Swaminathan warned it would take time to produce and administer enough vaccine doses to halt the spread of the virus.
"We are not going to achieve any levels of population immunity or herd immunity in 2021," she said, stressing the need to maintain physical distancing, hand-washing and mask-wearing to rein in the pandemic.

Britain, the first country to approve the Pfizer/BioNTech jab, opened seven mass vaccination sites across England on Monday.
But England's chief medical officer Chris Whitty told BBC television: "The next few weeks are going to be the worst weeks of this pandemic in terms of numbers into the NHS (National Health Service)."
"What we need to do, before the vaccines have had their effect... is we need to really double down" on observing lockdown measures, he added.
India - with the world's second-biggest virus caseload - will begin giving shots to its 1.3 billion people from Saturday in a colossal and complex undertaking.
Russian officials said Monday they would trial a one-dose version of the country's Sputnik V vaccine, part of efforts to provide a stopgap solution for badly hit countries.

Safest city

South Africa meanwhile shut land borders for a month to counter an unprecedented resurge in cases fuelled by a new virus strain.
Restrictions already in place, such as a ban on alcohol sales and large gatherings, and an overnight curfew, remain.
Portugal's Prime Minister Antonio Costa said Monday a new lockdown was unavoidable as the country suffered record numbers of virus deaths and infections.
"We are certainly facing a third wave" of the virus, Costa told journalists.
Lebanon tightened its virus restrictions with an 11-day total lockdown and fresh travel restrictions.
A team of 10 scientists from the WHO were preparing for a mission to China on Thursday to investigate the origins of the disease.
It will "conduct joint research cooperation on the origins of COVID-19 with Chinese scientists", Beijing's National Health Commission said in a statement that provided no further details.
The visit, comes more than a year after the pandemic began amid accusations that Beijing tried to thwart the investigation into the virus.
The United States and Australia have led international calls for an independent inquiry, enraging China.
The anniversary of the first reported death passed by unmarked on Monday in Wuhan, where commuters moved freely to work, and parks and riverside promenades buzzed with visitors.
"Wuhan is the safest city in China now, even the whole world," 66-year-old resident Xiong Liansheng told AFP.

Few Vaccines Actually Prevent Infection – Here's Why That's Not Actually a Problem

By Sarah L. Caddy
Source: https://www.sciencealert.com/few-vaccines-actually-prevent-infection-here-s-why-that-s-not-a-problem-with-covid-19

Jan 12 – Vaccines are a marvel of medicine. Few interventions can claim to have saved as many lives. But it may surprise you to know that not all vaccines provide the same level of protection. Some vaccines stop you getting symptomatic disease, but others stop you getting infected too.
The latter is known as "sterilising immunity". With sterilising immunity, the virus can't even gain a toehold in the body because the immune system stops the virus entering cells and replicating.
There is a subtle yet important difference between preventing disease and preventing infection. A vaccine that "just" prevents disease might not stop you from transmitting the disease to others – even if you feel fine. But a vaccine that provides sterilising immunity stops the virus in its tracks.
In an ideal world, all vaccines would induce sterilising immunity. In reality, it is actually extremely difficult to produce vaccines that stop virus infection altogether. Most vaccines that are in routine use today do not achieve this.
For example, vaccines targeting rotavirus, a common cause of diarrhoea in infants, are only capable of preventing severe disease. But this has still proven invaluable in controlling the virus. In the US, there has been almost 90 percent fewer cases of rotavirus-associated hospital visits since the vaccine was introduced in 2006. A similar situation occurs with the current poliovirus vaccines, yet there is hope this virus could be eradicated globally.
The first SARS-CoV-2 vaccines to be licensed have been shown to be highly effective at reducing disease. Despite this, we don't yet know whether these vaccines can induce sterilising immunity.

It is expected that data addressing this question will be available from the ongoing vaccine clinical trials soon. Although even if sterilising immunity is induced initially, this may change over time as immune responses wane and viral evolution occurs.

Immunity in individuals

What would a lack of sterilising immunity mean for those vaccinated with the new COVID vaccines? Quite simply it means that if you encounter the virus after vaccination, you may get infected but show no symptoms. This is because your vaccine-induced immune response is not able to stop every virus particle from replicating.

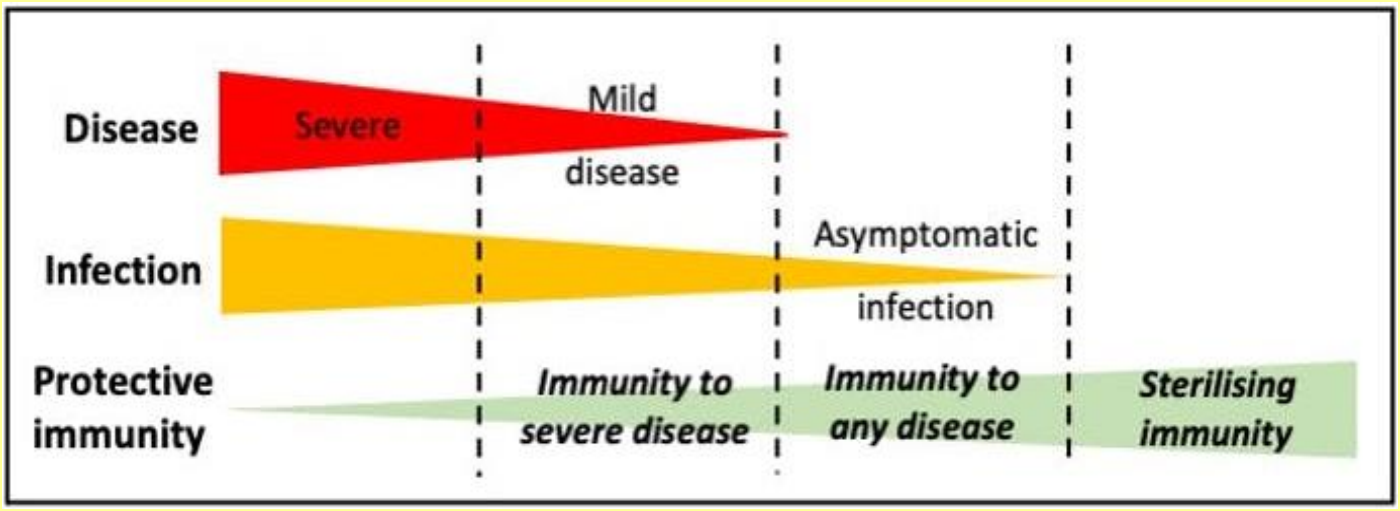
It is generally understood that a particular type of antibody known as a "neutralising antibody" is needed for sterilising immunity. These antibodies block virus entry into cells and prevent all replication.

However, the infecting virus may have to be identical to the vaccine virus in order to induce the perfect antibody.

Thankfully, our immune responses to vaccines involve many different cells and components of the immune system. Even if the antibody response isn't optimal, other aspects of immune memory can kick in when the virus invades. These include cytotoxic T cells and non-neutralising antibodies. Viral replication will be slowed and consequently disease reduced.

We know this from years of study on influenza vaccines. These vaccines typically induce protection from disease, but not necessarily protection from infection. This is largely due to the different strains of influenza that circulate – a situation that may also occur with SARS-CoV-2.

It is reassuring to note that flu vaccines, despite being unable to induce sterilising immunity, are still extremely valuable at controlling the virus.



The inverse relationship between coronavirus infection severity and protective immunity. (Sarah L Caddy)

Immunity in a population

In the absence of sterilising immunity, what effect might SARS-CoV-2 vaccines have on the spread of a virus through a population? If asymptomatic infections are possible after vaccination, there has been concern that SARS-CoV-2 will simply continue to infect as many people as before. Is this possible?

Asymptomatically infected people typically produce virus at lower levels. Though there is not a perfect relationship, usually more virus equals more disease. Therefore, vaccinated people are less likely to transmit enough virus to cause severe disease.

This in turn means that the people getting infected in this situation are going to transmit less virus to the next susceptible person. This has been neatly shown experimentally using a vaccine targeting a different virus in chickens; when only part of a flock was vaccinated, unvaccinated birds still showed milder disease and produced less virus.

So, while sterilising immunity is often the ultimate goal of vaccine design, it is rarely achieved. Fortunately, this hasn't stopped many different vaccines substantially reducing the number of cases of virus infections in the past.

By reducing disease levels in individuals, this also reduces virus spread through populations, and this will hopefully bring the current pandemic under control.

Sarah L Caddy *is Clinical Research Fellow in Viral Immunology and Veterinary Surgeon @ University of Cambridge.*

Muslim scholars definitively back Covid-19 vaccine as halal

Source: https://www.thenationalnews.com/uae/health/muslim-scholars-definitively-back-covid-19-vaccine-as-halal-1.1143479

Dec 10 – **Even if pork gelatin – a common stabiliser in vaccines – was present, it would be considered a medicine, not a foodstuff and therefore not forbidden in Islam**

Obaid Al Shamsi, director general of the National Emergency Crisis and Disasters Management Authority, takes the first dose of Covid-19 vaccine

As the UAE's vaccine drive began on December 22, a crucial religious ruling was sent out: the vaccine is halal.

The UAE Fatwa Council was one of the first Islamic authorities to deliver that view – an hour after the Pfizer-BioNTech vaccine was approved in Dubai. The ruling came as scholars across the Muslim world looked for guidance.

The issue is this: for years pork gelatin has been used in some vaccines as a stabilising agent, ensuring a vaccine remains safe and effective in storage.

Many scholars have now said the substance used in some of the shots is medicine, not a foodstuff – and the need to save life overrides any normal religious observance, such as the prohibition of pork. On Saturday, Indonesia, which has the world's largest Muslim population, also said that the vaccine is halal.

But the issue remains complex and has been marred by fake news and myths. Here we clarify the latest thinking.

Sheikh Mohammed bin Rashid receives the Sinopharm vaccine to protect against Covid-19 on November 3, 2020. Courtesy: Dubai Media Office

Why do vaccines contain gelatin?

For years, vaccines and other drugs have contained gelatin, a substance derived from the collagen of animals such as chicken, cattle, pigs and fish. 'Porcine gelatin' is derived from pigs.

Gelatin is used in a wide variety of medicines, including capsules and some vaccines.

In vaccines, the substance is used as a stabiliser to ensure the liquid remains safe and effective when stored.

Unlike the gelatin used in foods – is it often found in jelly sweets, desserts and fruit snacks – it is highly purified and broken down into small molecules called peptides.

Many Muslim scholars do not regard this as consuming pork products.

Are there alternatives to using gelatin in vaccines?

Yes. In recent years the need to satisfy religious observance, particularly for Muslims and Jews, has led to the use of alternatives to gelatin.

The UK government agency Public Health England says that Fluenz Tetra, the nasal spray vaccine that protects children against flu; MMR VaxPro, which protects against measles, mumps and rubella; and Zostavax, which protects older adults against shingles, all contain porcine gelatin.

The MMR vaccine has a non-porcine alternative. At this time, the others do not.

If alternatives are available, why is this an issue?

The vaccines created to protect people against the new coronavirus were the fastest ever created.

And, once scientists have an effective stabiliser and test it with a vaccine, any change would require extensive lab work and clinical studies.

As Public Health England notes: "Developing a new, safe and effective vaccine with a different stabiliser may take several years or may never happen."

Which vaccines use porcine gelatin and which do not?

This is where it gets complicated. The common use of gelatin, and the speed at which the shots were introduced in the global drive, means the substance may have been used in a number of vaccines.

Drug makers have also been relatively slow to clarify exactly what was used.

This is likely to be because the overriding concern is the protection of life above all else, and perhaps out of concern they could confuse the public. It is also for regulators to determine whether to approve a product or not.

Chinese pharmaceutical company Sinovac, which trialled its vaccine in Indonesia, assured the public there that the shots were "manufactured free of porcine materials". But when Indonesian clerics needed more details, Sinovac took months to provide them.

At the weekend, the religious authorities in Indonesia – which is the hardest hit east Asian nation, with 800,000 cases and more than 23,000 deaths – ruled the vaccine was permissible whatever its halal status, and urged the public to take it.

In the face of fake news spread about its vaccine, Pfizer-BioNTech confirmed it "does not contain any components of animal origin".

Most vaccine makers have highlighted that the products used were highly refined for medical use, whatever their provenance.

What does the Fatwa Council say?

In short, none of the above should be of consideration to Muslims.

The UAE Fatwa Council acknowledged that there were "growing concerns among Muslims over the halal status of the Covid vaccines", in a statement on December 22, 2020 – the same day the Pfizer-BioNTech vaccine was approved and weeks after Sinopharm was introduced in Abu Dhabi.

But it said that even though non-halal ingredients are haram, it is permissible because there are no alternatives, and the substance is not a foodstuff.

A coronavirus vaccine is in "compliance with Islamic Sharia's objectives on the protection of the human body", it said.

The judgment is based on several principles in Islam, including the preservation of life and the medical use of various products.

Dr Adil Sajwani, an Emirati family medicine doctor and a member of the national awareness team for Covid-19 at the UAE's Ministry of Health and Prevention, urged the public not to be swayed by old beliefs or fake news.

"Scholarly opinion has changed now, especially in the UAE," he said.

"If the substance is transformed into medicine, it is no longer considered prohibited."

Hospital Offers Workers $500 to Get COVID-19 Vaccine

Source: https://www.medscape.com/viewarticle/943654

Jan 06 – Houston Methodist Hospital is offering $500 to employees as a "thank you" bonus for their hard work during the pandemic — and for taking both doses of a COVID-19 vaccine, according to CBS News.

The "Hope Bonus" will go out in March, Marc Boom, MD, president and CEO of the hospital system, wrote in an email to staff last week.

"Eligibility criteria will include getting a COVID-19 vaccination, fulfilling our obligation as health care workers to lead the community," he wrote.

The hospital also gave employees $500 bonuses about 6 weeks ago for working during the pandemic, and the upcoming bonus is meant to show extra gratitude.

The Houston area has been a coronavirus hot spot, with more than 249,000 cases and nearly 2,700 deaths. According to TV station KHOU 11, the COVID-19 hospitalization levels by the end of next week are expected to surpass the July surge, which was the worst month of the pandemic in Houston.

"This bonus is a thank you for your perseverance throughout a difficult 2020 as well as something to look forward to, to provide hope, during the next couple of challenging months," Boom wrote.

Houston Methodist began giving COVID-19 vaccines to employees on Dec. 15. About 55% of the 26,000 employees have received the first dose of the vaccine, and thousands more have scheduled appointments, according to CNN. The health system isn't requiring vaccination at the moment but "will be eventually" for most workers, Boom wrote.

"There is a small minority of staff who I have spoken to on the floor who are reluctant," Roberta Schwartz, PhD, executive vice president and chief innovation officer for the health system, told CBS.
Some workers are watching how others handle the vaccine, she said. Others have general concerns about vaccines, and a few are worried about the COVID-19 vaccine in particular. At the same time, the public interest in the vaccine seems strong, she said.
"Our phones are inundated with people who want the vaccine. It's hard for us to feel the reluctance in the general society as we're only hearing from people who want it," she said. "Even our IT desk got 1,500 phone calls from people wanting this vaccine."

Experts Debate Wisdom of Delaying Second COVID-19 Vaccine Dose

Source: https://www.medscape.com/viewarticle/943533

Jan 04 – A proposal to delay administration of the second dose of COVID-19 vaccines — suggested as a strategy to boost the number of people who get some degree of protection from a single immunization with the Pfizer/BioNTech or Moderna vaccines — is inciting a strong debate among clinicians and public health officials.
Proponents argue that getting some degree of protection to a greater number of Americans is worthwhile, particularly as case numbers and hospitalizations continue to rise and with the emergence of a more contagious variant.
Opponents raise concerns about diverting from the two-dose schedule evaluated in clinical trials, including a lack of data on long-term protection from a single dose. They also suggest a longer interval between dosing could increase resistance of SARS-CoV-2 virus.
It is time to consider delaying the second dose, Robert M. Wachter, MD, at the University of California San Francisco and Ashish Jha, MD, MPH, at Brown University in Providence, Rhode Island, write in an opinion piece in *The Washington Post* January 3.
The two experts state that supply constraints, distribution bottlenecks, and hundreds of thousands of new infections daily prompted them to change their stance on administering COVID-19 vaccines according to the two-dose clinical trial regimen. Furthermore, they cite a study in the *New England Journal of Medicine* that suggests 80% to 90% efficacy for preventing SARS-CoV-2 infection following one dose of the Moderna vaccine.
Not everyone agrees one dose is a good idea. "Clinical trials with specific schedules for vaccine dosing — that's the whole basis of the scientific evidence," Maria Elena Bottazzi, PhD, associate dean of the National School of Tropical Medicine at Baylor College of Medicine in Houston, Texas, told *Medscape Medical News*.
After one dose "the immune system is learning, but it's not ideal. That's why you need the second dose," Bottazzi said. "I appreciate the urgency and the anxiety…but the data support [that] clinical efficacy requires two doses."
Another proposed strategy to extend the current supply of COVID-19 vaccines to more Americans involves splitting the current dosage of the Moderna vaccine in half. Officials in the United States and the United Kingdom are reportedly considering this approach. In the US, the FDA would have to approve any dosing change.

Agreeing to Disagree

Wachter shared a link to his opinion piece on Twitter, stating that "We both came to this view because of the slow rollout & the new variant. But it's a tough call and reasonable people will disagree."
"There are no correct answers but there's data deficiency, plenty of fodder and need for healthy, intellectual debate. That wouldn't be occurring if there was an ample supply of vaccines," Eric Topol, MD, director of the Scripps Translational Science Institute and editor-in-chief of Medscape, tweeted on January 3.
"If the problem were with the supply of the vaccine, one might make an argument for focusing on 1st dose. But the problem is in distribution of the vaccine & giving actual doses," John Grohol, PsyD, tweeted.
"Right now we don't have a supply issue, we have a distribution issue," Angela Shen, ScD, MPH, a research scientist in the Vaccine Education Center at Children's Hospital of Philadelphia, told *Medscape Medical News*. Emergency use authorization for the Johnson & Johnson and other COVID-19 vaccines in development could further boost available supplies, she added.
"The clinical trials studied two doses," Shen said. "We don't have data that one dose is going to have lasting protection."

Does New Variant Change Equation?

Wachter and Jha, in their editorial, cited quote from former boxing champion Mike Tyson that, "Everybody has a plan until they've been punched in the mouth." 'Punches' such as the new variant, the high number of cases and deaths in the United States, and other problems prompted them to advocate for the delayed dosing strategy.

"Appreciate the concern for the new variant — I think it's worth noting that we're punching ourselves in the mouth with the slow vaccine rollout, which is the first problem to solve," Jake Quinton, MD, an internist at UCLA Health in Los Angeles, noted on twitter.

Vaccine and Public Resistance Raised

"I agree with the problem but not with the proposed solution, which is guess work not based on data," the Jan Grimm Lab at Memorial Sloan Kettering Cancer Center in New York City responded to Wachter and Jha on Twitter. **"There ARE data though that show that 1 shot alone did not elicit sufficient T-cell nor antibody response. This might also lead to mutations resistant to the vaccines. Dangerous!"**

Other physicians took to Twitter to point out that changing the recommendations at this point could further erode public confidence in COVID-19 immunization. For example, Deirdre Habermehl, MD, wrote, "We've spent months telling the public the best route is to follow the science and now without data think a course correction based on a guesstimate is ok? Public confidence is low enough and the real issue is logistics at this point."

COVID-19 blood plasma therapy ineffective in severely ill patients

Source: https://newatlas.com/health-wellbeing/coronavirus-blood-convalescent-plasma-therapy-ineffective-severely-ill-patients/

Jan 12 – Early findings from a large international clinical trial suggest severely ill COVID-19 patients do not benefit from an experimental therapy involving infusions of blood plasma from those who have recovered from the disease. This particular arm of the study was halted, but the trial will continue to investigate the treatment in moderately ill patients.

Early in 2020, as the COVID-19 pandemic was first sparking across the globe, several researchers raised the idea of convalescent plasma as a possible tool to help treat patients. The treatment dates back to the late 19th century and suggests antibodies in the blood of those who have recovered from a particular disease can help patients suffering from an acute case of the same disease.

In March 2020 a large global study began investigating a variety of different treatments for COVID-19. Called REMAP-CAP, the trial ultimately expanded to include 15 countries and 290 hospitals. Convalescent plasma was one of the key COVID-19 treatments the trial was investigating.

A recent early analysis of the trial's findings is suggesting the treatment does not improve patient outcomes in severely ill cases. This preliminary analysis, not yet published in any peer-reviewed journal, was based on data from 912 subjects.

The results have led the leaders of the REMAP-CAP study to halt further enrollment of severely ill patients for this particular arm of the trial. However, the arm of the trial investigating the plasma treatment in moderately ill COVID-19 patients will continue.

"Although it is disappointing that all critically ill patients don't appear to gain any benefit, this is still vitally important to know," says Anthony Gordon, a senior investigator working on the trial. "Convalescent plasma is a precious resource, and we can now continue to focus on identifying exactly which patients might benefit the most from treatment – maybe people earlier in their illness or those with weak immune systems."

REMAP-CAP is not the only trial investigating the efficacy of convalescent plasma for COVID-19. A broad array of investigations around the globe are ongoing, however, so far the data is still far from definitive. An active Cochrane review tracking 138 studies, suggested in its most recent update that the efficacy of this therapy is still uncertain. A BMJ editorial published in October last year went even further, flatly calling convalescent plasma therapy for COVID-19, "ineffective".

Nevertheless, the REMAP-CAP team is still investigating the therapy in moderately ill patients. Manu Shankar-Hari, a researcher working on the trial hypothesizes the experimental therapy could still be effective in certain scenarios, and continuing the trial will help home in on the specific cases convalescent plasma may be useful.

"It is biologically plausible that patients who are not producing antibodies at the time of convalescent plasma therapy and those patients with excess virus may benefit more than others," says Shankar-Hari. "Our additional analyses will explore this. Aside from these severe patients, patients who are moderately ill and patients with immune impairments may benefit.

It is therefore vital that plasma donations continue."

Do citizens have the right to know the name/brand of the vaccine they are injected with?

I vote YES!

New insights into how COVID-19 can impact the brain and CNS

Source: https://newatlas.com/health-wellbeing/coronavirus-infect-damage-brain-neurological-cns-yale/

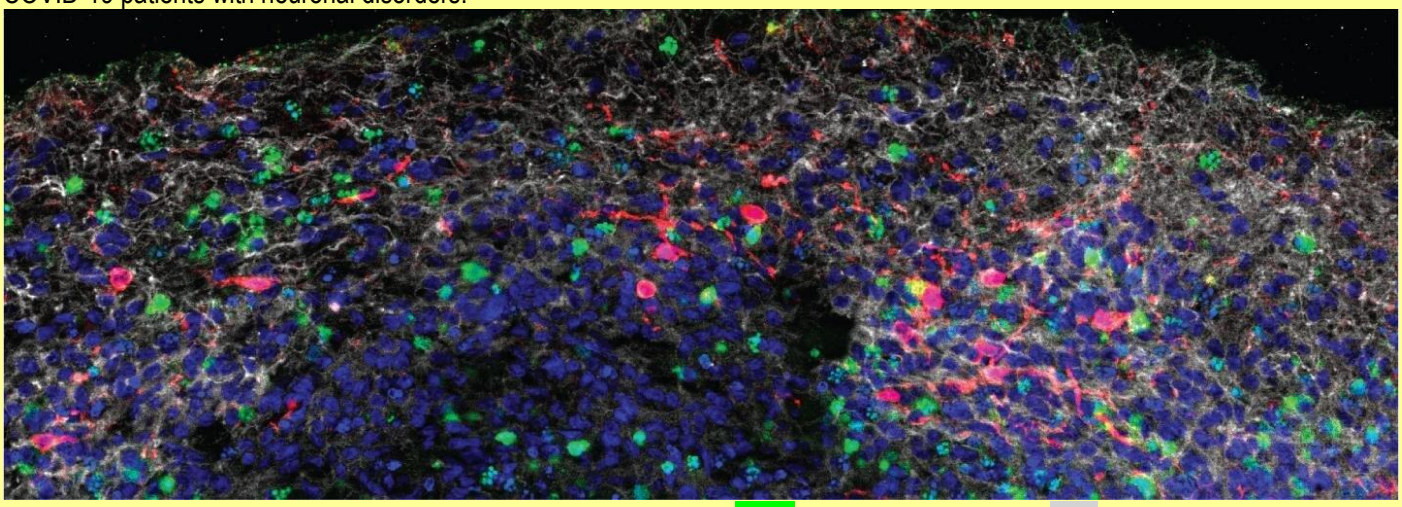
Jan 12 – A robust new study led by scientists from Yale School of Medicine has comprehensively demonstrated how SARS-CoV-2, the novel coronavirus that causes COVID-19, can infect the brain and central nervous system (CNS). The study validates a growing body of observational research attributing neurological issues to COVID-19.

As 2020 progressed and we learned more about the effects of COVID-19, many clinicians began to suggest this novel virus causes more than just respiratory disease. The temporary loss of one's sense of smell was an early unexpected sign the virus could be affecting parts of the brain. Unlike a common cold, which causes similar symptoms due to simple sinus congestion, COVID-19 seemed to be disrupting this sense in a different way.

From increasing cases of stroke, to memory loss and other cognitive complaints, a number of neurological concerns appeared to suggest the virus was somehow getting into the brain, but how it was doing that wasn't particularly clear. Studying the effects of SARS-CoV-2 on the brain presented researchers with a challenge. Beyond post-mortem autopsies it is virtually impossible to sample brain tissue directly, so it is difficult to directly investigate whether the virus was explicitly infecting the brain.

The new Yale-led research utilized a variety of methods to investigate how the virus could infect brain cells. Lab-grown brain cell models called brain organoids, detailed SARS-CoV-2 mouse models, and post-mortem human brain tissue were all aspects of the new study which ultimately discovered the novel coronavirus can indeed directly infect brain cells.

"Our study clearly demonstrates that neurons can become a target of SARS-CoV-2 infection, with devastating consequences of localized ischemia in the brain and cell death," says co-senior author Kaya Bilguvar. "Our results suggest that neurologic symptoms associated with COVID-19 may be related to these consequences, and may help guide rational approaches to the treatment of COVID-19 patients with neuronal disorders."



An image of a human brain organoid shows numerous dying cells (green) surrounding neurons (gray) that have been infected by SARS-CoV-2 (red) – 2021 Song et al

The new study offers plausible evidence demonstrating SARS-CoV-2 can infect the brain and central nervous system (CNS), but due to a lack of robust clinical research it is still unclear what those neurological effects of COVID-19 are in the long-term. A recently published review article surveyed more than a century of viral infections and suggests there is a precedent for flu-like viruses leading to neurological complications.

"Since the flu pandemic of 1917 and 1918, many of the flulike diseases have been associated with brain disorders," explains lead author on the review, Gabriel A. de Erausquin. "Those respiratory viruses included H1N1 and SARS-CoV. The SARS-CoV-2 virus, which causes COVID-19, is also known to impact the brain and nervous system."

The review lays the foundation for a new cohort study dedicated to investigating the long-term impacts of SARS-CoV-2 on the brain. The study aims to follow a large volume of COVID-19 patients, with evaluation points at six, nine, and 18 months post hospital discharge.

"Scientific leaders, including the Alzheimer's Association and representatives from more than 30 countries – with technical guidance from the World Health Organization – have formed an international, multidisciplinary consortium to collect and evaluate the short- and long-term

consequences of SARS-CoV-2 on the CNS," the new review article explains. "This program of studies aims to better understand the long-term consequences that may impact the brain, cognition, and functioning – including the underlying biology that may contribute to AD [Alzheimer's disease] and other dementias."

A significant volume of questions still remain: How does SARS-CoV-2 get into the brain? What makes a person more susceptible to neurological infection? Are there long-term neurological effects from mild COVID-19 cases? Does SARS-CoV-2 infection increase one's chances of developing neurodegenerative conditions such as Parkinson's or Alzheimer's?

Akiko Iwasaki, an author on the new Yale study, says future work will need to answer all these questions as we begin to grapple with the long-term after-effects of the pandemic. And this Yale study, demonstrating how the virus can infect brain cells, is the first step on the path to finding answers.

"Understanding the full extent of viral invasion is crucial to treating patients, as we begin to try to figure out the long-term consequences of COVID-19, many of which are predicted to involve the central nervous system," says Iwasaki.

▶▶ **The new Yale study was published in the *Journal of Experimental Medicine*.**

First Confirmed Case of COVID-19 Transmission to Great Apes

Source: https://www.sciencealert.com/covid-19-has-been-transmitted-to-great-apes-for-the-first-time

Jan 12 – At least two gorillas at California's San Diego Zoo have caught the coronavirus, the first known instance of natural transmission to great apes, officials said Monday.

Two primates began coughing last week and have since tested positive for COVID-19, while a third is showing symptoms, Governor Gavin Newsom said.

They are thought to have contracted the virus from an asymptomatic zoo worker, though this has yet to be confirmed.

"Aside from some congestion and coughing, the gorillas are doing well," the world-famous zoo's executive director Lisa Peterson said in a statement.

"The troop remains quarantined together and are eating and drinking. We are hopeful for a full recovery."

Gorillas share up to 98 percent of their DNA with humans, and studies have found that some non-human primates are susceptible to COVID-19 infection.

It is not yet known if the gorillas will have a serious reaction to the disease that has killed 1.94 million humans, or if other troop members have also been infected.

The San Diego Zoo Safari Park, where the gorillas are kept, has been closed to visitors since early December as record cases began surging through Southern California.

Workers are all required to wear personal protective equipment such as masks when near the gorillas, the zoo said.

New small antibodies show promising effects against COVID-19 infection

Source: https://eurekalert.org/pub_releases/2021-01/ki-nsa011221.php

Jan 12 – Researchers at Karolinska Institutet in Sweden have developed, in collaboration with researchers in Germany and the U.S., new small antibodies, also known as nanobodies, which prevent the SARS-CoV-2 coronavirus from entering human cells. The research study, published in *Science*, shows that a combined nanobody had a particularly good effect - even if the virus mutated. According to the researchers, the nanobodies have the potential to be developed into a treatment for COVID-19.

Specific proteins, spike proteins, on the surface of the SARS-CoV-2 coronavirus help the virus infect host cells. Therefore, antibodies that block the spike proteins and prevent them from binding to the cell can be a way to stop infection.

From the perspective of potential therapeutic interventions, small fragments of antibodies, referred to as single-domain antibodies (sdAb) or nanobodies, may be a better alternative than regular antibodies. That is because nanobodies are significantly smaller. They are therefore able to bind to the virus in more places than regular antibodies. Nanobodies also have greater stability and are easier to produce cost-effectively on a large scale.

Researchers at Karolinska Institutet are now publishing, in collaboration with researchers at the University of Bonn in Germany and the Scripps Research Institute in California, a study describing new nanobodies against SARS-CoV-2 infection.

"What is uniquely special here is that we have stitched together nanobodies that bind to two different places on the spike protein of the virus," explains Martin Hällberg, researcher at the Department of Cell and Molecular Biology at Karolinska Institutet, and one of the research study's corresponding authors.

"This combination variant binds better than individual nanobodies and is exceptionally effective in blocking the virus' ability to spread between human cells in cell culture."

Additionally, the combined nano-antibodies worked even when tested on a virus variant that mutates extremely quickly.

"This means that the risk is very small that the virus would become resistant to these combined nanobodies," notes Martin Hällberg.

To generate the nanobodies, alpacas and llamas - animals whose immune systems naturally produce both antibodies and nanobodies - were vaccinated with the spike protein of the coronavirus. Among the nanobodies generated by the animals, the researchers selected the best binders. Among these, four were identified as showing an exceptional ability to block the virus' ability to spread among human cultured cells.

The research group at Karolinska Institutet then used electron cryomicroscopy (cryo-EM) to study in detail how the various nanobodies bind to the virus' spike protein. Thanks to their structural knowledge, they were able to propose suitable protein links to bind different nanobodies together into combinations relevant for research, as well as provide a possible explanation for the mechanism of how the antibodies neutralise the virus.

"My 'favourite' is the nanobody from the llama," Martin Hällberg says. "It binds directly over the surface where the virus binds the host cell receptor ACE2, and the nanobody also shares a large majority of the amino acids critical for binding with ACE2. What this means is that the virus will have an extremely difficult time mutating extensively on that surface and at the same time being able to bind ACE2. A variant where this llama antibody is linked to one of the antibodies from alpaca was a fox trap that the virus never managed to get out of in our experiments."

The researchers now hope that their nanobodies will be able to be developed into a drug treatment as a complement to a vaccination against COVID-19.

"It possibly could be used clinically for those already ill, or for prevention for individuals who for one reason or another cannot be vaccinated, or who have a weakened immune system, and therefore may not form a sufficiently strong immune response after a vaccination," explains Martin Hällberg.

Dioscure Therapeutics, a spin-off company from the University of Bonn, will be conducting further testing of the nanobodies in clinical trials. The researchers at Karolinska Institutet will make attempts to improve the binding further by changing individual building blocks in the nanobodies.

The research was funded by the Swedish Research Council and the Knut and Alice Wallenberg Foundation, as well as by research funders in Germany and the U.S.

Saliva could hold clues to how sick you will get from COVID-19

Source: https://www.sciencemag.org/news/2021/01/saliva-could-hold-clues-how-sick-you-will-get-covid-19

Jan 13 – To the known risk factors for developing severe COVID-19—age, male sex, or any of a series of underlying conditions—a new study adds one more: high levels of the virus in your saliva. Standard COVID-19 tests sample the nasal passage. But several new tests look for SARS-CoV-2, the pandemic coronavirus, in saliva, and the new work finds a striking correlation between high virus levels there and later hospitalization or death. If the results are confirmed, saliva tests could help doctors prioritize which patients in the early stages of the disease should receive medicines that drive down levels of the virus.

"I thought it was pretty striking," says Shane Crotty, a virologist at the La Jolla Institute for Immunology, who was not involved with the research. Crotty notes the results suggest virus levels in saliva reflect viral load deep in the lungs, where the disease does much of its damage in severe cases. "That is a fundamentally valuable insight," Crotty says.

The new work isn't the first to link the body's coronavirus load and disease outcome. Several research groups have found a correlation between high viral levels in the nasal passages at the time of a patient's hospital admission and ultimate disease severity. But other groups have failed to find that same link.

The standard test to detect SARS-CoV-2 samples nasal mucus using nasopharyngeal (NP) swabs. The procedure is unpleasant, but it is the customary way to sample respiratory pathogens. In recent months, however, several research groups have developed and received emergency use authorization from the U.S. Food and Drug Administration for tests detecting SARS-CoV-2 in saliva.

Yale University researchers were among the first, and the university's hospitals have been using both saliva and NP swab tests. In both cases, labs analyze the samples using quantitative reverse transcription polymerase chain reaction tests, which can detect genetic material from SARS-CoV-2 and quantify the number of viral particles in each milliliter of sample.

Researchers led by Akiko Iwasaki, an immunologist at Yale, compared viral loads in saliva and NP swabs from 154 patients and 109 people without the virus. They divided the patients into groups that had low, medium, and high viral loads as determined by both types of test. Then they compared those results with the severity of symptoms the patients developed later.

They found that patients who developed severe disease, were hospitalized, or died were more likely to have had high virus loads in their saliva tests, but not in their NP swabs. Viral load in both saliva and nasal mucus declined over time in patients who recovered, but not in those who died.

When Iwasaki and her colleagues reviewed patients' electronic medical records for markers of disease in the blood, they found that high saliva viral loads correlated with high levels of immune signals such as cytokines and chemokines, nonspecific molecules that ramp up in response to viral infections and have been linked to tissue damage. People with more virus in their saliva also gradually lost certain cells that mount an immune response against viral targets, had lower levels of antibodies targeting the spike protein that the virus uses to enter cells, and were slower to develop the strong immune response needed to knock down the virus in cases where they recovered. The team's results appeared on 10 January in a preprint that has not been peer reviewed.

Iwasaki and her colleagues argue that saliva may be a better predictor of disease outcome than nasal mucus because the latter comes from the upper respiratory tract, whereas severe disease is associated with damage deep in the lungs. "Saliva may better represent what is going on in the lower respiratory tract," Iwasaki says, because cilia lining the respiratory tract naturally move mucus up from the lungs into the throat, where it mixes with saliva; coughs have the same effect.

The results don't have enough statistical power to reveal how much more likely a person with a high saliva viral load is to develop severe COVID-19, Iwasaki says. She is also eager for other groups to replicate the results, especially because efforts to link high NP swab viral loads with disease progression have had mixed results.

If other research confirms the finding, "it would clear away a lot of the fog" around this disease, Crotty says. Monica Gandhi, an infectious disease expert at the University of California, San Francisco, adds that if saliva tests are predictive, they could help doctors identify patients to treat early with either antibodies to reduce viral load or steroids to tamp down overactive nonspecific immune responses.

Saliva tests are cheaper and easier than NP tests, but much less widely available. So confirmation of the new results could bolster efforts to make saliva tests more readily available, says Sri Kosuri, CEO of Octant, Inc., a biotech company. "If this study happened in March, we'd be talking about whether we should be doing NP testing at all," Kosuri says.

As the Vaccines Arrive, So Do the Questions

By Robin Rauzi

Source: http://www.homelandsecuritynewswire.com/dr20210113-as-the-vaccines-arrive-so-do-the-questions

Jan 13 – As the first COVID-19 vaccines are being administered across the United States—developed, tested, and approved with historic speed—countless questions have arisen about what comes next. Is one vaccine better than another? Can the United States both speed up inoculation and overcome some people's hesitance to get the shot?

Dr. Courtney Gidengil, a senior physician policy researcher in RAND's Boston office, authored a comprehensive review of vaccine safety in 2014, which is being updated now and will be released soon. She said that the size of the patient trials (over 30,000 participants in each of the Pfizer and Moderna trials) and length of follow-up to date should instill confidence, despite the newness of mRNA vaccines. Extended studies of other vaccines also show no evidence of long-term damaging effects, she said. The robust vaccine safety monitoring system that is already in place is also being expanded for the new COVID-19 vaccines.

For teens and younger children, however, vaccine trials are just getting underway. Children respond differently to COVID-19, rarely getting ill; but the rare serious reaction to the virus is a dangerous inflammatory response about a month later. Gidengil, who is also an infectious disease physician at Boston Children's Hospital, says that trials are getting underway for children as young as 12 and expects to see trials starting for those younger than 12 and pregnant women this spring.

That the initial rollout has been bumpy shouldn't be a surprise, noted Jeanne Ringel, director of RAND Heath Care's Access and Delivery Program. State public health systems have been stretched thin by the pandemic for months. Florida's approach, which is to make anyone 65 and older eligible immediately for vaccination, shows the challenges of fast mass vaccination. County officials, for instance, resorted to using commercial platforms like Eventbrite to manage reservations, and phone systems were overwhelmed by demand.

"There's always a tension between the prioritization and the speed at which we can vaccinate. So if we're going to focus on prioritizing particular groups, then that's going to take a little longer because we have to identify those groups," Ringel said. A first-come first-served approach might get more shots administered more quickly, she added, but it might not be as effective from a public health perspective.

The virus, of course, is continuing to spread rapidly in the United States, leading some to ask whether those who have had the disease—or worry that they've been recently exposed—should get the vaccine. The current eligibility guidelines say that those with active COVID-19 symptoms can wait 90 days if supplies are limited, Gidengil said. It's also unknown how long antibodies last from natural infection.

"There really are no safety concerns at this point based on the trials—which included at least some people with COVID-19—as well as our experience with other infections and vaccines," Gidengil added. "Whether you know you had COVID-19 or not, there's no contraindication to taking the vaccine at some point. It's best just to take it as soon as possible if offered."

For those in non-priority groups, vaccines will likely be available late spring or early summer, depending on the supply and demand in a particular location. "If you're in communities where there is more vaccine hesitancy and therefore less demand, you might be able to get a vaccine earlier," noted RAND senior policy researcher Lori Uscher-Pines, who has conducted projects on vaccine distribution.

The other variable is how quickly additional vaccines might be granted emergency use authorization by the U.S. Food and Drug Administration, which also could expand the number of doses available. Internationally, other types of vaccines—such as those that use inactivated virus—are already safely being given out, said epidemiologist Dr. Jennifer Bouey, who is RAND's Tang Chair in China Policy Studies and works on global health and pandemic preparedness.

There is some difference in the level of protection that each demonstrated in the drug trials, but all are above 50 percent effective, Bouey said. "If we were to use multiple types of

vaccine, that's OK," she added. For instance, if patients got an mRNA vaccine this year, they could get one that used a weakened or inactivated virus in the future. That could be important because it's also unknown how long protection from a vaccine will last. Immunity protecting against other coronaviruses such as SARS and MERS lasts just a year or two, Bouey said.

The RAND experts also cautioned people not to change their behavior and urged them to continue to be just as careful after getting vaccinated. At the moment, it's unknown if those who are exposed to the virus after being vaccinated might still be able to transmit the virus to others. That is being studied now by vaccine makers Moderna and Pfizer with more data expected to be released in late January and February.

"We have reason to believe that vaccine should considerably cut down on transmission," Gidengil said. But COVID-19 "behaves differently than a lot of infections we've seen, so we want to be careful to err on the side of being conservative and not make any assumptions."

All of these unknowns are likely contributing to some people's reluctance to get the vaccine—including health care workers, who were placed at the front of the line in most states. But this dynamic could change, noted Uscher-Pines. Although hospitals cannot mandate the vaccine as a condition of employment when it has only emergency use authorization, they can create other "carrots and sticks," such as recommending more PPE for those who are not vaccinated.

"Health care workers tend to work in tightly bonded teams. One strategy recommended for them is to have one-on-one conversations between those who are more confident about getting immunized," Gidengil said. "At my hospital, I work in the infectious diseases group. I literally get stopped in the hallways by nurses who are pregnant or breastfeeding or a trainee who is just not sure about the vaccine and it's a great opportunity to talk through the data."

Robin Rauzi *is commentary editor at RAND.*

No long-term risk from mixing Covid-19 vaccines, scientists say

Source: https://www.thenationalnews.com/uae/health/no-long-term-risk-from-mixing-covid-19-vaccines-scientists-say-1.1144800

Jan 13 – Taking one type of vaccine now and another in a year is widely thought to be safe and could even offer better protection

The long-term mixing of different Covid-19 vaccines is unlikely to be harmful – and could even provide better protection against the coronavirus, several top experts said.

Taking one type of vaccine today and a separate dose by another manufacturer a year down the line could become normal, particularly if the pandemic continues for years.

Several top scientists gave their expert view to *The National* as many people debate whether to take the first available shot or wait.

Although the six vaccines approved for use around the world were each tested on hundreds of thousands of people, inevitably some have a preference or have medical reasons to hold off for now.

We may well, if there are issues around people developing immunity, deliberately switch vaccines. But we need to do a lot of work before we decide

Prof Hunter, University of East Anglia

"You shouldn't need it, but you cannot be over-vaccinated, so any risk would be very low," said Prof Ian Jones, professor of virology at the University of Reading in the UK.

The approved vaccines were extensively tested, but it remains unclear how long the protection they offer will last.

With the vaccines released so far, a booster injection is required within weeks of the first dose, but it may be that, beyond this, a further shot is needed to sustain protection.

Prof Jones said that if a person completed two doses of one vaccine now, and took a different coronavirus vaccine a year later, there were unlikely to be any risks.

But experts said they draw a sharp distinction between that practice and that of combining vaccines within a short space of time.

Prof Paul Hunter, professor of medicine and infectious diseases at the University of East Anglia, UK, said one drug could stimulate enzymes in the liver that break down another drug, making it less effective.

"Interactions are one of the things we hammer into medical students now," he said.

"They have to be careful."

If a booster is needed even later on, scientists say there may be an upside to using a different coronavirus vaccine.

Known as heterologous prime boosting, this phenomenon has been seen with vaccinations against numerous diseases.

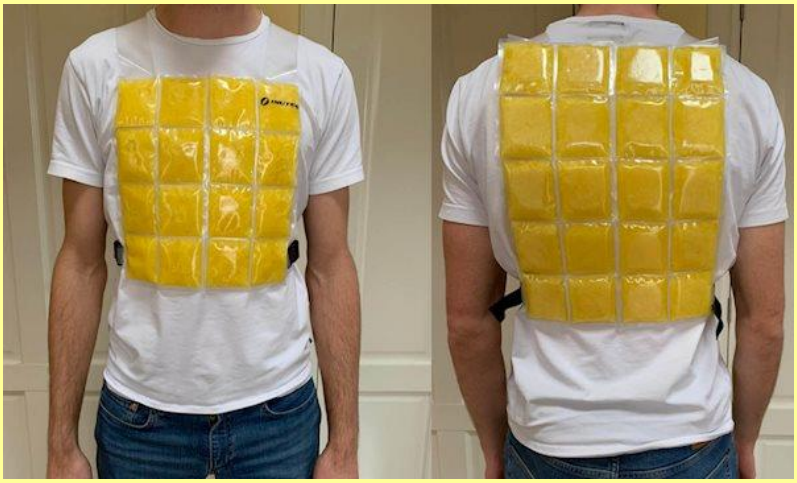
"This has been known to greatly increase both antibody and T-cell immunogenicity when performed using certain vector combinations, above repeated dosing with the same vaccine candidate," the World Health Organisation said in a 2014 briefing document.
Using the same vaccine repeatedly can lead the immune system to target the vaccine itself, reducing its efficacy.
An example is adenoviral vector immunity. This may affect the Oxford-AstraZeneca vaccine, which is based on a harmless form of an adenovirus that normally infects chimpanzees.
The adenovirus has had DNA added so that, once it enters human cells, it causes them to produce coronavirus spike proteins.
It is the body's immune response to these spike proteins that offers protection against the coronavirus.
But if there is an immune response against the adenoviral vector itself, spike protein production on subsequent doses is hampered, and immunity fails to improve as it should.
"This might be why the AstraZeneca vaccine is not as effective as the other vaccines," Prof Hunter said.
"You give the second dose and ... if the body has already developed some immunity to the carrier virus, it gets destroyed before it's had a chance to insert its payload."
Trials are under way to find out whether protection is stronger when a person receives one dose of the Oxford-AstraZeneca vaccine and one dose of Russia's Sputnik V vaccine, which is based on a different adenovirus.
Immunity to the vaccine is thought to be less of a problem with the two mRNA vaccines, made by Pfizer-BioNTech and Moderna.
"We may well, if there are issues around people developing immunity to the carrier and we have to give boosters in a year or so's time, deliberately switch vaccines," Prof Hunter said.
"But we need to do a lot of work between now and then before we decide."

EDITOR'S COMMENT: Perhaps too early to answer complicated questions.

Cooling Vests May Ease Clinicians' PPE Heat Strain

Soure: https://bit.ly/2K9sXe5

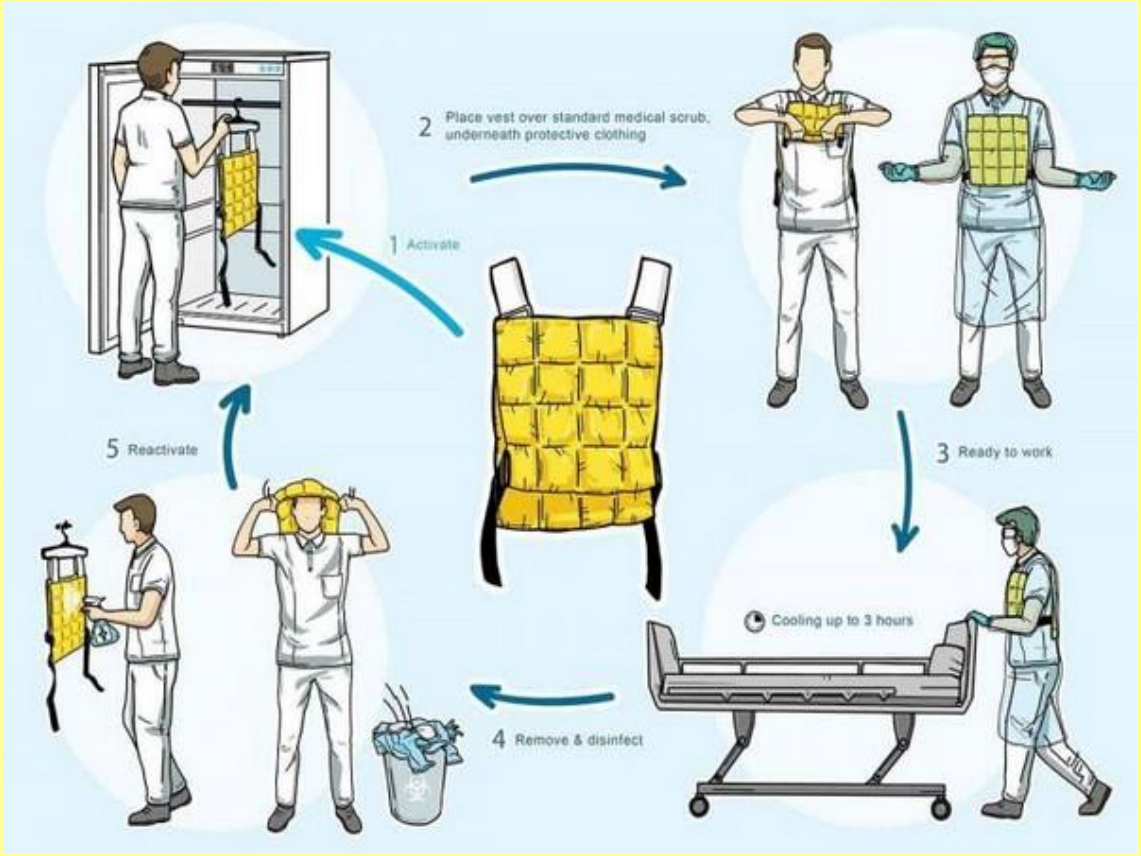
Jan 13 – Nurses who wear cooling vests under their PPE feel less burdened by heat during their shifts, a new study finds.
An analysis of data from seventeen nurses who wore a cooling vest under their PPE on one day and PPE only on another found that the vests led to a slight improvement in body temperature but a much bigger improvement in the sensation of being too hot, according to the report published in Temperature (online Dec 26, 2020).



"Nurses wearing a cooling vest during a COVID-19 shift experience a substantial reduction of heat stress during their work," said study coauthor, Thijs Eijsvogels, an assistant professor of exercise physiology in the department of physiology at the Radboud University Medical Center.
"This is an important finding, because PPE is known to induce heat stress, which increases fatigue and sensory displeasure, and is known to impair effective decision making," Eijsvogels said in an email. "Hence, the use of cooling vests may extend work tolerance time and improve of recovery of nurses involved in COVID-19 care."
An earlier unpublished survey showed that heat was getting to healthcare workers, Eijsvogels said.
"Among 386 healthcare workers involved in COVID-19 care, we found a high prevalence of thermal discomfort (77%), excessive sweating (64%), thirst/dehydration (81%), headache (57%) and fatigue (59%)," he said. "These findings highlight the need to find and implement effective solutions to reduce heat stress among nurses involved in COVID-19 care."
To explore the possibility that a cooling vest might help nurses wearing full PPE while caring for COVID-19 patients, Eijsvogels and his colleagues recruited 17 volunteers who would wear a cooling vest under PPE one day and PPE alone on another as a control. The

volunteers also were asked to swallow an ingestible electronic temperature capsule system to give a continuous reading of core body temperature under each scenario.

Core temperatures measured by the capsules were slightly lower when participants wore the cooling vests: 37.5 degrees C (98.96 F) at the end of the day versus 37.2 degrees C (99.5 F) in the control condition. But thermal comfort and thermal sensation were improved by the vests. Only 18% of nurses reported thermal discomfort and 35% reported a slightly warm thermal sensation at the end of the day as compared to 81% and 94%, respectively, in the control group. The average heart rate was slightly lower when cooling vests were worn.



"Beyond their effectivity, cooling vests are very easy to implement in routine clinical care," Eijsvogels said. "Due to their low weight, easy fit, and long-lasting cooling power, nurses can benefit from up to three hours of pleasant working conditions. Also, the vests are easy to disinfect and re-activate in a refrigerator."

The cooling vest might be worth trying, said Jennifer S. White an assistant professor with the department of occupational therapy at the University of Pittsburgh School of Health and Rehabilitation Sciences.

White hasn't been working with COVID-19 patients but did have 14 years of experience that included wearing PPE during epidemics including SARS.

"I can definitely speak to the discomfort and heat involved in wearing PPE," she said. "If there was something that could have cooled me down when I was working with patients, I definitely would have been interested."

While cooling vests might improve working conditions, it would be better if healthcare workers could be switched out more often, said Jade Flinn, a biocontainment nurse educator at the Johns Hopkins Hospital. "In situations where you can't switch out, like the back of an ambulance on a long transport, this might be helpful," she added.

In hospitals overwhelmed by the surge of COVID-19 patients it also may not be possible to switch out healthcare workers as often, Flinn said. "I would consider wearing a cooling vest especially if I were in a full Tyvek suit," she added. "I am very sensitive to heat exhaustion and I would want to wear one. Even if it would not bring my core temperature down, at least it would be comforting."

Seeking to 'Flush' out COVID-19 in Wastewater

Source: http://www.homelandsecuritynewswire.com/dr20210114-seeking-to-flush-out-covid19-in-wastewater

Jan 14 – Back in July, scientists detected noninfective fragments of coronavirus RNA in raw sewage at Yosemite National Park, revealing, unfortunately, that visitors had been carrying—and depositing—the virus since the park reopened the previous month.

Though it may seem a bit unsavory, studying human waste can tell us a lot about COVID-19 and give governments a leg up on containing the spread of the virus. Researchers can predict if the coronavirus might attack a community by checking sewers for viral fragments

in the community's poop; preliminary studies from earlier this year, conducted by the Centers for Disease Control and Prevention (CDC), academia, and other research organizations, indicated that communities might see an increase of the coronavirus in wastewater two to four days before a spike in hospitalizations. Using this wastewater-based epidemiology (WBE) approach, the public health community is banding together to identify and treat health threats in a non-invasive way.

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T) recently joined a multiagency WBE initiative that will not only gather virus data from sewer systems but standardize the science. The coalition is led by the CDC National Wastewater Surveillance System, whose goal is to turn sewers into health monitors. CDC is also collaborating with the Department of Health and Human Services and agencies like the U.S. Environmental Protection Agency, Food and Drug Administration, and DHS, to accelerate the WBE research. The goal is to better understand the spread of the virus in communities to contain and defeat it.

Collectively, WBE isn't focusing on an individual's health. Here, the testing is focused on the health of whole communities to get ahead of, and flatten, the curve during the pandemic. Instead of testing everyone, scientists can use this method to screen for areas in which populations should be offered more testing and encourage these populations to strictly follow emergency public health guidelines.

For its part, S&T is working with the National Institute of Standards and Technology (NIST) and the University of Louisville School of Medicine to develop guidelines to standardize WBE testing methods nationwide. Because there are currently many ways to test wastewater, data gathered from across the U.S. could be difficult to compare; using the new standards, the data can be more readily shared and compared across cities, states and regions to inform more effective healthcare decisions.

For example, knowing through reliable WBE data where outbreaks are occurring and how severe they are can inform critical decisions on prioritizing personal protective equipment, immunizations, and customizing countermeasures.

"The proposed standards will help guide an appropriate sampling and testing strategy designed around the existing infrastructure," said Philip Mattson, the DHS standards executive at S&T. "We can't get this job done alone. We are partnering to accelerate these solutions so that other communities across the U.S. can benefit as fast as possible and make more informed decisions using science-based guidance."

In May 2020, S&T started working with the University of Louisville on the standards project, focusing on sampling and testing methods tied to defined epidemiological frameworks. These standards will not only help with this pandemic but also with future public health threats and ongoing population health risks.

The Louisville researchers use 24-hour timed autosamplers installed in manholes and send them to multiple labs for analysis to see how much coronavirus RNA is in the samples. Then the researchers compare the data with the findings of representative COVID-19 random sampled testing of residents done every eight weeks across the city. A single sample could provide insight into the infection prevalence of a whole community, making this testing very cost effective.

The researchers are also monitoring other catchment areas, including the northern Kentucky's Sanitation District No. 1, the state prisons, nursing homes and a small rural town. The purpose is to learn at what geographic scale sampling should occur—at a building level, campus level, neighborhood level or at an entire city level—and how everything should work together. That has not been established.

"If you say, 'I'm sampling a dorm,' then the next questions are 'What sampling method is most appropriate? Which laboratory analysis and epidemiologic model might be most appropriate?'" said Dr. Ted Smith, University of Louisville professor of environmental medicine. "It is really important as a country to be clear about these different scales because there are different implications for public health consequences and countermeasures."

But developing standards takes time. "Standard guidance documents and physical standards, such as reference materials, are critical for data comparability and help ensure that high quality results are provided to decision makers," said Nancy Lin, a NIST biomedical engineer who co-leads the WBE standards development.

The good news is that these standards are not only for COVID-19. They are expected to be applicable for many kinds of environmental health risks, like detecting other pathogens or potentially exposures to dangerous chemicals. Additionally, health status biomarkers, like the stress hormone cortisol, for a population in a facility, neighborhood or entire community may one day soon be gleaned on a near-real-time basis. These biomarkers could provide insights into trends in prescription and illicit drug use, and risk factors, such as smoking, for many chronic diseases.

Using WBE to passively monitor biological and chemical data can inform governments, health insurers and health providers how to better service communities. For example, if heart disease patients also live in highly polluted areas where high levels of breakdown products from air pollution can be found in urine, physicians may consider that additional location-based risk data when treating those patients. Health insurers can decide where to offer their products such as managed Medicaid. City planners could develop more localized health risk mitigation like planting air

pollution vegetation barriers (trees, shrubs, etc.). With WBE, we can also have an early warning of toxic chemical spills so emergency managers could track the duration and extent of such disasters.
"New kinds of commercial laboratory and data analytics companies can develop a panel of pathogens, toxins, and health status biomarkers that we regularly check to assess a population, and we could potentially identify a problem much earlier and then make a much bigger difference in its trajectory," Smith explained. "This would improve our health and resilience as a country and therefore be more competitive and more productive."
Moreover, with standardized WBE research becoming integrated into the infrastructure, more jobs could be created as more technologies used for monitoring the sewer systems are built by private companies, who also participate in gathering and delivering samples to the labs.
"We want to deliver something that is useful, that can go to the field and help people make appropriate decisions with the standardized guidelines we provide," Mattson said. "Our role is just one piece that fits into this overarching multiagency National Wastewater Surveillance System. We are glad to be lending our expertise to this multi-agency effort and look forward to having these standards in place to keep our communities safe."

A proposal

Citizens over 70 years old either live in nursing homes or with their families or with an aid/nurse/assistant. At the same time, people in these ages do have certain health problems plus the physiologic body damage that comes with age. And this is what make them extra vulrarable or sensitive to any kind of therapy that interacts with their immune system (i.e. a vaccine). So, why vaccinating these fragile populations instead of their care givers that compose their immediate micro-environment? If the later is virus-protected so will be the elderly!

Israeli company develops 'breathalyzer' COVID-19 test with 98% accuracy

Source: https://www.jpost.com/health-science/israeli-company-develops-breathalyzer-covid-19-test-with-98-percent-accuracy-655657

Jan 16 – Israeli breath test diagnostics company Scentech Medical has developed a newer, more efficient – and seemingly more accurate – coronavirus test, the company announced.
During its preliminary testing, which has still not been completed, the company has seen 98% accuracy in the use of the test, which takes just a few minutes to perform.

The test in use is much like that which police use to test drivers if they are under the influence of alcohol – however, it is capable of accurately and quickly testing for COVID-19. The user breathes into a tube and waits a few minutes for the results as the test distinguishes between thousands of gas compounds in the breath.
As the technology is still in its testing stages, it has still not been approved for use, nor has it received approval by the Food and Drug Administration (FDA).
Nevertheless, the company flew past the threshold required for a diagnostic test with efficacy at least equal to that of the "gold-standard" PCR coronavirus tests, with a sensitivity of over 91% and a specificity of over 91.2%.
With the company's "unique algorithm," it claims to be able to have an even higher level of sensitivity and specificity (98%). Such results are higher than existing commercial tests. The algorithm is one which is in standard practice approved both in Israel and around the world. These preliminary results could mean that the test is eligible for FDA approval.
Although many are concerned about testing efficacy with the new range of coronavirus variants rampant around the world – such as those in the United States, United Kingdom and South Africa – the test, according to Scentech Medical CEO Yaniv Hevron, can encompass them.

"Our system is effective in detecting asymptomatic patients, as well as new mutations and new outbreaks," Hevron told *The Jerusalem Post*.
The participants in the trials of the innovative COVID-19 test included healthy and corona-positive volunteers alike and merely had to wait for a number of minutes to receive their results back. However, Scentech hopes to move forward in speeding up the testing process further, aiming for a 30-second test.
"The biomarkers identified in the mapping process are a scientific breakthrough and the basis for the construction of a 'chemical fingerprint' that will be used to identify coronavirus, coronavirus mutations, and immunity status," the company claims. This system is currently undergoing testing at the Shamir Medical Center. The company predicts the testing will conclude by the end of March.
If and when the product is marketed, it can be used by any and all.
"It requires one operator with no technical skills," Hevron told the *Post*. However, at least at the first stage of planned release, it will not be made available for public use.
Scentech has already been in touch with foreign governments to discuss marketing the product abroad.
Scentech, in cooperation with Next-Gen medical – a company with which it is currently merging – initially received approval for experimentation of the testing protocol by the Institutional Review Board in April of last year.

Some post vaccination data from Israel

Of the 1.7 million who were vaccinated (mid Jan 2021), 1,127, or 0.06%, reported side effects, which included weakness, headaches, dizziness and fever as well as pain or swelling at the site of the shot. So far 15 people needed to be hospitalized after the shot, mostly due to pre-existing conditions.
Approximately 4.6% of those vaccinated were diagnosed with coronavirus within 7 days after vaccination; 6.4% after 8-14 days; 3.8% after 15 days or more. In addition, 375 people were hospitalized after vaccination: 244 within 1-7 days; 124 within 8-14 days and just 7 persons after 15 days.

… and from the United States

So far (mid Jan 2021), 15 million people have been mRNA vaccinated (both Pfizer and Moderna). According to VAERS (Vaccine Adverse Event Reporting System): 55 deaths; 96 life threatening events; 24 permanent disabilities; 225 hospitalizations and 1,388 visits at the Emergency Departments of hospitals. In certain cases, patients died within days following vaccination.

Coronavirus germs lingered in car for two hours after infected person got out, study finds

Source: https://www.thenationalnews.com/uae/transport/coronavirus-germs-lingered-in-car-for-two-hours-after-infected-person-got-out-study-finds-1.1147786

Jan 17 – Coronavirus particles were found to linger in a vehicle for hours, in a study that showed the potential risk of car sharing or using a taxi during the pandemic.
The findings, by researchers at the University of Florida, adds to the weight of evidence that shows people with the virus release tiny infectious airborne particles that can be breathed in by others.
Researchers fixed a particle-collecting device, called a personal cascade impactor sampler, to the sun visor on the passenger side of the patient's car.

The patient, a woman in her 20s, who tested positive for Covid-19 but had only mild symptoms, then drove home from the clinic she initially attended after she fell ill. During the 15-minute trip, the windows were closed and the air conditioning was on.
Two hours later, a researcher wearing personal protective equipment turned off the sampler – which had been less than a metre from the woman with its intake pointed at the car roof – and removed the device.
When scientists analysed the filters, they detected coronavirus genetic material on several of them.

"Our data highlights the potential risk of Sars-CoV-2 transmission by minimally symptomatic persons in the closed space inside a car ... and suggest that a substantial component of that risk is via aerosolised virus," the researchers said.
Although coronavirus genetic material was detected on several of the sampler's filters, the researchers were able to grow coronavirus particles in the laboratory only from the filter that collected particles between 0.25 and 0.5 micrometres in diameter (between one 4,000th and one 2,000th of a millimetre). Particles this small can penetrate deep into the lungs if breathed in.
It is well known that respiratory pathogens can spread by three routes: contact, droplet and airborne spread, and early on in the pandemic, public health messages tended to emphasise the dangers of contact or droplet infection.
Contact spread happens directly from person to person, or from a contaminated surface to a person, while droplets are larger particles released that rapidly land on another person or on a surface when a person coughs, sneezes or even simply talks.
Airborne spread involves much smaller particles – typically less than 5 micrometres (one 200th of a millimetre) in diameter – that remain suspended in the air for up to several hours.
As well as this latest piece of research, there have been several studies showing that suspended particles are a risk factor for spreading the virus, as is the case with some other respiratory viruses, such as measles and chickenpox.
Dr Davinder Pal Singh, a cardiologist at NMC Royal Hospital in Dubai, who recovered from Covid-19, said particles containing the virus could persist in the air for hours.
He said the duration of contact a person had with an infectious patient iwas a significant factor in the spread of the disease, with longer exposure times increasing the risk of spread and of more severe illness.
"Precautions a person should take are to wear a mask and maintain a two-metre distance as much as possible," he said.
Studies in recent months have shown that face masks can protect against droplet or airborne spread of the virus, and health authorities also highlight the importance of maintaining good ventilation to flush out suspended particles.
Research on hamsters published in December indicated that infections caused by airborne spread might cause more severe illness than infections by other routes, because the animals infected this way contained greater numbers of virus particles and lost more weight.
The Florida study was published online by medRxiv, but has not yet been reviewed by other scientists.

Large US study affirms men more vulnerable to COVID-19 than women

Source: https://newatlas.com/health-wellbeing/men-more-vulnerable-coronavirus-than-women/

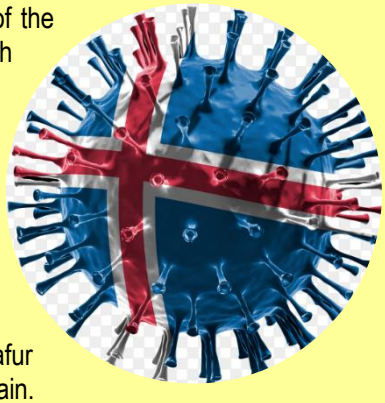
Jan 17 – A new study looking at data from nearly 100,000 subjects in Houston, Texas, has affirmed men seem much more vulnerable to COVID-19 than women. The study found men, independent of age, are more likely to contract the virus, suffer from severe complications, and die from the disease compared to women.
One of several compelling epidemiological observations arising in 2020, as the novel coronavirus SARS-CoV-2 rapidly spread across the world, was the tendency for men to be hit harder by COVID-19 than women. Early, small studies out of China seemed to suggest men were suffering from more severe cases of COVID-19.
This new research, led by Farhaan Vahidy from the Houston Methodist Research Institute, set out to investigate the association between biological sex and COVID-19 in a large US metropolitan city. Data from nearly 100,000 subjects undergoing SARS-CoV-2 testing were analyzed.
The results revealed men were more likely to test positive for the virus, they were more likely to be admitted into intensive care, and ultimately more likely to die from the disease. According to the researchers, these sex differences were still present even after adjusting for, "age, race, ethnicity, marital status, insurance type, median income, BMI, smoking and 17 comorbidities."
Early on in the pandemic the observation that males were more susceptible to COVID-19 was hypothesized to be due to gender differences in social behaviors. A CDC report published in July 2020 suggested men are more likely to downplay the risk of COVID-19, disregard preventative advice such as social distancing and mask-wearing, and engage in high-risk activities such as attending public gatherings.
Although the CDC report did not disregard the possible biological sex differences that could influence COVID-19 severity, the study did hypothesize psychosocial and behavioral factors play a significant role in explaining epidiomelogical differences between men and women. However, Vahidy and colleagues note in their new study that there has been enough observation of COVID-19 sex differences across a spread of cultural and geographical areas to suggest the differences may not primarily be social or behavioral.

"While gender-related behaviors such as smoking, drinking, the propensity to seek hospital care and presence of comorbidities could affect the outcome of COVID-19, the increased risk of death seen in males across several different cultures in the world point to biological risk determinants," the researchers write.
It is not unusual for diseases to affect men and women differently. Parkinson's disease, for example, occurs in men much more frequently than women, while Alzheimer's disease is the other way around, striking women at much higher rates than men. A growing body of research is working to unpack the biological sex differences in disease risk.
In the case of COVID-19, scientists are investigating several possible reasons for why the disease could hit men harder than women. A robust article in *Nature* last year presented a strong case for sex-based immune differences being key to variances in disease severity, while a more recent Australian study suggested men have more ACE2 receptors on lower lung cells which could account for their greater vulnerability to COVID-19.
"Sex disparities in COVID-19 vulnerability are present, and emphasize the importance of examining sex-disaggregated data to improve our understanding of the biological processes involved to potentially tailor treatment and risk stratify patients," conclude Vahidy and colleagues in the new study.

▶▶ **The new research was published in the journal *PLOS ONE*.**

Iceland Genetically Sequences Every COVID-19 Case in World-Leading Strategy

Source: https://www.sciencealert.com/iceland-tracks-and-contains-covid-19-by-genetically-sequencing-every-positive-case



Jan 17 – Iceland has genetically sequenced all its positive COVID-19 cases since the start of the pandemic, an increasingly vital practice as worrying new strains emerge from Britain and South Africa.
The World Health Organization on Friday urged all countries to ramp up genome sequencing to help combat the emerging variants.
Scientists at the Icelandic biopharma group deCODE Genetics' laboratory in Reykjavik have worked relentlessly for the past 10 months, analysing each positive coronavirus test in Iceland at the request of the country's health authorities.
The aim is to trace every case in order to prevent problematic ones from slipping through the net.
"It takes us relatively short time to do the actual sequencing," explains the head of the lab, Olafur Thor Magnusson, adding that "about three hours" is all that is needed to determine the virus strain.
The entire process, from isolating the DNA to sequencing it, can take up to a day and a half, and has enabled Iceland to identify 463 separate variants – which scientists call haplotypes.
Prior to sequencing, the DNA of each sample is first isolated, then purified using magnetic beads.
The samples are then taken to a massive, bright room full of equipment, where a deafening sound emanates from small machines resembling scanners.
The machines are gene sequencers which map the novel coronavirus genome.

World leader

Inside each machine is a black box called a "flow cell", a glass slide that contains the DNA molecules.
This technology has played a large role in Iceland since the start of the pandemic.
"The sequencing of samples is key to helping us follow the state and development of the epidemic," Health Minister Svandis Svavarsdottir told AFP.
Authorities have used the sequencing information to decide on precise, targeted measures to curb the spread of the virus, she said.
While the South African variant has not been detected in Iceland, 41 people have been identified as carriers of the British variant.
All of them were stopped at the border – where PCR tests are conducted on travellers – effectively preventing the variant's transmission on the subarctic island.
DNA identification also made it possible to establish a clear link between visitors of a pub in central Reykjavik and the majority of infections in a new wave in mid-September – leading authorities to close bars and nightclubs in the capital.

Sequencing also identified a separate strain from two French tourists who tested positive on arrival in Iceland, and who were initially accused – mistakenly – of being the cause of the September surge.
All of the around 6,000 COVID-19 cases reported in Iceland have been sequenced, making it the world leader in COVID sequencing.
While several countries, such as Britain, Denmark, Australia and New Zealand, carry out high levels of sequencing, none of them come anywhere near Iceland's levels, although global statistics are incomplete.

Child's play
So why is Iceland so far ahead of the game?
Gene mapping is deCODE's speciality. Founded in 1996, the company has carried out the largest ever genetic study of a population.
For a 2015 study on cancer risk factors, it sequenced the entire genome of 2,500 Icelanders and studied the genetic profile of a third of the then-population of 330,000.
Compared to that, sequencing COVID-19 samples is child's play.
"It's very easy to sequence this viral genome: it's only 30,000 nucleotides, it's nothing," quips Kari Stefansson, the 71-year-old founder and chief executive of the company.
By comparison, the human genome normally analysed in his labs consists of 3.4 billion pairs of nucleotides, or organic molecules, he adds.
While Iceland's rigorous sequencing has been useful for tracking the spread of the virus, it has yet to lead to any major scientific discoveries for deCODE.
"If there are differences between viruses with the various pattern mutations, they aren't very obvious. Not sufficiently obvious for us to pick it up," says Stefansson.

One-in-eight 'recovered' Covid patients 'DIE within 140 days': Study finds devastating toll on people who were hospitalised - with a THIRD readmitted within weeks

Source: https://www.dailymail.co.uk/health/article-9157893/Covid-UK-One-eight-recovered-Covid-patients-DIE-140-days.html

Jan 17 – Almost a third of recovered Covid patients are readmitted to hospital within five months and up to one in eight die of Covid-related complications.
Research by Leicester University and the Office for National Statistics (ONS) found that out of 47,780 people discharged from hospital in the first wave, 29.4 per cent returned to hospital within 140 days and 12.3 per cent died.
The devastating long-term effects of **coronavirus** can cause many survivors to develop heart problems, diabetes and chronic liver and kidney conditions.
Study author Kamlesh Khunti, professor of primary care diabetes and vascular medicine at Leicester University, told the **Telegraph** this was the 'largest study of people discharged from hospital after being admitted with Covid'.
Professor Khunti said: 'People seem to be going home, getting long-term effects, coming back in and dying. We see nearly 30 per cent have been readmitted, and that's a lot of people. The numbers are so large.'
The study has yet to be peer-reviewed and the alarming statistics are based on initial data. In other developments:

- NHS figures revealed one in six Covid-19 patients in English NHS hospitals arrived without the virus but were infected there since September;
- Another 671 deaths were recorded, the highest number for any Sunday of the pandemic so far, along with 38,598 new cases;
- NHS England chief executive Sir Simon Stevens said a patient is being admitted to hospital with coronavirus every 30 seconds;
- Ex-Supreme Court judge Lord Sumption sparked a row after telling stage 4 bowel cancer sufferer Deborah James on TV that her life was 'less valuable' than other people's;
- All travellers arriving in Britain face being forced to quarantine in hotels under plans to further lock down the country's borders;
- England rugby star Maro Itoje called for every schoolchild to have a laptop as he vowed to tackle the 'digital divide';

- Parks remained packed despite the Prime Minister warning people to 'think twice' before leaving the house;
- Dominic Raab warned the public it is 'too early' for them to book summer holidays for this year.

But Professor Khunti said he was surprised to find that patients were returning to hospital with a different diagnosis and that many had developed further complications.

He added: 'We don't know if it's because Covid destroyed the beta cells which make insulin and you get Type 1 diabetes, or whether it causes insulin resistance, and you develop Type 2, but we are seeing these surprising new diagnoses of diabetes.'

The Government currently register a death as Covid-related if the patient dies up to 28 days after a positive test.

But the real death toll may be much higher if thousands of Covid survivors return to hospital with serious health problems months after first contracting the disease.

In December, the ONS estimated one in 10 people who caught Covid went on to suffer long Covid with symptoms lasting three months or more.

Common symptoms of long Covid include extreme tiredness, shortness of breath and problems with memory and concentration.

Group (sample size)	Adverse event	Rate per 1,000 person-years (95% CI)		Rate ratio (95% CI)
		COVID-19 cases	Control group	
Sex: Male (*n* = 26,245)	Death	318.4 (307.5 to 329.6)	38.5 (34.9 to 42.3)	8.3 (7.5 to 9.2)
	Readmission	757.5 (740.7 to 774.7)	214.3 (205.8 to 223.1)	7.2 (6.5 to 8.0)
	Respiratory	780.9 (763.8 to 798.3)	127.3 (120.7 to 134.1)	14.1 (11.0 to 18.3)
	Diabetes	142.4 (135.2 to 150.0)	95.6 (90.0 to 101.6)	7.7 (7.1 to 8.3)
	MACE	130.7 (123.7 to 137.9)	43.0 (39.2 to 47.1)	7.6 (7.0 to 8.2)
	CKD	43.7 (39.7 to 48.0)	20.5 (17.9 to 23.4)	10.0 (7.3 to 13.8)
Sex: Female (*n* = 21,535)	Death	322.0 (309.9 to 334.5)	44.8 (40.6 to 49.4)	3.5 (3.4 to 3.7)
	Readmission	776.4 (757.5 to 795.7)	224.5 (214.8 to 234.5)	3.5 (3.3 to 3.6)
	Respiratory	757.6 (738.9 to 776.6)	131.4 (124.0 to 139.1)	4.4 (4.1 to 4.6)
	Diabetes	107.9 (101.0 to 115.3)	74.2 (68.6 to 80.0)	3.2 (3.1 to 3.3)
	MACE	120.6 (113.2 to 128.3)	42.0 (37.9 to 46.5)	3.3 (3.2 to 3.5)
	CKD	32.5 (28.8 to 36.7)	20.3 (17.5 to 23.5)	4.4 (4.0 to 4.9)
Age group: <70 years (*n* = 25,955)	Death	86.2 (80.7 to 91.9)	6.1 (4.7 to 7.7)	6.1 (5.8 to 6.5)
	Readmission	556.6 (542.6 to 570.8)	127.0 (120.5 to 133.8)	5.8 (5.4 to 6.1)
	Respiratory	615.8 (601.1 to 630.8)	58.5 (54.1 to 63.1)	10.5 (9.7 to 11.4)
	Diabetes	123.9 (117.4 to 130.7)	73.2 (68.2 to 78.4)	4.6 (4.3 to 4.8)
	MACE	55.7 (51.4 to 60.4)	13.0 (11.0 to 15.3)	5.2 (5.0 to 5.5)
	CKD	24.4 (21.6 to 27.5)	6.9 (5.4 to 8.6)	11.4 (9.8 to 13.3)
Age group: ≥70 years (*n* = 21,825)	Death	658.4 (640.1 to 677.0)	85.6 (79.6 to 91.9)	1.5 (1.4 to 1.6)
	Readmission	1,069.0 (1,045.7 to 1,092.6)	334.2 (322.3 to 346.5)	1.5 (1.3 to 1.6)
	Respiratory	994.2 (971.7 to 1,017.0)	217.8 (208.2 to 227.7)	1.7 (1.6 to 1.8)
	Diabetes	131.3 (123.2 to 139.8)	102.1 (95.6 to 109.0)	1.3 (1.2 to 1.4)
	MACE	227.9 (217.3 to 239.0)	79.7 (74.0 to 85.8)	1.4 (1.3 to 1.5)
	CKD	59.3 (53.9 to 65.1)	37.4 (33.5 to 41.6)	1.5 (1.3 to 1.7)
Ethnic group: White (*n* = 34,355)	Death	403.4 (392.5 to 414.5)	53.1 (49.4 to 57.0)	3.0 (2.7 to 3.4)
	Readmission	876.8 (860.7 to 893.2)	263.6 (255.3 to 272.2)	2.9 (2.5 to 3.2)
	Respiratory	861.1 (845.1 to 877.3)	164.5 (157.9 to 171.3)	4.3 (3.6 to 5.2)
	Diabetes	119.6 (113.6 to 125.7)	85.5 (80.8 to 90.4)	2.9 (2.6 to 3.1)
	MACE	153.4 (146.7 to 160.3)	53.9 (50.2 to 57.9)	2.8 (2.6 to 3.1)
Ethnic group: Non-White (*n* = 8,315)	Death	126.6 (115.0 to 139.0)	12.7 (9.3 to 16.9)	2.1 (1.8 to 2.5)
	Readmission	553.7 (529.2 to 579.0)	126.1 (114.8 to 138.2)	1.6 (1.3 to 1.9)
	Respiratory	567.8 (543.0 to 593.4)	49.9 (42.9 to 57.8)	3.5 (2.7 to 4.6)
	Diabetes	184.1 (170.1 to 198.9)	121.1 (110.1 to 133.0)	1.6 (1.4 to 1.8)
	MACE	68.2 (59.8 to 77.4)	18.8 (14.6 to 23.8)	1.7 (1.5 to 2.0)

Although vaccines are considered most important for the elderly, who are most at risk of dying if they catch Covid-19, the research shows it is also crucial to get the jabs to adults of other ages.

It found death rates were 14 times higher among under-70s with coronavirus (86.2 per 1,000 person-years), compared to those without (6.1). Readmission rates were also four times higher (556.6 vs 127.0).

Under-70s were affected by lung, heart, kidney and liver problems, and new cases of diabetes, weeks or even months after they had recovered from Covid-19. But the risks were still greatest for the over-70s.

It found death rates were 14 times higher among under-70s with coronavirus (86.2 per 1,000 person-years), compared to those without (6.1). Readmission rates were also four times higher (556.6 vs 127.0)

The Leicester researchers wrote: 'Individuals discharged from hospital following acute Covid-19 face elevated rates of mortality, readmission and multi-organ dysfunction compared with the background levels that exist for these individuals, and the relative increase in risk is neither confined to the elderly nor uniform across ethnic groups.'

Responding to the study, Christina Pagel, director of the clinical operational research unit at University College London, tweeted: 'This is such important work. Covid is about so much more than death. A significant burden of long-term illness after hospitalisation for Covid.'

It comes as NHS England chief executive Sir Simon Stevens said that someone is being admitted to hospital with Covid 'every 30 seconds'.

The NHS boss, who was appearing on the Andrew Marr show, said that hospitals had seen a huge increase in patients since Christmas and added that there are enough new cases to fill a whole hospital every morning. He also revealed that a quarter of the admissions are people under the age of 55.

Sir Simon said: 'The facts are very clear and I'm not going to sugar-coat them, hospitals are under extreme pressure and staff are under extreme pressure.

'Since Christmas Day we've seen another 15,000 increase in the in-patients in hospitals across England, that's the equivalent of filling 30 hospitals full of coronavirus patients.

'Staggeringly, every thirty seconds across England another patient is being admitted to hospital with coronavirus.'

It comes as a further 671 people have died from Covid-19 today, representing the highest Sunday increase.
The surging death rate comes despite hopes infections might finally be tailing off. A raft of official data and scientific estimates published this week offered the strongest evidence yet that the tough lockdown restrictions have worked.
Cambridge University researchers believe the R rate - the average number of people each infected person passes the disease onto - may have dipped to as low as 0.6 in London and the South East. The figure must be below one for an outbreak to shrink.
Public Health England revealed weekly Covid cases have fallen in every age group except the over-80s, despite the spread of the highly infectious variant first spotted in Kent which officials feared couldn't be contained.
In more positive news, he also revealed that a trial for 24-hour Covid vaccines within the next 10 days.

SaNOtize initiates trials of nasal spray against Covid-19 in UK

Source: https://www.clinicaltrialsarena.com/news/sanotize-trials-nasal-spray/

Jan 11 – Canada-based SaNOtize Research and Development has initiated the clinical trials of its nasal spray against Covid-19 at Ashford and St Peter's Hospitals NHS Foundation Trust in Surrey, UK.
SaNOtize Nitric Oxide Nasal Spray (NONS) is designed to exterminate the SARS-CoV-2 virus in the upper airways and stop its incubation and spread to the lungs.
The treatment is based on a natural nanomolecule called nitric oxide, produced by the human body with proven anti-microbial properties against SARS-CoV-2.
In lab tests at Utah State University's Antiviral Research Institute, the spray proved to be 99.9% effective in killing the virus within two minutes.
Furthermore, studies using the spray in Covid-19 infected rodents showed a 95% drop in viral load within a day after infection while half the rodents showed no detectable virus.
The rodents were first inoculated with the virus and given two treatments of the nasal spray.
At present, the SaNOtize NONS is in Phase II clinical trials throughout Canada approved by Health Canada as well as in other countries.
University of London Institute of Cardiovascular Research at Royal Holloway director and Neurology professor Pankaj Sharma said: "The fact that a relatively easy and simple nasal spray could be an effective treatment is welcome news and offers a significant advance in our therapeutic armoury against this devastating disease."

Seasonal Coronaviruses' Spike Proteins Evolve to Evade Immune Responses

Source: https://www.genengnews.com/news/seasonal-coronaviruses-spike-proteins-evolve-to-evade-immune-responses/

Jan 12 – The appearance of SARS-CoV-2 variants has permeated the news since the beginning of the year. Viruses mutate, so new variants are not surprising. But the phenotypes associated with those changes could potentially be a cause of concern; particularly if they impact immune memory or vaccine efficacy. Now, scientists address the influence of antigenic drift (slow mutational changes over time) on immune evasion of seasonal coronaviruses. In doing so, they show that two seasonal human coronaviruses undergo adaptive evolution in regions of the viral spike protein that are exposed to human humoral immunity. The findings suggest that a continual reformulation of coronavirus vaccines may be necessary.
The work is published in *eLife* in the paper, "Evidence for adaptive evolution in the receptor-binding domain of seasonal coronaviruses OC43 and 229E."
First, a quick coronavirus primer. There are hundreds of coronaviruses circulating in animals such as bats, cats, pigs, and camels. Seven coronaviruses are known to date to infect humans. The coronaviruses that commonly infect people, causing a mild infection that likely resembles the common cold, are 229E, NL63, OC43, and HKU1. The other, more notorious, group consists of MERS-CoV, SARS-CoV, and SARS-CoV-2.
"Some coronaviruses are known to reinfect humans but it is not clear to what extent this is due to our immune memory fading or antigenic drift," said first author Kathryn Kistler, a PhD student at the Vaccine and Infectious Disease Division, Fred Hutchinson Cancer Research Center in Seattle. "We wanted to investigate whether there is any evidence of coronaviruses related to SARS-CoV-2 evolving to evade our immune responses."
The research team looked at the four seasonal human coronaviruses (HCoVs). Since HCoVs have been circulating in the human population for 20–60 years, regularly infecting and

reinfecting humans, it is likely that their antigens have faced pressure to evolve against the immune system.

The authors noted that it is not known to what extent reinfection by these viruses is due to waning immune memory or antigenic drift of the viruses.

The team used a variety of computational methods to compare the genetic sequences of many different viruses, enabling them to see how they have evolved over the years. They were especially interested in any changes that might have occurred in viral proteins that could contain antigens, such as spike proteins which are on the surface of coronaviruses and are therefore exposed to the immune system.

The researchers found a high rate of evolution in the spike proteins of two of the four viruses, OC43 and 229E. Nearly all of the beneficial mutations appeared in a specific region of the spike proteins called S1, which helps the virus infect human cells. This suggests that reinfection by these two viruses can occur as a result of antigenic drift as they evolve to escape recognition by the immune system.

The team also estimated that beneficial mutations in the spike proteins of OC43 and 229E appear roughly once every two to three years, about half to one-third of the rate seen in the flu virus strain, H3N2.

"Due to the high complexity and diversity of HCoVs, it is not entirely clear if this means that other coronaviruses, such as SARS-CoV-2, will evolve in the same way," explained Trevor Bedford, principal investigator and associate member at the Vaccine and Infectious Disease Division, Fred Hutchinson Cancer Research Center. "The current vaccines against COVID-19, while highly effective, may need to be reformulated to match new strains, making it vital to continually monitor the evolution of the virus' antigens."

How to Distribute 100 Million Vaccine Doses in 100 Days

By Thomas J. Bollyky, Jennifer B. Nuzzo and Prasith Baccam

Source: https://www.nytimes.com/2021/01/20/opinion/covid-vaccine-biden.html

Jan 20 – Faced with a slow, chaotic vaccine rollout and ever-rising Covid-19 cases, President Biden has an ambitious plan: to administer 100 million doses of the coronavirus vaccine in his first 100 days in office. Since the vaccines became publicly available in mid-December, 16.5 million shots have made their way into the arms of Americans, an average of 447,000 doses per day. Mr. Biden's goal of more than doubling this rate can be achieved if the United States implements a vaccination campaign that treats Covid-19 more like an act of bioterrorism and less like the seasonal flu.

While the United States does not currently have enough vaccine to inoculate all 331 million Americans, supply is far from the only obstacle to ending the pandemic. Only 46 percent of the 36 million doses distributed to states so far have been administered. The challenge has been managing the complex logistics of mass vaccination in tandem with addressing the concerns of people who are reluctant to be vaccinated.

Fortunately, we don't have to develop a strategy from scratch. The federal government has already thought through what it would take to vaccinate large numbers of Americans in a short period.

In the months after the Sept. 11 attacks, the federal government amassed a cache of medicines and vaccines that could be used to protect civilians from a bioterrorist attack involving anthrax or smallpox. Researchers working for the government estimated how many clinics and workers would be required to rapidly dispense and administer stockpiled vaccines and medicines. The Biden administration can learn from these efforts to inoculate Americans against Covid-19.

Building on the strategies developed for smallpox vaccination, we estimate that administering an average of one million shots daily for 100 days would require at least 400 vaccination sites across the country, staffed by somewhere between 100,000 and 184,000 people. About 17,000 of those workers would need to be qualified to administer vaccines. Our model assumes that each clinic would operate 12 hours per day and have 10 vaccination stations (like checkout lines in a grocery store) that together could vaccinate 200 people per hour. This plan would require 120 to 220 workers at each clinic per shift and could immunize 2,400 people per clinic per day.

Of course, the coronavirus is not completely analogous to smallpox. Our numbers are based on guidelines from the Centers for Disease Control and Prevention and vaccination exercises that were conducted in San Francisco and New Jersey more than a decade ago. Some of our assumptions may not be appropriate for all states or settings, particularly rural areas that lack infrastructure and trained workers. But this approximation gives us a window into the scale of effort required to achieve the Biden administration's immunization goals.

Administering a million vaccine doses a day for 100 days will require substantial federal investment; state and local public health departments simply do not have enough people qualified to conduct vaccinations at this scale. You must be a doctor or nurse to administer vaccines in many states, although some allow trained pharmacists, medical assistants and physicians assistants to do so. To ensure adequate staffing, states will need to train and authorize other health workers — such as dentists, emergency medical technicians and paramedics — to give vaccines.

There is also the problem of demand. Mass vaccination plans for bioterrorism generally assume the population is willing to be vaccinated. Reports of health care workers refusing coronavirus vaccinations are deeply worrisome. State and local governments need to bolster their engagement with community groups to address concerns about the vaccines.

Increasing the volume of vaccinations need not come at the expense of getting doses to the people most at risk from Covid-19. Because it's important to ensure that people getting vaccinated meet current eligibility criteria, mass vaccination clinics can focus on people over 65, whose age can be easily verified. Mobile clinics can vaccinate essential workers and people who get their medical care at federally qualified health centers — a population that disproportionately includes lower-income individuals and members of minority groups.

Health departments need more resources to dispense vaccines to every American who wants one. Mr. Biden's $1.9 trillion spending proposal includes $20 billion to establish community vaccination programs and requests funding to hire 100,000 health workers. Those programs should include people qualified to administer vaccines and enough workers to manage large vaccination clinics. It is money well spent in a pandemic, and Congress should authorize it.

Administering 100 million doses in 100 days would be the most ambitious vaccination campaign in U.S. history. It needs support that will be equal to the task.

Thomas J. Bollyky *is director of the global health program at the Council on Foreign Relations and the author of "Plagues and the Paradox of Progress: Why the World Is Getting Healthier in Worrisome Ways."*

Jennifer B. Nuzzo *is a senior fellow for global health at the Council on Foreign Relations and an associate professor at the Johns Hopkins Bloomberg School of Public Health.*

Prasith Baccam *is a computational epidemiologist at IEM, an emergency management and homeland security consultancy.*

Free online tool calculates risk of COVID-19 transmission in poorly-ventilated spaces

By Savvas Gkantonas

Source: https://www.cam.ac.uk/research/news/free-online-tool-calculates-risk-of-covid-19-transmission-in-poorly-ventilated-spaces

The vital role of ventilation in the spread of COVID-19 has been quantified by researchers, who have found that in poorly-ventilated spaces, the virus can spread further than two metres in seconds, and is far more likely to spread through prolonged talking than through coughing.

The tool can help people use fluid mechanics to make better choices, and adapt their day-to-day activities and surroundings in order to suppress risk, both for themselves and for others

The results, reported in the journal *Proceedings of the Royal Society A*, show that social distancing measures alone do not provide adequate protection from the virus, and further emphasise the vital importance of ventilation and face masks in order to slow the spread of COVID-19.

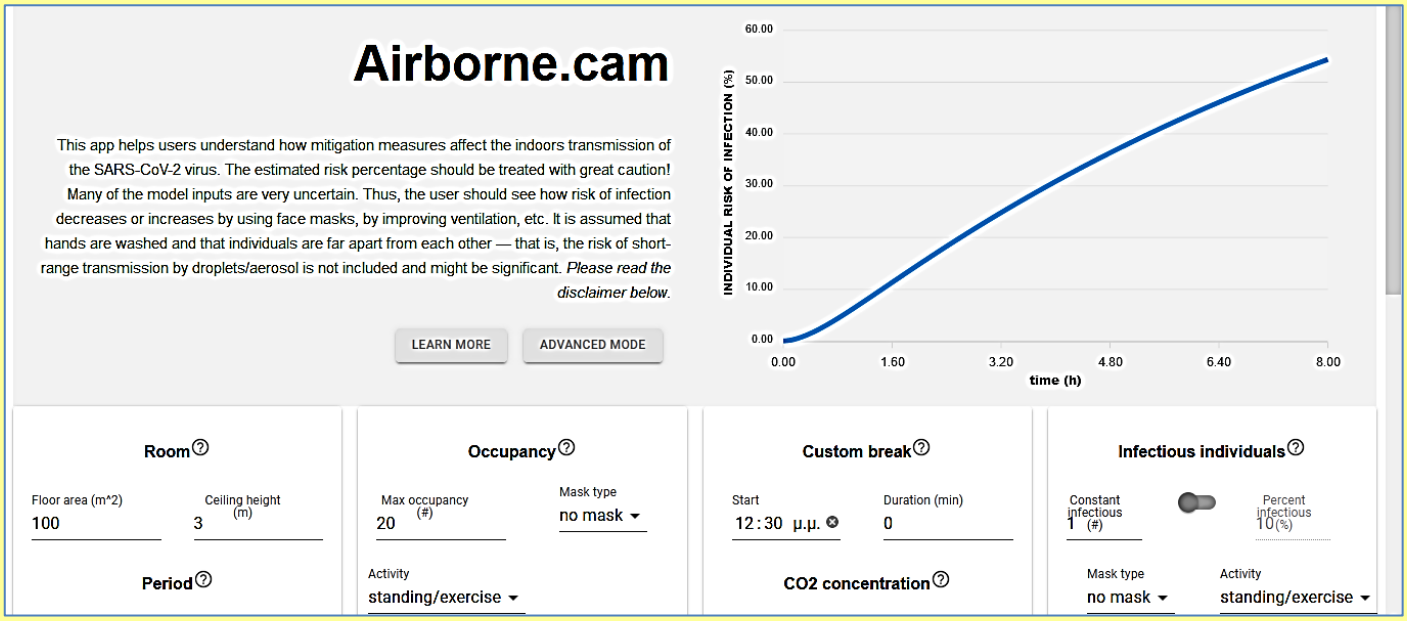
The researchers, from the University of Cambridge and Imperial College London, used mathematical models to show how SARS-CoV-2 – the virus which causes COVID-19 – spreads in different indoor spaces, depending on the size, occupancy, ventilation and whether masks are being worn.

These models are also the basis of a free online tool, Airborne.cam, which helps users understand how ventilation and other measures affect the risk of indoor transmission, and how that risk changes over time.

The researchers found that when two people are in a poorly-ventilated space and neither is wearing a mask, prolonged talking is far more likely to spread the virus than a short cough. When speaking, we exhale smaller droplets, or aerosols, which spread easily around a room, and accumulate if ventilation is not adequate. In contrast, coughing expels more large droplets, which are more likely to settle on surfaces after they are emitted.

It only takes a matter of seconds for aerosols to spread over two metres when masks are not worn, implying that physical distancing in the absence of ventilation is not sufficient to provide safety for long exposure times. When masks of any kind are worn however, they slow the breath's momentum and filter a portion of the exhaled droplets, in turn reducing the amount of virus in aerosols that can spread through the space.

The scientific consensus is that the vast majority of COVID-19 cases are spread through indoor transmission – whether via aerosols or droplets. And as was predicted in the summer and autumn, now that winter has arrived in the northern hemisphere and people are spending more time indoors, there has been a corresponding rise in the number of COVID-19 cases.



"Our knowledge of airborne transmission of SARS-CoV-2 has evolved at an incredible pace, when you consider that it's been just a year since the virus was identified," said Dr Pedro de Oliveira from Cambridge's Department of Engineering, and the paper's first author. "There are different ways to approach this problem. In our work, we consider the wide range of respiratory droplets humans exhale to demonstrate different scenarios of airborne viral transmission – the first being the quick spread of small infectious droplets over several metres in a matter of a few seconds, which can happen both indoors and outdoors. Then, we show how these small droplets can accumulate in indoor spaces in the long term, and how this can be mitigated with adequate ventilation."

The researchers used mathematical models to calculate the amount of virus contained in exhaled particles, and to determine how these evaporate and settle on surfaces. In addition, they used characteristics of the virus, such as its decay rate and viral load in infected individuals, to estimate the risk of transmission in an indoor setting due to normal speech or a short cough by an infectious person. For instance, they show that the infection risk after speaking for one hour in a typical lecture room was high, but the risk could be decreased significantly with adequate ventilation.

Based on their models, the researchers have now built Airborne.cam, a free, open-source tool which can be used by those managing public spaces, such as shops, workplaces and classrooms, in order to determine whether ventilation is adequate. The tool is already in use in several academic departments at the University of Cambridge. The tool is now a requirement for any higher-risk spaces at the University, enabling departments to easily identify hazards and control-measure changes needed to ensure aerosols are not allowed to become a risk to health.

"The tool can help people use fluid mechanics to make better choices, and adapt their day-to-day activities and surroundings in order to suppress risk, both for themselves and for others," said co-author Savvas Gkantonas, who led the development of the app with Dr de Oliveira.

"We're looking at all sides of aerosol and droplet transmission to understand, for example, the fluid mechanics involved in coughing and speaking," said senior author Professor Epaminondas Mastorakos, also from the Department of Engineering. "The role of turbulence

and how it affects which droplets settle by gravity and which remain afloat in the air is, in particular, not well understood. We hope these and other new results will be implemented as safety factors in the app as we continue to investigate."
The continuing development of Airborne.cam, which will soon be available for mobile platforms, is supported in part by Cambridge Enterprise and Churchill College.

Reference: *P. M. de Oliveira et al. 'Evolution of spray and aerosol from respiratory releases: theoretical estimates for insight on viral transmission.' Proceedings of the Royal Society A (2021). DOI: 10.1098/rspa.2020.0584*

A five-day course of ivermectin for the treatment of COVID-19 may reduce the duration of illness

By Sabeena Ahmed, Mohammad Mahbubul Karim, Allen G. Ross, et al.
Int J Infetious Dis |Dec 02, 2021; Vol 103; pp. 214-16
Source: https://www.ijidonline.com/article/S1201-9712(20)32506-6/fulltext

Highlights

- Ivermectin, an FDA-approved anti-parasitic agent, was found to be an inhibitor of SARS-CoV-2 replication in the laboratory.
- Ivermectin may be effective for the treatment of early-onset mild COVID-19 in adult patients.
- Early viral clearance of SARS-CoV-2 was observed in ivermectin treated patients.
- Remission of fever, cough and sore throat did not differ among treatment groups. No severe adverse event was observed.
- Larger trials will be needed to confirm these preliminary findings.

Abstract

Ivermectin, a US Food and Drug Administration-approved anti-parasitic agent, was found to inhibit severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) replication in vitro. A randomized, double-blind, placebo-controlled trial was conducted to determine the rapidity of viral clearance and safety of ivermectin among adult SARS-CoV-2 patients. The trial included 72 hospitalized patients in Dhaka, Bangladesh, who were assigned to one of three groups: oral ivermectin alone (12 mg once daily for 5 days), oral ivermectin in combination with doxycycline (12 mg ivermectin single dose and 200 mg doxycycline on day 1, followed by 100 mg every 12 h for the next 4 days), and a placebo control group. Clinical symptoms of fever, cough, and sore throat were comparable among the three groups. Virological clearance was earlier in the 5-day ivermectin treatment arm when compared to the placebo group (9.7 days vs 12.7 days; $p = 0.02$), but this was not the case for the ivermectin + doxycycline arm (11.5 days; $p = 0.27$). There were no severe adverse drug events recorded in the study. A 5-day course of ivermectin was found to be safe and effective in treating adult patients with mild COVID-19. Larger trials will be needed to confirm these preliminary findings.

How to Have a COVID-Safe Car Ride, According to Science

Source: https://www.sciencealert.com/best-evidence-based-tips-for-the-most-covid-safe-car-ride-possible

Jan 22 – Sharing a car with someone is one of the riskiest things you can do without cohabitating, as far as coronavirus transmission goes.
While taking a car may feel like a slightly safer alternative compared to public transportation, it's still a small, enclosed space. Even if all passengers are wearing masks, some small particles can escape from the face coverings into the air.
"It's usually not significant when you're outdoors, because it gets diluted," Varghese Mathai, a physicist at the University of Massachusetts, Amherst, told Insider. "But when you're in a confined space like that of a car, if [the particles] are not flushed out of the cabin, they can remain and build up a concentration with time."
Mathai, along with researchers from Brown University, has been modelling how particles may move inside vehicles with various levels of ventilation.
Unsurprisingly, in their simulation, published in *Science Advances* earlier this month, rolling down all of the windows was the most effective way to clear out potentially virus-laden particles from a car.

When all windows were closed, 8 percent to 10 percent of the tiny particles one person exhaled could reach another. That number dropped to 0.2 percent to 2 percent when all four windows were open.

But on a chilly winter day, opening all of the windows may not be the most practical option, so the authors experimented with alternatives, and came up with some suggestions.

If you're going to open two windows, pick the ones opposite the driver and passenger

The simulated car was based on a Toyota Prius driving at 50 miles per hour, with a driver in the front left seat and a single passenger in the back right.

While a passenger may intuitively crack the window closest to them upon getting in a car, opening the windows opposite the driver (front right) and passenger (back left) provided better ventilation in the model.

In a moving car, fresh air typically flows in through the rear window and out the front window, Mathai said. Opening the windows opposite the occupants not only provides an entry and exit point for particles, but also creates a current of air separating the passenger from the driver.

However, Mathai said the difference between the two-windows-open configurations they tested was "marginal."

You should open some windows at least halfway if you're sharing a car, and always wear a mask

Opening car windows is not a foolproof way to avoid coronavirus transmission, Mathai said â€" and cracking them just a tad won't do much at all.

"If you just cracked the window, we do not get this kind of a strong drop," Mathai said. "It would be good to open it at least to half level."

Sharing a car with someone outside of your household is a risky move, and opening windows is one way to reduce that risk. But Mathabi cautioned that extra ventilation is not a substitute for other prevention measures, such as mask-wearing, handwashing, and sanitizing common surfaces.

Plastic barriers between driver and passenger could help stop droplets

The simulation didn't factor in potential barriers between the front and back seat, like a traditional taxi partition or a makeshift plastic sheet.

Mathai said that, while such sheets are not a substitute for fresh air, it doesn't hurt to have them. As other experts have told Insider, preventing coronavirus transmission is like layering Swiss cheese: each layer has its limitations, but if you stack enough slices, you should be able to cover the holes.

"The barriers are helpful in preventing all kinds of droplet transmission, including the small ones, possibly," Mathai said. "But a better way is to also have a ventilation system, so that the air inside the cabin gets replenished with fresh air from the outside."

Covid pandemic demonstrates effects of ignoring warnings: WEF report

Source: https://www.army-technology.com/features/covid-pandemic-demonstrates-effects-of-ignoring-warnings-wef-report/

Jan 21 – The Covid-19 pandemic came about as a result of ignoring long-term risks and is now an immediate global risk, according to the World Economic Forum's Global Risks Report. Climate change, state collapse and weapons of mass destruction remain a long-term threat.

The report states the pandemic could increase disparities and social fragmentation, will threaten the economy over the next three to five years and in the five to ten-year timeframe will weaken geopolitical stability. It will unfairly impact billions of caregivers, workers and students who will have less chance of taking advantage of pathways to recovery, especially minorities who were disadvantaged before the pandemic.

The report was produced in partnership with strategic partners Marsh McLennan, SK Group and Zurich Insurance Group and academic advisers National University of Singapore, Oxford Martin School, University of Oxford and the Wharton Risk Management and Decision Processes Center, University of Pennsylvania.

At an online event to mark the launch, WEF president Børge Brende said: "The Global Risks Report has been warning about pandemics for 15 years. In our first report in 2006, we also focused on how a lethal flu spread by global travel could present a threat if we didn't build resilience.

"At the time of writing the report, nearly 100 million worldwide have contracted COVID-19, and there have been more than two million deaths. This is one of the deadliest viruses in history, and it shows that we should pay much more attention to blind spots but also risks that we have been addressing and building resilience."

Brende added that last year demonstrated that risks are global and interconnected and aren't confined by borders or categories. Issues like Covid and climate change do not recognise borders, and one of the major risks is a further geopolitically polarised world.

The report divides its analysis into six chapters: fractured future, barriers to digital inclusivity, youth in an age of lost opportunity, navigating global divides, imperfect markets and reflections on responses to Covid-19.

Talking through the issues addressed in each, WEF managing director Saadia Zahidi said: "The first aspect that we try to look at is the timeframes that are involved. So, which are the risks that are likely to play out in the next couple of years those clear and present dangers, which ones come up in the next three to five years after that that are simply knock-on effects. And then finally, the longer-term existential threats.

"When it comes to the first couple of years, it's not just the health crisis, but it's also the unemployment crisis that has been induced by the recession. It's also the digital divides and cybersecurity failure.

"Beyond two years, you start looking at some of the economic fallout, for example, the possibility of debt crisis the possibility of commodity shocks, the possibility of price instability and of course across all of this, youth disillusionment also comes up. Finally, at five to 10 years out, you see those existential threats. That includes climate change, first and foremost, but also concerns about state collapse and weapons of mass destruction."

Pandemic Ready: How to Rapidly Scale up Liquid Handling in Diagnostic Labs

The COVID-19 crisis has led to unparalleled pressure on labs to ramp up capacity for testing for the SARS-CoV-2 virus. Many labs have turned to INTEGRA's electronic pipettes and pipetting robots to help tackle the challenge of increasing testing capacity while, at the same time, enhancing the reproducibility of results. + MORE

A world with long COVID

By Claudine Fry and **Charles Hecker**

Source: https://www.controlrisks.com/riskmap/top-5-risks/01-a-world-with-long-covid

A fragmented and competitive exit from the pandemic will test relations between business, governments and society

For 2021, we fervently wanted to return to the normal fare of geopolitical risk: trade wars, regional conflicts, political stability, the trajectory of international institutions. All these will be present in the coming year. But COVID-19 will remain a – perhaps even *the* – dominant factor shaping the global outlook in 2021.

If we are fortunate, the narrative will shift from resurgent spread and rising mortality to vaccine distribution and the start of an uneven recovery. Most likely, the story of 2021 will

fall somewhere in between. We will experience a year of stuttering and patchy vaccine rollouts and pockets of "forever COVID". A highly fragmented exit from the pandemic will create tensions among – and within – an emerging group of "have" and "have not" countries. All this will disrupt how nations work with each other, how companies work with nations, and how companies and nations interact. 2021 will not work without strong global leadership, in national capitals and in company headquarters. Both have room for improvement on 2020.

If 2021 does not mark the end of the pandemic, it will be the year that determines what is left when the worst is over.

Pockets of forever COVID will endure around the world, like flu, or measles. These will not constitute a pandemic, defined by rapid growth of a disease simultaneously across the world. But they will trouble the world for as long as they threaten to spread. Countries with lingering COVID-19 outbreaks may be cut off from international events and travel for prolonged periods. Supply chains may be disrupted, and global businesses fragmented.

All our hopes are pinned on vaccines, and on overcoming the many complexities involved in manufacturing and distributing them on a vast scale. From this springs the question of who gets what. Competition will be fierce. The have states have gobbled up vaccine supplies before they even exist. But they will have to fight it out to catch the first doses that fly off the production line. Alliances will be tested. As for the have nots, the COVAX scheme offers hope that successful vaccines will be available to those countries with fewer resources and less diplomatic might. They will also have access to vaccines made available by big powers, but these may be unpredictable or come with strings attached.

Internationalist-minded visionary leaders have never been more in demand. They are in short supply. US President-elect Joe Biden has a large constituency to win over domestically who did not vote for him or his internationalist and pandemic-battling agenda. And he looks out at a fractured world that remains mistrustful and suspicious of the US, even with a new leader. His presidency raises considerably the prospects of the coordinated international response COVID-19 demands. But the chances remain slim. National priorities will be the top priorities.

And this all assumes people want to be vaccinated and that the vaccines work in the long term. If significant numbers refuse vaccination, efficacy suffers. Possible shocks to immunisation campaigns include security breaches or distribution failures that affect supply. Regulatory disagreements or even counterfeit vaccines would undermine public confidence.

Where does this leave businesses? With some notable exceptions, 2020 was, for many, more about survival than growth. In 2021, the balance of priorities will shift to seeking growth and opportunity – which form the essence of survival even in normal times. To do this, companies will need to be alert to flare-ups, not only of infections, but of the pandemic's related ills of regulatory, reputational and operational risk. Internally, they will need to manage the transformation of the workplace. Externally, they will have to lead, join or be trampled by the changing marketplace.

The vaccine's supply chain and logistics trail will dictate the shape of the coming year. The countries and target groups that absorb the vaccine most easily will be those that return to meaningful economic activity first and fastest. But a great number of countries, and an even larger number of people, will have to wait their turn.

This foretells of a deeply fragmented exit from the pandemic, one that will generate considerable tension between countries that return to robust economic activity relatively rapidly, and those that remain mired in the pandemic.

Companies have already asked us whether they should buy vaccines and inoculate their employees. If we look deeply enough into 2021, we can just about envision a scenario where vaccine supply exceeds demand, leaving doses available to the private sector. For now, though, this is best seen as an outlier scenario.

The vaccine will always grab the headlines, but there are lower profile issues that are equally important. More than anything else, the new relationship between the company and the state will feature heavily in 2021. COVID-19 has lodged itself in the nexus of the public and private sectors.

The bailouts and income support that created rivers of cash at the outset of the pandemic will dwindle. Those bailouts came with terms and conditions, but they also came with strings. Companies that took government money will be indebted – directly or indirectly – to their public sponsors. Taking public money means accepting public scrutiny – your circle of stakeholders will widen as a result.

State budgets will creak under the weight of their new debt, pushing some countries to the wall, or forcing others into prolonged austerity. Entering the post-COVID-19 world with sovereign risk concerns are a motley crew of countries ranging from the UK to Ukraine, from Angola to Zambia, from Bangladesh to Iraq and Ecuador. Know where fiscal fault lines overlap with your exposure, monitor them and familiarise yourself with the triggers for potential crisis.

In some countries, your company and your colleagues will continue to be left to fend for yourselves. This will pile pressure on companies' capacity to spot opportunity before anyone else does, and certainly before the moment passes. If this sounds like a normal day at the office – sorry, the "office" – it is. Those that strike the right balance between tactical crisis

management and strategic opportunity-spotting will better manage a series of delicate looming trade-offs.
In every country, the state is playing a more prominent role in regulating international commerce – a trend the pandemic has substantially accelerated. Even the most devoted trading nations now understand that their healthcare sector is part of an increasingly wide variety of strategic sectors and essential assets that must not be left to the appetites of global M&A scouts. Since the start of the pandemic, the EU and more than half of the OECD group of wealthy nations have tightened the rules governing inbound investment. Many of these rules are designed to protect domestic healthcare sectors. Beyond that, though, countries are ever more jealously guarding their domestic tech sectors, a priority equal to defending national security and sovereignty. For companies, expansion plans, investment plans and any number of cross-border transactions will need to identify every stakeholder – supporters as well as detractors, people as well as institutions – to manage the obstacle course of foreign investment.
The second relationship that needs attention, if not repair and rebuilding, is that between the company and society. The global public health crisis has thrust companies into a position and role that not all yet wear comfortably – that of public steward of a new way of living and working.
Activists will hold a mirror to your company and the successes and failures of its pandemic management. Customers will want to do business with companies that reflect and even promote their values. As illustrated by controversy over conditions for retail factory workers in the UK who continued operating during COVID-19 in 2020, a perceived or actual failure to manage the impact of COVID compassionately, proportionately and diligently will have reputational and commercial consequences. Shareholders and the market will punish companies that transgress against a new list of public priorities – care for the environment, care for workers and lower-paid employees, and promoting a diverse workplace, to name just a few. The challenge applies to companies with a deep and wide sense of duty of care obligations as well as those that do not, as they wrestle with how to redesign pre-COVID office-based perks and manage any restructuring post-COVID sensitively.
These issues are not all new, but their severity and centrality to a functional relationship between a company and the marketplace are. We have been telling clients for some time now that they need to prepare for an unprecedented level of public scrutiny – not just the kind that comes from government agencies, but the kind that comes from a public with a new sense of agency in steering the place and role of companies in society.

Claudine Fry *designs and manages consulting engagements for Control Risks' clients with a particular interest in political risk in Europe, the Middle East and Africa. Claudine has a remit to build our retainer business, through which our clients have access to bespoke intelligence and analysis on a long-term, on-demand and flexible basis.*
Charles Hecker *is responsible for shaping Control Risks' thought leadership on geopolitics, global security, political risk and their impact on international business. Charles speaks at industry, policy and academic conferences and represents the company's work to the international media.*

Covid: vaccine side effects reported in Switzerland

Source: https://lenews.ch/2021/01/22/covid-vaccine-side-effects-reported-in-switzerland/

Jan 22 – As at 21 January 2021, Swissmedic, Switzerland's drug approval authority, had received 42 reports of suspected adverse drug reactions in connection with the first COVID-19 vaccinations in Switzerland, it said in a press release.
Experts at Swissmedic, are currently looking these cases. However, so far their analysis has not found anything leading the body to change its positive benefit/risk ratio of the SARS-CoV-2 vaccines it has approved, which include the Pfizer/BioNTech and Moderna vaccines.
26 (62%) of the 42 cases were not serious and involved mild reactions that are already known from earlier clinical trials. 16 (38%) were classified as serious, including 5 associated with a fatal outcome. However, the 5 who died were all aged between 84 and 92 years old and **died of illnesses that commonly occur at this age**, said Swissmedic. Despite a chronological correlation with vaccination, there is no concrete evidence to suggest that vaccination was the cause of death.

On 22 January 2021, Switzerland's Federal Office of Public Health (FOPH) announced that close to 170,000 vaccine doses had been administered in Switzerland, mainly to people above the age of 75 or to people with chronic diseases. Given the vulnerability of most of those currently receiving the shots, a certain baseline level of death is to be expected.

EDITOR'S COMMENT: "... died of illnesses that commonly occur at this age ..." Does this mean that these people should have died at this specific date even if they have not done the vaccine just because they were old? Same for all the old people at the Canadian nursing home that died after vaccination? Can science really predict the exact time of our death? Can science estimate the stupidity factor that affects those in high places?

COVID-19 positive children more likely to transfer infection than adults: Lancet

Source: https://www.businesstoday.in/current/world/covid-19-positive-children-more-likely-to-transfer-infection-than-adults-lancet/story/428646.html

Jan 21 – Children and adolescents are less vulnerable to coronavirus infection but are more infectious than older individuals, according to a report published in the popular medical journal The Lancet this week. "Children and adolescents were less susceptible to infection but more infectious once infected, than individuals aged 20 years or older," the study said.
Besides, a team of Chinese and American researchers claimed that asymptomatic cases are also less infectious than symptomatic COVID-19 patients. "Individuals aged 60 years or older were at a higher risk of infection with SARS-CoV-2 than all other age groups. Infants aged 0-1 year were significantly more likely to be infected than children aged 2-5 years, and children aged 6-12 years. Children and adolescents younger than 20 years of age were more likely to infect others than were adults aged 60 years or older. Asymptomatic individuals were much less likely to infect others than were symptomatic cases. Symptomatic cases were more likely to infect others before symptom onset than after," according to the finding of the study quoted by The Lancet.
The high infectivity of children with SARS-CoV-2 infection highlights the need for careful planning of school reopening, the researchers suggested. The latest Lancet study was conducted by studying 20,000 families from Wuhan. The study included the households of all lab-confirmed or clinically confirmed COVID-19 cases and lab-confirmed asymptomatic coronavirus infections identified by the Wuhan Centre for Disease Control and Prevention between December 2, 2019, and April 18, 2020.
Wuhan was the first epicentre of COVID-19, accounting for 80 per cent of cases in China during the first wave.
The study was aimed at understanding the household transmissibility of coronavirus and risk factors associated with infectivity and susceptibility to infection in Wuhan.

Here's Why Some COVID-19 Strains Are Spreading Faster Than Others

By Sarah Otto
Source: https://www.sciencealert.com/here-s-why-some-covid-19-strains-are-spreading-faster-than-others

Jan 23 – A new variant of coronavirus has swept across the United Kingdom and been detected in the United States, Canada, and elsewhere. Scientists are concerned that these new strains may spread more easily.
As an evolutionary biologist, I study how mutation and selection combine to shape changes in populations over time. Never before have we had so much real-time data about evolution as we do with SARS-CoV-2: over 380,000 genomes were sequenced last year. SARS-CoV-2 has been mutating as it spreads, generating slight differences in its genome. These mutations allow scientists to trace who is related to whom across the family tree of the virus.
Evolutionary biologists, including myself, have cautioned against over-interpreting the threat posed by mutations. Most mutations will not help the virus, just like randomly kicking a working machine is unlikely to make it better.
But every once in a while a mutation or suite of mutations gives the virus an advantage. The data are convincing that the mutations carried by the variant that first appeared in the UK, known as B.1.1.7, make the virus more "fit."

Higher fitness or chance?
When a new variant becomes common, scientists determine the reason behind its spread.
A virus carrying a particular mutation can rise in frequency by chance if it is:

- carried by a superspreader;
- moved to a new uninfected location;
- introduced into a new segment of the population.

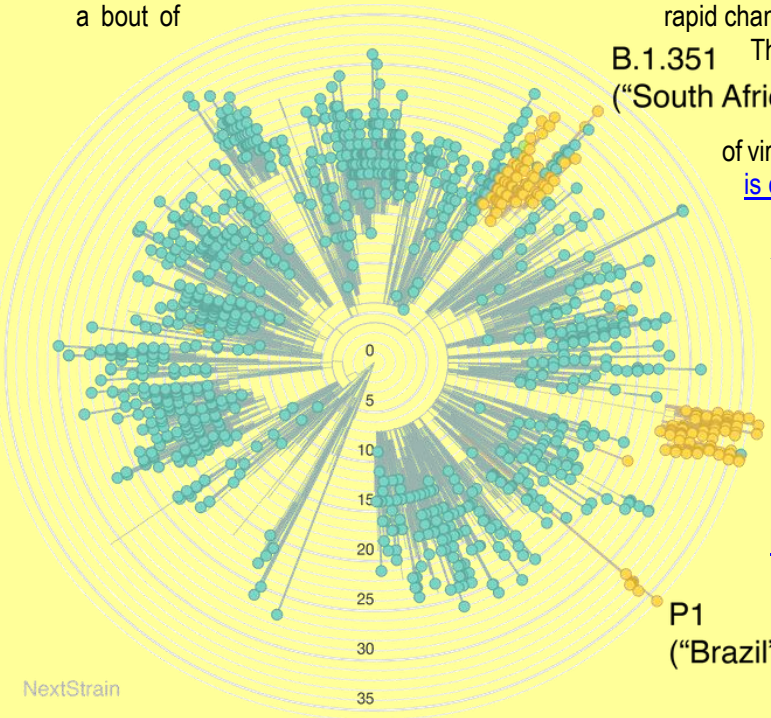
The latter two examples are called "founder events": a rapid rise in frequency can occur if a particular variant is introduced into a new group and starts a local epidemic. Chance events may explain the rise in frequency of several different SARS-CoV-2 variants. But B.1.1.7 is an exception. It shows a very strong signal of selection.
For the past two months, B.1.1.7 has risen in frequency faster than non-B.1.1.7 in virtually every week and health region in England. This data, reported on Dec. 21, 2020, helped convince UK Prime Minister Boris Johnson to place much of the country under lockdown and led to widespread travel bans from the UK.
The rise of B.1.1.7 cannot be explained by a founder event in new regions, because COVID-19 was already circulating across the UK.
Founder events in a new segment of the population (e.g., following a conference) also aren't plausible given the widespread restrictions against large gatherings at the time.
Our ability to track the evolution of SARS-CoV-2 is due to the massive effort by scientists to share and analyze data in real time.
But the incredibly detailed knowledge we have about B.1.1.7 is also due to just plain dumb luck.
One of its mutations altered a section of the genome used to test for COVID-19 in the UK, allowing the picture of evolutionary spread to be drawn from more than 275,000 cases.

Evolution in action

Epidemiologists have concluded that B.1.1.7 is more transmissible, but there are no signs that it is more deadly.
Some researchers estimate that B.1.1.7 increases the number of new cases caused by an infected individual (called the reproductive number or Rt) by between 40 and 80 percent; another preliminary study found that Rt increased by 50-74 percent.
A 40-80 percent advantage means that B.1.1.7 isn't just a little more fit, it's a lot more fit.
Even when selection is this strong, evolution isn't instantaneous. Our mathematical modelling, as well as that by others in Canada and the US, shows that it takes B.1.1.7 a couple of months to reach its meteoric rise, because only a small fraction of cases initially carries the new variant.
For many countries, like the US and Canada, where the number of COVID-19 cases has been precariously rising, a variant that increases transmission by 40-80 percent threatens to push us over the top.
It could lead to exponential growth in cases and overwhelm already threadbare medical care. Evolutionary change takes a while, buying us maybe a few weeks to prepare.

More variants

One surprise for researchers was that B.1.1.7 bears a remarkable number of new mutations.
B.1.1.7 has accumulated 30-35 changes over the past year. B.1.1.7 doesn't mutate at a higher rate, but it appears to have undergone a bout of rapid change in the recent past.



The virus may have been carried by an immunocompromised individual. People with weaker immune systems fight the virus constantly, with prolonged infections, recurrent rounds of viral replication and only a partial immune response to which the virus is constantly evolving.

Each dot represents a SARS-CoV-2 genome, with branches connecting related viruses to their ancestors. The centre represents the virus introduced into humans. The viruses furthest from the centre carry more mutations. Highlighted in gold are the three new variants. (NextStrain/CC BY 4.0)

Preliminary research reports that have yet to be verified have described two other variants of concern: one originally from South Africa (B.1.351) and one from Brazil (P1).
Both variants show a recent history of excess mutations and rapid increases

in frequency within local populations. Scientists are currently gathering the data needed to confirm that selection for higher transmission, not chance, is responsible.

What changed to allow spread?
Selection plays two roles in the evolution of these variants.
First, consider the role within those individuals in which the large number of mutants arose. B.1.1.7's 23 mutations and P1's 21 mutations aren't randomly arrayed across the genome but clustered in the gene encoding the spike protein.
One change in the spike, called N501Y, arose independently in all three variants, as well as in immunocompromised patients studied in the US and UK. Other changes in the spike (e.g. E484K, del69-70) are seen in two of the three variants.
Beyond the spike, the three variants of concern share one additional mutation that deletes a small part of the drably named "non-structural protein 6" (NSP6).
We don't yet know what the deletion does, but in a related coronavirus NSP6 tricks a cellular defence system and may promote coronavirus infection.
NSP6 also hijacks this system to help copy the viral genome. Either way, the deletion might alter the ability of the virus to take hold and replicate within our cells.

Easier transmission
The parallel evolution of the same mutations in different countries and in different immunocompromised patients suggests that they convey a selective advantage to evade the immune systems of the individuals in which the mutations occurred. For N501Y, this has been backed up by experiments in mice.
But what accounts for the higher transmission rate from individual to individual? This is challenging to answer because the many mutations that arose at once are now bundled together in these variants, and it could be any one or a combination of them that leads to the transmission advantage.
That said, several of these variants have arisen before on their own and haven't led to rapid spread.
One study showed that N501Y had only a weak transmission advantage on its own, rising rapidly only when coupled with the suite of mutations observed in B.1.1.7.
While the evolutionary story of COVID is still being written, one important message is emerging now. The 40-80 percent transmission advantage of B.1.1.7, and potentially the other variants B.1.351 and P1, will overwhelm many countries in the next few months.
We're in a race against viral evolution. We must roll out vaccines as quickly as possible, stem the flow of variants by restricting interactions and travel and get in front of spread by ramping up surveillance and contact tracing.

***Sarah Otto** is Killam University Professor in Evolutionary Biology @ University of British Columbia*

Biden Unveils National COVID-19 Strategy, Saying: "Help Is on the Way"

By Stephanie Soucheray
Source: http://www.homelandsecuritynewswire.com/dr20210122-biden-unveils-national-covid19-strategy-saying-help-is-on-the-way

Jan 22 – "Help is on the way," said President Joe Biden yesterday as he unveiled his 200-page national COVID-19 strategy and signed 10 executive actions aimed at tackling the pandemic, including ensuring the safe opening of schools, new guidance for foreign travel, and ensuring the National Guard in all 50 states is involved in the pandemic response.
"Things will get worse before they get better," Biden said, flanked by Vice President Kamala Harris, Anthony Fauci, MD, chief medical advisor to the president and the director of the National Institute of Allergy and Infectious Diseases, and Jeff Zients, the Biden administration's COVID czar.
Throughout the address, Biden warned that dark days are ahead for Americans, that it will take months to vaccinate enough Americans to make a difference in transmission rates, and that the death toll will likely top 500,000.
"We didn't get into this mess overnight," Biden said. "But we will get through this, we will defeat this pandemic. This is a full-scale wartime effort."

Testing, Equity, Masking, Vaccines
The executive actions taken yesterday include creating a National Pandemic Testing Board and a COVID-19 Health Equity Task Force to ensure a racially equitable pandemic response.

Biden also said states will be reimbursed fully by the Federal Emergency Management Agency (FEMA) if they use the National Guard to aid in the pandemic response.
Masks will be required in airports, and there is a new executive order requiring international travelers to show proof of a negative COVID-19 test before arriving in the United States.
Biden also maintained his promise of 100 million doses delivered in the arms of Americans during his first in 100 days in office, and once again urged every American to don a mask for the next 100 days as a patriotic act.
The Centers for Disease Control and Prevention (CDC) COVID Data Tracker shows 35,990,150 COVID-19 vaccine doses have been distributed, and 16,525,281 doses have been administered, including 1,908,256 in long-term care facilities.

Cases Top 24 Million
Biden officials have told CNN they inherited no national vaccine plan from the outgoing Trump administration, and in many arenas were starting from scratch as more than 24 million Americans have already been sickened by the novel virus.
The United States reported 178,255 new COVID-19 cases yesterday, and 4,229 deaths, according to the Johns Hopkins COVID-19 tracker. There are 122,700 COVID-19 patients in US hospitals, according to the COVID Tracking Project. In total, the country has 24,570,340 cases, including 408,877 deaths, according to the Johns Hopkins online tracker.
Among those cases, according to the latest CDC data, there are at least 144 confirmed cases of the B117 variant in 20 states, mostly in California, Florida, and New York.
Both Arizona and California remain hot spots. Though COVID-19 numbers have started to improve in Los Angeles County, health officials told the *LA Times* the "end is not yet in sight." Over the past week the county has reported an average of 11,369 new cases per day, down 25% from the previous week.
Arizona health officials said more people in the state need to get tested. Arizona has the highest rate of new COVID-19 cases in the country, but only 15,000 people a day are getting tested.
According to the state's Department of Health Services, yesterday Arizona saw 4,845 new virus cases and 262 related deaths, bringing the state's totals since the pandemic began to 690,544 cases and 11,528 deaths.

Monoclonal Antibody Use in Nursing Homes
Drugmaker Eli Lilly says its monoclonal antibody, **bamlanivimab**, prevented COVID-19 infections in nursing home residents and staff. The antibody was approved for emergency use in November to treat COVID-19, but this is the first time the drug has been shown to prevent infection.
In the study, which included 965 participants, residents who were randomized to receive bamlanivimab had up to an 80% lower risk of contracting COVID-19 versus residents in the same facility randomized to placebo.
"These data provide important additional clinical evidence regarding the use of bamlanivimab to fight COVID-19 and strengthen our conviction that monoclonal antibodies such as bamlanivimab can play a critical role in turning the tide of this pandemic." said Daniel Skovronsky, MD, PhD, Lilly's chief scientific officer and president of Lilly Research Laboratories.
A peer-reviewed study yesterday published in *JAMA* found that bamlanivimab paired with etesevimab, another monoclonal antibody, reduced COVID-19 virus shedding but not bamlanivimab alone in those with mild to moderate disease (see CIDRAP news story).

***Stephanie Soucheray** is a news reporter for CIDRAP News.*

Taking Proven Measures Now to Mitigate COVID-19 Pandemic

Source: http://www.homelandsecuritynewswire.com/dr20210122-taking-proven-measures-now-to-mitigate-covid19-pandemic

Jan 22 – The Independent Panel for Pandemic Preparedness and Response is urging all countries to ensure implementation of critical public health measures known to decrease virus transmission in order to curb the spread of COVID-19. It has also expressed grave concern at the prospect of inequitable vaccine rollout around the world.
In the Independent Panel's report to the WHO Executive Board, its Co-Chairs express deep concern over the continued significant rises in the numbers of COVID-19 cases and deaths. Since January 1, the world is recording an average of almost 12,500 daily deaths and 682,000 recorded cases.
"These cases and deaths are causing untold grief to families and avoidable stresses on health workers and systems," says Co-Chair Helen Clark. "Basic measures like testing, contact tracing, isolation, physical distancing, and wearing masks all have a role to play. We

urge all governments to step up to protect the lives of their citizens and to support and promote the public health measures proven to work."
The Co-Chairs note that basic public health measures are even more pressing as new and reportedly more infectious variants of SARS-CoV2 are detected.
On the issue of vaccines, Co-Chair Ellen Johnson Sirleaf says that the Panel is grateful to scientists for developing vaccines in record time. "We regret, however, that the vaccine roll-out is currently favouring wealthy countries. A world where high income countries receive universal coverage while low-income countries are expected to accept only twenty per cent in the foreseeable future is on the wrong footing – both for justice and for pandemic control. This failure must be remedied."

Progress Report Describes Failures in the Global Alert and Response Systems
The Independent Panel's Second Report on Progress to the WHO Executive Board – an interim report before a major report scheduled for the World Health Assembly in May – updates the Board on initial findings and the Panel's concerns.
A major concern is that the international system for alert and response is not fit for purpose. It seems to come from an earlier analogue era and needs to be brought into the digital age, the Panel's report says. Modern information systems are picking up signals of new disease before countries are formally reporting. These are outpacing the procedures and protocols of the International Health Regulations including the declaration of a public health emergency of international concern.
The Report considers whether the international system acted fast enough to detect and alert the world to this novel infectious pathogen with pandemic potential. "When there is a potential health threat, countries and the World Health Organization must further use the 21st century digital tools at their disposal to keep pace with news that spreads instantly on social media and infectious pathogens that spread rapidly through travel," says Co-Chair Clark.
"Detection and alert may have been speedy by the standards of earlier novel pathogens, but viruses move in minutes and hours, rather than in days and weeks." There is a need for a new international framework.
The Co-Chairs appreciate that at the time, many people worked hard to identify the health threat, and took measures to address it. Identifying the timing gaps is a lesson for future response preparedness, not a critique of those who did their best.
The Panel is also concerned that even when WHO declared a Public Health Emergency of International Concern on 30 January – the loudest alarm possible under the International Health Regulations – many countries took minimal action to prevent the spread internally and internationally. The Panel is examining this further including by analysing the chronology of actions of countries and by WHO, in relation to the spread of the virus and the emergence of new evidence.
In its Progress Report, the Panel also describes additional early shortcomings at each step of the global and national response to COVID-19 which have contributed to the pandemic. These include a failure to measure preparedness in a way that predicted actual performance, and a failure of countries to prepare, despite years of warnings of the inevitability of a health threat with pandemic potential.

Crippling, Deepening Inequalities
The Panel finds that the pandemic response has deepened inequalities, both within and between countries. Low-income countries are bearing long lasting economic burdens of the pandemic. The inequitable access to vaccines is amongst the most glaring examples of inequality exacerbated by the pandemic.
The Panel will further examine and recommend ways in which pandemic preparedness and response systems can be improved so that countries have equitable access to protective equipment, supplies such as oxygen and ventilators, and diagnostics, therapies, and vaccines.

High Expectations of WHO Need to Be Backed by Support for It
The Panel is also concerned that Member States have high expectations of the World Health Organization but have left it underpowered to do that job.
"The WHO is expected to validate reports of disease outbreaks for their pandemic potential and, deploy support and containment resources, but its powers and funding to carry out its functions are limited," says Co-Chair Sirleaf. "This is a question of resources, tools, access, and authority."
To this end the Panel is concerned that the incentives for Member States to cooperate with WHO are too weak to ensure their effective engagement with the international system in an effective, transparent, accountable, and timely manner.

A New Global Framework, Real Investment Needed

In the lead up to its report to the World Health Assembly in May, the Independent Panel will continue to gather information and analyse what happened during the early weeks and months of the spread of SARS-CoV2, as well as examining the wider social and economic impacts, and the implications for the international system.

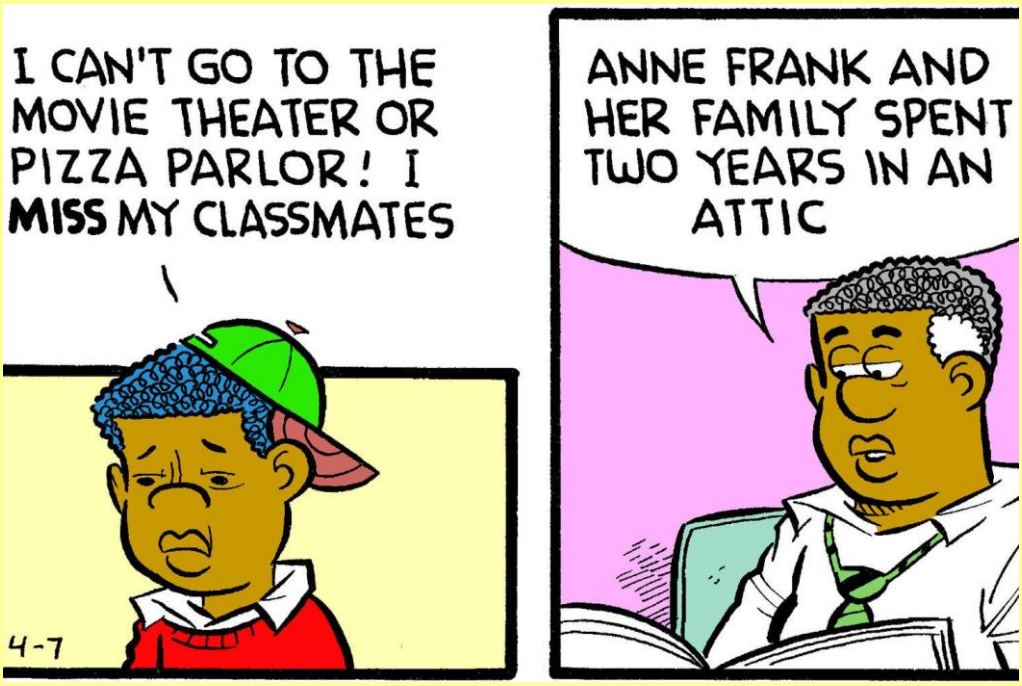
The Panel's report underscores that lessons from this pandemic are both painful and grave and must be a catalyst for "fundamental and systemic change in preparedness for future such events, from the local community right through to the highest National and global levels. There needs to be a fundamental shift so that pandemic preparedness is recognized as an obligatory investment not as a voluntary cost."

"The consequences of this pandemic remind us of how important effective multilateralism is," says Co-Chair Sirleaf.

"Geopolitical tensions have impacted on the response, and the resulting pandemic has given us many interlinked reasons to rethink and reset the way in which the international system and countries prepare and respond to global health threats. With 7.6 billion lives interrupted, a regression on previous gains towards the Sustainable Development Goals; the loss of trust in governments and institutions; and a loss of some six trillion dollars in GDP, there is every reason to change."

"We are at a global crossroads," the Co-Chairs said. "The Independent Panel aims to make recommendations to support the world to be more prepared, more secure, and more resilient to future pandemic threats."

The Independent Panel's Second Report on Progress is available in six languages at www.TheIndependentPanel.org/documents.



HOTZONE
SOLUTIONS
GROUP

HAPPY
new year
2021

A
holistic approach
in
CBRNe operations

Consultation
Products
Training

www.hotzonesolutions.org