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EDITORS CORNER



Editorial Brig Gen (ret'd) Ioannis Galatas, MD, MA, MC

Editor-in-Chief C²BRNE Diary



Dear Colleagues,

September was the month of the drones!

All of a sudden (not really) the whole world is talking about what drones can actually do. Many articles devoted on the dangers drones can hide and how they can be used in malicious ways both in peace and at war. Countless sales around the globe on daily basis; weak legislations and not effective response plans along with soft fines disclose the problem we are currently facing. And we have not seen



much for the time beings. Apart from the Aramco incident - mosty caused by accompanying cruise missiles aand some delays at the Dubai International Airport nothing much or bloody. But in the future, this new asymmetric weapon will exhibit its deadly potential unless drones are under strickt regulations and used only by those who have a good reason to do that. Otherwise, many bad things might happen including one or two (or more) CBRN incidents with or without IEDs. Now that ISIS lost its war and the caliphate dream, it would be a good opportunity to retaliate by using this technology. They have the combat experience and know-how, they can buy drones from local markets, they still have the money to buy something reliable and they

have some many soft (and hard) targets to choose from. In that respect, our September's message is this: "Control the drone market before it is too late!!!"

Take good care First Responders and among other things please keep an eye on the skies over you – if it small and makes a Bzzzzz noice, be Alert! Joystick terrorism is not a theory anymore and you should be adequately prepared!

The Editor-in-Chief



A "Pracademic" Approach to Homeland Security

By Terry Hastings and Eric Stern

Source: https://www.domesticpreparedness.com/preparedness/a-pracademic-approach-to-homeland-security/

Aug 21 – It is important for academics and practitioners to collaborate and learn from each other. Academic research can help to address real-world challenges, and practitioners are uniquely positioned to provide meaningful insight to help shape research agendas.

Academics and practitioners often view the world very differently, especially in first responder-oriented disciplines such as homeland security (narrowly defined) and emergency management. Academics conduct research, examine practices from an evidence-based perspective, and formulate theories, whereas practitioners focus on the immediate real-world operational realties and intense pressures they face each day. Academics are often criticized for being too <u>high-minded</u>, abstract, and detached from reality. As such, practitioners sometimes fail to appreciate the value of research and are often <u>unwilling</u> to learn and adapt for a multitude of reasons. These stereotypes contain some truth. However, as the discipline of homeland security has <u>matured</u>, academics and practitioners are increasingly recognizing the importance of learning from each other and <u>collaborating</u> in the production of usable, actionable knowledge. This "<u>pracademic</u>" approach to homeland security can produce relevant and useful insights for all parties involved.

Overcoming Obstacles

The proliferation of <u>homeland security and emergency management degree programs</u> has been coupled by a growth in basic and applied academic research as well. Researchers from colleges and universities are examining a myriad of homeland security issues (broadly defined), to include the study of <u>terrorism</u>, the use of <u>unmanned aircraft systems</u>, and <u>disaster resilience</u>, just to name a few areas of academic interest. Additionally, there are now several homeland security-related academic <u>journals</u> to complement the previously existing disaster science and emergency/crisis management journals for researchers to publish their work.

Unfortunately, practitioners often do not have easy access to or the time to read and digest the various academic-oriented research products. Even when they do, academics generally write their articles for other academics, not practitioners. Dense journal articles with numerous citations and academic theories rarely resonate with practitioners. Additionally, first responders and other homeland security officials must contend with an ever-evolving list of threats and hazards, to include extreme weather, terrorism, public health emergencies, and many other concerns. The sheer volume and pace of work – especially for state and local agencies – can be overwhelming. Many agencies are focused on addressing the issue of the day or immediate challenges with little ability to dedicate any effort to more strategic-level issues. Furthermore, the "peer review publish or perish" pressures faced by tenure track academics (already juggling academic research projects, teaching, and university service/administration demands) often create strong disincentives to collaborate with practitioners – especially for vulnerable junior scholars. Despite the obstacles, the urgent nature of the threats and hazards communities face makes it clear that academics and practitioners must make time to collaborate and look for opportunities to work together. Congress, the U.S. Department of Homeland Security, and many other federal agencies have encouraged

the formation of multi-university <u>Centers of Excellence</u>, funded research, and encouraged the formation of mixed scholar-practitioner communities focusing on natural <u>hazards</u> and emergency management <u>education</u>. This approach is already yielding important results. For example, the collaboration between University of Delaware Professor Joseph Trainor and first responder practitioner Tony Subbio on Critical Issues of Disaster Science and Management paired researchers and practitioners to explore key <u>issues</u> of mutual and public interest. <u>Impact360</u> is another new and promising effort that seeks to connect research and practitioners.



Collaborating Through the Chaos

State and local homeland security and emergency management agencies should also be exploring new ways to collaborate with their academic counterparts. One such example of an effective academic and practical collaboration at the state level relates to the creation of a <u>"Managing Chaos" workshop</u> for senior officials. With funding support from the Federal Emergency Management Agency's (FEMA) Complex Coordinated Terrorist Attack program, the New York State Division of Homeland Security and Emergency Services (<u>DHSES</u>) worked with both academics and practitioners to develop a half-day workshop for senior officials, to include <u>political leaders</u> and first responder agency executives. The workshop involves facilitated discussions around the concepts of crisis leadership, crisis decision-making, and crisis communication.



The Managing Chaos Workshop in Albany, NY (Source: Courtesy of DHSES Twitter, January 2019).

In developing the workshop, DHSES collaborated with several academic institutions, including the <u>College</u> of <u>Emergency Preparedness</u>, <u>Homeland Security</u>, and <u>Cybersecurity</u> at the State University of New York at Albany, and the <u>Center for Homeland Defense and Security</u> at the U.S. Naval Postgraduate School. These entities were able to provide DHSES with the latest academic thinking related to crisis management. In addition, DHSES relied heavily on the concepts outlined in <u>The Politics of Crisis</u> <u>Management</u>, <u>Meta-Leadership</u>, and other contemporary academic works. Practical perspectives were incorporated as well, to include the insights and lessons learned from jurisdictions that dealt with complex insights, to include Orlando, Las Vegas, San Bernardino, Aurora, and others. DHSES also collaborated extensively with <u>Daniel Linskey</u>, the former superintendent-in-chief of the Boston Police Department and incident commander during the Boston Marathon Bombing. Linskey's real-world experiences further amplified the academic research. The result of this academic/practitioner collaboration is a unique workshop that provides senior officials with a broad, yet useful, perspective on how to better manage crisis situations based on proven techniques and strategies.

To date, DHSES has delivered the workshop to more than 200 senior officials from across New York with very positive feedback. The research and real-world insights resonate with the participants, plus the workshop concludes with a scenario-based exercise using mock news clips that help to reinforce the learning objectives. This type of hands-on pedagogy is particularly relevant for <u>adult learners</u>, as they tend to learn better by doing and appreciate the



opportunity to apply the concepts, not just listen to them.

Most state and local homeland security and emergency management agencies are not overrun with extra staff and time, so partnering with academic institutions can serve as a force multiplier. In addition to helping with research, colleges and universities can also provide interns, faculty-supervised student "consulting" teams (capstone projects), and other types of support. Managed effectively and in a spirit of mutual collaboration and respect, the academic/practitioner partnership can yield impressive results and produce useful products and insights. Yet, like any relationship, it takes time, commitment, and communication to succeed. Therefore, academics and practitioners must be willing to invest the necessary level of effort.

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North Korea: 5 Ways the U.S. Marines Would Crush Kim in a War

Aug 21 By Kyle Mizokami Source: <u>https://nationalinterest.org/blog/buzz/north-korea-5-ways-us-marines-would-crush-kim-war-75181</u>

Kyle Mizokami is a defense and national security writer based in San Francisco who has appeared in the Diplomat, Foreign Policy, War is Boring and the Daily Beast. In 2009 he cofounded the defense and security blog Japan Security Watch.

EDITOR'S COMMENT: Realy?

Dayton, Ohio, First Responders Getting Help After Shootings

Source: https://www.govtech.com/em/safety/Dayton-Ohio-First-Responders-Getting-Help-After-Shootings.html



Authorities remove bloody rags and debris at the scene of a mass shooting, Sunday, Aug. 4, 2019, in Dayton, Ohio. Multiple people in Ohio have been killed in the second mass shooting in the U.S. in less than 24 hours, and the suspected shooter is also deceased, police said. AP/John Minchillo

Aug 20 — It took Dayton police just 32 seconds to stop the mass shooter who opened fire in the Oregon District. Sixteen days later, mental health experts continue to give the officers and

other city workers who rushed to the scene the help they need now. Kathy Platoni, a Centerville clinical psychologist, began treating Dayton first responders at 4:30 a.m. Aug. 4, less than four hours after the shooting. She said she is still seeing first responders every hour on the hour daily, whether they fired their weapon or not that night.



"As a group they are doing well," Platoni said. "But this has taken a tremendous toll. This is difficult to deal with even for the most seasoned police officer."

Dayton City Manager Shelley Dickstein said she has checked in with the police officers who engaged Connor Betts, 24, to encourage them to be mindful of their mental health and to use available resources. She said she's talked with officers to find out if they are talking to each other and to ensure they have an adequate support network.

"The first thing I did was check in with officers on administrative leave to make sure they know how much we appreciate them and making sure they have support," she said.

Dickstein said the city is talking to other staff who responded to the crime scene, including officers and medics who administered CPR, applied tourniquets and provided support.

Help available right away

Platoni got a call about the shooting at 2:45 a.m. the day of the shooting that killed nine people, plus the shooter, and left 17 with gunshot injuries. Platoni — who survived the Fort Hood, Texas mass shooting in 2009 — was in Columbus on active duty with the Ohio Military Reserve at the time, but was released to come help first responders in Dayton.

She got into town around 4 a.m. and was talking with first responders by 4:30 a.m. She wasn't the only mental health help, though.

Steve Click, first responder liaison for the Ohio Department of Mental Health and Addiction Services, said the state helped get first responders in contact with mental health resources by 6 a.m.

"The Montgomery County Addiction and Mental Health Board had mental health clinicians available right away. First responders had to opportunity to talk with someone, to process, before they even went home," Click said. "Most of the time first responders have to wait a day or two to get those services."

Click also said the way the Dayton community rallied around first responders and thanked them for their actions has helped in the coping process.

"A lot of first responders wonder if they are the only one feeling certain things or if they did the right thing," Click said. "It is important to let them know what they're feeling is a normal reaction to an abnormal circumstance. This is normal for them right now."

Anyone "even remotely involved" after the shooting went through a "defusing" session, Platoni said. The defusing process aims to help people to be able to walk through the crisis and explore what happened. Participants are also given information on how to cope with stress and where to seek help.

Platoni said it is too early to be certain, but it is a possibility that some first responders may develop PTSD because of this incident. Many first responders are experiencing lingering effects on their sleep and feelings that something like this could happen again.

"These sessions aren't meant to prevent PTSD, but to allow first responders to go back to work with a healthier mindset," Platoni said.

Survivors' guilt felt

Staff across the city are experiencing trauma because the shooting is another significant crisis that has shaken the organization, Dickstein said. Planning safety and security measures for a Ku Klux Klan rally in May took extensive time for city workers, and days later, a series of tornadoes hit the area, including the northern section of Dayton.

"This one is particularly horrific because you never want to be a community that has a mass shooting, and you don't have to be at the event to be traumatized," Dickstein said.

There is a great deal of survivors' guilt in the community and across city government among people who were there that night but were not harmed or who thought about going out but did not for whatever reason, Dickstein said.

Many people witnessed the crime scene in the aftermath of the shooting and "cannot unsee" the terrible things they saw, and it's important to make sure they have someone they are talking to to help process their feelings and emotions, Dickstein said.

Dickstein said city staff are physically tired from responding to emergencies and working long hours, and she's giving workers permission to take time off to recharge.



"It's about giving people the permission, because a lot of times we are very passionate and committed to this work and are so wrapped up in the job that we don't take care of ourselves," she said. "As a leader in this organization, it's really important for me to give people permission."

Dickstein said she sent out a video clip to all city staff that emphasized importance of mental health and self-care and the city resources to help staff in these areas.

"You can't care for others if you can't care for yourself," she said.

EDITOR'S COMMENT: Stress desensitization. Something always forgotten in emergency SOPs.

Small Towns Face Congestion Risk During Evacuations

Source: https://www.routefifty.com/infrastructure/2019/08/small-towns-face-congestion-risk-during-evacuations/159378/

Aug 22 – Hurricanes, floods and wildfires have all tested state or local governments' ability to coordinate emergency evacuations in recent years.



Evacuation routes that don't get people out of harm's way quickly or poorly executed plans can have deadly consequences, and now new research is highlighting communities across the country where evacuation routes are most constrained.

StreetLight Data, a San Francisco-based transportation analytics company, analyzed traffic data from 30,000 small towns to flag communities <u>most at risk</u> for overcrowded roads or severely restricted evacuation options in the event of a natural disaster.

Florida and California have the most communities with limited evacuation routes.

The top five towns deemed most at risk are all island communities—Camano, Washington; Hilton Head Island, South Carolina; Mercer Island, Washington; Hutchinson Island South, Florida and Sanibel, Florida. But the analysis also found landlocked communities, like Carpendale, West Virginia, and Pahrump, Nevada, could have similarly constrained evacuation routes in the case of an emergency.

Laura Schewel, CEO of StreetLight Data, said the company focused its analysis on towns of under 40,000 people with the understanding that they might have fewer planning resources than big cities or metropolitan areas.



"Our goal is to find a way that someone who has regional responsibility can compare different communities and say 'Hey, maybe this one is most at risk' and put extra resources there," she said.

To evaluate which communities were most at risk, StreetLight used location data collected anonymously from cell phone applications and connected car navigation systems to understand where and when people travel. Based on that information, the company extrapolated which routes into local communities are most frequently used by travelers and which are most susceptible to overcrowding and congestion in the case of an emergency.

Analysts looked at the number of routes in and out of a town, use of the primary route on an average day, and the town's population.

In the case of an island community, it's understandable that one bridge might be the only option to carry traffic in and out of a town during an evacuation.

But even in landlocked communities with more exit route options, residents' travel habits could pose a risk during an evacuation, Schewel said.

"In non-island situations, you might have a town that has three ways out but if 85 percent of trips all use one way, that's a risk," she said. "If there is a fire, for example, and people are reacting and doing what they normally do, you have a big bottlenecking risk on that route."

There could be a good reason for not using other routes, perhaps the roads are gravel or long and winding, Schewel said.

Knowing ahead of time which routes pose congestion risks can give emergency planners a better understanding of how long it takes to evacuate an area or which routes they could direct residents toward to ease congestion, she said.

"People's habits add risk to the mix," she said.

The states found to have the most at-risk communities are Florida with 20, California with 14, Arizona with eight, Texas with six, and Washington with six.

State, local and federal government have all raised concerns over the adequacy of evacuation resources in recent years. The Paradise, California wildfires <u>highlighted inadequacies</u> in local alert systems. Gridlock experienced by California residents during past wildfire evacuations has spurred<u>some to review</u> road capacities. In Texas, lawmakers are worried about the propensity of hurricane evacuation routes to flood and<u>cut off</u> residents' escape routes. In Corpus Christi, lawmakers have considered<u>adding</u> a third evacuation route to island communities to address congestion concerns.

Federal lawmakers in both the House and the Senate have introduced legislation this year to improve emergency evacuation routes. A <u>Senate bill</u> would create a \$100 million grant program that would fund connector road projects that create new access to thoroughfares or improve or expand existing roads and bridges.

A <u>House bill</u> would similarly fund a grant program for improvement projects, but would allocate \$1 billion toward the effort.

Climate Change Could Pose Danger for Muslim Pilgrimage

Source: http://www.homelandsecuritynewswire.com/dr20190823-study-climate-change-could-pose-danger-for-muslim-pilgrimage

Aug 23 – For the world's estimated 1.8 billion Muslims — roughly one-quarter of the world population — making a pilgrimage to Mecca is considered a religious duty that must be performed at least once in a lifetime, if health and finances permit. The ritual, known as the Hajj, includes about five days of activities, of which 20 to 30 hours involve being outside in the open air. , because of climate change there is an increasing risk that in coming years, conditions of heat and humidity in the areas of Saudi Arabia where the Hajj takes place could worsen, to the point that people face "extreme danger" from harmful health effects.

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least once in a lifetime, if health and finances permit. The ritual, known as the Hajj, includes about five days of activities, of which 20 to 30 hours involve being outside in the open air.

According to a new study by researchers at MIT and in California, because of climate change there is an increasing risk that in coming years, conditions of heat and humidity in the areas of Saudi Arabia where the Hajj takes place could worsen, to the point that people face "extreme danger" from harmful health effects.



In a paper in the journal *Geophysical Review Letters*, MIT professor of civil and environmental engineering Elfatih Eltahir and two others report the new findings, which show risks to Hajj participants could already be serious this year and next year, as well as when the Hajj, whose timing varies, again takes place in the hottest summer months, which will be from 2047 to 2052 and from 2079 to 2086. This will happen even if substantial measures are taken to limit the impact of climate change, the study finds, and without those measures, the dangers would be even greater. Planning for countermeasures or restrictions on participation in the pilgrimage may thus be needed.

The timing of the Hajj varies from one year to the next, Eltahir explains, because it is based on the lunar calendar rather than the solar calendar. Each year the Hajj occurs about 11 days earlier, so there are only certain spans of years when it takes place during the hottest summer months. Those are the times that could become dangerous for participants, says Eltahir, who is the Breene M. Kerr Professor at MIT. "When it comes in the summer in Saudi Arabia, conditions become harsh, and a significant fraction of these activities are outdoors," he says.

There have already been signs of this risk becoming real. Although the details of the events are scant, there have been deadly stampedes during the Hajj in recent decades: one in 1990 that killed 1,462 people, and one in 2015 that left 769 dead and 934 injured. Eltahir says that both of these years coincided with peaks in the combined temperature and humidity in the region, as measured by the "wet bulb temperature," and the stress of elevated temperatures may have contributed to the deadly events.

"If you have crowding in a location," Eltahir says, "the harsher the weather conditions are, the more likely it is that crowding would lead to incidents" such as those.

Wet bulb temperature (abbreviated as TW), which is measured by attaching a wet cloth to the bulb of a thermometer, is a direct indicator of how effectively perspiration can cool off the body. The higher the humidity, the lower the absolute temperature that can trigger health problems. At anything above a wet bulb temperature of 103 degrees Fahrenheit, the body can no longer cool itself, and such

temperatures are classified as a "danger" by the U.S. National Weather Service. A TW above 124 F is classified as "extreme danger," at which heat stroke, which can damage the brain, heart, kidneys, and muscles, is "highly likely" after prolonged exposure.



Climate simulations considered by Eltahir and his co-investigators, using both "business as usual" scenarios and scenarios that include significant countermeasures against climate change, show that the likelihood of exceeding these thresholds for extended periods will increase steadily over the course of this century with the countermeasures, and very severely so without them.

Because evaporation is so crucial to maintaining a safe body temperature, the level of humidity in the air is key. Even an actual temperature of just 90 F, if the humidity rises to 95 percent, is enough to reach the 124-degree TW threshold for "extreme danger." At a lower humidity of 45 percent, the 124 degree TW threshold would not be reached until the actual temperature climbed to 104 F. (At very low humidity, the wet bulb temperature equals the actual temperature).

Climate change will significantly increase the number of days each summer where wet bulb temperatures in the region will exceed the "extreme danger" limit. Even with mitigation measures in place, Eltahir says, "it will still be severe. There will still be problems, but not as bad" as would occur without those measures. The Hajj is "a very strong part of the culture" in Muslim communities, Eltahir says, so preparing for these potentially unsafe conditions will be important for officials in Saudi Arabia. A variety of protective measures have been in place in recent years, including nozzles that provide a mist of water in some of the outdoor locations to provide some cooling for participants, and widening some of the locations to reduce overcrowding. In the most potentially risky years ahead, Eltahir says, it may become necessary to severely limit the number of participants allowed to take part in the ritual. This new research "should help in informing policy choices, including climate change mitigation policies as well as adaptation plans," he says.

The research team included Suchul Kang, an MIT postdoc, and Jeremy Pal, a professor of civil engineering and environmental science at Loyola Marymount University in Los Angeles. The work was supported by a seed grant from the MIT Environmental Solutions Initiative.

A How-To Guide for Identifying Terrorists by Their Behavior

Source: http://www.homelandsecuritynewswire.com/dr20190823-a-howto-guide-for-identifying-terrorists-by-their-behavior

Aug 23 – The Las Vegas Joint Terrorism Task Force arrested a 23-year-old man Aug. 8 who was allegedly plotting to attack Jewish houses of worship and bars frequented by the LGBTQ community in the city. In 2017, he began to frequent websites peddling a narrative that people who shared his extremist views were under attack. And as he began to relate to that narrative, he started frequenting online forums and social media groups that peddled even more radical messages that contained urgent and overt calls for

violence. This firearms, as well as targets and attack his allies were eventually mobilized him to gather bombmaking materials and establish contact with like-minded individuals to discuss potential tactics. But little did he know that the co-conspirators he thought were actually undercover FBI agents who had been monitoring his online activity.

Stratfor Worldview writes in the <u>National Interest</u> that in many ways, the Las Vegas man's actions and path to radicalization were quite similar to those of the jihadist security guard in Orlando who shot up the Pulse

nightclub in 2016. This suspect, however, was radicalized not by the Islamic State but by U.S.-based white supremacist groups like Atomwaffen Division. This highlights that terrorism is not owned by a particular organization or ideology. Rather, it's a tactic deployed by anyone looking to use violence for some political or religious aim. And having not only government officials but everyday people understand that is key to

catching additional would-be attackers before it's too late.





Perspectives on terrorism

A journal of the Terrorism Research Initiative (TRI) & the Institute of Security and Global Affairs (ISGA)

Counterterrorism Bookshelf: 60 Books on Terrorism & Counter-Terrorism-Related Subjects Selected by Joshua Sinai <u>Bibliography: Terrorism by Country – Pakistan</u> Compiled and selected by Judith Tinnes <u>Bibliography: Conflict in Syria (Part 4)</u> Compiled and selected by Judith Tinnes <u>Recent Online Resources for the Analysis of Terrorism</u> Compiled and selected by Berto Jongman

From Latin America to West Africa, Hezbollah's complex web of connections is fueling its terrorist activity

Source: https://www.thenational.ae/opinion/comment/from-latin-america-to-west-africa-hezbollah-s-complex-web-of-connections-is-fuelling-its-terrorist-activity-1.904231

Aug 29 – When Paraguay announced it was designating Hezbollah as an international terrorist organization last week, it created a new legal basis to take action against the Lebanese group's money laundering and terror-financing activities. These fundraising operations span the globe, from Latin America and the US to West Africa. Hezbollah exploits existing smuggling routes, links to cartels and relies on family networks to boost its coffers, without having to develop a criminal infrastructure.

With Hezbollah's proscription, Asuncion can help reduce the group's influence. The fight against Hezbollah needs to be global and Latin America, where much of the group's illicit activities are concentrated, is a good place to start.

Until recently, Latin American governments were unwilling to label Hezbollah a terrorist group. Last month, however, Argentina took the unprecedented step of doing so, noting Hezbollah's responsibility for terror attacks against an Israeli embassy and a Jewish community centre on Argentinian soil in 1992 and 1994. The designations followed Argentina's creation of a public registry for terror entities and individuals.

Argentina's actions clearly influenced Paraguay, its neighbor to the north, whose government previously refused to acknowledge the obvious. In January, Paraguay's then foreign minister Luis Castiglioni publicly denied that Hezbollah had engaged in illicit finance activities in the country. Interior minister Juan Ernesto Villamayor also downplayed the issue. Even then Supreme Court president Victor Manuel Nunez Rodriguez said he had no evidence Hezbollah was financing terrorism. The Trump administration urged Paraguay to reconsider. Multiple visits by senior officials – including Secretary of State Mike Pompeo to Paraguay in April and Argentina in July – ultimately persuaded Paraguay that it needed to get tougher on Hezbollah.

Even before the designation, Paraguay extradited a handful of suspected Hezbollah operatives to the US. However, the creation of a new legal instrument was necessary, given that Paraguay has for years been a key hub of the group's illicit finance operations. For four decades, the terrorist group built extensive infrastructure in the Tri-Border Area of Argentina, Brazil and Paraguay.





The TBA is a metropolitan center, home to nearly one million residents and a well-developed tourism infrastructure, including three international airports. It is an ideal place for Hezbollah to establish roots and raise funds, given the pervasive corruption in Paraguay's government, not to mention its weak judicial system. The TBA is shared by three countries, with two languages, three currencies, weak border controls and well-established smuggling routes that have contributed to an illicit economy, which Brazilian authorities estimate is worth \$18 billion a year. Hezbollah has taken its share of that economy through a network of local residents; the TBA has one of the largest Shiite Lebanese communities in Latin America. Hezbollah's modus operandi in the TBA is a miniature version of what it does in Lebanon to co-opt Shiites. As in Lebanon, Hezbollah has funded Shiite communal institutions across Latin America. Where those institutions already existed, it has offered support. As a result, clerics in local mosques, instructors of youth movements such as the scouts, and teachers are imparting Hezbollah dogma to local communities. Communities in Latin America regularly mark May 25, the day Israel withdrew from south Lebanon, with carefully choreographed communal events. They frequently welcome Hezbollah and Iranian clerics as speakers and support the group's media with local correspondents and get support, in turn, from Hezbollah's publications. For example, via the Lebanese embassy in Paraguay, Hezbollah mounted a campaign to prevent the extradition to the US of suspected Hezbollah financier Nader Mohamad Farhat. Shiite communities in the TBA also join in mourning Hezbollah's fallen.

Last week, for example, Lebanese residents of the TBA took to social media to mourn the death of two Hezbollah operatives, Yasser Ahmad Daher and Hassan Zbeeb, killed in southern Syria in the recent Israeli airstrikes. Israel claimed the two had travelled to Iran to train with drones before being dispatched to southern Syria and had been planning to mount an attack across the border.

Hezbollah can also leverage its followers to raise funds. Given Hezbollah's growing need to generate revenue over the annual group's subsidy from Iran, its financial backers and facilitators overseas escalated their involvement in illicit activities. In Latin America, this includes drug trafficking and money laundering. For cartels, Hezbollah offers an opportunity to expand their markets without having to build a faraway criminal infrastructure. After all, Hezbollah can leverage supporters across the globe. Access to this network offers cartels efficient channels to distribute merchandise to distant markets as well as repatriate revenue through complex trade-based money-laundering schemes.

In the Lebanese-Canadian Bank case of 2011, US authorities accused Hezbollah facilitators of laundering drug money for Mexican and Colombian cartels to the tune of \$200 million a month by channeling it through West African used-car businesses that imported their inventory from US dealers.

The money, once laundered, would be repatriated to Colombia, minus a hefty commission. The complex web of connections necessary to run these schemes is rooted in family networks that run through Hezbollah-linked expatriate communities. For example, the Barakat family, the most identified with Hezbollah in the TBA, has multiple members and



businesses, not only across Latin America but in West Africa too, an important area for Hezbollah's money laundering and drug-trafficking operations.

The US is not immune to such influence. Many of Hezbollah's schemes run through Miami and other American commercial hubs, as evidenced by a string of recent cases involving TBA businesses trading with front companies in both Miami and New York. Such schemes often triangulate with Hong Kong and China, where Hezbollah operatives have an established commercial presence, thus ensuring they control virtually every step of the trade.

The size and complexity of these operations has ensured that Hezbollah's terror-financing continues to thrive, despite criminal investigations into drug trafficking and money-laundering schemes.

If Hezbollah's sources of funding outside Tehran are to dry up, the Trump administration and its allies, especially in Europe and the Gulf, need to aggressively expand investigations to halt Hezbollah's fundraising.

So far, the signs are not encouraging. The Trump administration has certainly used its political influence to get other countries to impose sanctions against Hezbollah, including in Latin America. Yet much more needs to be done. Hezbollah's fundraising apparatus continues to thrive, thanks to the strong loyalty and family bonds that tie local communities to the terror group. Prosecuting illicit finance schemes and disrupting their chain of supply is a vital component of any successful strategy. Ultimately unless the social, educational, religious and cultural infrastructure of these communities is severed from Hezbollah's control, the group's nefarious influence and its ability to indoctrinate and recruit will ensure continuity of commitment to its fundraising efforts.

Emanuele Ottolenghi is a senior fellow at the Foundation for Defense of Democracies.

Why Saddam Hussein buried Iraq's air force in the desert

Source: https://www.wearethemighty.com/history/iraq-buried-air-force-desert



Aug 29 – After the United States invaded Iraq in 2003 looking for nuclear, biological, or chemical weapons, American troops found a lot of bizarre things – toilets and guns made of gold, a Koran written in blood, and Saddam's romance novel. While they didn't find any weapons of mass destruction, they did manage to find some weapons. Specifically, they found aircraft buried in the sand next to a perfectly good airfield. One day in 2003, American forces near al-Taqqadum Air Base in Iraq began pulling scores of Mig-25 Foxbat fighters and SU-25 Frog Foot fighter-bombers out of the sand. The aircraft were missing wings but, for the most part, remained fairly well-kept despite being in the sand for who-knows-how-long. If Saddam wasn't giving inoperable planes a good burial, one wonders why he would intentionally put his planes in the ground.

The answer starts with the fact that the Iraqi Air Force sucked at defending Iraqi airspace.





In the Iran-Iraq War that lasted until the late 1980s, the Iraqi Air Force could reasonably hold its own against the superior U.S.- bought aircraft flown by the Islamic Republic of Iran at the time. But Iranian



fighter pilots were very, very good and Iraqi pilots usually had to flee the skies before the onslaught of Iranian F-14 Tomcats. Against other Middle Eastern powers, however, Saddam Hussein's air power could actually make a difference in the fighting – but that's just against Middle Eastern countries. The United States was another matter.



Iraqi pilots were ready to go defend their homeland from the U.S.-led invasion, but the Iraqi dictator would have none of it. He knew what American technology could do to his aircraft, especially now that the U.S. was flying the F-22. They would get torn to shreds. He also



remembered what his pilots did in the first Gulf War when sent to defend the homeland. They flew their fighters to the relative safety of Iran rather than face annihilation, and Iran never gave them back. Saddam wanted his air force. So he decided to keep them all safe.

At al-Taqqadum and al-Asad air bases, the dictator ordered that his most advanced fighters be stripped and buried in the sand near the airfields. In retrospect, this was probably a good decision for the aircraft. Whatever was left unburied was quickly and forcibly dismantled by the U.S. Air Force on the ground during the invasion. In trying to fight off the Coalition of the Willing, Iraq's air forces all but disappeared.

Saddam hoped that by saving the aircraft in the sand, he could prevent their destruction and when he was ready (because he assumed, he would still be in power after all was said and done), he could unbury them and use their advanced status to terrify his enemies and neighbors.

That, of course, didn't happen.

'The new norm': High school designed to protect students if there's a mass shooting

Source: https://www.cbc.ca/radio/asithappens/as-it-happens-tuesday-edition-1.5261253/the-new-norm-high-school-designed-to-protect-students-in-potential-mass-shooting-1.5260035



The Fruitport High School design includes bulletproof barriers for students to hide behind. (TowerPinkster)

Aug 28 – Amid reports indicating shootings are becoming more common at U.S. high schools, Bob Szymoniak says it's time to start designing school infrastructure to maximize the safety of students and staff.

Szymoniak is a school superintendent in west Michigan, where a \$48-million US construction project is underway at Fruitport High School. The building is specially designed to make it harder for a potential shooter to get at their targets — and it's a type of school design that architects in other areas of the U.S. are starting to experiment with.

According to the Washington Post, more than 228,000 students have been exposed to gun violence since the Columbine High School shooting in Colorado in 1999.

Classes will begin at Fruitport High School on Sept. 3, but the construction is not expected to be finished until 2021.

Szymoniak spoke with *As It Happens* guest host Helen Mann about the school's new design. Here is part of their conversation.







Can you walk me through some of the security features that the new Fruitport High School will have?

We curved the hallways, and the reason we did that was to reduce the sight lines if, God forbid, we had an active shooter in the hallway.

We also built "wall wings," we're calling them. These are cement block walls that are perpendicular to the hallway walls that jut out into the hallway about four feet to further reduce the sight lines of an active shooter. And they also provide refuge for students who would be in the hallway.

And these walls are built adjacent to the classroom doors. So if need be, a student behind the wall could get help immediately from within the classroom.

Once the students are in the classroom, there is what we call a "shadow zone" where we have built another wall wing into the classroom that cuts down dramatically the sight line into the classroom.

So if I'm an active shooter and I'm in the hallway, and the students are in that shadow zone and I look into the classroom, I can't tell anybody's there.



Classrooms at Fruitport High School will be designed with a 'shadow zone' where students can hide without a shooter being able to see them from the hallways. (TowerPinkster) What about in terms of locking kids into certain areas?

All of our doors district wide will have access control where we can lock all of the doors with the push of a button from a cellphone.

How did your school district come to the decision to work these features into the new school design?



It was a combination of factors. The architect that we employed has experience in building security design elements into a project like ours.



And so given the nature of our country these days, the number of school shootings that we have, and they just don't seem to stop, it seemed responsible and appropriate for us to factor in as many security elements into the design of the building as we could.



What kinds of conversations are you having with parents about the new design?

We had a team of folks involved in the design and the decisions were made within that team. Since those decisions were made, these security elements have been shared with our parents, and the feedback that I've been getting has been very positive.

Have there been any parents who have resisted or had complaints about this? Not one.

You also need to understand that these design elements don't look like security design elements. If you didn't know you were looking at a security design element, you would think you were looking at a modern, attractive, functional school.

Have you, though, had any discussions or given any thought to the impact this may have on young people going to school in a building that is specifically designed to protect them from a shooter?

Like I said, if you walk into our building you wouldn't know it was designed to do that. But will you be having those discussions with students?



Unfortunately, we have to do active shooter training with our students, and so they will learn what those security elements are. But my sense is that they will appreciate the fact that they're there to keep them safe.

You mentioned that the design firm behind this is used to building secure facilities. As I understand it, they also design prisons. Is that right?

That's my understanding, yes.

The hallways are curved to impede a would-be shooter's sight line and there are concrete 'wing walls' where students can hide, says Bob Szymoniak, a school superintendent in west Michigan. (TowerPinkster)

So, have they designed a significant number of schools before this?

They have, but I don't know that they have designed any with the security elements that we have.

I will say that it's not often that new high schools are built, so this is likely unique across the state. But I would imagine that these types of design elements will become the new norm in school construction.

As an educator for, as I understand it, more than 30 years, did it ever occur to you that one day you might be involved in helping build a school designed to protect people from mass shooters? It's one of the saddest aspects of my career, having to come to terms with that.

But this is not new. Since the Columbine shooting in 1999, school safety and security has been on my mind as it has been the minds of probably every school administrator in America.

How much do you think it might detract from some of the larger issues that teachers and superintendents should be looking at?

I would say that it goes beyond that. Education has changed so much in even the last 10 years that there's a lot of different reasons to be anxious in this line of work.

But we do what we absolutely can to keep our students and staff safe. And they know that. And it's just the state of affairs in our country.

Written by Sarah Jackson and John McGill. Interview produced by Allie Jaynes. Q&A has been edited for length and clarity.

EDITOR'S COMMENT: I hope the new school will have inner security doors in every classroom, gym, lab, kitchen etc. and control doors isolating certain parts of the school

Europe's Fear of Refugees Is the Only Thing That Can Save Syria

Source: http://www.homelandsecuritynewswire.com/dr20190904-europe-s-fear-of-refugees-is-the-only-thing-that-can-save-syria

Sep 04 – Since last April, the Syrian government has been on a rampage, making life in Idlib dangerous once more. Even so, no one wants to live near a hospital. Bashar al-Assad's regime and his Russian allies have bombed <u>health facilities 521</u> times since the start of the conflict. The United Nations Commission of Inquiry on Syria has <u>charged</u> the regime and its allies with having "systematically targeted medical facilities." Indeed, civilians are more at risk being next to a hospital than being near a front line. And children are more endangered in schools; 87 education facilities have been attacked just since April.

Muhammad Idrees Ahmad writes in *Foreign Policy* that this is a deliberate and sustained assault on a civilian population. But the sheer predictability of the attacks has robbed it of its news value. With Syria out of the headlines as Brexit, Kashmir, hurricanes, and Hong Kong dominate the news, close to 900 people have been <u>killed</u> since the regime renewed its assault in April, one-third of them children.

An additional 576,000 Syrians have been displaced, most of them already refugees. The bombing has targeted homes, camps, bakeries, and markets. It has also targeted water facilities, making

diseases common. Over 40,000 people in Idlib have contracted <u>tropical diseases</u> in just the past two months due to the lack of clean water and sanitation.

Yet, at last month's G-7 summit in France, Idlib went unmentioned in the discussions over global security. In a reversion to an earlier norm, security was defined exclusively in terms



of terrorism. By diverting the focus onto nonstate actors, world leaders were able to evade the political complications of acknowledging state crimes.

"By bribing Turkey to keep Syrian refugees out of sight, the European Union has been able to keep Syrian suffering out of mind," Ahmad writes. "The West, it seems, is haunted more by the specter of the refugee than by the suffering of children. To break through this apathy, Syrians will have to use the only leverage available to them: The threat to flee toward Europe once again."

EDITOR'S COMMENT: Good title! BUT when Ahmad says "Europe", he really means "Greece" since ALL borders leading to Europe are closed and sealed. We are not afraid of refugess or immigrants as long as they behave properly and do not intend to change our way of life mainly because we do not invite them to our countries.

IMPORTANT QUESTION FOR SERIOUS & GENIOUS MINDS

You have two countries divided by sea. The distance from each other ranges from <3 to ~10 km. In one side you have 1.000.000 refugees and illegal immigrants ready to cross the sea by all means. How can all these people be stopped WITHOUT the use of force (aka without shooting them or sinking their boats)? Pls direct your ideas by email to the Editor of *C*²*BRNE DIARY*.

Faster, Smarter Security Screening Systems

Source: http://www.homelandsecuritynewswire.com/dr20190905-faster-smarter-security-screening-systems

Sep 05 – By now, attendees to sporting events, visitors to office buildings, and especially frequent fliers are all quite familiar with the technologies used at security checkpoints. You arrive at the security checkpoint, check your bags, show your ID and maybe your ticket or boarding pass, throw away the coffee or water you've been chugging, and then wait in a long line until it is your turn to be screened. Though the lines can be inconvenient, these safety measures are in place for a reason: they work. Scanning technologies have been around for years and are essential to the security of our critical infrastructure and those who pass through it every day.

S&T says that now, the Department of Homeland Security (DHS) <u>Science and Technology Directorate</u> (S&T) is working with industry to help the systems, whether at airports, government facilities, border checkpoints, or public spaces like arenas, to work faster and smarter. Soon, using emerging biometric technologies, you can opt-in to be confirmed and on your way to your final destination in a matter of seconds.

It's all about speed and scale: processing millions of people quickly, safely, and efficiently and sending them on their way—or, in some instances, recognizing those who might not have the best intentions. And as the capabilities continue to evolve, as facial/iris/fingerprint capabilities become more intuitive and even faster, DHS S&T continues to assess systems to ensure they remain accurate and function as they should.

"If you think of it like the children's book 'Where's Waldo,' you know who you're looking for and it's easy to spot him," said Arun Vemury, Director of DHS S&T's <u>Biometric and Identity</u> <u>Technology Center</u> (BI-TC). "But, when he is one among thousands on a page he is much harder to find because you may confuse him with others, especially if they are wearing



stripes. So, when you're just trying to verify one person who has an ID, it's much easier to do. But when you have hundreds of thousands or millions, it becomes much more difficult."

In May 2019, the BI-TC held its second annual <u>Biometric Technology Rally</u> at the <u>Maryland Test Facility</u> (MDTF) in Upper Marlboro, Maryland. The goal: bring together subject matter experts, industry partners, security stakeholders, and volunteers to test new and emerging automated biometric technology systems for high-throughput use cases. Over the course of the test, 15 companies (selected from more than 48 submissions) put their technologies to the test, processing hundreds of volunteers (with their informed consent) in a controlled high-traffic, high-throughput environment. Rally feedback and lessons learned will help industry further improve their biometric systems and DHS components and stakeholders to assess the performance, maturity, and limitations, of cutting edge technologies.

"We found that several use cases, such as border security, aviation security, and physical access controls at government facilities have similarities. The intent here is to continue to push technology developers to continue to improve technologies, make them easier, faster, and more accurate," said Vemury. "We are working with technology providers to clarify our expectations that the technology work more effectively for all users, reduce errors, make systems more cost-effective for governments, and offer a better user experience for the people undergoing the screening process."

Building off the success of the inaugural rally in 2018, DHS S&T used a robust and repeatable testing process, collecting data including biometric collection error rates, collection times, matching error rates, and user satisfaction and comparing results across the systems. The testing stations were unmanned, and volunteer after volunteer used the systems and reported out their experiences, good and bad. Data collected was used to assess performance of collection systems and algorithms. The feedback gathered will allow industry to improve current capabilities and inform the next generation of biometric scanning technology.

"When you conduct screening operations, you usually have an officer involved. If you have a ratio of one officer to one person, that's very time consuming and expensive," said Vemury. "These technologies, the way they were tested, no one was providing instruction to the user, so operators can focus on higher value security tasks. It was supposed to be intuitive and easy to someone who wants to participate but may not be familiar with the new process."

"We encouraged industry to consider creative solutions with few constraints on how they use their dedicated 6'x8' space," he continued. "But, we tried to get people through the entire process in less than five seconds, maybe up to ten seconds. It really has to be fast and very effective for all users."

S&T notes that findings from the 2019 Biometric Technology Rally are published on the <u>MdTF</u> <u>website</u>. For detailed information about the Rally results, watch the <u>acquisition systems webinar</u> and the <u>matching systems webinar</u>.

Counterproductive Counterinsurgency: Is Mozambique Creating the Next Boko Haram

Source: http://www.homelandsecuritynewswire.com/dr20190905-counterproductive-counterinsurgency-is-mozambique-creating-the-next-boko-haram

Sep 05 – After the Islamist insurgent group al-Sunnah wa Jamaah (ASWJ) killed seven people in northern Mozambique in July, the Islamic State claimed involvement, the second time they have done so since June. In the weeks since, ASWJ attacks have continued, most recently the shooting of five people on August 23. The evidence to substantiate direct links between the Islamic State and ASWJ is slim—and ASWJ does not need a transnational affiliation to be considered a threat to stability in Mozambique. The group has clashed repeatedly with Mozambican

security forces since October 2017 and is linked to more than 140 violent events that have resulted in more than 400 reported fatalities, according to the Armed Conflict Location & Event Data Project (ACLED).



Hilary Matfess and Alexander Noyes write in <u>Lawfare</u> that the threat to the country and the region is real, and Mozambique's current approach threatens to escalate the crisis. The experience of other African countries provides an instructive lesson: A hardline response that depends solely on repression will only make things worse.

"Mozambique needs to handle this growing security challenge in a way that will tackle the problem instead of exacerbating it with heavy-handed tactics justified as being 'tough on terrorism,'" Matfess and Noyes write. "A more comprehensive approach, which focuses on shared socioeconomic development and leverages international partnerships, would be more effective in fighting extremist groups like ASWJ."

HH the Amir inaugurates new Trauma and Emergency Center at HGH

Source: https://www.qatarliving.com/forum/news/posts/hh-amir-inaugurates-new-trauma-emergency-center-hgh



Sep 10 – In another major boost to the healthcare sector in Qatar, Hamad General Hospital's (HGH) stateof-the-art <u>Trauma and Emergency Center</u> was officially inaugurated yesterday by His Highness the Amir Sheikh Tamim bin Hamad Al Thani.

One of the largest emergency facilities in the region, the new center represents a significant expansion of trauma and emergency services in the country.

In addition to the center, Hamad Medical Corporation's (HMC) new Hyperbaric Therapy Unit, the first of its kind in Qatar, was also officially opened yesterday.

His Excellency the Prime Minister and Interior Minister Sheikh Abdullah bin Nasser bin Khalifa Al Thani, HE the Minister of Public Health Dr Hanan Mohamed Al Kuwari, other dignitaries and some senior doctors and officials at HMC attended the inauguration.

HH the Amir toured the facilities and was briefed on the medical facilities linking the new building with the relevant departments at Hamad General Hospital (HGH).

HE the Minister of Public Health described the opening of the new center as an important milestone in emergency and trauma care services in Qatar.

"The inauguration of the new Trauma and Emergency Center underlines our ongoing commitment to expanding capacity and improving services. This commitment will ensure that the people of Qatar will continue to receive the best possible care delivered in leading-edge facilities, now and for many years to come," she said.

HE Dr Al Kuwari highlighted that "the new Trauma and Emergency Center - at four times the size of the former Emergency Department - also offers a greatly improved patient



experience" and "will serve as a beacon of excellence" in HMC's network of emergency services. Chief of Healthcare Facilities, Hamad Al Khalifa highlighted HMC's commitment to delivering high-quality trauma and emergency care in Qatar. He mentioned that the center will provide an enhanced patient environment.



"Patients have an unparalleled level of comfort. They can recover in a state-of-the-art healing environment, improving their recovery journey and the healthcare experience for both themselves and



their family," he said. Acting chief medical officer at HMC, Dr Abdulla Al Ansari underlined the key role of clinical teams at the new Trauma and Emergency Center in meeting Qatar's emergency and trauma care needs.

"Not only does the new center offer a spacious healing environment equipped with the latest technology, but it also benefits from the delivery of care by the very best doctors, nurses, and other clinical staff," he said.

"Those in need of urgent medical care can be received and treated through the Emergency Department on the ground floor and we also have trauma, urgent, and critical care facilities available across the remaining three floors, which house state-of-the-art diagnostic equipment, including an MRI, ultrasound, and three CT scanners. Our patients will also benefit from a threefold increase in X-ray capacity, compared to the former Emergency Department," Dr Al Ansari described.

Dr Al Ansari said walk-in patients arriving at the new center's Emergency Department will be triaged and after initial assessment and treatment will either be admitted to the hospital or discharged.

To further boost capacity, the See and Treat area of the former Emergency Department will also remain open.



The first floor of the new center will house the Hamad Trauma Center, Qatar's major trauma facility, which receives around 2,000 cases each year.

The facility also benefits from five trauma and emergency rooms which are fully equipped to be converted into mini operating theatres in the event of a mass casualty incident or an accident requiring immediate surgical intervention.

While the ground floor of the new Trauma and Emergency Center is dedicated to walk-in emergencies and the first floor to critical and trauma care patients, the second floor is dedicated to urgent care patients, whilst the third floor has been designed to care for patients requiring isolation or monitoring before being discharged.



EDITOR'S COMMENT: Two ponts: (1) No comment on the CBRN capabilities of the ED; and (2) the last sentence of the article is a bit strange and confusing.



18 Years After 9/11, Al-Qaeda Remains Malevolent Force Worldwide

Eighteen years ago, 19 al-Qaeda operatives hijacked U.S. commercial airliners and flew them into the World Trade Center in New York City and the Pentagon in Washington, D.C. A fourth hijacked airplane crashed in a field in rural Pennsylvania. The attacks—the deadliest ever on American soil—killed nearly 3,000 civilians and injured thousands more. Within weeks, the U.S. launched military operations against al-Qaeda's suspected safe havens in Afghanistan. That December, al-Qaeda's co-founder <u>Osama bin</u> <u>Laden</u> is believed to have escaped U.S. bombing in Afghanistan's Tora Bora Mountains and fled to Pakistan.

Bin Laden, who orchestrated the 9/11 attacks, was ultimately killed in a U.S. counterterrorism operation in May 2011. However, al-Qaeda remains every bit the malevolent and determined force it was in 2001. Al-Qaeda's reach extends well beyond Afghanistan, with branches in the Arabian Peninsula, North Africa, and South Asia—all of which have carried out terror attacks in the recent past.

CEP has documented al-Qaeda and its affiliates' doctrine; organizational structure; financing, recruitment, and training activities; history; violent activities; government designations; associations; and rhetoric.

- To read the CEP report, Al-Qaeda, please click <u>here</u>.
- To read the CEP report, Al-Qaeda in the Arabian Peninsula (AQAP), please click <u>here</u>.
- To read the CEP report, Al-Qaeda in the Islamic Maghreb (AQIM), please click here.
- To read the CEP report, Al-Qaeda in the Indian Subcontinent (AQIS), please click here

Americans Pause to Remember the 9/11 Terrorist Attacks

Source: http://www.homelandsecuritynewswire.com/dr20190911-americans-pause-to-remember-the-9-11-terrorist-attacks

Sep 11 – Americans paused Wednesday to mark the 18th anniversary of the September 11, 2001 terrorist attacks that killed nearly 3,000 people in New York, Virginia and Pennsylvania. President Donald Trump and first lady Melania Trump walked outside the White House to observe a moment of silence at 8:46 a.m., the time when hijackers flew the first of two commercial jetliners into the World Trade Center in New York. Later, Trump is addressing a ceremony at the Pentagon for



families of those killed when al-Qaeda terrorists flew a hijacked plane into the building that is the headquarters of the U.S. military. Early Wednesday, ahead of the ceremony, an American flag was unfurled down the side of the Pentagon.

In New York, in an annual ceremony at Ground Zero of the attack, people began reading the names of all the victims killed on the day that now is etched in the memories of Americans across the country. Hundreds of survivors and family members of those killed gathered at the 9/11 Memorial, where the Twin Towers of the World Trade Center stood before two al-Qaedahijacked commercial flights brought them down. Vice President Mike Pence is attending ceremonies in Shanksville, Pennsylvania, near where United Airlines Flight 93 crashed after passengers took control from the terrorists who had hijacked the plane with the intention of crashing it into the White House.

Nineteen men affiliated with al-Qaida carried out the four hijackings.

The deadliest attack on American soil since Pearl Harbor in 1941, the events of September 11 permanently changed America's perception of national security and prompted then-President George W. Bush to declare war on terrorism and invade Afghanistan, where al-Qaeda had training grounds.

U.S.-led coalition forces knocked the Taliban from power in Afghanistan, but the conflict is still ongoing, ranking as the United States' longest war. U.S. and Taliban representatives have held recent peace talks, but just as details of a potential agreement were being made public, Trump canceled planned meetings with Taliban and Afghan officials because of continued Taliban attacks in Kabul.

The United States searched for al-Qaeda leader Osama bin Laden for years after the attacks, and in May 2011 a team of U.S. Navy Seals raided a compound in Abbottabad, Pakistan where they shot him dead.

Memorials for those killed in the attacks now stand at all three sites in New York, Virginia and Pennsylvania. The Pentagon crash site was quickly rebuilt after the attacks. A new tower at the World Trade Center site took longer to ER IN OUR HER construct, but now rises above

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the Manhattan skyline as the tallest building in the United States.

It's Hard to Commemorate 9/11 If You Don't **Understand It.**

Source: http://www.homelandsecuritynewswire.com/dr20190911-it-s-hardto-commemorate-9-11-if-you-don-t-understand-it

EMBER Sept. 11, 2019 marks the 18th anniversary of the deadliest terrorist attack in world history. It also marks a generational shift, with American children born after that date entering adulthood having grown up with their country perpetually fighting a so-called war on terror. The 9/11 attacks and their immediate aftermath belong to an era before Twitter, Instagram, and Facebook. Daniel Byman writes in Foreign Policy that it's hard for this younger generation to imagine a time when the U.S. communications system crashed and the Internet seemed to break, at least temporarily, as frantic Americans scrambled to learn about the fate of friends and relatives while false reports and rumors ran rife. In today's information-saturated environment, it is difficult for them to internalize the confusion of the time, when Americans wondered about the scope of the attack, the perpetrators behind it, and what the country would do in response.

The 9/11 attacks represent an outlier. More than 10 times as many people died on that day as have died in any single terrorist attack before or after in the United States

"In the first years after 9/11, my students and I feared that terrorism would grow ever more dangerous: Student papers in that period dwelled on lurid scenarios involving smallpox, miniature armies of jihadi snipers, and other nightmares," Nyman writes. "However, even more sober predictions that 9/11 would lead terrorists to escalate further, either in the form



of even more spectacular strikes or of chemical, biological, and radiological attacks, have not materialized."

He concludes:

The events of 9/11 are increasingly a memory, and without education that memory can easily become a caricature. Americans who are not fortunate enough to study at an elite university are particularly susceptible to vague threats being used to justify unnecessary government spending or an administration's preferred policy, without a recognition of how the dangers facing the country have changed since 2001. Capturing all the nuances surrounding 9/11 is vital, but the proper response today also requires recognizing that terrorism is constantly evolving, and when it strikes again it may not come from an expected or familiar source.

Artificial Intelligence Is Changing Every Aspect of War

Source: http://www.homelandsecuritynewswire.com/dr20190911-artificial-intelligence-is-changing-every-aspect-of-war

Sep 11 – As the navy plane swooped low over the jungle, it dropped a bundle of devices into the canopy below. Some were microphones, listening for guerrilla footsteps or truck ignitions. Others were seismic detectors, attuned to minute vibrations in the ground. Strangest of all were the olfactory sensors, sniffing out ammonia in human urine. Tens of thousands of these electronic organs beamed their data to drones and on to computers. In minutes, warplanes would be on their way to carpet-bomb the algorithmically ordained grid square. The *Economist* writes that Operation Igloo White was the future of war-in 1970. America's effort to cut the Ho Chi Minh trail running from Laos into Vietnam was not a success. It cost around \$1bn a year (about \$7.3bn in today's dollars)-\$100,000 (\$730,000 today) for every truck destroyed-and did not stop infiltration. But the allure of semi-automated war never faded. The idea of collecting data from sensors, processing them with algorithms fueled by ever-more processing power and acting on the output more quickly than the enemy lies at the heart of military thinking across the world's biggest powers. And today that is being supercharged by new developments in artificial intelligence (AI). Al is "poised to change the character of the future battlefield", declared America's Department of Defense in its first ai strategy document, in February, A Joint Artificial Intelligence Centre (JAIC) was launched in the Pentagon in summer 2018, and a National Security Commission on Artificial Intelligence met for the first time in March. The Pentagon's budget for 2020 has lavished almost \$1bn on Al and over four times as much on unmanned and autonomous capabilities that rely on it.

How China Disrupts the Middle East

Ву

Daniel

Pipes

Source: https://www.meforum.org/59338/how-china-disrupts-the-middle-east

Sep 11 – As Vladimir Putin's declining Russia flaunts its power in the Middle East, Xi Jinping's ascending China eludes the attention it deserves. But the Communist Party of China has begun investing money and gaining influence in ways that have vast – and worrisome – implications.

"After years of relative passivity [Beijing] is now making a concerted effort to expand its strategic presence and economic clout" in the Middle East, writes <u>Ilan Berman</u>, senior vice president of the American Foreign Policy Council, in the current issue of the *Middle East Quarterly*. (I rely extensively on his fine analysis in what follows.) Berman rightly calls this "one of the most consequential ... trends of recent years."

Two motives – energy and ideology – explain China's regional ambitions. As the country becomes more prosperous, its growing energy consumption leads to more dependence on Middle Eastern suppliers. China imports more than half of its crude oil and of that, nearly 40 percent comes from the Middle East, with the proportion continuing to rise. In Berman's estimation, the region "is quickly becoming a key engine of Chinese economic growth," which in turn implies an imperative for Beijing to gain more influence over what happens there.

Beyond this practical need, asserting Chinese power has become an end in itself since Xi took power in 2013, leading to what Berman calls "an increasingly aggressive, expansionist



foreign policy." This includes an attempt at <u>global economic dominance</u> via the Belt and Road Initiative that involves 100 countries.



In the Middle East, this has meant that the Chinese government's ambitions have grown in the past five years from merely buying energy and selling arms to a far deeper involvement. Symbolic of this transformation, annual Chinese investment in the region a decade ago amounted to \$1 billion; at just a single forum recently, it pledged \$23 billion in loans and development aid. In August, it sent a <u>\$1 billion</u> cash infusion to Turkey alone.

Militarily, Beijing become a leading contributor to UN peacekeeping operations, sent the People's Liberation Army Navy on visits to many ports, and opened its first regional base in Djibouti in 2015. The future presumably holds many more Chinese military bases.

As Beijing begins to "alter politics and security in the region," Berman notes "tremendous consequences." Here are three:

U.S.-Israel ties: China's leaders so appreciate the Jewish state's technological prowess that they invested \$3.2 billion in the first half of 2019 and now are estimated to control or have influence over as much as one-quarter of Israel's tech industry, including military contractors working on confidential projects with American firms. Indeed China may soon replace America as Israel's single largest source of investment, a prospect that not only has official Washington "increasingly alarmed" but could damage a decades-long, particularly close and productive bond.

Xinjiang: China's massive repression of its Muslim population, especially of the Uyghurs in its far western province of Xinjiang, has met with a collective shrug from such Muslim notables as Saudi crown prince Mohammed bin Salman (MbS) and Turkish president <u>Recep Tayyip Erdoğan</u>. This inexcusable lack of concern contrasts dramatically with the Muslim world's prolonged tantrum over little Israel's far milder treatment of the Palestinians, It also signals that China's size, power, and ruthlessness renders it free to repress Islamic religion and culture within its domains and perhaps beyond.

High-tech dictatorship: The "<u>China model</u>" of surveillance, censorship, monitoring, and repression has become an important export commodity. It also has terrible implications: the ChiCom ability to control

every aspect of its subjects' lives (think <u>smartphones as spy devices</u> and <u>200GB</u> <u>photographs</u>) through innovative and ubiquitous technologies hugely enhances the power of the state.

Not surprisingly, these find a ready market in the Middle East. Chinese companies have helped Iran's mullahs to stay in power since the Green Movement of 2009. They have taken



over nearly all of <u>Egypt</u>'s telecommunications, giving President Sisi vast controls to stifle his population. They are also worryingly active in Lebanon and <u>Saudi Arabia</u> (and <u>elsewhere too</u>, such as Africa and Latin America).

Faithful to communist anti-imperialist dogma, Xi strenuously denies that his government seeks to develop a sphere of influence in the Middle East, instead proclaiming an innocent intent merely to help with economic development. Ignore the puffery: Beijing not only "holds the power to alter alliances, political discourse, and even domestic freedoms throughout the region," as Berman puts it, but it intends to exploit that power to the maximum.

Daniel Pipes is president of the Middle East Forum.

New EU Office Criticized by Liberals, NGOs as Conveying a "Xenophobic Message"

Source: http://www.homelandsecuritynewswire.com/dr20190912-new-eu-office-criticized-by-liberals-ngos-as-conveying-a-xenophobic-message

Sep 12 – EU Commission chief Ursula von der Leyen was accused by liberal and leftist members of the European Parliament and by several international organizations, of creating a new position which conveys a xenophobic message. The new office – the official name is **The Office for Protecting Our European Way of Life** — has been the subject of bitter criticized within Brussels and throughout the EU.

The BBC <u>reports</u> that Von der Leyen has renamed several of the Commission positions in order to make them sound less formal and more goal-oriented. As part of this new approach, she has renamed the former Office for Migration, Home Affairs, and Citizenship to the Office for Protecting Our European Way of Life.

"Creating a portfolio 'Protection of the European way of life' in response to 'legitimate fears and concerns about the impact of irregular migration' is totally misguided and reprehensible," said Sophie in 't Veld, a progressive Dutch MEP.

't Veld called the new position a "fake portfolio," adding: "The implication that Europeans need to be protected from external cultures is grotesque and this narrative should be rejected."

Ska Keller, a German lawmaker who heads the Green party bloc in the European Parliament, also voiced her concern that the new post implied a "contradiction between supporting refugees and European values."

"We hope President von der Leyen does not see a contradiction between supporting refugees and European values," she said.

Damien Careme, a French member of the Greens, said the portfolio name was "an abomination."

"It looks pretty but when one realizes that it means he will be in charge of migration, integration and security, then it's absolutely disgusting," Careme added.

The head of Amnesty International's European office, Eve Geddie, said, "Linking migration with security, in the portfolio of the Commissioner for Protecting our European Way of Life, risks sending a worrying message."

Von der Leyen Defends Post

The new post has been given to Margaritis Schinas, a former Greek member of European Parliament and longtime civil servant for the Commission.

In her letter to him outlining the portfolio, von der Leyen said "the European way of life is built around solidarity, peace of mind and security."

"We must address and allay legitimate fears and concerns about the impact of irregular migration on our economy and society," she added.

He clarified the goal of the position by saying his office would be "better protecting our citizens and borders and modernizing our asylum system, to investing in Europeans' skills



and creating brighter futures for our youth, I am confident that we can take great strides over the next five years to both protect and empower Europeans."



Von der Leyen's office responded to the criticism by pointing out that the name of the portfolio had been included in her public strategy papers since July, and that the purpose of the office was to coordinate cross-border development and fighting terrorism, as well as protect values and democracy. "Our European way of life is holding up our values," she told reporters. "The beauty of the dignity of every single human being is one of the most precious values."

EDITOR'S COMMENT: I strongly sympathize all those opposing the new office because they are Europeans that have taken hundrends of illegal immigrants to their own homes! Margaritis Schinas is the right person for the job not because he is Greek but exactly because he is Greek since Greece is left alone to deal with the illegal immigration tsunami when all other doors are sealed.

The Shocking Paper Predicting the End of Democracy

Source: http://www.homelandsecuritynewswire.com/dr20190912-the-shocking-paper-predicting-the-end-of-democracy

Sep 12 – Everything was unfolding as it usually does. The academics who gathered in Lisbon this summer for the International Society of Political Psychologists' annual meeting had been politely listening for four days, nodding along as their peers took to the podium and delivered papers on everything from the explosion in conspiracy theories to the rise of authoritarianism. Rick Shenkman writes in *Politico* that, then, the mood changed. As one of the lions of the profession, 68-year-old Shawn Rosenberg, began delivering his paper, people in the crowd of about a hundred started shifting in their seats.

They loudly whispered objections to their friends. "Three women seated next to me near the back row grew so loud and heated I had difficulty hearing for a moment



what Rosenberg was saying," Shenkman writes.

What caused the stir? Rosenberg, a professor at UC Irvine, was challenging a core assumption about America and the West. His theory? Democracy is devouring itself—his phrase and it won't last.

As much as President Donald Trump's liberal critics might want to lay America's ills at his door, Rosenberg says the president is not the cause of democracy's fall—even if Trump's successful anti-immigrant populist campaign may have been a symptom of democracy's decline.

We're to blame, said Rosenberg. As in "we the people."

Democracy is hard work. And as society's "elites"—experts and public figures who help those around them navigate the heavy responsibilities that come with self-rule—have increasingly been sidelined, citizens have proved ill equipped cognitively and emotionally to run a well-functioning democracy. As a consequence, the center has collapsed and millions of frustrated and angst-filled voters have turned in desperation to right-wing populists.

His prediction? "In well-established democracies like the United States, democratic governance will continue its inexorable decline and will eventually fail."

Not All Types of Extremism Are Terrorism – Conflating the Two Is Dangerous

By Daniel Kirkpatrick and Recep Onursal

Source: http://www.homelandsecuritynewswire.com/dr20190912-not-all-types-of-extremism-are-terrorism-conflating-the-two-is-dangerous

Sep 12 – When the Conservative MP Nigel Evans was interrupted during a television interview in early September by an anti-Brexit protester, he <u>criticised</u> the "extremism" of Remainers. Back in February, the avowed Brexiteer Jacob Rees–Mogg warned that delaying Brexit <u>would risk a surge</u> in right–wing extremism. <u>Others</u> have also blamed Brexit for the rise of <u>"extremist views"</u> from both ends of the political spectrum – and complained that extremism is being encouraged from the top.

But the word extremism shouldn't be used lightly. As <u>Sara Khan</u> – the lead commissioner at the Commission for Countering Extremism – said in July: "We shouldn't lazily throw around the word 'extremism'. We need to use it with precision and care."

In less turbulent times, this ambiguity in the meaning of extremism might not have been a big concern. However, considering the <u>division in British society</u> that's been exposed and gradually deepened by Brexit, this remains a pressing problem.

The government <u>officially defines extremism</u> as the "Vocal or active opposition to fundamental British values, including democracy, the rule of law, individual liberty and mutual respect and tolerance of different faiths and beliefs ... calls for the death of members of our armed forces (are also) extremist."

According to <u>a recent survey</u>, 75 percent of public respondents find this definition "very unhelpful" or "unhelpful." A recent study <u>even showed</u> that far-right groups with clearly dangerous ideology are using the definition to "prove" that they are not extremist.

These conceptual challenges are also reflected within the language of politics. In our recent analysis of <u>British parliamentary</u> debates between 2010 and 2017, we discovered a significant and worrying convergence between the terms "terrorism" and "extremism" to the point where they are increasingly being used interchangeably.

These terms have in many ways converged in political discourse replicating the same frames of reference for both concepts. Back in 2013, the then-prime minister, <u>David Cameron</u>, referred to the "extremist ideology that perverts and warps Islam to create a culture of victimhood and justify violence". He argued that the UK "must confront that ideology in all its forms ... and not just on violent extremism."

More recently, the former home secretary, <u>Sajid Javid</u>, argued that extremism has "gone from being a minority issue to one that affects us all ... and the way we all live our lives is under unprecedented attack".

But extremism and terrorism should not be so simply interlinked.



Language Matters

Extremism has tended to refer to both violent and non-violent forms of political expression, whereas terrorism is predominantly violent. To be an extremist could mean anything from being a nationalist, a communist, to being an animal rights activist – as long as this ideology is regarded as extreme relative to the government's position. However, in the 1,037 parliamentary debates we analyzed, terrorism generally referred to somebody involved in political violence.

Politicians from all parties increasingly stressed the transition from extremism to terrorism by using the terms "violent extremism" and "non-violent extremism" as a substitute for one another. Extremism was often framed as a pathway into terrorism.

But it's worrying to extend the meaning of terrorism in this way to cover both violent and non-violent extremism. A person's understanding of something shapes how they respond to it. So a child who views the sea as a playground will swim and play, whereas a fisherman will view it as a livelihood, casting his rod and nets accordingly. Put differently, the way extremism and terrorism are framed by politicians reflects and shapes how the police and security officials implement policy and how the public perceive these policies.

Targeting non-violent extremism as if it were terrorism is a problem because it directs counter-terrorism efforts against people's political identities instead of political violence. Doing so closes off possible opportunities for dialogue.

Too Much of an Assumption

The area of counter-terrorism policy which this most closely relates to is the Prevent program. The Prevent duty, which extends to teachers and university staff, seeks to safeguard against vulnerable individuals being drawn into political violence. According to 2017-18 official <u>statistics</u>, 7,318 people were subject to a referral under the <u>Prevent program</u>, due to concerns that they were vulnerable to being drawn into terrorism. Of these, 14 percent were referred for concerns related to Islamist extremism and 18 percent for concerns related right-wing extremism.

Our analysis shows that what was previously solely considered "terrorism" is increasingly being framed interchangeably as "extremism". And the meaning of non-violent extremism is gradually being reduced to the point where it can only be understood as terrorism. Under current counter-terrorism policy, certain public bodies are endowed with authority to monitor non-violent extremism as if it were terrorism.

All this reflects an underlying assumption that extremism always functions as a pathway into terrorism. This assumption has been used to legitimize counter-terrorism measures against both violent and non-violent extremism. These measures no longer focus on the behaviors or support for political violence – instead they focus on the ideologies which do not conform to the state's definition of "normal" values.

Tackling extremism can help prevent terrorism, but only if the distinctions between them are properly understood. Conflating extremism and terrorism may even undermine <u>counter-terrorism</u> due to issues such as community alienation. That's why challenging the assumption that all extremism leads to terrorism is important in improving policy responses to the very real threat of political violence.

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With Bolton Out of the Way, Peace with North Korea Is Possible

By Christine Ahn

Source: https://truthout.org/articles/with-bolton-out-of-the-way-peace-with-north-korea-is-possible/

Sep 13 – On September 10, President Trump fired John Bolton, his third national security adviser, announcing on Twitter that Bolton's "services were no longer needed." Unsurprisingly, Bolton fired back by tweet, countering that he hadn't been fired, but in fact had offered his resignation.



It was no <u>secret</u> in Washington that Trump grew increasingly frustrated with Bolton's hawkish positions, even joking in meetings with him, "If it was up to John, <u>we'd be in four wars now</u>." Despite their differences, Trump viewed Bolton as instrumental to advancing his foreign policy



agenda. <u>According to several sources</u>, "the president says having Bolton on his team improves his bargaining position and gives him a psychological advantage over foes like Iran and North Korea."

From the very day Bolton assumed the role of national security adviser 17 months ago, prospects for peace with North Korea didn't have a fighting chance. Bolton was a proponent of U.S. military action to prevent Iran and Iraq from obtaining weapons of mass destruction, and he made his position on North Korea clear in an August 2017 <u>Wall Street Journal op-ed</u> in which he outlined military options for North Korea, from cyberattacks to regime change through special operations forces.

<u>Uri Friedman in *The Atlantic*</u> predicted that "Bolton's firm belief in the purifying power of regime change, his confidence in the efficacy of war and distrust of measures short of war, suggest he's more likely to steer the Trump administration in an even more hardline direction."

There was never a diplomatic deal with North Korea that John Bolton liked. In fact, from the 1994 Agreed Framework the United States negotiated with North Korea to freeze its nuclear weapons program, up to the February 2019 Hanoi summit, Bolton has had his hand in sabotaging any agreement between Washington and Pyongyang.

Bolton was among the chief architects in the Bush administration who destroyed the Agreed Framework, the 1994 agreement the Clinton administration negotiated with then-leader Kim Jong II to freeze North Korea's nuclear weapons program.

According to former State Department official Robert Carlin, "The Agreed Framework did not fail; it was murdered. It was deliberately destroyed by the Bush administration. That's not a failure." Bolton, Donald Rumsfeld and Dick Cheney justified gutting the Agreed Framework after discovering that the North Koreans were enriching uranium. "This was the hammer I had been looking for to shatter the Agreed Framework," <u>Bolton wrote</u> in his memoir.

Unsurprisingly, it was Bolton who played a key role in squandering the opportunity for a deal at the second summit between Trump and Kim Jong Un in Hanoi in February. According to longtime North Korea expert Leon Sigal, working-level meetings led by U.S. Special Representative Stephen Biegun ahead of the summit resolved a number of issues, including an end-of-war declaration, establishment of liaison offices in Pyongyang and Washington, and the scaling back of U.S.-South Korean war drills. Then, in Hanoi, Trump presented a "grand bargain" to Kim: trade all of its nuclear weapons, material and facilities in exchange for an end to U.S.-led sanctions. North Korea viewed this offer as a U.S. demand for North Korea's unilateral disarmament. North Korea was further offended by Bolton, who explained on CBS after Hanoi that denuclearization also included Pyongyang's "ballistic-missile program and its chemical- and biological-weapons program."

With election season upon us, Trump recognizes that he doesn't have a single foreign policy victory — especially an agreement with North Korea, in which he has invested so much political capital. Although North Korea has not crossed the red line by testing long-range missiles, the country has conducted several short-range missile tests and Kim has set an end-of-vear deadline for diplomatic а breakthrough before what many experts predict could be a return to testing nuclear weapons. To make progress on reaching an agreement with Kim, Trump likely realized Bolton had to go. That's why Bolton was sent to Mongolia during the third summit with Kim in June,

so as not to derail progress with North Korea.

Instead of celebrating the deposing of one of the most dangerous men



in power, the liberal establishment — especially the Democratic leadership - used Bolton's firing to further attack Trump. While Trump himself was leading the charge to "totally destroy" North Korea during the early days of fire and fury, as the two Koreas began to make historic peace following the 2018 winter Olympics, his stance shifted while those of his national security adviser — and leaders across the aisle — hadn't. House Speaker Nancy Pelosi tweeted, "John Bolton's sudden departure is a symbol of the disarray that has unnerved our allies since day one of the Trump Administration. Steady leadership & strategic foreign policy is key to ensuring America's national security."

But it wasn't just the establishment Democratic leadership. Progressive champion Alexandria Ocasio-Cortez <u>tweeted</u> a photo of a *CNN* headline that read: "Trump sides with Kim Jong Un over Bolton" and added, "That's it. That's the headline." This was <u>re-tweeted</u> by Rep. Ilhan Omar who added, "Trump sides with yet another dictator."

Progressives, especially Korean Americans, were flabbergasted, especially given that both Ocasio-Cortez and Omar were among the first Democrats to co-sponsor <u>H.Res. 152</u>, which calls for an end to the Korean War with a peace agreement. Minju Bae, a labor organizer of Asian American communities in New York City tweeted, "Someone needs to write an oped about how @AOC and @IlhanMN's tweet about 45 and Kim Jung Un is actually REALLY harmful to the people working towards a people's reunification of the Korean Peninsula."

Progressive journalist <u>Adam Johnson</u> called out the squad by tweeting, "When U.S. leaders side with allied dictators it's bad and should be called out. When they have mere talks with dictators of countries we've been sanctioning and threatening and bombed and killed 20% of the population ... this is not at all the same thing." This forced a nuanced <u>response from Rep.</u> <u>Omar</u>, "I support diplomacy with North Korea and a formal end to the Korean War, which is why I cosponsored the resolution by @RoKhanna recognizing that."

On North Korea, Democrats couldn't be more wrong on how dangerous Bolton was and the numerous obstacles he placed to achieving diplomacy with Pyongyang. Meeting with Kim Jong Un isn't a concession; it's the process of building peace. Instead of perpetuating tired old tropes about North Korea that close the political space for diplomacy, progressives and Democrats should be attacking Trump from the left.

Instead of a knee-jerk reaction to Trump's erratic diplomacy with North Korea, progressives and Democrats could offer a bold vision for rigorous diplomacy that could yield a final resolution to the Korean War and ultimately denuclearization. In a memo to all presidential candidates, a of peace and network disarmament organizations led by the Korea Peace Now! campaign outlined pro-diplomacy and propeace principles for a new U.S. policy on North Korea. Among the principles are a step-by-step confidence-building measures. approach. supporting our ally South Korea, making the peace process more inclusive, but critically, ending the Korean War.

Successful diplomacy to achieve denuclearization will require a step-by-step process that must include a peace agreement and normalized relations. With Bolton out of the way, Biegun now has a clear path to advance a peace process. In a <u>speech</u> last week at the University of Michigan, he offered a pragmatic approach to reviving stalled talks:

Neither the United States nor North Korea has to accept all the risk of moving forward. There are immediate actions that we can take if negotiations make progress. Judging by the talks President Trump has had with Chairman Kim, and that our team has had over the past year with our North Korean counterparts, it is clear that both sides can quickly agree to significant actions that will declare to our respective peoples—and to the world—that U.S.-North Korea relations have taken an irreversible turn away from conflict.

As veteran Korea journalist Tim Shorrock told *Truthout* in an email, "If Trump sticks with Stephen Biegun, who had embraced that strategy before being overridden by Bolton, then I think prospects are good once talks start again, at least for an interim agreement."

It's time to end the Korean War by replacing the 1953 Armistice Agreement, which temporarily halted the Korean War, with a formal peace agreement. When





U.S. and North Korean commanders signed the ceasefire, they promised within 90 days to return to negotiate a permanent political settlement. That agreement is long overdue. It is in the interests of 80 million people who live on the

Korean Peninsula, the millions more throughout the region, and all Americans. Ending 70 years of hostility and mistrust will take leaders across the political aisle to support peace.

Christine Ahn is the international coordinator of Women Cross DMZ, a global movement of women mobilizing for peace on the Korean Peninsula.

EU Counter-Terrorism Coordinator Says Many ISIS Militants Back from Conflict Zones

Source: https://aawsat.com/english/home/article/1902101/eu-counter-terrorism-coordinator-says-manyisis-militants-back-conflict-zones

Sep 14 - Many ISIS members have actually returned to Europe, said EU Counter-Terrorism **Coordinator Gilles De Kerchove.**

He added that some have been killed in fighting areas and others' fate is unknown as they might have gone to Libya or Afghanistan.



In his statement to Asharg Al-Awsat, De Kerchove warned of ISIS activities elsewhere, following their defeat in Syria and Iraq, with the continued activity of their leaders there so far.

The European official pointed to the terrorist group's activities in other parts of the world.

His remarks were made on the sidelines of launching the first European anti-terrorism judicial record under

the supervision of the European Justice Agency (Eurojust). Responding to a question on the importance of this judicial record, De Kerchove said it aims at linking

parts of the case together in order to have access to its details.

Intelligence and security agencies exchange information and this is what we need to do for judicial information, he explained.

Such record allows concerned parties to know about the ongoing trials and verdicts, which facilitates linking figures and organizations and finding the relationship between terrorism and organized crime, he further noted.

Regarding the return of European foreign fighters from conflict zones, he said "there is no unified decision on the European fighters detained in Syria and Iraq."

"European countries want to pursue their cases, and we are working to collect information that allows their prosecution."

"We are also considering the possibility of their return, but, so far, there is no final decision at the level of the European Union on dealing with the European ISIS militants," he stressed.

De Kerchove pointed out that this case also has a humanitarian dimension, which is represented in ISIS militants' widows and children and the difficult circumstances in which they live within camps opened to receive them.

Regarding the possibility of prosecuting European fighters, he said: "we can help, and we will have a role." "We have shown willingness to cooperate, and we have already made several contacts," the EU official said.

"It is important that in case these people returned, we have a judicial record including all the information about them."

Concerning fears of ISIS re-emergence in another country after its defeat in the border area between Syria and Iraq, he said ISIS already still exists through its influence on people in different parts of the world.


He gave as an example the attack targeting a church in Sri Lanka, which killed a great number of civilians. "ISIS leaders are still active in several areas in Syria and Iraq and are developing terrorist schemes. So, it is not easy for anyone to say that ISIS is over."

It is noteworthy that a number of European capitals, including Brussels, The Hague, London, Paris, and others, have been facing great controversy for some time now on the issue of the return of ISIS militants' widows and children.

This controversy began to intensify after US President Donald Trump had called on European countries to receive 800 foreign fighters holding European nationality and were detained in Kurdish-controlled camps in northeastern Syria.

EDITOR'S COMMENT: EU – living in a parallel universe!

Is "Islamist" suicide bombing in the Middle East really motivated by religion?

By Dan Peterson

Source: https://www.patheos.com/blogs/danpeterson/2019/09/is-islamist-suicide-bombing-in-the-middle-east-really-motivated-by-religion.html

Sep 14 – My friend Dr. William J. Hamblin and I published the following column in Salt Lake City's *Deseret News* on 11 July 2015:

The so-called "New Atheists" differ from previous generations of vocal unbelievers (e.g., Bertrand Russell and Antony Flew) by not merely repudiating the existence of God but aggressively denying the moral legitimacy and cultural value of religious faith. They're fond of citing the great 17th-century mathematician



and philosopher Blaise Pascal: "Men never do evil so completely and cheerfully," he said, "as when they do it from religious conviction."

And nothing has played so well into the hands of the New Atheists in this regard than the violence associated over the past couple of decades with fundamentalist Islam. It's believers in God, partisans of the New Atheism observe, who strap bombs to their backs and fly airplanes into buildings.

"For good people to do evil things," the outspokenly atheistic Nobel laureate physicist Steven Weinberg has famously said, "that takes religion."

Of course, matters aren't quite so simple as some imagine. Pascal himself, for instance, was a very devoted Christian, and Weinberg shared his 1979 Nobel Prize with Mohammad Abdus Salam, a devout Anglo-Pakistani Muslim who quoted the Quran in his acceptance speech.

But the fundamental problem with blaming religion for suicide bombings may surprise many readers: The data simply don't support the charge. Not by a long shot.

In 2005, Robert Pape of the University of Chicago published a vitally important book titled "Dying to Win: The Strategic Logic of Suicide

Terrorism." It's based upon meticulous analysis of every suicide attack occurring anywhere in the world between 1980, when modern suicide terrorism began, and 2003.

Pape's case is factually rich and rigorously argued. "The data show," he concludes, "that there is little connection between suicide terrorism and Islamic fundamentalism, or any one of the world's religions. In fact, the leading instigators of suicide attacks are the Tamil Tigers in Sri Lanka, a Marxist-Leninist group whose members are from Hindu families but who are adamantly opposed to religion."

He continues: "Rather, what nearly all suicide terrorist attacks have in common is a specific secular and strategic goal: to compel modern democracies to withdraw military forces from territory that the terrorists consider to be their homeland. Religion is rarely the root cause, although it is often used as a tool by terrorist organizations in recruiting and in other efforts in service of the broader strategic objective."



Even in the Middle East, at least half of the suicide attacks between 1980 and 2003 had little, if any, link to Islamic fundamentalism; indeed, many such attacks were undertaken by Communists, secular nationalists and even Christians. The motivations were this-worldly, tied to national liberation. Those who carried them out weren't impelled by poverty, alienation, psychological dysfunction, hopelessness or a pathological desire for death. On the contrary, by a very wide margin, suicide attackers turn out to have been relatively prosperous, exceptionally well-integrated within their communities, healthy and in no



conventional way suicidal. Their acts were oddly altruistic and idealistic, however depraved others outside their community might judge them to be. Why have we so misunderstood what's going on? For one thing, we've paid disproportionate attention, in a sense, to suicide attacks in the Middle East; after all, the Tamil Tigers in Sri Lanka target that nation's Sinhalese Buddhist majority, not us. The West has no vital interests there, and little representation, and we seldom hear reports about Sri Lanka on the nightly news. So our sample is skewed. Moreover, although they've spoken openly, we've paid curiously little attention to what suicide attackers have actually said about their motives and goals.

The fundamental point of Robert Pape's argument is strikingly congruent with the entirely distinct case made by Graham Fuller in his brilliant 2010 book <u>"A World Without Islam</u>." We've summarized that 2010 book in a previous column: Fuller observes that today's divisions between the (Islamic) East and the (Christian) West regularly trace the same geographical and other lines that divided East from West long before the rise of Islam in the seventh century (see <u>"Is Islam a primary</u> alvialence?" published Sept 6, 2014).

cause of international violence?" published Sept. 6, 2014).

In other words, what we typically understand to be a fundamentally religious conflict in the Middle East may, at its root, have relatively little to do with religion. And that, if true, has major ramifications for — among many other things — the way in which the United States and the West should conduct their foreign policy in and about the region.

"It isn't what we don't know that gives us trouble," Will Rogers once quipped, "it's what we know that ain't so."

A must-read article

Bone, not adrenaline, drives fight or flight response

Source: https://www.sciencedaily.com/releases/2019/09/190912111018.htm





TWA hijacker arrested in Greece after 34 years

Source: http://en.protothema.gr/twa-hijacker-arrested-in-greece-after-34-years-photos/

Sep 21 – A 65-year-old Lebanese was arrested in Mykonos after being wanted for 34 years by international prosecutors for his involvement in Hezbollah, as well as the hijacking aboard a TWA airliner in 1985 and the assassination of a US Navy officer whom they shot and threw on the runway at Beirut Airport.

Among the passengers that were being held in the airplane was also the famous Greek singer Demis Roussos.

The arrest of the foreign fugitive was carried out in the port of Mykonos on the morning of September 19, following the extensive investigations by the police on "suspicious" visitors to the island.

He was aboard a cruise ship that had crossed Rhodes and Santorini, and Mykonos was the last stop before returning to Turkey.

During a passport check, his name was found to be on Interpol's red list.





The hijacking

The bloody story of the 65-year-old Lebanese from Beirut began in the mid-1980s. It was June 1985 when an alarm sounded at the airports of Athens and Rome. Onboard flight TWA 847, from Athens to Rome, authorities received an alert for hijacking.

The Hezbollah-related perpetrators first headed for the Beirut airport, where some passengers were released, including singer Demis Roussos, in exchange for fuel.



There, when a US Navy diver, Robert Stethem, resisted, the terrorists shot him and threw his corpse on the runway.

Following negotiations, the hostages were released, transported by vehicle to Syria and from there to a US Air Force aircraft in West Germany.

The first arrest

Two years later, in 1987, the Lebanese was arrested in Frankfurt. The German authorities were preparing to

extradite him to the US where a warrant is pending.

But that never happened. His associates in Beirut abducted two German nationals and demanded that he be exchanged. For three decades the Lebanese had managed to slip away from the US authorities. That was the case until the morning of September 19, when the Greek police officers in Mykonos during a passport check arrested him and brought him to justice.



It should be noted that the 65-year-old was carrying a fake ID, but international law enforcement authorities had been able to find out the names he was using, and when one of them came up during the passport check, it was all over for him.



A.I. 101: What is artificial intelligence and where is it going?

Algorithms, the building blocks of artificial intelligence, are detailed, step-by-step instructions for completing a task.

By Melissa Hellmann (Seattle Times business reporter)

Source: https://www.seattletimes.com/business/technology/ai-101-what-is-artificial-intelligence-and-where-is-it-going/

Sep 21 – The phrase "artificial intelligence" in pop culture often conjures up dystopian images such as the sentient computer Hal 9000 from the 1968 film "2001: A Space Odyssey" that killed people for its self preservation; or the cyborg assassin with a metal endoskeleton in director James Cameron's "The Terminator." In recent years, our fascination with the potential of AI has taken a more starry-eyed turn, as shown in the 2013 sci-fi drama "Her," where the main character falls in love with a virtual assistant.

In reality, artificial intelligence (AI) technology is quickly permeating every aspect of our lives. From Amazon's voice-activated Alexa to writing technology that helps managers craft job postings, AI is in our hearts, homes and workplaces. And it's only going to become a bigger part of our lives: Experts call the rise of AI the driving force behind the fourth industrial revolution.

On a recent afternoon at the NVIDIA robotics research lab in Seattle's University District, researchers use a simulated kitchen to test robots' ability to perform simple tasks such as grabbing objects. A 5-feet 7-inch tall white robot, basically a spindly arm affixed with a claw



of the sort customarily found in an arcade vending machine, glided around the kitchen on its two Segway wheels.

Following the command of a research scientist sitting at a nearby computer, the robot grabbed a Cheez-It box on the counter and extended its limb to gently place the snacks inside a cabinet.

"What's deceptive is that what's simple to us in the kitchen is challenging for a robot," said University of Washington Computer Science and Engineering Professor Dieter Fox, who also serves as the lab's senior director of robotics research. The Silicon Valley-based technology company <u>opened the robotics lab last</u> fall to harness the UW's talent in a sector where Seattle plays a central role.

Still, paranoia around the capabilities of AI technology persist. When <u>we recently asked readers what they</u> <u>want to know</u> about AI, many focused on the negative. We received questions such as, "How will we know when we aren't in control?" and "When will it be against the law to make, produce and distribute since it is a patent danger to humans?" Others voiced concerns about the potential that AI will displace workers. Such worry was reflected in a recent Northeastern University and Gallup survey that found <u>71 percent of Americans</u> feared the surge in AI would cause more job loss than gain.

The A.I. Age | This 12-month series of stories explores the social and economic questions arising from the fast-spreading uses of artificial intelligence. The series is funded with the help of the <u>Harvard-MIT</u> <u>Ethics and Governance of Al Initiative</u>. Seattle Times editors and reporters operate independently of our funders and maintain editorial control over the coverage.

We're here to clear up confusion, and highlight the pros and cons of AI technology. Over the coming months, The Seattle Times will explore the social and economic effects of AI by examining regulation of the technology, privacy concerns and the changing landscape of labor in the AI Age. This piece will explain some of the terms you'll hear, and look at examples of AI around us.

But first, let's go over the basics.

<u>Robots entered the cultural imagination</u> about 100 years ago in the Czech play R.U.R., in which artificial people wipe out humans. A seminal moment for AI came a few decades later, when the British mathematician Alan Turing proposed the first test to measure a computer's intelligence in his 1950 paper, <u>Computing Machinery and Intelligence</u>.

The Turing test analyzed whether a machine has developed a humanlike level of awareness through a test that involved one human and one machine respondent, and a human judge placed in another room who would ask the two contestants questions for five minutes. If the judge mistook the machine for a human more than 30% of the time, the computer was determined to have artificial intelligence — a test that many researchers believe has yet to be passed.

<u>Computer scientist John McCarthy</u> coined the phrase "artificial intelligence" in 1956, later describing it as the "science and engineering of making intelligent machines, especially intelligent computer programs." In the decades since, AI has continually reached new milestones.

In 1997, IBM's Deep Blue computer for the first time defeated a professional player in a six-game chess match, demonstrating the calculating abilities of computers. This July, Facebook and Carnegie Mellon University announced they'd created an AI program called Pluribus that defeated five top players in the popular poker game Texas Hold'em, suggesting AI has reached a level of strategic reasoning that surpasses humans, the researchers said. Carnegie Mellon University computer science professor Tuomas Sandholm said the research behind Pluribus could be applied to real-world scenarios including optimizing strategies in investment banking.

Common terms

As AI becomes more widespread, you'll hear a lot of new terms, such as deep learning, deepfakes, algorithms and natural language processing. Here's a guide to some of those concepts and how you may unknowingly cross paths with them.



Algorithms

Algorithms are mathematical formulas that amount to a set of processing instructions — akin to a recipe — that aim to solve a specific problem. In some AI systems, algorithms are designed to allow the program to learn on its own. For instance, if a robot followed a recipe to mix together flour, eggs and milk, then placed the ingredients in a preheated oven to bake a cake, it might learn over several attempts — a data set — that too much flour would make the cake dry.



(James Abundis/Seattle Times)

Machine learning

Ever wonder how Netflix, out of thousands of titles, recommends a few TV shows that match your tastes? Or how an ad for the Wayfair rug you've been eyeing popped up on your Facebook feed? It's not magic, it's an analytics system called machine learning that finds patterns in a large amount of data. Platforms such as Facebook make recommendations by collecting information about users, including their browsing history, age and online purchasing habits, to make inferences about future choices or preferences.

Machine learning comes in three forms: supervised, unsupervised and reinforcement learning. Most practical applications of AI are found in supervised learning, which is used <u>when workers annotate images</u> that are fed into software. For instance, autonomous vacuums are taught how to clean without running into objects through the use of algorithms and the labeling of images of rooms that serve as training data for the technology.

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When people purchase mattresses online, customers' information is pooled into a large database and unsupervised learning finds patterns to predict future purchasing habits. Based on the actions of other customers who purchase mattresses, for example, the algorithm could determine that the person is likely to buy a bed frame next. Unsupervised learning is when a system goes on a fishing expedition to find underlying patterns in information without a specific goal in mind.



The AI bot Pluribus <u>beat five top poker players in Texas Hold 'em</u> through reinforcement learning — it improved its results by learning which bets were likely to win more money, and analyzed its hands afterward to determine whether alternatives would have yielded better results. In reinforcement learning, a system teaches itself through trial and error.



(James Abundis/Seattle Times)

Deep learning

Just as human brains learn to recognize various people through knowledge and experience, self-driving cars can be trained to recognize pedestrians and objects on roads through an AI subset called deep learning. Relying on numerous layers of algorithms to sift through and process large amounts of data,



(James Abundis/Seattle Times)

deep learning utilizes a web of computation models called "neural networks" that are designed to mimic human brains. The more driving experience the car has, the more likely it is to recognize humans in their various colors, shapes and sizes. This type of deep learning is also at work when Facebook suggests name tags on images that are uploaded to its platform. The technology called facial recognition analyzes a person's face by measuring the distance between facial features and uses algorithms to find a match.



Natural language processing

Have you wondered how Siri understands that you need the directions to Sammy's house and not the sandwich store? Or how a transcript of a voice mail is sent to your email inbox when you've missed a call? Thank <u>natural language processing</u> (NLP). NLP technology uses machine-learning algorithms that tag parts of speech and the relationships between words to analyze the meaning in text and audio. <u>Gmail's</u> <u>Smart Compose feature</u>, unveiled last year, takes NLP a step further by offering users suggestions to complete a sentence in the body of an email.

Deepfake technology

Another new application of AI, deepfake technology, uses deep learning models to manipulate photos and videos to create realistic images of people doing or saying something they never did, sometimes for nefarious reasons. Watch out for deepfake videos that depict fabricated political speech in the upcoming election cycle!

Region is an AI hub

The presence of the two tech giants Amazon and Microsoft has made the Puget Sound area a veritable hub for artificial intelligence. Combine those with the University of Washington, and "we have a strong flow of really talented scientists and engineers who've grown to call Seattle home," said Eric Boyd, who oversees development of Microsoft's AI tools.

Microsoft's cloud-computing service for artificial intelligence, Azure AI, allows developers and data scientists to easily add capabilities such as translation and image recognition to their projects. For office workers, AI tools in <u>Microsoft 365</u> offers suggestions to complete projects in Word, PowerPoint and Excel. AI-powered speech recognition tools in the translation and transcription service Translator are also used in <u>lectures to provide captions</u> on a screen for students who are deaf or hard of hearing.



(James Abundis/Seattle Times)

One-way Amazon is transforming the retail sector is through its checkout-free shopping at Amazon Go. Amazon Go uses computer vision, multiple sensors and deep learning — the



same technologies found in autonomous cars — to automatically detect when a customer takes items from shelves and walks out of the store. An Al-powered feature on the Amazon app called StyleSnap allows shoppers to customize their wardrobes by uploading a photo or screenshot of a style they admire. The StyleSnap option uses computer vision and deep learning to classify the clothes and offer recommendations for similar items found on the site that match the shopper's desired look.

Meanwhile, the Amazon virtual assistant Alexa uses natural language processing and machine-learning algorithms to enable more than 90,000 tasks, such as listening to music on command, calling friends and family, booking hotel rooms and controlling light switches.

"We have been working with advanced technologies like machine learning for decades, but we are only in the beginning stages of understanding the possibilities and how invention can improve lives for good by helping solve the big (and small) problems we all face every day," Amazon's Vice President of the Core Al team, Pat Bajari, said in an email.

Still scared?

Meanwhile, AI technology is transforming the retail, automotive and hospitality industry worldwide. Automated check-ins and robots are becoming more commonplace in hotels, and retail stores such as Walmart have rolled out autonomous floor cleaners and smart conveyor belts to keep up with competitors such as Kroger and Whole Foods.

Concerned about job security, hotel workers around the nation have created contract language that grants employees some say in the deployment of technology. In recent months, dockworkers have protested and launched petitions to thwart projected job losses after the Port of Los Angeles' decision to deploy automated vehicles.

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At the NVIDIA robotics lab in Seattle's University District, lab head Dieter Fox works with an AI-powered robot in a simulated kitchen environment. (Steve Ringman / The Seattle Times)

Some AI experts argue it is unrealistic to expect all manual laborers to become data analysts. Society should redirect people who lack higher education to jobs that draw on the uniquely human trait of empathy, said Oren Etzioni, CEO of the Seattle-based Allen Institute for Artificial Intelligence. As a step to finding new careers for people displaced by advancements in artificial intelligence and automation, Etzioni has suggested wage increases for caregivers and the creation of government programs to train a new generation of caretakers.

"You don't want a robot taking care of your baby; an ailing elder needs to be loved, to be listened to, fed, and sung to. This is one job category that people are - and will continue to be

 best at," Etzioni wrote in a Wired article.



Predictions are all over the map about whether technology will usher in new work to offset the loss of jobs to artificial intelligence in upcoming years. The manufacturing industry will be hit the hardest, according to a <u>recent Oxford Economics report</u> that found 20 million manufacturing jobs will be lost by 2030. On a more positive note, a 2018 report from <u>World Economic Forum — a nonprofit composed of the world's 1,000 top companies</u> — predicts that while 75 million jobs will be displaced by automation, it will generate 133 million new roles across all industries within the next three years if workers receive continuous retraining.

What's the future of AI?

There's already a backlash against the application of some forms of AI technology. In recent months, several cities and states have banned or considered a <u>moratorium on facial-recognition</u> technology after reports of its potential for misuse. A recent <u>Washington Post investigation</u>, for instance, showed Immigration and Customs Enforcement and Federal Bureau of Investigation agents used the software to scan millions of Americans' driver's licenses without their consent in order to track down undocumented immigrants and identify suspects.

A growing number of AI experts and politicians agree that the advancements in AI have outpaced government regulation. Technology companies <u>such as Microsoft</u>, followed <u>by Amazon</u>, have urged Congress to issue <u>federal guidelines on the use of facial-recognition technology</u>.

Meanwhile, some politicians seek to expand government support of AI. U.S. Sen. Martin Heinrich (D-N.M.), Rob Portman (R-Ohio), and Brian Schatz (D-Hawaii) introduced legislation in May to fund AI developments over the next 10 years. Backers say the <u>bipartisan Artificial Intelligence Initiative Act</u> seeks to prepare an AI workforce and deploy ethically responsible AI tools for private, government and academic use.

Although the next stop remains unknown, the Al train isn't stopping anytime soon. As World Economic Forum Founder and Executive Chairman Klaus Schwab aptly <u>summarized the Fourth Industrial</u> <u>Revolution</u>, "There has never been a time of greater promise or greater peril."



"The good news is I have discovered inefficiencies. The bad news is that you're one of them."







CBRNe World Source: <u>https://www.academia.edu/4999305/CBRN_recce_systems?email_work_card=view-paper</u>

Hazmat Challenge Tests Responders' Skills in Simulated Emergencies

Source: http://www.homelandsecuritynewswire.com/dr20190821-hazmat-challenge-tests-responders-skills-in-simulated-emergencies



Aug 21 – Ten hazardous materials response teams from Nebraska, New Mexico, Oklahoma and Tennessee are testing their skills in a series of graded exercises Aug. 19-23 at Los Alamos National Laboratory's Hazmat Challenge.

"The Challenge provides a unique training venue for hazmat responders where they are able to test and develop their technical response capabilities in a difficult but safe environment," said Jeff Dare, group leader for Emergency Response at Los Alamos National Laboratory.



"Recent upgrades to our Emergency Response Training Center have allowed us to create the most challenging scenarios yet."

LANL <u>says</u> that the event, held at Los Alamos, requires participants to respond to simulated hazardousmaterials emergencies involving aircraft, rail and highway transportation, industrial piping, a biological lab, a confined space event, and more. The finale of the Hazmat Challenge is a skills-based obstacle course. Teams are graded and earn points based on their ability to perform response skills through a 10-station obstacle course while using fully encapsulating personal protective equipment.

The Laboratory began the Hazmat Challenge in 1996 to hone the skills of its own hazmat team members. The event is now a comprehensive training opportunity in a competitive format that is open to all hazardous materials response teams across the nation. The winning team receives a traveling trophy and top-scoring teams in the technical categories are awarded permanent trophies. Separate trophies will be awarded to the three top scoring teams in the obstacle course event.



CBRNe Word

Source: https://www.academia.edu/4999304/The_use_of_UAVs_as_CBRN_detection_platforms?email_work_card=title



Emergency management of biohazard events outbreak on ship and hospital

By Luca Zelinotti

DISSERTATION

University of Rome Tor Vergata – Intern CBRNe Masters

Source: https://www.academia.edu/33312441/Emergency_management_of_biohazard_events_outbreac_k_on_ship_and_hospital?auto=download_

In this context we analyze two cases about development of biological event: the first-one in confined environment like a ship, instead of second in a dynamic and critical environment for the system as a hospital. Through the analysis of case happened, tabletop simulation, and the opinion of expert as doctors, firefighters, and rescue workers, we evaluate the hazard and we analyze the effect on the system, and how to interface The risk assessment is development the impact on systems, and how to interface with the national health system and its weakness. Analyzing the current system of response to events, there are analysis of the critical points. Moreover, it evaluates the current state of the art and the actors involved, their training and skill. Through the analysis of the critical points are identified solutions to optimize and improve the system.

The Jihadist CBRN Threat

Source: https://worldview.stratfor.com/article/jihadist-cbrn-threat

2010 - In an interview aired Feb. 7 on CNN, U.S. Secretary of State Hillary Clinton said she considers weapons of mass destruction (WMD) in the hands of an international terrorist group to be the largest threat faced by the United States today, even bigger than the threat posed by a nuclear-armed Iran. "The biggest nightmare that many of us have is that one of these terrorist member organizations within this syndicate of terror will get their hands on a weapon of mass destruction," Clinton said. In referring to the al Qaeda network, Clinton noted that it is "unfortunately a very committed, clever, diabolical group of terrorists who are always looking for weaknesses and openings." Clinton's comments came on the heels of a presentation by U.S. Director of National Intelligence Dennis Blair to the Senate Select Committee on Intelligence. In his Annual Threat Assessment of the U.S. Intelligence Community on Feb. 2, Blair noted that, although counterterrorism actions have dealt a significant blow to al Qaeda's nearterm efforts to develop a sophisticated chemical, biological, radiological and nuclear (CBRN) attack capability, the U.S. intelligence community judges that the group is still intent on acquiring the capability. Blair also stated the obvious when he said that if al Qaeda were able

to develop CBRN weapons and had the operatives to use them it would do so. All this talk about al Qaeda and WMD has caused a number of STRATFOR clients, readers and even friends and family members to ask for our assessment of this very worrisome issue. So, we thought it would be an opportune time to update our readers on the topic.

Realities Shaping the Playing Field

To begin a discussion of jihadists and WMD, it is first important to briefly re-cap STRATFOR's assessment of al Qaeda and the broader jihadist movement. It is our assessment that the first layer of the jihadist movement, the al Qaeda core group, has been hit heavily by the efforts of the United States and its allies in the aftermath of 9/11. Due to the military, financial, diplomatic, intelligence and law enforcement operations conducted against the core group, it is now a far smaller and more insular organization than it once was and is largely confined geographically to the Afghan-Pakistani border. Having lost much of its operational ability, the al Qaeda core is now involved primarily in the ideological struggle (which it seems to be losing at the present time). The second layer in



the jihadist realm consists of regional terrorist or insurgent groups that have adopted the jihadist ideology. Some of these have taken up the al Qaeda banner, such as al Qaeda in the Islamic Maghreb (AQIM) and al Qaeda in the Arabian Peninsula (AQAP), and we refer to them as al Qaeda franchise groups. Other groups may adopt some or all of al Qaeda's jihadist ideology and cooperate with the core group, but they will maintain their independence for a variety of reasons. In recent years, these groups have assumed the mantle of leadership for the jihadist movement on the physical battlefield. The third (and broadest) component of the jihadist movement is composed of grassroots jihadists. These are individuals or small groups of people located across the globe who are inspired by the al Qaeda core and the franchise groups but who may have little or no actual connection to these groups. By their very nature, the grassroots jihadists are the hardest of these three components to identify and target and, as a result, are able to move with more freedom than members of the al Qaeda core or the regional franchises. As long as the ideology of jihadism exists, and jihadists at any of these three layers embrace the philosophy of attacking the "far enemy," there will be a threat of attacks by jihadists against the United States. The types of attacks they are capable of conducting, however, depend on their intent and capability. Generally speaking, the capability of the operatives associated with the al Qaeda core is the highest and the capability of grassroots operatives is the lowest. Certainly, many grassroots operatives think big and would love to conduct a large, devastating attack, but their grandiose plans often come to naught for lack of experience and terrorist tradecraft. Although the American public has long anticipated a follow-on attack to 9/11, most of the attacks directed against the United States since 9/11 have failed. In addition to incompetence and poor tradecraft, one of the contributing factors to these failures is the nature of the targets. Many strategic targets are large and well-constructed, and therefore hard to destroy. In other words, just because a strategic target is attacked does not mean the attack has succeeded. Indeed, many such attacks have failed. Even when a plot against a strategic target is successfully executed, it might not produce the desired

results and would therefore be considered a failure. For example, the detonation of a massive truck bomb in a parking garage of the World Trade Center in 1993 failed to achieve the jihadists' aims of toppling the two towers and producing mass casualties, or of causing a major U.S. foreign policy shift. Many strategic targets, such as embassies, are well protected against conventional attacks. Their large standoff distances and physical security measures (like substantial perimeter walls) protect them from vehicle-borne improvised explosive devices (VBIEDs), while these and other security measures make it difficult to cause significant damage to them using smaller IEDs or small arms. To overcome these obstacles, jihadists have been forced to look at alternate means of attack. Al Qaeda's use of large, fully fueled passenger aircraft as guided missiles is a great example of this, though it must be noted that once that tactic became known, it ceased to be viable (as United Airlines Flight 93 demonstrated). Today, there is little chance that a flight crew and passengers of an aircraft would allow it to be seized by a small group of hijackers.

CBRN

Al Qaeda has long plotted ways to overcome security measures and launch strategic strikes with CBRN weapons. In addition to the many public pronouncements the group has made about its desire to obtain and use such weapons, we know al Qaeda has developed crude methods for producing chemical and biological weapons and included such tactics in its encyclopedia of jihad and terrorist training courses. However, as STRATFOR has repeatedly pointed out, chemical and biological weapons are expensive and difficult to use and have proved to be largely ineffective in realworld applications. A comparison of the Aum Shinrikyo chemical and biological attacks in Tokyo with the March 2004 jihadist attacks in Madrid clearly demonstrates that explosives are far cheaper, easier to use and more effective in killing people. The failure by jihadists in Iraq to use chlorine effectively in their

attacks also underscores the problem of using improvised chemical weapons. These problems were also apparent to the



al Qaeda leadership, which scrapped a plot to use improvised chemical weapons in the New York subway system due to concerns that the weapons would be ineffective. The pressure jihadist groups are under would also make it very difficult for them to develop a chemical or biological weapons facility, even if they possessed the financial and human resources required to launch such a program. Of course, it is not unimaginable for al Qaeda or other jihadists to think outside the box and attack a chemical storage site or tanker car, or use such bulk chemicals to attack another target - much as the 9/11 hijackers used passenger- and fuelladen aircraft to attack their targets. However, while an attack using deadly bulk chemicals could kill many people, most would be evacuated before they could receive a lethal dose, as past industrial accidents have demonstrated. Therefore, such an attack would be messy but would be more likely to cause mass panic and evacuations than mass casualties. Still, it would be a far more substantial attack than the previous subway plot using improvised chemical weapons. A similar case can be made against the effectiveness of an attack involving a radiological dispersion device (RDD), sometimes called a "dirty bomb." While RDDs are easy to deploy - so simple that we are surprised one has not already been used within the United States - it is very difficult to immediately administer a lethal dose of radiation to victims. Therefore, the "bomb" part of a dirty bomb would likely kill more people than the device's "dirty," or radiological, component. However, use of an RDD would result in mass panic and evacuations and could require a lengthy and expensive decontamination process. Because of this, we refer to RDDs as "weapons of mass disruption" rather than weapons of mass destruction. The bottom line is that a nuclear device is the only element of the CBRN threat that can be relied upon to create mass casualties and guarantee the success of a strategic strike. However, a nuclear device is also by far the hardest of the CBRN weapons to obtain or manufacture and therefore the least likely to be used. Given the pressure that al Qaeda and its regional franchise groups are under in the post-9/11 world, it is simply not possible for them to begin a weapons program intended to design and build a nuclear device.

Unlike countries such as North Korea and Iran. jihadists simply do not have the resources or the secure territory on which to build such facilities. Even with money and secure facilities, it is still a long and difficult endeavor to create a nuclear weapons program — as is evident in the efforts of North Korea and Iran. This means that iihadists would be forced to obtain an entire nuclear device from a country that did have a nuclear weapons program, or fissile material such as highly enriched uranium (enriched to 80 percent or higher of the fissile isotope U-235) that they could use to build a crude, gun-type nuclear weapon. Indeed, we know from al Qaeda defectors like Jamal al-Fadl that al Qaeda attempted to obtain fissile material as long ago as 1994. The organization was duped by some of the scammers who were roaming the globe attempting to sell bogus material following the collapse of the Soviet Union. Several U.S. government agencies were duped in similar scams. Black-market sales of military-grade radioactive materials spiked following the collapse of the Soviet Union as criminal elements descended on abandoned Russian nuclear facilities in search of a quick buck. In subsequent years the Russian government, in conjunction with various international agencies and the U.S. government, clamped down on the sale of Soviet-era radioactive materials. U.S. aid Russia in the form of so-called to "nonproliferation assistance" — money paid to destroy or adequately secure such nuclear and radiological material — increased dramatically following 9/11. In 2009, the U.S. Congress authorized around \$1.2 billion for U.S. programs that provide nonproliferation and threat reduction assistance to the former Soviet Union. Such programs have resulted in a considerable amount of fissile material being taken off the market and removed from vulnerable storage sites, and have made it far harder to obtain fissile material today than it was in 1990 or even 2000. Another complication to consider is that jihadists are not the only parties who are in the market for nuclear weapons or fissile material. In addition to counterproliferation programs that

offer to pay money for fissile materials, countries like Iran and North Korea would likely be quick to purchase such items, and they have the resources to do so, unlike



jihadist groups, which are financially strapped. Some commentators have said they believe al Qaeda has had nuclear weapons for years but has been waiting to activate them at the "right time." Others claim these weapons are prepositioned inside U.S. cities. STRATFOR's position is that if al Qaeda had such weapons prior to 9/11, it would have used them instead of conducting the airline attack. Even if the group had succeeded in obtaining a nuclear weapon after 9/11, it would have used it by now rather than simply sitting on it and running the risk of it being seized. There is also the question of state assistance to terrorist groups, but the actions of the jihadist movement since 9/11 have served to steadily turn once quietly supportive (or ambivalent) states against the movement. Saudi Arabia declared war on jihadists in 2003 and countries such as Yemen, Pakistan and Indonesia have recently gone on the offensive. Indeed, in his Feb. 2 presentation to the Senate committee, Blair said: "We do not know of any states deliberately providing CBRN assistance to terrorist groups. Although terrorist groups and individuals have sought out scientists with applicable expertise, we have no corroborated

reporting that indicates such experts have advanced terrorist CBRN capability." Blair also noted that, "We and many in the international community are especially concerned about the potential for terrorists to gain access to WMDrelated materials or technology." Clearly, any state that considered providing WMD to jihadists would have to worry about blow-back from countries that would be targeted by that material (such as the United States and Russia). With jihadists having declared war on the governments of countries in which they operate, officials in a position to provide CBRN to those jihadists would also have ample reason to be concerned about the materials being used against their own governments. Efforts to counter the proliferation of nuclear materials and technology will certainly continue for the foreseeable future, especially efforts to ensure that governments with nuclear weapons programs do not provide weapons or fissile material to jihadist groups. While the chance of such a terrorist attack is remote, the devastation one could cause means that it must be carefully guarded against.

Royal staff placed in quarantine after white supremacist sent letter containing fake poison to the Queen, court hears

Source: https://theworldnews.net/uk-news/royal-staff-placed-in-quarantine-after-white-supremacist-sent-letter-containing-fake-poison-to-the-queen-court-hears

Sept 02 – Royal staff were placed in quarantine after a white supremacist sent a letter containing fake poison to the Queen, a court has heard.

A Chemical Biological Radiological Nuclear (CBRN) response was launched after a self-styled "Muslim



Slayer" sent the package along with a note saying: "The Clowns R Coming 4 You".

David Parnham, 36, sent similar letters containing white powder to then-prime minister Theresa May, two bishops and the Home Office in October 2016, making an apparent reference to reports of attacks by people dressed up as clowns, the Old Bailey heard.

Members of the Royal Household, believed to be Buckingham Palace, were left concerned for their health and

the well-being of their colleagues. Some were kept separate from other staff for hours as the substance was being identified. Parnham also caused widespread fear and upset through a '<u>Punish A Muslim Day'</u> hate campaign, the court heard.



Liberal Democrat peer Lord Hussain told of his "total shock" at receiving one of the poison letters. It had been forwarded to him from the House of Lords to his home address while he was unwell. He wrote in a victim impact statement read out in court: "As I read it for the first time I felt total shock at

its contents as well as fear, not only for myself but for my family, my home and all other Muslims.

In December 2016, Parnham sent a fan letter to Dylann Roof, a white supremacist responsible for shooting nine black parishioners dead in Charleston, South Carolina.

He told Roof: "I just wanted to thank you for opening my eyes. Ever since you carried out what I'd call the 'cleansing' I've felt differently about what you'd call 'racial awareness'."

In February 2007, letters were sent to various mosques and Islamic centres around the county.

A letter to Berkeley Street Mosque in

Hull contained a drawing of a sword with a swastika on it cutting someone's head off, with the words "You are going to be slaughtered very soon".

The author signed off as "Muslim Slayer".

In 2018, the series of typed "Punish A Muslim Day" letters were sent out to a large number of people, encouraging violence on the April 3 2018 - Roof's birthday.

Parnham was caught through DNA, handwriting and fingerprints on the letters.

Judge Anthony Leonard QC indicated that he would complete sentencing on Tuesday.

"I have lived in this country for 47 years and have never before seen or read anything like this."

Parnham, from Lincoln, has pleaded guilty to 15 offences relating to hundreds of letters penned between June 2016 and June 2018.

He has admitted encouraging murder, making hoaxes involving noxious substances and bombs, sending letters with intent to cause distress, and encouraging offences.

The court heard that Parnham claimed he did not remember writing to the Queen.

Parnham's activities first came to the attention of authorities in July 2016 when seven of letters were intercepted at Sheffield mail centre and found to contain harmless white powder.

A further 11 letters were identified as having been delivered.

A letter to former PM David Cameron contained the wording "Allah is great", while letters to MPs and mosques contained the wording "Paki Filth".

In October 2016, more letters containing white powder stated that "the clowns R coming 4 you" and were intended to reach the Queen and Mrs May.

Is Level A still the best PPE choice for HazMat professionals?

By Steven Pike

Source: https://www.argonelectronics.com/blog/level-a-ppe-hazmat-professionals

Sep 04 – For the last thirty plus years, the <u>HazMat training</u> community has looked to Level A personal protective equipment (PPE) as the best way to safeguard HazMat specialists and first responders when handling chemical incidents.

But is Level A protection always the best choice? And are there some situations where Level A might actually be causing more harm than it does good?



These were just a few of the questions that were raised in a recent <u>podcast</u> interview on the online HazMat forum <u>The HazMat Guys</u>, featuring personnel protection expert Jeff Stull from the <u>'Rethink Level A'</u> campaign.



Level A all the way?

Stull has more than <u>thirty-five years' experience</u> in HazMat, including working with elite response teams within the US coastguard. And in the podcast he puts forward some compelling arguments for rethinking the current reliance on Level A protection.

As he explains: "At the time, we were trying to have the best PPE...and we thought that we had to protect against everything. We developed suits with commercial companies and they came out with this high tech stuff - and that's how we got the encapsulating suits that we're using today.

"But since then we've learned that, just like everything else, HazMat's gotten smarter. They are better trained, they have better awareness and they've got <u>better tools</u>."

Rethinking Level A protection

<u>PPE clothing</u> relies on material integrity that keeps out vapours and liquids - and the high-tech and totally encapsulating nature of Level A has long been believed to offer the highest level of protection. All PPE however constrains your ability to sense and feel.

And, as Stull argues, the encapsulating nature of Level A protection can mean there's more risk of operators being prevented from doing their job than there is of them being exposed to the chemical.

Heat stress is a major concern - as is impaired sensory awareness which can lead to physical mishaps. If you're concerned about tripping, about getting into a small space, or about running a monitor, he says, then you're being distracted from your true focus of mitigating and assessing the scene.

Stull also raises the point that it is not just specialist HazMat teams who are using Level A.

As he explains, Level A was originally the standard for CBRN protection - but these days the same equipment is also being used by non-specialist personnel (such as law enforcement, DoD etc) who often prefer a more user-friendly form of PPE.

Achieving safe and effective mission response

Stull believes it's important not to underestimate the role that response tactics have to play when it comes to monitoring the scene and limiting exposure.

The ability to manage the environment, to control the way in which people enter that environment, when they go in and how long they stay there are all significant factors, he says.



What's more, an incident that might be considered a Level A entry when approached from one direction may be a completely different matter when approached from a different entry point, and when factors such as wind and positive pressure are taken into consideration.

Changing trends in PPE

Mobility, maneuverability and functionality are vital for safe and effective mission response - but, says Stull, this isn't always achievable when wearing an encapsulating suit.

And that's why, he says there's been a shift towards the use of more form-fitting clothing that offers personnel the level of chemical protection they need but that also gives them the ability to access confined spaces, to safely negotiate uneven ground - and even to climb up and down ladders.

Naturally, he says, not all form fitting suits are created equal. Many manufacturers still choose to focus on the material, but it's also about the design, the seal and the interfaces. Chemicals will always take path of least resistance, so the integrity of the sleeves, zipper, the face seal, the boots are all key.

Choosing the appropriate PPE for the given task and the given situation is crucial for increasing responder safety.

And given that HazMat teams have so much training, awareness and technology at their disposal - there is a compelling argument for giving personnel a greater choice of clothing that reflects that advanced level of training and capability.

By offering HazMat teams with protective wear that's more form-fitting, says Stull, HazMat teams can focus their energy on what's important, they can work faster and they can limit their exposure.

An Overdue Modernization of HazMat PPE

By Jeffrey Stull and Christina Baxter

Source: https://rethinklevela.com/blog/f/an-overdue-modernization-of-hazmat-ppe

[excerpts from chapter in HDIAC entitled "The Evolution of Protective Equipment for Disaster Response"; published in the 2018 HDIAC Department of Defense Considerations for Disaster Response State of the Art Report]

June 2019 – The implementation of a hierarchy of industrial hygiene practices is a fundamental methodology for protecting people from workplace hazards. Where a workplace hazard is identified, avoiding the hazard altogether or substituting alternative materials or processes should be considered first. If avoidance or alternatives are not possible, engineering and administrative controls may protect against an identified hazard or address how the work is performed. Even where engineering or administrative controls are possible, personal protective equipment (PPE) remains as a last line of defense. For first responders to hazardous materials (HazMat) incidents, PPE is an essential safeguard for individual protection when action is needed to save lives and protect property.

Most chemical protective ensembles were designed for industrial applications and later adapted for emergency response use. It has only been the more recent ensembles designed to meet the NFPA 1994 specifications that have been designed specifically for a disaster response scenario. Unfortunately, PPE is often purchased in small lots by a widely distributed network of independent procurement activities, especially in the United States. This is due to the vast number of emergency response organizations, managed at the local level. The broad user profiles and the infrequent use of products leads to a slow research and development process by companies as the procurement rate does not allow the manufacturers to amortize the development costs in a timely manner. In addition, there are significant mission and cultural differences within the emergency response community which has resulted in uneven adoption of existing standards and, in many cases, uneven adoption of the legal requirements set forth by OSHA.

The most significant driver for current material technology are the various tests that are applied for qualifying product materials and components. Early philosophies towards the evaluation of protective clothing materials has involved relatively severe challenge conditions that minimize choices of products that can provide greater levels of comfort and



function. The development of NFPA 1994 and its ensuing revisions has led to the classification of ensemble levels. Unlike what had previously existed through the use of NFPA 1991/NFPA 1992 alone. The recognition that many exposures will be incidental coupled with material technology that can achieve high levels of evaporative heat loss is leading to products that can be worn more comfortably and functionally under range of conditions. Separating biological and radiological particle hazards from chemical hazards as one part of the hazardous material PPE strategy is another means for allowing first responders to have optimal levels of protection. Just as turnout clothing uses total heat loss the balance thermal insulation, the same types of practices will ensue in hazardous materials protective clothing industry as the industry validates new material solutions with commensurate exposure hazard levels. Over the past 3 decades, there has been considerable focus on the quality of totally encapsulating chemical protective suits representing the Level A performance, which is further defined by compliance with NFPA 1991. Nevertheless, the use of Level A ensembles represents only a fraction of the overall use of PPE for hazardous materials response. Moreover, many of the exposure levels used for qualifying these ensembles is well in excess of the maximum exposed conditions to which responders face in actual incidents. Emergency responders increasingly desire more tactically oriented ensembles for which encapsulating suits cannot deliver the requisite functional performance. To this end, there are different government-sponsored projects that are focused on providing new ensembles that use relatively high, but credible levels of chemical resistance and overall integrity tests for defining ensembles that can provide Level A performance. The acceptance of these products will likely change the spectrum of hazardous materials response PPE.

Why Encapsulating Hazmat Suits are PPE Dinosaurs

By Jeffrey O. and Grace G. Stull

Source: https://rethinklevela.com/blog/f/why-encapsulating-hazmat-suits-are-ppedinosaurs

June 2019 – Both Suit Design and Testing Need a Complete Overhaul to Better Match Real-World Needs

More than 30 years ago, hazardous materials response teams emerged as the new area of specialization within the fire service in the wake of Love Canal and other chemical spill disasters. At the time these teams were forming, PPE offerings were meager.

Many of the products were either military hand-me-downs, designed mainly for chemical warfare agents. Or, they were of a general industrial design with inferior materials. The Environmental Protection Agency evolved its levels of protection, and OSHA published new regulations aimed at both hazardous waste remediation and emergency response (commonly referred to as "Hazwoper"), setting the stage for a complete hazardous materials industry PPE overhaul.

For fire service hazmat teams, the protective suits were split along the EPA levels with totally encapsulating suits and liquid splash suits. Rubber suits that encapsulated both the wearer and their breathing apparatus were established as the high-end products while conventional rainwear was adapted for splash protection.

Being for the worst case and representing potential unknown exposure conditions then typical for hazmat incidents, much of the industry product development focused on Level A. New test methods had only recently been developed for chemical permeation resistance, which could measure chemical passage through the material on a molecular level.

Do no harm

This material testing was supplemented with the seemingly sensible inflation tests to demonstrate the "gas-tight" quality of the suits, evaluations that could even be done in the field. The need for broad chemical resistance for all parts of the ensemble — suit, visor,



gloves and footwear and their seams — gained acceptance and redefined the ideal product characteristics following a National Transportation Safety Board investigation of face shield cracks in chemical protective suits.

Supplemented by the concept that the product should do no harm, a flame resistance requirement was established. The ensuing products clearly provided an envelope of protection around the end user.

At first, the products that met NFPA 1991 applied two different material strategies. One approach built all of the pertinent performance properties in a single layer. The second combined a flame resistant cover over a chemical layer.

At about the same time, the industry was forced in transitioning from traditional rubber suits to new plastic laminates — many representing new material technologies. Alternatively, a class of relatively light-weight, disposable materials made their entry into the market. All of these products were generally more cumbersome, less flexible, and often more expensive than the products they replaced.

'Duct tape' solution

While a great deal of product development was undertaken to address vapor-protection in totally encapsulating suits, this was not the case for the Level B splash suits addressed by NFPA 1992. The original products were generally of an encapsulated or other encumbering design that first responders did not want.

Also, hazmat teams regarded the risks to be significantly less and considered products meeting the standard as being not as critical for their response capabilities. Those factors combined with a lack of ingenuity on the part of most manufacturers in dealing with suit interfaces (with gloves and respirator facepieces) generally meant relatively little change for industry offerings. The "duct tape" solution seemed to be the most common approach for attaining liquid splash protection.

The problem is that hazardous materials teams generally use liquid-splash protective ensembles the vast majority of the time — some teams estimate that Level B product use comprises 95 percent of their response calls. Hazmat teams make due with existing products by carefully sizing up the incident and training their personnel to avoid contamination.

On the other hand, vapor-protective suits that are generally certified to NFPA 1991 find dramatically less use but comprise a much greater consumption of industry attention, hazmat team training and department resources. Ask any hazmat responder if given the choice of which ensemble to wear and the answer will be hands down opting for splash suits.

Lacking ingenuity

The continued justification for NFPA 1991 suits remains the worst-case scenarios for a truly serious chemical release or high-risk set of circumstances. So, does this mean that Level A suits are used less for good operational, hazard assessment reasons or do hazmat teams generally try to find reasons for not wearing totally encapsulating suits?

We feel that the chemical-protective clothing industry is stuck in a rut with most of it lacking any kind of ingenuity. The focus appears to be mainly in developing new materials instead of addressing the fundamentals of design and practical protection.

This situation has been created by an overbearing standard, which is predicated on a technology that is now nearly 30 years old. For example, the encapsulating nature of these suits is established because of the logic that the SCBA must be protected from the exposure to chemicals. That might have been true in the 1980s, but now SCBA are rated for warfare agents.

There are also suits designed for much more deadly chemical and biological warfare with the SCBA outside the suit, but with a sophisticated interface.

Test failure

Then there is the convenient inflation test. This test does nothing more than demonstrate that the suit is free from small holes.



Testing involving challenge gases under dynamic use conditions show protection factors for encapsulating suits that are nearly equivalent to the SCBA. Yet, chemical toxicity effects on the skin require much higher concentrations than for inhalation exposures.

Thus, just moving an SCBA to the outside of the suit completely changes the form, fit, and the level of operational function. The same over design is present in the types of allowable materials. The material chemical testing drives the qualities of the material, not the operational environment.

Consider that materials must hold out detectable levels of chemicals for one hour under 100 percent concentration exposure conditions. This type of exposure simply does not happen — it would be the equivalent of swimming in the chemical. Remember, hazmat responders avoid direct exposures wherever possible.

If one then additionally includes the aspect of flame resistance, other disconnections between real protection needs and delivered performance become apparent. The current criteria for NFPA 1991 suits promotes a level of flame resistance that is more akin to turnout clothing than it is for suits used in environments where monitoring is a mainstay for assessing the risk of flash fire.

Regulation makeover

If the operational parameters have changed and the tests that most influence encapsulating suits are no longer valid for defining levels of chemical protection, then should there not be a complete makeover of NFPA 1991 and the products it defines?

We say yes.

The greatest hazard of an encapsulating suit is the suit itself. Hardly any other type of personal protective equipment used by the fire service is more encumbering than a Level A suit.

Response teams only wear these suits when they have to. And when they do, they are more likely to be affected by heat stress and dangerous decrements of function and mobility than they are likely to be exposed to chemicals.

Certainly chemical protection goals must not be sacrificed, but there can be no question that the current forms of HazMat encapsulating suits should be facing extinction and give rise to a new generation of practical, appropriately-designed high end chemical protective ensembles.

New, More Comfortable Hazmat PPE Coming

By Jeffrey O. and Grace G. Stull

Source: https://rethinklevela.com/blog/f/new-more-comfortable-hazmat-ppe-coming

June 2019 – Personal protective equipment for hazardous materials response may seem like one of those areas where the technology has evolved to maturity. After all, over the past three decades we have seen a transformation of rubber-based hand-me-down suits from the military to a new wide range of lightweight plastic-based products and other innovations that seemingly make protection during chemical incidents easier and safer. Yet, there are significant challenges arising for the hazmat PPE world. What has been conventionally divided between Level A total-encapsulating suits and Level B splash-protective clothing as defined by the EPA and OSHA is no longer deemed the right hierarchy of performance. Moreover, with improvements in how firefighters engage in hazardous materials responses along with new tools, the demands for traditional PPE are changing. So are the standards that regulate hazmat PPE.

In the past, first responders often had to assume worst-case conditions because of the unknown circumstances for the release of various chemicals unless the incident involved obvious telltale clues. Certainly, hazmat response has been predicated on a careful upfront assessment for individuals are put into potentially hazardous environments.

Nevertheless, thanks to widespread training, the use of smaller, more capable monitoring devices and a variety of PPE to choose from, hazmat teams have a more sophisticated approach in identifying and mitigating hazardous materials incidents. Rarely, does he hazmat team enter an unknown situation.



Due in part to OSHA regulations, nearly all firefighters receive some form of hazardous materials response training. This training teaches firefighters to properly identify scene hazards and take appropriate initial steps for sizing up an incident.

More advanced training for technician and operational levels further provides a good foundation for instructing first responders how to remain safe and properly mitigate particular incidents. Less expensive but comprehensive monitors combined with a variety of online and otherwise available assessment tools further the level of information available to hazmat responders.

Thanks to overly robust standards for PPE, different clothing options have evolved to those including a range of high-end materials and components that are amply capable of providing exceptional barrier protection.

Legacies dictate design

Many products are certified to the different standards that include NFPA 1991 for vapor protective ensembles, which was intended to replace the Level A vernacular. Many meet NFPA 1992 requirements for the lesser protective liquid splash protective ensembles, the equivalent of Level B splash suits.

While there are seemingly more high-end materials available, conventional suit designs have remained static. Level A suits remain body bags with arms and legs. And many splash suits, especially those not certified to NFPA standards, have dubious liquid protection capabilities.

With their increased sophistication, hazmat personnel want greater mobility, and there is a greater need for tactical-like operations in several types of responses. The problem is that the primary focus for hazmat PPE has been on materials science and their performance against various hazardous chemicals.

The industry transitioned from rubber-based elastomeric materials with known multiple limitations in providing protection against specific chemical classes to exceptionally thick and expensive specialized Teflon laminates to finally relatively thin plastic film composites.

The latter materials show a high degree of permeation resistance against a wide range of chemicals and, in many cases, hold out these chemicals for eight hours or more. While this may be seen as a significant benefit to first responders, the overemphasis on material technology has been at the expense of product design.

Part of this problem is due to overly rigorous material chemical resistance testing that has eliminated options for more flexible and comfortable materials.

An alternative approach

Hazardous materials first responder simply felt that being uncomfortable and restricted was part of the job as the industry maintained its position for fabrics highly resistant to plastic-based chemicals. However, after 9/11 there came a range of clothing dedicated to chemical and biological terrorism response – commonly called CBRN PPE.

Many of these suits are different. This is because the materials are used for a broader range of first responders other than the highly trained hazmat teams. These first responders need clothing that is easier to don and wear.

CBRN responders were provided products that, while having less chemical resistance, were more functional. This approach acknowledged the expected circumstances of diminished chemical or biological threats that exist following the terrorism incident, such as contaminated victims and environments rather than ongoing releases.

Thus, the differences in clothing choices became more manifest. Many can remember how different response teams outfitted their members to white powder calls in everything ranging from encapsulating suits to relatively deficient disposable clothing.

A new standard emerged in the form of NFPA 1994 that positioned products for the broader first responder population but also accounted for more realistic material performance levels. This led to more flexible and formfitting clothing designs.

Interestingly, the departments that used both the conventional NFPA 1991 and NFPA 1992 for hazmat and NFPA 1994 clothing for CBRN found that they generally preferred CBRN



clothing. Responders found they could more easily perform tasks and be more comfortable than they could in the old Level A and Level B outfits.

The future

The trend toward better fitted clothing has influenced key standards. NFPA 1991, which remains the standard for totally encapsulating suits, has continued its past trend with only minor modifications.

NFPA 1992 has been somewhat repositioned to allow for more practical designs that ensure appropriate levels of liquid protection as originally intended including evaluation of materials against chemicals that are now operationally relevant.

However, the largest change came from the revision of NFPA 1994.

The scope of that standard has been broadened to include not only CBRN terrorism response and all types of hazardous materials response, but an entirely new hierarchy of PPE has been defined. The standard also has been revised to include an alternative type of ensemble compared to the classical Level A ensemble.

The new clothing, known as a Class 1 ensemble, uses realistic levels of chemical resistance and define appropriate levels of overall clothing integrity and other protective qualities. These criteria advance more functional related products to allow hazmat first responders to safely deal with hazardous materials incidents more comfortably.

Other classes have been introduced to address options for rugged environment use and protection from accidental flash fire. A new revised NFPA 1994 is due to issue in May. Already there is activity in the marketplace to adjust clothing outfits for meeting these new needs.

The hope is that a transformation will take place in hazmat PPE as it has been driven in other areas to promote clothing systems that provide appropriate levels of protection without compromising needed function and sustained wearing capabilities.

The process is gradual, but every once one in a while it works.

Using ultracold atoms to find WMDs

Source: https://phys.org/news/2019-09-ultracold-atoms-wmds.html

Sept 05 – One problem in dealing with weapons of mass destruction is that they are well hidden. The key to finding them may be to change the methods we use to look. One such method is taking shape in a lab in the basement of Small Hall at William & Mary.

"Basically, we're making it so you can see what you can't see," said Seth Aubin, associate professor of physics at William & Mary.

Aubin recently received a grant from the U.S. Department of Defense's Defense Threat Reduction Agency to develop a new type of instrument capable of detecting hidden infrastructure for <u>weapons of mass</u> <u>destruction</u>.

"The agency is particularly interested in finding underground factories or missile silos, things like that," Aubin said, "but you could also use it for spotting submarines or even finding smuggling tunnels and caves."

In order to see the invisible, Aubin says, we first have to reconsider what it means to look. The human eye is designed to process light—or, when you're talking particle physics, photons. When we refer to something as "visible," Aubin explains, it typically means that the photons bouncing off that thing move at a wavelength our eyes can process and therefore see.

But what would happen if we changed our interpretation of "see" to account for something other than light? Aubin aims to do just that: find what's invisible in terms of light, but visible in terms of mass.

Aubin and his team (Bennett Atwater '20, Hantao "Tony" Yu '22, Ph.D. candidates Andrew Rotunno and Shuangli Du, and staff scientist Doug Beringer) are developing a device that uses <u>ultracold</u>

atoms to spot distortions in the Earth's gravitational field and "see" using matter instead of light.





"Photons are not that sensitive to gravity," Aubin said. "Things that are sensitive to gravity are things that have mass. The heavier it is, the more sensitive it is and <u>atoms</u> are way heavier than photons."

The idea is to mimic the process of optical interferometry, a precise way of making measurements by monitoring the constructive and <u>destructive interference</u> produced by wavelengths of light. This is how a global team of scientists, including several from William & Mary, were able to detect <u>gravitational waves</u> for the first time, an achievement worthy of the Nobel Prize.

"Basically, you take a <u>light beam</u> and make it go along two paths," Aubin said. "One path will be closer to something and its path will get distorted by gravity. When the beams recombine, you read out the phase difference and it can tell you a lot about what's out there. We're doing the same thing, except with atoms instead of photons."

It makes perfect sense if we leave our comfortable world of Newtonian physics and enter into the realm of quantum mechanics, where mass and energy are interchangeable, and all matter behaves like a wave at the <u>atomic level</u>.

"The idea is to use this method to measure the Earth's gravitational field to an insane precision, let's say part per billion," Aubin said. "That means you're measuring a number that's nine digits long. All the information is in that last digit. That last digit tells you the variation in the gravitational field. What causes it to vary is mass, mass that is missing, like a tunnel or a cave, or mass that's extra, like oil or iron or uranium ore."

It turns out that if you want to get insanely precise, you first have to get insanely cold. The lab uses atoms cooled to about a microkelvin of temperature, nearing absolute zero, the lowest temperature theoretically possible. In fact, the researchers use the coldest object in the universe, the Bose–Einstein condensate, to calibrate their instruments.

"One of the reasons we go so cold is because you don't have to go looking for the quantum mechanics, it comes looking for you," Aubin said. "Matter starts to behave like a wave, whether you like it or not."

Right now, the team is working with super-cold rubidium and potassium atoms, which are cooled using an array of carefully positioned lasers. Nearly half the lab space is dedicated to a table of lenses, mirrors and other optics. They're all oriented to create the perfect laser beam, which is transported to an atomzapping area via fiberoptic cable.

"When you first look at this, it looks like a gigantic mess," Aubin said, standing beside the optic table. "It is not messy, it's very well organized. For a large fraction of the elements here, if you move them 10 to 100 microns, nothing will work."

Aubin compares laser light photons to snowballs. A snowball is internally cold, but when it's lobbed your way and smacks against your skin, it feels hot. That's because the snowball had



a lot of kinetic energy. The photons in laser beams also have a lot of energy, and, like a snowball, are internally cold.

"Laser photons are very energetic, so if you are not clever about how you interact laser light with material, it'll get hot," Aubin said, "but if you are clever about how you interact it, you will actually transfer the coldness of the photons to something else, in this case, our atoms."

Once the atoms are cooled, they are held in a trap before being transferred onto a square-inch microchip, which supports a microwave magnetic field. The field will work to send the atoms along two separate paths before bringing them back together, whereupon the researchers will measure the atomic wavelengths for constructive or destructive interference.

"The chip is where all the physics happens," Aubin said, "but in order to make the physics happen, you need an entire room of equipment."

So far, the team has successfully changed the spin direction of two atoms, but they have yet to send the atoms along two separate paths. A larger-than-expected learning curve may in part be to blame.

"It turns out that microwaves are sort of the dark art of electrical engineering," Aubin said. "It's hard enough that it's not even taught to physicists, so we're teaching ourselves microwave engineering as we go along."

A team of undergraduate students are designing the microwave circuits to power the chip. They have had to do most of the fabrication in-house, Aubin said, gesturing to stacks of electronics scattered around the lab.

"We build most of the stuff that we need," Aubin said. "Typically, you can't buy it, because this stuff just doesn't exist. If you're doing something for the first time, you've got to invent your own tools."

PLA's only woman CBRN emergence rescue team

(People's Daily Online) 11:07, July 19, 2015



Photo shows the training scene of the only woman CBRN (Chemical, biological, radiological and nuclear) emergency rescue team in southwest China's Yunnan province in July. (Photo/81.cn)







EDITOR'S COMMENT: Any special reason for not wearing rubber gloves???





Restrict use of riot-control chemicals

By Dan Kaszeta *Nature* **573**, 27-29 (2019) Source: https://www.nature.com/articles/d41586-019-02594-5



Police fired tear gas to clear protesters during a demonstration in Hong Kong in August 2019. Credit: Anthony Kwan/Getty

Sep 03 – In the past few months, tear gas and pepper spray have been deployed to break up street protests in Hong Kong, Gaza, Paris and on the US–Mexico border. Police forces use these riot-control chemicals to clear crowds or to stop fighting. In theory, exposure should be minimal — a group should disperse within minutes to avoid the gas.

The line between civilian and military applications of these chemical agents is a fine one. Rules governing their use are confused. Reference books and training materials continue to cite toxicology studies from the 1950s. And those were done on animals and soldiers, not the public.

The chemicals involved are mainly CS (2-chlorobenzalmalononitrile, the primary component of tear gas) and OC (oleoresin capsicum, a chilli-pepper extract used in pepper spray). Tear gases were developed to harass the enemy or to clear bunkers and tunnels in conflicts such as the Vietnam War, as alternatives to deadly force. Pepper sprays came into use in the 1980s for police and self-defence use after being developed as an animal repellent in the 1960s.

Effects vary from person to person. They range from irritation to permanent injury and death. Occasionally, people are exposed to dangerous levels. Authorities might miscalculate how much agent to use. Someone with an injury or disability, or who is under restraint, might be unable to flee. This variation is not being considered when agents are used in the street.

For example, a 2016 review of the medical literature¹ by Physicians for Human Rights identified 5,131 people from 31 studies who had been injured by riot-control chemicals. Two of these were killed: one from respiratory problems caused by CS exposure; the other after being hit on the head by a tear-

gas projectile. Another 70 people (1.7%) developed permanent disabilities, including blindness.

To minimize deaths and serious injuries, researchers and policymakers must work together to expand the evidence base and design guidelines for when and how to use riot-control



agents. Stricter reporting and restrictions on use would allow these valuable tools to be deployed as they are intended: to fight violence and crime while keeping the public safe. In a fog

What are these chemicals? Most 'tear gases' are solid powders, delivered in sprays or bursts from canisters. CS is often combined with a flammable filler and spreads as smoke from burning grenades. Sometimes, it is dissolved in a solvent such as methylene chloride. Clouds of acrid fog or smoke drive people to leave buildings or large areas.

CS irritates the skin and eyes and has a distinct peppery smell. It is commonly also used to prepare soldiers for potential exposure to more-dangerous nuclear, biological and chemical agents. It is possible to develop a tolerance to the effects of CS.

The OC in pepper spray comes from the chilli pepper (*Capsicum annuum*). Strengths vary greatly, so it is usually diluted and sprayed directly at a person or group. It can be extremely irritating, to the point of incapacitation, through intense burning sensations on contact with skin, eyes and the respiratory tract.



Tear gas is used to disperse an environmental protest in Istanbul's Taksim Square in 2013.Credit: Osman Orsal/Reuters

A handful of other sprays used in the 1950s, such as CN (phenacyl chloride) and CR (dibenzoxazepine), are still deployed today, although they are widely considered obsolete. CN is marketed (often as 'mace') in the United States as a self-defence spray. Egyptian security forces allegedly used CR against antigovernment protesters in 2011. Adamsite (diphenylaminechlorarsine) and DC (diphenylcyanoarsine) were also once used in munitions. And in Venezuelan riots in 2013, local police allegedly used old stocks of adamsite that were perhaps left over from US military aid delivered in the 1960s.

These alternatives have a narrower margin of safety than do CS and OC. Also, old munitions degrade into toxic by-products that are unpredictable and poorly studied. Security forces might use more grenades or shells if the munitions don't seem to be working as expected, increasing risks.



Health impacts

CS and the older agents (such as CN and adamsite) are said to have low toxicity; it takes a very high dose to kill a person. But these estimates are largely extrapolated from tests in the 1950s and 1960s on laboratory animals². The toxicity of CS was described in this journal nearly 50 years ago³. Human studies tended to be limited to healthy male volunteers. This demographic might have been broadly true then for street-gang members, bank robbers and military personnel, but it is not typical of protesters today.

A crowd is likely to contain people with many different vulnerabilities, such as heart conditions or asthma and other respiratory problems. A cloud of CS could drift the wrong way and affect people who are not the target. People unrelated to a disturbance can be caught up in it by mistake.

Nobody knows how much CS or OC is lethal to someone with asthma or the lung disease emphysema, or to a person who needs therapeutic oxygen. It is likely that respiratory conditions will be aggravated, although the research literature is equivocal. In training environments, people who wear contact lenses have told me that these heighten pain when they get OC droplets or CS particles in their eyes.

The effects on children, pregnant women and older people are poorly studied. An analysis after the 2013 Gezi Park civil disturbances in Turkey found women to be more seriously affected by the respiratory effects of CS than men were⁴. No mechanism was established.



US Navy recruits test their protective equipment before entering a gas chamber as part of their training.Credit: PO Camilo Fernan/DVIDS

And there are many more safety issues to consider. Projectiles containing agents can cause head injuries⁵. The hot, burning canisters in which CS is often dispensed can burn the skin and start fires. Rioters might be exposed to solvents and toxic by-products from burning munitions⁶. Contaminants might be found in poorly made agents, sometimes encountered in the developing world, or in those that are well past their use-by date. None of these factors has been adequately explored.

The parlous state of research in this area stems from many factors. Lab-based testing of people, particularly vulnerable individuals, is likely to be unsafe and unethical. Old data involving prisoners might be questionable. Much field data potentially exist, but gathering them would require identifying people who were involved in civil disturbances. Such individuals might not make themselves available for study, particularly in countries with oppressive regimes or ongoing unrest.

Lax laws

The use of riot-control agents for enforcing domestic law is explicitly permitted by the 1997 Chemical Weapons Convention. Applications in warfare are not. There is no ban on



producing or stockpiling these agents. Signatories to the treaty (comprising most countries in the world) are required to declare stocks. There is no international framework for controlling export and trade in these substances. Nor is there a reporting mechanism for instances of use.

The use of these agents is thus a matter for national laws. But governments specify few legal prohibitions, other than through generic laws on police misconduct. Major exporters of the chemicals, such as the United States, tend to have few legal restrictions. The United Kingdom prohibits import, possession or use for personal defence by private citizens. Unsurprisingly, countries with few safeguards on policing, such as China and Turkey, have seen more-widespread uses of tear gas in recent years.

Riot-control agents are often misrepresented in the media. Reports sometimes refer to CS incorrectly as a nerve agent or confuse it with mustard gas or Agent Orange. Some commentators are quick to point out that riot-control agents are banned by a treaty or represent 'war crimes'. They are not, and do not. This misrepresentation can escalate violence. People who think that nerve agents are being used against them might think that they need to resort to lethal force.

Careful consideration

Governments need to reconsider how they use riot-control agents. Members of the public deserve protection from injury.

When personnel who have had effective training deploy these substances, they can be a valid alternative to batons, tasers or guns in one-on-one situations. Batons often cause fractures^I; tasers can cause cardiac arrests. And tear gas and pepper spray might have some utility in a prison yard.

But more-widespread use, such as lobbing them indiscriminately into demonstrations, needs careful examination. The risks of death, injury or property damage cannot be ignored. The effects of any chemical weapon are inherently unpredictable; history is full of examples of 'friendly' casualties caused by agents carried on shifting winds.

Vast clouds of gas can also be counterproductive. Causing death or injury often escalates, rather than diffuses, a situation.

What next?

Researchers should gather more data about the toxicity of riot-control agents on people other than healthy young men, including women and those with underlying health conditions. Efforts must be made to engage with and study victims of exposure in ways that do not compromise their safety. A better understanding of risks could provide potent evidence to justify increased regulation.

Policymakers and law enforcers should prepare guidelines for best practices and uses of these agents. A good start would be a code of conduct. This should be backed up by legal frameworks that require those wishing to purchase the agents to adhere to the code. Hard projectiles and canisters that burn could be banned or at least restricted to particular situations, such as prison riots or cases in which lethal force has already been used. Training should be increased.

The Chemical Weapons Convention could be amended to include stronger provisions for riot-control agents. The Organisation for the Prohibition of Chemical Weapons has the framework and infrastructure for such work because it polices other chemical weapons. Riot-control agents should be on the agenda at the organization's meeting in November.

References available at sour 's URL.

Dan Kaszeta is an independent consultant on chemical, biological, radiological and nuclear defense, and founder and managing director of Strongpoint Security in London. He has worked for the US Army and the Department of Defense, has advised the White House and is writing a book on the history of nerve agents.



3-D Printers Could Help Spread Weapons of Mass Destruction

Source: https://www.scientificamerican.com/article/3-d-printers-could-help-spread-weapons-of-mass-destruction/



3-D printers can do more than adorn a hobbyist's workshop—similar machines can produce weapons. Credit: Getty Images

Sep 10 – In the mid-1990s boy scout David Hahn used household objects and his scientific knowledge to <u>start building a nuclear reactor in his backyard</u>. Police and the Environmental Protection Agency stopped him before he could finish. Twenty years later, revolutions in manufacturing and computing have made projects such as Hahn's a lot more feasible; if he had access to a 3-D printer, for example, he might have finished his reactor before authorities intervened. Modern technologies also mean one does not need to be as smart as Hahn to create at least some kinds of DIY weapons. With the right machine and blueprints anyone can <u>build a handgun</u> in their living room—and firearms are just the beginning. Researchers fear that artificial intelligence and 3-D printing might one day create, on demand, weapons of mass destruction. A <u>report published Tuesday</u> from a multi-institutional research group led by the Middlebury Institute of International Studies at Monterey sounds an alarm about this possibility. "This is the proverbial <u>wicked problem</u>," says paper co-author Robert Shaw, Director of the institute's Export Control and Nonproliferation Program. Shaw says the proliferation of 3-D printers, combined with advances in artificial intelligence, could make it much easier for nations or individuals to covertly build nuclear, chemical and biological weapons.

When most of us think of 3-D printing, also known as additive manufacturing, we picture jets depositing layers of plastic to create <u>models for hobbyists</u>. But the potential for the technology goes much further—some researchers have claimed that the ability to print almost anything imaginable will <u>usher in a new industrial revolution</u>.

Industrial-scale 3-D printers are already advancing technology related to extremely dangerous weapons. The U.S. National Nuclear Security Administration (NNSA), for instance, is using these machines to <u>manufacture models of nuclear weapons</u> for testing. "While using 3-D printing to maintain the nation's nuclear weapons stockpile, NNSA labs are advancing the broader science of the field," the administration <u>said in a 2016 blog post</u>.



Meanwhile defense contractor Raytheon has a 3-D printer that can manufacture 80 percent of a missile, and Los Alamos National Laboratory is using these machines to <u>produce high explosives</u>.

Not even an advanced machine can print weapon components without expert designs—but there are concerns that artificial intelligence could allow unskilled humans to come up with the necessary blueprints, thanks to a technique called generative design. With this process a user can give a computer a design problem and set requirements for the final result. The AI suggests many possible solutions, and humans pare down the results. For example, when General Motors wanted to <u>replace its heavy eight-component</u> <u>seat belt bracket</u> with a lighter version that used fewer pieces, engineers plugged these parameters into a generative design algorithm and 3-D printed the result as a solid piece of material. NASA recently used the technique to <u>create a prototype lander</u> for space missions.

"The skill that used to be a barrier for developing enrichment equipment for nuclear weapons might be taken out of the hands of a human," says Ferenc Dalnoki-Veress, a Middlebury physicist who co-authored the report. "This is potentially dangerous."

The combination of additive manufacturing and AI creates three major risk areas, according to the report's authors. The first would involve a nation with an existing missile program, such as North Korea, improving its output by printing rocket parts or propulsion-system components. The use of 3-D printers could "advance its capabilities, accelerate its capabilities, or augment its production capabilities in a way where they can produce more missiles more quickly, or at least prototype missiles more quickly," Shaw says.

The second potential danger is that 3-D printers could help establish a weapons program by producing the required infrastructure—without alerting international watchdogs. Observers can currently monitor the global supply chain for signs someone is building a factory meant to produce weapons of mass destruction; this is one reason the import and export of certain substances, such as ammonia-based fertilizer (a key component in <u>homemade bombs</u>), are tightly regulated and scrutinized. But industrial 3-D printing could potentially bypass some of the world's existing arms control frameworks. Today if a country wants to manufacture a dangerous chemical such as sarin, it needs to go through public channels to purchase a particular kind of noncorrosive metal piping. Soon it may have the ability to print these supplies instead.

The third risk is a "black swan" event, a threat no one sees coming. "We see the possibility we could have something completely new, that no one here is really thinking of, that could have weapons of mass destruction capabilities," Shaw says.

Not everyone is convinced 3-D printing and generative design will ramp up the possibility of apocalypse. "For state actors, 3-D printing can be useful ... but I don't see that additive manufacturing magically solves a lot of problems," says Martin Pfeiffer, a doctoral candidate at the University of New Mexico and an expert on the anthropology of nuclear war. For nonstate actors, he adds, "additive manufacturing could let you do some things with a smaller visibility footprint, but you can't 3-D print a plutonium or [highly enriched uranium] core."

Giacomo Persi Paoli, a <u>researcher at nonprofit research institute RAND Europe</u> who <u>investigated 3-D-printed small arms for the United Nations</u>, sees parallels between his work and that of the Middlebury researchers. "What they're saying is plausible," he says, but he notes that successfully 3-D printing a weapon is harder than it sounds. "It's a combination of four things," he explains. Making a weapon requires a digital blueprint, the 3-D printer itself, the material that will be shaped by the printer, and human labor to finish the weapon. "It's very unlikely that whatever comes out of the printer will be plug-and-play, ready to go," he says.

Take the Liberator, <u>one of the earliest functional 3-D printed handguns</u>. It was the result of hundreds of iterations and a lot of human effort. The completed design did not come out of the printer ready to shoot: it required a careful assembly, and even then, the gun did not work all the time. The same would likely be true of more complex weapons. Generative design promises to make parts of the process easier, but consider the instances in which generative design produced good results: GM's seat belt

bracket and NASA's lander. Both projects had engineers shaping the design, not amateurs. That does not mean these worries can be dismissed altogether. "The genie's out of the bottle—it keeps me up at night," says Gretchen Hund, former director of the Pacific Northwest National Laboratory's Center for Global Security. Hund, who <u>built a career</u> on



identifying emerging issues and technologies that might have national security implications, says the additive manufacturing market has exploded in the past five years—and remains largely unregulated.

"Given the speed at which technology is advancing ... this is something policymakers should be aware of," Paoli says. "This is a plausible threat. It's not immediate, but it shouldn't be discounted."

The new report suggests that 3-D printing could be part of the WMD supply chain within the next 10 years. "Right now, people aren't paying enough attention to it," says co-author Miles Pomper, a senior fellow of the James Martin Center for Nonproliferation Studies. "And this is trying to sound that alarm to get them to focus."

ISIS Foreign Fighters and the Threat of CW Use

By Zamawang Almemar (Chemical and Biological Defense Analyst SAIC, DTRA, U.S.) Source: <u>http://nct-magazine.com/nct-magazine-sep-2019/isis-foreign-fighters-and-the-threat-of-cw-use/</u>

There has been a major growing concern by the U.S. and the international community regarding ISIS foreign fighter returnees and their interest in using Chemical Weapon (CW) devices on Western targets. After numerous reports and incidents of chemical attacks by ISIS and their use of various chemical weapons, such as mustard and chlorine gas in Iraq and Syria from 2014 to 2017, authorities initiated major campaigns to counter ISIS CW attacks.

Recently, authorities have been fearing the threat of ISIS foreign fighters returning to their home countries and using their battlefield skills to manufacture and deploy chemical weapons on Western targets. In these potential attacks against the general population the First Responders will become the first line of defense in such attacks. Therefore, it is crucial for them to be fully informed about this threat so that they can continuously provide the public with invaluable information and education regarding protection measures, as responding to such a crisis that would undoubtedly cause mass chaos. The CW of choice for these lone wolf attackers would most likely be either sulfur mustard or the common Toxic Industrial Chemical (TIC) - chlorine. Therefore, it is crucial for first responders to be able to distinguish between these two chemicals and know how to respond to each incident respectively.

Sulfur mustard, commonly known as mustard gas, is a light to dark brown oily liquid that causes significant respiratory problems if inhaled. It also causes skin irritation and blindness in individuals exposed to these chemicals. Skin blisters are also another major side effect of mustard gas, but more importantly, the agent can be fatal when used in high concentrations. Since it is heavier than air, it stays close to the ground. Mustard gas was first introduced as a chemical warfare agent by the Germans during World War I and the agent was also used by the Saddam Hussein regime in 1988 on the Kurdish town of Halabja, which resulted in 5,000 deaths. More recently, it has been reported that ISIS manufactured and used a crude mixture of mustard gas against the general population and ground forces in several towns in Iraq and Syria.

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

Nerve Agent Antidotes and Novichok Issues – Current Efforts To Improve Organophosphate Antidotes may not Immediately Translate to Novichok Solutions

By Jack J. Fernandes (CEO & Founder of Regenica Biosciences Inc.) Source: <u>http://nct-magazine.com/nct-magazine-sep-2019/nerve-agent-antidotes-and-novichok-issues/</u>

"Circles appeared before my eyes: red and orange. A ringing in my ears. I caught my breath. And a sense of fear: like something was about to happen. I sat down on a chair and told the guys, 'It's got me," This was Andrei Zhelenznyakov's description of his experience, as the first known person to have ever been directly exposed to one of the notorious Novichok Nerve Agents in 1987. While working as a military researcher on a highly classified chemical



weapons project for the Soviets, Zheleznyakov's fume hood malfunctioned, leaving him directly exposed to the dangerous chemical compound which forms a part of a grouping that Russian scientists have called "the deadliest nerve agents ever made." According to the Guardian, "By 1992 (...) the nerve agent had gutted Zheleznyakov's central nervous system. Less than a year later he was dead, after battling cirrhosis, toxic hepatitis, nerve damage and epilepsy."

In more recent times, the UK media has been abuzz with stories regarding the bizarre circumstances surrounding the chemical attack on Yulia Skripal and her father Sergei in March 2018. The two collapsed while eating dinner at a restaurant in the British town of Salisbury and rushed to the hospital where they were treated for presumed nerve agent poisoning. Shortly thereafter, the UK media began publishing an article after article, some claiming that following biological sampling the culprit was Novichok – the same incredibly deadly Soviet nerve agent that Zhelenznyakov was exposed to in 1987.

Following this high-profile attack in the UK the deadly agents have re-emerged as premier global chemical threats. Still, despite the media recognition of the Novichok agents as tangible real-world threats, the advancement of antidotes to protect against them has been inadequate. There are a few reasons for this, but one large reason has to do with the uncertainty surrounding the structure of the Novichok agents as well as the belief that, although not precisely known, the Novichok agents likely have a different structure than several of the other well-known organophosphorous nerve agents.

A myriad of potential structures has been proposed for Novichok candidates, with a wide variance among them. However, all of the structures seem to suggest that the Novichok compounds possess a standard organophosphorus core which is seen in the familiar G-series nerve agents that were first synthesized by the Germans starting in 1936. The Novichok agents are believed to have certain substitutions, leading the Novichok compounds to be commonly depicted as a phosphoramidates or phosphonates, usually fluorinated. Due to the mechanism of action of standard oxime antidotes, however, this significant variance in the chemical structure of the Novichok compounds negatively impacts the efficacy of standard treatments. This is a large issue drug developers' face in adapting the current nerve agent antidote efforts to the unique idiosyncrasies of a potential phosphoramidate.

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

CBRN Terrorism: Response Mechanisms of INTERPOL

(paper assignment as a partial fulfilment of the requirements of the module on Military Support to Disasters)

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Source: https://www.academia.edu/4231947/CBRN_Terrorism_Response_Mechanisms_of_INTERPOL

Protecting chemical facilities from terrorist attacks addressed at House committee hearing

By Debra Flax

Source: https://homelandprepnews.com/stories/36446-protecting-chemical-facilities-from-terroristattacks-addressed-at-house-committee-hearing/

Sep 12 – A U.S. House committee hearing on Wednesday focused on how to strengthen a federal program that protects high-risk chemical facilities from terrorist attacks.


C²BRNE DIARY – September 2019

"High-risk chemical facilities hold large stores of industrial chemicals that pose a safety and security risk to the American people if they are released or detonated," House Energy and Commerce Committee Chairman Frank Pallone (D-NJ) said during opening remarks at the hearing by the Subcommittee on Environment and Climate Change. He cited a recent report that found more than one-third of Americans live in areas around chemical facilities that would make them vulnerable during an attack.



Lawmakers are working to improve the Department of Homeland Security's Chemical Facility Anti-Terrorism Standards (CFATS) program, which Pallone said provides critical national security protections by requiring chemical facilities to assess and address their vulnerabilities. Lawmakers specifically discussed legislation that would reauthorize the CFATS program, the Protecting



and Securing Chemical Facilities from Terrorist Attacks Act of 2019, H.R. 3256, which was introduced in June by U.S. Rep. Cedric Richmond (D-LA).

The CFATS program was set to expire from its 2014 multiyear extension at the beginning of 2019, but Congress acted to extend the program until April 2020. H.R. 3256 would extend the program until 2025.

Since its creation in 2006, the CFATS program has aimed to engage publicand private-sector stakeholders to identify facilities that utilize and/or store the highest-risk chemicals in cases of terrorist attack or exploitation. The program also ensures those facilities have the proper security measures in place to reduce the risk of the hazardous chemicals being used by bad actors against the American public.

"CFATS organically promotes risk-based decision making," David Wulf, associate director for chemical security at DHS's Cybersecurity and Infrastructure Security Agency (CISA), told the panel. "Our inspectors, as

well as many of our headquarter's expert staff, work directly with facilities as they think through how to address the 18 risk-based performance standards that cover an array of different risk reduction measures: those designed to deter, detect, delay a terrorist attack, measures focused on cybersecurity, those focused on internal threats and background checks or on response and training."

Wulf reported that there are roughly 30,000 facilities that handle the threshold amount of hazardous chemicals that have submitted top screen reports to the CFATS program. Approximately 10 percent of the total facilities are categorized into four tiers as the highest risk facilities that are regulated by the program. He hopes that through the continuation of the program and subsequent increases in workforce development and program



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strengthening, that the main focus remains on attack prevention for the high-risk facilities but also to allow for voluntary involvement from the remaining 90 percent of facilities that have submitted top screen reports to the program.

During his testimony, Wulf highlighted the importance of maintaining long-term stability for the CFATS program and the facilities that the program regulates. When asked if he was pleased with the five-year extension, Wulf said that he would "love to see a zero put behind it."



"Enacting a multiyear CFATS authorization as Congress did in 2014, has facilitated important improvements in the CFATS program, as well as incentivized facilities to engage with the department on facility security," Wulf said. "Facilities unsure of the return on capital investment were assured that security standards established by CFATS would not change and made critical investments to improve security. DHS/CISA would like to look to a long-term policy solution for protecting and security chemical facilities." Two provisions of H.R. 3256 state that exemptions should be made for certain chemical facilities that share information more with state and local emergency planning officials, Congress, the Government Accountability Office, and other applicable agencies.

Wulf said in his testimony that highly trained CFATS inspectors do currently engage on a community level with emergency planning committees, but that sharing CFATS requirements, measures, and overall information with too many individuals and agencies can undermine the protected aspect of the program's goals.

U.S. Rep. Jeff Duncan (R-SC) made a similar remark in his inquiries, stating that the Environmental Protection Agency (EPA) supports environmental issues, the Occupational Safety and Health Administration handles workplace hazards and that DHS was specifically established to protect against terrorist acts.

However, in the hearing's second panel, that point was rebutted by Michele L. Roberts, national cocoordinator of the Environmental Justice Health Alliance for Chemical Policy Reform, who criticized the lack of improvements to the EPA's Risk Management Program that can be addressed and encouraged through the CFATS program.

"Frankly, the entire CFATS program is secretive and confusing. Even experienced advocates are sometimes unsure about aspects of CFATS. Because it's impossible to know for sure what facilities are even required to participate in CFATS, it's impossible for community



members or advocates to fully understand the level of danger, planning, preparedness (or lack thereof) in their neighborhoods," Roberts said in her opening statement.

"The emergence of new technologies and cybersecurity threats, coupled with this administration's attacks on the other foundational policies and programs that protect workers and communities from catastrophic events at hazardous facilities, means that a really strong and important CFATS bill and program are more important now than ever," Roberts said.

An additional concern brought up by several lawmakers, including Committee Chairman Paul Tonko (D-NY), was the effect that climate change and extreme weather events have on the high-risk chemical facilities and how CFATS manages those threats.

"Chemical fires, explosions, and releases can have serious consequences regardless of whether an incident was an accident, a natural disaster, or an act of terrorism," Tonko said.

While Wulf stressed the terrorism security aspect of CFATS, he also explained that many of the 18 riskbased performance standards presented by CFATS also protect against extreme weather events.

"CFATS is appropriately focused on the security of high-risk chemical facilities including provisions to ensure that security systems are appropriately redundant," Wulf said, such as by having back-up power for closed-circuit TV cameras and other security systems in place in the event of severe weather.

Debra Flax is an experienced journalist with writing, editing, and content development expertise. With a master's degree in Communications from the University of Alabama, Debra has specialized training in online media and news distribution. She has acquired skills in writing and online development from various positions at city newspapers, media outlets, retail companies, and non-profit organizations.

The effect of communication during mass decontamination

By John Drury

Source: https://www.academia.edu/7719305/The effect of communication during mass decontaminat ion

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

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

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

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

Originality/value – This research highlights the importance of effective responder communication strategies. Further, findings indicate the value of examining feedback from field exercises in order to facilitate a greater understanding of public experiences of the decontamination process.



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More Info: Carter, H., Drury, J., Rubin, G. J., Williams, R., & Amlot, R. (2013). The effect of communication during mass decontamination. Disaster Prevention and Management, 22(2), 132–147. DOI 10.1108/09653561311325280

Pesticides May Have Caused Cuban "Sonic Weapon" Symptoms

Source: http://www.homelandsecuritynewswire.com/dr20190920-pesticides-may-have-caused-cuban-sonic-weapon-symptoms

Sep 20 – A strange illness affecting the brains of Canadian and U.S. diplomats in their countries' embassies in Havana may have been caused by exposure to pesticides, a new study says.

U.S. authorities had suspected that the brain disorder symptoms the diplomats exhibited were the result of Cuba using a secret sonic weapon.

The BBC <u>reports</u>, however, that a clinical study has found that the mysterious health complaints of Canadian and U.S. diplomats in Cuba **may have been caused by neurotoxins in**

anti-mosquito pesticides.

The Canadian study said the symptoms suffered by some forty Canadian and U.S. diplomats and their families at missions in Havana were possibly triggered by "low-dose exposure to neurotoxins."

Those affected suffered a range of unusual symptoms, including hearing and vision complications, dizziness, fatigue, disorientation, and headaches.

The incidents, which took place from late 2016 into 2018, led Ottawa and Washington to reduce their

embassy staffs in Havana, with the administration of President Donald Trump claiming that the diplomats had been attacked by some sort of secret sonic weapon.

The study, carried out by a team affiliated with the Canadian <u>Brain Repair Center</u> and the <u>Nova Scotia</u> <u>Health Authority</u>, gave no credence to the acoustic weapon theory.

"There are very specific types of toxins that affect these kinds of nervous systems ... and these are insecticides, pesticides, organophosphates — specific neurotoxins," the study's lead author, Alon Friedman, was quoted as saying by Canadian broadcaster CBC.

The researchers say that the patterns of brain injury "all raise the hypothesis of recurrent, low-dose exposure to neurotoxins."

Specifically, the results were "highly suggestive" of something called cholinesterase inhibitor intoxication. Cholinesterase is an important enzyme in the human nervous system, and blocking it through an inhibitor can lead to death. The chemical weapon, Sarin, is an example of a potent cholinesterase inhibitor, as is VX, which was used in the killing of Kim Jong-nam, the half-brother of North Korea's leader.

But the low, consistent doses the researchers believe were delivered are consistent with exposure to commercial pesticides, the study's authors said.

The BBC notes that Cuba routinely uses pesticides to kill insects that might carry disease, and that Cuban health authorities carried out an intensive program of spraying from late 2016 and throughout 2017 to stop the spread of the Zika virus, which was then spreading in Brazil and Colombia, but which was also discovered in other Latin American and Caribbean countries. Embassy records cited by Radio-Canada said that the offices and homes of diplomats were among the sites sprayed.

The study involved twenty-six people, including a control group of people who have never lived in Cuba. Participants were subjected to blood tests and brain scans. A pet dog that had died in Canada also had its brain studied.



Friedman said there were plans to extend the study to members of the broader Cuban population in cooperation with local scientists to see whether other residents had also been affected by the neurotoxins.

The Canadian researchers said that proving the definitive cause was "difficult, if not impossible at this time" - but that their hypothesis offered "a plausible explanation". But "other causes cannot be ruled out", they wrote.

EDITOR'S COMMENT: Really? Why only Canadians and Americans? Why only diplomats? Are Cubans immune to the neurotoxin? Sounds like an "*ethnic bomb*" – OK, let us all wait for the big national study that will provide more concrete data. Or not!







PRNE DIARY

BIO NEWS

Hajj Health and Safety Boosted by New Health Early Warning System

Source: https://www.domesticpreparedness.com/updates/hajj-health-and-safety-boosted-by-new-health-early-warning-system/



Aug 19 – Authorities in Saudi Arabia are deploying a new health surveillance system to help keep people protected from communicable diseases during the annual hajj pilgrimage.

For the first time, the Global Centre for Mass Gatherings Medicines of the Saudi Ministry of Health is using the Health Early Warning System (HEWS), which ensures the early detection of and timely response to health threats and emergencies related to mass gatherings.

The new system monitors clinical reporting to identify clusters of unusual health events. Using a mixture of syndromic and indicator-based surveillance, it is well adapted to spot the diarrhoeal diseases and respiratory infections that are liable to occur during mass gatherings which may occur due to crowding, variable living conditions and poor hygiene.

Developed in 2018 by the Ministry of Health Saudi Arabia in collaboration with World Health Organization (WHO) experts, HEWS was previously tested on a lower scale during last year's hajj season and proved effective.

This year, the system is being applied electronically in 17 hospitals and 96 health facilities in vicinity of hajj areas, including Makkah, Madinah, Mina, Arafat and Mozdalefah, as of early August 2019. It is expected to help health authorities receive pre events signals and alerts, take immediate action and thus contribute to avoiding or reducing morbidity and mortality rates. It will also help policy-makers to better plan health interventions and services for future hajj seasons.

The news so far this year has been encouraging. A few days after the arrival of pilgrims for the hajj, several signals had been received through HEWS, but investigation had determined that no exceptional interventions were required. Most of the cases were diagnosed as acute febrile syndrome with rash or with neuroglial manifestation while a few were diagnosed as acute jaundice.

The annual Islamic hajj pilgrimage is one of the world's largest mass gathering events, bringing together around 2.3 million people from across the globe in the same place at the same time.

Pilgrims flocked to Mina on Friday 9 August 2019 to begin the official rituals of Hajj, followed by ascending to the holy mountain of Arafat to perform the main hajj ritual.



Saudi health authorities have allocated 30 000 health professionals from various disciplines to provide health care for pilgrims through a network of hospitals, health centres, mobile clinics, ambulances and air medical evacuation. They initiated awareness-raising campaigns before and during the hajj and arranged with other countries to implement health screening/awareness before the start of the hajj season.

Saudi Arabia has welcomed more than 1.8 million pilgrims from abroad so far through its major air, sea and land crossings. More pilgrims are expected before ascending to Arafat, in addition to around 500 000 Saudi and expatriate domestic pilgrims.

Bioengineering the End Times

By Bryan Walsh

Source: https://onezero.medium.com/bioengineering-the-end-times-95b648c49e76



Aug 19 – In the darkened ballroom of the Mandarin Oriental Hotel in Washington, D.C., some of the finest minds in government are debating how to stop the end of the world. They're here to take part in a daylong tabletop exercise put on by the Johns Hopkins Center for Health Security, an academic nonprofit focused on biosecurity. The participants — which include former Senate majority leader Tom Daschle and Dr. Julie Gerberding, who headed the CDC during the George W. Bush administration — are playacting the role of presidential advisers convened to respond to a fictional outbreak of a new virus.

The scenario on the table has been meticulously crafted by infectious disease experts, and details are doled out to the participants via reports from a Hopkins staffer who plays the role of the national security adviser and through fictional cable news segments that are shown on a TV in the ballroom. It might sound like a very Washington game of pretend, but such tabletop exercises offer officials an invaluable opportunity to test out answers to unprecedented crises — like the global disease pandemic about to strike.

The outbreak begins when groups of people in Germany and Venezuela begin to fall ill with a disease



that has no known cause. That sets off alarm bells that grow louder as the disease erupts in new countries, including the United States. Just as they did with SARS, scientists soon manage to identify the mysterious virus causing the outbreak. They name it Parainfluenza Clade X to indicate that it is a member of an unknown branch, or clade, of the parainfluenza family. The news is surprising — parainfluenzas usually

cause nothing worse than the common cold, yet this new Clade X spreads as efficiently as the flu and initially kills more than 10% of its victims. It is impervious to existing antivirals and vaccines. There is no effective treatment.

By the end of the Hopkins exercise, 20 months into the fictional pandemic, 150 million people worldwide — 2% of the global population — have died from Clade X.

Up to this point the simulation has consciously echoed past disease outbreaks like SARS or the 2009 H1N1 flu pandemic, although with what appears to be a much more dangerous virus. But the exercise takes a turn when the participants learn that Clade X did not emerge naturally from the wild like SARS, the result of a viral encounter between an unlucky animal and an unlucky human. Clade X, scientists discover, was created in a lab by members of an environmental extremist group with the goal of immediately and drastically reducing what they see as human overpopulation. With the

of immediately and drastically reducing what they see as human overpopulation. With the use of cutting-edge genetic engineering tools, a run-of-the-mill parainfluenza strain was spiked with the neurological virulence genes of a Nipah virus, a real-life pathogen that



emerged in Southeast Asia in the late 1990s and can kill as many as three-quarters of its victims during its rare outbreaks.

As the exercise unfolds, the participants at the Mandarin Oriental debate whether the United States should close its borders to slow the spread of the disease, and where to concentrate increasingly scarce health resources. But their decisions ultimately make little difference. While we saw in the last chapter that nature demands a virus choose either contagiousness or virulence, the makers of Clade X have used biotechnology to override evolution, ensuring that their creation can retain both the transmissibility of a parainfluenza virus and the deadliness of Nipah. It is the perfect bioweapon: a virus that spreads like the common cold and kills like Ebola. The world is defenseless.

The global economy has collapsed under the strain, with the Dow Jones average down 90%, U.S. GDP down 50%, and unemployment at 20%. Washington is barely functioning — the president and the vice president are both ill, and one-third of Congress is either dead or incapacitated. Former Missouri Senator Jim Talent, who is playing the secretary of defense, puts it starkly as the simulation concludes and the lights come up at the Mandarin Oriental. "America," he tells the audience, "was just wiped out."

The Clade X exercise, which took place in May 2018, was the latest in a series of pandemic simulations put on by the Center for Health Security. The scenarios are always worst case, which is the point. One earlier exercise, called "Dark Winter" and staged by Hopkins in 2001, simulated a smallpox bioterror attack on the United States. The timing — just a few months before the 9/11 attack — was eerily prescient, as if the organizers had foreseen how the threat of terrorism, including bioterrorism, would come to consume the U.S. government and public in the years to come.

At their best, these exercises provide a way to road-test how we might react to health threats that loom just over the horizon. In 2001 that meant the possibility that terror groups like al-Qaeda might get their hands on a sample of smallpox virus and release it into the world as an infectious weapon, seeking to sicken and kill as many people as possible. Such conventional bioterror remains a real threat — al-Qaeda, and more recently ISIS, have both sought to find and weaponize existing viruses like smallpox.

The Clade X exercise, however, shows that the threat from biology is evolving like a virus. Miraculous new biotechnology tools have been developed over the past few years, including in synthetic biology — the broad name for the science of rewriting the genes of living things — and the gene-editing technique CRISPR, which enables biologists to find and replace bits of DNA in a cell almost as easily as they might cut and paste letters in a Microsoft Word document. These tools promise life-changing medical advances, but one day soon they might also allow an ambitious terror group — or even a single alienated microbiologist — to tweak the genes in existing pathogens and create something far worse than nature ever could. Something like Clade X. "Clade X was a fictional pathogen, but it is based on scientific principles," Dr. Tom Inglesby, director of the Center for Health Security, told me after the exercise. "These kinds of things are absolutely plausible."

As deadly and as disruptive as a conventional bioterror incident would be, an attack that employed existing pathogens could only spread so far, limited by the same laws of evolution that circumscribe natural disease outbreaks. But a virus engineered in a lab to break those laws could spread faster and kill quicker than anything that would emerge out of nature. It can be designed to evade medical countermeasures, frustrating doctors' attempts to diagnose cases and treat patients. If health officials manage to stamp out the outbreak, it could be reintroduced into the public again and again. It could, with the right mix of genetic traits, even wipe us off the planet, making engineered viruses a genuine existential threat.

And such an attack may not even be that difficult to carry out. Thanks to advances in biotechnology that have rapidly reduced the skill level and funding needed to perform gene editing and engineering, what might have once required the work of an army of virologists employed by a nation-state could soon be done by a handful of talented and trained individuals. Or maybe just one.

When Melinda Gates was asked at the South by Southwest conference in 2018 to identify what she saw as the biggest threat facing the world over the next decade, she didn't hesitate: "A bioterrorism event. Definitely." She's far from alone.

In 2016, President Obama's director of national intelligence James Clapper identified CRISPR as a "weapon of mass destruction," a category usually reserved for known nightmares like nuclear bombs and chemical weapons. A 2018 report from the National



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Academies of Sciences concluded that biotechnology had rewritten what was possible in creating new weapons, while also increasing the range of people capable of carrying out such attacks. That's a fatal combination, and one that plausibly threatens the future of humanity like nothing else.

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Biohackers are pirating a cheap version of a million-dollar gene therapy

https://www.technologyreview.com/s/614245/biohackers-are-pirating-a-cheap-version-of-a-Source: million-dollar-gene-therapy/

Aug 30 – Citing the tremendous cost of new drugs, an international group of biohackers say they are creating a knock-off of a million-dollar gene therapy.

The drug being copied is Glybera, a gene therapy that was the world's most expensive drug when it came on the market in Europe in 2015 with a \$1 million per treatment price tag. Glybera was the first gene therapy ever approved to treat an inherited disease.



gene therapy cost less than \$7,000 to create.

Now a band of independent and amateur biologists say they have engineered a prototype of a simpler, lowcost version of Glybera, and they plan to call on university and corporate scientists to help them check, improve, and test it on animals.

The group says it will start sharing the materials and describe their activities this weekend at Biohack the Planet, a conference in Las Vegas that hosts citizen scientists, journalists, and researchers for two days of presentations on body implants, biosafety, and hallucinogens.

"This was developed in a shed in Mississippi, a warehouse in Florida, a bedroom in Indiana, and on a computer in Austria," says Gabriel Licina, a biohacker based in South Bend, Indiana. He says the prototype

Experts briefed on the biohacking project were divided, with some calling it misguided and unlikely to work. Others say the excessive cost of genetic treatments has left patients without options and created an incentive to pirate genetic breakthroughs.

"It's a fairly big deal to see biohackers turning their focus to gene therapies because the potential consequences can be quite large," said Rachel Sachs, an associate professor of law at Washington University in St. Louis and an expert on drug pricing. "They may see themselves as serving the interests of the patient community."

This year the Swiss pharmaceutical firm Novartis introduced another gene therapy, Zolgesma, for spinal muscular atrophy, with a price of \$2.1 million. Because of the cost, some parents have struggled to obtain it for their children and the treatment is unlikely to be made available in most of the world.

Disrupting the narrative

The gene therapy that the biohackers say they are copying, Glybera, was approved for people with an ultra-rare blood disease called lipoprotein lipase deficiency. But it didn't prove cost-effective and was <u>pulled from the market in 2017</u> by its manufacturer, UniQure. To date, only one insurer, in Germany, is known to have paid for the treatment.

Andreas Stürmer, a biotechnologist and environmental engineer who is based in Linz, Austria, says after the idea of reverse engineering the treatment occurred to him he brought



the concept to Licina. Their collaboration took place through Facebook messages and Skype calls, and included help from David Ishee, a biohacker in Mississippi.

In another recent example of copy-cat gene therapy, a biohacker in Florida in 2018 produced and ate an oral gene therapy for lactose intolerance using a 20-year-old scientific paper as a recipe.

"It's about disrupting the narrative," says Licina, also the cofounder of <u>SciHouse</u>, a community biotechnology lab in Indiana. "It was like, 'Well, why the f*ck not?"

One reason not to is that copying and selling the drug could infringe on UniQure's intellectual property. Tom Malone, a spokesperson for UniQure, says the company had not been informed of the biohacking attempt. He says it still owns a patent on the drug but it does not believe there is strong demand for the treatment. "To that end, a "knock off" version of Glybera would likely face significant regulatory and commercial hurdles," says Malone.

Also, the US Food and Drug Administration has said it is illegal to sell do-it-yourself gene therapy supplies. Still, some biohackers feel confident grabbing information from published papers, even if some of it has been patented. "This thing is protected 10 different ways," says Ishee. "I don't care. Because I'm not selling it."

Get the job done

To make their knock-off, the biohackers checked the original Glybera papers for the information about the genetic sequence of the gene that patients require corrected copies of. They then placed an order with a gene synthesis company for a copy of the DNA, which was added to a circular genetic construct called a "minicircle." When added to a cell, the mincircle will begin manufacturing small amounts of the lipoprotein lipase enzyme.

That is an important difference from the original Glybera, which employed an injection of viruses into the leg muscle to deliver the gene. Viral "delivery" is a complex undertaking but is the most commonly used strategy in gene therapy. The biohackers don't have access to viruses because of their high cost, but say minicircles can potentially be injected, too.

Robert Kotin, an expert in gene therapy production, calls the minicircle technology controversial and says it has shown contradictory results. While minicircles, unlike viruses, could possibly be readministered time and again, they are not as efficient in getting cells to follow genetic instructions.

"It's not the same [but] it can get the job done. It's just less efficient," says Ishee of the minicircles, which are based on his design. He thinks they could be injected over a period of half a year. "It's like if you wanted to dig a swimming pool or a pond—you could buy a backhoe and dig it in a day or you could do it with a shovel at no cost over several months."

Biohacking claims

This isn't the group's first time making a splash with genetic tinkering claims. Ishee has tried (unsuccessfully) to modify the DNA of dogs, and Licina and Stürmer were involved with a startup company called Ascendance Biomedical whose CEO, Aaron Traywick, injected himself with an untested herpes vaccine in 2018, prompting a <u>wave of criticism</u>.

Traywick was later <u>found dead</u> in a flotation tank. His drowning was <u>ruled accidental</u> and not related to his gene experiments.

This time, the team is taking steps to show that their genetic invention, which they are calling "Slybera," should be taken seriously. At the Las Vegas event this weekend, they will be calling for help to test their version of the treatment on animals, something they say is too expensive to do themselves.

"I'm not saying that we have a completed gene therapy," says Licina. "Only that we have one piece." Currently, the group says Slybera is not ready for patients and needs further development.

Painful disease

Since Glybera was pulled from the European market two years ago, patients with the fatstorage disease it treats, known by the abbreviation LPLD, don't have many options. Usually diagnosed in childhood, LPLD is characterized by the presence of fat particles in the blood, making it look creamy white. Patients face a lifetime of strict diets and must abstain



from alcohol and sugar or face side effects like excruciating pain from pancreatitis. Many female patients are unable to have children because of the effects of the disease.

"These severe dietary restrictions are very isolating," says Jill Prawer, the founder of LPLD Alliance, a patient advocacy group in the United Kingdom. "I was hugely disappointed when Glybera was taken off the market ... but I don't know enough about biohacking, especially about its safety and efficacy—or its legality."

Prawer wonders "how central the patient's safety, welfare, and well-being" would be to the biohackers, who all work on biotechnology as a hobby, "and what safeguards would be in place if something went wrong."

Social justice issue

Daniel Gaudet, a doctor in Montreal who treats patients suffering from the deficiency, 19 of whom received Glybera in clinical trials, believes the biohackers' plan is naive. While he agrees Glybera was too expensive, he thinks developing a gene therapy is too complex and risky for amateurs to undertake.

"Access and affordability are real challenges," says Gaudet. "We must be creative, but biohacking is not the solution."

Others aren't as sure that the biohackers should be written off. Geneticist Michael Hayden led the original Glybera research team at the University of British Columbia. He recalls the thrill when the treatment worked on animals and the hope he felt that patients might be helped. To show that, a company called AMT (which later became UniQure) was formed to run a definitive study on patients.

That's when the problems started, Hayden says. "As the clinician scientists, we lost control of the project completely. ... They decided that they were going to charge a million dollars a shot. In 2012, in Europe, this was outrageous."

"The right to access medicine is a social justice issue," Hayden says. "Any way to provide potential benefits to patients is entirely meaningful, and I would never stand in the way [of biohackers]." In fact, he says he would be interested in being connected to the team trying to pirate his drug. "We'd love to learn more," he says.

Measles Outbreaks: Europe Losing Ground, with 4 Countries Losing "Measles Elimination" Status

Source: http://www.homelandsecuritynewswire.com/dr20190829-measles-outbreaks-europe-losing-ground-with-4-countries-losing-measles-elimination-status

Aug 29 – The number of measles cases in Europe is soaring, with four European elimination status owing to measles

outbreaks, according to the World Health Organization (WHO).

In a report published 29 August, WHO said that in the first six months of 2019, cases of the highly contagious yet preventable disease climbed to nearly 90,000 in 48 European countries, more than doubling last year's total number. The *New York Times* reports that nearly 80 percent of the cases were recorded in four countries through June: Ukraine, Kazakhstan, Georgia, and Russia.

Ukraine, which accounts for about 60 percent of the cases, is implementing a robust response, said Siddhartha Datta from the WHO's regional office in Europe, including "school-based vaccination, high-risk vaccination of military recruits, and health care workers."

WHO stripped Britain, Greece, the Czech Republic, and Albania of their measles elimination based on 2018 data. "Each of these countries are examples that have extremely high national vaccination coverage," said Kate O'Brien, director of the WHO's immunization department. "So, these are not examples of countries that have particularly weak [healthcare] systems." Measles is a potentially fatal illness that causes coughing, rashes, and fever, but it is easily preventable with vaccination.

Close to 365,000 measles cases have been reported worldwide this year, the WHO said, almost three times as many as in the first half of 2018



Comment

Sources: <http://dx.doi.org/10.15585/mmwr.mm6834a4> <https://tinyurl.com/yxbkpr2g>

On 12 Oct 2018, 5 confirmed cases of mumps among migrants who had been transferred between 2 detention facilities were reported by the facilities to the Texas Department of State Health Services (TDSHS). By 11 Dec 2018, 8 Texas detention facilities and 6 facilities in 5 other states had reported 67 mumps cases to U.S. Immigration and Customs Enforcement (ICE) Health Service Corps (IHSC) or local health departments.

On 12 Dec 2018, TDSHS contacted CDC to discuss mumps control in detention facilities and facilitate communication with IHSC. During 4-17 Jan 2019, 6 more state health departments reported new cases in detention facilities, which prompted CDC and IHSC to launch a coordinated national outbreak response.

During 1 Sep 2018-22 Aug 2019, a total of 898 confirmed and probable mumps cases (1) in adult migrants detained in 57 facilities (18% of 315 U.S. facilities that house ICE detainees*) were reported in 19 states (Figure); an additional 33 cases occurred among staff members.

Private companies operated 34 facilities; 19 were county jails that house detained migrants, and 4 were ICE-operated. 44 percent (394) of cases were reported from facilities that house ICE detainees in Texas.

Median patient age was 25 years (range = 17-67); 846 (94%) were male. Based on detainee custody status during their incubation period (12-25 days before symptom onset), most (758, 84%) patients were exposed while in custody of ICE or another U.S. agency; 43 (5%) were exposed before apprehension; and the custody status at the time of exposure of 97 (11%) was unknown. Among those with data on complications, 79 (15%) of 527 male patients reported orchitis, and at least 13 patients were hospitalized. More than half (576, 64%) of cases were confirmed by quantitative reverse transcription-polymerase chain reaction testing or viral culture testing at CDC, state public health laboratories, Association of Public Health Laboratories-CDC Vaccine Preventable Disease Reference Centers, or commercial laboratories. Sequencing of isolates from 70 patients identified genotype G, the most common mumps genotype detected in the United States since 2006 (2). IHSC provided

over 25 000 doses of measles-mumps-rubella (MMR) vaccine in response to mumps in 56 facilities. Since 2015, approximately 150 mumps outbreaks and 16 000 cases have been reported in the United States, typically in close-contact settings such as universities, schools, and athletic events. This is the 1st report of mumps outbreaks in detention facilities.

MMR vaccination efforts differ among detention facilities; facilities should follow local or state health department recommendations for preventing and responding to mumps (3) and should report cases and follow disease control guidance from their health department.

Detainees and staff members at increased risk for mumps should be offered MMR vaccine per existing recommendations for vaccination during outbreaks (4,5). MMR vaccine has not been shown to be effective at preventing disease in persons already infected with mumps; facilities should be aware that cases might occur among detainees exposed before vaccination.

Health departments, CDC, IHSC, and facility health administration can work together to develop appropriate control measures based on local epidemiology and the specific needs of each facility. Identifying and vaccinating close contacts of exposed or symptomatic persons with mumps in detention centers is challenging. IHSC can look up transfer history and facilitate vaccine procurement for detainees in ICE custody upon request from facility health services administrators. CDC is coordinating communication among state and local health departments, IHSC, and other federal partners to mobilize appropriate resources and is providing technical support for implementing appropriate disease control and prevention measures. Effective public health interventions require understanding of facility



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and custody operations, which often involve frequent transfers of detainees (between facilities and states) and multiple entities with authority for operations and detainee custody.

As of 22 Aug 2019, mumps outbreaks are ongoing in 15 facilities in 7 states, and new introductions into detention facilities through detainees who are transferred or exposed before being taken into custody continue to occur.

So why only UK, Greece, Albania and the Czech Republic?

DRC Ebola: CMRE update, 30 Aug 2019

Since the beginning of the epidemic, the cumulative number of cases is 3017, of which 2912 are confirmed and 105 are probable. In total, there were **2015 deaths** (1910 confirmed and 105 probable) and 902 people healed.

Biohazard Management

Source: https://www.labmanager.com/lab-health-and-safety/2019/08/biohazard-management#.XW5E8EdS_IU

Sep 02 – The explosion of biotech companies and research into fighting cancer and other diseases, combined with the ever-present threat of biological weapons of mass destruction have propelled concern and discussion of biohazards into prominence. Given the complexities and potential for harm, it is paramount that we promote understanding and sensible approaches to managing biohazards.



Definition, levels, and examples

A biological hazard, biohazard for short, is a biological material that poses potential harm to the health of other living organisms. Most importantly, we are concerned with those that pose threat to humans. However, biohazards may also potentially harm animals, aquatic life, and plants. Biohazard material could be bacterial, viral, or toxic. The United States Centers for Disease Control and Prevention (CDC) ranks biohazards into <u>four levels</u>, with Level 1 being minimum risk and Level 4 being extreme risk. Here are brief definitions of the levels with examples of biohazards ranked for each:¹

- Biohazard Level 1: Well-characterized bacteria and viruses not known to consistently cause disease in healthy adult humans, and of minimal potential hazard to laboratory personnel and the environment. Examples include *Escherichia coli*, varicella (chicken pox), and feline leukemia virus.
- **Biohazard Level 2:** Similar to Level 1 agents, but known to cause mild disease in humans or are difficult to contract. Examples include measles, mumps, salmonella, influenza A strains.
- Biohazard Level 3: Indigenous or exotic bacteria and viruses that can cause serious or fatal disease in humans, but for which vaccines or other treatments exist. Examples include anthrax, tuberculosis, yellow fever, and malaria.
- **Biohazard Level 4:** Biological agents that are likely to cause serious or fatal human disease for which vaccines, preventive, or therapeutic interventions are not available. Examples include Ebola virus, Marburg virus, Lassa fever virus, and other hemorrhagic diseases.

Regulatory compliance

The list of select biological agents includes approximately 40 viruses, bacteria, rickettsia, fungi, and toxins. In the United States, any work with or transfer of these agents is controlled due to their capacity to cause considerable harm to human health. The Federal Select Agent Program developed by the Department of Health and Human Services (HHS) along with the CDC regulates all work with and transfer of select agent material, be it for agriculture, animals or animal products, or public health.



The public health regulations contain five main components²:

- The list of biological "select agents"
- Procedures for registration of facilities that transfer or use these agents. Any organization that transfers or obtains these agents must register with HHS and provide sufficient information that the facility meets all the biosafety level requirements for working with the particular agent or agents
- Process for documenting successful transfer of agents requiring both shipping and receiving parties to complete written record forms
- Audit, quality control, and accountability verification procedures
- Procedures for appropriate disposal of select agents

Other parts of the regulations address exemptions, designation of a facility responsible official, restricted access and security, training, and notification of any theft, loss, or release of material.

Exposure prevention—the primary goal

Efficient and proper management of biohazards begins with preventing exposures. If we are handling or working with biological agents with known human etiology, and especially any agents in biohazard class 2, 3, or 4, we should have the necessary infrastructure in place and a comprehensive written exposure control plan in effect.

The exposure control plan (ECP) is written to address the unique conditions of the current operations, research, facility design, and personnel actions necessary to carry out the facility's mission. One exceptional reference for developing your ECP is the CDC's *Biosafety in Microbiological and Biomedical Laboratories*³ (BMBL), which contains ample information on biological risk assessment. A good companion to the BMBL is OSHA's model ECP contained in Appendix D of 29 CFR 1910.1030.⁴ A good ECP should address the following key elements:

- Administration, responsibilities, and accountability: Provides a clear organization of personnel and assigns responsibilities for implementation and support, and identifies positions and/or departments responsible for reviewing and updating the ECP, maintaining and providing necessary personal protective equipment, engineering controls, and other infrastructure and equipment
- **Determination of employee exposure:** Identifies all employees that have potential occupational exposure and conducts job hazard analyses and exposure assessments
- **Exposure control methods:** Details specific procedures for safe work including engineering controls, PPE, universal precautions, signage, access, and security
- Health and medical monitoring: Protects against laboratory-acquired illness by documenting
 and certifying the necessary immunizations and vaccinations are attained
- Emergency procedures: Describes procedures for reporting and investigating any accident, exposure incident, spill, or release that injures laboratory staff or contaminates the environment
- Employee training: Ensures that everyone working in the containment facility has been trained on and understands the ECP. Informs employees about each infectious agent present, the associated risks, and the signs and symptoms of infection or disease
- Reporting and recordkeeping: Ensures procedures for identifying, reporting, and correcting exposures, incidents, near misses, or violations of protocol are recorded, investigated, and corrected

Biohazardous wastes

A final major element of managing biohazards is the task of handling the wastes properly. Questions abound due to biohazardous waste versus medical waste and the inevitable mixing of the two. You need to know in which category to place the waste and the proper protocols for treatment and disposal.

If a waste meets any of the criteria below, it is usually considered a biohazardous waste:

- 1. Laboratory waste, including but not limited to:
 - o Human or animal specimen cultures from medical or pathology labs



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- Research laboratory cultures and stocks of infectious agents
- Waste from the production of bacteria, viruses, spores
- o Discarded live and attenuated vaccines used in healthcare or research
- Discarded animal vaccines
- Culture dishes and devices used to transfer, inoculate, or mix cultures
- 2. Human surgery or autopsy specimens or tissues suspected of being contaminated with infectious agents
- 3. Animal parts, tissues, fluids, or carcasses suspected of being contaminated with infectious agents
- 4. Waste that contains fluid blood, blood products
- 5. Containers or equipment containing blood
- 6. Blood from animals known to be infected with diseases highly communicable to humans

Biohazardous waste disposal

If you are disposing of any CDC-listed select agent waste, be sure to follow all regulations of the Federal Select Agent Program. In addition, be sure to check with all local agencies (e.g. sanitary landfill or sewer departments) for approval prior to disposal.

In general, solid biohazardous waste should be sterilized or otherwise inactivated and rendered noninfectious prior to disposal as normal sanitary waste. Inactivation is achieved by autoclaving or by vapor sterilization with ethylene oxide, formaldehyde, glutaraldehyde, hydrogen peroxide, or other approved methods. Liquid biohazardous waste must be inactivated using appropriate chemical disinfection prior to discharge to the sanitary sewer. Animal carcasses and other large solids should be disposed through an approved vendor or other special means such as incineration or chemical decomposition.

Medical wastes and their disposal

Medical wastes are generally defined as biohazardous waste (see above) or sharps and are generated or produced by the following activities:

- 1. Diagnosis, treatment, or immunization of humans or animals
- 2. Research associated with the above
- The production or testing of medicinal serums, vaccines, antigens, or antitoxins made from living organisms

Generally, all medical wastes are disposed through approved, contracted specialty vendors. Any other means of disposal must be authorized and approved by all federal, state, and local agencies.

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- 4. *Model Exposure Control Plan*, OSHA Bloodborne pathogen standard, 29CFR1910.1030, Appendix D. Occupational Safety and Health Administration. Washington, D.C. April 2012

Senolytics – remember this word in 5 to 12 years



Sweden – Tularemia (Part II)

Source: http://outbreaknewstoday.com/sweden-tularemia-count-nears-700/



Sep 04 - In a follow-up on the tularemia, or harpest situation in Sweden, a little over 120 people have become ill with tularemia over the past week, bringing the total to around 690 in 2019.

> Compared to the previous weeks, there is a slight slowdown in the number of new cases, while compared to previous years there are still an unusually high number of people who fall sick with the bacterial infection. according to Folkhalsomyndigheten.

Most new cases of illness are reported from the Dalarna and Gavleborg region, which together now have over 400 cases, while the number of new cases from Orebro counties has decreased.

According to the CDC, tularemia is a disease that can infect animals and people. Rabbits, hares, and rodents

are especially susceptible and often die in large numbers during outbreaks. People can become infected in several ways, including: tick and deer fly bites, skin contact with infected animals, drinking contaminated water and inhaling contaminated aerosols or agricultural and landscaping dust.

Symptoms vary depending how the person was infected. Tularemia can be life-threatening, but most infections can be treated successfully with antimicrobials.

COMMENT

The number of cases of tularemia in Sweden continues to grow. Past reports have suggested that the outbreak is mosquito-borne but none of the reports have included clinical details of the cases. If an insect bite was responsible, one would see glandular or ulceroglandular disease, but if the outbreak was waterborne, then oropharyngeal infection with draining lymphadenopathy might be seen. - Mod.LL

New tool turns CRISPR into "genetic Swiss Army Knife"

Source: https://newatlas.com/biology/new-tool-turns-crispr-into-genetic-swissarmy-knife/

Sep 04 – The CRISPR tool is fast developing into a powerful way to edit the genes of bacteria, mammals, plants, humans, and even reptiles. It's often referred to as "genetic scissors," but a new improvement turns it into a "genetic Swiss Army Knife." Research led by Caltech has refined the formula to help the tool zoom in on specific organs, tissues or cell types, and give it greater control over what happens next. CRISPR contains two main parts: guide RNA molecules that direct

the tool to specific parts of the genome, and an enzyme that can then edit the genes at that specific location. The most commonly-used enzyme is Cas9, but other variations are emerging, such as Cas12a, Cas12b and CasX.



But as useful as CRISPR can be, it's not perfect. Rather than focus on the enzyme, the Caltech team instead made improvements to the guide RNA. The problem they set out to solve is that these molecules are "always on," meaning they will seek out their target no matter where they are in an organism. This could lead to <u>off-target mutations</u>.

So, the researchers on the new study engineered conditional guide RNAs (cgRNAs) that are more precise, and more powerful once they get to their target. They work on the kind of IF/THEN statements normally seen in computing: the cgRNAs can react to the presence or the absence of an RNA trigger, and then either become active or inactive in response.

In practice, that means CRISPR can wait until it detects certain biomarkers in a cell – say, those that indicate disease – and then either activate or silence a gene to help treat that disease. And since healthy cells wouldn't have that biomarker, the cgRNAs wouldn't be triggered there, keeping the treatment targeted.

The team tested the technique in bacteria, and were able to demonstrate both ON/OFF and OFF/ON logic. RNA triggers successfully switched off cgRNAs that started on, while others switched on cgRNAs that started off.

"There is still a long way to go to realize the potential of dynamic RNA nanotechnology for engineering programmable conditional regulation in living organisms, but these results with CRISPR/Cas9 in bacterial and mammalian cells provide a proof of principle that we can build on in seeking to provide biologists and doctors with powerful new tools," says Niles Pierce, lead author of the study.

Norway – Food safety (norovirus)

Source: https://www.foodsafetynews.com/2019/09/norway-norovirus-outbreaks-linked-to-seaweed-salad-from-china/

Sep 03 – More than 100 people have fallen ill in Norway from norovirus likely in a frozen seaweed salad from China. The 1st outbreak of norovirus suspected to be linked to the seaweed salad occurred in mid-June 2019 and the most recent was at the beginning of August 2019. The implicated product was also shipped to Denmark.

"It is suspected that seaweed from China was the cause of more than 100 cases of gastroenteritis from at least 11 eateries in different areas of Norway. Most of the outbreaks were in June and July 2019. Investigations are still ongoing. Norovirus was detected in patients from at least 2 of these eateries," Guri Aanderud, senior adviser in the seafood section at the Norwegian Food Safety Authority (Mattilsynet) told



Food Safety News.

"We have no information regarding individual cases such as age, sex, place of residence, or hospitalization related to these outbreaks as norovirus is not notifiable in Norway. However, symptoms of norovirus are generally mild and self-limiting. All involved restaurants have received and served seaweed salad from two different lots in the relevant time period. Many of the people who reported illness have stated that they have eaten dishes containing seaweed salad."

On 22 Aug 2019, **Goma Wakame Seaweed salad bags** of 1000-gram imported into Norway by Ostlandske Formidling AS (Ofas) were withdrawn from the market due to suspected norovirus. Product was sold to the food service sector in Norway but distribution may have included several stores across the country. It was imported into Denmark by World Seafood and is produced by Dalian Kowa Foods Co. in China. Affected

bags have item number 8032 and lot number 1904, which was manufactured on 14 Mar 2019, and lasts until 13 Mar 2021, and lot number 1811, which was made on 8 Nov 2018 and lasts until 7 Nov 2020.

Since withdrawing the product, no further outbreaks linked to seaweed salad have been reported.



The Norwegian Food Safety Authority took product samples that have not yet been fully analyzed and the Norwegian Institute of Public Health (FHI) has informed the European Centre for Disease Prevention and Control (ECDC) via the Epidemic Intelligence Information System (EPIS).

Aanderud added it also knew of a Spanish RASFF [Rapid Alert System for Food and Feed] alert from 13 Aug 2019 related to a foodborne outbreak caused by norovirus GI and GII in frozen seaweed salad from China, via Germany. Countries part of this notice include Austria, Germany, Greece, Italy, Portugal, Romania, Slovakia, Spain, and the United Kingdom. The International Food Safety Authorities Network (INFOSAN) was mentioned in both RASFF notifications.

Adam Bradshaw, technical officer in the Department of Food Safety and Zoonoses at the World Health Organization, said INFOSAN was working with colleagues at the European Commission's RASFF because the frozen seaweed salad suspected to be responsible for the outbreak was distributed from China. He added it does not have the authority to disclose non-public information on behalf of countries involved in the outbreak when asked which countries had reported cases and how many.

"To better understand the potential international aspects of this event, we have been in contact with the INFOSAN emergency contact point in China to seek details as to whether the implicated frozen seaweed salad has been distributed from China to any other countries. Once further information is available, we will update all INFOSAN members through the INFOSAN community website," said Bradshaw.

COMMENT

It should be noted that the prototypic norovirus, Norwalk virus, was originally isolated in Norwalk, Ohio, the state where an outbreak popped up at the Republican National Convention in 2016. Norovirus infections and outbreaks are usually more common in cooler, winter months. About half of all cases occur from December through February in countries above the equator and June through August in countries below the equator. However, in places closer to the equator, norovirus may be less seasonal. This may be because of temperature or the timing of the rainy season, but may also be associated with the birth rate. Worldwide, norovirus is the leading cause of gastroenteritis outbreaks. New norovirus strains emerge about every 2 to 4 years. Often, but not always, these new strains lead to an increase in outbreaks worldwide. - Mod.LL



Advances in 3D Printing Technology: Increasing Biological Weapon Proliferation Risks?

By Kolja Brockmann

Source: https://isnblog.ethz.ch/technology/advances-in-3d-printing-technology-increasing-biological-weapon-proliferation-risks#more-65264

Sep 07 – The states parties to the Biological and Toxin Weapons Convention (BWC) gathered in Geneva from 29 July to 8 August for a series of Meetings of Experts. Among other topics, states reviewed scientific and technological developments that impact the objectives of the treaty. Additive manufacturing (AM)-also referred to as 3D printing-is one of the technologies that is starting to receive attention, next to more well-known biotechnologies and genetic engineering techniques. Advances in AM have been met with concerns over its potential to facilitate the development, production, delivery and thus proliferation of biological weapons-and have highlighted the

potential role of export controls in reducing these risks.

Concerns with this technology are therefore shared by the <u>Australia Group</u> (AG), a multilateral governance body that rarely interacts with the BWC. The AG's relationship with the BWC <u>has been controversial</u> due to its exclusive membership and the alleged impact of export controls on the sharing of technology. Nevertheless, the AG has effectively set the standard for controls on the trade in relevant goods and key biotechnologies—

with many non-members adopting the group's control lists in their own export control systems.



AM and bioprinting

AM is often talked about as if it were one unitary technology, however, it is better described as a category of automated manufacturing techniques. The main commonality of these techniques is the deposition and fusing of layers of materials. These techniques (see a selection of techniques here) can be used to build an object of virtually any shape or form, reducing the loss of material and enabling more complex objects and performance new characteristics. An increasing variety of materials can be used as feedstocks to produce objects using these techniques, including polymers, resins, metal powders and so-called bioinks.

One technique that is <u>currently receiving</u> <u>particular attention</u> is <u>bioprinting</u>. In contrast to the inanimate materials used as feedstock by other AM techniques, <u>bioprinting constructs</u> objects made from biological materials such as <u>living cells</u>. Using <u>bioinks</u> involves the

What challenges does AM pose to nonproliferation and export controls?

AM promises to bring production to the enduser. It could decentralize production and thus reduce the need for the physical transportation of goods across borders. AM is also said to be 'deskilling' certain aspects of manufacturing, making it easier for producers with less knowledge and experience to produce more complex products. This characterization should however be used with caution and it is better to view AM as causing a shift in knowledge and skill requirements rather than their reduction. However, AM does threaten to provide a substitute for other, controlled production techniques and the associated equipment, thus potentially enabling the circumvention of the barriers imposed by export controls. Perhaps more crucial than the new performance characteristics it enables is the increased digitization and automation of this production



Source: 3D Bioprinting for Reconstructive Surgery, 2018

added complexity of their high sensitivity to environmental conditions, growth and differentiation factors, and the particularities of the construction of tissue. In bioprinting, the bioinks are deposited using, for example, small nozzles for extrusion or an inkjet to achieve precisely layered arrangements of cells and support structures. These materials then grow into functional tissue based on the cells' biological processes. technology. As such, it further increases the importance of intangible transfers of technology—particularly the digital build files which encode both the characteristics of the object to be produced and the commands for the AM machine—which can easily be transferred for example via email. Compared to physical goods, digital transfers of technical data are harder to track and control.



Moreover, the specialized audit capabilities to verify compliance with technology export controls are still very rare. States must therefore rely on intelligence and law enforcement information to detect illicit transfers and internal compliance mechanisms in companies are ever more important.



Bioink

Increasing capabilities, substitution and remaining barriers

AM has a range of potential applications in the development, production and delivery of biological weapons. All of <u>these are still</u> <u>evolving</u>—as with almost all AM technologies and thus provide a moving target for regulatory measures. Among the many potentially relevant applications of AM, three are worth particular consideration:

Printing of production or laboratory equipment AM can be used to print components of production and laboratory equipment and other items required for the production of biological weapons. In this way, AM could limit the footprint-acquisition of particular equipment, materials and specialized knowledge-of a clandestine biological weapon development or production effort. There are however also several technical barriers that currently remain: Especially when using polymers, chemical compatibility and resistance still limit the range of materials that can be used. Moreover, there has so far only been limited testing of relevant properties of products and how printed items interact with chemicals and biomaterials. While AM may offer an alternative production pathway for some

parts and equipment, it currently only results in a modest substitution effect as much of the equipment that is of concern can already be acquired through commercial providers for laboratories and the pharmaceutical industry. Using new AM techniques for this purpose <u>likely</u> still involves more significant technical expertise, knowledge and process development requirements. This means that only under very specific circumstances an actor may choose to pursue this pathway to manufacture production or laboratory equipment.

Bioprinting of tissue samples

Among the many positive applications of bioprinting in medicine, the printing of tissue for pharmacological testing is potentially also relevant in the context of the development of biological weapons. Such synthetic tissue is already being used to test pharmaceutical compounds for toxicity and other characteristics. As this technology matures, bioprinted samples may be used for biomedical research and testing that is involved in the development of biological weapons. For example, bioprinted tissue could be used to assess specific interactions between biological agents and certain tissue types under conditions that are otherwise difficult to simulate. However, these techniques are not uniquely enabling. Established methods, such as animal testing, are currently still more accessible and require a more common set of knowledge and skills. While bioinks and suitable printers are commercially available, the knowledge required to take advantage of this technology is less accessible to an actor with malicious intent.

Printing of delivery systems or their components Potential risk scenarios like <u>terrorists using</u> <u>adapted commercial drones to disperse a</u> <u>biological weapon</u> have long been known to experts. The use of AM to produce components for delivery systems such as drones contributes to making their designs more adaptable, increase their capabilities and could thus make them more suitable for use as a delivery system for biological weapons. Plans and build files for printable parts of commercially available drones

are openly shared in the do-ityourself (DIY) community. <u>Simultaneously</u>, the capabilities and customizability of off-the-shelf drones have also



increased. Certain spray tanks and types of nozzles that are already subject to export controls can be produced using AM. However, the relatively low level of sophistication of these parts means that they do not necessarily present a major obstacle to their acquisition by a state or a non-state actor.

Addressing AM in the Australia Group and the BWC

The applications of AM relevant to the development, production and delivery of biological weapons are still relatively unknown. However, developments in bioprinting, as well as in the printing of drone components and laboratory equipment, continue at a rapid pace due to commercial and scientific interests-and an active DIY community. While relevant applications of AM currently still require considerable talent recruitment and process development efforts, particularly the digitized and automated nature of AM will likely mean that these barriers will be successively removed. Although the convergence of biotechnology and AM currently only produces moderate biological weapon proliferation risks, these are expected to increase. It is thus important to neither undernor overestimate the immediate impact.

Discussions in the AG on if and how to exert controls over the transfer of relevant goods and technologies area are therefore confronted by a difficult array of challenges. These include tracking advances in a rapidly evolving set of technologies and defining the associated risks. At the same time, export controls should not stifle developments for civilian applications of these technologies. Many of the challenges posed by AM extend beyond the biological and chemical weapons context and are relevant to missiles and the nuclear and conventional arms fields. Thus, they are of interest to all the export control regimes. Members of the regimes should therefore consider it as a topic for possible dialogue between the regimes, in regarding potential technical particular parameters for controls on AM machines and controlling intangible transfers of technical data that are used in AM.

At the same time, while export controls are currently a focus of regulatory discussions in the context of AM, meeting the challenges it creates in connection with biological weapons requires a more comprehensive approach. As such, discussions in both the BWC and the AG also need to pay attention to the role of research ethics and risk mitigation procedures in relevant research fields. This would include a stronger emphasis on raising awareness about possible weapons applications at relevant universities, research institutes and in DIY communities, as well as the development of stronger industry compliance and due diligence standards. States thus need to engage with all stakeholders and carefully monitor the nuanced risk picture currently faced to prevent AM from becoming an enabler of biological weapon proliferation.

Kolja Brockmann is a Researcher in the SIPRI Dual-Use and Arms Trade Control program.

Is the United States Ready as Ebola Threatens to Return?

By Joe Lieberman and Tom Ridge

Source: https://www.govtech.com/em/safety/ls-the-US-Ready-as-Ebola-Begins-to-Rear-its-Ugly-Head-Again.html

Sep 10 — Five years ago, the Ebola virus broke through inadequate public health systems in West Africa and spread throughout the world. America was lucky. Only a few cases traveled here, but the U.S. government also did not respond as we had reason to expect.

Despite assurances that our country would be able to handle such a serious disease, our public health agencies and health care institutions made some serious mistakes.

The Centers for Disease Control and Prevention neglected to consult with the Occupational Safety and Health Administration when developing guidance for hospitals. It issued the guidelines and

then had to reissue them because they had not adequately accounted for air-handling systems and missed the mark when it came to personal protective equipment.



Congress waited much too long to provide emergency supplemental funding to help our health care and public health infrastructure respond. And one governor quarantined a nurse only because she had provided humanitarian assistance in an area where the disease was prevalent. Communications to the public about what was happening were disorganized, confusing and unnecessarily frightening.

Today, the threat from Ebola is more serious. The World Health Organization has declared it to be a global public health emergency because Ebola has again defied controls and spread to the city of Goma in the Democratic Republic of Congo, where it could in turn spread throughout more densely populated urban areas and gain access to the global transportation system. We support this declaration and the additional resources and attention it should bring to the situation, but the WHO should have made it earlier. Ebola was an emergency long before it spread to Goma.

There are encouraging signs that some experimental Ebola drugs are working, and the CDC and U.S. Department of Health and Human Services seem to be more effectively tracking the disease. On the other hand, changes made previously to help local hospitals in the U.S. better prepare to treat those infected are not being implemented as designed. And that will have real human consequences the next time Ebola or another highly infectious disease — including a new highly pathogenic strain of influenza — reaches America.

During the outbreak five years ago, 56 hospitals across the U.S. were designated Ebola treatment centers, or ETCs. The idea was to increase national capacity to care for patients who contracted this highly infectious disease. These hospitals are mostly clustered around major airports where travelers from West Africa are likely to arrive, including Chicago's O'Hare International Airport. They were initially equipped with dedicated clinical care resources, specialized infrastructure and trained staff to safely manage and treat patients suspected or confirmed to have Ebola. Since its inception in 2014, fewer resources have been allocated to this hospital network. As a result, the ETCs are having difficulty maintaining their ability to respond to Ebola cases that may come again to the U.S., and other infectious diseases that may follow.

Outbreaks are costly. Public health responses to Ebola, Zika, MERS, SARS and other diseases cost tens of billions of dollars, much of which can be avoided by taking preventive action. Congress can wait until Ebola or some equally deadly infectious disease arrives in our country, overwhelms state, local, tribal and territorial health care and public health capacity, and threatens lives and then provide billions in emergency supplemental funding. Or Congress can now recognize that these significant disease events will continue to occur and proactively take steps to ensure we can respond by creating a standing response fund.

In 2018, the bipartisan Blue-Ribbon Study Panel on Biodefense, which we co-chair, issued a report called Budget Reform for Biodefense. In it, we recommended \$2 billion for the Public Health Emergency Fund — a substantial increase over current funding levels — and which would be replenished with regular annual appropriations. Hospitals, other health care institutions and the public health community would have the funds they need, when they need it, to immediately protect our citizens. We hope that Congress will take up this recommendation soon, before Ebola — or another disease to which we are not paying as much attention — sickens and kills too many people here in the United States.

Former U.S. Sen. Joe Lieberman and former Pennsylvania Gov. Tom Ridge, the first U.S. secretary of Homeland Security, co-chair the bipartisan Blue-Ribbon Study Panel on Biodefense.

On the Anniversary of 9/11, a New Advance in the Fight Against Bioterrorism: Public Health Watch

Source: https://www.contagionlive.com/news/on-the-anniversary-of-911-a-new-advance-in-the-fight-against-bioterrorism-public-health-watch

Sep 11 – On this day, when we remember the lives lost in the terrorist attacks of September 11, 2001, we must also never forget the <u>anthrax scare</u> in the days that followed them.





Because, sadly, the threat posed by similar biologic attacks has hardly diminished over the past 18 years—if anything, it has only become more pronounced.

Thankfully, researchers are also working on ways to diminish the dangers posed by these threats, as evidenced by recent work out of the National Research Institute of Police Science and the Research and Education Center for Prevention of Global Infectious Diseases of Animals in Japan. At these institutions, experts have sought to further refine the rapid determination system of viral genome sequences—or RDV method—an exhaustive gene amplification approach that can be used in the rapid identification of pathogenic agents in response to bioterrorism and so-called "biocrime" events.

They published their most recent findings in the September issue of the journal Forensic Science,



Medicine and Pathology (FSMP)—and the early results are promising.

"The RDV method usually requires a virus propagation step," study co-author Junji Hosokawa-Muto told *Contagion*®. "In virus-rich materials, it may be possible to detect viral genes without the propagation step. In this case, we found that it can be detected more guickly."

As Hosokawa-Moto and colleagues note, the rapid identification of pathogenic agents is vital in the event of a biologic-based attack in order to quickly facilitate appropriate treatment and, if necessary, isolation of victims. Although various methods have been used for virologic analysis of forensic samples including blood, fluids, clothes, etc, the current most commonly used approaches are molecular methods, which include virus detection by the amplification of specific genes (or

methods, which include virus detection by the amplification of specific genes (eg, Polymerase chain reaction) that require viral species-specific primers.

According to the authors of the *FSMP* paper, if the viral species "cannot be readily assumed," identification... may be "extremely time-consuming and labor-intensive." The <u>RDV method</u>



was developed to mitigate these issues through the detection of "species-independent viruses," without primers, which allows for rapid detection of unidentified viral genome sequences, usually within 2 days—often less.

To test the approach both with and without the time-consuming viral propagation step, Hosokawa-Muto et al tested for pathogenic virus genes in fluid swab samples from a young (16-day-old) cat that died after a suspected viral infection. Via the RDV method, the authors identified nucleotide sequences of feline herpesvirus and feline calicivirus, findings that were later confirmed via direct sequencing.

Clinically, the viability of RDV has important implications in the response to bioterrorism/biocrime, according to Hosokawa-Muto and colleagues, in that it could serve as an efficient and affordable tool that can quickly identify pathogens used in these attacks, particularly in settings in which so-called next-generation sequencing (NGS) is not yet available. However, the technique may also be used for more day-to-day functions, such as in the investigation of the cause of viral illness of unknown etiology (eg, sudden infant death), they added.

"I hope the RDV method will be used in laboratories that do not yet have NGS," Hosokawa-Muto explained. "We are currently exploring other rapid detection methods."

If only they—or someone else—could invent a world in which they wouldn't be necessary.

<u>Emergent BioSolutions Awarded 10-Year HHS Contract to Deliver</u> <u>ACAM2000® (Smallpox [Vaccinia] Vaccine, Live) Into the</u> Strategic National Stockpile

In support of the U.S. government's policy to maintain a stockpile to be able to protect every American from smallpox, Emergent BioSolutions Inc. announced a contract award by the Office of the Assistant Secretary for Preparedness and Response in the U.S. Department of Health and Human Services for the continued supply of ACAM2000® (Smallpox [Vaccinia] Vaccine, Live) into the U.S. Strategic National Stockpile.

Disasters and People with Serious Mental Illness

This bulletin focuses on the experiences of individuals with serious mental illness (SMI) before, during, and after disasters. Research focused on individuals with schizophrenia, bipolar disorder, major depression, and post-traumatic stress disorder (PTSD), and on individuals with SMI as defined in part through functional limitations



Is Your Organization Ready for a Pandemic?

Several key factors have been identified recently that make organizations vulnerable to pandemics. One of the hardest to overcome? **Diseases don't respect borders.** We can't count on outbreaks across the globe to remain isolated.

Pandemic response is something every business continuity manager should take seriously.

Does your BC/DR plan cover the interruptions a pandemic could cause, like weeks of mass absenteeism or even quarantine? What if disease causes delays along your supply chain?

<u>Download the white paper</u> to understand how pandemics typically develop and resolve, and how businesses like yours may be affected.



From bioerror to bioterror - should we worry about synthetic biology?

Source: https://www.abc.net.au/radionational/programs/sciencefriction/from-bioerror-to-bioterror---should-we-worry-about-synthetic-bi/11510726

Sep 15 – Today's scientists aren't just manipulating existing lifeforms and their DNA, new biotech tools now make it easier to engineer new, artificial biological entities from scratch – ones that don't exist in



nature.

Synthetic biology has big, exciting applications, but also comes with big risks. For example, what if an engineered virus escapes a lab unintentionally, or a person with malicious intentions uses it to commit bioterrorism?

From bioerror to bioterror, *Science Friction's* Natasha Mitchell was the only journalist at a recent closed NATO biosecurity workshop in Switzerland where leaders in the military, science and citizen science, sociology, and technological governance met at to consider the threats (read more below).

Image: Maurizio Cigognetti

Guests

Dr Peter Emanuel, Army Senior Scientist for Bioengineering, US Department of Defence

Daniel Feakes, Head of Implementation Support Unit, <u>UN Biological</u> <u>Weapons Convention</u>, UN Office for Disarmament Affairs.

Dr Todd Kuiken, Genetic Engineering and Society Center, North Carolina State University

<u>**Dr Filippa Lentzos**</u>, Senior Research Fellow, joint appointment in the Department of Global Health & Social Medicine and the Department of War Studies, Kings College London

<u>Rebecca Moritz</u>, Responsible Official and Institutional Contact. Dual Use Research, University of Wisconsin Madison

Dr Piers Millet, Director of Safety and Security at iGEM (International Genetically Engineered Machines Competition)

Dr Edward (Ed) J. Perkins, Senior Research Scientist, U.S. Army Engineer Research and Development Center

The workshop, Security and Resilience for Emerging Synthetic Biology and Biotechnology Threats, was run by the International Risk Governance Center (IRGC@EPFL) at EPFL and the NATO Peace Science for Peace and Security Programme

Evaluating the risks posed by synthetic biology

This four-day workshop was organized by EPFL's International Risk Governance Center (IRGC@EPFL). We spoke with Marie-Valentine Florin, the Center's executive director, about IRGC's role at EPFL.

How can synthetic biology be used improperly or maliciously?

Synthetic biologists are able to construct new biological systems and functions with applications in energy, health care and farming. Yet these same technologies can also be hijacked to create potentially dangerous pathogens for which there is no known treatment.

So as researchers, we need to ask ourselves what we can do to advance science and technology for the common good while at the same time managing the risks of "dual-use" research, or research that can be turned against people or the environment.

The EPFL workshop, which was funded by NATO's Science for Peace and Security Programme, gave scientists, national and international regulators, security agencies and



businesses a chance to pool their expertise in order to clarify the causes and potential consequences of these risks and refine existing response strategies.

The working groups formed during the workshop will now turn their discussions into a report and a book discussing the various problems, current and potential future solutions, existing obstacles and recommendations. The workshop participants explored both the failure of well-intentioned researchers to take necessary precautions and the impact of their negligence, as well as the danger that knowledge or material will be used for malevolent purposes.

What is IRGC@EPFL?

IRGC was created by EPFL in 2017 to serve as a forum for cross-disciplinary dialogue on complex, uncertain and ambiguous risks – which are often a counterpart to opportunities. Our goal is to give policymakers the information they need to make decisions based on solid scientific and technological



foundations.

Most technologies are aimed at reducing existing risks – think climate change, diseases and natural disasters – and this is something that should be promoted by public policies. It is also essential to create positive incentives through targeted research programs, financial support, and standards that reward performance gains. But new dangers can always arise, and this is where IRGC comes in. Our

recommendations are meant to highlight key risks and challenges and help identify possible strategies to deal with them.

We have a dual mission. First, we seek to develop widely applicable risk governance concepts and instruments. Risk governance refers to the processes, standards, regulations and structures that come into play when riskrelated decisions have to be made. This includes assessing, and communicating about risks with the involvement of the various

managing

stakeholders. We then issue recommendations, mainly for public policymakers, about how to manage the risks posed by some emerging technologies.

Why does EPFL need IRGC?

All major universities around the world have an institute or center that studies the link between technology and public policy. The concept of risk is central because it is what justifies public intervention. Yet the risk governance approach that we take encompasses more than simple risk management. For a university like EPFL, it means creating the conditions necessary for new technologies to be adopted. For example, we commonly recommend that new technological applications must not only improve existing performance in some way, but they must also be economically viable and generally responsible, i.e. socially acceptable and environmentally respectful.

Our role at EPFL is to answer researchers' questions about such topics. We can also be more proactive in certain areas, such as insisting on the importance of taking cultural differences into account when assessing risk acceptability – in genome editing, for example – and raising awareness of the role and place of ethics in researchers' work.

What is IRGC currently working on?

Our work is focused on two of EPFL's areas of expertise: digitalization and life sciences. In digitalization, this year we are working on deepfakes, which is when text, audio or video content is falsified in order to mislead or manipulate people. We're looking at what steps can be taken to ensure machine learning is used to improve diagnostics, predictions and decisions without being applied to actually producing deepfakes as well. In the life sciences, we have set up a program to help decision-makers achieve the social, regulatory and economic conditions needed to promote fairness in the

burgeoning field of precision medicine. This year, our focus is on value creation in this field.



Qatar builds capacity to deal with bioterrorism

Source: https://www.gulf-times.com/story/641769/Qatar-builds-capacity-to-deal-with-bioterrorism



Officials and dignitaries participating in the workshop. PICTURE: Nasar K Moidheen

Sep 15 – A workshop that got underway in Doha on Sunday comes as part of Qatar's preparations for major events, including the 2022 FIFA World Cup, in order to prevent, detect and respond to any biological terrorist acts or threats, an official has said.

The event aims to build and strengthen national capacities in Qatar to face biological accidents, stressed Dr Jameela al-Ajmi, representative of Hamad Medical Corporation and head of the Biological Weapons Convention (BWC) working group, while delivering the keynote address on the opening day of the Project Biosafe: Bioterrorism Risks and Controls Workshop.

She also informed that a team of specialists to respond to biological disasters at the national level and to respond to emergencies.

The workshop has been organised by Qatar's National Committee for the Prohibition of Weapons (NCPW), represented by the Doha regional centre for training on weapons of mass destruction, and the National Central Bureau (Interpol Doha), the officials Qatar News Agency (QNA) reports.

The event is being held under the Biosafe project in co-operation with Interpol - International Criminal Police Organisation, and will run for four days.

Dr al-Ajmi said Qatar acceded to the 1972 Biological Weapons Convention, the first multilateral disarmament treaty banning the development, production and stockpiling of an entire category of weapons of mass destruction, out of its belief in the importance of achieving international peace and security. She noted that Qatar was one of the first signatories to the agreement, QNA added.

The official praised the efforts exerted by the NCPW to activate and implement conventions at the national and international levels in the face of threats caused by biological weapons to national, regional and international security, referring that these efforts culminated in the promulgation of the Biological Weapons Act No 4 of 2016.

The committee has also held several seminars, workshops and training courses with the aim of building national capacities and raising awareness for various segments of society, she said.

Dr al-Ajmi stressed that regarding preparedness and crisis management, the committee has formed a national team of specialists to respond to biological disasters at the national level and to respond to emergencies, by taking preventive measures against biological attacks and on how to respond to bioterrorism.





The head of the National Central Bureau (Interpol Doha), Major Mohamed Fahad al-Hajri, highlighted Qatar's standing commitment to combating terrorism and transnational crime and maintaining international peace and security, pointing to the fruitful co-ordination between the bureau and the NCPW in accordance with Interpol standards.

NCPW secretary Captain Abdulaziz Hamdan al-Ahmed said in remarks on the sidelines of the workshop that the hosting of this event came as part of the committee's plans to prepare a response team in case of any biological emergency.

Captain al-Ahmed added that the NCPW met with the Interpol in co-operation with the Interpol bureau in Doha in order to co-ordinate this event.

Further, the NCPW secretary said participation in the event focused on the bodies concerned with biological hazards such as the Ministry of Public Health and the General Administration of Civil Defence, and also noted the participation of a number of private hospitals and pharmacies in addition to companies that specialised in dealing with biological materials, QNA reported.

On its first day, the workshop discussed global terrorism and biosecurity, and reviewed the experience with hazardous biological materials in Qatar, as well as the assessment of biological threats and risks.

The workshop will discuss a number of topics, including the structure adopted in Qatar for the prevention and response to chemical, biological, radiological, nuclear and explosive weapons, preventive measures in dealing with natural disease outbreaks, crime scene management, the risks of biological terrorism and the means of monitoring it, in addition to a number of other related issues.

Blast sparks fire at Russian laboratory housing smallpox virus

Source: https://www.theguardian.com/world/2019/sep/17/blast-sparks-fire-at-russian-laboratory-housing-smallpox-virus

Sep 17 – A gas explosion has sparked a fire at a Russian laboratory complex stockpiling viruses ranging from smallpox to Ebola, authorities have said.

The State Research Centre of Virology and Biotechnology denied that the fire had exposed the public to the pathogens stored inside, some of the deadliest on Earth.

The blast took place during repairs to a fifth-floor sanitary inspection room at the facility – known as Vector – in Koltsovo, in the Novosibirsk region of Siberia, <u>the centre said</u> on Monday. The site housed secret biological weapons research during the Soviet era and is now one of Russia's main disease research centres.

One worker suffered third-degree burns after the blast, which blew out the glass in the building. The fire reportedly spread through the building's ventilation system. A fire covering 30 square metres was later extinguished.





Russian authorities insisted that the room where the explosion occurred was not holding any biohazardous substances and that no structural damage was caused. The mayor of Koltsovo said that the laboratory did not contain any disease samples because of ongoing repair work.

The smallpox virus survives in two places on Earth: at Vector and at another high-security laboratory at the US Centers for Disease Control and Prevention in Atlanta.

Russian authorities last month were slow to release information about an explosion at a military testing site that caused a spike in radiation levels in Arkhangelsk region. The blast occurred when a liquid-fuelled rocket carrying nuclear materials exploded, killing at least five people.

Authorities initially denied the incident had occurred and reportedly did not tell local hospital staff that the victims had been exposed to deadly levels of radiation. <u>Russia</u> has not said what the military specialists were working on, although experts have speculated it may be a nuclear-powered cruise missile mentioned by Vladimir Putin last year.

Monday's incident was not the first at the Vector lab. In 2004, a researcher died at the complex after accidentally <u>pricking herself with a needle carrying the Ebola virus</u>. Russian media then claimed it was the only death from the virus in Russia's history. Outbreaks of anthrax and smallpox were caused by Soviet weapons development programmes in the 1970s and subsequently covered up by the government. The Vector institute was threatened by a lack of funding in the 1990s, raising concerns that researchers could sell their expertise or actual biological samples to governments such as Iraq and North Korea. The laboratory also gave training on how to respond to a potential terrorist attack in the 2000s. A weapons cache including grenade launchers reportedly belonging to a mafia group was found near the facility in 2006.

The lab has also held highly contagious forms of bird flu and strains of hepatitis.

Smallpox virus: crunch time for the fate of a global killer

Source: https://www.theguardian.com/society/2011/feb/13/smallpox-virus-vector-health-terror

Feb 2011 – Twenty miles south-east of Novosibirsk, in Siberia, several dozen concrete buildings have been erected outside the town of Koltsovo. The settlement is ringed with triple rows of barbed wire fences. Video cameras and motion sensors monitor any activity near the wires while soldiers from an elite Russian army unit patrol its perimeter.



This is Russia's State Research Centre of Virology and Biotechnology – or Vector, as it is usually known. Frozen in winter, when temperatures plunge below -30C, and then scorched in summer, when the heat routinely rises above 30C, the place is as unwelcoming as you could imagine. Given its name, location and a high-security protection, Vector would make an ideal setting for a James Bond film.



This would be a fitting accolade, for Vector contains a number of unsettling scientific secrets, with the most sinister being housed in bio-containment laboratory P-4, in Building 6. Here a small storage plant, chilled by liquid nitrogen, holds phials of one of the deadliest pathogens known to medical science: the smallpox virus.

Smallpox killed the Egyptian pharoah Ramses V in 1145 BC and Tsar Peter II of <u>Russia</u> in 1730 and was responsible for an estimated 300–500 million deaths in the 20th century alone; only in 1980 was it declared eradicated by the World Health Organisation following a series of global vaccination programmes. But smallpox – with its once dreaded symptoms of blistered skin, lesions, delirium and fever – does survive in two places on Earth: at Vector and at another high-security laboratory, at the Centre for Disease Control in Atlanta, USA.

At the Russian and American units, scientists have continued to study the smallpox virus for the past decade. However, these last repositories are now under threat. In May, the World <u>Health</u> Assembly – the decision-making body of the WHO – will be asked to set a date by which these collections should be destroyed. If agreed, the move would result in the extinction of one of the deadliest ailments to have afflicted our species.

Previous assemblies have delayed moves to have these last smallpox stocks destroyed. Nevertheless, it is expected that a decision will be taken this time: either to eradicate the virus or to save it.

The issue may seem straightforward: why should humanity keep phials of a deadly virus that it went to such pains to eradicate and which could trigger a horrific epidemic in the event of an accidental release? This point is stressed by the many doctors and scientists who back the call for the phials' destruction. It is time to wipe this scourge from our planet, they say.

Such views are not shared by all scientists, however. An opposing group claims that disposal of the CDC and Vector's smallpox stocks would be a disaster, arguing that the world needs these samples in order

to develop new drugs against the disease should it one day reappear, either accidentally or intentionally. Those stocks could be our saviour, they claim. The World Health Assembly vote is going to trigger an intense scientific battle.

A detailed look at both sides is illuminating, starting with those researchers – including many senior scientists and defence officials in Russia and the US – who say it would be a calamity



if the smallpox pathogen was destroyed. These virus supporters, who are known as "retentionists", argue there is a strong prospect that smallpox samples may already have been obtained by terrorist groups and that the Vector and CDC stocks will therefore be needed to help defend the world from bio-terror attacks. To back this point, the Russians say Iran made several attempts in the 1990s to recruit some of their Vector scientists – efforts that may have been successful in a couple of instances.

American scientists and officials take a similar view. Before 9/11, the US supported the destruction of smallpox stocks, but it now takes the risk of an attack seriously. Last month, an unnamed US scientist – who was also a former UN inspector – told the *Wall Street Journal* that inspections in Iraq in 2003 and 2004 provided some "credible intelligence that suggests it [the virus] was there". Hence the need to retain smallpox samples and to continue testing drugs and vaccines that could counter the disease if a release occurred.

This argument has powerful supporters. Last month, an editorial in the science journal *Nature* argued that the danger posed by the use of smallpox as a terrorist weapon should not be ignored. The vaccination programmes of the last century, although saving countless lives, has – paradoxically – left the world's population dangerously exposed. "Smallpox would be an effective weapon – it spreads easily and kills almost one-third of the people it infects," the editorial states. "Furthermore, the triumph of smallpox eradication after widespread vaccination in the 1960s and 1970s means that some 40% of the world's population has no immunity today." In short, we're vulnerable and care is needed to ensure the protection of billions of individuals now defenceless against a new smallpox epidemic.

There is a further argument, put forward by retentionists. The smallpox virus is such a deadly pathogen, it acts as a Rosetta stone for understanding the immune system, they say. This point is stressed by Dr Inger Damon, head of the CDC's poxvirus section. She is one of only 10 scientists who has access to the centre's smallpox samples – housed in a high-security laboratory that can only be reached using electronic security cards and retinal scanners – which she uses to study diagnostic tests, anti-virus therapies and new vaccines against the virus. "There is considerable uncertainty about possible undisclosed virus stocks that might exist – about what might be out there and about the dangers of smallpox being used as an agent of terrorism," she says. "That is why we need to keep these stocks and to keep studying them."

However, other scientists disagree and argue the virus should be wiped out completely. This camp – known as the "destructionists" – argue that there is little new information to be gained from continued research on the smallpox virus. Experiments on pathogens have yielded all the information that can be gleaned. At the same time, keeping samples alive maintains a constant risk of an accidental release that could have disastrous consequences.

An example is provided by the accidental release of the variola virus, which causes smallpox, from a research laboratory at Birmingham university in 1978. Janet Parker, a medical photographer, was infected and subsequently died, though not before transmitting the disease to her mother. In the end, the outbreak was contained, although the head of the microbiology unit, Professor Henry Bedson, subsequently killed himself, leaving a note apologising for his role in the incident.

However, there is another, more important reason for eradicating the world's last smallpox stocks, argues DA Henderson, head of the WHO's eradication campaign and a former leading US expert on bioterrorism. Once virus stocks are destroyed, "any lab, scientist or country found to have the virus after the date of destruction is de facto guilty of very serious crimes against humanity," he says.

This argument is backed by security expert Jonathan Tucker of Darmstadt University. "If the authorised stocks of the virus were eliminated, it would become possible to draw a clear red line and brand any possession, synthesis or hostile use of the variola virus as a crime against humanity, punishable with the most severe economic, political and military sanctions," he states.

How these arguments will influence the World Health Assembly is difficult to assess. It is possible it may vote for destruction but for the US and Russia to refuse. Another scenario might see an

agreement to destroy most samples, but retain a handful as last resorts. (CDC has 451 samples at present, Vector 120.) Or it may simply agree to the status quo.

In any case, eradication of the US and Russian samples would not necessarily wipe out smallpox for eternity. Its genome is known and scientists, using the latest in DNA technology,



could recreate the virus from scratch, a point stressed by Dr Inger Damon. "Biology has now advanced to the stage where it is no longer inconceivable that one could put together a virus as large as the smallpox variola using synthesised nucleic acids," she says. "This is all the more reason, I believe, for keeping the natural variety in safe containment for future study."

Smallpox bioterrorist attack could devastate planet for 10 years

Source: https://www.rt.com/news/452079-smallpox-bioterrorist-attack-devastate-planet/

Feb 2019 – In August 2018, Australian scientists launched a complex international simulation dubbed, 'Exercise Mataika', which investigated a 'worst-case scenario' for a smallpox bioterrorist attack and the results are horrifying.

Smallpox, one of the most infectious diseases known to man, was officially eradicated in 1980, but two officially known samples of the disease are held in secure laboratories in the US and Russia.

The team's simulation began with a smallpox bioterrorist attack in Fiji; the first case is reported in a private hospital but is not diagnosed properly as doctors are unfamiliar with the (now effectively-extinct) disease. The hypothetical outbreak then spreads to 200 people, of which roughly 40 percent die.

As the virus spreads, local health systems are overwhelmed, mass panic ensues, exacerbated by media reports and a 13-day delay in correctly identifying the outbreak. The number of infected quickly rises to 2,000 cases, including doctors, at which point nurses go on strike. The first wave of 32,000 vaccinations arrive in Fiji just as another, larger attack occurs in a more populous country in Asia.

In the study's worst-case scenario, only 50 percent of people infected with the disease are isolated and only half of the people they had contact with are tracked and vaccinated. This leads to a *"catastrophic blow-out in the epidemic."*

"Under these conditions, modelling shows it will take more than a billion doses and 10 years to stop the



epidemic," the researchers explain.

The variola genome, which causes smallpox, is fully sequenced and advances in synthetic biology have increased the likelihood of smallpox being synthesized in a laboratory. In addition, roughly one in five people live with some degree of immunosuppression in developed countries across the globe, while a large proportion of the world population today is unvaccinated.

Biosecurity experts previously scoffed at the potential for a smallpox bioterrorist attack until Canadian scientists reconstructed the extinct horse pox virus in a lab using mail-order DNA in 2017.

Worldwide, the World Health Organization has a stockpile of 34 million vaccine doses from member donations, however, it only has roughly two million in its own possession.

As governments and health organizations work to contain the infection in the simulation, the global workforce is decimated, which severely disrupts transport, power,

communications and food infrastructure.

"Trust in government and authority structures has disappeared, and legitimate attempts at communication by authorities are viewed with suspicion and fuel conspiracy theories," the researchers write of the worst-case scenario.

"The results of the exercise are sobering... the results and lessons learned should be considered by every country in the world," says biosecurity expert Michael Osterholm, the director of the Centre for Infectious Disease Research and Policy (CIDRAP) at Minnesota University.



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World Unprepared for Pandemic: WHO

Source: http://www.homelandsecuritynewswire.com/dr20190918-world-unprepared-for-pandemic-who

Sep 18 – The next deadly pandemic could spread within thirty-six hours, disrupt economies and destabilize national security, WHO and World Bank experts have said. The panel said current efforts to manage a pandemic are "grossly insufficient."

An international panel of experts, working under the auspices of the World Bank and the World Health Organization (WHO), has warned that disease pandemics pose a threat to millions of people and have the potential to harm the global economy.

SIMULATION GLOBAL FLU PANDEMIC

Epidemic-prone viral diseases such as Ebola, SARS, and the flu have become increasingly difficult to control, as long-term armed conflicts, forced migration, and weak and failed states become more commonplace in the world, the report warned.

"Disease thrives in disorder and has taken advantage — outbreaks have been on the rise for the past several decades and the specter of a global health emergency looms large," the GPMB said.

Efforts have been made by governments and

MONTH 5 Total deaths **29,509,648**

CNN <u>reports</u> that the <u>Global Preparedness</u> <u>Monitoring Board</u> (GPMB), a 15-member panel of political leaders, heads of agencies, and experts, released their report on Wednesday. They urged governments to do more to prepare for and mitigate the risks of pandemics.

"The threat of a pandemic spreading around the globe is a real one," the GPMB said. "A quick-moving pathogen has the potential to kill tens of millions of people, disrupt economies and destabilize national security."

NGOs to increase preparedness for major disease outbreaks since the last major outbreak of Ebola in West Africa, in 2014-2016, but, the report said that those efforts were still "grossly insufficient." Current management health and diseases emergency is characterized by "a cycle of panic and neglect," said Gro Harlem Brundtland, a former WHO head who co-chaired the Board.

Even more troubling, the report found that a large number of national health systems, especially



in poor nations, would collapse if confronted by a pandemic.

"Poverty and fragility exacerbate outbreaks of infectious disease and help create the conditions for pandemics to take hold," said Axel van Trotsenburg, acting chief executive of the World Bank and a member of the panel.

DW <u>reports</u> that the WHO had warned earlier this year of the inevitability of another flu pandemic, one caused by airborne viruses.

The report's authors pointed to the disease's last pandemic, the Spanish flu of 1918. The outbreak killed roughly 50 million people. The group warned that a similar outbreak today would be exacerbated by air travel and could spread throughout the world in less than 36 hours.

"In addition to tragic levels of mortality, such a pandemic could cause panic, destabilize national security and seriously impact the global economy and trade," the GPMB report warned. Researchers also warned about the current level of mistrust that governments, scientists, the media, public health, and health workers are facing today.

"The situation is exacerbated by misinformation that can hinder disease control communicated quickly and widely via social media," the WHO report said. "In the event of a pandemic, such a breakdown in public trust represents a serious threat to the effectiveness of governments and public health workers to manage the crisis."

Over 3,000 Killed by Deadly Virus in Democratic Republic of the Congo This Year – and It's Not Ebola

By Jeremy Rossman and Matthew Badham

Source: http://www.homelandsecuritynewswire.com/dr20190918-over-3-000-killed-by-deadly-virus-in-democratic-republic-of-the-congo-this-year-and-it-s-not-ebola

Sep 18 – Ebola outbreaks, such as the current one in the Democratic Republic of the Congo (DRC), which has claimed 2.074 people's lives, are widely covered in the media. But another virus is ravaging the DRC with minimal publicity. That virus is measles.

Although measles has a much lower mortality rate than Ebola (around 2 percent compared with around 60 percent), there have been over <u>165,000 suspected cases of measles</u>, with over 3,200 deaths in the DRC since the start of 2019.

In a <u>recent speech</u>, Tedros Adhanom Ghebreyesus, director-general of the World Health Organization (WHO), said that he was "embarrassed to talk only about Ebola" in response to questions on recent developments in the DRC.

Measles is proving fatal at an alarming rate, far faster than Ebola. In the week ending August 11, 2019, <u>5,600 cases</u> were reported, with 141 deaths. Figures in the same week for Ebola were <u>63 confirmed cases</u> and 45 deaths, meaning that, on average, measles is killing around three times as many people per week as Ebola.

For a vaccination program to be effective, at least <u>92-95 percent</u> of the population must be immunized – this creates so-called <u>herd immunity</u>. Another approach is ring vaccination.

This is where clusters of people who are particularly at risk are vaccinated. This approach can help to contain the spread of an outbreak, but with aid organizations facing attacks, community mistrust and under resourcing, even ring vaccination approaches are proving difficult to implement in both outbreaks. Many local communities in the DRC mistrust medical workers. It stems from years of regional isolation and <u>conflict</u>. In some areas, this mistrust has even led to violence against the "wealthy" and "foreign" humanitarian aid workers, resulting in treatment centers being closed and the <u>containment response</u> being stalled for both Ebola and measles.

Thanks to the combination of rumors of Ebola being fabricated, conspiracies around vaccination programs, and deeply held traditional beliefs, the <u>difficulties in delivering aid</u> don't appear to be ending any time soon.

The perception that the international response to measles is minimal compared with the effort mounted against Ebola also <u>stirs mistrust and anger</u> within the DRC. Measles poses



less of a threat globally and specifically to wealthy countries, as vaccination programs are widespread and effective (<u>about 92 percent coverage in the U.S.</u> and <u>about 86 percent globally</u>). In contrast, isolated Ebola cases in the US and other wealthy countries during the 2013–16 West Africa epidemic caused widespread public fear and outcry.

Future-Proofing Humanitarian Aid

Even countries with well-developed healthcare systems would struggle to contain an Ebola outbreak, while a measles outbreak in a country with widespread immunity would have far less social, medical and economic impact.

In July 2019, the World Health Organization (WHO) declared the current Ebola outbreak a <u>public health</u> <u>emergency of international concern</u>, partly in response to international pressure and fear of the disease spreading to other countries. Measles has been given no such status.

Although Ebola poses a greater threat than measles in wealthy countries, within the DRC measles is causing more illness and death, but has generated a smaller international response. The WHO has raised almost <u>\$114m</u> for combating the DRC Ebola outbreak, while barely <u>\$2.5m</u> has been raised to combat measles.

This is especially relevant when considering that an aspect of public resistance stems from the response teams only treating Ebola, whereas, from a community perspective, diseases such as measles and malaria are far greater threats to their lives. For example, malaria was responsible for over <u>27,000 deaths</u> in the DRC in 2017.

How then should the international community respond to outbreaks to protect both the overall health of a community and the global spread of a specific disease? Perhaps the solution is as recently proposed by <u>Doctors Without Borders</u> and <u>The Alliance for International Medical Action</u>. They suggested that instead of the international community delivering targeted aid for only Ebola, resources should be deployed to strengthen local infrastructure and provide a decentralized capacity to provide care to all communities.

This may enable a country to contain an Ebola outbreak while still responding to outbreaks of other infectious and non-infectious diseases, providing better care for local communities. By using international resources to strengthen local infrastructure, it might be possible to create more resilient community health systems capable of responding to future outbreaks, possibly without needing international support.

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Declaring Vaccine Hesitancy One of the Ten Biggest Health Threats in 2019 Is Unhelpful

By Christine Stabell Benn

Source: http://www.homelandsecuritynewswire.com/dr20190920-declaring-vaccine-hesitancy-one-of-the-ten-biggest-health-threats-in-2019-is-unhelpful

Sep 20 – The World Health Organization (WHO) recently <u>declared</u> vaccine hesitancy one of the ten biggest threats to global health in 2019, along with air pollution and climate change. The declaration followed several measles outbreaks in Europe and the U.S., but most cases were in a country where the health system had broken down: <u>Ukraine</u>.

Nothing suggests that these outbreaks were caused by the few who declined a measles vaccine. A <u>substantial proportion of cases</u> occurred in people who had been vaccinated – so the outbreaks were mainly the result of broken healthcare systems and vaccine failure rather than vaccine hesitancy.

But the WHO declaration provides extra motivation for the health authorities in many countries that now mandate or consider mandating vaccines. The rhetoric is well-known:


vaccines work, the science is settled, vaccine-hesitant parents are uninformed or misguided victims of the social media platforms where crooks spread fake science.

It is taken as a given that vaccines are similarly and uniformly beneficial – aside from rare side effects – and no sane person would question that. But are vaccines similarly and uniformly beneficial?

There is no doubt that vaccines can induce immunological "memory" against their target disease. And, at the population level, this reduces the risk of getting the target disease, at least for a period.

With smallpox, the vaccine actually led to the eradication of a devastating disease that <u>killed around 30</u> <u>percent of those infected</u>. We are close to eradicating two other serious infections: polio and measles. Up to fifty years ago, polio infected almost everybody. And although only a small proportion developed clinical disease, it was still a <u>major cause of paralysis</u>. Measles infection, although seldom dangerous in wealthy areas, can be deadly in <u>crowded</u>, poor areas. These two infections are now close to extinct thanks

to vaccines.



Overall Health Effects

But we don't have a lot of evidence about the overall health effects of vaccines. Everybody has been so sure that vaccines only protected against the target infection, nothing else, and so nobody studied the overall health effects. They were simply assumed to be proportionally beneficial. For instance, if a measles vaccine is 90 percent effective and measles represents 10 percent of all deaths, then introducing the measles vaccine will reduce overall mortality by 9 percent. If the DTP vaccine protects against diphtheria, tetanus and pertussis – three potentially deadly diseases – then it will reduce overall mortality correspondingly.

None of the currently used vaccines were tested in randomized trials to document that they were overall beneficial before being introduced. And once a vaccine is recommended, it is almost impossible to study it in randomized trials because most ethical committees would not allow researchers to deprive a child of a recommended vaccine.

There is now increasing evidence that vaccines may have non-specific effects. They alter the immune system more broadly and so <u>may affect the risk of other infections</u>. Sometimes, for <u>live vaccines such as the measles vaccine</u> and <u>oral polio vaccine</u>, this seems to enhance the capability of fighting off other infections. Unfortunately, inactivated vaccines, such as the DTP vaccine, seem to increase the risk of other infections, particularly for females.



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We do not have the evidence for all vaccines to tell vaccine-hesitant parents that it is overall beneficial for their child to receive each one of them. Rather, we have to acknowledge that there are things about vaccines that have not been investigated very well.

Most vaccine-hesitant parents that I have come across are concerned that vaccines have not been investigated for their overall health effects. Telling them that the science is settled and stigmatizing them for their hesitance and mandating vaccines is inadequate and will only increase the popular opposition and hesitancy.



New Conversation

A good starting point for the new conversation we need to have with vaccine-hesitant parents is to stop talking about vaccines in plural, but discuss them individually. They are, after all, as different as drugs. And just as it would not make sense to say that "drugs work" it makes little sense to state that "vaccines work".

There is considerable evidence that live vaccines, such as the measles vaccine, have beneficial effects on overall health – reducing the risk of measles and other infections, thereby the risk of dying. But we must admit that we do not have the same kind of evidence for other vaccines.

As health professionals, we can give people advice along the lines of "If it was my child, I would..." – but given the lack of evidence, we should not judge parents who choose not to vaccinate. And we should not mandate vaccines.

It would be wonderful to eradicate measles, but that can be achieved with a vaccination coverage of 95 percent – the point at which <u>herd immunity</u> is achieved. And it is still only a small percentage of the population that does not want to vaccinate – so if we vaccinate those who want to vaccinate, then eradication is within reach, without shaming or forcing vaccine-hesitant parents. If we manage to eradicate measles, we may want to continue the vaccination for its beneficial non-specific effects.

Regarding other vaccines, where evidence for overall benefit is missing, we need randomized trials of their effect on overall health to provide the safety evidence that parents rightly request. Rather than making vaccine hesitancy a top-ten threat, the WHO should make it a top-ten priority to follow-up on its decision from 2014 to further investigate the overall health effects of vaccines.

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