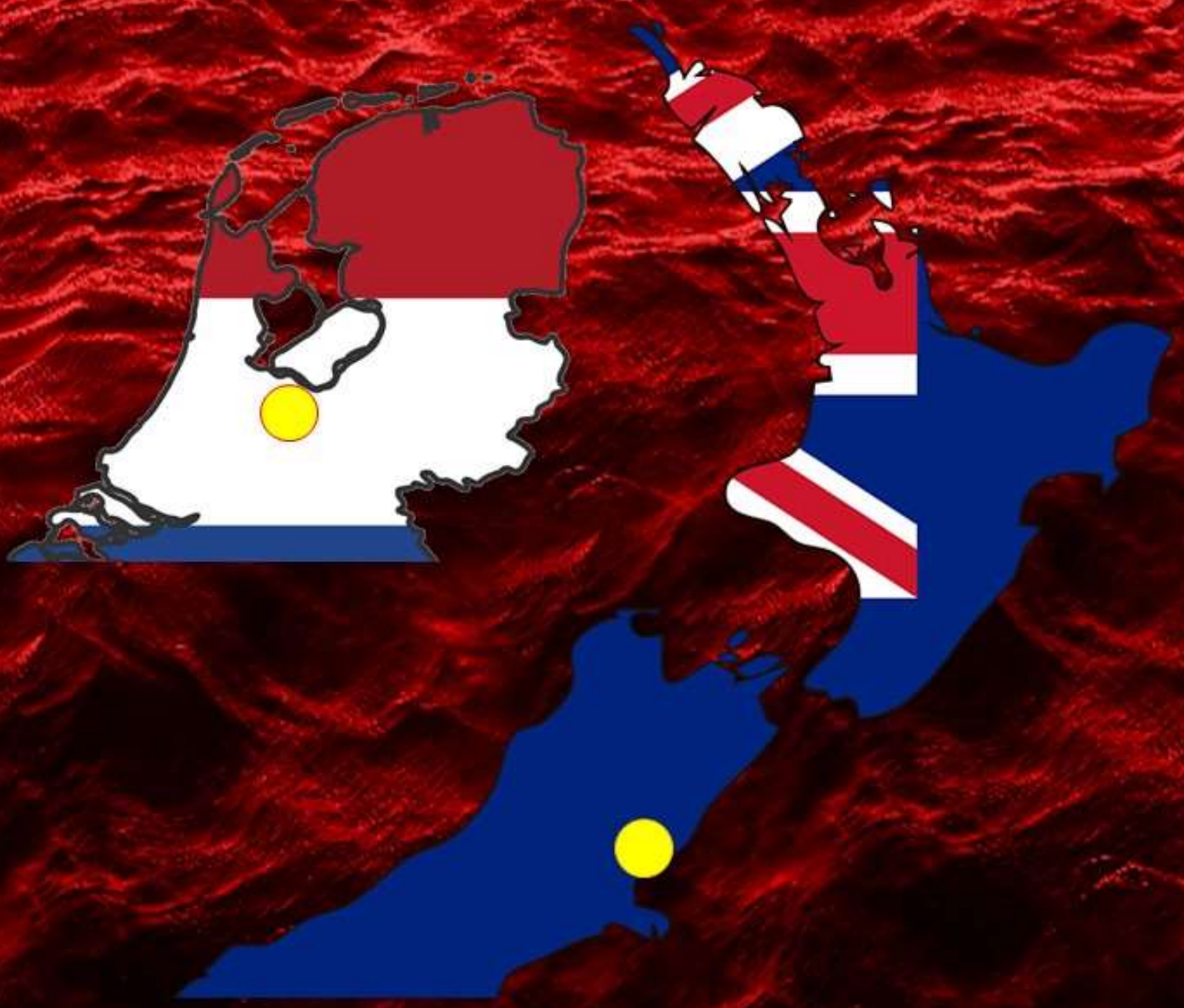
2 CBRNE DIARY

Dedicated to Global First Responders

CBRNE-Terrorism Newsletter

March 2019



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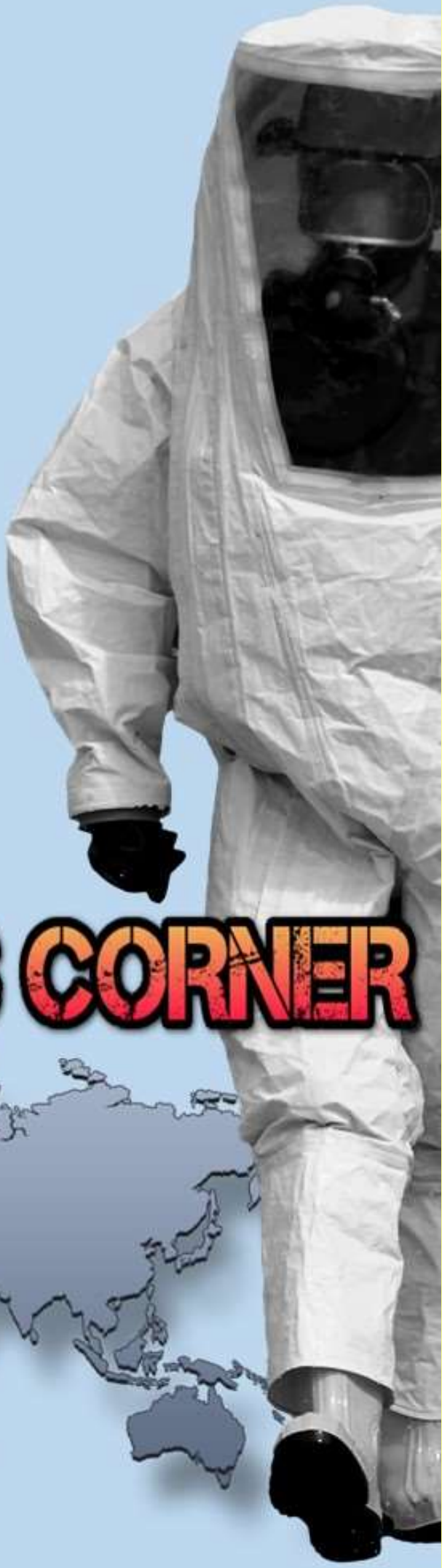


EDITOR'S CORNER

Editorial

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

Editor-in-Chief
C²BRNE Diary

Dear Colleagues,

March was not a good month for many reasons – let us see what happened on our troubled planet:

- Serious near-war clash between two nuclear neighbors, India and Pakistan – so close to a doomsday! Was it because of old disputes or the main underlying reason was the control of waters in the area?
- Immigration is good for your country! Canadians, British, Swedish, Americans, Japanese and Germans are trying to persuade us. I do not think so (according to a 2019 Pew Research Center's poll[1] – and 74% of Greeks, agrees with me)!
- Christianchurch mosques' terrorist attack violently broke the New Zeland's bubble and the "*everybody loves us*" attitude.
- Utrecht tram terrorist attack – not a bubble case as above but another proof that the unexpected always happens!
- Italian school bus terrorist arson incident – they welcomed him; they provided him shelter and a nice job; he paid back by almost burning all these school children alive.
- Read the inside story on how to make chemical weapons – is it so simple?
- A forgotten (or never known) chemical weapons story…
- Why we focus so much on North Korea's nuclear weapons when this nation has tons of CWAs (and BWAs) and the means to disperse them all over?
- A very interesting mobile HAZMAT/CBRNE/HME/IED decision support system is available to make your life a little more comfortable.
- Anthrax letters in Tunisia – real this time!
- Marburg virus vaccine is on the way.
- Ebola continues to march in Congo but still under 1000 – the critical awakening limit. Says who? Just me! Because right now, it seems that international society is cool with the existing situation.
- Plague in Madagascar – really? We thought it was part of their misery life there. Wasn't it?
- Turkey wants to see a world free of nuclear weapons FM stated – I am not joking! Or is he?
- Another uranium smuggling case in Georgia – people must make a living.
- Buga-Buga radiation poisoning – a hoax or reality?
- Stricter EU rules to prevent HME. Greeks are laughing on new legislation!
- World's most murderous malware: TRITON.
- Drones can now change shape in flight.
- A single drone caused havoc in Frankfurt's International Airport.

Take care CBRN First Responders – you are the only shield between our societies and unexpected!

The Editor-in-Chief

[1] https://www.pewglobal.org/2019/03/14/around-the-world-more-say-immigrants-are-a-strength-than-a-burden/

Airloy: The New Super Material

The most versatile material in the world may be here. Airloy is going to change everything from home insulation to modern structures.

Will terrorism continue to decline in 2019?

By Gary LaFree

Source: https://theconversation.com/will-terrorism-continue-to-decline-in-2019-104466

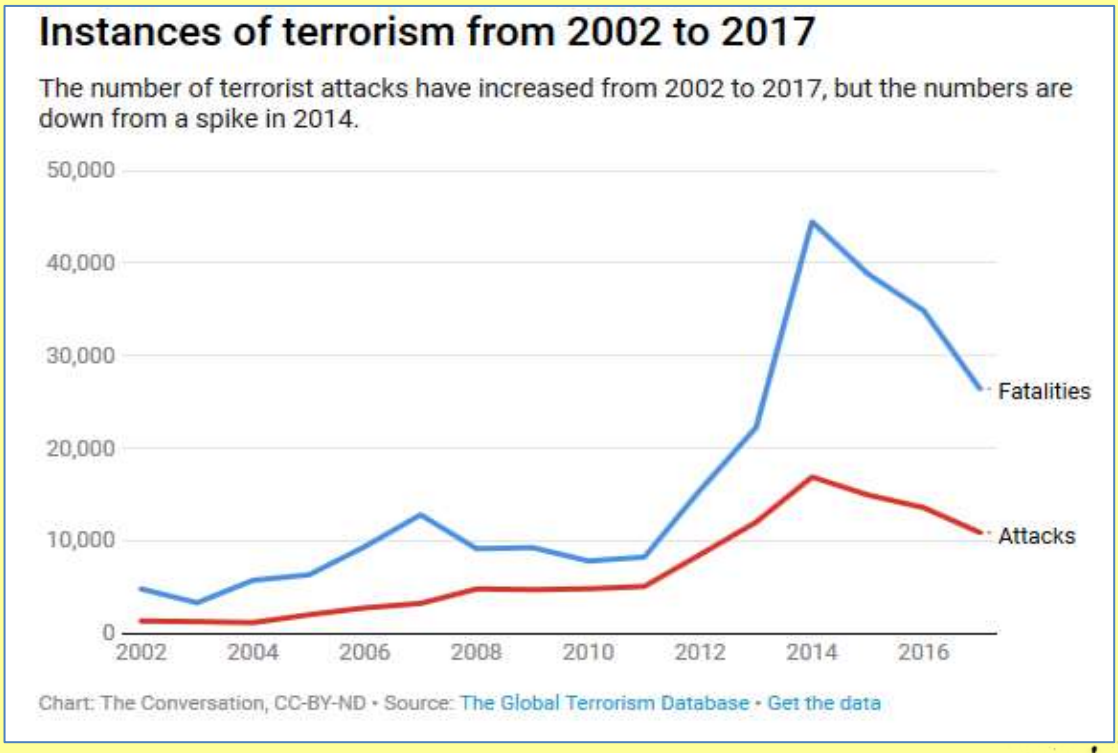
Feb 27 – Lost in the headlines, rapidly accelerating news cycles and the pervasive fear generated by terrorist threats is the fact that terrorist attacks worldwide have actually been declining – in some areas substantially.

Terrorism researchers like me have long noted that the number of terrorist attacks rises and falls in waves – generally lasting several decades.

I'm the founding director of the National Consortium for the Study of Terrorism and Responses to Terrorism, or START, and one of the original creators of the Global Terrorism Database. My colleagues Laura Dugan, Erin Miller and I define terrorism as "the threatened or actual use of illegal force and violence by non-state actors to attain a political, economic, religious or social goal through fear, coercion or intimidation." The database shows that the world has been gripped by a wave of terrorist attacks that began shortly after the 9/11 attacks.

My research using the START database shows the extent of this spike. From 2002 through 2014, worldwide terrorist attacks increased by 12 times and terrorist fatalities increased by more than eight times. Especially hard hit were Iraq and Afghanistan in the Middle East, India and Pakistan in South Asia, and Nigeria in sub-Saharan Africa.

The most active terrorist organizations driving this worldwide boom were the Taliban, Al-Shabaab, the Islamic State Group (also known as IS), the Communist Party of India–Maoist and Boko Haram.



But since 2014, the picture has changed dramatically – a development that has gone largely unreported in the media.

Let's examine that change.

A downward trend

In 2015 total terrorist attacks decreased by 11.5 percent and total terrorism-related deaths by 12.7 percent.
In 2016, we saw a further 9.2 percent decrease in attacks and 10.2 percent decline in total terrorism-related deaths.
The downward trend continued in 2017, the most recent data available, with a 19.8 percent drop in attacks and a 24.2 percent decline in fatalities.
Taken together, these 36 months have witnessed the single largest three-year decline in attacks and fatalities since the Global Terrorism Database began in 1970 – nearly a half century ago.
The recent declines are geographically dispersed. In the peak year of 2014, five countries – Iraq, Pakistan, Afghanistan, Ukraine and Somalia – accounted for 57.2 percent of the world's total terrorist attacks and more than half of the worldwide terrorism-related fatalities.
By the end of 2017, all five of these countries had experienced sizable declines in attacks.
Three of these countries also experienced a dramatic decline in fatalities: a 53.6 percent drop in Iraq, a 55.4 percent drop in Pakistan, and a 97.1 percent drop in Ukraine. The violence in Ukraine was concentrated in 2014 and 2015 and associated with the rapid rise of the Euromaidan revolution and culminated in the overthrow of the Russian-backed Ukrainian president.
During the same period, fatalities increased by 12.5 percent in Afghanistan and 203 percent in Somalia, but these increases weren't big enough to offset the declines in Iraq, Pakistan and Ukraine.

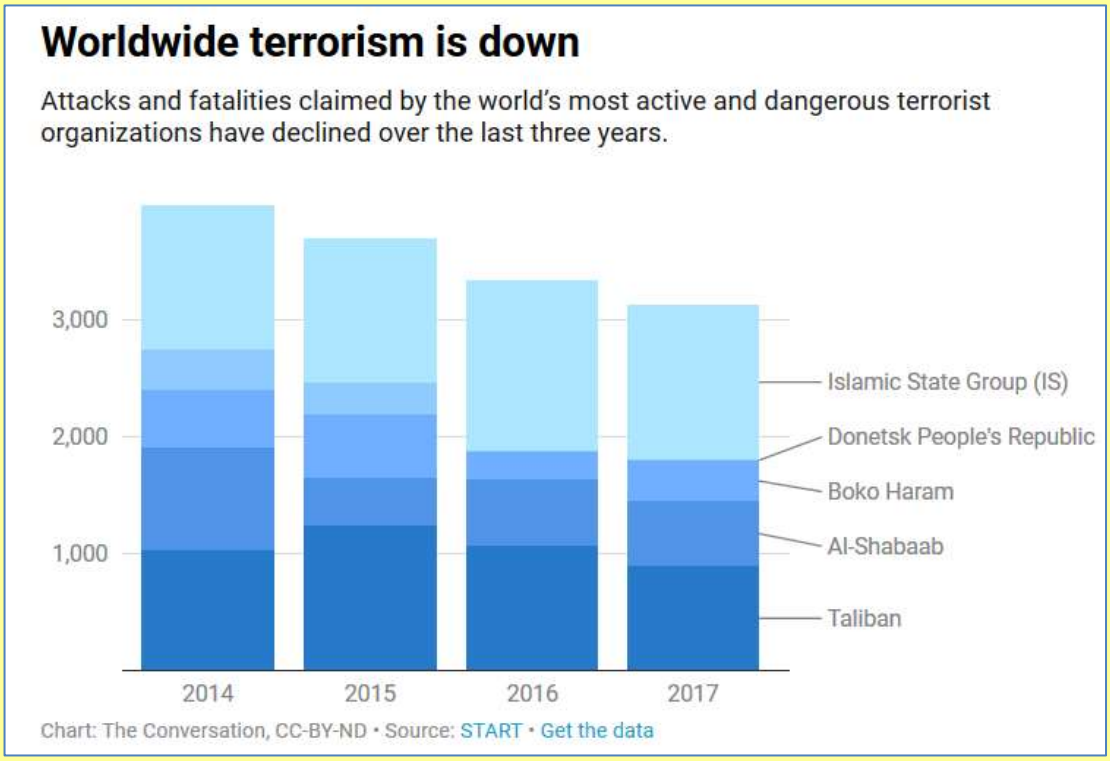
Major groups less active

Attacks and fatalities claimed by the world's most active and dangerous terrorist organizations have also declined during the last three years.
In 2014, the five most active terrorist organizations in the world were the Islamic State Group, or IS, the Taliban, Al-Shabaab, Boko Haram and the Donetsk People's Republic – a separatist organization operating in Ukraine and receiving military backing from Russia.

A member of the self-proclaimed Donetsk People's Republic forces, one of the world's most active terrorist organizations, in the rebel-controlled village of Yelenovka outside Donetsk, Ukraine. Reuters/Alexander Ermochenko

By the end of 2017, attacks by the Taliban, Al-Shabaab, Boko Haram and the Donetsk People's Republic had all declined. Total attacks by IS decreased by 2.2 percent from 2014 to 2015 but then increased by 7.7 percent from 2015 to 2017.

In Western Europe and the United States, total terrorist attacks are down sharply from the 1970s. In 2017, Western Europe accounted for only 2.7 percent of worldwide attacks and the United States for less than 1 percent of attacks.



That may seem surprising given the amount of media attention generated by a small number of high profile attacks. In 2015, attacks in Paris took the lives of 130 and injured another 400. In 2016, Western Europe experienced a series of mass casualty attacks carried out by IS and its affiliates in Nice, Brussels and Berlin.

While the total number of attacks in the United States remains extremely low, the public was shocked in 2015 by the 14 victims of the attack by Syed Farook and Tashfeen Malik in San Bernardino, California, and the nine people killed by Dylann Roof's attack at the Emanuel African Methodist Episcopal Church in Charleston, South Carolina.

In 2016, Americans witnessed the 49 deaths linked to the assault carried out by Omar Mateen in Orlando, Florida. And in 2017, Americans learned of the eight deaths in New York City linked to Sayfullo Habibullaevic Saipov who claimed an affiliation with IS.

Some hotspots remain

Terrorist attacks and fatalities are not declining everywhere and every year.

The START database shows that in 2017, attacks and fatalities increased in India, the Philippines and Nepal. In 2016, attacks and fatalities increased in the Democratic Republic of the Congo, South Sudan and Turkey. And in 2015 attacks and fatalities increased in Afghanistan, Bangladesh and Egypt.

Also, while worldwide attacks have declined, a large number of countries are still being targeted. Thus, while terrorist attacks took place in a total of 100 countries in 2014, total countries experiencing attacks was 99 in 2015, 108 in 2016 and 100 in 2017. Countries only experiencing attacks in 2016 included Kazkhstan, Panama and Switzerland.

This effect was especially apparent with IS and its affiliates, which claimed fewer attacks and deaths in 2017 but at the same time carried out attacks in a larger number of different countries.

Not all reasons for declines in terrorist attacks are positive.

For example, an argument can be made that terrorist attacks have declined in Afghanistan in part because the Taliban in recent years has been so successful in taking back control of the country.
A similar outcome – but with the regime rather than the terrorist perpetrators gaining control of the situation – no doubt explains declining terrorist attacks and fatalities in Syria.
While we have observed major declines in terrorist attacks and fatalities from 2015 to 2017, both attacks and fatalities remain at historically high levels.
The number of attacks in 2017 is 27.9 percent higher than in 2012, and deaths 70.6 percent higher.
Even more strikingly, attacks were more than twice as common in 2017 as they were during 1992 – the peak year for an earlier wave.

An end to chaos?

One thing is certain: The number of terrorist attacks in a particular region of the world as a whole will eventually peak and then decline.
It seems logical to conclude that the chaos and disorder that follow in the wake of terrorist attacks provide strong incentives for societies to adopt strategies for countering them.
Few individuals or communities prefer living endlessly in chaos and violence. We can only hope that we have reached that tipping point in 2019. At the same time, we must humbly admit that prediction is the most precarious task of the social sciences.

***Gary LaFree** is Professor of Criminology and Criminal Justice, University of Maryland.*

Are India and Pakistan on the Verge of a Water War?

By Keith Johnson
Source: https://foreignpolicy.com/2019/02/25/are-india-and-pakistan-on-the-verge-of-a-water-war-pulwama-kasmir-ravi-indus/

Feb 25 – With tensions rising between India and Pakistan in the wake of a deadly terrorist attack earlier this month that killed more than 40 Indian police officers in Kashmir, New Delhi has decided to retaliate in part by cutting off some river water that flows downstream to Pakistan. The decision to build a dam on the Ravi River, whose waters are allocated to India by treaty but a portion of which had been allowed to flow through to Pakistan, adds an extra source of conflict between two nuclear-armed neighbors that have repeatedly clashed over the disputed Kashmir territory.
To understand the issue better, Foreign Policy spoke with Sunil Amrith, a professor of South Asian studies at Harvard University and the author of *Unruly Waters*, a look at how water shapes South Asia's history, politics, and economic development.
Foreign Policy: India and Pakistan were torn apart at Partition, including critical water resources that had been shared under British India; is this the mother of all transnational water conflicts?

Sunil Amrith: It probably is, at least in the suddenness, the arbitrariness, and the brutality with which it emerged. In Asia, many of the other transnational water conflicts were slower to escalate—for example, it wasn't until the 1980s that neighboring states had the capacity or the ambition to dam and divert the upper reaches of the Himalayan rivers. In terms of the numbers of countries and interests at stake, the Mekong is perhaps the ur-transnational water conflict in Asia, but in the sense of a conflict that was created with the stroke of a pen, the conflict over the Indus delta is quite distinctive.
FP: From the vagaries of the monsoon and famines in the colonial period to the development and dam-building boom in the Jawaharlal Nehru years, how central is control of water to India's concept of nationhood, especially under Prime Minister Narendra Modi?
SA: The control of water has long been central to many visions of freedom and nationhood in India; that is one of the key arguments in *Unruly Waters*. This goes back to at least the late 19th century, when a

diverse group of Indian nationalists, British water engineers, and administrators began to see irrigation as India's salvation. The dam-building boom of the Nehru years epitomized the ambitions of a proud post-colonial state and its planned conquest over the vagaries of nature and climate. Nehru famously called large dams the "temples of the new India."

Under Modi, the control of water has continued to be of symbolic value. The government has also committed itself to the gigantic river-linking project, at an estimated cost of at least $90 billion. But none of this started with Modi. I think in terms of their approach to water management, there is a long thread of continuity across the past several Indian governments.

FP: In this case, India seems to be exercising its legitimate claim to the waters in the Ravi. Do you see this escalating, to the point that India starts to infringe on Pakistan's allocated waters in the western rivers or even abandons the Indus Water Treaty altogether? What happens if it does?

SA: The World Bank-brokered IWT of 1960 is a paradox: It is touted by many scholars of international relations as an example of successful cooperation between hostile states, and at the same time it's a frequent target of complaints from politicians on both sides of the border.

Following the failure to broker a deal where India and Pakistan would manage the water resources of the basin collectively, the Indus Treaty sought to legislate their division: The waters of the Sutlej, the Beas, and the Ravi were awarded to India; and the west Indus, the Jhelum, and the Chenab to Pakistan.

In practice, a significant quantity of water flowed into Pakistan even after India's extraction of what water it needed from the eastern rivers. But this is now in question, as India has vowed to impound more water from the Ravi River. Interestingly, one factor that stopped India doing this earlier was internal conflict over the river's use between the Indian states it flows through. We must always remember that conflicts over water in South Asia are intra-national at least as much as they are international. This is unlikely to change anytime soon.

There have been periodic calls in India for a unilateral withdrawal from the Indus Treaty, a threat that was issued last in 2016. So far, this has not led to action, and things have settled back into an uneasy coexistence. I would like to think that both sides have too much to lose from the unraveling of these delicate arrangements for the brinkmanship to be pushed too far. But given the global slide to unilateralism and the heightened tension the region,

there is always the possibility of strident rhetoric provoking a conflict over water, a conflict in which the real losers will be local people on both sides of the border.

FP: Pakistan is a seriously water-stressed nation already. How serious are the implications for Pakistan of diversions of water flow?

SA: Pakistan is one of the most water-stressed countries in the world. One recent estimate suggests that Pakistan will face a shortage of 31 million acre-feet of water by 2025. [Pakistan uses about 104 million acre feet every year for agricultural irrigation.] Its underground aquifers are critically depleted from the over-extraction of groundwater, and the two largest dams—the Tarbela and the Mangla—have seen a decline in their storage capacity due to excessive deposits of silt. As such, any diminution in water flow will have serious consequences for the livelihoods of Pakistan's farmers, who have already faced, over the past few years, a dearth of fresh water during the critical season—just before the monsoon, when the summer crop is planted.

FP: Given where the rivers are, is this dispute best understood within the context of the Kashmir conflict, or just a legacy of the Partition?

SA: Both. One reason why Partition so immediately created a water conflict in the Indus basin is that it was already one of the most thoroughly engineered hydraulic systems in the world at that time. But Kashmir was crucial to the conflict from the very outset—something that Daniel Haines's excellent book, *Rivers Divided*, shows very clearly. The waters of the Chenab and the Jhelum—awarded to Pakistan under the IWT—flow through Indian-administered Kashmir before they flow into Pakistan. This meant that negotiations over water were always bound up with concerns over territorial sovereignty—and it is one reason why tensions in Kashmir very quickly escalate conflicts over water, as has happened in this case.

FP: India isn't just an upstream nation, with respect to Pakistan. It's downstream from China. What are the prospects, given Chinese hydropower development in the Tibetan basin, that there are further transnational water conflicts, with dire impacts downstream?

SA: More than 400 dams are under construction, or planned for the coming decade, in India, Nepal, Bhutan, Pakistan; many more will be built across the Chinese border in Tibet. If the plans come to fruition, this will be among the most heavily dammed regions in the world. These schemes both aggravate international tensions and carry grave ecological risks, which themselves respect no borders. To the same extent that India fears Chinese ambitions to dam the Brahmaputra in particular, Bangladesh has already felt the negative effects of India's hydraulic engineering upstream.

Having said this, I am always reluctant to draw too direct a line between water scarcity and political conflict—either across or within borders. Conflicts over water are inextricably bound up with politics at every level from the local to the regional. The specter of "water wars" is a blunt tool with which to capture the unpredictability of struggles over water. The existential importance of water might defuse conflict as much as competing attempts to control water will deepen it.

FP: Climate change threatens Tibetan Plateau water resources in a couple of ways—more rainfall in the medium term, but also quicker glacial melts and less water flow in the future. How much could climate change aggravate the already tense cross-border water situation?

SA: The recent Hindu Kush Himalaya Assessment suggests that, even with a drastic reduction in carbon emissions, one-third of the Himalayan glaciers are doomed to melt by the end of this century; without a reduction in emissions, that grows to two-thirds. The livelihoods of well over a billion people are directly at risk from this. Most studies predict that, after an initial period of augmented river flow due to glacial melt, the rivers will begin to dry up for part of the year from 2050 or 2060, putting at risk the food security of a significant portion of humanity. The threat of further conflict as a result is multifaceted. Reduced flow will lead to energy as well as water shortages. The increasing prevalence of extreme precipitation events, also widely predicted, will threaten the stability of the dams, with grave risks downstream.

The report on the glaciers made the headlines, in a few places, for a day or two. It staggers me that this isn't the biggest news story in the world at the moment.

Keith Johnson is Foreign Policy's global geo-economics correspondent. He has been at FP since 2013, after spending 15 years covering terrorism, energy, airlines, politics, foreign affairs, and the economy for the Wall Street Journal. He has reported from Europe, the Middle East, Africa, and Asia.

Is it more dangerous to let Islamic State foreign fighters from the West return or prevent them from coming back?

By David Malet

Source: http://www.homelandsecuritynewswire.com/dr20190228-is-it-more-dangerous-to-let-islamic-state-foreign-fighters-from-the-west-return-or-prevent-them-from-coming-back

Feb 28 – The United states and other countries around the world are dealing with the same question: Should their citizens who join foreign terrorist organizations and fight for them be allowed to return to their home country?

Many of the men and women who left their homes in the West to join the Islamic State group or similar terrorist organizations in Syria and Iraq as fighters or supporters now want to come home. Their desire to return has coincided with the defeats suffered by IS in the diminishing territory under its control.

The U.S. government argues that countries should take back their foreign fighters and prosecute them rather than allow them to be free to act on the world stage.

But other countries are more concerned with the threat of returnees committing domestic terrorism. And, despite its arguments, the U.S. has recently moved to keep at least one American-born ISIS member from returning.

Determining which approach makes Western countries safest requires examining the facts about foreign fighters.

Inconsistent U.S. stance

Only about 250 to 300 Americans are said to have left the country to join the Islamic State in Syria and Iraq. The numbers who left Europe are much greater, 5,000 to 6,000, according to a 2018 report from the Program on Extremism at George Washington University.

The United States and its allies recently split over the Trump administration's insistence that other governments bring home their citizens who joined the Islamic State.

Syrian rebel groups have detained hundreds of ISIS-affiliated Westerners, but have threatened to release over 3,000 them if the United States withdraws its forces from the region. The Free Syrian Army has already released at least one British foreign fighter, and his whereabouts are now unknown.

But American officials have undercut their position by declaring that Hoda Muthana, a young mother who left the United States to join IS, should not be permitted to return either, illustrating the inconsistency of the American approach to this issue.

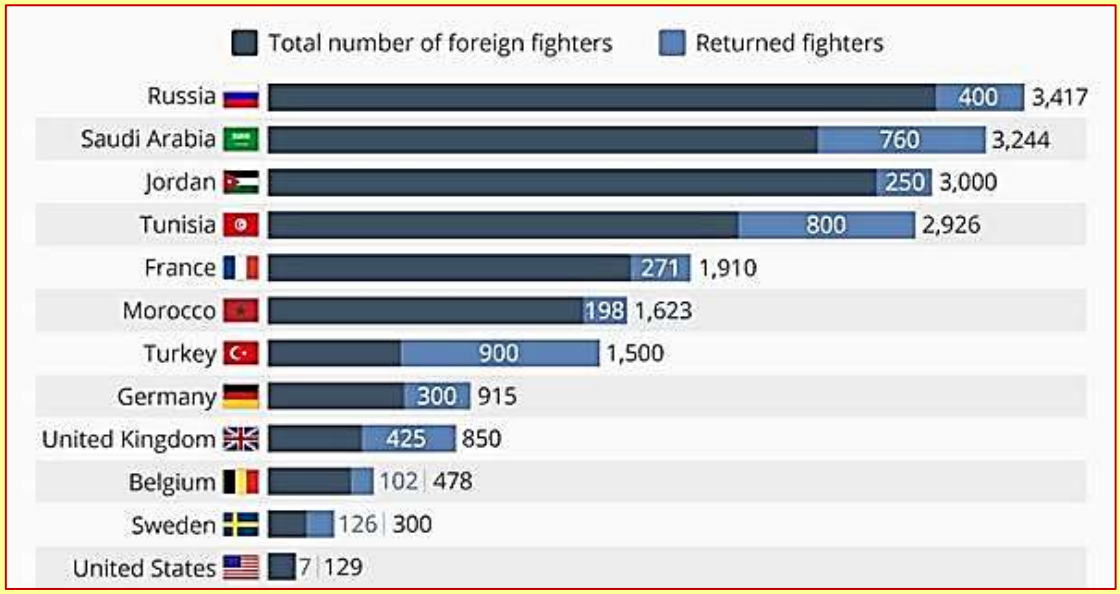
Range of national policies

The U.S. was actually the first country in the world to outlaw foreign fighting. Congress passed the initial legislation while George Washington was still president, despite the role of foreign volunteers in the American Revolution.

Under U.S. law, individuals can lose their citizenship for joining a foreign army or armed group as an officer, or for joining forces hostile to the United States.

However, prosecutions have been rare. American foreign fighters through history have been charged instead with violations that are easier to demonstrate in court than fighting on foreign soil (which would require witnesses and testimony from abroad), such as handling weapons of mass destruction and providing material support for terrorist organizations. Unlike some allies, the U.S. has not attempted to prevent foreign fighters from returning by removing their citizenship.

Part of the disagreement between the U.S. and its allies over foreign fighters stems from the fact that every country has different policies concerning such returnees.
France and Russia are among the countries in the process of taking some or all of their citizens back to face charges at home. Canada, which has been divided by internal partisan debates, has switched approaches, from stripping citizenship to allowing foreign fighters to return and potentially face criminal charges. But the Canadian public safety minister dismissed the American call to reclaim its citizens as a mere "suggestion."
The U.K. has passed laws stripping citizenship from individuals who travel to join terror groups. In its own case of a young mother being held by rebels, it has argued that because her father was an immigrant from Bangladesh, she is eligible for citizenship from that country and her U.K. citizenship can be removed.
The U.S. has taken this approach in the Muthana case as well. Its argument is that her father's employment as a foreign diplomat means that she is not a citizen, despite having been born in America.



Fears vs. facts

One American response to the rise of IS was to push for passage of two United Nations Security Council resolutions that require every country in the world to try to stop their citizens from becoming "foreign terrorist fighters" and to track and prosecute them.
These resolutions are why some countries like Australia are eager to remove their foreign fighters' citizenship status: If a foreign fighter can be stripped of citizenship retroactively, it is no longer an obligation for that country to return or prosecute them.
National responses have varied and are driven by domestic homeland security politics. Denmark has a successful reintegration program that provides social services to help some returnees deradicalize and disengage. But opponents of this policy mounted challenges and won court rulings ensuring that Denmark can strip citizenship as well.
Since relatively few Americans have gone to Syria and only a handful have returned, there has not been a national debate about returnees until the recent Muthana case.
Many national responses have been prompted by fear of domestic terrorism.
The U.K. relied upon one 2013 study indicating that, in theory, as many as 10 percent of returnees could become terrorists. However, the same researcher found in 2015 that the rate was actually .002 percent, and hundreds of returnees have already been back for years with no sign of terror activity.
The local IS network behind the Paris and Brussels attacks included some returnees.
But otherwise foreign fighters have not produced a wave of domestic terrorism in the West.
My own research indicates that most domestic terror plots by returnees, including successful attacks, occur only within the first few months and that there is no evidence of any long-term threats by returnee sleeper cells.

Foreign fighters who have been barred from their home countries have fanned the flames of terrorism and insurgency when left unchecked. Osama bin Laden was the most prominent of hundreds of such militants who created far more havoc than any returnees. And in the social media era, they do not even need to return home to reach domestic audiences.
The American government should weigh this evidence carefully as it moves to address the risks of ISIS returnees.

***David Malet** is Assistant Professor, American University School of Public Affairs.*

U.S. offers up to $1 million reward for information on Bin Laden son Hamza

Source: http://www.homelandsecuritynewswire.com/dr20190228-u-s-offers-up-to-1-million-reward-for-information-on-bin-laden-son-hamza

Feb 28 – The United States has offered a reward of up to $1 million for information leading to the "identification or location" of the son of Osama bin Laden, the deceased leader of the Al-Qaeda terror organization.

"Hamza bin Laden is the son of deceased former AQ leader Osama bin Laden and is emerging as a leader in the AQ franchise," a State Department statement said on 28 February, using an acronym for the extremist group.
"He has released audio and video messages on the Internet calling on his

followers to launch attacks against the United States and its Western allies, and he has threatened attacks against the United States in revenge for the May 2011 killing of his father by U.S. service members," the statement added.

The United States invaded Afghanistan in late 2001 because the Taliban-led government had protected Al-Qaeda and the elder bin Laden, who organized the September 11, 2001, terror attacks in the United States that killed nearly 3,000 people.
The Taliban was driven from power, and bin Laden, hiding in the northern Pakistani city of Abbotabad, was killed in a U.S. raid in 2011.
Speculation about Hamza bin Laden's location has centered on Pakistan, Afghanistan, Syria, and Iran.
A 2018 United Nations report highlighted that "Al-Qaeda propaganda continues to highlight a new generation of potential leaders, such as Hamza bin Laden…in an apparent attempt to project a younger image to its sympathizers."
In a July 2016 audio recording, Hamza bin Laden threatened revenge against the United States for killing his father.
"If you think that your sinful crime that you committed in Abbottabad has passed without punishment, then you thought wrong," he said.

Business continuity

U.K. unveils new counter-terrorism information sharing platform

Source: http://www.homelandsecuritynewswire.com/dr20190306-u-k-unveils-new-counterterrorism-information-sharing-platform

Mar 06 – **A new counter-terrorism project to keep the public safe by enhancing collaboration between business, industry and the public sector has been announced today.**

The government says that this joint initiative will see a ground breaking interactive online platform developed to provide secure expert advice and training to businesses and public sector organizations to help them develop their own counter-terrorism approaches.

In the event of an attack, the platform will give businesses access to timely and accurate information.

The Security Minister, Ben Wallace, announced the project at the Home Office Security and Policing Event in Farnborough today.

The £10 million project is being funded by Pool Re, the terrorism reinsurer, and led by Counter Terrorism Policing, in partnership with the Joint Security and Resilience Centre, part of the Home Office.

Security Minister Ben Wallace, said:

This project is one of the first of its kind - a collaboration between the police, the insurance sector, and the government that will help to keep the country safe and secure.

If we are to properly respond to the terrorist threat, we need to ensure everyone plays their part. That is why partnerships like this one are so vital and I thank Pool Re for their leadership.

Pool Re Chairman Geoff Riddell said:

Pool Re and the insurance industry are uniquely placed to promote resilience, protect the UK's economic infrastructure and enhance national security interests by improving the UK's ability to tackle terrorism.

We take this responsibility very seriously, and as such are delighted to be collaborating with the Home Office and counter terrorism policing to deliver this critical initiative.

The platform will meet a longstanding need from the private sector for more credible, quality and timely information to be used in their protective security and resilience planning.

The national policing lead for Protective Security, Deputy Assistant Commissioner Lucy D'Orsi, said:

Since the tragic events of 2017, counter terrorism policing has been working alongside government and the private sector to strengthen our defences against terrorism through greater collaboration and information sharing.

That is why this ground-breaking new platform is so important, as it will allow businesses to access credible information 24/7, connect users to experts, provide accredited online training and send direct messages in the event of an attack – strengthening our frontline against the unprecedented threat.

By supporting this initiative, Pool Re will improve the engagement, collaboration and sharing of information between the private sector, policing and the security services - resulting in a better assessment of emerging threats and helping us to work together to keep the UK safer.

The government's counter-terrorism strategy, CONTEST, is committed to building a more integrated relationship with the private sector to increase the UK's ability to tackle terrorism.

The platform is being developed primarily for the private sector, specifically focused on small and medium-sized businesses for whom access to expert external advice can sometimes be costly.

Consultation with key partners is already underway and further discussions will continue this year to ensure the platform is fit for purpose.

Technical development will commence later in the year.

European ethno-nationalist and white supremacist movements thrive

Source: http://www.homelandsecuritynewswire.com/dr20190306-european-ethnonationalist-and-white-supremacist-movements-thrive

Mar 06 – More than seventy years after the defeat of Nazi Germany, ethno-nationalist and white supremacist movements in Europe continue to thrive. They include far-right political parties, neo-Nazi movements, and apolitical protest groups. Some groups openly espouse violent white supremacy, while others have propagated their radical stances under the guise of populism. Such populist groups claim that they are striving to protect average hardworking Europeans by preserving their livelihoods and heritages from economic and cultural threats posed by immigrants and ethnic minorities.

In a new report from the Counter Extremism Project (CEP), the authors argue that though not all of these groups directly link their ideologies to Nazism, their propaganda portrays immigrants and ethnic minorities in a similar manner to how Nazi propaganda portrayed Jews, blaming them for national economic troubles and depicting them as a serious threat to the broader national identity.

From the report's executive summary:

In a June 2018 speech, German Chancellor Angela Merkel recognized that the majority of refugees are victims, and that "escape and expulsion are part of our German and European history."[1] Nonetheless, several far-right political parties in Europe have infused anti-immigrant and particularly anti-Muslim xenophobia into their party platforms through the concept of ethno-nationalism—the idea that a nation should be composed of a single ethnicity. These parties postulate that hardworking European natives are suffering economic and cultural losses due to immigrants and ethnic minorities who want to replace national, religious, and cultural identities with foreign values. Ethno-nationalists also view multiculturalism as a code word for the destruction of the native national identity. For example, Hungary's neo-fascist Jobbik political party rejects "the dead-end Western European multiculturalism" and has pledged to "defend our cultural identity developed over our history."[2] Groups like Germany's Alternative für 2Deutschland (AfD) political party lament the influx of Muslim immigrants, which they claim weakens the German culture and quality of life. AfD has gone so far as to claim that Islam is a danger to Germany.[3]

These far-right political parties have therefore been able to unite ethno-nationalism with populism by propagating the notion that ethno-nationalism serves the average hardworking individual and the broader national identity. Their propaganda campaigns have allowed them to generate substantial popular support and make gains in domestic elections. The AfD came in third in Germany's September 2017 parliamentary elections.[4] In March 2018's Italian parliamentary elections, the far-right, anti-immigrant Lega Nord ("Northern League") party succeeded in becoming the third largest party in Italy's parliament. In June 2018, League leader Matteo Salvini assumed the role of Italy's interior minister. He has since refused a migrant aid ship permission to dock in Italy and called for a national census to address "the Roma question."[5] Both parties also view the European Union as a harmful foreign influence that has undermined the sovereignty of their respective nations.[6] Salvini has even derided the euro as a "German currency" and a "crime against humanity."[7]

Some ethno-nationalist political movements have openly embraced the language and symbolism of the Nazi movement. In Hungary, Gabor Vona, the former chair of the far-right Jobbik, has blamed international Jewry for attempting to buy Hungary and interfere in its elections. Jobbik has also used the Nazi "Arrow Cross" to symbolize pride in Hungary's Nazi past.[8] In 2014, a Hungarian court ruled that Jobbik may be referred to as "neo-Nazi" in Hungary.[9] Despite similarities in propaganda, however, not all of Europe's far-right political movements have

openly embraced links to the Nazi or neo-Nazi movements. Members of the French anti-immigrant Les Identitaires movement reject violence and consider themselves to be patriots defending European identity from cultural corruption imposed by Islamic mores.[10] Les Identitaires' youth wing, Generation Identity (GI), has a presence across Europe and uses social media and popular demonstrations to propagate similar anti-Islamic notions and gain traction with young people.[11]

Some of Europe's historically non-political, violent far-right groups have not only embraced similar populist language to the ethno-nationalist political movements, but also continue to espouse openly racist concepts and employ violence to achieve their visions of an ethnically homogenous state. Combat 18, a violent neo-Nazi skinhead group founded in the United Kingdom in 1992, currently has a presence in at least 18 countries.[12] Similar to ISIS in its aim to create a Muslim-only caliphate, the group encourages supporters to carry out lone-wolf terrorist attacks as part of its greater aim to create white-only countries through violence.[13] National Action is another group of young far-right extremists that, in 2016, became the first far-right group to be labeled as a terrorist organization in the United Kingdom after it praised the murder of a parliamentarian.[14] The group, whose members believe that "Britain should be for British people,"[15] reportedly operates training camps where recruits learn hand-to-hand combat in preparation for "white jihad."[16] Not only do these violent white supremacist groups employ similar strategies to some of the most prominent Islamic terror groups, but they are also motivated to pursue the radical end goal of an ethnically or culturally homogenous state due to similar concerns that their identity and way of life are under threat.

The report's key findings

- ✓ European far-right ethno-nationalist groups have cast immigrants as a scapegoat for economic hardship faced by young Europeans. Rather than promote overt white supremacy, these groups denigrate minorities—particularly Muslim immigrants—as detrimental to European culture.
- ✓ Far-right political parties like Germany's Alternative für Deutschland and Italy's Lega Nord have been able to generate substantial popular support by promising to defend their respective countries against the cultural attacks of immigrants and foreign influences, and have consequently made gains in domestic parliamentary elections.
- ✓ Groups like Les Identitaires and its youth wing, Generation Identity, have renounced violence in favor of utilizing social media and public demonstrations to portray themselves as legitimate, mainstream movements protecting European culture. These groups have directly targeted Europe's youth through social media and public demonstrations.
- ✓ Groups including Combat 18 and the Nordic Resistance Movement, which openly embrace neo-Nazi ideology and violent tactics, are still able to recruit for violent activities, despite the rise of non-violent, populist groups.

▶▶ **Notes are available at source's URL.**

— Read more in European Ethno-Nationalist and White Supremacy Groups (Counter Extremism Project, 2019).

EDITOR'S COMMENT: One general ascertainment (we love to put labels on people; we love even more to distort meanings at our will) and one question (I love my country. How should I be called?).

Immigration is beneficial to local economies, even after 100 years

Source: http://www.homelandsecuritynewswire.com/dr20190313-immigration-is-beneficial-to-local-economies-even-after-100-years

Mar 13 – A new study in the *Review of Economic Studies* finds that **U.S. counties with more historical immigration have higher incomes, less poverty, and lower unemployment today.**

An important issue in current American political discourse is the effect that immigrants have on the communities in which they settle. While this topic has received significant attention, the focus has generally been on the short-term effects of immigrants. We know much less about the long-run consequences of immigration.

Researchers studied the effects of immigration into the United States from 1850 to 1920, a period in which immigration to the country increased dramatically, and the immigration sources also changed. In 1850 over 90 percent of foreign-born people living in the United States were from Great Britain, Ireland, or Germany. By 1920, this figure was only 45 percent.

Oxford University Press says that the authors found that immigration resulted in benefits that were felt soon after their arrival. Immigration resulted in more and larger manufacturing establishments, greater agricultural productivity, and higher rates of innovation. These findings are consistent with a long-standing narrative suggesting that immigrants contribute to economic growth by providing an ample supply of unskilled labor, as well as a smaller supply of skilled people, who bring with them knowledge and innovations that are important for development.

The size of the effects suggest that increasing the percentage of immigrants in a county by 4.9 percent results in a 13 percent increase in average per capita income today, a 44 percent increase in average manufacturing output per capita from 1860-1920 (and a 78 percent increase in 1930), a 37 percent increase in farm values, and a 152 percent increase in the number of patents per capita.

The researchers also found that these economic benefits did not have long-run social costs. Places with more historical immigrant settlement today have similar levels of social capital, civic participation, and crime rates.

"What is fascinating is that despite the exceptionalism of this period in US history," said the paper's lead author, Sandra Sequeira. "There are several important parallels that one could draw between then and now: the large influx of unskilled labor, the small but important inflow of highly skilled innovators, as well as the significant short-run social backlash against immigration. There is much to be learned from taking a longer perspective on the immigration debate."

EDITOR'S COMMENT: Native Americans, also known as American Indians, Indigenous Americans and other terms, are the indigenous peoples of the United States, except Hawaii. There are over 500 federally recognized tribes within the US, about half of which are associated with Indian reservations. The term "American Indian" excludes Native Hawaiians and some Alaska Natives, while Native Americans (as defined by the US Census) are American Indians, plus Alaska Natives of all ethnicities. Native Hawaiians are not counted as Native Americans by the US Census; instead, they are included in the Census grouping of "Native Hawaiian and other Pacific Islander". The ancestors of modern Native Americans arrived in what is now the United States at least 15,000 years ago, possibly much earlier, from Asia via Beringia. A vast variety of peoples, societies, and cultures subsequently developed. Native Americans were greatly affected by the European colonization of the Americas, which began in 1492, and their population declined precipitously mainly due to introduced diseases as

well as warfare, territorial confiscation, and slavery. With such a historical background it is not a surprise to read the results of the study mainly because the United States is an immigrant nation. The situation is totally different in most of the European nations where native people go back in history for centuries. In that respect, although immigration is not bad and, in many instances, promotes things in the host country, illegal immigration has the opposite results. Different cultures and religions, inability or unwillingness to integrate and incorporate with local populations, dependence on benefits without working, lack of working skills, experience and education are only a few of the drawbacks of illegal immigrants flooding Europe. Extrapolation of American data in the European environment is not useful and even the idea of comparisons is not appealing despite the fact that certain EU countries are basing their progress and future survival on immigrants – both legal and illegal – in an effort to equalize the low birth rates observed.

Christchurch shootings: ~~49~~ 50 dead in New Zealand mosque attacks

Source: https://www.bbc.com/news/world-asia-47578798

Mar 15 – **Forty-nine people have been killed and at least 20 wounded in shootings at two mosques in Christchurch, New Zealand.**

Australian Prime Minister Scott Morrison described an alleged gunman, who had Australian citizenship, as an "extremist, right-wing" terrorist.

A man in his late twenties was charged with murder and will appear in court on Saturday morning, police confirmed.

Two other men and one woman were detained nearby and firearms seized, Police Commissioner Mike Bush said.

He said police had determined that one of the people detained was not involved in the incident, and officers were working to understand if the other two were connected.

The gunman appeared to have live-streamed footage of his rampage to Facebook, filmed with a head-mounted camera. The footage appeared to show him firing indiscriminately at men, women, and children from close range inside the Al-Noor mosque.

Police called on the public not to share the "extremely distressing" footage online. Facebook said it had removed the gunman's Facebook and Instagram accounts and was working to remove any copies of the footage.

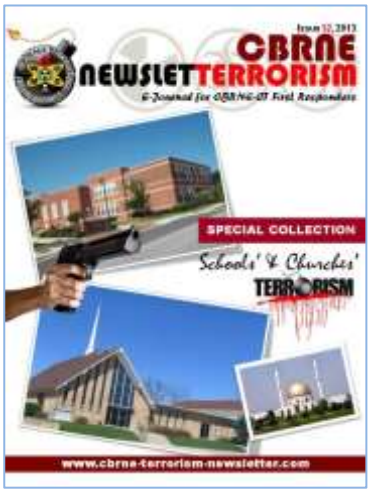
The suspect was also believed to have published a manifesto outlining his intentions, in which he espoused far right and anti-immigrant ideology.

Police Commissioner Bush confirmed that the suspect who was charged was not known in advance to either New Zealand or Australian security services.

28yo Australian (Romper Stomper) Brenton Tarrant who named his rifle "Turkofagos"

New Zealand Prime Minister Jacinda Ardern called it one of New Zealand's "darkest days". "It is clear that this can now only be described as a terrorist attack," she said.

EDITOR'S COMMENT: Having a limited experience from designing church response to terrorism in Houston, TX some time ago, I can tell this: the key to prevention might be an outdoors invisible armed human shield patrolling among coming civilians and screening possible suspects (read more on the Special Collection issue of CBRNE-Terrorism Newsletter/Dec 2013). Once the terrorist is inside the building whether it is a church or a mosque, then the only thing that can be done is to count the dead and pray for as less wounded as possible. Simple as that. And only one person would be enough to execute such an attack taking into advantage the element of surprise, the fear and terror ignited and the unavailability of armed response not until proper authorities arrive at the incident site (and that will take some time). Were the two mosques in the national targets' list? Most probably not! Christchurch, the second most populous city (2018) in one of the many islands (South Island) of N Zealand, and despite its attractive name (for all sides involved in global terrorism), does not have specific



"attractive" characteristics for such actions apart from its ultra-clear waters and recent suffering from earthquakes (2010-2012). But because of this, it was the ideal place to conduct this act of online terrorism. That reminded me an old Al Qaeda threat against a peaceful pensioners' village in Miami with an average age of inhabitants of +75yrs and no multinational companies, gov buildings, critical infrastructure or other attractive assets – only the ideal environment to spread the message "we do not care! You are next!"
The word "*turkofagos*" in Greek means "the one who eats Turks". Although there are no known relations with Greece or Greek NZ/Australian communities, many old people consider all Muslims as Turks since, after the Arab caliphates, it was the Ottoman Empire that spread Islam worldwide.

The New York Times: ISIS Spokesman Ends Silence By Calling For Retaliation Over New Zealand Massacres

"The spokesman of the Islamic State emerged from nearly six months of silence on Monday to mock America's assertion of having defeated the group and to call for retaliation over last week's mosque attacks in New Zealand. "The scenes of the massacres in the two mosques should wake up those who were fooled, and should incite the supporters of the caliphate to avenge their religion," the spokesman, Abu Hassan al-Muhajir, said in a 44-minute audio recording. Mr. al-Muhajir portrayed the shootings by a white extremist, which killed 50 Muslims as they prayed in the city of Christchurch, as an extension of the campaign against the Islamic State. He likened the mosque attacks to the weekslong battle raging in the last village under ISIS control in Syria. "Here is Baghuz in Syria, where Muslims are burned to death and are bombed by all known and unknown weapons of mass destruction," he said, painting the people in the town as regular Muslims when in fact coalition officials believe that the majority of them are either Islamic State fighters or their wives and children. Throughout his speech, Mr. al-Muhajir belittled the White House's claim of victory over the terrorist organization, calling it a "state of confusion and contradiction that makes it impossible for any observer to know what is meant by the word 'victory.'"

Breaking the Chains of Violence

By Arlene J. Schar and Dr. David Leffler

In the words of New Zealand's Prime Minister Jacinda Ardern, today is "one of New Zealand's darkest days." In the aftermath of today's terrorism, 49 are left dead and at least 20 seriously injured by a calculated attack against two mosques in Christchurch, New Zealand. The 74-page manifesto posted online by one of the perpetrators espouses white supremacist views and inspiration from current and past leaders, citing the names of other individuals who have taken part in shootings throughout history to justify their "assault on civilization." Prime minister Jacinda Ardern states, "These are people that I would describe as having extremist views, that have absolutely no place in New Zealand and in fact have no place in the world."

As a civilization, how have we come to this?
So far, our way of addressing terrorist attacks has been to capture the perpetrators and administer justice, which unfortunately does nothing to bring back the victims whose lives have been taken. We have grown so accustomed to terrorist attacks that we have resigned

ourselves to a feeling of inevitability that they will occur. Over time, we have created a culture which in many ways condones and promotes terrorism; a culture that is xenophobic, glorifies violence, and instills fear of those who are different from us.
Political commentator Ayesha Hazarik, speaking on *CNN Talk*, said that as a Muslim, she is "sickened and frightened" by the attacks.
"We have a culture, a media and social media culture, that not only tolerates hatred to Muslims but celebrates it," she said. "Shame on the people who have promoted this."
A culture that promotes hatred will surely continue to foster terrorist attacks. To stop these attacks, we must shift our cultural values to peace and tolerance. A proven way for us to accomplish this is by utilizing a little-known means of ending all war and terrorism once and for all: Invincible Defense Technology (IDT).

Invincible Defense Technology: A Non-Religious, Humane and Beneficial Approach

The practical components of IDT are the non-religious Transcendental Meditation (TM) and the more advanced TM-Sidhi programs. When large groups of experts practice these programs together, a powerful field effect of coherence and peace is generated that spills over into the surrounding population. Extensive scientific research has repeatedly confirmed measurable decreases in war deaths, terrorism, and crime when IDT is utilized. Due to this research the non-profit organization Global Union of Scientists for Peace (GUSP) advocates this simple and cost-effective approach for reducing social stress (see: https://www.gusp.org/global-peace-summit).

Invincible Defense Technology is Cost-Effective

For about the cost of a few modern fighter jets, any military could establish a group of warriors trained in this advanced IDT approach. This Prevention Wing of the Military would practice IDT programs twice a day in large groups, defusing societal tensions not only in their country but also globally. The collective consciousness of all populations will rise through the influence of greater harmony and peace. Those who have engaged in violence will no longer do so. Studies have shown repeatedly that this method works–and will continue to work as long as the peace-creating group is maintained.

Implementation

IDT is not restricted to the military; any large groups of experts trained in the advanced IDT techniques can accomplish the same goals of alleviating terror and violence simply by practicing this approach in groups twice a day. These groups could be comprised of congregations at places of worship, prisoners, the elderly in nursing homes, even schoolchildren. The important factor is that the techniques be performed by trained experts consistently in groups twice a day. In this way the chains of violence will finally be broken.

Nothing Else has Worked

At this critical juncture of our history, it is not only enough for governments and militaries to take preventative action; it is up to each of us as individuals to examine our own values and honestly assess whether we are promoting peace and tolerance or fostering hatred in our everyday speech and actions. As individuals, we can each embrace the tenets of Transcendental Meditation and set aside twenty minutes twice a day to practice the techniques that will ultimately shift our culture from hate to love.
It is up to each one of us to now take responsibility for the world we have created by together consciously creating a world without terrorism.

Arlene J. Schar *has served as Dr. Leffler's Executive Assistant at the Center for Advanced Military Science (CAMS) (http://www.StrongMilitary.org since 2015. She has edited and co-authored many of Dr. Leffler's articles.*
Dr. David Leffler *served as an Associate of the Proteus Management Group at the Center for Strategic Leadership, US Army War College. Currently, he serves as the Executive Director at CAMS.*

EDITOR'S COMMENT: This is a totally different approach and I am not sure how effective is or will be in the future but any effort to return our troubled planet into normality is worth examining. In the meantime, all those responsible for top-level policies and politics should have a word-by-word study of the Manifesto mentioned herein and re-discover pieces of the desired solutions for the benefit of their citizens. In Greece, we have a popular saying: "*from a little one [child] or a crazy person you learn the truth*!" *(«από μικρό κι από τρελό μαθαίνεις την αλήθεια! »*)

Dutch shooting: Utrecht police arrest suspect after three killed

Source: https://www.bbc.com/news/world-europe-47615231

Mar 18 – A man has been arrested after three people were killed and five wounded, some seriously, in a shooting on a tram in the Dutch city of Utrecht. Gokmen Tanis, a 37-year-old born in Turkey, was found several hours after the attack in a building about two miles (3km) from the scene. Authorities said the attacker's motive was unclear. Police raided several properties and arrested two others in connection with the incident, Dutch media reported. The shooting sparked a city-wide manhunt and the closure of schools.

What happened on Monday?

At about 10:45 local time (09:45 GMT), police were called to reports of a shooting on board one of the city's trams at the 24 Oktoberplein junction.

One witness told local media that "a man started shooting wildly". Several of the injured were said to be in a critical condition.

Another witness told Dutch public broadcaster NOS that he had helped an injured woman when the tram came to an emergency stop.

"I looked behind me and saw someone lying there behind the tram," he said. "People got out of their cars... and they started to lift her up.

"I helped to pull her out and then I saw a gunman run towards us, with his gun raised," he said. "I heard people yell 'Shooter! Shooter!' and I started to run."
The gunman then fled the scene, leading to the manhunt which lasted for much of Monday.
Schools were closed and security was increased at airports and mosques while counter-terrorism police worked to locate the suspect.
A photograph of him was posted on social media by police, who warned people against approaching him.
A number of raids were reportedly carried out and counter-terrorism officers were pictured patrolling the streets near to where the attack happened. Police surrounded a building not far from the scene of the attack and arrested Mr Tanis on Monday evening.

What do we know about the suspect?
Police said the shooting appeared to be a terrorist incident but, at a press conference on Monday evening, a prosecutor said it could have been motivated by "family reasons". Mr Tanis was known to Dutch police, the prosecutor added. The threat level was temporarily raised to its highest point in the province of Utrecht

What's the reaction been?
Prime Minister Mark Rutte said the country had been "jolted by an attack", which he described as "deeply disturbing".
"There are many questions and rumours," he said. "It is unclear what the motives are behind this attack."

He said local elections would go ahead as planned on Wednesday but flags would be flown at half-mast.
Leaders from around the world, including French President Emmanuel Macron and Spanish Prime Minister Pedro Sánchez, offered their condolences.
European Commission President Jean-Claude Juncker said the EU "stands side by side with the Netherlands and its people during these difficult times."
The threat level in Utrecht was reduced following the arrest. It had earlier been raised to its highest level and paramilitary police posted to airports and mosques. Utrecht University closed all its buildings and trains were not allowed to run into the city's central station.
Utrecht, the Netherlands' fourth largest city, has a population of about 340,000. Crime levels are low and gun killings are rare, which is the case for much of the country.

EDITOR'S COMMENT: Not a single word like terrorist or terrorism. Only shooting and shooter. But it is the BBC and has to be politically correct. But the truth is that the person who generates terror is a terrorist! End of story!

Senegalese man sets Italian school bus on fire with children on board

Source: https://www.rt.com/news/454296-senegalese-man-italian-school-bus-fire/

Mar 20 – The driver of a school bus filled with children has been arrested by Italian police for setting fire to the vehicle near Milan. The Senegalese man reportedly called for an end to "deaths in the Mediterranean" during the incident.

Miraculously all 51 schoolboys managed to escape the fire without injuries, although 12 children and two adults were sent to hospital for smoke inhalation, according to RaiNews24.

The 46-year-old Senegal-born driver reportedly spilled gasoline down the aisle of the bus while shouting that he wants to stop deaths in the Mediterranean Sea before igniting the blaze.

"I want to end it, the deaths in the Mediterranean must be stopped," he said according to the Italian news outlet.

The children were students of Vailati middle school in the Italian city of Cremona, and raised the alarm by calling their parents after the driver announced that he wanted to kill himself.

The Carabinieri, Italy's national police service, stopped the vehicle by erecting a series of checkpoints that the driver attempted to break through.

The man eventually lost control of the vehicle and attempted to set the bus alight before the military rescued the students by breaking the windows.

The driver was reportedly known to police and has been arrested for the arson attack.

EDITOR'S COMMENT: I will not comment the incident – besides, you already know my opinion from previous issues of the "CBRNE-Terrorism Newsletter" on how to manage arrested terrorists. But I applause the government of the UAE who almost instantly deported a man working in a Dubai security company (*Transguard* - part of the Emirates aviation group), when he uploaded on Facebook "celebrating" comments after the New Zealand incident and he car bomb attack on 40 Indian soldiers in Pulwama last month by the extremist group Jaish-e-Mohammed.. This is what reliable companies, governments and serious rulers do!

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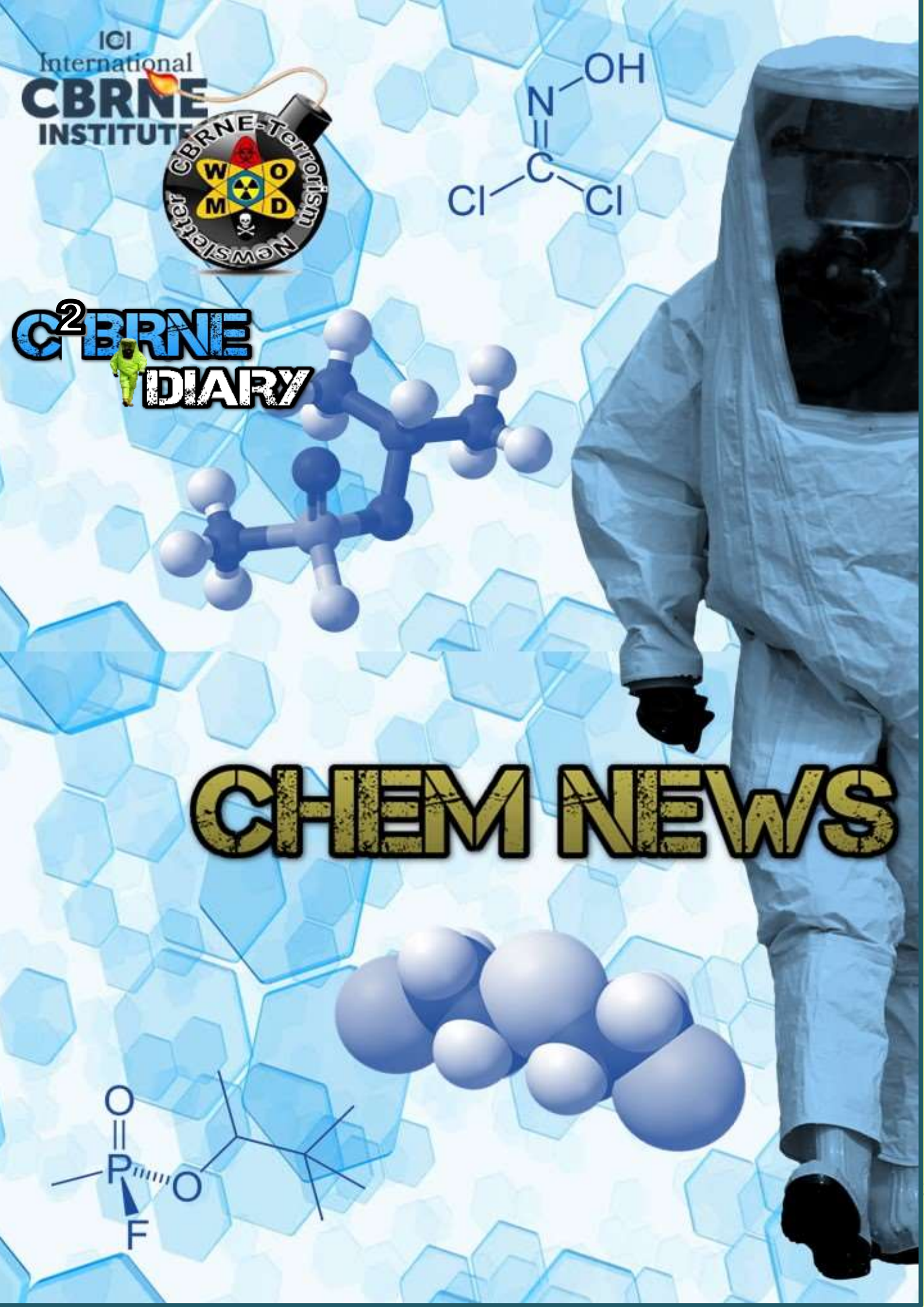
CBRNE-Terrorism Newsletter

C²BRNE DIARY



CHEM NEWS

From Iraqi weapons of mass destruction to Syrian chemical weapons

By Thierry Meyssan

Source: https://www.voltairenet.org/article205496.html

Mar 05 – The behavior of Western journalists is particularly strange – they copy the allegations made by their political leaders by treating them a priori as founded in truth, but do not take into account the contrary interpretations offered by many international instances. They reveal themselves to be incapable of questioning the fake news in which they wallow.

The justification for the destruction of Iraq

Thus, in 2003, they unanimously parroted the allegations of George W. Bush, according to which Iraq possessed weapons of mass destruction. Then they copied the lies of Tony Blair, according to which Iraq possessed missile launchers capable of reaching the West in 45 minutes and killing the population by spraying combat gases. And finally, they adopted the fairy tales told by Secretary of State Colin Powell, according to which Iraq was hiding Oussama ben Laden.

However, at the same time, the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) stated that there was no doubt that the allegations of Messrs Bush and Blair were false. This Commission was the only organization which had been allowed access to Iraqi territory, and had been able to realize all the verifications it wanted. Neither the CIA nor MI6, which contradicted the Commission, had enjoyed such an opportunity.

Let's remember, by the way, that Jacques Chirac's France was opposed to the war on Iraq. But it chose to use the argument that « War is always the worst of solutions », and not the argument that the Anglo-Saxon accusations were clearly untrue, as the UNMOVIC had revealed.

Today, we remake History with films and TV series. We agree to admit that we have been tricked. But we pretend that the US and UK Intelligence services were manipulated by their political leaders, and that no-one had any way of knowing. This is untrue, and it is enough to study the Press of that time to see that they were all in league in their attempt to attempt to discredit the Director of the UN Commission, Swedish politician Hans Blix, who dared to stand up to to the greatest world power of that time. That is what the Chilcot Commission was supposed to establish, thirteen years later [1].

Identically, we never mention the accusations hurled by Colin Powell at the UNO Security Council [2], according which Oussama ben Laden was living in Baghdad en 2002, and that his lieutenants still lived there, busy making ricin. Since Iraq, they claimed, they were preparing attacks in France, the United Kingdom, Spain, Italy, Germany and Russia. There was therefore a state of emergency.

However, believing this rubbish supposes that one knows nothing about the Ba'ath party in power in Iraq. Thus, rather than admit their ignorance, the Western journalists preferred to forget the episode.

The complicity between the medias has not changed

Nothing has changed since the attack on Baghdad by the United States and their allies – the medias have lied once again, deliberately this time, in order to hide their previous involuntary lie. They all prefer to tell us how they were abused. Not one of them has admitted to professional misconduct by minimizing the advice of UN experts.

Historians who have studied war propaganda have shown that those who seek war always build up an incredible quantity of proof and false witness accounts. Although all journalists recognise that « the first victim of war is Truth » (Rudyard Kipling), not one of them has yet tried to develop a method which would protect them from being intoxicated once again. And yet it's quite simple – it's enough to keep a cool head, and when everyone else gets excited, do not hesitate to swim against the current and do your job, always remembering to check your sources. This is what we have done, and it has earned us the title of « conspiracy theorists ».

The justification for the war against Syria

So, concerning the war on Syria, everyone continues to believe unquestioningly that the events began as a « revolution against a dictatorship », and that the « régime » had responded by « massacring its own people » using « tortures », « barrel bombs » and « chemical weapons », which forced the population to turn to violence. All of this is either stupid (as was the case of the phoney invitation of Oussama Ben Laden by President Saddam Hussein), or else denied by various international missions (as with the UNMOVIC).

The La « revolution against the dictatorship » has been formally contradicted by the only organisation capable of judging the situation – an international mission by the Arab League which was authorised to travel everywhere in Syria, and which had the personnel numerous enough to cover the whole territory (24 December 2011 to 18 January 2012) [3]. But journalists always prefer to believe Western governments rather than the organisations which have the means of verifying.

The photographs of people who died under « torture », blamed on Syria by the Caesar Report, are in reality photographs of people who died under torture by the jihadists. We only need to think for a moment - Caesar declared he took them for the Syrian Arab Army, but did not know the identity of the dead. What purpose could it serve for Damascus to establish a photographic file with absolutely no information on the victims?

The « barrel bombs » are a legend which is equally stupid – why would the Syrian Arab Army use hand-made bombs when it possesses sophisticated bombs supplied by Russia?

After the Iraqi weapons of mass destruction, the Syrian chemical weapons

The most interesting point here is the accusation of the use of chemical weapons. The Organization for the Prohibition of Chemical Weapons (OPCW) handed in its report on 1 March 2019. It had been tasked with establishing the truth about the alleged attack of 7 April 2018 in Douma, which was unilaterally sanctioned by the bombing of Syria by the United States, France and the United Kingdom the following week. The OPCW report is a pearl. Although it does not say so explicitly, it confirms point by point that the whole affair is a montage.

Let's note that after the attack on the Ghouta five years earlier, Syria joined the Chemical Weapons Convention. Its stocks of chemical weapons had been stored under guard, then destroyed by the United States and Russia, under the control of the OPCW. Pretending that Damascus still possessed chemical weapons after this work of destruction is above all contesting the work accomplished by the Hague, Moscow and Washington.

In 2018, the State Department claimed that it had credible proof of the « use of Sarin gas by Syria » against the « democrats », while Russia denounced a spectacle commanded by the United Kingdom. The British Minister for Foreign Affairs, Boris Johnson, played his indignation with a straight face, railing against these « grotesque, bizarre accusations », and this « flagrant lie ».

However, the attack was alleged by three sources, all of them British – the White Helmets (a NGO controlled by MI6), the Syrian Observatory for Human Rights (a shopfront for the Muslim Brotherhood with Intelligence by MI6), and the Army of Islam (an armed group founded by Zohran Allouche, whose entire family lived in London in a luxurious residence guarded by the police). The mission of the OPCW, blocked by the Army of Islam, was to count the bodies of the victims and autopsy them. It was not authorized to enter Douma until after they had been « incinerated » - an unbelievable treatment for the bodies of Muslims, and not justified from a sanitary point of view. According to the OPCW, the samples taken attest to the fact that no prohibited chemical substance had been used in Douma. None.

However, the organization admits that two shells may have been fired on the site of the alleged contamination, and that they may have contained a chlorinated toxic substance. Chlorine disperses in the open air. It can only kill in a confined space. This is why it has never been listed as a prohibited weapon, and is used by everyone as a household cleaning product.

Let's also note that the Army of Islam (Jaych al-Islam) is the « democratic » organization which decapitated, with production-line efficiency, « Bachar's dogs » (meaning the Syrians who refused to vilify the heretic President Bachar el-Assad) [4]). It won celebrity by condemning to death the Syrians found guilty of homosexuality and throwing them off the

rooftops. It was the Army of Islam's chief, Mohamed Allouche, supported by the Western powers, who presided the delegation of the « moderate opposition » at the UNO negotiations in Geneva.
In short, the bombing of Syria by the United States, France and the United Kingdom was not only a violation of international Law, but was also unjustified.

The treatment of the OPCW report by the Press
If the Western Press were honest, it would have published a faithful rendition of the OPCW report. This was not the case. The Anglo-Saxon journalists remained curiously silent, only mentioning the information in passing. Their French counterparts were more specious.
They stated that in the past, a report by the OPCW/UN Joint Mechanism had confirmed the use of chemical weapons by Syria. But they omitted to note that the UN Security Council had rejected this report because the Mechanism had not respected the rules of the OPCW.
Others pretended that the mission had established the use of chlorine in Douma. They forgot to specify that the OPCW considered it probable that a toxic agent containing chlorine was used as a weapon, and was possibly dispersed by two shells. They especially avoided mentioning that in the open air, chlorine is not a lethal poison, but an irritant - the reason it is not classified as a prohibited chemical weapon.
You are probably wondering why these Press articles escaped your notice, and why you have never heard any apologies from Mrs. May and Messrs. Macron and Trump? Simply because the Press is not doing its job of informing the public, and the Western leaders are without honor.

***Thierry Meyssan** is political consultant, President-founder of the Réseau Voltaire (Voltaire Network). Latest work in French – Sous nos Yeux. Du 11-Septembre à Donald Trump (Right Before our Eyes. From 9/11 to Donald Trump).*

Are we prepared against North Korea's biochemical weapons?

Source: http://english.donga.com/List/3/08/26/1652609/1

Mar 06 – "The United States demanded at the recent summit that North Korea abandon its biochemical weapons. Apart from nuclear weapons, I'd like to ask whether the South Korean government is responding to North Korea's biological and chemical weapons and whether it can protect the South Korean people from such weapons, which can serve as a threat to the country's security." This is what Park Ki-beom, a student at the Department of Political Science and

International Relations at Seoul National University and a member of the SNU Student Association of Korean Peninsula Affairs, told Yang Uk, who heads the WMD Response Center of Korea Defense and Security Forum. The following is Yang's explanation.

It's an insightful question. Biochemical weapons are weapons of mass destruction (WMD) that even poor countries can easily produce. This is why they're often called a poor man's nuclear weapons. They also boast the greatest economic efficiency. Let's say a weapon's capacity to kill or wound people in a unit area can be converted, and conventional arms cost 100. While nuclear weapons would require 50 to 60, chemical weapons would only need 10 to 20 to have the same result.

Biochemical weapons are a clear, present threat, just like nuclear weapons. Currently, North Korea is No. 1 in terms of the possession of chemical weapons, while the Republic of Korea joined the Convention on the Prohibition of the Development Production Stockpiling and Use of Chemical Weapons and on Their Destruction (CWC), which took effect in 1997, and accordingly dismantled all chemical weapons in 2008. North Korea's will to use chemical arms any time was demonstrated when North Korean leader Kim Jong Un's half-brother, Kim Jong Nam, was killed in 2017.

Biological weapons are basically easy to use as they are comprised of virus or bacteria. However, most armed forces don't count them as valid weapons since it's not easy to control them for military purposes. Still, it is possible that North Korea would employ biological weapons for a military purpose. According to the 2018 Defense White Paper released by the South Korean government, North Korea is capable of culturing and producing various types of biological arms on its own, such as anthrax bacillus, smallpox, and the plague.

Anthrax Bacillus is particularly likely to be used for a military purpose by the North since the area and scope of its usage can be controlled, as seen in the 2001 anthrax attacks in the United States. With the notable development of the country's biotechnology and chemical industry, North Korea will be able to apply the advanced technology to its system of weapons.

In the meantime, South Korea, through the Armed Force CBR Defense Command, has continuously enhanced its capability to prepare against various biochemical wars. Armed with protective equipment against CBR agents, the South Korean forces are capable of fighting enemies even in biochemical wars. However, the current system has a blind spot about protecting individuals from a possible biochemical warfare. How many households would have a gas mask or a protective clothing in preparation for a biochemical warfare? With its policy objective of national security being the "realization of a society that protects the safety and life of people," the South Korean government should demonstrate leadership in terms of protection against CBR agents.

Biochemical weapons used to be tactical means employed only along the front line, but are now more likely to be strategically used due to the development of missiles and other projectiles. The United States is now primarily engaged in negotiations for the denuclearization of North Korea, but there's no principal player that discusses the regime's biochemical weapons. Leaving out biochemical weapons while having a dialogue with North Korea regarding disarmament is an act that overlooks the key aspect of the issue.

EDITOR'S COMMENT: Soldiers wear gas masks; the special vehicle decontaminates asphalt BUT the soldier in the front is not wearing gloves! Bad selection of photo or just bad reality and worst training?

NCPW chief stresses educating children about dangers of Weapons of Mass Destruction

Source: https://www.thepeninsulaqatar.com/article/14/01/2018/NCPW-chief-stresses-educating-children-about-dangers-of-Weapons-of-Mass-Destruction

Jan 2018 – The National Committee for the Prohibition of Weapons (NCPW) celebrated the 5th anniversary of Doha Regional Centre for Training on the Conventions on Weapons of Mass Destruction (WMD). It also outlined its role since inception in December 2012 in

capacity-building at the national, regional and international levels, promoting international peace and security and implementing disarmament conventions.

In a press conference held to review the Center's achievements, **NCPW Chairman Staff Major General (Pilot) Nasser bin Mohammed Al Ali** said that the integrated legislative system for the prohibition of

weapons in the State of Qatar has contributed significantly to the spread of peace and security in the country, pointing to the issuance of Law No. 16 of 2013 on chemical weapons and the draft of implementing regulations to develop integrated system through the issuance of chemical licenses and Law No. 4 of 2016 on biological weapons.

Highlighting the importance of raising awareness and educating young people about the dangers of WMD in the achievement of international peace and security, he said that the State of Qatar is completely free of extremist 'ideologies' because of its great role and broad steps in educating young people by cooperating with the Ministry of Education and Higher Education, Qatar University and Education City universities, involving students in the official delegations of the Committee to major international conferences and forums on disarmament and organising training and awareness-raising workshops and developing research awards in the areas of WMD agreements and risk awareness.

Seven workshops were held to raise awareness about the WMD conventions, in which more than 3,200 students from different schools and universities in the country participated, he pointed out.

Annual prizes for students in the field of conducting scientific research and designing awareness posters on weapons of mass destruction (nuclear, chemical, biological) and internationally prohibited weapons were also created, Al Ali said.

This, he said, made the State of Qatar one of the leading countries that introduced this experiment at the regional and international levels in addition to including some of the topics of WMD proposed by the Committee in the secondary school curriculum for the academic year 2016/2017.

The NCPW Chairman underlined the role of the Doha Regional Center for Training of the Conventions on Weapons of Mass Destruction as it trained more than 39 states parties to the Chemical Weapons Convention, noting that the Center had held 27 training programs in collaboration with the Organisation for the Prohibition of Chemical Weapons in the areas of assistance and protection, annual declarations of chemicals, and chemical safety and security management. It also contributed to the training of the GCC countries, including the siege countries who attended workshops and seminars that increased their practical capabilities.

Boycotting the Doha Regional Center despite Qatar's welcome to host them, these countries have lost the opportunity to participate in the development of their staff within the center, which is the first of its kind in the Middle East and specialised in training on WMD-related

conventions and qualifying national, regional and Asian cadre in the field of preparedness for any chemical, nuclear or biological emergencies, he stressed.
Al Ali pointed out that the number of participants in the Center's activities increased as more Asian and African countries participated in its activities and many of them asked for an increase of their participation in the activities held by the Center.
On regional and international activities, the Chairman of the National Committee for the Prohibition of Weapons highlighted the Center's cooperation with the International Atomic Energy Agency (IAEA) and the Comprehensive Nuclear-Test-Ban Treaty Organisation since the establishment of the Committee in 2004 and the State of Qatar's commitment to timing and transparency in their annual declarations on chemicals listed in the Chemical Weapons Convention, in addition to holding 27 events in cooperation with the Organisation for the Prohibition of Chemical Weapons and attracting the best experts in the world to give lectures in this context.
He also hailed the State of Qatar's winning of IAEA board of governors' membership for the second consecutive year.
The press conference was attended by Vice-Chairman of the National Committee for the Prohibition of Weapons Brigadier (Air) Hassan Saleh Al Nesf (EC: currently the Director of NCPW), and representatives of its members.
The committee includes representatives from the General Secretariat of the Council of Ministers, the ministries of interior, municipality and environment, public health, energy and industry and the general customs authority.

Experts from Asia Explore New Approaches to Prevention of Accidents and Misuse of Chemicals

Source: https://www.opcw.org/media-centre/news/2019/03/experts-asia-explore-new-approaches-prevention-accidents-and-misuse

Chemical safety and security specialists at an OPCW seminar in Doha, Qatar

Mar 04 — **Chemical safety and security specialists from Asia shared expertise and experiences during a seminar of the Organization for the Prohibition of Chemical Weapons (OPCW), held in Doha, Qatar, from 26 – 28 February.**

The Seminar on Chemical Safety and Security Management for OPCW Member States in the Asian Region was organized in collaboration with the National Committee for the Prohibition of Weapons (NCPW) of Qatar.

In his opening statement, NCPW Chairman, Brigadier General Hassan Saleh Al-Nesf, placed the event within the wider context of "the challenges facing the world in general, and our region in particular". He underlined the importance of chemical safety and security for economic and technological development, noting that the "chemical industry is one of the most important pillars" of such growth.

Acting Director of the International Cooperation Division of the OPCW, Mr Shawn DeCaluwe, stated in his opening speech that, "Since its inception in 2012, the Chemical Safety and Security Programme in Doha has evolved into a leading international forum connecting top experts in the field. The number of participants and the level of expertise represented here indicate strong cooperation between the OPCW and its Member States, the cooperation that continues to strengthen chemical safety and security in Asia."

Attendees shared their views on new approaches to various aspects of chemical safety and security, the development of national policy and legislation on chemical safety, and security and risk management.

Experts also discussed the role of academia in chemical processes safety management, alarm management, vulnerability assessment, and human factor analysis on chemical safety and security management. They also underlined the importance of practice-sharing, and education and outreach in building strong chemical safety and security worldwide.

The seminar brought together 66 participants from 16 OPCW Member States, including representatives from National Authorities, the chemical industry, industry associations, policy makers and academia.

The attendees represented the following countries: Bangladesh, Belgium, China, Germany, India, Indonesia, Iran, Jordan, Malaysia, Pakistan, Philippines, Qatar, Republic of Korea, Sri Lanka, Tajikistan, and Vietnam.

Background

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

Over 96% of all chemical weapon stockpiles declared by possessor States have been destroyed under OPCW verification. For its extensive efforts in eliminating chemical weapons, the OPCW received the 2013 Nobel Peace Prize.

ISIS Chemical-Weapons Expert Speaks

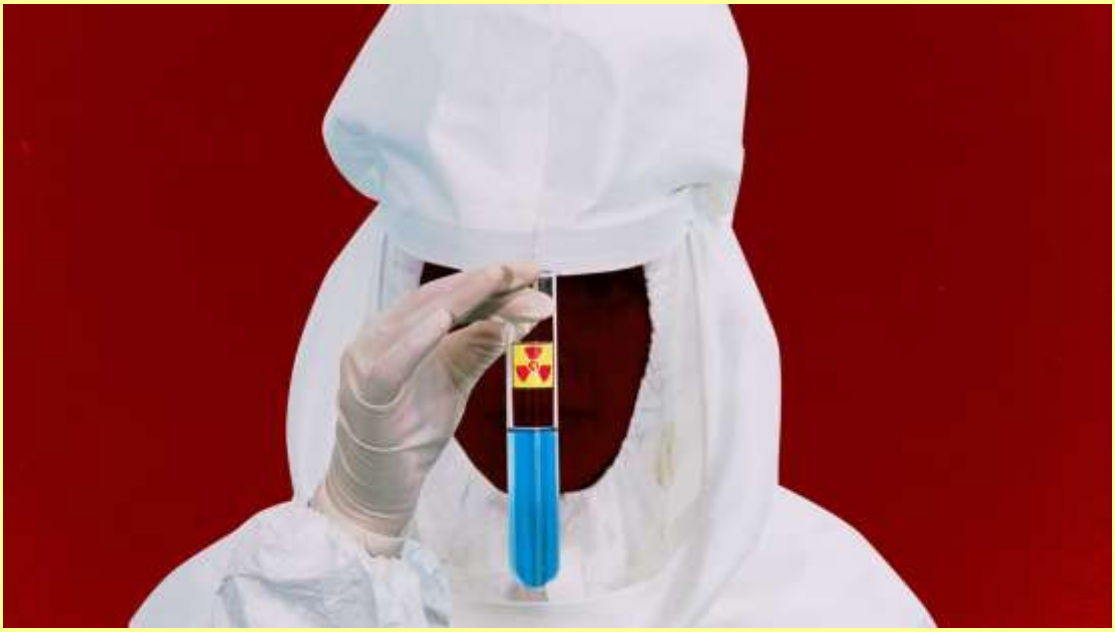
Source: https://www.thedailybeast.com/isis-chemical-weapons-expert-speaks-in-exclusive-interview

Mar 11 — **"ISIS was looking for scientists," said Ahmed, a 36-year-old follower of the so-called Islamic State who holds a Ph.D. in medicinal chemistry and drug design. And Ahmed was looking for a chance to put his scientific knowledge to use.**

This would not be theoretical research. ISIS and al Qaeda before it has been working since at least the 1990s to obtain biological and chemical weapons. But as with many gruesome enterprises, ISIS has been more methodical than its predecessors and competitors.

We do not yet know for sure the extent to which ISIS was successful and cannot confirm some of the claims made by Ahmed, but they fit with those made by an Iraqi geologist, Suleiman al-Afari, who told *The Washington Post* recently that **he supervised a mustard gas production line for the Islamic State**.

We also know that ISIS, through its global social media and internet recruiting, managed to create a corps



of scientists interacting in person and on dark web forums to support the creation of a WMD arsenal, and Ahmed, whose name has been changed here, was part of the team. We interviewed him last month along with other ISIS prisoners being held in the Iraqi capital.

At the height of its power four years ago, ISIS' worldwide recruiting effort offered top dollar to equip labs and support scientists to an extent much greater than anything Ahmed had been offered in Iraq, which basically was nothing.

"I knew I could synthesize the biological and chemical weapons I researched on the web," he told us. "I just needed the supplies and a well-equipped lab."

U.S. coalition and Iraqi forces have recently announced the discovery of an installation in Mosul where ISIS was indeed working on such weapons, and Ahmed says he was involved in that same lab's operations.

We should be careful not to confuse the attempts by ISIS to develop and use chemical weapons with the infamous attacks launched by the Syrian government of Bashar al-Assad. **Of an estimated 300 such attacks in Syria in the course of the conflict there, a new**

study from the Global Public Policy Institute (PDF) estimates 98 percent are attributable to the regime, and only about 2 percent to ISIS.

But the group's aspirations in this regard, and some usage, is well documented. For instance, the group successfully deployed mustard and chlorine gas against the Kurdish Peshmerga. ISIS also set up a secret chemical weapons production facility in northern Iraq and has been quite innovative in using drones as dispersal devices for biological and chemical materials.

Surprisingly, research on the extent to which the group used or desired to expand on the use of chemical and biological weapons remains rare and largely under-researched, as noted in a report published last year by the Combating Terrorism Center at West Point.

Ahmed, imprisoned inside the compounds of the Iraqi Special Operations Forces of the Iraqi Counter Terrorism Services, recounted in detail his rise from a promising but frustrated young scientist, to one who saw himself as a galvanized agent of social change at the time he joined ISIS, to his eventual capture. Ahmed, like so many who joined and served ISIS, had come into contact with the group via social media while a Ph.D. student in India after a scientist friend, who was already working for them, encouraged him to join up.

While initially attracted to the idea of an "Islamic State," he claimed it was not so much the ideology as what he thought would be the ability to show off his scientific and technical skills that actually drew him to ISIS: "At first I was looking into their ideology because of their interest in science and technology. I was convinced I would join an authentic scientific community. Many scientists joined from many countries," he claimed in our interview. **"Lots of nuclear physicists and engineers, especially from Russia joined them."**

Ahmed said he did not ever join the group physically, but supported them virtually and substantially. Searching the worldwide web and pursuing scientific journals, some of which he hacked into, allowed him to pass on knowledge about manufacturing chemical and biological weapons to those scientists already working in the Mosul lab.

While Ahmed started his work for ISIS by spreading this research and interacting on web forums on behalf of the group in 2015 and 2016, he fully intended to join the lab in Mosul upon his graduation and was confident of his ability to create the desired chemical and biological weapons. At the time, he believed ISIS was already an established state and would continue to expand.

"I would upload and [my research] would get read by the high command of the Caliphate," he told us. "They were interested in my posts and asked how we can acquire these chemicals. I also summarized books from a Russian website. There are loads of [scientific] journals I could access on the web and it's not classified. I told them everything was in my summary, but also told them, you must have a real lab."

The operation in Mosul succeeded in producing mustard gas, which it dispersed in various operations using drones. In Baghdad, we viewed pictures of victims allegedly burned in ISIS mustard gas attacks.

Ahmed and his research colleagues working in the Mosul lab were not the only ISIS members striving for biological weapons. A chilling arrest occurred as recently as June 2018, in Germany, when Sief Allah H, a Tunisian man living in Cologne, was arrested after preparing the deadly biological poison ricin, made from castor beans. Security sources told ICSVE—the International Center for the Study of Violent Extremism—that the police knew of his activities and that he was following instructions provided over the internet by ISIS, and that police surveillance of the operation was terminated and arrests made after he succeeded, but before he was actually able to deploy the infamous compound.

Ahmed proudly boasted about his knowledge of computer science and the ability to modify, synthesize, and manufacture lethal weapons from raw substances, at times appearing highly ecstatic and fervent in his answers during the interview.

"There are loads of scientific journals and it's not classified. You just have to access them through a scientific institution," said Ahmed, explaining how he managed to access the latest in science by **going to the dark web and using a Russian website that cracked these journals' codes. "I used Russian search engines that no one can penetrate and a Tor browser to hide and search,"** Ahmed said. **"For instance, the first item I put up for them was from the journal of Organic Phosphorus Chemistry about VX gas in Israel. It's a new**

generation nerve agent. The authors told how they made particle Isomers and structural modifications to enhance the activity of the gas in use," Ahmed said. "I can tell a scientist about how to carry out the organic synthesis for this in micro quantities."

"There was one article on **pyrophoric [flammable] materials** from a hazardous materials journal," Ahmed went on. "These pyrophoric materials become flammable with water and moisture creating gas, fire and choking smoke to cause asphyxiation. The article was speaking about the flammability [of the materials] and what kind of gas was being generated, about the hazardous materials you could throw to troops, and on streets, on floating bridges, etc. All the necessary materials are available on the market... There was also a book from a Russian website about the experimental synthesis of all explosives. For me, I can synthesize any of these.

"My friend [in ISIS] told me about WMD, that they were interested in making mustard gas, nitrogen, and sulfur. Nerve agents are easy to synthesize," Ahmed said, noting that he was disappointed that ISIS wasn't going further into the subjects he felt proficient in.

"It's like writing a paper. I can search and modify the structure. I passed this to them. If I gain access to a lab, then I can do it. In our lab in India [where he was studying] I learned how to synthesize theoretically. We take the structure into a software and see how it works on this nerve, then we try it on animals. I synthesized for anti-diabetic and anti-epileptic activity and it worked, so I know I can do it for these substances as well."

Ahmed, who does not appear particularly connected to his own emotions, insisted that his work for ISIS was to help them as a state to be able to defend against and repel attackers. When reminded that ISIS had been at war with the Iraqis, Syrians and Western powers at that point, he kept insisting that the weapons he hoped to build for them were only for defense.

He also seemed oblivious to ISIS's already deployed use of mustard gas against civilian populations. "My idea was to use weapons as a deterrent, not to be used against humankind." He also seemed oblivious to the extraordinary brutality of ISIS during the time he was working for them and much more interested in and excited by the recognition he could achieve.

He hoped to branch out from poisons and plagues to explore new technologies for delivering them. "I learned in the engineering world they [ISIS] were interested in anti-aircraft missiles and drones. They complain about coalition jet fighters destroying their troops on the ground. **The admin on the website, there was a guy on the website who provided links from a British university to make drones from organic synthesis to make the whole body of the drone. It was some kind of solution, liquid phase synthesis, polymer science. We have already developed anti-aircraft missiles. We were going to use them."**

It appears that Ahmed was not particularly religious prior to joining ISIS. He articulated only a very rudimentary grasp of the Islamic faith, which he said he rarely practiced. "I was not very religious. I was not looking for an Islamic State. They [ISIS] were more interested in science and technology. They were thinking forward. My family is interested in science and technology. I find religion suspicious."

Although incongruous on its face, it has been common for many ISIS recruits to believe that somehow the Caliphate could fulfill their dreams, even if those had little to do with the way ISIS twisted the teachings of the Quran and the sayings of the Prophet Muhammad.

Ahmed said he was deeply dissatisfied with widespread corruption and sectarian discrimination in the Iraqi job market following the 2003 toppling of the Saddam regime. As a Sunni, and despite being qualified, he felt he was kept out of jobs in areas of national defense and in any government-sector related to science.

"Political things, the quality of the regime after 2003, it pushed me to interact and work against the regime," he said. "I worked as a student in a lab in Iraq for four years. It was not possible to gain employment there. After, I worked in a pharmaceutical lab. It was totally corrupt. The whole facility was corrupt and it lacked in everything. I was completely frustrated. I considered it a primary school," he said.

Ahmed claimed he was compelled to look for jobs elsewhere, first in Qatar and then Bahrain and Abu Dhabi, but to no avail. His disconnected personality probably contributed to his failure in that regard, but all the same he was a gifted individual frustrated by his inability to pursue his chosen field—until ISIS came along.

Ahmed was arrested in 2018 by the Kurdish security forces during an undercover counterterrorism operation in Erbil, the capital of the Iraq's Kurdish regional government. **He was then handed over to the U.S. Army in Erbil for further interrogation and later transferred to Iraqi authorities in Baghdad.**
While Ahmed claimed he had stopped working for ISIS after he looked more closely into their violent Islamic ideology, he continued to see himself, as many jihadists are encouraged to do, as a sort of chivalric hero and, in his case, a chemical whiz kid.
During our interview, he expressed regret over his decision to join ISIS.
"My advice to everyone in the world is not to believe [ISIS] propaganda and media. Real jihad is to support your country and families and provide them with the best knowledge. Don't believe ISIS or join any upcoming group."
At the same time, he seemed to still be angling for a job in his chosen field. Appearing to think we could bounce him out of prison, he offered to help the Americans now to fight ISIS. He had made a similar egotistic offer to the Peshmerga and also to others who had handled him following his capture.
Ahmed's story serves to demonstrate ISIS' horrifying ambitions and tryst with chemical and biological weapons in Iraq and Syria, nearly actualized through their power to attract scientists like him from around the globe.
These experts are capable of researching methods for and carrying out the manufacture of weapons of mass destruction from raw substances and materials that ISIS also appears adept at procuring.
The notion that ISIS and its operatives can deploy weapons of mass destruction outside of Syria and Iraq still remains far-fetched, but even if Ahmed is overstating his abilities by a considerable margin, there is no question that the Caliphate had a substantial group of capable scientists, engineers and technicians.
ISIS' capacity for innovation and the ability to replicate itself elsewhere—that is, engage in transfer of tools and techniques learned abroad for use in Europe, Asia or the Americas—must be taken seriously.
The Islamic State may have lost every last acre of the Caliphate in Iraq and Syria, but it lives on in the the minds of many who would inflict terrible attacks on its enemies, and may yet acquire the means to do so.

The Chemical Weapons Attack on Birjinni

Source: https://www.hrw.org/reports/1992/iraqkor/KOREME4.htm

Fear of chemical weapons attack was a prime reason why the villagers of Koreme tried to flee to Turkey. It was also a prime reason why they decided to return to Koreme and surrender. They had seen close-up the effects of chemical bombardment in the village of Warmeli. They had seen the terror of the Warmeli villagers. They had seen the dead lying by the roadside, unburied. Thus, although Koreme and its families were never attacked chemically, a complete case history of Koreme requires understanding how chemical weapons attacks on villages were carried out during Anfal. For this reason, this chapter now leaves aside the narrative of Koreme's villagers and turns to the account of a chemical weapons attack on a village in the same region as Koreme.

The Decision to Exhume at Birjinni

The logical place to make an investigation of a chemical weapons attack would have been the village of Warmeli, since it was the place, located some three hours' walk from Koreme in the direction of Turkey, where the Koreme villagers arrived in the immediate aftermath of a chemical attack. For scientific and forensic reasons, however, Warmeli was not ideal. Although extensive interviews were carried out by MEW/PHR investigators with some families who had survived the attack and returned to Warmeli following the March 1991 Kurdish uprising, the relatives of those who had died in the chemical attack on August 27, 1988 could not be interviewed. They had managed to enter Turkey in 1988, remained there in refugee camps for over three years, and then dispersed to different locations after mid-1991, when conditions in Kurdistan made it possible for them to return.
As a consequence, direct eyewitnesses of the Warmeli chemical attack were not available for interview. Moreover, the victims had apparently remained unburied during several years,

according to Warmeli villagers. They took MEW/PHR investigators to places where they said the bodies had been left, indicating that the skeletons were still there when they returned in 1991, and said that slides of earth following storms had partially covered them. They had heaped on more earth to complete the burial.

The MEW/PHR forensic team had hoped to find graves of persons who had been buried shortly after a chemical attack and in thesame clothing they were wearing at the moment of the attack in order to determine whether residues or other evidence of chemical agents remained after so many years. It was not very likely that residues of an air-disseminated chemical agent would remain after four years, even on a body that had been immediately buried; it would be extremely unlikely in the case of an unburied skeleton exposed to the elements over several years.1 Nonetheless, it was important for MEW/PHR to pursue the possibility as a scientific experiment; while lack of physical evidence would indicate little, the presence of chemical agents after exposure over four years would be an important forensic and scientific finding. But this experiment could not be carried out in Warmeli. Furthermore, without relatives and eyewitnesses to interview in Warmeli, positive identification of skeletal remains of persons who had died in the chemical attack would have been impossible.

For these reasons, the MEW/PHR forensic team did not exhume at Warmeli, and instead undertook to investigate a chemical weapons attack on the village of Birjinni. Birjinni is near Warmeli -- also a few hours' walk from Koreme in the direction of Turkey -- and although Koreme villagers did not pass through it during their flight, it had the main elements of chemical bombardment typically reported by survivors of the August 1988 Anfal campaign in the Dohuk region. Just as important, its survivors included eyewitnesses and relatives of the victims, and two of the victims were apparently buried soon after the attack in their original clothing.

Birjinni's Isolation

Birjinni, before Anfal, was a small village of some 30 houses. The houses were made of stone and mud-brick, and there was a stone-and-cement mosque and a school built by the government in 1984. The village did not have electricity. It lies in the District of Zawita, Dohuk governorate, about an hour- and-a-half by car in good weather, plus a half hour walk up a mountain slope, from the town of Zawita.

The village occupies a narrow saddle and mountain pass along a chain of higher ridges between the cities of Zakho and Dohuk. It comprises a tell 10 meters high and 100 meters wide. On the north side of the village lies a low sloping terrace, consisting of about 0.3 hectares with orchards and limited farmland. (See Birjinni Village Plan.) Prior to the Anfal campaign, the villagers raised wheat, barley, lentils, watermelon, tomatoes, cucumbers, red peppers, apples, grapes, and pomegranates; they also kept flocks of sheep and goats. Temperatures are hot and dry in the summer, and villagers report that up to 2-3 meters of snow falls on the mountain saddle in winter. The slopes on each side of the saddle fall away steeply.

Two roads originally led to the village, one from Zawita and the second from Dohuk. The road to Dohuk was traditionally of great importance to the village, because the villagers went to the city to sell produce in the market. The villagers reported, however, that in 1980, the government closed the road as a counterinsurgency measure. Reportedly the government, concerned about peshmerga activity in the area, ordered the villagers to abandon Birjinni and move to a collective town near Dohuk. In addition, in the late 1970s and early 1980s, the government began bringing in Arabs from the south to regions in Dohuk to replace Kurds who had been removed from their lands to collective towns.

When the Birjinni and other villagers in the area refused to abandon their land, "the government cut off our village. They put up a line of military posts and checkpoints, and no one from our area was allowed to come through. We weren't allowed to go to Dohuk or to sell anything. If they caught people, they beat them, and once in 1984 they executed seven men caught along the road." This was not the first time the road had been closed and the village isolated; villagers reported that it had been closed at various times, sometimes for several years, between the early 1960s and 1975.

There had long been active fighting between the army and peshmerga in the mountains and valleys around Birjinni. At various times during the 1980s, the peshmerga had bases within an hour's walk from Birjinni. Birjinni was fired upon with artillery and aerial bombardment off

and on from "1975 through Anfal," although villagers reported that "no one was ever hit in those raids. We built ourselves shelters in the caves nearby on the hill. The army didn't dare come up here, there were too many peshmerga all around." Many of the village men were active peshmerga fighters in the mid to late 1980s, serving fifteen days on duty and fifteen days off. The peshmerga, villagers said, did not maintain a garrison in Birjinni itself.

The Chemical Weapons Attack

At dawn on August 25, 1988, Hassan, a farmer, was awake, but still inside his house in Birjinni. He lived there with his father and mother, his four brothers, and his wife and four children. He was preparing to go to the orchards that morning, unless bombing and artillery prevented him. There had been "a lot of bombing for days. We could see many aircraft passing all the time."

Hassan knew that the government and the peshmerga had each built-up large ground forces to the north, but no battle had broken out. He had heard from numerous displaced persons passing through that the border with Turkey was closed, and that government soldiers were killing many who tried to cross. "They were being forced back into the lower valleys," he explained, "where they could be captured by the soldiers." He and other villagers tried to get more information from the KDP clandestine radio, but it was being jammed.

Hassan's wife was on the roof of the house at dawn and saw planes pass overhead. She saw them circle several times, but was not sure if they were observing the village or something else, because they were still far away. Hassan went outside to look, and reported a squadron of eight aircraft. Some of the villagers became frightened and went across the saddle to bomb shelters they had built on some ledges. Hassan and his family remained at home.

Shortly afterwards, the aircraft made a bombing run across the saddle on which the village sat, from east to west. Hassan reported seeing three planes drop four bombs each. Other surviving villagers agreed with his report; many had been watching the sky since early dawn, concerned that bombardment with conventional bombs was about tobegin. The bombs fell in three groups of four bombs, one group on the eastern edge of the village, and the other two on the western edge. Hassan's wife said they created a "tremendous noise"; her sister said the explosion was not like any of the other bombs that had been dropped on the village in previous years. Hassan said, by contrast, that the explosions were not as strong as other bombs dropped on the village. He reported seeing one group of four bombs fall "about 80 to 100 meters from the houses in the village."

Surviving villagers described the smoke rising from the bombs as "white, black, and then yellow, rising about 50 or 60 meters into the air in a column. Then the column began to break up and drift. It drifted down into the valley, and then passed through the village. Then we smelled the gas for the first time."

The smell of the gas was "pleasant, at first. It smelled of apples and something sweet." Several men said it smelled like "pesticides in the fields." Shortly thereafter, however, "it became bitter. It affected our eyes, and our mouths, and our skin. All of a sudden it was hard to breathe. Your breath wouldn't come. You couldn't breathe."2

The planes continued to fly overhead, said Hassan's sister-in-law, "in circles. They flew around and around. They watched us." And another village man added, "the [planes] flew very low, but they didn't fire at us with their machine guns." The planes reportedly stayed perhaps a half hour, until the main cloud of smoke had dispersed. Other villagers reported that the aircraft made other bombing sorties following thechemical bombing, starting fires in the fields which, because it was late August, were dry and brown. There was burning everywhere.

The smoke from the chemical bombs, Hassan said, "settled into the lower land, it drifted down the valley toward the fields and the orchards. I took my family, three of my children and my wife, and we ran to higher ground. We went the other direction from the smoke." There was complete panic in the village; people ran in all directions, trying to escape. Families were separated, children were lost from their parents, and everyone, Hassan's wife said, "was trying to save themselves, each one himself, even the mothers of children, because they couldn't breathe."

But Hassan's father and mother, several brothers and a sister, stayed in the house, because "they didn't know what the smoke could do." When they understood what was happening,

they ran from the house to an orchard in the ravine, "but it was deep in the valley. The smoke followed them, and there they were overcome." Hassan and his wife realized that one of their four children, Dejwar, a boy of five years, was missing. Dejwar had gone with his grandfather to the orchard in the ravine, and not up the hill with his father and mother.

After about half an hour, Hassan and other survivors on higher ground thought it was safe to come back down to the village. The planes had flown off, and Hassan took that as a good sign. Nearby the house, however, they found Hassan's mother and twelve-year-old sister lying on the ground, overcome by the gas. Survivors took them and the other injured people to the spring and began to wash them with water. The mother and sister had similar symptoms, family members said; their hands and legs were paralyzed, they "were trembling and shaking all over, especially in their limbs." Hassan's wife and sister-in-law tried to get them to swallow water, but "they couldn't. Their throats were burning, and they were vomiting. My mother whispered, 'I think there's a hole in my head'." Within several hours after exposure to the smoke, both the mother and sister went blind, according to family members; the condition lasted several weeks for each of them.

Hassan went down from the village and found his father, a man "more than sixty years old," and his son Dejwar lying dead just outside the orchard. He could find no marks on the bodies that he could see, "it was like they were sleeping, except their faces were blue." His two brothers were also found dead in the small cave where they had taken cover together.

These four -- the grandfather, Hasan Saleh Hasan, born c. 1930; Hasan's two brothers, Hakim Hasan Saleh, born 1964, and Kurdi Hasan Saleh, born 1965; and Hasan's son Dejwar Hamid Hasan, born 1983 --were the total dead from the chemical attack on August 25, 1988, according to village survivors.[3] There were "many injured, some more seriously than others," villagers said, but no tally was made.[4]

The Aftermath of the Attack

Those who could fled Birjinni within hours of the attack. They feared the planes would return and that government soldiers would arrive shortly. They understood that this was a wholly different kind of attack; whereas, in earlier episodes, they had only to protect themselves from artillery and bombardment, relatively sheltered in their remote mountain home, the gas attack was obviously a prelude to something new. Looking down into the valleys from their mountain saddle, they could see large groups of peasants trying to flee to Turkey, as the villagers from Koreme, Warmeli, and numerous other places sought to do. The peshmerga did not seem able to fight a holding action to allow the civilians to retreat behind them. The enormity of the government action and the use of chemicals as a weapon of terror had thrown everything into confusion.

Not everyone was able to go to Turkey, however. Hassan's mother, injured in the chemical attack and by now blinded and partly paralyzed, her muscles "fluttering like an insect's," was unable to undertake the arduous trip. She started out with the others, her son said, but could not go on and turned back with other villagers, including some men who later disappeared in government custody.

The fleeing villagers left the bodies unburied, so great was their hurry. They brought the grandfather and little boy's bodies further down the valley to the bottom of the orchard and left them there. The two brothers were left in the cave where they had succumbed. Government soldiers apparently arrived in the village two days later and subsequently buried the bodies of the grandfather and little boy near where they had been left. They were buried in their clothes, without the performance of Islamic ritual. The two brothers were not buried at all, but instead the soldiers left them in the cave in large nylon or plastic wrappings.

In 1991, shortly after the March 1991 Kurdish uprising, a peshmerga from Koreme, whose sister was married to one of the dead brothers, ventured up to Birjinni. He found the skeletons of the two brothers in the plastic or nylon sacks, and buried them at the cave. He found the unmarked graves of the grandfather and son, partially digging up one body to be sure, and then covering it back over. The soldiers took custody of the villagers who had either returned or never left, removing them first to the fort in Dohuk, and later to the collective camp at Beharke near Erbil. An unknown number of the village men, who had stayed behind rather than flee to Turkey, disappeared after being taken to the Dohuk fort.

Those who went on to Turkey traveled by night. On the afternoon of the attack, they went to a nearby mountain and hid until dark. Then they moved slowly and cautiously across the hills and ravines between Birjinni and the mountains marking the border. There were "thousands and thousands of other people on the roads," and in the end, it was perhaps the fact that so many people were fleeing that enabled them to slip through. Even given the size of the government force assigned to capture the Kurdish villagers, the number fleeing was so great that some got through the Iraqi army lines.5 But it took the Birjinni villagers three days to get to Turkey. Iraqi soldiers shot at them and shelled the area. The survivors saw the bodies of people killed by Iraqi soldiers as they tried to flee, and at least two of their own villagers were killed by mortar fire; as "soon as [the soldiers] saw us, they shot at us. I don't know how we could have surrendered to them, they just shot at us." Still, many did surrender, including families from Birjinni and "the men from those families, we don't know where they are today, they disappeared."

At the border, the Birjinni villagers were met by units of the Turkish army. Turkish soldiers took them into custody and, according to the villagers, planned to repatriate them to the Iraqi army.6 They watched others being repatriated, but for unknown reasons, the Birjinni villagers were taken to a refugee camp and given asylum. At the camp, Turkish physicians examined their chemical weapons injuries, but gave them no specific treatment, villagers said.7 The sister who was blind regained her eyesight after several months; her muscles continued to have spasms, and she suffered from partial paralysis and "weakness."

The Birjinni villagers remained in the refugee camp at Diyarbakir, Turkey until the uprising in March 1991, when they came back across the border. They returned to their village and discovered that it, like so many others, had been methodically destroyed in its entirety. The school, mosque and stone houses had been dynamited to rubble; the mud houses had been scraped to the ground. Nothing remained. Landmines were placed around the village to deter its inhabitants from returning.

They went to live as refugees in a collective town near the main Dohuk highway, going up to the mountains to begin replanting the crops and the orchards for a few days at a time, walking the six hours in each direction from the busstop on the main Zawita road to the village.

Since then, the apple trees have blossomed, despite an unusually harsh winter in 1991-92, and some of the grape vines and pomegranates have been replanted. By June 1992, the wheat was ready for harvest, although landmines in the fields presented a consistent danger.

Investigations by the Forensic Team

Members of the forensic team visited Birjinni in the company of villagers on June 1, 7, and 10, 1992. The team's activities, detailed in Appendices 1 and 2, divide into four types: Taking the survivor testimony summarized above; archaeological investigation and mapping of the village as it existed prior to destruction; investigation and sampling of the sites where chemical bombs were reported to have fallen; and exhumation of the remains of two victims of the chemical weapons attack.

Birjinni village

The team archaeologist undertook to map and survey the village to establish the structures that existed prior to its destruction (see Birjinni Village Plan). His investigations demonstrated that the village consisted of approximately 40 houses, as described above, with two stone and concrete structures reported by villagers to have been the school and mosque. All buildings had been destroyed; it was not possible on the basis of physical evidence to state with certainty the year of destruction, but the vegetation growth and other evidence was consistent with the former inhabitants' report that the village had been destroyed in 1988.

The school and mosque, as identified by villagers, had evidently been destroyed from the inside, with explosives aimed to implode structures rather than explode them, given the configuration of rubble located within the interior of the building site. The buildings had collapsed upon themselves. These conclusions are consistent with eyewitness accounts of the destruction of cement buildings in other villages.8 They are also consistent with the account in "The End ofAnfal" of special demolition teams detailed to undertake the "destruction and removal of the remnants of the saboteurs and their premises."9 The remainder of the houses had been razed down to their foundations, in a fashion indicating the use of earth moving and scraping equipment.

The chemical weapons bomb sites

The team archaeologist also investigated the sites where villagers indicated chemical bombs had fallen (see Birjinni Village Plan). He found three clusters of four airborne canisters, each spaced around the edge of the village terrace. Four of these bomb craters, along the western edge of the terrace and about 700 meters from the village, were examined in detail, while the locations of the other eight craters were visually confirmed.

The four craters examined in detail consisted of low conical depressions 2.2 meters across and 0.6 to 1.2 meters deep. Fragments of the bombs were found lying immediately beside and in the craters. In two instances they consisted of an iron outer envelope that was heavily rusted, an aluminum inner canister, a heavy lid labelled "Top" in English, a spout in the lid, and twisted tail fins. The fragments near each crater in those two instances were sizable: approximately 1 meter by 0.5 meter by 0.5 meter, and approximately 10 kilos in weight.

Soil samples were collected from the craters and scraped from inside a canister. At the time of writing, laboratory analysis of the samples is still underway.10 The four craters were spaced on a straight line about thirty meters apart, consistent with survivor accounts that they had been dropped from low altitude by aircraft heading in a westerly direction.

Exhumations of chemical weapons victims.

Under the direction of the forensic team's scientific head and chief anthropologist, the skeletal remains of two of the four apparent victims of the chemical attack were exhumed. The forensic team was told that these two skeletons were those of the grandfather and the small boy who had died in the attack. The skeletons of the other two victims, buried in the cave, were not exhumed.

Exhumation of the two skeletons confirmed that one was that of an old man, approximately sixty years old. Relatives identified him as the grandfather on the basis of artifacts and clothing found with the skeleton in the grave. The second skeleton was that of a young boy, approximately five years old. He was identified as the grandson on the basis of clothing. Forensic examination of the two skeletons was limited to determining whether there was any sign of trauma or perimortem violence that might contradict the account of the villagers that the two decedents were overcome by chemical weapons. No indications contrary to death by chemical agents were found. The skeletons were then reburied in new graves in accordance with Islamic ritual.

Conclusions concerning the chemical weapons attack.

The forensic team found nothing in the evidence of the exhumation and the archaeological investigation that was inconsistent with the account of the chemical weapons attack given by village witnesses. On the contrary, the lack of trauma to either skeleton supports the villagers' account. The physical evidence of the canisters, although lacking physical evidence of the specific chemical agents deployed apparently by reason of time, chemical and weather-related deterioration, also supports the villagers' account.

Iraq has admitted using chemical weapons during these years, and the international community has concluded there is no question that Iraq used chemical weapons against Iran in the Iran-Iraq War, and against Kurdish civilians in the late 1980s.11 Moreover, the account of the Birjinni villagers is consistent with numerous other confirmed accounts of chemical weapons in the area, and is substantially the same as theaccount concerning Birjinni appearing in Galbraith & Van Hollen, finding that Birjinni was attacked with chemical weapons. Birjinni villagers, interviewed by PHR investigators in Turkey in 1988, gave the same account.

Accordingly, notwithstanding that the laboratory analysis of physical samples of chemical agents has not been completed, and taking into account eyewitness reports by the villagers, the forensic team is of the opinion that the village of Birjinni was attacked by chemical weapons on or about August 25, 1988; that some or all of the craters investigated by the team archaeologist were made by chemical weapons bombs; and that the skeletal remains exhumed by the forensic team were those of chemical weapons victims.

▶▶ References are available at source's URL.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Source: https://www.gas-dortmund.de/index-gas.php?lan=1&spath=370

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Toxic alcohols (methanol, glycols) were used as prove of concept. The application will be developed further regarding the intake or exposure to toxic industrial chemicals (TICs) during the Horizont 2020 project ToxiTriage in which G.A.S. participates.

Recent Research: Global Chemical, Biological, Radiological and Nuclear (CBRN) Security Market Forecast 2019-2025

Source: https://www.marketinsightsreports.com/reports/12311039183/global-chemical-biological-radiological-and-nuclear-cbrn-security-market-size-status-and-forecast-2019-2025?source=mvilletouchstone&Mode=18

Mar 12 – Orbis Research has announced the addition of the "Global Chemical, Biological, Radiological and Nuclear (CBRN) Security Market Size, Status and Forecast 2019-2025" to store by company, by country, and by application/type for the competitive landscape analysis.

The ***Global Chemical, Biological, Radiological and Nuclear (CBRN) Security Market*** status, future forecast, growth opportunity, key market and key players. The study objectives are to present the Chemical, Biological, Radiological and Nuclear (CBRN) Security development in United States, Europe and China.

Chemical, biological, radiological and nuclear defense (CBRN defense or CBRNE defense) is protective measures taken in situations in which chemical, biological, radiological or nuclear warfare (including terrorism) hazards may be present. CBRN defense consists of CBRN passive protection, contamination avoidance and CBRN mitigation.
By function, the global CBRN security market is segmented into protection, detection, decontamination, and simulation. The protection segment in CBRN security market held the leading share of 33.6% in 2016. The leading share of the segment is due to increasing military expenditures. Detection segment stood as the second-leading segment in the market in the same year.
In addition, CBRN systems are used for accidental incidents. These include events caused by human or technological errors such as accidental leaks or factory spillage of poisonous gas or liquids. Intentional CBRN incidents occur when CBRN materials are released into the environment with the intention of terrorism or war or when hazardous material is discharged into the environment deliberately.
The global chemical, biological, radiological, and nuclear (CBRN) security market is rising at a steady pace globally as demand for effective CBRN protection measures to combat terrorist attacks is at an all-time high. The threat of use of weapons of mass destruction by terrorist organizations have raised alarms to prevent possible attacks with CBRN systems. CBRN security is a rising market to address concerns related to protecting civilian lives and maintenance of economic stability.
In 2018, the global Chemical, Biological, Radiological and Nuclear (CBRN) Security market size was xx million US$ and it is expected to reach xx million US$ by the end of 2025, with a CAGR of xx% during 2019-2025.

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Unexpected Measure Against Chemical Threats

Source (videos): https://i-hls.com/archives/89635

Mar 07 – Drone technology will have an important role in the UK's defenses against chemical weapon attacks. Defense secretary Gavin Williamson has announced an £11m plan to boost the defense, outlining how drones and robotics would be deployed in potentially dangerous areas to prevent human life being put at unnecessary risk.
The news come just weeks after the secretary of state promised how drones would be key in the future of defence in Britain.
The move comes a year after the Salisbury nerve agent attack on a Russian ex-spy, allegedly by Russian military agents. A painstaking clean-up was conducted by the authorities of locations and buildings around Salisbury which were feared to have been contaminated.
The money will be spent deploying drones and robots into potentially hazardous areas, cutting the risk to personnel and identifying threats faster. It will also be spent on improving Britain's ability to analyse with more speed and accuracy potentially lethal substances and combat the effects of chemical agents, according to telegraph.co.uk.
Williamson added: "We recognise we need resilience to face evolving threats which is why we have invested £11 million into ensuring we have a world-leading capability."
The funding will be available in the new financial year and will be invested straight into programs that will aim to benefit DSTL scientists and the Armed Forces, according to commercialdroneprofessional.com.

CBRNe Awareness Training of the NCT Team

By Ryan Perry (Analyst IB Consultancy)
Source: http://nct-magazine.com/nct-magazine-march-2019/cbrne-awareness-training-nct-magazine-team/

Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNe) threats are increasingly being used by state and non-state actors worldwide, enhancing their lethality and finding

ever-changing ways to deploy them. In our mission to make this world a safer and more secure place, IB Consultancy (IBC), the creator of NCT events and magazine, is ramping up its efforts to understand CBRNe issues threatening the general population as well as military and civil first responders; the policies governments around the world are employing to fight these threats; and the equipment being developed by industry leaders to assist in this effort. Over the last week, we took another important step in that direction by undertaking a CBRNe awareness course given by the Director of Operations of Hotzone Solutions Group, Magnus Backlund and the President of the International CBRNe Institute's (ICI), Mr. Yves Dubucq at the ICI HQs in Les Bons Villers, Belgium. The Awareness Course included: amplifying our knowledge of CBRNe agents and their effect on the human body; the detection of an array of CBR agents; the stages of contamination and decontamination; and the Personal Protective Equipment (PPE) required when confronting the greatest dangers of today. The course provided the IBC team with an invaluable experience and the knowledge needed to continuously serve the CBRNe community.

Magnus Backlund first took us through the different types of CBRNe agents, the way that they affect the human body, the difficulty in addressing biological agents, and the lasting effect of radiological sources.

After completing the previous session, we were given the practical experience of trying out the different kinds of PPE used by first responders when a CBR incident occurs. Mr. Backlund explained what characterizes the different levels of PPE, when each level is required based on the threat assessment, while assisting us in the donning and doffing procedures.

On day two we addressed the threat of contamination for responders in the hotzone, the importance of a hard line between the hot, warm, and cold zones, and decontaminating personnel, equipment, and the injured. Mr. Backlund also took us through the set-up of the Contamination Control Station (CCS) and the proper disposal methods of contaminated material.

Mr. Dubucq took the torch from Mr. Backlund for a practical lesson on detection. Discussing different chemical agents including GA, GB, GD, GF, HD and VX, we learned about the important differences in their characteristics, how this affects their detection, and the way in which they change the decontamination process.

Specifically, with the use of simulants, Hotzone Solutions was able to showcase the procedural elements to be kept in mind when operating detection equipment.
For the last portion of the two-day training, we learned about the level of protection of impermeable suits, also giving us the chance to don one. Members of our team did their best to efficiently don and doff the equipment, as well as practice walking and working in the gear.
Whilst technology is imperative in mitigating and responding to CBRNe threats, the training to correctly use it and the practice required to improve its use during the response cannot be underestimated. Training at the ICI with experienced members of Hotzone Solutions Group provided us at IBC with an increased insider knowledge on what is needed to prepare for and respond to CBRNe incidents. This however, was just another step for our team as we continue to amplify our knowledge within the field. We hope that all of you join us in our mission.

NATO The Secretary General's Annual Report 2018

Source: https://www.nato.int/nato_static_fl2014/assets/pdf/pdf_publications/20190315_sgar2018-en.pdf

Countering Weapons of Mass Destruction and Chemical, Biological, Radiological and Nuclear Threats

In 2018, NATO continued to work with Allies, partner nations and other international organisations to combat the proliferation of weapons of mass destruction (WMD) and to defend against chemical, biological, radiological and nuclear (CBRN) threats. NATO has a Combined Joint CBRN Defence Task Force designed to perform a full range of related missions related to CBRN events and attacks against NATO populations, territory or forces. The taskforce is led by an individual Ally on a 12-month rotational basis. In 2018, Germany took over as lead nation. In 2018, the Alliance continued to help build capacity for members and partners in the area of CBRN defence. For instance, the NATO School in Oberammergau, Germany held 14 different training courses on CBRN defence and WMD non-proliferation. The Joint CBRN Defence Centre of Excellence, based in Vyškov, Czech Republic, also organised a mobile training course in Kuwait to further develop Kuwait's civil crisis response capabilities. In October, NATO held an annual conference on WMD and CBRN issues in Reykjavík, Iceland, gathering over 100 participants from 45 countries, as well as high-level representatives from the United Nations, the European Union, the Organisation for the Prohibition of Chemical Weapons and the Comprehensive Nuclear Test-Ban Treaty Organization. The meeting focused on the state of global arms control treaties.

Nuclear Deterrence

NATO continues to ensure that all components of its nuclear deterrence remain safe, secure and effective. The fundamental purpose of NATO's nuclear capability is to preserve peace, prevent coercion and deter aggression. In 2018, the Alliance's Nuclear Planning Group met at both the Ministerial and Ambassadorial level to consider the actions of Russia – which has been modernising its strategic systems, announcing new nuclear weapons programmes, deploying dual-capable missiles, using irresponsible and aggressive nuclear rhetoric, and developing and deploying intermediate-range ground-launched cruise missiles in violation of the Intermediate-Range Nuclear Forces Treaty. At the 2018 Brussels Summit, Allies urged Russia to address concerns about the development of a new missile system, noting widespread doubts about Russian compliance. In December, Allies formally concluded that Russia was in violation of the Intermediate-Range Nuclear Forces Treaty and called for Russia to return to compliance with its Treaty obligations, noting that the United States was adhering fully to its Treaty commitments. Taking into account the challenges posed by an uncertain world, the Nuclear Planning Group has taken careful and measured decisions to maintain the effectiveness and coherence of NATO's nuclear deterrence, including decisions on adaptation to maintain the credibility of the Alliance's nuclear-capable forces.NATO continues to exercise nuclear deterrence capabilities to demonstrate effectiveness, with a growing emphasis on the coherence of NATO's conventional operations and nuclear deterrence, recognising that nuclear weapons are unique and that the circumstances in which they might have to be used are extremely remote. NATO remains committed to arms

control and disarmament as an essential contribution to achieving the Alliance's security objectives, but regrets that the conditions for achieving full disarmament have not become more favourable. In 2018, NATO continued to work to improve understanding of nuclear issues across the Alliance. It did this by organising a series of visits to nuclear bases and facilities, running a series of courses on elements of nuclear deterrence for military and civilian audiences from both NATO Headquarters and member nations, and by sponsoring an annual Nuclear Policy Symposium in Washington, D.C.Aside from the independent nuclear capabilities of the United States, the United Kingdom and France, and the national contributions of dual-capable aircraft and associated infrastructure, NATO works to achieve the broadest possible participation of Allies in the nuclear deterrence mission.

Development of an Algorithm for Calculating the Risk of Terrorist-CBRN

By Bolduc DL, Marr J, King J and Dudley R

Source (full paper): https://www.omicsonline.org/development-of-an-algorithm-for-calculating-the-risk-of-terrorist-cbrn-2157-2526.1000117.php?aid=8945

In order to avert a disaster from a terrorist chemical, biological, radiological or nuclear (CBRN) attack, it is important to study the likelihood of terrorists using CBRN weapons. This study reports on the development of an algorithm for calculating the 'risk' of a terrorist seeking CBRN weaponry with 67.3 percent prediction accuracy. The algorithm was developed through four phases, Phase I proposed independent variables likely associated with Terrorist-CBRN (T-CBRN) derived from our interpretation of the literature; Phase II involved constructing a 'Random Nations Matrix' from 74 countries or locations of the world selected at random, for correlating the proposed independent variables; Phase III entailed the construction of a multivariate model from the independent variables which met our correlation criteria with T-CBRN; and finally in Phase IV, an algorithm was derived from the model design for calculating the risk of a terrorist seeking, acquiring and or using a CB agent.

Does sarin cause birth defects?

By Dan Kaszeta

Source: https://now.mmedia.me/lb/en/commentaryanalysis/549103-does-sarin-cause-birth-defects

Months after the sarin nerve agent attacks in Syria, we are now confronted, on Twitter and in *The Telegraph* and *The Daily Star*, with stories and images of babies being born with deformities and defects, allegedly caused by sarin exposure. But what do we know about whether sarin causes birth defects? In the last few weeks, many people have asked me these questions, and it has forced me to closely examine the available scientific literature. This literature is not extensive, but there are dozens of articles and books that do address the subject. On the whole, the available literature seems to show that sarin does not cause birth defects.

Before addressing the conclusion, it is important to examine the question of whether these babies were affected by sarin from the broader perspective of birth defects in general. In the United States, a generally healthy country, one report is that one baby in 33 is born with some sort of defect or abnormality, although exact definitions and statistics vary. This baseline rate is somewhat higher in many developing countries, including a reported prewar (2006) rate of 7.48% for Syria. Even if we could confirm that the mothers in question were exposed to sarin, how do we know that these specific babies wouldn't have had defects without the presence of sarin? It is also important to understand that birth defects come from many causes. Exposure to teratogens, agents or substances that cause birth defects, is only one of many different possible causes.

According to the Encyclopedia of Toxicology, as much as 79% of birth defects are of unknown cause and only 6% are from teratogens.

While it is easy to see that any individual case may be lost in the general background noise of generally expected birth defects, this does not exclude sarin as a teratogen.

But do we know if sarin is a teratogen? The vast majority of human exposures, either deliberate or accidental, are among adult men, not pregnant women. But the subject has been studied. The canonical textbook in the field, Medical Aspects of Chemical Warfare, has very little to say, despite addressing sarin at great depth. Other works do not believe sarin or other military nerve agents are teratogens, including Dr. Ramesh Gupta's Handbook of Toxicology of Chemical Warfare Agents and Dr. James Romano's encyclopedic Chemical Warfare Agents: Chemistry, Pharmacology, Toxicology, and Therapeutics, despite exhaustive explorations. However, since deliberately exposing humans, let alone pregnant women, is well beyond morality and ethics, science can look to animals for some evidence. Much of the existing literature up to the early 1990s was well summarized by Dr. Nancy Munro in an excellent 1994 article. Munro had access to US government studies for this article and references a study of rats and rabbits where sarin caused no fetal malformation, even at doses high enough to kill the mother. Another study showed chronic exposure of low levels of sarin in rats having no discernable link to birth defects. A more recent study exposed chicken eggs to various levels of sarin and studied the development of the eggs and chicks, concluding that sarin did not increase incidence of malformations. The resulting chicks did have some neurological impairment, but no physical abnormalities.

Some studies have occurred with closely related chemicals, such as the nerve agent VX. VX, although having different physical characteristics, acts through the same biochemical mechanisms as sarin. A large accidental exposure of sheep to VX occurred in Utah in 1968 which, although a debacle for the US government, gave rise to the interesting Van Kampen veterinary study that showed that, at least in sheep, no birth defects were noted.

The few large sample populations of humans exposed to sarin that do exist are in Japan, Iraq, and Iran. Studies in Japan, both for the small 1994 Matsumoto incident (here and also here) and the larger 1995 Tokyo incident make no reference to birth defects or reproductive effects. Dr. Ohbu's article on the Tokyo exposure is as close as we get in modern scientific literature to addressing this issue directly. Four women were pregnant when they were exposed to sarin in Tokyo; all four delivered normal babies.

Iran represents another pool of affected population to study. At least 700 tons of nerve agents were used by Iraq in the Iran-Iraq war. I consulted with Dr. Shahriar Khateri, an Iranian expert who studies the long-term effects of chemical warfare upon members of the Iranian population. Khateri told me that Iranians could find no link between nerve agent exposure and birth defects, though he stresses that more research is needed in this area of inquiry.

Since sarin is chemically related to pesticides in the organophosphate family, perhaps studies there can shed some like. Leiken and Mcfee's Handbook suggests that malathion might cause birth defects (while also categorically saying the military nerve agents do not), but Dr. Jan Storm, in Patty's Toxicology, states that "organophosphate pesticides have generally not shown reproductive or developmental effects in animal studies." Several authorities point out a number of reasons why organophosphate pesticides differ from their nerve agent cousins in regard to long-term biological effects, including Dr. Romano's work cited above.

One might also ask about whether sarin affects the offspring of men exposed to it. Dr. William Page studied this as part of long cohort study of military volunteers exposed to chemical agents from 1955 to 1975. This study showed no substantial difference in birth defect rates between men exposed to chemical warfare agents and those not exposed.

Finally, what about antidotes? Perhaps atropine, the principal sarin antidote could be to blame? At least according to B. Bailey and Mosby's Drug Consult, the latter of which speaks of exposing rats to absurdly high doses out of proportion to nerve agent treatment, atropine is probably not a culprit in birth defects.

The basic conclusion to be had here is that a number of people with far more specialized knowledge than mine have studied the possibility and think that sarin

probably does not cause birth defects. Of course, the possibility cannot be completely excluded, but it seems quite unlikely that the reported births in Syria are (a) different somehow from the expected baseline (b) not caused by something else and (c) caused by sarin exposure. While I have every sympathy for the mothers and children, it seems to me that there is every risk that tragic events are being exploited for political purposes in this instance. Sarin is bad and should never be used, but to blame it for deformed babies in contravention of the published science seems wrong to me.

Dan Kaszeta is a former US Army and US Secret Service specialist on chemical, biological, and radiological defense, now working as an independent consultant based in London.

New Product: HighDRO® Decontamination Wastewater Storage Tanks

Source: https://www.highlandtank.com/new-product-highdro-decontamination-wastewater-storage-tanks/

Healthcare workers risk exposure to chemical, biological, radiological, or nuclear (CBRN) materials when their medical facility receives patients contaminated with these substances during incidents such as mass casualty attacks. Such incidents could be associated with man-made (intentional or unintentional) or natural disasters and can involve a wide range of hazardous substances – including chemical weapons agents, toxic industrial chemicals, and dangerous meth and fentanyl drug residue.

Guidance documents, such as the Occupational Safety and Health Administration (OSHA) Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances, recommends that hospitals with an emergency room should be prepared to decontaminate incoming mass casualty victims. Permanent decontamination facilities are generally recommended because these facilities can be activated quickly, can function well in harsh climates, and offer reliable long-term service,

even during a natural disaster. These permanent facilities usually contain decontamination showers as a critical step in the overall decontamination process.
Decontamination wastewater is wastewater generated as a result of decontamination activities performed at medical facilities that may contain CBRN substances.
Wastewater from decontamination showers can contain low-level concentrations of the CBRN substance(s) with which victims are contaminated. Wastewater utilities are required to detect and detain decontamination wastewater containing CBRN substances. Standard protocols for decontamination activities include procedures to prevent runoff of decontamination wastewater and contain it on-site in holding tanks until it can be analyzed and disposed of safely.
HighDRO® Decontamination Wastewater Storage Tanks are required at medical facilities to hold or store wastewater generated because of decontamination activities performed to remove CBRN residue or hazardous materials (HazMat) from equipment or personnel. These "tight" tanks are available for either underground or aboveground installations and are designed to store a wide range of contaminated wastewater.

Applications
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• Military Bases
• Nuclear Energy Centers
• Industrial and Petrochemical Plants
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• Research and Educational Institutions
• Transportation Hubs
Decontamination wastewater storage tanks are watertight and made of double-wall steel to allow for 100% secondary containment and periodic tightness testing.
They are available for either underground or aboveground installations and come complete with tough interior and exterior dielectric coatings. A complete tank leak and level monitoring system is supplied with each tank for mounting inside the decontamination suite. Accessories include wastewater pumps and controls as well as Highland's High-LINKTM integrated communication system to enhance security and promote around-the-clock peace-of-mind. Our team at Highland Tank will work with you on your next water storage tank project to help find the right tank for your application.

A very good CBRN training video (Netherlands Army)

Source: https://www.youtube.com/watch?v=Qz9ps8RPvhc

EDITOR'S COMMENT: Watch it again and again to see the details that make the difference compared with other similar videos! It is a *lege artis* procedure performed the correct way!

Forget About North Korea's Nukes: Fear Kim's Chemical Weapons

By Kyle Mizokami

Source: https://nationalinterest.org/blog/buzz/forget-about-north-koreas-nukes-fear-kims-chemical-weapons-48152

The most effective means overall of mitigating Pyongyang's chemical threat may be to bargain the weapons away ahead of time. If the North could be persuaded to give up most or all of its chemical weapons, it would lessen the threat to civilians and soldiers in wartime, both on the Korean peninsula and abroad. That would involve talking to North Korea , something the Obama administration has not been too interested in doing. If the world wishes to do away with North Korea's chemical weapons, it needs to start talking to the reclusive country now.

Mar 19 – In recent years, North Korea's chemical weapons have taken a backseat to her nuclear weapons. They are, however, no less dangerous. The deterioration of the Korean People's Army (KPA) makes them more essential to victory than ever before. For both practical and doctrinal reasons, North Korea will almost certainly use chemical weapons in wartime, from riot control to lethal nerve gases.
Chemical weapons will be used to create a local, tactical advantage on the front lines and neutralize some advantages, such as air power. Thanks to North Korea's prodigious missiles and artillery, they can be employed beyond the battlefield as well. North Korea will likely attack South Korea (ROK) through its depth with chemical weapons, from the Demilitarized Zone to Busan.
The vast number of delivery systems would make shutting down the KPA chemical threat impossible during wartime.

North Korean Chemical-Weapons Doctrine
North Korea parses weapons of mass destruction into different usage categories. Nuclear weapons are a strategic deterrent meant to guarantee the security of the Kim dynasty. Northern nukes likely have no operational role in a wartime scenario, since their usage would cause South Korea and the United States to topple the North Korean government.
Chemical weapons, on the other hand, do have an operational role. North Korean military forces train to operate in a chemical environment on a regular basis, and North Korea manufactures its own chemical protective gear and detection systems, some of which have been found bound for Syria.
Chemical weapons would be used in a number of ways, but the primary goal is the suppression of enemy defenses, allowing the KPA to overcome ROK and U.S. forces. Troops fight less effectively when in chemical protective gear, and defenses are dispersed to mitigate the effects of chemical attack.
Given the unpredictability of the battlefield and chemical weapons in particular, North Korean planners will use them as early in the war as possible, when their overall picture of the battlefield is at its maximum. As the war progresses and uncertainty mounts, chemical weapons use will become less productive and even counterproductive.

Types of Chemical Agents
North Korea has a wide spectrum of agents to choose from, and would be expected to tailor its use of chemical agents to the specific task at hand. The effects of these weapons range from temporary incapacitation to death.
The South Korean Ministry of National Defense estimated in 2012 that North Korea had a stockpile of between 2,500 and 5,000 metric tons of chemical weapons. Annual production is estimated at 4,500 tons in peacetime and 12,000 tons in wartime.
North Korea is thought to have chemical weapons from the principle five categories: riot, choking, blood, blister and nerve agents. Riot-control agents are thought to be Adamsite (DM), CN and CS gases. Riot agents and so-called "tear" gases are meant to disperse crowds and are generally nonlethal to healthy adults.
North Korea is also thought to have so-called choking/pulmonary agents, gases that act upon the respiratory system. Short-term exposure requires hospitalization; prolonged exposure is lethal. The KPA is thought to have access to both chlorine-gas and phosgene choking agents.
So-called blood agents, which act through exposure to the human bloodstream, include hydrogen cyanide and cyanogen chloride.
North Korea also has mustard gas, a blister agent, which irritates skin and mucus-production areas, such as the eyes and nose.
Finally, North Korea is believed to have highly lethal nerve agents, which work by disrupting the human body's nervous system, resulting in asphyxiation. **North Korea is believed to have stockpiles of sarin, soman, tabun, VM and VX nerve agents.**
According to longtime analyst Joseph Bermudez, North Korea is believed to have specialized in "sulfur mustard, chlorine, phosgene, sarin and the V-agents."

Delivery Systems

North Korea has a multitude of ways to deliver chemical weapons to targets, ranging from long-range missiles to commandos. Pyongyang will have the ability to attack targets in South Korea and beyond, from locations not just near the DMZ, but theoretically as far as the Russian and Chinese borders.

An important factor to consider in this discussion is the relatively short ranges involved in-theater. The Korean peninsula is relatively short; from Hyesan on the North Korean/Chinese border to the southern tip of South Korea is less than 500 miles, or the distance from Portland, Maine to Baltimore, Maryland. Pyongyang to the DMZ is only 100 hundred miles and only 120 miles to Seoul.

Rockets and missiles are one-way North Korea could deliver chemical weapons and have the longest reach. As of 2014, the U.S. Department of Defense estimates North Korea has less than one hundred short-range missile launchers of all types, including **the Toksa/KN-02 Viper (a derivative of the Russian SS-21 Scarab) with a range of 75 miles, and its collection of Scud missiles, with a maximum range of 185 to 625 miles. Toksas and Scuds would have to be based close to the border.**

North Korea also has less than fifty launchers for its No Dong missiles. Developed using Scud technology, No Dong has a range of 800 miles, making it useful for striking from deep inside North Korea against South Korea and Japan.

Artillery is by far the most numerous chemical-weapons delivery system. North Korea is believed to have 5,100 multiple rocket launchers and 4,400 self-propelled artillery pieces. Rocket artillery of 122-millimeter or greater and field artillery of 152-millimeter or greater would be capable of firing chemical shells. The majority of Pyongyang's artillery would be capable of delivering chemical strikes.

The North Korean People's Air Force is capable of delivering chemical weapons by air, but its aging fleet of airplanes are less reliable and less likely to get through South Korean defenses than other means. They will also be heavily in demand for conventional missions. Nevertheless, **it has eighteen Su-7BMK "Fitter" and thirty-two Su-25 "Frogfoot" aircraft that could carry out chemical strikes.**

North Korea's large number of special forces and their importance to any war plan make it likely they would work with chemical weapons to some extent. Trained in infiltration techniques, North Korean infiltrators could be used to deliver chemical weapons or exploit the chaotic aftermath of a chemical attack. There may be ways North Korea plans to disseminate chemical weapons that remain undiscovered. Chemical agents could be delivered by submarine or drone. North Korea could even use new, undiscovered tunnel systems to launch chemical attacks behind South Korean lines.

Targets

North Korea will use chemical weapons to alter the correlation of forces the way other countries use high technology. The most important targets would be South Korean forces directly across the border, manning the country's impressive border defenses. Attacks such as these in support of a ground offensive would seek to break through and facilitate the push on Seoul and beyond.

Air bases would be key targets for chemical strikes, as shutting them down, even temporarily, would negate the tremendous advantage the United States and South Korea have in terms of air power. Daegu Air Base, home of the Republic of Korea Air Force's F-15K fighter bombers, and the American bases of Kunsan and Osan would likely be hit hard by North Korean missiles.

South Korean ports, such as Busan, will also be the targets of strikes, as these will be the nodes through which American reinforcements will flow. Chemical weapons could be used against ROK Army reservist depots, delaying the firming up of reinforcements for the front.

North Korean Special Forces could even use chemical weapons against civilian targets. Attacks on politicians, infrastructure and other high-value civilian targets could cause panic and a loss of confidence in the government. Attacks similar to to the 1995 sarin gas attack in Tokyo, Japan could lower civilian morale and cause panic. A panicked civilian population will create serious problems, as civilians clog the roads attempting to flee the fighting.

Finally, U.S. facilities in Asia beyond the Korean peninsula will come under chemical attack. Chemical attacks on Kadena Air Base, Misawa Air Base and Yokota Air Base in Japan would staunch the flow of U.S. airpower into the region. (There is little downside to

attacking Japanese territory, since the Japanese do not have offensive weapons.) Similarly, attacks on facilities at Yokosuka, Atsugi and Sasebo would target U.S. Navy forces. Guam, a base for American submarines and bombers, is in reach of longer-range North Korean missiles, such as Taepodong.

Conclusion

Would North Korea chance using chemical weapons? The deterioration of the conventional North Korean military makes the use of gas more necessary than ever. The KPA has few "force multipliers" to enhance its effectiveness on the battlefield and even fewer that only it alone would use.

It's long been thought that chemical-weapons use would invoke "massive retaliation" by the United States and South Korea. However, short of employing nuclear weapons, the latter powers will already be using everything at their disposal to defeat a KPA invasion force. From the North Korean point of view, as long as the nuclear threshold is not crossed, there's little political downside to using chemicals.

The failure of the West to respond to chemical use in Syria has shown that warnings about "red lines" and the use of gas are hollow. There are great differences between gassing Syrian civilians and American troops, but it's clear that some of the taboo of using chemical weapons has worn off.

North Korea's chemical-weapons threat is real and the likelihood of their use in wartime is high. Once war is underway, the best way for U.S./South Korean forces to mitigate their effects would be to degrade North Korea's command and control and take the offensive. If the NK general staff is unable to send orders and receive accurate intelligence, it will find it difficult to plan chemical strikes. A fast-moving UN offensive may also catch slow-moving artillery and missile units.

The most effective means overall of mitigating Pyongyang's chemical threat may be to bargain the weapons away ahead of time. If the North could be persuaded to give up most or all of its chemical weapons, it would lessen the threat to civilians and soldiers in wartime, both on the Korean peninsula and abroad. That would involve talking to North Korea , something the Obama administration has not been too interested in doing. If the world wishes to do away with North Korea's chemical weapons, it needs to start talking to the reclusive country now.

***Kyle Mizokami** is a 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.*

FAST-ACT Decontamination Guide App

Source: https://itunes.apple.com/us/app/fast-act/id1446010360?mt=8

FAST-ACT® has just introduced a revolutionary Decontamination Guide that is available online through a large index chemical list, as well as through the Apple Store and Google Play. **The FAST-ACT Decontamination Guide App is the largest directory of chemical threats that list decontamination solutions for immediate action and neutralization of potentially toxic chemicals.** This innovative decontamination app provides Hazmat Personnel, Police, Military, and First-Responders the ability to obtain pertinent information that is needed quickly for the decontamination of chemical threats, and most importantly it offers knowledge on the best decontamination solution to implement when using the FAST-ACT chemical decontamination products.

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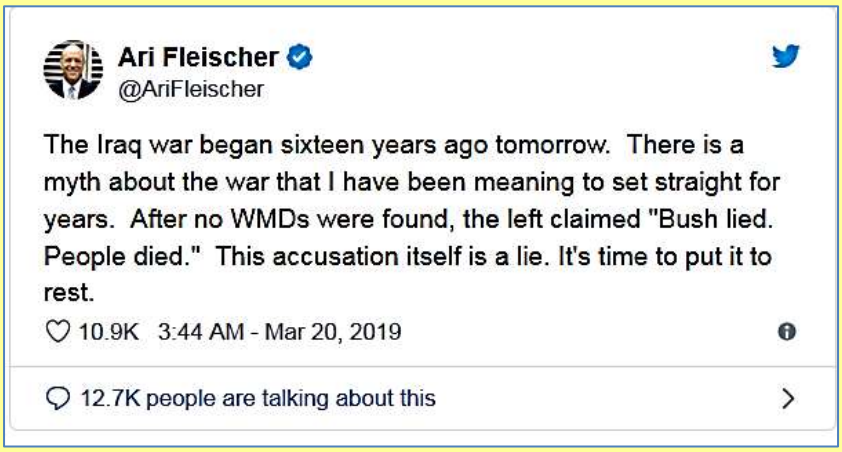
George W. Bush really did lie about WMDs, and his aides are still lying for him

By Dylan Matthews

Source: https://www.vox.com/policy-and-politics/2019/3/20/18274228/ari-fleischer-iraq-lies-george-w-bush-wmds

Mar 20 – Ari Fleischer is a liar. He lies about stuff big and small. And as President George W. Bush's press secretary during the run-up to the Iraq War, he participated in a large effort to exaggerate and misrepresent what the intelligence community believed about weapons of mass destruction and Iraq's (negligible) links to al-Qaeda.

But Fleischer does not like it when people point out that he's a liar, so he took to Twitter on Tuesday night to mark the anniversary of the invasion of Iraq and address what is, in his mind, a major tragedy surrounding the war: the fact that people sometimes point out that he and his friends are liars.



Some might argue the real victims of the war are the nearly 300,000 civilians and combatants killed due to an unnecessary invasion, but Fleischer would rather focus on his and his colleagues' hurt feelings.

Fine. Let's focus there. Fleischer is, once again, lying — and lying about the times his colleagues lied. There were numerous occasions when Bush and his advisers made statements that intelligence agencies knew to be false, both about weapons of mass destruction (WMDs) and about Iraq President Saddam Hussein's nonexistent links to al-Qaeda. The term commonly used for making statements that one knows to be false is "lying."

Mother Jones's David Corn has been excellent about chronicling specific examples over the years. Here are just a few:

- In October 2002, Bush said that Saddam Hussein had a "massive stockpile" of biological weapons. But as CIA Director George Tenet noted in early 2004, the CIA had informed policymakers it had "no specific information on the types or quantities of weapons agent or stockpiles at Baghdad's disposal." The "massive stockpile" was just literally made up.
- In December 2002, Bush declared, "We do not know whether or not [Iraq] has a nuclear weapon." That was not what the National Intelligence Estimate said. As Tenet would later testify, "We said that Saddam did not have a nuclear weapon and probably would have been unable to make one until 2007 to 2009." Bush did know whether or not Iraq had a nuclear weapon — and lied and said he didn't know to hype the threat.
- On CNN in September 2002, National Security Adviser Condoleezza Rice claimed that aluminum tubes purchased by Iraq were "only really suited for nuclear weapons programs." This was precisely the opposite of what nuclear experts at the Energy Department were saying; they argued that not only was it very possible the tubes were for nonnuclear purposes but that it was very likely they were too. Even more dire assessments about the tubes from other agencies were exaggerated by administration officials — and in any case, the claim that they're "only really suited" for nuclear weapons is just false.
- On numerous occasions, Vice President Dick Cheney cited a report that 9/11 conspirator Mohamed Atta had met in Prague with an Iraqi intelligence officer. He said this after the CIA and FBI concluded that this meeting never took place.

- More generally on the question of Iraq and al-Qaeda, on September 18, 2001, Rice received a memo summarizing intelligence on the relationship, which concluded there was little evidence of links. Nonetheless, Bush continued to claim that Hussein was "a threat because he's dealing with al-Qaeda" more than a year later.
- In August 2002, Cheney declared, "Simply stated, there's no doubt that Saddam Hussein now has weapons of mass destruction." But as Corn notes, at that time there was "no confirmed intelligence at this point establishing that Saddam had revived a major WMD operation." Gen. Anthony Zinni, who had heard the same intelligence and attended Cheney's speech, would later say in a documentary, "It was a total shock. I couldn't believe the vice president was saying this, you know? In doing work with the CIA on Iraq WMD, through all the briefings I heard at Langley, I never saw one piece of credible evidence that there was an ongoing program."

The Bush administration on numerous occasions exaggerated or outright fabricated conclusions from intelligence in its public statements. Bush really did lie, and people really did die as a result of the war those lies were meant to build a case for. Those are the facts.

Fleischer's excuse doesn't hold water

Fleischer does not address these concrete instances in which the administration lied. Instead, he outsources his analysis to the Robb-Silberman Commission, a bipartisan group empaneled by Bush in 2004 to figure out what went wrong in the intelligence community's assessment of Iraq's biological, chemical, and nuclear weapons capabilities.

The commission did conclude that the CIA and other intelligence agencies made numerous mistakes in the run-up to the war. This is uncontroversial. While some noble dissenters, like the State Department's Bureau of Intelligence and Research and technical nuclear weapons experts at the Department of Energy, pushed back on the prevailing view in the intelligence community, the community as a whole clearly failed and vastly overestimated the likelihood that biological, chemical, and nuclear weapons programs existed.

But the commission was not allowed under its mandate to consider whether political actors misused or lied about the intelligence they received. "We were not authorized to investigate how policymakers used the intelligence assessments they received from the Intelligence Community," the report clearly states. "Accordingly, while we interviewed a host of current and former policymakers during the course of our investigation, the purpose of those interviews was to learn about how the Intelligence Community reached and communicated its judgments about Iraq's weapons programs — not to review how policymakers subsequently used that information."

That means the report did not cover the Bush administration's decision to ignore warnings about fabricated documents meant to suggest that Iraq sought uranium from Niger. In his State of the Union address in 2003, Bush stated, "The British Government has learned that Saddam Hussein recently sought significant quantities of uranium from Africa," despite the fact that, as the Washington Post's Peter Eisner reported, "Dozens of interviews with current and former intelligence officials and policymakers in the United States, Britain, France and Italy show that the Bush administration disregarded key information available at the time showing that the Iraq-Niger claim was highly questionable."

Eisner added, "In February 2002, the CIA received the verbatim text of one of the documents, filled with errors easily identifiable through a simple Internet search, the interviews show. Many low- and mid-level intelligence officials were already skeptical that Iraq was in pursuit of nuclear weapons."

The Robb-Silberman report also ignored institutions like the Office of Special Plans, a group at the Defense Department set up by Undersecretary Douglas Feith to feed raw, unanalyzed intelligence to senior policymakers. While more focused on alleged links between Iraq and al-Qaeda than WMDs, the OSP "developed, produced and then disseminated alternative intelligence assessments on the Iraq and al-Qaeda relationship, which included some conclusions that were inconsistent with the consensus of the intelligence community, to senior decision-makers," according to a later report by the Pentagon's inspector general.

What's more, while the report found no evidence of direct political pressure for intelligence community members to change conclusions, it nonetheless suggests that the prevailing prewar climate altered judgments of intelligence analysts.

An analyst at the Department of Energy told the commission, "DOE did not want to come out before the war and say [Iraq] wasn't reconstituting." The atmosphere of impending war, the commission continues, "contributed to the too-ready willingness to accept dubious information as supporting the conventional wisdom and to an unwillingness even to consider the possibility that the conventional wisdom was wrong." Furthermore, as explored in the commission report, part of the failure within the intelligence community was a failure of senior appointed officials like George Tenet, not of their subordinates. Two senior CIA officials — James L. Pavitt, former head of clandestine operations, and Tyler Drumheller, former head of the CIA's Europe division — said that there was massive internal debate about whether to trust "Curveball," the key source for claims about bioweapons in Iraq.

Curveball has since admitted to fabricating his whole story, but Pavitt and Drumheller insist that they and many others in the CIA had issued warnings before the war that he should not be trusted. Tenet and his No. 2 at the CIA, John McLaughlin, did not heed those warnings and said publicly that they had received no such warnings. "They know what the truth is," Drumheller told the Los Angeles Times.

Was Tenet a Bush administration official, and thus blameless under Fleischer's account, or an intelligence community figure, and thus blameworthy? I'd argue he was both, and his eagerness to ignore warnings from subordinates is suggestive of a broader problem in which the Bush administration ignored evidence that did not serve the purpose of building a case for war.

It is time to apologize

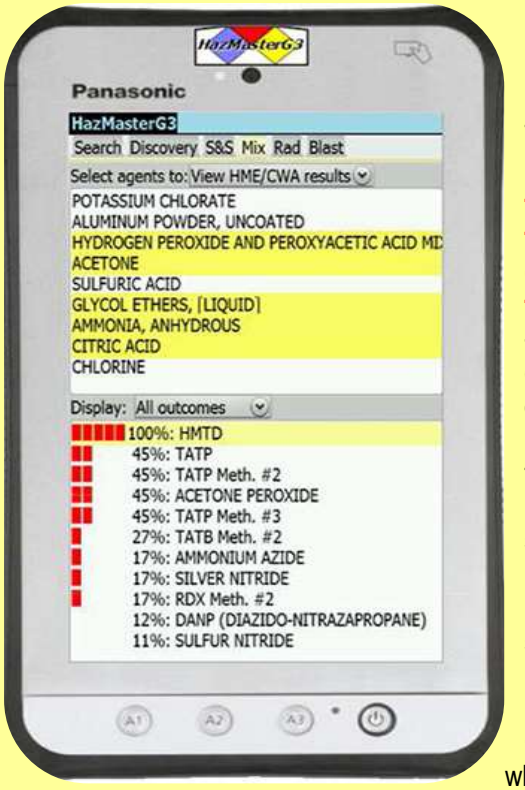
One of the most galling things about the 16 years since the US decided to destroy Iraq is the failure of any major policymakers, or even ancillary policymakers, to apologize for their choice to launch a war that killed hundreds of thousands of people.

Even former Secretary of State Colin Powell, commonly thought to be one of the more even-keeled members of the Bush administration, has insisted that the decision to invade was just, based on the intelligence he had. Bush speechwriter David Frum, who has recently enjoyed a rehabilitated reputation as someone who agrees with Donald Trump on basically everything but nonetheless dislikes him, has accused Iraqis of choosing to be slaughtered after the invasion.

To engage in world politics is to weigh in on matters of life and death. Policymakers *will* get things wrong and they *will* cause people to lose their lives. But engagement in world politics does not necessitate lying to the American people and the world at large. And it does not require the vile score-settling posture that Bush administration veterans have chosen to take.

Fleischer and his friends got away with it, and they all have lucrative careers now. The least they could do is apologize to the thousands of Iraqis whose fathers, mothers, sisters, brothers, sons, and daughters were killed. To instead mark the anniversary of a decision that ruined their lives with nonsensical ass-covering isn't just ridiculous. It's morally obscene.

***Dylan Matthews** is Vox's Senior Correspondent since 2014. He is particularly interested in global development, anti-poverty efforts in the US and abroad, factory farming and animal welfare, and conflicts about the right way to do philanthropy*



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- Integrated X-Ray, disrupter operations, shock tube and electronics calculators.
- Virtually mix an unlimited number of agents to identify probable dual-use precursor outcomes.
- Virtually mix chemicals to identify explosions, toxic gas emissions and many other hazardous chemical reactions.
- Virtually mix chemicals to predict probable HME and CWA outcomes.
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- Crater estimation tool to estimate the NEW used to create a given crater.
- Identify which detector(s) are suitable for detection of specified HME precursors.
- Sensitive site exploitation tools tailored for HME and narcotics uses.
- Foreign term exploitation for seven high-priority languages.

warfare/WMD, cocaine, heroin and methamphetamines.
- Identify consumer product sources of dual-use precursors, and their key components.
- Comprehensive breaching and disposal shot set-up and stand-off calculators.
- Interactive clandestine lab identification tool – select what is observable on-scene, and the system will generate a report indicating likely uses for the lab based on the on-scene indicators.
- Identify typical industrial uses and processes that utilize HME and explosives precursors.
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Source: http://otwo.com/hand-held-automatic-ventilators-resuscitators/carevent-ca/

The threat of a chemical-agent release in a crowded area has presented new challenges over the last few years. This environment is as dangerous as that which may be encountered during confined space entry in the industrial setting in atmospheres that are Immediately Dangerous to Life or Health (IDLH). The O-Two CAREvent® CA chemical agent resuscitation environment ventilator has been developed to meet these challenges.

The O-Two CAREvent® CA has only one external control. The chemical agent and IDLH environments are considered to be so hazardous that the less the rescuer has to do to ventilate the patient, the quicker the patent can be resuscitated and the greater the chance for the patient's survival. With the O-Two CAREvent® CA, all that is required is to turn on the oxygen/air supply, apply the mask to the patient's face and secure the airway. The O-Two CAREvent® CA will provide automatic ventilation to the non-breathing patient at a rate and volume designed to provide adequate oxygenation while reducing the risk of gastric insufflation, in accordance with the current guidelines for resuscitation.

The micro-pneumatic circuitry of the O-Two CAREvent® CA requires no batteries or electrical supply to operate. Should the patient start spontaneous breathing, the demand breathing feature of the O-Two CAREvent® CA allows the patient to breathe at his or her own rate and volume. The patient's inspiratory effort (if adequate) will also cause the automatic circuit shut-off to stop the automatic cycling of the ventilator, allowing the patient to breathe at her or his own rate and volume. If the patient stops breathing again, the automatic cycling will restart with no action required by the rescuer.

A manual override button is provided on the O-Two CAREvent® CA to allow for the provision of two breaths followed by 30 chest compressions during CPR in accordance with the current resuscitation guidelines. In addition, it can also be used to supplement spontaneous ventilations if required. An additional feature of the O-Two CAREvent® CA is the two L/min mask purge, bleed flow. This reduces the risk of the patient drawing in toxic ambient air into the mask should a leak occur in the mask-to-face seal. By combining this simplicity of operation with technological sophistication, the O-Two CAREvent® CA provides trained individuals with a safe and effective means of maintaining artificial ventilation during respiratory arrest, which may occur during confined space entry or a toxic chemical agent release.

Accessories available for the O-Two CAREvent® CA include the head harness system, which assists in maintaining a mask-to-face seal during extrication and transport and to provide hands-free operation.

Also are available are the deluxe transport ventilator circuit with positive-end expiratory pressure (PEEP) port and the gurney clip, which allows the device to be attached to the handrail of the gurney or emergency stretcher during transport


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DIARY
BIO NEWS

Experts question BioWatch's replacement

Source: http://www.homelandsecuritynewswire.com/dr20190226-experts-question-biowatch-s-replacement

Feb 26 – BioWatch, the program launched more than fifteen years ago to detect bioterrorism attacks in major American cities, has been routinely criticized for not living up to its early promise. Many have suggested doing away with the system all together.

The Trump administration though is planning to replace BioWatch with BioDetection 21, which will see more than 9,000 bio-detection sensors deployed across the United States by 2025.

David Willman, writing in the *Los Angeles Times* ("Homeland Security replacing troubled biodefense system with another flawed approach") is unconvinced:

> *a lengthy report last fall, commissioned by Homeland Security's scientific staff, warned that the trigger devices frequently can't distinguish between deadly pathogens and airborne pollen or paper dust, increasing the likelihood of false alarms.*
>
> *The report also showed that four trigger devices failed in testing last year to detect tiny, unclumped anthrax spores — the type that experts say a skilled terrorist or state-sponsored biowarfare program might produce.*
>
> *Moreover, the triggers correctly detected small particles of viral material — simulating smallpox or other deadly viruses that could be weaponized — in just eight of 168 attempts, a success rate of less than 5%.*
>
> *Trigger devices have "clear limitations … for detection of smaller particles and some biological threat categories," the report said.*

The *Times* obtained a copy of the report, which was produced by the Johns Hopkins University Applied Physics Laboratory. "The findings were consistent with Homeland Security's earlier evaluations of triggers, according to current and former federal scientists."

> *Given the drawbacks of the triggers and handheld identifiers, Homeland Security risks replacing BioWatch with a system that would be even less useful, according to several current and former government scientists who have led federal efforts to improve biodetection.*
>
> *"The technology hasn't evolved to the point where it would be an effective replacement" for BioWatch, said Stephen A. Morse, a microbiologist who worked for 32 years at the U.S. Centers for Disease Control and Prevention.*

Willman's verdict: Replacing BioWatch with BioDetection 21 means that an already-questionable system would be replaced by a system which offers even fewer benefits.

Latest DRC Ebola death count: 594 (March 15)

Meet the Amazing Fungus that Farms Bacteria

By Linh Anh Cat

Source: https://www.forbes.com/sites/linhanhcat/2019/02/27/fungus-farms-bacteria/

Feb 27 – The agricultural revolution of 10,000 years ago was thought to be a unique hallmark of *Homo sapiens*. Now, we know that termites cultivate monocultures of fungi and damselfish farm algae. Humans and animals aren't the only ones farming - microbes are doing it, too, according to researchers who discovered that a fungus can farm bacteria.

The soil fungus *Morchella crassipes*, also known as thick-footed morel, is a decomposer as well as a beneficial mycorrhizal fungus that forms symbiotic relationships with plants. The thick-footed morel is also a bacterial farmer. Here are five characteristics of human agriculture that the thick-footed morel also uses to farm the bacteria *Pseudomonas putida*.

1. Cultivation

In human agriculture, improving a crop's growth conditions is cultivation. Researchers saw that the thick-footed morel was producing compounds that helped *P. putida* grow. In fact, *P. putida* grew significantly more with the help of the thick-footed morel than without it.

2. Harvesting

Researchers found that the fungus was harvesting bacteria when conditions favored resource storage. The fungus are also likely eavesdropping on signaling between bacteria to detect how dense the bacteria are growing before harvesting them. To prove the fungus was receiving a benefit from the bacteria, the scientists labeled carbon molecules in glucose and observed the labeled molecules moving from bacteria to fungus. This study is the first to demonstrate carbon transfer from bacteria to fungi.

3. Storage

The thick-footed morel develops structures called sclerotia, which aid in survival by allowing the fungus to store harvested carbon from the bacteria. The fungus can access these nutrient stores when external resources are scarce, much like a grain silo for humans. The researchers washed the storage structures repeatedly and discovered that hundreds of thousands of bacteria are attached to each of the structures with different strength levels of attachment. In fact, scientists observed that the thick-footed morel benefited with a reduced stress response.

4. Dispersal

Just as farmers choose certain crops they propagate across their fields, fungi also physically aid in dispersing the bacteria they are cultivating. Fungi have hyphae, which are root-like filaments that extend out in the soil. Bacteria can use these hyphae as "fungal highways". Most bacteria can't move efficiently through soil, so bacteria being cultivated by the fungus are able to hitch a ride on the hyphae. This is a huge advantage for the bacteria, who are able to outcompete other species unable to disperse through soil. Scientists even saw that the bacteria were able to cross an air barrier with the help of the fungal highway.

5. Division of labor

Much like division of labor in human societies, parts of the thick-footed morel fungus cultivate the bacteria while other parts help store the carbon for future use. This source-sink system is similar to human agricultural systems, where we move food from the fields to be processed and sold at grocery stores.

These five characteristics were confirmed experimentally using cell counting and 13C isotopic labeling. Much like humans, fungi can use cultivation, harvesting, storage, dispersal, and division of labor to farm bacteria. Don't fear, hallmarks of agriculture that we can still claim as unique to humans include artificial selection or development as well as cultural transmission of agricultural innovations.
Bacteria and fungi are the main components of the soil microbiome. Soil microbiome research is finishing a rapid discovery phase thanks to relatively cheap next-generation sequencing technology. Now, scientists want to unlock more mechanistic understandings of what is happening between microbes in the soil. This study is an important step in that direction.

***Linh Anh Cat** is a microbial ecologist.*

Sound Waves Can Be Hacked for Everything from Ad Targeting to Bioterrorism

By Jessica Baron
Source: https://www.forbes.com/sites/jessicabaron/2019/02/27/sound-waves-are-being-hacked-for-everything-from-ad-targeting-to-bioterrorism/#9b37bb115ef4

In a new era of behavioral biometrics, the way we walk, talk, swipe our fingers across our phones, and otherwise innocently interact with the world around us has become a means of identifying who we are and what we are doing at any given time. The privacy implications are obvious – while these quantifying mechanisms were originally designed to protect us, they now give away more about us than we realize or feel comfortable sharing.

Personal privacy
Now, sound is being used to identify not only people but their actions at work and at home as well. New techniques used by smartphone apps track you through the use of ultrasonic tones that the human ear can't pick up on. According to ZDNet, some of these work "by emitting high-frequency tones in advertisements and billboards, web pages, and across brick-and-mortar retail outlets or sports stadiums. Apps with access to your phone's microphone can pick up these tones and build up a profile about what you've seen, where, and in some cases even the websites you've visited." And these aren't even the apps that just use your microphone.
The fact that people rarely appreciate how much their personal data is worth to companies means this will only grow in popularity. In an undated paper (published in 2017 at the latest), researchers from the Technische Universität Braunschweig in Brunswick Germany found that 234 Android apps already had the ability to listen for ultrasonic tones without the user's knowledge.
But an individual's privacy, even while deeply important, likely doesn't hold the same value as that of scientists working on research in academic, industrial, and government labs.
Research from computer scientists and engineers at the University of California, Riverside is giving us new insight into the types of sound signals that machines in laboratories produce and to what extent those sounds can be hacked to leak valuable information for the purpose of espionage.
The scientists say that by simply recording the sounds produced by a lab instrument, they managed to reconstruct what the researcher was doing and the results they were getting.
According to Philip Brisk, a UC Riverside associate professor of computer science who worked on the project:
Any active machine emits a trace of some form: physical residue, electromagnetic radiation, acoustic noise, etc. The amount of information in these traces is immense, and we have only hit the tip of the iceberg in terms of what we can learn and reverse engineer about the machine that generated them.
And the risks are all too real. If our phones can easily use the sounds we make for marketing purposes, there's even more at stake when lab sounds are recorded (or devices are hacked to record them). Other researchers could theoretically "scoop" a lab's research, trade secrets

could be revealed, or, in the case of confidential research, the information could even put national security at risk.

This particular experiment was done on DNA synthesizers, which are automated systems that have both a cyber and physical domain, leaving them open to security breaches. The engineers developed an attack methodology that could not only break into the machine and steal the DNA sequences being analyzed, but was 88.07% accurate in predicting the sequences based on the sounds emitted from the machine using a microphone up to 0.7 meters away, even in the presence of background noise. Attackers would have to have biomedical knowledge in order to process the information, but one can easily imagine the information being hacked and sold to those with the appropriate expertise.

Laboratory equipment for RNA/DNA synthesizing / Getty

What are the risks?

There are many ways that DNA can be used maliciously, most notably in the creation of artificial pathogens for the purpose of bioterrorism. Labs that work on pathogens such as Ebola, which has a relatively simple genome, could potentially be hacked by a bad actor looking to alter the virus to become more virulent, for example. According to the researchers, "in 2010 the US Department of Health and Human Services issued a statement to commercial DNA synthesis companies, warning them to be on the lookout for customers ordering 'sequences of concern,' or snippets of DNA from the genomes of anthrax, Ebola, smallpox, and several other deadly pathogens." The availability of second-hand DNA synthesizers on auction sites such as eBay makes this even more feasible instead of just the stuff of nightmares.

If potential bioterrorists were able to eavesdrop on a lab, they could have the most cutting-edge information available to work with. On the other hand, the tech can be used to enhance national security as well. Eavesdropping on a suspected terrorist's machine could give law enforcement officers insight into how it is being used and allow them to intervene.

The risk is not limited to those who work with DNA. The researchers also cited studies in which sound waves revealed information about additive manufacturing, objects being printed by a 3-D printer, and allowed hackers to carry out physical attacks on magnetic hard disks, or even obtain electroencephalography (EEG) signals from a brain-computer interface to gain private user information.

For the rest of us, these signals can be used to collect user information including login details on smartphones.

Prevention mechanisms

Luckily, there are various defense mechanisms under development. But the first step is understanding that the risks exist and just how much information we produce without realizing it. This is important in both the home and the lab.

Ways of preventing these acoustic attacks include: using anti-vibration pads to reduce noise, creating artificial noise that masks signals that reveal information but doesn't disturb workers, asking manufacturers to design components to reduce the number of sounds their machines make, adding in redundant steps to confuse anyone listening, performing other tasks at the same time the machine makes the relevant noises, and taking measures to secure laboratories from microphones that can be hacked. Of course, banning every electronic device with recording capabilities in the lab is no easy task.

And, of course, none of this really helps individuals from cyber sound hacking, though the risks aren't nearly as serious in this case.

For the rest of us, it's worth looking through apps on our devices and turning off microphone access to any app that shouldn't need it (and being careful when downloading an app that asks for access). Unfortunately, there's usually no way to know when an app is accessing your microphone or sending information to companies.

There's no reason a company should know what conversations you're having or what other noises you or your family or appliances make in your home solely for the sake of advertising to you. Turning off microphone access to apps that don't need to make recordings should not interfere with their operation and it's wise to be suspicious if that is the case.

Now that we know just how pervasive microphone hacking is, we can begin asking more intelligent questions about who is using them and how we can protect ourselves at home and at work. It's also worth noting what devices in your home have microphones, including smartphones, tablets, computers, televisions, baby monitors, and smart assistants such as Alexa.

Companies such as Facebook and Apple have strongly denied spying on people in their homes, but if we've learned anything recently it's that people have learned the hard way that companies don't always tell the truth and customers have very little recourse.

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Human error in high-biocontainment labs: a likely pandemic threat

By Lynn Klotz

Source: https://thebulletin.org/2019/02/human-error-in-high-biocontainment-labs-a-likely-pandemic-threat/

Feb 25 – Incidents causing potential exposures to pathogens occur frequently in the high security laboratories often known by their acronyms, BSL3 (Biosafety Level 3) and BSL4. Lab incidents that lead to undetected or unreported laboratory-acquired infections can lead to the release of a disease into the community outside the lab; lab workers with such infections will leave work carrying the pathogen with them. If the agent involved were a potential pandemic pathogen, such a community release could lead to a worldwide pandemic with many fatalities. Of greatest concern is a release of a lab-created, mammalian-airborne-transmissible, highly pathogenic avian influenza virus, such as the airborne-transmissible H5N1 viruses created in the laboratories of Ron Fouchier in the Netherlands and Yoshihiro Kawaoka In Madison Wisconsin.

Such releases are fairly likely over time, as there are at least 14 labs (mostly in Asia) now carrying out this research. Whatever release probability the world is gambling with, it is clearly far too high a risk to human lives. Mammal-transmissible bird flu research poses a real danger of a worldwide pandemic that could kill human beings on a vast scale.

Human error is the main cause of potential exposures of lab workers to pathogens. Statistical data from two sources show that human error was the cause of, according to my research, 67 percent and 79.3 percent of incidents leading to potential exposures in BSL3 labs. These percentages come from analysis of years of incident data from the Federal Select Agent Program (FSAP) and from the National Institutes of Health (NIH). (Details may be found in the Supplementary Material document.)

Understanding human error is important to calculating the probability that a pathogen will be released from a lab into the surrounding community, the first step in calculating the likelihood of a pandemic. A key observation is that human error in the lab is mostly independent of pathogen type and biosafety level. Analyzing the likelihood of release from laboratories researching less virulent or transmissible pathogens therefore can serve as a reasonable surrogate for how potential pandemic pathogens are handled. (We are forced to deal with surrogate data because, thank goodness, there are little data on the release of potentially pandemic agents.) Put another way, surrogate data allows us to determine with confidence the probability of release of a potentially pandemic pathogen into the community. In a 2015 publication, Fouchier describes the careful design of his BSL3+ laboratory in Rotterdam and its standard operating procedures, which he contends should increase biosafety and reduce human error. Most of Fouchier's discussion, however, addresses mechanical systems in the laboratory.

A CDC staff microbiologist examines reconstructed 1918 Pandemic Influenza Virus at a Biosafety Level 3-enhanced lab. Photo Credit: James Gathany/CDC

But the high percentage of human error reported here calls into question claims that state-of-the-art design of BSL3, BSL3+ (augmented BSL3), and BSL4 labs will prevent the release of dangerous pathogens. How much lab-worker training might reduce human error and undetected or unreported laboratory acquired infections remains an open question. Given the many ways by which human error can occur, it is doubtful that Fouchier's human-error-prevention measures can eliminate release of airborne-transmissible avian flu into the community through undetected or unreported lab infections.

Human-error incident data

In its 2016 study for the NIH, "Risk and Benefit Analysis of Gain of Function Research," Gryphon Scientific looked to the transportation, chemical, and nuclear sectors to define types of human error and their probabilities. As Gryphon summarized in its findings, the three types of human error are skill-based (errors involving motor skills involving little thought), rule-based (errors in following instructions or set procedures accidentally or purposely), and knowledge-based (errors stemming from a lack of knowledge or a wrong judgment call based on lack of experience).

Gryphon claimed that "no comprehensive Human Reliability Analysis (HRA) study has yet been completed for a biological laboratory… . This lack of data required finding suitable proxies for accidents in other fields."

But mandatory incident reporting to FSAP and NIH actually does provide sufficient data to quantify human error in BSL3 biocontainment labs.

Federal Select Agent Program incident data. FSAP incident data were collected from summary reports to Congress for the years 2009 through 2015.

Three of the seven FSAP incident categories involve skill-based errors: 1) needle sticks and other through the skin exposures from sharp objects, 2) dropped containers or spills/splashes of liquids containing pathogens, and 3) bites or scratches from infected animals. Some skill errors, such as spills and needle sticks could be reduced with simple fixes (see below).

The rule-based and knowledge-based incident categories are: 4) pathogens manipulated outside of a biosafety cabinet or other equipment designed to protect exposures to infectious aerosols; 5) potential exposures resulting from non-adherence to safety procedures or deviations from lab standard operating procedures, and 6) failure or problem with personal protective equipment–a mix of skill, rule, or knowledge-based errors.

The seventh category is mechanical or equipment failure, or defective labware. Another category not mentioned in the FSAP reports is failure to properly inactivate pathogens before transferring them to a lower biosafety level lab for further research.

During the 2009-2015 time period, FSAP received a total of 749 incident reports from select-agent research facilities. Conservatively, 594 or 79.3 percent of those incidents involve human error. (Details may be found in the Supplementary Material.)

National Institutes of Health incident data. Incident reports to the NIH Office of Science Policy cover the period from 2004 through 2017 and BSL3 and BSL4 facilities. They were obtained through a Freedom of Information Act request.

There were no reported incidents from BSL4 facilities. Reporting to NIH is required only for incidents involving pathogens that contain recombinant DNA. While it is highly likely there have been incidents in BSL4 facilities, they may not have involved pathogens with recombinant DNA and so would not show up in the reports to NIH.

The 128 incident reports provide extremely detailed descriptions. The reports are often several-dozen pages long so almost no questions remain about details.

Of the 128 incidents, 86 or 67.2 percent were due to human error. This percentage is in the same ballpark as the FSAP reports.

Some human errors are "one-off," meaning they happened once and likely won't happen again. One-off errors are difficult to anticipate, so it is unlikely that one can devise meaningful changes in standard operating procedures to prevent them. Here is one example of a one-off error, slightly modified from an incident report:

A researcher was exchanging two plastic 24-well plates in the tabletop Sorvall centrifuge. While closing the lid, it was caught on a centrifuge wrench which was accidentally placed into the path of the lid. The wrench jumped and knocked one of the removed 24-well plates onto the counter. The plate landed at approximately a 45-degree angle and lost approximately half its contents to the bench top.

For some errors, there are procedural changes that should reduce their frequency. For instance, needle sticks can occur from syringes with sharp metal needles when being used to transfer liquids from one small container to another. For injecting animals, sharp metal needles are needed; but for liquid transfers, blunt-plastic needles would suffice. Also, dropping items could sometimes be prevented using lab carts to transport items from place to place, rather than carrying them by hand.

Here are three comments from the aforementioned Fouchier publication.

- "Only authorized and experienced personnel that have received extensive training can access the facility."
- "All personnel have been instructed and trained how to act in case of incidents."
- "For animal handling, personnel always work in pairs to reduce the chance of human error."

The first two bullets speak to standard training of lab workers who work with particularly dangerous pathogens. It is unclear whether the diligent training of lab workers he outlines would substantially reduce human error:

The entities reporting incidents to NIH mention similar diligent training; nonetheless, undetected or unreported laboratory acquired infections occur with high frequency in these

laboratories. Furthermore, it is unclear whether other laboratories creating and researching airborne-transmissible diseases are so carefully designed and diligent in their training.
The two-person rule for animal handling is a good idea that is not typically mentioned in the detailed NIH incident reports. Animal bites and needle punctures brought about by unruly lab animals are not uncommon.

Release from high biocontainment through incomplete inactivation
Beyond the aforementioned undetected or unreported laboratory-acquired infections lies another route by which pathogens can be released from high biosecure level labs—incomplete inactivation.
Inactivation is designed to destroy the pathogenicity of an infectious agent, while retaining its other characteristics for research in which live pathogens are not needed. Since there are reliable inactivation procedures, failure to inactivate is a human error.
Pathogens are inactivated for research that can be performed in lower BSL2 biocontainment, where it is much easier to carry out. Research in BSL3 and BSL4 laboratories is difficult, both because of restricted movement in the personal protective equipment that must be worn and because of restrictions in operating procedures that aim to minimize potential exposure to pathogens.
While incomplete inactivation does not usually directly cause a release into the community, researchers in BSL2 labs are at a much higher risk of infection, and their street clothes, hair, and skin can become contaminated. But incomplete inactivation is a route to *potential* release into the community.
The FSAP does not routinely collect data on incomplete inactivation, and it seems no one else does either. Thus, enough data to calculate probabilities for this type of incident are not available. But the Government Accountability Office (GAO) has weighed in on the issue. The GAO reports anecdotal evidence and some numbers on incomplete inactivation to support the contention that it is a serious issue. The office has identified 11 incidents, in addition to 10 incidents already identified by the FSAP. Notably, two of the incidents involved Ebola and Marburg viruses, which because of a lack of countermeasures (vaccines and antivirals) are researched at BSL4 facilities.
Among other things, the GAO report called attention to a well-publicized incident in which a Defense Department laboratory "inadvertently sent live *Bacillus anthracis*, the bacterium that causes anthrax, to almost 200 laboratories worldwide over the course of 12 years. The laboratory believed that the samples had been inactivated." The report describes yet another well-publicized incident in China in which "two researchers conducting virus research were exposed to severe acute respiratory syndrome (SARS) coronavirus samples that were incompletely inactivated. The researchers subsequently transmitted SARS to others, leading to several infections and one death in 2004."
The GAO identified three recent releases of Ebola and Marburg viruses from BSL4 to lower containment labs due to incomplete inactivation.
A fourth release in 2014 from the CDC labs occurred when "Scientists inadvertently switched samples designated for live Ebola virus studies with samples intended for studies with inactivated material. As a result, the samples with viable Ebola virus, instead of the samples with inactivated Ebola virus, were transferred out of a BSL-4 laboratory to a laboratory with a lower safety level for additional analysis. While no one contracted Ebola virus in this instance, the consequences could have been dire for the personnel involved as there are currently no approved treatments or vaccines for this virus."
The CDC has issued a report on this mixup, and the steps they have taken to avoid this *particular* error in the future.
All these incidents confirm the role of incomplete inactivation that would lead to an increased likelihood of release into the community from a BSL2 lab. These are all human errors, some involving BSL4 pathogens. Along with the observation that other human errors are the cause of more than two-thirds of potential exposures in BSL3 labs, it is clear that state-of-the-art laboratory design will not prevent release into the community.

The probability of release into the community
In an analysis circulated at the 2017 meeting for the Biological Weapons Convention, a conservative estimate shows that the probability is about 20 percent for a release of a

mammalian-airborne-transmissible, highly pathogenic avian influenza virus into the community from at least one of 10 labs over a 10-year period of developing and researching this type of pathogen. This percentage was calculated from FSAP data for the years 2004 through 2010.
Analysis of the FOIA NIH data gives a much higher release probability—that is, a factor five to 10 times higher, based on a smaller number of incident reports.
While there is no obvious reason in the NIH data that would explain this high probability, exposures and latent (not-active) infections with *M. tuberculosis* was indicated in four incident reports. *M. tuberculosis* is not a select agent so incidents involving it would not necessarily be reported to the FSAP. Tuberculosis is highly contagious by the airborne route, so it might be easier to acquire a TB infection in the lab. Unfortunately, airborne TB infections might be a harbinger of what could occur in research on airborne-transmissible flu.
Facility-reported descriptions of the 11 relevant incidents are provided in the Supplementary Material (Appendix 2). Lab-acquired infections are often discovered some time after the incident occurred. Only for three were the causes confirmed to be human error. For the other eight, neither the infected lab workers nor facility officials knew how the infection occurred. While it is likely that human error was involved in many of these eight infections, their causes will never be known.

Likelihood that mammalian-airborne-transmissible, highly pathogenic avian influenza release could cause a deadly pandemic

The avian flu virus H5N1 kills 60 percent of people who become infected from direct contact with infected birds. The mammalian-airborne-transmissible, highly pathogenic avian influenza created in the Fouchier and Kawaoka labs should be able to infect humans through the air, and the viruses could be deadly.
A release into the community of such a pathogen could seed a pandemic with a probability of perhaps 15 percent. This estimate is from an average of two very different approaches. One approach involves purely mathematical branching theory, where Harvard researcher Marc Lipsitch and coworkers provide a graph in which, conservatively, the probability that a pandemic is seeded from a single release is about 20 percent. In the second approach, where infection progress through the community from person to person is simulated, Bruno Kessler Foundation researcher Stefano Merler and coworkers found that there is a probability from five percent to 15 percent that a single release could seed a pandemic. How deadly and how transmissible such viruses are in humans is not known.

Dealing realistically with human errors in lab research

Human error will continue to play a major role in laboratory incidents, and undetected or unreported laboratory acquired infections and incomplete inactivation incidents will continue to occur. No matter how well facilities are designed to prevent release into communities, human error will dodge design.
For an already identified 14 labs creating or researching mammalian-airborne-transmissible, highly pathogenic avian influenza, the potential 16 percent probability of a laboratory release into the community over five years of research (a result found in a study now being prepared for publication) is already uncomfortably high. NIH incident reports indicate possibly much higher probabilities of a such a release–thus, a greater likelihood of a pandemic. This does not take into the account a release from incomplete inactivation. Combining release probability with the not insignificant probability that an airborne-transmissible influenza virus could seed a pandemic, we have an alarming situation.
Those who support mammalian-airborne-transmissible, highly pathogenic avian influenza experiments either believe the probability of community release is infinitesimal or the benefits in preventing a pandemic are great enough to justify the risk. For this research, it would take extraordinary benefits and significant risk reduction via extraordinary biosafety measures to correct such a massive overbalance of highly uncertain benefits to too-likely risks.
Whatever probability number we are gambling with, it is clearly far too high a risk to human lives. There are experimental approaches that do not involve live mammalian-airborne-transmissible, highly pathogenic avian influenza which identify mutations involved in mammalian airborne transmission. These "safer experimental approaches are both more scientifically informative and more straightforward to translate into improved public health…"

Asian bird flu virus research to develop live strains transmissible via aerosols among mammals (and perhaps some other potentially pandemic disease research as well), should for the present be restricted to special BSL4 laboratories or augmented BSL3 facilities where lab workers are not allowed to leave the facility until it is certain that they have not become infected.
It must be emphasized that the focus here is for only a very small subset of pathogen research. Most pathogen research should proceed unimpeded by unnecessary regulations.

▶▶ **Read also:** https://thebulletin.org/2019/02/supplementary-material-for-human-error-in-high-biocontainment-labs-a-likely-pandemic-threat/

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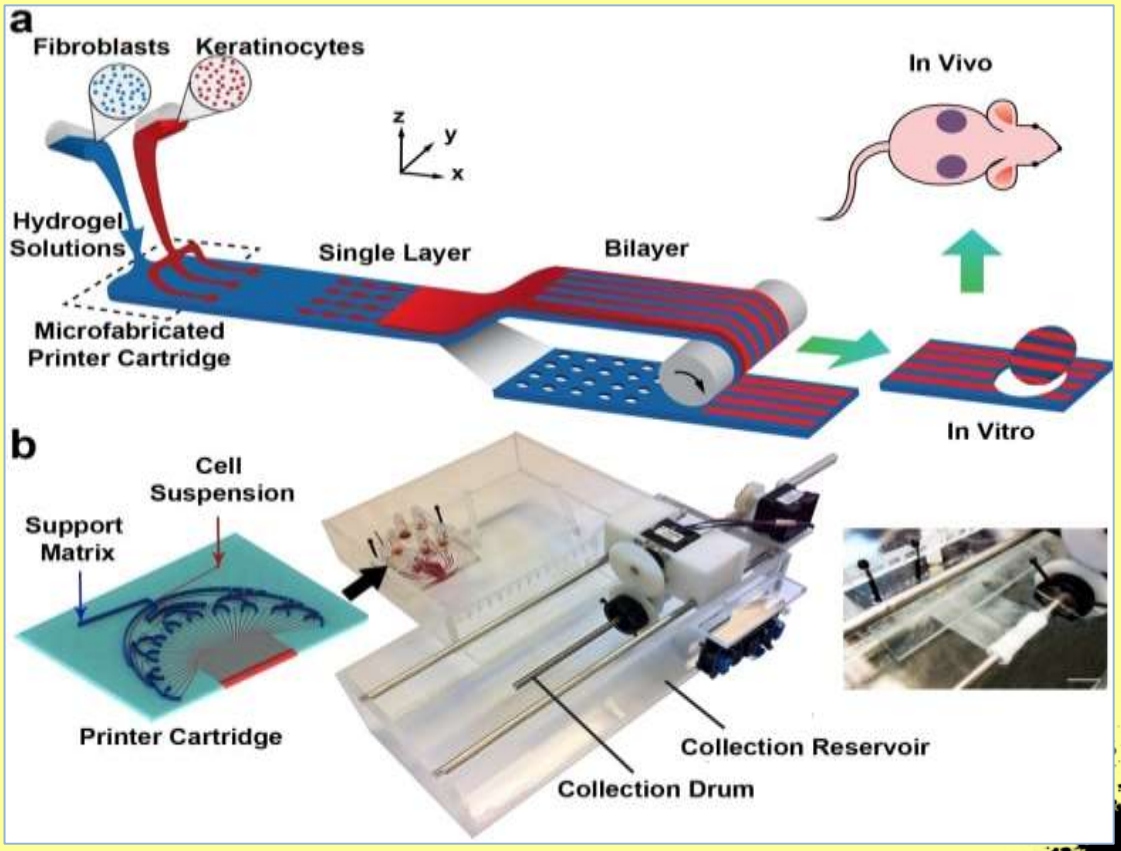
3D bioprinter patches up wounds using a patient's own skin cells

Source: https://newatlas.com/skin-bioprinter-prints-onto-wounds/58688/



KSA MERS-COV Cases and vaccines

Source: https://www.mdpi.com/1999-4915/11/3/212

Abstract

MERS-CoV is present in dromedary camels throughout the Middle East and Africa. Dromedary camels are the primary zoonotic reservoir for human infections. Interruption of the zoonotic transmission chain from camels to humans, therefore, may be an effective strategy to control the ongoing MERS-CoV outbreak. Here we show that vaccination with an adjuvanted MERS-CoV Spike protein subunit vaccine confers complete protection from MERS-CoV disease in alpaca and results in reduced and delayed viral shedding in the upper airways of dromedary camels. Protection in alpaca correlates with high serum neutralizing antibody titers. Lower titers of serum neutralizing antibodies correlate with delayed and significantly reduced shedding in the nasal turbinates of dromedary camels. Together, these data indicate that induction of robust neutralizing humoral immune responses by vaccination of naïve animals reduce shedding that potentially could diminish the risk of zoonotic transmission.

Citation: *DR Adney, L Wang, N van Doremalen, W Shi, Y Zhang, WP Kong, et al. Efficacy of an adjuvanted Middle East respiratory syndrome Coronavirus spike protein vaccine in dromedary camels and alpacas. Viruses 2019; 11(3): 212; doi:10.3390/v11030212.*

Commend (ProMed)

In the discussion chapter, the authors indicate that after vaccination, low neutralizing antibody titers were detected in the upper respiratory tract. Vaccine platforms aimed specifically at inducing high levels of mucosal immunity or those that induce humoral as well as cellular immunity may be required for complete protection. The response to vaccination in dromedary camels varies widely, as was demonstrated in the study by the fact that one out of the 3 camels in the vaccination group did not respond to vaccination at all. The trial involved alpacas and dromedaries born in the US; intranasal challenge with MERS-CoV yielded distinctly different outcomes in the alpaca compared to dromedary camels. Though alpacas are easier to get, future vaccination trials deserve to be performed on dromedary camels.

Although the origins and transmission of MERS are poorly understood, since the emergence of the disease in 2012, the dromedary camel has remained as the one documented source of human zoonotic infection. There is considerable circumstantial evidence supporting camel-to-human transmission, including evidence of camels and humans becoming infected with an identical MERS-CoV. Among the 1125 MERS-CoV cases reported to WHO between 1 Jan 2015 and 13 Apr 2018, 30.9 per cent were primary cases (the 1st known human case in a potential or putative chain of transmission). Among primary cases, 191 (54.9 per cent) reported direct or indirect contact with dromedaries, 164 (47.1 per cent) reported direct, physical contact with dromedaries, and 155 (44.5 per cent) reported contact with products derived from dromedaries, namely unpasteurized camel milk.

One of the measures to interrupt zoonotic transmission of MERS could be vaccination of dromedaries and/or humans. Vaccination of dromedaries should target mainly the offspring, regarded to be the main source of virus dissemination. The above report addresses one of several vaccination trials performed in recent years.

A recent review paper by Chinese researchers (ref 1) included vaccination (in humans and animals) among its topics. It was indicated that among all the functional/non-functional structural proteins of MERS-CoV (similar to SARS-CoV), the S protein is the principal antigenic component that induces antibodies to block virus-binding, stimulate host immune responses, fuse or neutralize antibodies and/or protect the immune system against virus infection. Therefore, the S protein has been selected as a significant target for the development of vaccines.

The authors review 5 MERS-CoV vaccine strategies, their development and advantages/ disadvantages.

1. Inactivated virus vaccines
2. Live-attenuated virus vaccines

3. Viral vector vaccines
4. Subunit vaccines
5. DNA vaccines.

For each strategy, the process of production, references, advantages and disadvantages are presented (see table 3 in ref 1).

There are still no commercial vaccines available against MERS-CoV. To vaccinate camels, animals in which MERS-CoV infection is manifested by a mild or subclinical disease, the MERS vaccine -- when becoming certified and available -- should preferably be combined with vaccine(s) protecting against significant camel disease (for example, camel pox) in order to safeguard the cooperation of the camel owners.

Reference:

Z Song, Y Xu, L Bao, L Zhang, P Yu, Y Qu, et al. From SARS to MERS, thrusting coronaviruses into the spotlight. Viruses 2019; 11(1): 59; <https://doi.org/10.3390/v11010059>; <https://www.mdpi.com/1999-4915/11/1/59>.

Get your head out of bioterror sand

By Charles Onyango

Source: https://www.the-star.co.ke/news/2019/03/04/charles-onyango-get-your-head-out-of-bioterror-sand_c1902703

The chairman KEMRI Dr Edwin Muingia flanked by Dr Solomon Mpoke and Dr Elizabeth Bukusi in a Naivasha hotel during a team building event with Kemri staff. The Institute has raised an alert over a bio-terrorism attack. By George Murage

Mar 04 – Cases of infectious diseases with enormous public health implications have been reported in West African countries. During clinical Ebola investigations in West Africa countries, the biomedical community raised

concerns regarding the prospects of bioterrorism.

Experts have continually warned that a new era of 'the most devastating form of terror that is difficult to predict, and of which the underlying consequences can be extremely upsetting' is emerging.

Concerns have specifically been raised regarding how microbe stocks and technology appear to have passed into the hands of extremists with the motivation and the skills to selectively deploy these biological stockpiles in acts of terrorism.

The situation of biological warfare has been encouraged by the advances in aeronautical technologies, which have made it easier for these weapons to be launched even through bomblets delivered by aircraft or spray tanks affixed to aircrafts or tall buildings.

Public health is an important tool for containing infectious diseases and the threat of biological warfare.

No act of biological aggressions has been documented in Kenya. But being a strong strategic partner in the war on terror, Kenya has everything to worry about regarding the possibility of such attacks.

In other words, it is sensible for the country to focus on medical countermeasures that will improve public health in general, regardless of whether a biological attack occurs.

In progressive societies, public health is equipped with — and has access to modernized electronic devices with the ability to capture data on symptoms during an illness outbreak and simultaneously transmit it for analysis and feedback.

Kenya enjoys recognition as one of the citadels of scientific innovations in Sub-Saharan Africa. The country can use this innovative zeal to invest in public health initiatives that will respond to the threat of bioterrorism.

Kenya's public universities are, perhaps, some of the best in Africa, with a rich history of having distinguished faculty members and comparatively exceptional research facilities. Many faculties offer courses such as molecular biology, genetic engineering, immunology of infectious diseases and biomedical sciences. These are the emerging toolboxes of public health and academic research, and continue to expand the traditional reductionist approach to science.

Kenya can tap into the vibrancy of her research institutions to be responsive to bioterrorism and to appropriately respond to re-emerging infectious diseases by encouraging relevant faculties to actively participate in public health research.

They can work in areas such as developing laboratory processes and procedures to contain biothreats and engage in interdisciplinary research to develop new models of response to the realities of bioterrorism. They can also help in designing a Multi-Lab Response, a network of public health and university labs providing infrastructure for response to a suspect outbreak.

It would also be wise to develop and implement laws on biosecurity and rope in experts from public health and biomedical academia.

Bioterrorism is likely to remain rare or to happen in places beyond the gaze of the international press. But there is need to educate the public to be responsive to this form of terror before it becomes a challenge to our public health system and society.

Haunting spectra of bioterrorism

Source: https://www.deccanchronicle.com/nation/current-affairs/040319/haunting-spectre-of-bioterrorism.html

Mar 04 – Biological agents have been used since antiquity to attack the enemies. The Allies built facilities capable of churning out anthrax spores, brucellosis, and botulism toxins. Thankfully, the war ended before they were used.

The "Cobra Event" written by Richard Preston in 1998 is a science thriller which narrates a botched bioterrorism offensive on the USA. In the book, the perpetrator of the attack, clones a virulent smallpox genome with a highly contagious common cold virus, and cranks out a genetically engineered virus, codenamed "Cobra". The resultant virus which is as contagious as common cold and as deadly as smallpox, maneuvers itself to the brain of the infected person, where it replicates

exponentially and annihilates the brain cells. As a consequence, of its relentless onslaught the infected person is left to die of a disease called "Brain-pox". In 1998, when President Bill Clinton came across Preston's book, he found it so unputdownable that he ended up doing an all-nighter .By the time he finished reading the book, he was so deeply changed that he went on to become the first world leader to focus on bio-defense and create a new division in 1999 called the "National Pharmaceutical Stockpile", in order to store medicines for a bioterrorism eventuality.

Biological agents have been used since antiquity to attack the enemies. The ancient Hittites marched victims of plague into the cities of their enemies; Herodotus talks of archers' firing arrows dipped in manure to cause infection. In 650 BC, Assyrian politicians dumped fungus from rye into their opponents' wells, causing people to suffer from fatal ergot poisoning. Tatars of the 14th century disseminated bubonic plague by vaulting diseased corpses into towns. During World War II, many of the countries involved looked into biowarfare with great interest. The Allies built facilities capable of churning out anthrax spores, brucellosis, and botulism toxins. Thankfully, the war ended before they were used.

It was, however, the Japanese who made massive use of biological weapons during World War II. The Japanese biowarfare program which was known as "Unit 731" consisted of more than 150 buildings in Manchuria near the town of Pingfan, five satellite camps, and a staff of more than 3,000 scientists. The Japanese Army Air Force dropped ceramic bombs full of fleas carrying the bubonic plague on Ningbo, China. And during the Cold War, the United States and Soviet Union created large stockpiles of biological agents for use in war and against civilian populations Bioterrorism is the intentional release of viruses, bacteria, toxins or other deleterious agents to cause illness or death in people, animals, or plants. Terrorists would find biological agents convenient because they are tough to detect and do not produce symptoms of the disease for several hours to several days which would afford them sufficient time to make good their escape after the attack. They are also looked upon as an attractive weapon as they are relatively easy and inexpensive to obtain. Besides, they can also be quickly disseminated, and are very effective at causing widespread fear and panic beyond the actual physical damage to a state or country. To top it all, even harmless bacteria and viruses can be weaponised into highly dangerous and virulent pathogens through gene-transfer/cloning or by way of gene editing.

It's for this reason that we have witnessed some incidents of bioterrorism in the present century. In 1972 police in Chicago arrested two college students, Allen Schwander and Stephen Pera, who had planned a

bioterror event of poisoning the city's water supply with typhoid and other bacteria. However, the first known bioterrorist attack of the 20th century, also the single most massive bioterrorist attack so far on U.S. soil, happened in 1984 in Oregon, USA. It was perpetrated by the followers of Osho Rajneesh, who wanted to start a charter school by winning approval, in the local elections. They attempted to gain control of the local elections by infecting the salad bars with a bacteria called Salmonella to prevent people from voting. The attack affected 751 people with severe food poisoning. There were, however, no fatalities. Similarly, in June 1993 in Japan, the religious group Aum Shinrikyo released anthrax in Tokyo causing a foul odour. The attack was a total failure, as the group had mistakenly used the vaccine strain of the bacterium instead of a pathogenic strain.

The bioterrorist agents which are virulent and are likely to be used by terrorists are anthrax (Bacillus anthracis), botulism (Clostridium botulinum), plague (Yersinia pestis), smallpox (variola major), tularemia (Francisella tularensis) and viral hemorrhagic pathogens (filoviruses and arenaviruses). Besides them, many other agents could also potentially be used in a bioterrorist attack.

In 2001, anthrax-laced letters killed five people, hospitalized several people and terrorized the US. Initially, the attacks were reckoned to be the handiwork of Al Qaeda. But, F.B.I in 2010 closed its investigation by weirdly concluding that the 2001 attacks on the offices of several US Senators, were carried out by Bruce E. Ivins, a microbiologist at the US Army Medical Research Institute of Infection Disease.

In the USA during the 1950s and '60s, Army researchers became interested in weaponizing tularemia, highly infectious bacteria but seldom lethal. It has been more than 40 years since the American bioweapons program shut down, and many of the details remain classified. But Joel McCleary, a former aide to Jimmy Carter, is reported to have stated that in several hundred experiments, tularemia was weaponized to bodacious strength by mixing it in a slurry with another agent, which bolstered its effects exponentially, causing it to devastate the human body. In several large outdoor tests, scientists drifted clouds of tularemia called "killing winds" over cages of live monkeys to evaluate its pathogenicity. They found that about 50 and 60 pounds of freeze-dried tularemia could stamp out about 60 percent of the population of London.

Another agent which terrorists would want to get hold of is the Smallpox virus which causes a highly contagious and incurable disease. Though eradicated in the 1970s. Its cultures are still being maintained by the governments of the USA and Russia. Some believe that after the collapse of the Soviet Union, cultures of smallpox have become available in other countries. One can imagine the disastrous consequences if rogue politicians or terrorists were to get hold of the smallpox strains.

The deadliest agents of all the terrorists would want to use is the Ebola virus disease. It causes high fatality rates ranging from 25-90% with an average of 50 %. No cure currently exists, although vaccines are in development. Death from Ebola virus disease is commonly due to multiple organ failure and hypovolemic shock. The Soviet Union investigated the use of filoviruses for biological warfare, and the Aum Shinrikyo group unsuccessfully attempted to obtain cultures of Ebola virus.

How would a bioterrorist attack look? "Operation Dark Winter" was the cryptonym for an advanced-level bio-terrorist attack simulation conducted from June 22-23, 2001. It was designed to execute a mock version of a covert and widespread smallpox attack on the United States. It took place at Andrews Air Force Base and was coordinated by the Center for Strategic and International Studies and the Johns Hopkins Center for Civilian Biodefense Studies. During the exercise, as the smallpox virus started to spread, first in Oklahoma and then in pockets across the nation, the participants quickly discovered that the country had no standing response plan and only enough vaccine to protect 5 percent of the population. Within weeks, as many as a million people in the United States were estimated dead. "Dark Winter" exposed the inadequacies of national emergency response during the use of a biological weapon against the Americans.

Former U.S. Senator Joe Lieberman, in an interview to CNBC in March 2017, is reported

to have stated that a worldwide pandemic could end the lives of more people than a nuclear war. Lieberman also expressed worry that a terrorist group like ISIS could develop a synthetic influenza strain and introduce it to the world to kill the civilian. In a New York Times report, the Gates Foundation has foreboded that a microbial outbreak similar to that of the Spanish Influenza pandemic could end up killing more than 360 million people worldwide, despite the widespread availability of vaccines and modern Medicare. The report cited increased globalization, rapid international air travel, and urbanization as increased reasons for concern.
The next 100 years is being described as the "century of biology." Incredibly rapid and sweeping changes in transgenics and enhanced bio-production technologies would make it easier for terrorists to bioengineer bio-weapons. Most biosecurity concerns today appear to be stemming from synthetic biology and the risk of using the new technology to make lethal viruses in the lab. Similarly, the new war against bioterrorism will also be waged with genomics, immunology and biotechnology. Scientists at Harvard Medical School have found a gene variation that makes mice resistant to anthrax, and another group is reported to have developed a molecule that confers protection to rats against lethal doses of anthrax toxin. Recently, the CRISPR/Cas system has emerged as a promising technique for gene editing. I shall discuss the CRISPR/Cas system and the threat of bioterrorism in India separately in future write-ups.
Finally, a terrorist or a bio-terrorist commits acts of terror due to lack of awareness and education, to help him realize the importance of diversity and the underlying spiritual unity of humankind. Spirituality helps an individual, to develop an awareness of the oneness of humanity. It is only through this awareness and the uplifting of human consciousness that disease of terrorism can be uprooted from this planet.

Tunisia – Anthrax toxin letters

Source: https://aawsat.com/english/home/article/1615976/envelopes-containing-anthrax-delivered-major-tunisian-figures

Mar 03 – **The Tunisian counter-terrorism agencies have revealed in their preliminary investigations that the envelopes delivered to politicians, journalists, and syndicate members contained the anthrax toxin.** This was the 1st terrorist plot of its kind in the country, they added. They continued, 20 public figures were targeted in this terrorist plot, including 10 prominent politicians, 7 journalists, and activists in syndicates and human rights.
Moreover, they said that the terrorist groups have shifted their tactics after security measures against them have limited their activity. For years, they have relied on armed attacks, but they are now forced to resort to poisoning their victims, said the security agencies.
President of the Tunisian General Labor Union (UGTT) Noureddine Taboubi and assistant secretaries Bu Ali Mubaraki, and Sami al-Tahiri were among the targets, revealed "high-ranking" Tunisian media sources. Sufian al-Sulaiti, a spokesman for the counter-terrorism apparatus, affirmed that the agencies will listen in the upcoming period to the testimonies of 15 of the targeted figures. Furthermore, several terrorist group experts said that toxic substance letters is a method that has been adopted by several terrorist organizations in the past. They urged the need to amend strategies and derive lessons from foreign experiences, such as attacks in Afghanistan, in order to confront terrorism in Tunisia.

Comment (ProMED)

Tunisia is a country in the Maghreb region of North Africa, with its capital Tunis facing the Mediterranean. Exactly what has been found in these 20 letters is not clear. The title of the news report claims "anthrax", which is the disease, and the counter-terrorism agency claims they contained anthrax toxin. But there are various toxins which necessitate special preparation while anthrax spores are easier to culture. Normally these threat letters contain a harmless white powder in the hope

of generating fear and stress. But this represents a bioterrorism attack on Tunisia, whatever the severity turns out to be.
Since 2005 there has just been one case of anthrax in Tunisia in a sheep in Tunis in September 2007. Nothing since. The country is essentially free of anthrax. One case, no deaths, suggests just a single positive diagnostic sample -- maybe a swab or blood sample -- with no other information other than it came from a "sick" sheep. So. there would not have been any cultures on hand to use. We must await clarification. - Mod.MHJ
Tunisia's Criminal Court on terrorism cases in the capital's Court of Appeal has sentenced 31 people to death over the 2014 terrorist attack on the house of former Interior Minister Lotfi Ben Jeddou. Among the 31 suspects are Seifallah Ben Hassine, known as Abu Ayyad, an associate of late al-Qaeda leader Osama Bin Laden and founder of the militant group Ansar al-Sharia. He is also the main suspect in a series of terrorist acts, including the assassination of Tunisian leftist Chokri Belaid and MP Mohamed el-Brahmi. The 31 suspects, who include Algerians as well as Tunisians, were sentenced in absentia. Some of them are reportedly dead
Tunisia is a small country, and any laboratory is probably government funded and staffed. Also, the basic microbiologic culturing of *B. anthracis* is not that complicated, whatever the Tunisian claims. Without wanting to go into details of what might or might not be involved in these letter contents, the coincident timing of the letter mailings with the public sentencing of the 31 terrorists and other suspects would rally public support of their government, both in the present situation and down the road. - Mod.MHJ

Rise of European populism linked to vaccine hesitancy

Source: http://www.homelandsecuritynewswire.com/dr20190304-rise-of-european-populism-linked-to-vaccine-hesitancy

Mar 04 – **There is a significant association between the rise of populism across Europe and the level of mistrust around vaccines,** according to a study by Queen Mary University of London.
Lead author Dr. Jonathan Kennedy from Queen Mary's Global Public Health Unit at the Blizard Institute, said**: "It seems likely that scientific populism is driven by similar feelings to political populism, for example, a profound distrust of elites and experts by disenfranchised and marginalized parts of the population.**
"Even where programs objectively improve the health of targeted populations, they can be viewed with suspicion by communities that do not trust elites and experts. In the case of vaccine hesitancy, distrust is focused on public health experts and pharmaceutical companies that advocate vaccines."

Data from 14 European countries
The study, published in the *European Journal of Public Health*, looked at national-level **data from 14 European countries.** This data included the percentage of people in a country who voted for populist parties in the 2014 European Parliament elections, and the percentage of people in a country who believe that vaccines are not important, safe and/or effective, according to data from the 2015 Vaccine Confidence Project.
QMUL says that the analysis found a highly significant positive association between the percentage of people in a country who voted for populist parties and the percentage who believe that vaccines are not important and not effective.
Professor Sophie Harman, an expert on global health politics from Queen Mary's School of Politics and International Relations, who was not involved in the research, commented: "Like restrictions on reproductive rights, anti-vaccination rhetoric has long been the canary in the coal mine for populism."

Tracing back to discredited research on MMR vaccine and autism
In the research article, Dr Kennedy writes that modern vaccine hesitancy is usually traced to Andrew Wakefield's now discredited 1998 *Lancet* article, which claimed a link between the **measles, mumps and rubella (MMR) vaccine and autism.**

MMR vaccination rates in the U.K. fell from 92 per cent in 1995 to a low of 79 per cent in 2003, well below the 95 per cent rate needed to achieve herd immunity. Confirmed cases of measles in England and Wales rose from 56 in 1998 to 1370 in 2008.
Wakefield was struck off the UK medical register and the *Lancet* study retracted. Nevertheless, his ideas remain influential and are cited as a reason why measles cases have increased in Europe over the past few years.

Examples from European populist parties
There is additional anecdotal evidence suggesting a connection between the rise of populist politicians and political movements in Western Europe and increasing levels of vaccine hesitancy, Kennedy writes.
The most prominent example is Italy. The Five Star Movement (5SM) have raised concerns about vaccine safety and the link between MMR and autism. It is argued that these concerns caused MMR vaccination coverage to fall from 90 per cent in 2013 to 85 per cent in 2016, and resulted in an increase in measles cases from 840 in 2016 to 5000 in 2017.
Despite this, the upper house of the Italian Parliament—bolstered by newly elected representatives from 5SM and League—recently passed a law to repeal legislation that makes vaccines compulsory for children enrolling in state schools.

In France, the right-wing Front National have also raised concerns about vaccine safety and laws that make childhood vaccinations mandatory.
And in Greece, the left-wing SYRIZA government proposed that parents should be able to opt out of vaccinating their children.
While UKIP has not expressed similar concerns, a poll conducted by Mori showed UKIP voters were almost five times more likely than the general population to believe that MMR was unsafe.

The United States, Donald Trump, and Andrew Wakefield
Further afield in the United States, Donald Trump has met well-known anti-vaccination campaigners, including Wakefield, and expressed sympathy with their ideas. For example, in 2014 he tweeted: "Healthy young child goes to doctor, gets pumped with massive shot of many vaccines, doesn't feel good and changes—AUTISM. Many such cases!"
Dr. Kennedy adds: "Vaccine hesitancy will be difficult to resolve unless its underlying causes of populism—an iniquitous economic system and unrepresentative political system—are addressed."

— Read more in Jonathan Kennedy, "Populist politics and vaccine hesitancy in Western Europe: an analysis of national-level data," European Journal of Public Health (25 February 2019).

EDITOR'S COMMENT: According to the Cambridge English Dictionary, populism is defined as political ideas and activities that are intended to get the support of ordinary people by giving them what they want. In my own, more simplistic approach is «lying to the people by giving them what people demand or expect to hear". Populism has an interesting infiltration to people with low educational level but also to people in the very high hierarchy in various fields. The former does not know much about many things and the latter might know too much to question almost everything. Apart from this personal sallow philosophical approach, there is something called evidence medicine. Evidence-based medicine (EBM) is the conscientious, explicit, judicious and reasonable use of modern, best evidence in making decisions about the care of individual patients. EBM integrates clinical experience and patient values with the best available research information. It is a movement which aims to increase the use of high-quality clinical research in clinical decision making. EBM requires new skills of the clinician, including

efficient literature-searching, and the application of formal rules of evidence in evaluating the clinical literature. The practice of evidence-based medicine is a process of lifelong, self-directed, problem-based learning in which caring for one's own patients creates the need for clinically important information about diagnosis, prognosis, therapy, and other clinical and health care issues. It is not "cookbook" with recipes, but its good application brings cost-effective and better health care. The key difference between evidence-based medicine and traditional medicine is not that EBM considers the evidence while the latter does not[2]. So far, what is at hand is the fact that vaccination helped to get rid of many diseases – remember smallpox? On the other hand, there is no concrete evidence to link certain vaccines with autism or other diseases, especially in children. Because if there was such a link, do you think that we physicians should continue performing vaccinations? Perhaps the pharmaceutical industry should target a helpful vaccine targeting political stupidity promoting the contagious populism. If they do that, their services to the world will be highly recognized and appreciated! Until then, vaccinate your children and accept the fact that even routine medical interventions might have adverse effects even if performed *lege artis*. Being in the 21st century does not mean that we know human body insight and out. On the contrary, we are still learning and most of the times we are amazed about the fantastic secrets were hidden for years or centuries. Time and research will reveal who was right or wrong. In the meantime, think of what is best for your children WITHOUT putting at risk the children of other people.

Virgin plane quarantined after mass outbreak of sickness

Source: https://www.theguardian.com/business/2019/mar/06/virgin-plane-quarantined-gatwick-after-mass-outbreak-of-sickness

Mar 06 – Passengers and crew on a Virgin Atlantic flight from Barbados were quarantined after landing at Gatwick airport due to widespread sickness on board.

The Airbus A330 aircraft was met by the emergency services on arrival at 5.30am after an eight-hour flight from Bridgetown.

One of the passengers, Trevor Wilson, said they were held on the plane for more than 90 minutes.

He wrote on Twitter: "This flight was exclusively cruise passengers from the MSC Preziosa. The illness seems to have originated on board ship not the plane. Five members of cabin crew became sick on flight."

He said that the sickness was "mainly a bad chesty cough, possibly chest infection".

A South East Coast ambulance service spokesman confirmed assistance was called just before 5am "following reports of a number of passengers and crew feeling unwell and nauseous". About 30 people were treated at the scene, three of whom were taken to hospital for further checks. **"We sent ambulance crews including our hazardous area response team and a number of other specialist paramedics to the scene,"** the spokesman said.

A Virgin Atlantic spokeswoman said: "A number of customers onboard the VS610, which landed at London Gatwick this morning from Barbados, reported feeling unwell. As a precaution the plane was met

[2] Izet Masic, Milan Miokovic, and Belma Muhamedagic. Evidence Based Medicine – New Approaches and Challenges. Acta Inform Med. 2008; 16(4): 219–225. doi: 10.5455/aim.2008.16.219-225

by the relevant authorities who made the decision to screen everyone onboard, in line with standard health and safety procedures.
"The wellbeing of our customers and crew is always our priority, and we are supporting those affected."

Qatar's famed health system has been ranked as the fifth best in the world

Source: https://www.qatarliving.com/forum/news/posts/qatar%E2%80%99s-famed-health-system-has-been-ranked-fifth-best-world

Mar 06 – Qatar has always taken great pride in its health system, which has been regarded as one of the best in the region.

There was further validation for this as the country's health system was recently chosen as the fifth best in the world and the first in the Middle East, reported *Gulf Times*.
London-based think tank *Legatum Institute* undertook the study.
According to the study, ***Qatar became the only country in the region to score in the top five on the annual prosperity index***, placed behind Singapore, Luxembourg, Japan and Switzerland.
Improved life expectancy, better health outcomes, and investment in health infrastructure helped Qatar finish in the fifth place.
Countries' performance in three areas — basic health outcomes, health infrastructure and preventative care, and physical and mental health — were evaluated while calculating the rankings.
Qatar rose from 13th rank globally last year to fifth this year, thanks to the country having the highest life expectancy rate in the Eastern Mediterranean Region. It also globally ranks in the top 25 percentile for healthcare access and quality, reported *The Peninsula*.
The country's healthcare spending is among the highest in the Middle East, with QR22.7bn invested in healthcare in 2018, a 4% increase from the previous year.
"The 2018 ranking recognises the investment the country has made in health infrastructure. Over the past two years, we've opened six new public sector hospitals and introduced more than 1,100 new hospital beds," said Qatar's Minister of Public Health HE Dr Hanan Mohamed Al Kuwari.
"We've also opened four new Health and Wellness Centres. The ranking also recognises that our focus on areas such as cancer, diabetes, and smoking cessation is having a positive

impact on people's lives, and ultimately it recognises that life expectancy in Qatar continues to improve," she added.

Qatar also ranks strongly for a number of health outcomes. The nation has the highest life expectancy rate in the Eastern Mediterranean Region and has seen the crude death rate per 100,000 population decline throughout this decade, from 99.1 in 2014 to 80.2 in 2017.

Additionally, infant mortality rates have declined consistently in recent years, from 7.4 per 1,000 live births in 2015 to 5.4 per 1,000 in 2017.

The health ranking in the annual prosperity index uses data from the World Health Organization (WHO), World Bank Development Indicators, the Gallup World Poll, and a variety of other sources to measure and rank the health of people living in 149 countries.

New ways to combat biological terrorism

Source: https://www.miragenews.com/new-ways-to-combat-biological-terrorism/

Mar 06 – The challenge to protect global communities against deliberate health threats is being tackled by Flinders University experts, with assistance from the Canadian Government.

The Torrens Resilience Institute, based at Flinders University, has been awarded $921,977 for a new three-objective program, to work in partnership with the Weapons Threat Reduction Program at Global Affairs Canada to devise new tools and intelligence responses.

Matthew Flinders Distinguished Professor Paul Arbon, the Director of the Torrens Resilience Institute, will lead the project, which will be managed by Dr Rebecca Hoile – an international bioterrorism expert who has previously headed Chemical, Biological and Radiological Sub-Directorate preparedness and prevention at Interpol in Lyon.

Recent incidents involving the deliberate use of Chemical, Biological, Radiological and Nuclear (CBRN) materials have occurred in Iraq, Syria, the United Kingdom, Malaysia, America and elsewhere.

This adds to growing evidence that criminal and terrorist individuals and groups are successfully acquiring materials and precursors for the production, trafficking and potential use of CBRN materials and agents, and intend to use biological pathogens and toxins to cause harm.

Such threats have prompted a higher level of responses to problematic biological events – and Flinders researchers will be working at the forefront of these important developments.

"During discussions with the sector, it was identified that strengthening the detection of suspicious biological events at the field level were needed across the health and security

interface," says Professor Arbon. "This includes increasing access to resources to assist in identifying what constitutes a potential deliberate event and actions to address the challenges of a deliberate incident.

"These recommendations form the basis of Project LINK and we welcome the opportunity to work with our colleagues internationally in building resilience to events of this nature."

Project LINK comprises a set of activities designed to reduce the impact of CBRN incidents and mitigate the global health security risk by addressing the need for improved coordination and enhanced tools for health security responses to deliberate incidents.

The new Torrens Resilience Institute project will deliver three outcomes:

- An improved CBRN intelligence database, based on international data regarding threats, incidents and trends.
- Developing improved coordination of response agencies and governments within the region.
- Developing a portable 'in-field' tool for health and veterinary services.

Dr Hoile, currently based at the TRI at Flinders Bedford Park and former head of the Bioterrorism Prevention program at Interpol, is committed to improving the health security interface.

"Today's global counter terrorism environment requires innovative methodologies and resources to better respond to threats and acts involving the deliberate use of CBRN agents," says Dr Hoile.

"The vulnerability remains as efforts to increase biosecurity and suitable education continue. Project LINK will provide an opportunity to continue building resources required to combat this issue."

Since its establishment in 2002, Canada's Weapons Threat Reduction Program (formerly known as the Global Partnership Program), has delivered more than $1.3 billion (CAN) in programs to mitigate threats posed by Weapons of Mass Destruction.

The Program works with partner countries, international organizations and non-governmental organizations on projects aimed at preventing weapons and materials of mass destruction from falling into the hands of terrorists and states that harbor them.

It implements Canada's obligations under the G7-led Global Partnership against the Spread of Weapons and Materials of Mass Destruction.

The Torrens Resilience Institute was established at Flinders University in 2009 to support organizations and societies in their ability to respond to disruptive challenges that could potentially overwhelm local disaster-management capabilities.

EDITOR'S COMMENT: One more time, tons of money for addressing CBRN threats on paper. The fact is this: Are all Canadian hospitals have a CBRN Response Unit ready, equipped and properly trained? My subjective answer is NO! If I am wrong please let me know and I will advertise it in the coming 2019 issues (all of them). Because this is the global answer, to the same question: "*Are we ready, today?*" On the other hand, experts should earn a living, aren't they?

Biological and chemical weapons: the other threats from North Korea

Source: https://www.militarytimes.com/news/pentagon-congress/2019/03/08/biological-and-chemical-weapons-the-other-threats-from-north-korea/

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Mar 08 – When it comes to North Korea, all eyes are on nuclear weapons, but the lack of attention toward chemical and biological capabilities weakens defense against potential attacks, according to experts in the field.

After the breakdown of talks between the United States and Pyongyang last week, the future of not only nuclear weapons but biological and chemical weapons is uncertain.

"The real terrorists' threats, primarily when you talk about weapons of mass destruction — nuclear, chemical and biological — are chemical weapons, biological diseases and

radioactive materials," said Paul Walker, vice chairman of the board of directors for the Arms Control Association.

Walker, who has worked in the international security field for more than 40 years, said chemical and biological agents are the biggest threats facing society today.

In the new Congress, lawmakers have paid particular attention to nuclear weapons. The House Armed Services Committee is holding a hearing on nuclear deterrence policies today and their counterparts on the Senate Armed Services Committee held a similar hearing on nukes last week. Neither panel plans to hold a hearing on chemical or biological weapons in the near future, according to committee staff members.

U.S. soldiers wear chemical warfare gear during a joint military exercise with South Korea at a US Army base in Dongducheon, 40kms north of Seoul, on March 3, 2011, aimed to simulate the detection and disposal of North Korea's chemical, biological, radiological and nuclear weapons. (Jung Yeon-je/AFP via Getty Images)

EDITOR'S COMMENT: Please can someone explain to me the need for SCBA equipment with Level-C PPE? And as always, no comment on the bulletproof vest that in reality protects only the umbilicus! Cannot tell if the ammunition pockets, the pistol holster or the patch on the helmet are made of a material that can be decontaminated or they are just single-use consumables.

Jenifer Mackby, a senior fellow at the Federation for American Scientists, said that while the image of the mushroom cloud at Hiroshima and Nagasaki makes people fear the use of nuclear weapons, there is little public knowledge about biological weapons.

"With biological weapons, people don't pay that much attention to it and, in fact, they probably don't even have a clue what it might be or how it could be put into action," Mackby said.

The U.S. intelligence community has made mention, albeit briefly, of North Korea's chemical and biological programs. During the Senate Select Committee on Intelligence hearing in January, intelligence community leaders reiterated how the advancements of weapons of mass destruction threaten U.S. and global safety.

John Parachini, a senior policy analyst at the Rand Corporation, recently wrote an article about the limited intelligence the United States has on North Korea's biological weapons programs. He said the United States does not have concrete proof of North Korea's biological capabilities.

"Based on the evidence we have in the open source environment, I think it's hard to tell they may have capabilities," Parachini said. "But the evidence we have as revealed in the Worldwide Threats statements from the U.S. intelligence community over the years have varied and have used cautionary language like they may have capabilities."

Unlike biological weapons, the United States does have more intelligence and understandings of North Korea's chemical weapons program. The U.S. intelligence community's 2019 Worldwide Threat Assessment noted that North Korea "used chemical weapons on the battlefield or in assassination operations during the past two years."

Gary Ackerman, an associate professor with the College of Emergency Preparedness, Homeland Security and Cybersecurity at the University of Albany, said North Korea has a sizable chemical weapons arsenal that poses a threat to neighboring countries like South Korea.

"There's still a fair amount of evidence that they have one of the largest chemical weapons arsenals that's around at the moment so North Korea is a huge threat in terms of chemical weapons," Ackerman said. "I'd say that largest state-level threat in terms of chemical weapons in the world."

There are multilateral treaties that hold states accountable for these weapons. The Chemical Weapons Convention and the Biological Weapons Convention have established international norms against the use, production, distribution, and stockpiling of chemical and biological weapons. The Biological Weapons Convention has 182 members while the Chemical Weapons Convention has 193.

Walker said North Korea signed the Biological Weapons Convention through ascension, but it has not signed the Chemical Weapons Convention. In addition to North Korea, Israel, Egypt and South Sudan have not ratified the Chemical Weapons Convention.

"All of your major players have signed and ratified," said Walker, who was a staff member for House Armed Services Chairman Ron Dellums in the 1990s. "The one important country missing is North Korea today."

Ackerman said the absence of North Korea's membership in the Chemical Weapons Convention may be a strategy to keep the United States and other countries guessing when it comes to the actual size of their chemical weapons program.

While the probability of a biological or chemical weapons attack is low, Parachini said continuing to initiate talks with North Korea helps the United States get a better sense of Pyongyang's biological and chemical capabilities.

"In order to keep that probability low and to understand that potential danger," Parachini said. "What's ideal is to get more transparency and so that's where the current dialogue with North Korea is important even if its focused on their nuclear and missile programs."

Marburg Vaccine Candidate Receives HHS Funding

Source: https://www.precisionvaccinations.com/marburg-virus-deemed-potential-bioterrorism-threat-us-department-homeland-security

Mar 07 – To increase national health security against biothreats, the U.S. Department of Health and Human Services (HHS) announced **it will begin co-developing a vaccine candidate against the Marburg virus.**

In addition to the threat of a naturally occurring infection, the Marburg virus is deemed a potential bioterrorism threat by the U.S. Department of Homeland Security.

Currently, there is not a licensed vaccine for Marburg.

The Biomedical Advanced Research and Development Authority (BARDA), part of the HHS Office of the Assistant Secretary for Preparedness and Response, awarded an initial 2-year, $10 million contract to Public Health Vaccines LLC, to begin development of a vaccine to protect against Marburg infection.

"This vaccine candidate is the first BARDA has funded against the Marburg virus, and it is an important step toward meeting an urgent public health and biodefense need," said BARDA Director Rick Bright, Ph.D.

"We will leverage our experience in establishing public-private partnerships that bring results that are critical to saving lives and protecting Americans – and possibly people across the globe – from health security threats."

The Public Health Agency of Canada initially developed the vaccine and licensed it to Public Health Vaccines LLC. This approach is similar to the one Merck & Co. used to develop its Ebola vaccine.

The Marburg virus was recognized in 1967 and since then multiple outbreaks have occurred with high mortality rates, most recently in 2017.

The Marburg virus is part of the family of hemorrhagic fever viruses that includes Ebola.

Marburg hemorrhagic fever (Marburg HF) is a rare but severe hemorrhagic fever which affects both humans and non-human primates. Marburg HF is caused by Marburg virus.

Marburg HF typically appears in sporadic outbreaks throughout Africa; laboratory-confirmed cases have been reported in Uganda, Zimbabwe, the Democratic Republic of the Congo, Kenya, Angola, and South Africa, says the CDC.

The mission of the Office of the Assistant Secretary for Preparedness and Response (ASPR) is to save lives and protect Americans from 21st-century health security threats. Within ASPR, BARDA invests in the advanced research and development, acquisition, and manufacturing of medical countermeasures – vaccines, drugs, therapeutics, diagnostic tools, and non-pharmaceutical products needed to combat health security threats.

To date, 43 BARDA-supported products have achieved regulatory approval, licensure or clearance. BARDA accepts proposals for the advanced development of medical countermeasures through the Broad Agency Announcement, BARDA-BAA-18-100-SOL-00003.

Biophotonics for biodefense

Source: https://www.bioopticsworld.com/articles/2019/03/biophotonics-for-biodefense.html

Mar 07 – Over the last five years, optical technologies have gained attention in biodefense and antibiotic resistance applications. **Because optical methods allow direct visualization of specific targets and provide a range of quantitative details, they're ideal for tracking pathogens.** "These technologies provide very rich information" compared to other approaches, says Qingshan Wei, a researcher at North Carolina State University. "The combination of optical technologies and molecular tools that detect specific targets provides great value."

Two such systems are showing promise for clinical application. The U.S. Biomedical Advanced Research and Development Authority (BARDA) recently approved a $10.7 million contract extension for First Light Diagnostics (Chelmsford, MA) to develop its **MultiPath Platform, which detects pathogens and biomarkers in 25 minutes and determines antibiotic susceptibility in 4 hours**. The system's optical imaging platform has four fluorescent color channels that detect up to 64 targets and 15 antibiotics in a 16-well cartridge. The system captures an image from each well and color channel, and then counts and analyzes the target cells or molecules. In the case of anthrax, the platform detects infection in less than 30 minutes using a fingerstick blood sample.

To rapidly detect pathogens in the lungs, **Proteus Interdisciplinary Research Collaboration (Proteus IRC)**, based in Edinburgh, Scotland, is developing optical technology to visualize bacteria and the inflammation it creates. In just 60 seconds, bacteria-

specific fluorescent probes and fiber-based imaging help clinicians determine which antibiotic therapies to prescribe. Calling the technology a potential game-changer, CARB-X, the world's largest public-private partnership focused on antibacterial preclinical R&D, anticipates application in intensive care settings. The Proteus project received a $1.12 million grant to accelerate development from CARB-X, which is funded by BARDA, Wellcome Trust, the National Institute of Allergy and Infectious Diseases, the British government, and the Gates Foundation.

For threat detection in remote settings, consumer devices as smartphones can be quickly converted into sensitive, single-molecule detectors by adding optical sensors. But reliable field use requires overcoming several hurdles. NC State's Wei notes that laboratory results are often hard to replicate because of the complexity found in real-world situations. Creating portable systems sometimes means sacrificing resolution, particularly when low-cost light sources or battery power sources are used. Field systems also require more validation. "We need to make sure the systems are robust in different environments and will respond to a range of operator skill levels," he says.

Down the road, Wei predicts, plants bioengineered to emit a molecule in response to a biological threat can become active biodefense sensors. "The research direction is changing," says Wei. "But chemistry is the foundation for moving light technology forward."

WHO launches strategy to fight 'inevitable' flu pandemic

Source: https://medicalxpress.com/news/2019-03-strategy-inevitable-flu-pandemics.html

Mar 11 – WHO recommends annual flu vaccines as the most effective way to prevent the spread of the disease, especially for healthcare workers and people at higher risk of influenza complications

The World Health Organization on Monday launched a strategy to protect people worldwide over the next decade against the threat of influenza, warning that new pandemics are "inevitable".

Influenza epidemics, largely seasonal, affect around one billion people and kill hundreds of thousands annually, according to WHO, which describes it as one of the world's greatest public health challenges.

WHO's new strategy, for 2019 through 2030, aims to prevent seasonal influenza, control the virus's spread from animals to humans and prepare for the next pandemic, WHO said.

"The threat of pandemic influenza is ever-present," WHO chief Tedros Adhanom Ghebreyesus said in a statement.

The world has suffered through a number of devastating influenzas pandemics, including the Spanish Flu, which in 1918 killed tens of millions of people globally.

Three pandemics have occurred since—in 1957, 1968 and in 2009—when the H1N1 swine flue pandemic claimed around 18,500 lives in 214 countries.

"Another influenza pandemic is inevitable," the UN health agency said, adding that "in this interconnected world, the question is not if we will have another pandemic, but when."

Launching the new strategy, the WHO chief stressed the need for vigilance and preparation. "The cost of a major influenza outbreak will far outweigh the price of prevention," he said.

While pandemic preparedness is estimated to cost less than $1 per person per year, WHO said responding to a pandemic cost roughly 100 times that amount.

The new strategy called for every country to strengthen routine health programmes and to develop tailor-made influenza programmes that strengthen disease surveillance, response, prevention, control, and preparedness.

Not prepared enough

WHO recommends annual flu vaccines as the most effective way to prevent the spread of the disease, especially for healthcare workers and people at higher risk of influenza complications.

It also called for the development of more effective and more accessible vaccines and antiviral treatments.

Due to its mutating strains, vaccine formulas must be regularly updated and only offer limited protection currently.

But Martin Friede, WHO's vaccines coordinator, urged broader use of seasonal vaccines, which help protect vulnerable populations but also help prepare countries to rapidly deploy vaccines in the case of a pandemic.
"In a perfect world, everyone would be vaccinated," Friede told reporters in Geneva.
Tedros said progress in recent years had made the world better prepared than ever for the next big influenza outbreak.
"But we are still not prepared enough. This strategy aims to get us to that point," he said.
WHO said it would expand partnerships to increase research, innovation and availability of new and improved vaccines and other tools to fight influenza.
It insisted its new strategy would also have benefits beyond the fight against influenza, since it would also increase detection of other infectious diseases, including Ebola.

Bioterrorism – Using Foods and Beverages as Deadly Weapons

By Dr. William Oliver Hedgepeth
Source: https://edmdigest.com/preparedness/bioterrorism-foods/

Mar 11 –"The food industry should start thinking seriously about various terrorism-related scenarios that could potentially involve radioactive materials and make preparations for dealing with these situations should they become reality," Robert A. Norton, Ph.D., urges in Food Safety Magazine.
"The most immediate element of concern for a food facility — maybe a large production plant or sprawling warehouse — would actually be from the direct blast effects emanating from an improvised explosive

device (IED) rather than from any radioactive material that might be present," Norton added.
He was particularly concerned about possible radioactive elements being inserted into foods and beverages to cause illnesses or death. But the U.S. Department of Agriculture (USDA) has provided the food industry very rigid safeguards against poisonous chemicals entering our food. The USDA has a detailed list of Food Safety Standard Operating Procedures (SOPs) on food handling, cleaning, cooking and personal hygiene.
According to the Department of Homeland Security, there are "an estimated 2.1 million farms, 935,000 restaurants, and more than 200,000 registered food manufacturing, processing, and storage facilities. This sector accounts for roughly one-fifth of the nation's economic activity."
Bioterrorism and Food Safety Research to Protect People
The Johns Hopkins University Bloomberg School of Public Health is a national leader in bioterrorism and food safety research. Scientists there are studying how harmful elements

can enter the complex, often invisible food and beverage supply chain that extends from raw materials to a final product on the dinner table.
There are two categories currently under research:

1. Terrorist targeting of livestock and crops during production, harvesting and storage (agroterrorism)
2. Terrorist targeting of processed foods during processing, manufacturing, storage, transport, distribution or service

Agroterrorism is an economic weapon that could target the estimated $150 billion livestock industry. That would include cattle, sheep, pigs and chickens, as well as produce such as grains, fruits and vegetables.
An attack on the U.S. food industry would cause great harm to the nation's economy and destroy the livelihoods of thousands of farmers and grocers. Furthermore, it would affect restaurants, warehouses and distribution centers, online companies, and the transportation systems of truck, rail, air and sea. And that does not include the cost of affected logistics, supply chains and transportation systems.
Public Laws to Protect the US from Bioterrorism
Congress enacted the Public Health Security And Bioterrorism Preparedness And Response Act of 2002 to prevent agricultural bioterrorism. Its focus is to put in place federal and state assistance and organizations to ensure that what we regularly eat and drink is safe. This law outlines the legal reporting provisions to keep us safe from bad actors' malevolent intentions or from accidents in any part of the supply chain.
The US. Food and Drug Administration (FDA) is the regulatory arm of the Department of Health and Human Services (DHS). It protects the public from deliberate attacks against our food and beverage supply as well as accidents that can lead to foodborne illnesses, such as the recall of E.coli-contaminated romaine lettuce in 2018.

University War Game Exercise Provides Training on How to Cope with Bioterrorism Attack

The University of Washington is one of the creators of a tabletop war game exercise involving a mock bioterrorist attack on food and an infectious disease. According to the UW website, this scenario involves "four fictional countries varying in population size and resources and their respective health departments and local emergency responders."
In responding to 22 separate incidents as the outbreak unfolds, participants discuss policy issues, such as:

- Who is responsible?
- What information is needed?
- When is public information given out?

The game's intended audience is "anyone who would be responding to a public health emergency." According to UW, that includes people such as:

- Hospital administrators and clinicians
- Public health administrators
- Nurses
- Laboratory directors
- Environmental health staff
- School district administrators
- First responders such as emergency medical services, fire safety, law enforcement and emergency medical technicians

2005 Workshop Identified Foodborne Threats to Public Health

In 2005, the Institute of Medicine's Forum on Microbial Threats hosted a public workshop in Washington, D.C., to examine issues critical to the U.S. food supply. The workshop resulted in the production of a 2006 report, Addressing Foodborne Threats to Health, which described how to protect the U.S. food supply. The report documents the range of chemicals -- from natural and man-made contamination sources -- that could poison the U.S. food and beverage supply.

The workshop also identified more than 250 foodborne diseases from information provided by the Centers for Disease Control and Prevention (CDC). The workshop also focused on ways to prevent accidental poisoning as well as deliberate threats. The workshop was partially the result of the U.S. government taking a serious stand on food and beverage safety with more than 15 federal agencies practicing oversight of our distribution systems.

Universities are Leading the Way in Food and Beverage Safety

Besides the U.S. government, state and local agencies, many U.S. universities are focusing on education, research and reporting on ways to improve U.S. food safety. For instance, Purdue University is one of many universities conducting research on chemicals that contain harmful microorganisms that could enter vegetables and other plants. Similarly, Regent University of California researchers are examining cantaloupes for harmful pathogens from washing and storage methods.

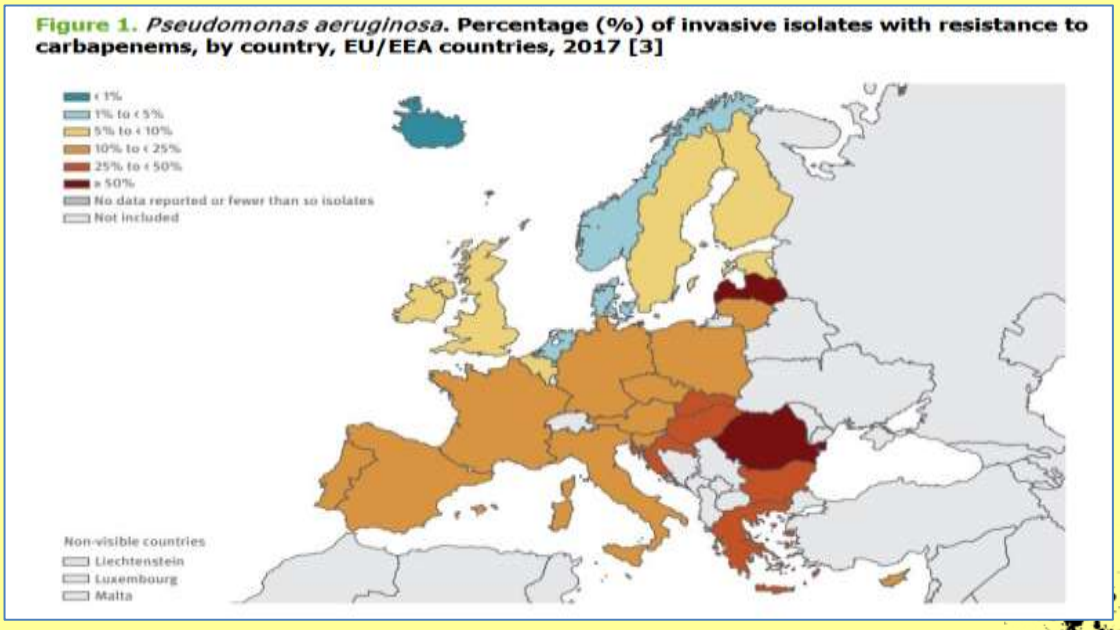
Food safety is a worldwide concern. In the Netherlands, Wageningen University has announced that it will open a new research facility for food safety in 2019.

Today's college students, as well as industry and government agencies, are well positioned to address the subject of bioterrorism thanks to education, training and awareness. In the future, terrorists seeking to contaminate U.S. foods and beverages will have a more difficult chance of success thanks to greater bioterrorism awareness.

Dr. Oliver Hedgepeth *is a full-time professor at American Military University (AMU). He was program director of three academic programs: Reverse Logistics Management, Transportation and Logistics Management and Government Contracting. He was Chair of the Logistics Department at the University of Alaska Anchorage. Dr. Hedgepeth was the founding Director of the Army's Artificial Intelligence Center for Logistics.*

Rapid risk assessment: Outbreak of VIM-producing carbapenem-resistant Pseudomonas aeruginosa linked to medical tourism to Mexico

Source: https://ecdc.europa.eu/sites/portal/files/documents/27-02-2019-RRA-Pseudomonas%20aeruginosa%2C%20Carbapenems%2C%20Surgical%20site%20infection-Mexico-final%20for%20web.pdf



Only a few European Union (EU)/European Economic Area (EEA) citizens are likely to have travelled to and undergone surgical procedures in the healthcare facilities associated with the outbreak, mainly the Grand View Hospital, in Tijuana, Mexico. Therefore, the risk of introduction and further spread of VIM-CRPA from this specific outbreak to healthcare facilities in the EU/EEA is low. However, there is an ongoing high risk of multi-drug-resistant organisms (MDROs) being imported into hospitals and other healthcare settings in the EU/EEA from patients hospitalized abroad for planned medical procedures and unexpected medical events. This applies to patients who travel and are hospitalized within the EU/EEA as well as outside the EU/EEA.

Madagascar – Plague

Source: http://outbreaknewstoday.com/madagascar-plague-cases-top-100/

Mar 09 – Plague is endemic in Madagascar, and a seasonal upsurge, predominantly of the bubonic form, usually occurs yearly between September and April. According to the general secretary of the Madagascar Ministry of Health, between 300 and 600 suspected cases are reported each year, with about 30 cases of pulmonary plague and 10 to 70 deaths.
Since August 2018, Madagascar health officials have reported 105 human plague cases. Of these, 91 cases were identified as bubonic plague, while 14 were pneumonic plague. Of the bubonic plague cases reported to date, 19 people have died; 12 of the 14 pneumonic plague cases also perished.
The districts that include confirmed cases of plague are Manandriana, Tsiroanomandidy, Ambositra, Midongy Atsimo, Ambalavao, Befotaka, Ambatofinandrahana, Miarinarivo, Anjozorobe, Faratsiho, Fianarantsoa, Moramanga, Ankazobe, Arivonimamo, Betafo, and Mandoto.
Plague is an infectious disease caused by the bacterium *Yersinia pestis*. It is found in animals throughout the world, most commonly rats but also other rodents like ground squirrels, prairie dogs, chipmunks, rabbits, and voles. Fleas typically serve as the vector of plague. Human cases have been linked to the domestic cats and dogs that bring infected fleas into the house.
People can also get infected through direct contact with an infected animal, through inhalation, and, in the case of pneumonic plague, person to person. *Y. pestis* [infection] is treatable with antimicrobials if started early enough.

Comment (ProMED-EAFR)
Plague infections on Madagascar have been relatively quiet since the dramatic outbreak in 2017.

The following paragraph is from Chanteau S, Ratsifasoamanana L, Rasoamanana B, et al. Plague, a reemerging disease in Madagascar. Emerg Infect Dis 1998;4(1):101-4, PMID: 9452403; available at <http://wwwnc.cdc.gov/eid/article/4/1/98-0114_article.htm>.

"Between 1930 and 1990, bubonic plague had 'virtually disappeared' on the island due to efficient pest-control and good health management. However, since 1990, an **annual 200 cases** are being reported and bubonic plague takes on epidemic form, especially in the port of Mahajanga, each year. In the capital city of Antananarivo, more cases are also being notified each year since 1990. **Madagascar (pop. 13 million) has accounted for 45% of all the cases of plague in Africa**."
Fatalities related to plague usually are caused by spread of the organism from the bubo (the very painful infected lymph node that drains the area where the flea bite occurred) to the bloodstream. The bacteremia can cause a coagulopathy, producing the purpura seen in the "black plague", and also may spread to the lungs causing a hemorrhagic pneumonia. It is the pneumonia that can facilitate person-to-person transmission.
Madagascar was the location of the isolation of **multi-antimicrobial resistant *Yersinia pestis* in 1995** (Galimand M, Guiyoule A, Gerbaud G, et al. Multidrug resistance in *Yersinia pestis* mediated by a transferable plasmid. N Engl J Med. 1997;337(10):677-80, PMID:

9278464; available at <http://www.nejm.org/doi/full/10.1056/NEJM199709043371004>). The strain was resistant to chloramphenicol, streptomycin, and tetracycline but sensitive to fluoroquinolones and trimethoprim as well as other aminoglycosides. This was an ominous observation; however, it is not clear whether this naturally occurring strain has persisted or spread. – Mod.LL

Anthrax Treatment Market is Set to Experience Revolutionary Growth by 2028

Source: http://www.thebusinessinvestment.com/2019/03/13/anthrax-treatment-market-is-set-to-experience-revolutionary-growth-by-2028/

Mar 13 – Anthrax is a harmful disease that affects humans as well as animals such as sheep, goats, horses and cattle. It is a life-threatening infection caused by a bacterium called *Bacillus anthracis*. *Bacillus anthracis* is a gram-positive and rod-shaped bacterium generally transmitted from animals. Anthrax spreads through three main routes: digestive route, aerial route and contact through skin. Over the past few years, anthrax has gained great popularity due to its use in bioterrorism. The spores of anthrax have been used for mass infection and in biological warfare.

Anthrax is not a communicable disease and anthrax skin infection is the most common amongst all infections. It develops an ulcer with a black center called as eschar. Ingestion of anthrax can cause seriously fatal diseases. The most lethal type is inhalation anthrax. Inhalation anthrax progresses rapidly with high fever, rapid breathing, shortness of breath, blood vomits, sweating, and chest pains that lead to heart attacks. Common symptoms of anthrax in human beings for respiratory infection include pneumonia and severe respiratory collapse. Diagnosis of anthrax infection is mostly done through a CT scan and an X-ray of lungs, a blood test for anthrax antigens and a biopsy skin test. Enzyme-Linked Immunosorbent Assay (ELISA) and Chemiluminescence based kits are available for the diagnosis of anthrax.

According to CDC, anthrax is classified as a Category A agent with serious bioterrorism potential. BioThrax (manufactured by Emergent BioSolutions, Inc.) is the only FDA-approved vaccine provided as a pre-exposure protection from anthrax infections.

Anthrax Treatment Market: Drivers and Restraints

The need for more appropriate methods for anthrax treatment is high, which is expected to be the prime factor driving the growth of the global anthrax treatment market. Increasing

healthcare investments in emerging economies, growing awareness about the availability of treatments and rise in research funding are anticipated to drive the growth of the global anthrax treatment market. Increasing public-private partnerships in order to facilitate novel developments for the innovative and effective treatment of anthrax are some other factors expected to further drive revenue generation in the anthrax treatment market. However, the high cost associated with diagnostic treatment is restraining the growth of the global anthrax treatment market.

Anthrax Treatment Market: Segmentation

Tentatively, the global anthrax treatment market can be segmented on the basis of anthrax type, drug class, distribution channel and geography. On the basis of anthrax type, the global anthrax treatment market can be segmented as: Cutaneous Anthrax, inhalation anthrax, gastrointestinal anthrax, injection anthrax; On the basis of drug class, the global anthrax treatment market can be segmented as: Fluoroquinolone,Tetracycline, others; On the basis of distribution channel, the global anthrax treatment market can be segmented as: Hospitals Pharmacies, Retail Pharmacies, e-commerce, Drug Stores, Others,

Anthrax Treatment Market: Overview: Anthrax infects people when spores get into the body. The disease is treatable in the early stages of the infection. The skin infection can be treated with common antibiotics such as erythromycin, ciprofloxacin, penicillin and tetracycline. Based on anthrax type, the global anthrax treatment market can be segmented into cutaneous anthrax, inhalation anthrax, gastrointestinal anthrax and injection anthrax. Amongst all, inhalation anthrax is considered to be the most lethal type of anthrax. According to CDC, anthrax is generally found in agricultural regions of Sub-Saharan Africa, Central and South America, Southern and Eastern Europe, Central and Southwestern Asia and the Caribbean. Anthrax is rare in the U.S. and very common in developing countries.

Anthrax Treatment Market: Regional Outlook

Geographically, the global anthrax treatment market can be classified into eight regions viz. North America, Latin America, Western Europe, Eastern Europe, Asia-Pacific excluding China and Japan, China, Japan, Middle East and Africa. Europe is expected to dominate the global anthrax treatment market due to the prevalence of anthrax in this region. North America is expected to be the second largest market for anthrax treatment. The Asia Pacific market is slated to experience delayed growth due to a lack of awareness towards anthrax treatment and diagnosis and low disposable income. The treatment for gastrointestinal and inhalational anthrax is expensive. Moreover, the market for anthrax treatment is focused on countries that face a threat of terrorist attacks.

Anthrax Treatment Market: Key Players

Some of the players identified in the global anthrax treatment market include Glaxo SmithKline Pharmaceuticals Ltd., Elusys Therapeutics, Inc., Emergent BioSolutions, Inc., PharmAthene, Inc., Teva Pharmaceutical Industries Ltd., Novartis AG, Bayer AG and others.

A sample of this report is available upon request @ https://www.futuremarketinsights.com/reports/sample/rep-gb-6873

Global Oral Vaccines market illuminated by new report

Source: https://www.whatech.com/market-research/medical/573089-global-oral-vaccines-market-research-report-by-product-type-end-user-application-and-regions-countries

Mar 13 – The global market for oral vaccines is primarily driven by increasing prevalence of infectious diseases in developing countries, bioterrorism, resistance to existing vaccines, etc.

In recent years, there has been colossal increment in the interest for sans needle antibodies because of clear decision to increasingly agreeable oral conveyance over parenteral organization. Oral vaccines hold potential to take inoculation to new dimension of magnificence, because of more adherence to immunization routine.

For profoundly irresistible ailments, for example, regular influenza, individuals lean toward oral immunizations to maintain a strategic distance from danger of defiled needles and syringes to wellbeing laborers, require less qualified wellbeing specialists and furthermore are less exorbitant than injectable antibodies. The main oral antibodies came into market was Sabin lessened strains trivalent polio antibody (tOPV), which saw enormous accomplishment since as far as inoculation and populace acknowledgment in Americas, Europe and Western Pacific, since 1999.

Oral polio immunizations animate mucosal insusceptibility and along these lines is increasingly powerful in transmission of infection. With the advancement of oral immunizations worldwide endeavors to control infectious maladies, for example, cholera and influenza, are entering another dimension as they offer a chance to anticipate flare-up among populace living in powerless zones.

Oral antibodies are likewise favored for vaccination for untamed life populace for horrendous sicknesses, for example, rabies. A portion of the instances of business oral immunizations incorporate Vaxchora (cholera), Vivotif, (typhoid), RABORAL V-RG (rabies), Tetramune, Rotateq, Rotashield, (Rotavirus), Dukoral (Cholera, the runs), LUIVAC (respiratory disease), Biostim (Klebsiella) and numerous others.

The worldwide market for Oral vaccines is essentially determined by expanding predominance of irresistible maladies in creating nations, bioterrorism, protection from existing immunizations, and so forth. Furthermore, tolerant adherence to sans needle antibody routine, inclination to oral immunizations by kids and geriatric populace, practical nature, ongoing FDA endorsements to oral immunizations for maladies, for example, cholera and so forth are a portion of the variables anticipated that would fuel the development of worldwide oral antibodies advertise.

In any case, traded off immunogenicity in youngsters and cost for keeping up a chilly chain, unavailability in remote zones and so on are a portion of the components restricting development of worldwide oral immunizations showcase. For example, upkeep of chilly chain for oral immunizations over the globe costs over US$ 300 Mn for each year.

Advancement of new conveyance framework for oral antibodies may result in more effectiveness of these items and may result in less disappointment rate for clinical preliminaries. Improvement of minimal effort oral antibodies for new signs not yet secured by existing immunizations presents tremendous open door for analysts in this field as this may build the take-up of nations with low vaccination availability.

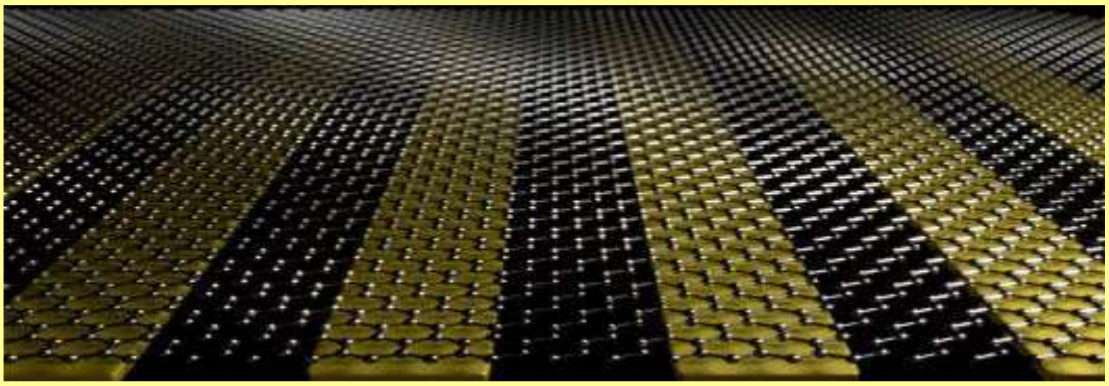
As of now, a few Oral vaccines items are being assessed in clinical preliminaries, yet they require progressively broad human examinations to set up the adequacy.

New Graphene-Based Device Is First Step Toward Ultrasensitive Biosensors

Source: https://phys.org/news/2019-03-graphene-based-device-ultrasensitive-biosensors.html

Mar 07 – Researchers in the University of Minnesota College of Science and Engineering have developed a unique new device using the wonder material graphene that provides the first step toward ultrasensitive biosensors to detect diseases at the molecular level with near perfect efficiency. Ultrasensitive biosensors for probing protein structures could greatly improve the depth of diagnosis for a wide variety of diseases extending to both humans and animals. These include Alzheimer's disease, Chronic Wasting Disease, and mad cow disease—disorders related to protein misfolding. Such biosensors could also lead to improved technologies for developing new pharmaceutical com-pounds. The research is published in *Nature Nanotechnology*, a peer-reviewed scien-tific journal published by Nature Publishing Group. "In order to detect and treat many diseases we need to detect protein mole-cules at very small amounts and understand their structure," said Sang-Hyun Oh, University of Minnesota electrical and computer engineering professor and lead researcher on the study. "Currently, there are many technical challenges with that process. We hope that our device using graphene and a unique manufactur-ing process will provide the fundamental research that can help overcome those challenges." Graphene, a material made of a single layer of carbon atoms, was discovered more than a decade ago. It has enthralled researchers with its range of amazing properties that have found uses in many new applications, including creating better sensors for detecting

diseases. Significant attempts have been made to improve biosensors using graphene, but the challenge exists with its remarkable single atom thickness. This means it does not interact efficiently with light when shined through it. Light absorption and conversion to local electric fields is essential for detecting small amounts of molecules when diagnosing diseases. Previous research utilizing similar graphene



nanostructures has only demonstrated a light absorption rate of less than 10 percent. In this new study, University of Minnesota researchers combined graphene with nano-sized metal ribbons of gold. Using sticky tape and a high-tech nanofabrication technique developed at the University of Minnesota, called "template stripping," researchers were able to create an ultra-flat base layer surface for the graphene. They then used the energy of light to generate a sloshing motion of electrons in the graphene, called plasmons, which can be thought to be like ripples or waves spreading through a "sea" of electrons. Similarly, these waves can build in intensity to giant "tidal waves" of local electric fields based on the researchers' clever design. By shining light on the single-atom-thick graphene layer device, they were able to create a plasmon wave with unprecedented efficiency at a near-perfect 94 percent light absorption into "tidal waves" of electric field. When they insert-ed protein molecules between the graphene and metal ribbons, they were able to harness enough energy to view single layers of protein molecules. "Our computer simulations showed that this novel approach would work, but we were still a little surprised when we achieved the 94 percent light absorption in real devices," said Oh, who holds the Sanford P. Bordeau Chair in Electrical Engineering at the University of Minnesota. "Realizing an ideal from a computer simulation has so many challenges. Everything has to be so high quality and atomically flat. The fact that we could obtain such good agreement between theory and experiment was quite surprising and exciting."

More Information: *In-Ho Lee et al, Graphene acoustic plasmon resonator for ultrasensitive infrared spectroscopy, Nature Nanotechnology (2019). DOI: 10.1038/s41565-019-0363-8*

Bioterrorism in India

Source: https://www.deccanchronicle.com/nation/current-affairs/180319/bioterrorism-in-india.html

Mar 18 – Although bioterrorism might seem a problem beginning in the late 20th century, a short story, `written by H.G.Wells in 1894, portended the threat of an attack with biological agents. It tells the tale of an anarchist who steals a vial of what he believes to be cholera bacilli to poison the water supply of the city of London.

As predicted by Wells, several incidents of bioterrorism have been witnessed the world over, but there has not been a single documented case of bioterrorism in India to date. But there have been few incidents in the past that might have been biological attacks, given the fact that it is tough to differentiate natural epidemics from biological attacks.

During the Indo-Pakistan war of 1965, a scrub typhus outbreak in northeastern India came under suspicion. Other cases which could not be officially confirmed as events of bio-terror include, the spread of bubonic plague in Surat in 1994 which caused several deaths,

dengue hemorrhagic fever in Delhi in 1996, anthrax in Midnapur in 1999 and encephalitis in Siliguri in 2001 and an anthrax scare in 2001 at Mantralaya in Mumbai.

Recent Nipah Virus outbreak which happened in 2018 in Perambra, Kerala has the physical attributes to serve as a potential agent of bioterrorism. The first human outbreak of Nipah virus was reported from Malaysia among pig farmers in 1998. The virus was named Nipah after the name of the village of "Sungai Nipah", in Malaysia. There were several outbreaks in Bangladesh and the first reported outbreak was in 2001. There was an outbreak in Nadia, West Bengal in 2007. The present epidemic in India after nearly 11 years with a high case fatality rate indicates that there is a total lack of health care systems preparedness and surveillance strategy.

India also appears ill-equipped to face the threat of bioterrorism, as was evident from the recent H1N1 epidemic, which claimed over 2,300 lives. We must know and get acquainted with this form of terror before it becomes an enormous challenge to our Health Department. Early detection and quick response to bioterrorism are contingent on close cooperation between public health authorities and law enforcement; however, such collaboration is currently lacking. The threat of bioterrorism is the most probable when compared to other weapons of mass destruction (WMDs), owing to rapid advancements in the field of synthetic biology besides the existence of hostile neighbours like Pakistan and Bangladesh. In 2002 at Kandahar, Afghanistan, the Pentagon detected anthrax at a suspected Al-Qaeda biological weapons site together with equipment conventionally used in biowarfare programme. Later some sketches and calculations to make helium-powered balloon bomb filled with anthrax was discovered in the Kabul office of an NGO headed by Bashiruddin Mahmood, one of the two Pakistani nuclear scientists arrested in Islamabad for questioning on their alleged links with Osama Bin Laden.

The links of Al Qaeda with four terrorist groups in India are well established. These groups are Lashkar-e-Taiba, Jaish-e-Mohammad, Harkat-ul-Jihad-ul-Islami and Harkat-ul- Mujahidin. On account of the close link of these terrorist groups with Al -Qaeda, there is a real risk of these terrorist groups launching a biological attack in India in the future. Besides the above state actors, there are numerous non-state actors in India and her neighbourhood as well.

High population density, subtropical climatic conditions, coupled with poor hygiene and inadequate sanitation facilities make India extremely susceptible and suitable for the spread of infectious diseases. Inadequate medical facilities and non-availability of medical services in remote areas make the circumstances still more ideal for contagious diseases to run like

wildfire. It's shocking but true that on an average a single government doctor serves nearly 12,000 people.

On top of it all, any battle with bioterrorism is fraught with numerous challenges, the first and foremost challenge being the collection or isolation of the microbes and their identification. It's challenging to pinpoint the origin of infection or the site of an outbreak or arrive at a realisation that a bioterrorism attack has been unleashed on the population. Without such information, it would be challenging to combat the assault as we would fail to press into action the concerted efforts of various agencies entrusted with the responsibility. Insofar as preparedness of India to a bioterrorist attack is concerned, it's incredibly deficient from the viewpoint of infrastructure, trained personnel, scientific expertise and public education. The existent institutional mechanisms lack proper coordination to counter any bioterrorism attack.

The fact of the matter is that we have not had any bioterrorism attack so far, which could be the reason why we find ourselves complacent, making our country that much more vulnerable to unsuspecting attacks, thereby considerably endangering the lives. It's imperative that we learn and gear up fully before such an eventuality occurs and becomes a massive challenge to us. Early detection and rapid response to bioterrorism hinges upon close cooperation between public health authorities and law enforcement. However, we seem to be lacking such collaboration at the moment.

To keep India battle ready to counter a bioterrorism attack, the National Disaster Management Authority (NDMA), Govt. of India (GoI) has proposed a model instrument where participation of both government and private sectors is a sine qua non to defeat any such attack. As epidemics have the potential to wreak havoc on a large scale like chemical and nuclear weapons, a multi-sector approach has been envisaged to be adopted. In India, several nodal ministries have been earmarked for dealing with epidemics caused by bioterrorism.

The central departments which are involved are Ministry of Health and Family Welfare (MoH and FW) which is one of the main ministries tasked with providing directions and technical support for capacity building, surveillance and early detection of an outbreak. Health ministry also helps in the deployment of Rapid Response Team's, human resources and logistic support. The Ministry of Home Affairs (MHA) is another nodal ministry which works in conjunction with MoH and FW. MHA is responsible for the assessment of the threat, intelligence inputs and implementation of preventive mechanisms. National Disaster Response Force (NDRF) is a specialised force constituted under MHA to deal with chemical, biological, radiological and nuclear (CBRN) attacks. It consists of 12 battalions, three each from the BSF and CRPF and two each from CISF, ITBP and SSB.

Each battalion has 18 independent specialist search and rescue parties of 45 personnel each including engineers, technicians, electricians, dog squads and medical/paramedics. The total strength of each battalion is 1,149. All the 12 battalions have been equipped and trained to respond to natural as well as human-made disasters. Battalions are also trained and equipped for response during CBRN emergencies. Besides, the Ministry of Defence (MOD) manages the matters and consequences of biowarfare. Clinical case management is backed by the Indian Army, as they have several hospitals nationwide. They use ambulances, aircraft and ships to handle casualties. The Defence R&D Organization (DRDO) is actively pitched into developing protective systems and equipment for troops to contend against nuclear, biological and chemical warfare.

The other ministries which are also responsible are the Ministry of Environment, Forests and Climate Change for evaluation of short and long-term consequences, the Ministry of Agriculture, the Department of Animal Husbandry, Dairying and Fisheries, Urban or Rural Development Ministry and Department of Drinking Water Supply, Indian Railways etc. NDMA has been made responsible for promulgating policies on management and approving plans of different ministries. And the National Crisis Management Committee (NCMC) coordinates and monitors responses in crises especially in disasters. It provides strong coordination and implementation of relief measures during disasters.

In order to enhance the preparedness of India towards bio-terror attacks, we should emulate the West and formulate training

exercises and implement technologies that are being adopted in countries like the USA and Europe. For instance, the state of New York in September 2016, held the fourth edition of its massive emergency response training exercise called the Excelsior Challenge, which is a training exercise designed for police and first responders to become familiar with techniques and practices should a real incident occur. "In 1999, the University of Pittsburgh's Center for Biomedical None Informatics deployed the first automated bioterrorism detection system, called Real-Time Outbreak Disease Surveillance (RODS), which collects data from many data sources and uses them to detect a possible bioterrorism event at the earliest possible moment.

The city of New York has developed unique software to combat bioterrorism. The tool called the New York City Syndromic Surveillance System tracks disease progression throughout the City of New York. We would do better if we conduct exercises like "Dark Winter" to know our preparedness and inadequacies in overcoming bio-terror attacks.

Bioterrorism is a low-probability, high-impact event. Biological agents imperil human, livestock and crop health, and thereby hurt the Indian economy. It's therefore imperative that we enhance our understanding of them with the intention of dealing with them effectively. Political awareness and public participation are indispensable for threat alleviation. In a country like India, where the population is on the increase by the day and has exceeded a billion, preventive strategies and efforts against bioterrorism require to be strengthened, improved and made useful. Such preparedness against bioterrorism will also capacitate our populace against natural epidemics, thus transforming India into a resilient society.

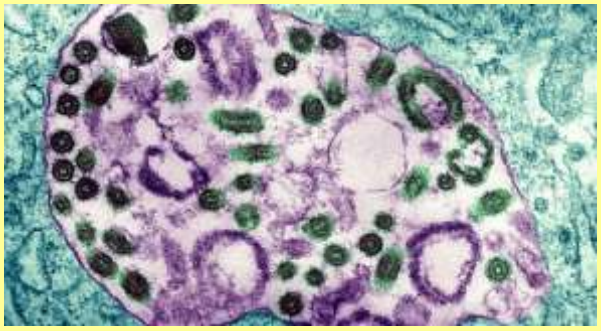
Author Damian Mark Smyth says, "We're One, we've always been One, we'll always be One until we think we are not." And herein lies our challenge, we are one, but we think we are separate; we have forgotten our Oneness. As a result of our mistaken belief that we are separate, we have created an imaginary world of duality which is leading to terrorism, war, conflict and suffering. When all the people on this planet realise they are one, there will be nothing to fight against and no strife.

Bioterror fears over Marburg virus, Ebola's deadlier 'cousin', as US begins $10m vaccine project

Source: https://www.telegraph.co.uk/news/2019/03/19/bioterror-fears-marburg-ebolas-deadlier-cousin-us-begins-10m/

Mar 19 – America has begun a $10m project making a vaccine to a deadly cousin of the Ebola virus considered a potential bioterrorism weapon.

Finding a way to stop Marburg virus is "an urgent public health and biodefence need", the US government said.



The hemorrhagic fever virus has caused a string of deadly outbreaks in Africa since it was discovered in the 1960s. Several outbreaks have had high mortality rates, killing four-out-of-five infected.

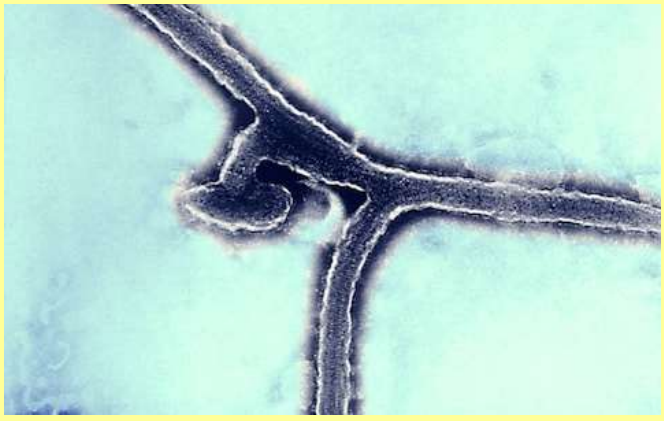
"In addition to the threat of naturally occurring infection, the Marburg virus, like Ebola, is deemed a potential bioterrorism threat by the US Department of Homeland Security," a statement said.

The US government's Biomedical Advanced Research and Development Authority (BARDA) has awarded a two-year, $10 million contract to a Massachusetts-based biotech firm to work on the vaccine.

Public Health Vaccines will start with a promising potential vaccine already identified by the Canadian government.
The Canadian vaccine is still in pre-clinical stages of development and the contract aims to show producing the vaccine is feasible.
"If that initial development succeeds, BARDA has the option to provide additional funding for a total of up to $72 million to advance the Marburg virus vaccine through a Phase 2 clinical trial, and begin development of a vaccine candidate against the Sudan Ebola virus, a closely related virus, as well," a statement said.
Marburg affects humans, monkey and apes and was first identified in 1967 when haemorrhagic fever outbreaks broke out simultaneously in laboratories in Marburg and Frankfurt in Germany, and Belgrade.
The laboratory workers all had contact with the blood, organs or cell-cultures from a batch of imported African green monkeys from north-western Uganda.
The outbreak then spread to relatives or medics caring for those infected. Seven people died. The most severe outbreak yet, in Angola in 2005, is thought to have killed 329 people, or 88 per cent of those infected.
America's Centres for Disease Control lists Marburg virus and the closely related Ebola virus, as a category A potential bioterrorism agent, alongside killer germs such as smallpox, plague and anthrax.
The pathogens are considered high priority and a potential threat to national security because they spread quickly, have high mortality and have the potential to cause widespread panic.
Marburg virus survives inside the African fruit bat, Rousettus aegyptiacus. These cave-dwelling hosts do not show obvious signs of illness, but when primates become infected it can be highly lethal.
Recent outbreaks are thought to have jumped from animals to humans who had contact with bats, for example through droppings. Once humans are infected, they can pass it to through direct contact, often with medics or relatives.

About Marburg virus disease

Marburg virus disease (MVD) is a hemorrhagic fever symptomatically identical to Ebola virus disease, it caused by the two Marburg viruses MARV and RAVV. The disease was identified after an outbreak in the German city of Marburg in 1967, associated with imported lab monkeys.



After an incubation period of up to 21 days, symptoms include high fever, nausea, rashes and abdominal pain. After five days symptoms progress to include shortness of breath, delirium, then subdermal bleeding, bloody stools and possibly vomiting blood. After two weeks, patients either worsen until death or experience a "convalescent" phase that may include muscle pain, hepatitis and psychosis.
MVD is fatal in up to 88 per cent of cases, causing death by multiple organ failure.
The virus is sometimes known to persist in individuals who have otherwise recovered, remaining, for example, in the breast milk of a nursing mother.

How it spreads

- Outbreaks of the disease have been associated with repeated visits to caves and mines in equatorial Africa. It is thought that the natural hosts of the Marburg viruses are the Old-World fruit bats known as flying foxes.
- MVD is transmitted between humans through direct contact with the bodily fluids of infected individuals.

How to prevent it

- Reduce risk of contact with infected bats and wear protective clothing when visiting caves.
- Avoid close physical contact with infected patients or with their bodily fluids.
- Bury the dead promptly and safely.
- Quarantine people who are likely to have been infected for 21 days.

How it is treated

There is no proven treatment available for MVD, although several are being evaluated. Treatment of patients is limited to rehydration and treatment of symptoms.

Development and Performance of a Checklist for Initial Triage After an Anthrax Mass Exposure Event

Ann Intern Med. 2019.
DOI: 10.7326/M18-1817

By Nathaniel Hupert, Marissa Person, Dan Hanfling, et al.

Source: https://annals.org/aim/article-abstract/2728713/development-performance-checklist-initial-triage-after-anthrax-mass-exposure-event

Abstract

Background

Population exposure to *Bacillus anthracis* spores could cause mass casualties requiring complex medical care. Rapid identification of patients needing anthrax-specific therapies will improve patient outcomes and resource use.

Objective

To develop a checklist that rapidly distinguishes most anthrax from nonanthrax illnesses on the basis of clinical presentation and identifies patients requiring diagnostic testing after a population exposure.

Design

Comparison of published anthrax case reports from 1880 through 2013 that included patients seeking anthrax-related care at 2 epicenters of the 2001 U.S. anthrax attacks.

Setting

Outpatient and inpatient.

Patients

408 case patients with inhalation, ingestion, and cutaneous anthrax and primary anthrax meningitis, and 657 control patients.

Measurements

Diagnostic test characteristics, including positive and negative likelihood ratios (LRs) and patient triage assignation.

Results

Checklist-directed triage without diagnostic testing correctly classified 95% (95% CI, 93% to 97%) of 353 adult anthrax case patients and 76% (CI, 73% to 79%) of 647 control patients (positive LR, 3.96 [CI, 3.45 to 4.55]; negative LR, 0.07 [CI, 0.04 to 0.11]; false-negative rate, 5%; false-positive rate, 24%). Diagnostic testing was needed for triage in up to 5% of case patients and 15% of control patients and improved overall test characteristics (positive LR, 8.90 [CI, 7.05 to 11.24]; negative LR, 0.06 [CI, 0.04 to 0.09]; false-negative rate, 5%; false-positive

rate, 11%). Checklist sensitivity and specificity were minimally affected by inclusion of pediatric patients. Sensitivity increased to 97% (CI, 94% to 100%) and 98% (CI, 96% to 100%), respectively, when only inhalation anthrax cases or higher-quality case reports were investigated.

Limitations
Data on case patients were limited to non-standardized, published observational reports, many of which lacked complete data on symptoms and signs of interest. Reporting bias favoring more severe cases and lack of intercurrent outbreaks (such as influenza) in the control populations may have improved test characteristics.

Conclusion
A brief checklist covering symptoms and signs can distinguish anthrax from other conditions with minimal need for diagnostic testing after known or suspected population exposure.

Primary Funding Source: U.S. Department of Health and Human Services.

How deadly pathogens have escaped the lab — over and over again

Source: https://www.vox.com/future-perfect/2019/3/20/18260669/deadly-pathogens-escape-lab-smallpox-bird-flu

Mar 20 – **In 1977, the last case of smallpox was diagnosed in the wild.** The victim was Ali Maow Maalin of Somalia. The World Health Organization tracked down every person he'd been in face-to-face contact with to vaccinate everyone at risk and find anyone who might have caught the virus already. Thankfully, they found no one had. Maalin recovered, and smallpox appeared to be over forever.

That moment came at the end of a decades-long campaign to eradicate smallpox — a deadly infectious disease that killed about 30 percent of those who contracted it — from the face of the earth. Around 500 million people died of smallpox in the century before it was annihilated.

But in 1978, the disease cropped back up — in Birmingham, in the United Kingdom. Janet Parker was a photographer at Birmingham Medical School. When she developed a horrifying rash, doctors initially brushed it off as chicken pox. After all, everyone knew that smallpox had been chased out of the world — right?

Parker got worse and was admitted to the hospital, where testing determined that she had smallpox after all. She died of it a few weeks later.

How did she get a disease that was supposed to have been eradicated?

It turned out that the building that Parker worked in also contained a research laboratory, one of a handful where smallpox was studied by scientists who were trying to contribute to the eradication effort. Some papers reported that the lab was badly mismanaged, with important precautions ignored because of haste. (The doctor who ran the lab died by suicide shortly after Parker was diagnosed.) Somehow, smallpox escaped the lab to infect an employee elsewhere in the building. Through sheer luck and a rapid response from health authorities, including a quarantine of more than 300 people, the deadly error didn't turn into an outright pandemic.

Could something like that happen today?

All over the world, bio research labs handle deadly pathogens, some with the potential to cause a pandemic. Sometimes, researchers make pathogens even deadlier in the course of their research (as Science Magazine reported last month, the US government just approved two such experiments after years of keeping them on hold).

Research into viruses can help us develop cures and understand disease progression. We can't do without this research. But on a few notable occasions, it's gone dangerously wrong and even killed people. Reviewing the incidents, it looks like there are many different points of failure — machinery that's part of the containment process malfunctions; regulations aren't sufficient or aren't followed. Human error means live viruses are handled instead of dead ones.

Sometimes, these errors could be deadly. "If an enhanced novel strain of flu escaped from a laboratory and then went on to cause a pandemic, then causing millions of deaths is a serious risk," Marc Lipsitch, a professor of epidemiology at Harvard, told me.

It's not that there's a high rate of mistakes in these labs; the rate of mistakes is actually quite low. But it's one thing to run a one-in-thousands chance of killing a handful of others from a mistake — the odds we face over a lifetime of driving. It's another thing entirely to accept a similar probability of killing millions of people.

The cost-benefit analysis for pathogens which might kill the people exposed or a handful of others is vastly different from the cost-benefit analysis for pathogens which could cause a global pandemic — but our current procedures don't really account for that. As a result, we're running unacceptable risks with millions of lives.

How pathogens can find their way out of the lab

The US government controls research into "select agents and toxins" that pose a serious threat to human health, from bubonic plague to anthrax. There are 66 select agents and toxins regulated under the program and nearly 300 labs approved to work with them. Researching pathogens and toxins allows us to develop vaccines, diagnostic tests, and treatments. New biology techniques also allow for more controversial forms of research, including making diseases more virulent or more deadly to anticipate how they might mutate in the wild.

So this research can be really important, and a critical part of public health efforts. Unfortunately, the facilities that do such work can also be plagued by a serious problem: human error.

The 1978 smallpox death was, most analyses found, caused by carelessness — poor lab safety procedures and badly designed ventilation. Most people would like to think that we're not so careless today. But scary accidents — caused by human error, software failures, maintenance problems, and combinations of all of the above — are hardly a thing of the past.

In 2014, as the Food and Drug Administration (FDA) did cleanup for a planned move to a new office, hundreds of unclaimed vials of virus samples were found in a cardboard box in the corner of a cold storage room. Six of them, it turned out, were vials of smallpox. No one had been keeping track of them; no one knew they were there. They may have been there since the 1960s.

Panicked scientists put the materials in a box, sealed it with clear packaging tape, and carried it to a supervisor's office. (This is not approved handling of dangerous biological materials.) It was later found that the integrity of one vial was compromised — luckily, not one containing a deadly virus.

In a lengthy report on how the incident happened, the FDA found persistent, horrifying shortcomings in the handling of these incredibly dangerous materials. Among them:

The security and inventory control of orphaned biological materials (material whose owner departed the lab, but did not properly remove, destroy, or transfer the material to a new owner) was not maintained.

...

FDA did not follow the CDC Select Agent Guidelines for the packaging and transfer of samples to a high containment facility for securing the materials.

...

FDA did not conduct a complete inventory of all of its laboratories and associated spaces when smallpox was eradicated in 1980 and all biological agents that cause smallpox were consolidated under the WHO Collaborating Centre repositories at the CDC. FDA also did not conduct a complete inventory when the Federal Select Agent Program was enacted in 2003.

The blizzard of dangerous errors over only a few months in 2014, and the additional errors uncovered by subsequent investigations, inspired the US government to change its practices. The government called on all labs that handle secure substances to immediately improve their inventory policies and review their procedures, and to provide written documentation that they'd done so. It launched government-wide reviews to better understand how to safely regulate pandemic pathogens. The FDA began providing better training and conducting periodic audits to make sure that the safety procedures that were ignored in this case are being followed.

The 1979 and 2014 incidents grabbed attention because they involved smallpox, but incidents of unintended exposure to controlled biological agents are actually quite common. Hundreds of incidents occur every year, though not all involve potentially pandemic pathogens.

In 2014, a researcher accidentally contaminated a vial of a fairly harmless bird flu with a far deadlier strain. The deadlier bird flu was then shipped across the country to a lab that didn't have authorization to handle such a dangerous virus, where it was used for research on chickens.

The mistake was discovered only when the Centers for Disease Control and Prevention (CDC) conducted an extensive investigation in the aftermath of a different mistake — the potential exposure of 75 federal employees to live anthrax, after a lab that was supposed to inactivate the anthrax samples accidentally prepared activated ones.

The CDC's Select Agents and Toxins program requires that "theft, loss, release causing an occupational exposure, or release outside of primary biocontainment barriers" of agents on its watchlist be immediately reported. Between 2005 and 2012, the agency got 1,059 release reports — an average of an incident every few days. Here are a few examples:

- In 2008, a sterilization device malfunctioned and unexpectedly opened, exposing a nearby unvaccinated worker to undisclosed pathogens.
- In 2009, a new high-security bio research facility, rated to handle Ebola, smallpox, and other dangerous pathogens, had its decontamination showers fail. The pressurized chamber kept losing pressure and the door back into the lab kept bursting open while the scientists leaned against it to try to keep it closed. Building engineers were eventually called to handle the chemical showers manually.
- In 2011, a worker at a lab that studied dangerous strains of bird flu found herself unable to shower after a construction contractor accidentally shut off the water. She removed her protective equipment and left without taking a decontaminating shower. (She was escorted to another building and showered there, but pathogens could have been released in the meantime.)

Now, the vast majority of these mistakes never infect anyone. And while 1,059 is an eye-popping number of accidents, it actually reflects a fairly low rate of accidents — working in a controlled biological agents lab is safe compared to many occupations, like trucking or fishing.
But a trucking or fishing accident will, at worst, kill a few dozen people, while a pandemic pathogen accident could potentially kill a few million. Considering the stakes and worst-case scenarios involved, it's hard to look at those numbers and conclude that our precautions against disaster are sufficient.
"We have to work with these flu viruses, that is how we can understand them," Michael Osterholm, director of the Center for Infectious Disease Research and Policy at the University of Minnesota, told Scientific American after the string of 2014 containment disasters. "What's more important is we have to be able to do this safely. That's really the key piece. We don't want to stop this work."

The challenges of safe handling of pathogens
Why is running labs without such errors so hard?
A look at the CDC's records of Select Agent containment failures helps answer that question. Errors come from many directions. With worrying frequency, people handle live viruses thinking they've been given deactivated ones. Technology that's a critical part of the containment process can fail unexpectedly. It's not that there's a single "problem" piece of technology — it's that there are so many that are a part of the containment process, and all of them have some small risk of failing. We can secure against showers depressurizing and sterilization equipment flying open when it malfunctions, but many other pieces of hardware are a critical part of containment measures, and they might have obscure malfunctions under the wrong conditions too.
These problems don't just occur in the US. In the United Kingdom, a recent investigation found:
more than 40 mishaps at specialist laboratories between June 2015 and July 2017, amounting to one every two to three weeks. Beyond the breaches that spread infections were blunders that led to dengue virus — which kills 20,000 people worldwide each year — being posted by mistake; staff handling potentially lethal bacteria and fungi with inadequate protection; and one occasion where students at the University of the West of England unwittingly studied live meningitis-causing germs which they thought had been killed by heat treatment.
Severe acute respiratory syndrome, or SARS, had an outbreak in 2003. Since then it hasn't reoccurred in the wild, but there have been six separate incidents of it escaping the lab: one in Singapore, one in Taiwan, and four times at one lab in Beijing.
"These narratives of escaped pathogens have common themes," argued an analysis of biocontainment failures by medical historian Martin Furmanski in the Bulletin of the Atomic Scientists. "There are unrecognized technical flaws in standard biocontainment, as demonstrated in the UK smallpox [case]. ... The first infection, or index case, happens in a person not working directly with the pathogen that infects him or her, as in the smallpox and SARS escapes. Poor training of personnel and slack oversight of laboratory procedures negate policy efforts by national and international bodies to achieve biosecurity, as shown in the SARS and smallpox escapes."
It's easy to see why these problems are hard to address. Adding more rules for those handling pathogens won't help if the people infected are usually not the ones handling the pathogens. Adding more federal and international regulations won't help if the regulations aren't consistently followed. And if there are still unrecognized technical flaws in the standards for biocontainment, how would we know until an incident made those flaws apparent?
This is a worry that's recently back in the news because the US government has approved research aimed at making certain deadly influenza viruses more virulent — that is, making it easier for them to spread from person to person. The researchers involved want to learn more about transmissibility and virulence, in order to better equip us to combat these diseases. The labs conducting such research have taken unusual steps to ensure their safety and to reduce the risk of an outbreak.
But have they reduced it enough? "We imagine that when there's an accident, it's because a ventilation system fails or someone just forgets to do something, or that it's sort of avoidable mechanical or human error," Lipsitch told me.

Yet many of the recent failures don't fit that pattern. "Rather, it was people doing something that they thought was the right thing and was neutralizing a dangerous pathogen by killing it, and in fact they still had some dangerous pathogen or contamination with a dangerous pathogen," he said. "My concern is not really that one of these people will do something that's foolish or reflects poor training. My concern is that there'll be human error of the kind that's not really avoidable."

Lipsitch does not think we should tighten standards for most research. He argues that our current approach, while its error rate will never be zero, is a good balance of scientific and global health concerns with safety — that is, for most of the pathogens biologists research. But for the most dangerous pathogens, the ones with the potential to spark a global pandemic, he points out that that calculus doesn't hold.

The influenza pandemic of 1918 killed 50 million people. Models of how influenza spreads suggest that an escape from containment by an influenza virus might not be contained in the local community where the incident occurred, as Birmingham's smallpox outbreak thankfully was. Is it sufficient for procedures to look airtight on paper, when the stakes are so high? Are there any labs in the world that we can confidently expect to be sufficiently careful with pathogens — to never, ever make the mistakes that other labs have made thousands of times despite high standards of caution?

So far, too much biosecurity policy has been reactive — tightening standards after something goes wrong. Given how badly things can go wrong, that's not good enough. It'll be exceptionally challenging to make our labs safer, but when it comes to the riskiest pathogens, we simply have to be up to the challenge.

Do we need a moratorium on germline gene editing?

Source: http://www.homelandsecuritynewswire.com/dr20190320-do-we-need-a-moratorium-on-germline-gene-editing

Mar 20 – In the wake of the news from China about **He Jiankui's gene-edited babies**, many scientists are calling for a moratorium on germline gene-editing. In fact, the Chinese health ministry released draft

guidelines aiming to stop rogue efforts which would engage in germline editing without approval.

Pandora Report notes that *Nature* considered the topic sufficiently important to publish the call by several top researchers and ethicists for a moratorium.

> *Whether or not a moratorium receives more widespread support, several things need to be done to ensure that germline gene-editing studies, done for the purposes of research only, are on a safe and sensible path. As a*

starting point, proposals for all ethically vetted and approved basic research studies that use gene-editing tools in human embryos and gametes, including those aimed at assessing efficacy and safety, should be deposited in an open registry.

Second, researchers need to develop a system that allows early recognition of any research that risks overstepping predefined boundaries. A useful model to follow could be the WHO guidance for regulating research with a potential biosecurity risk. The system should include a mechanism — perhaps affiliated with the open registry — that allows researchers to flag up potentially dangerous research. Analyzing whether He's work could have been prevented will help. It's important to hammer out whether, how and to whom scientists and ethicists who became aware of the project could have voiced their concerns — and how they could do so more easily in future. Raising the alarm would require a change of practice for researchers who, for the sake of scientific independence, often do not intervene in the choice of research projects undertaken by their peers.

"By 'global moratorium', we do not mean a permanent ban," say the writers — "rather, we call for the establishment of an international framework in which nations, while retaining the right to make their own decisions, voluntarily commit to not approve any use of clinical germline editing unless certain conditions are met."

— Read more in Editorial, "Germline gene-editing research needs rules," Nature (13 March 2019); Eric Lander et al., "Adopt a moratorium on heritable genome editing," Nature (13 March 2019); and G. Owen Schaefer, "A case against a moratorium on germline gene editing," The Conversation (20 March 2019).

Biotechnology advances offer opportunities for actors with malicious intent

Source: http://www.homelandsecuritynewswire.com/dr20190322-biotechnology-advances-offer-opportunities-for-actors-with-malicious-intent

Mar 22 – Over the past decade, the biotechnology economy has experienced remarkable growth, resulting in the rapid expansion of biological knowledge and application. Such advances have lowered the technical and financial barrier to entry for bio-experimentation outside the traditional environments of academia and industry. Together these developments provide exciting new opportunities for scientific growth. A new RAND report warns, however, that these advances create openings for actors with malicious intent to harness readily available tools and techniques to create biological threats or bioweapons.

In the report, the authors present the results of a workshop designed to convene key experts from diverse stakeholder groups to understand how a genetic database of "sequences of interest" (SOIs) can best support stakeholders — government agencies, academic researchers, and commercial groups — to improve the utility, safety, and security of biotechnology research endeavors. The sessions consisted of a mix of presentations, panel discussions, and small and large group discussions. **This report should be viewed as an exploratory first step in discussing a very complex topic with broad and often conflicting stakeholder interests.**

Key findings

- There is a need for broad stakeholder engagement, collaboration, and transparency across government agencies, as well as among the various nongovernment actors in industry and in the research community.
- There is no consensus on the attributes or boundary conditions that form an operational or implementable definition of an SOI.
- There is a need for and value in several distinct use cases of SOI databases.

- Gene synthesis companies would like a federally sanctioned database for screening orders; in contrast, representatives from federal agencies are hesitant to provide regulation beyond the select agent list and the voluntary Department of Health and Human Services screening framework guidance.
- Several databases exist for the purposes of screening synthetic biology orders; some combination of their design and capabilities may be optimal as a next step for research and development purposes.
- There is a need to balance access to a database with the associated security risks.

— Read more in by Ritika Chaturvedi et al., Assessing the Need for and Uses of Sequences of Interest Databases (RAND, 2019).

Emerging technologies pose challenges to the control of biological weapons, new SIPRI report

Source: https://www.sipri.org/media/press-release/2019/emerging-technologies-pose-challenges-control-biological-weapons-new-sipri-report

Mar 14 – Advances in additive manufacturing, artificial intelligence and robotics could increase the possibilities for the development, production and use of biological weapons. The existing biological arms control and non-proliferation governance framework needs to be adapted to address these security risks, according to a new report from the Stockholm International Peace Research Institute (SIPRI).

▶▶ Read the report here.

The SIPRI report, 'Bio Plus X: Arms Control and the Convergence of Biology and Emerging Technologies', will be presented at the international conference '2019. Capturing technology. Rethinking arms control' at the German Federal Foreign Office in Berlin on 15 March 2019.

Emerging technologies could facilitate the production and use of biological weapons

The report explores the risks and challenges posed by the interaction of developments in biotechnology and advances in three emerging technologies: additive manufacturing (so-called 3D printing), artificial intelligence and robotics. 'Each of these technologies could, in its own way, facilitate the development, production and use of biological weapons, and make them more dangerous,' says Kolja Brockmann, Researcher at SIPRI and lead author of the report. 'The increased use of robots in laboratories could lead to significant gains in productivity during the design-build-test cycle of biological weapons, while artificial intelligence could be used to find new ways to optimize the transmissibility or virulence of a biological agent,' says Dr Vincent Boulanin, Senior Researcher at SIPRI on emerging technologies.

Governance frameworks must be strengthened and re-envisioned

All three technologies are difficult to control, particularly due to their digitization and their dual-use nature. 'A key challenge for effective biological arms control is that treaty structures and the institutional arrangements in ministries and government agencies do not correspond to today's technical realities,' says Dr Sibylle Bauer, Director of the SIPRI Armament and Disarmament programme.

New policy options could address governance issues

The report recommends that, in order to tackle the governance issues presented by emerging technologies, national governments need to monitor and assess developments in science and technology on a more systematic basis. They should also strengthen international efforts to foster responsible science and biosecurity awareness. In addition, the report suggests that the private sector should reinforce self-regulation and compliance standards.