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# DIARY



February 2020



2019-nCoV

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# EDITOR'S CORNER

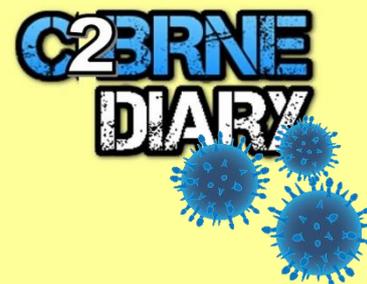




### Editorial

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

*Editor-in-Chief*  
C<sup>2</sup>BRNE Diary



*Dear Colleagues,*

There is no doubt that CoronaFebruary was the month that caught all the attention worldwide! I am sure that is not an outbreak but still do not know if it is an epidemic or a pandemic. The latter has not been announced from the WHO but the ongoing progress of the health problem fulfills the criteria – 29 countries in North America, Europe, Oceania, Asia. A second issue was the countermeasures taken from the Chinese government. Despite a number of predictions from respectful scientists about millions of deaths, the Western world worries more about civil rights and liberties than the spread of the virus. Perhaps in our societies we will kiss the virus to go away. I will not write again that too much democracy is bad for our health but I urge all to watch some “virus movies” like “Pandemic” or “Outbreak” in order to understand the magnitude of the problem. A third issue has to do with the availability of protective equipment. Soon a FFP2 face mask will worth a fortune not to mention that in some Chinese supermarkets people kill each other for the last piece on the self. A fourth issue is the debate if the Covid-19 is the revenge of the nature or a biological weapon that escaped from a biosecurity lab or was intentionally released. When comes to response and measures the coronavirus issue is a strong reminder of how a real bioterrorism attack would look like. The future offender might be an organism from the past or a new one constructed via the hundreds of novel biotechnologies with dual potentials.

Last but not least, we must pay a tribute to heroic physicians and nurses that work 24/7 in hazardous environments without the proper logistic support (protective equipment; accomodation; food and water; etc.). When the virus will be contained, I think that



all these people deserve a statue in all the cities affected along with a generous compensation that will help them return to normality (if still alive). **The greatest respect to all the colleagues fighting the invisible enemy!!!**

As for the rest of us, just be alert; test your plans and keep in mind that any deviation from SOPs usually leads to death or injury!

*The Editor-in-Chief*



## SUMMARY OF THE INTERNATIONAL CONFERENCE ON TERRORISM - Threats and Challenges after the fall of the caliphate

November 2019

Source: <https://www.counterextremism.com/sites/default/files/cep-cat-paris-conference-110719.PDF>



**Nature teaches humans!**



## Despite Defeats, the Islamic State Remains Unbroken and Defiant around the World

By Brian Glyn Williams

Source: <http://www.homelandsecuritynewswire.com/dr20200128-despite-defeats-the-islamic-state-remains-unbroken-and-defiant-around-the-world>

Jan 28 – In a series of bloody campaigns from 2014 to 2019, a multinational military coalition drove the Islamic State group, often known as ISIS, out of much of [the Iraqi and Syrian territory that the strict militant theocracy had brutally governed](#).

But the Pentagon and the United Nations both estimate that the group still has [as many as 30,000 active insurgents](#) in the region. Thousands more IS-aligned fighters are spread across Africa and Asia, from the scrublands of Mali and Niger to the deserts of Iraq and mountains of Afghanistan, to the island jungles of the Philippines.

I keep track of the loose alliance of various global affiliates and insurgent groups collectively known as the Islamic State. It's [part of my research chronicling America's wars](#) in remote lands [where I have worked](#) for the CIA and the U.S. Army. I also monitor Islamic State activities around the world for a [University of Massachusetts-Dartmouth project I lead called MappingISIS.com](#)

In recent months, the Islamic State group has reconstituted itself in the Syria-Iraq region and continues to inspire mayhem across the globe.



### Iraq, the Homeland of Jihadocracy

The "Dawla Islamia," or Islamic State, began as a Sunni Muslim insurgent group in Iraq amid the maelstrom of sectarian violence that followed the U.S.-led 2003 invasion. Up until then, Saddam Hussein's ruling Baathist party had suppressed Islamist jihadi groups of all stripes, limiting influence in Iraq from [Shiite-dominated Iran](#) and Sunni-fundamentalist Saudi Arabia.

In 2014 IS blitzed across the region and took over a [wide swath of Iraq and Syria](#), where it [functioned as a de facto government](#). It also maintained a ferocious fighting force, always seeking to expand the reach of its so-called "[caliphate](#)" fundamentalist Islamic regime.

Since [major defeats in 2017](#), the Islamic State group has retreated to a largely inaccessible sanctuary in the [remote Qara Chok, Hamrin and Makhmoul mountains](#) of northeastern Iraq. From there, they regularly attack U.S. and Iraqi troops, Kurdish forces and local Shiite militias. They also attract new Sunni recruits, resentful of discrimination and repression from the currently [Shiite-dominated Iraqi government](#).

The group's terror campaigns include [dressing up as government troops](#) at fake checkpoints and executing "traitors," [killing pro-government tribal and village elders](#) and [executing government employees in night raids](#) on their homes.

In the summer of 2019, IS fighters in northern Iraq also [burned hundreds of acres of crops](#) belonging to suspected pro-government villagers whom they labeled "infidels."

Most recently, IS fighters have been heartened by the [U.S. drone strike that killed Iranian Maj. Gen. Qassem Soleimani](#), who had led Iraqi Shiite militias against them. Soleimani's death, which Islamic State leaders hailed as "[divine intervention](#)," led to a [halt in joint U.S.-](#)



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[Iraqi operations](#) against the Islamic State. Iraq's parliament and prime minister have [called for all U.S. troops to leave Iraq](#), which would provide opportunity for IS forces to expand their operations.

### Syria, the Former Terror Capital

From 2015 to 2019, the Islamic State ran a government in the Syrian territory it occupied, based in the Raqqa province of northeastern Syria. That organization slowly collapsed under assaults by U.S.-backed Kurdish forces and the Syrian Arab Army, backed by Russia and Iran. As they retreated, IS leaders hid weapons caches and millions of dollars in the vast Syrian desert, and [reconstituted their movement as a guerrilla fighting force](#).

Since the defeat of their physical state, resilient IS insurgents in Syria have [killed pro-government Russian soldiers](#), [massacred pro-government Druze tribesmen](#), and attacked [anti-ISIS Kurdish fighters and intelligence officers](#) with car bombs and roadside bombs. Since President Donald Trump's October 2019 announcement that [U.S. troops would retreat from their bases](#) in northern Syria, many Islamic State fighters taken prisoner by the Kurds have also [broken out of their prisons](#).

Nevertheless, roughly 70,000 Islamic State members and supporters – men, women and children – still remain in their Kurdish-guarded internment camps, which have, however, become [training centers for a new generation](#) of jihadist "Cubs of the Caliphate." A November 2019 U.S. [Delta Force operation](#) led to the death of Abu Bakr al-Baghdadi, the Islamic State's messianic leader – but the group has already [chosen a successor](#) and has vowed to avenge al-Baghdadi's death.

### Nigeria, the Jungle Bastion

In 2015, the members of the [Boko Haram Islamist terrorist group](#), notorious for kidnapping local schoolgirls, swore allegiance to the Islamic State.

As many as 4,000 of its fighters operate in the northeastern jungles of Nigeria, [attacking army outposts, remote villages and even towns](#). They kidnap civilians and kill soldiers not just in Nigeria, but in the [neighboring countries of Chad, Niger and Burkina Faso](#), defying [multi-national military efforts](#) to suppress their activity.

### Afghanistan, the Fortress in the Mountains

In 2015, disgruntled, hardcore ex-Taliban from Pakistan and Afghanistan's dominant tribe, the Aryan Pashtuns, formed an Afghan affiliate of the Islamic State in the remote, forested mountains of the country's eastern Nangarhar Province.

From this rugged base, they carried out a [deadly wave of massive suicide bombings](#) in Kabul and elsewhere. They also [publicly executed](#) tribesmen and even Taliban whom they accused of having insufficiently extreme Islamist beliefs.

At its peak, this group had about 3,000 fighters, but U.S. and Afghan National Army attacks, including one that used [the world's largest non-nuclear bomb](#), have whittled their numbers down [to about 300](#). A top Afghan leader, [Abdullah Abdullah](#), described them to me as "fanatics who are beyond the pale and are incapable of being negotiated with."

### Egypt, the Bedouin Desert Stronghold

Since 2014, a group of Bedouin in the northern Sinai Peninsula, angry with the secular policies of the Egyptian government and perceived economic discrimination, have conducted several attacks in the name of the Islamic State. The group [blew up a Russian airliner](#) carrying more than 200 people, [massacred dozens of Coptic Christians](#) in their churches, and [slaughtered more than 200 worshipers at a Sufi Muslim mosque](#) in the Sinai.

The group remains active despite [counter-terrorism operations by the Egyptian military](#), sometimes with [assistance from the Israeli Air Force](#).

### The Philippines, the Pacific Outpost

In 2016, several groups of local jihadist terrorists and kidnapers in the lawless jungles of the predominantly Muslim islands of Basilan and Mindanao swore an oath of allegiance to the Islamic State.

These groups' most notable attack was their [bloody conquest of the town of Marawi](#) in 2017. They burned Catholic churches and took over 1,700 people hostage before being driven back by a U.S.-backed army of 10,000 Filipino troops. The battle saw the most intense fighting in the nation since World War II and led to the [deaths of over 900 insurgents](#). The Philippine IS franchise nonetheless remains active and most recently blew up a [Catholic church](#) in January 2019.

### Libya, the Fallback Capital

North Libyan jihadists swore allegiance to the Islamic State in 2015 and received assistance, training and financial support from IS commanders dispatched from Syria. The terrorists



captured the north Libyan coastal town of Sirte, which they nicknamed “Raqqa by the Sea,” as a fallback capital should IS lose its core lands in Syria and Iraq.

In early 2015 Libyan IS militants [beheaded dozens of captured Coptic Christians](#) and [Ethiopian Christians](#).

After months of intense urban combat, U.S.-backed militias from the nearby town of Misurata retook Sirte and surrounding regions in late 2016. Islamic State fighters retreated into the remote southern desert, now their base for bold insurgent attacks, such as the April 2019 seizure of a town and [public beheading of a local leader](#). The Pentagon continues to conduct [airstrikes on the group's bases](#).

**There are other Islamic State affiliates in lands as far afield as Niger, Mali, Yemen and Somalia. Terror cells claiming affiliation with IS have carried out attacks in the name of the Islamic State in places like Turkey, Sri Lanka, Bangladesh, Tunisia, Saudi Arabia, Iran, Dagestan and Kashmir.**

Among IS's resilient supporters are diehards who see military setbacks not as permanent defeats, but as tests of their faith in a [trans-generational forever war](#) designed to bring about the apocalypse.



*Brian Glyn Williams is Professor of Islamic History, University of Massachusetts Dartmouth.*

## WHEN HUMANS ARE USING THEIR BRAINS FOR NOBLE PURPOSES

### **Nanoparticle helps eat away deadly arterial plaque**

Atherosclerotic plaque-deposits on the inner walls of arteries are a frequent cause of heart attacks and strokes. A newly-developed nanoparticle could help minimize those deposits, as it prompts the body's own cells to "eat" them. [Read more](#)

### **Cheap, common drug may improve autism symptoms in children**

A novel clinical trial from an international team of researchers has found a cheap, generic drug (bumetanide) may effectively moderate the severity of symptoms associated with autism spectrum disorder (ASD) in children. [Read more](#)

### **Body-on-Chip system mimics the behavior of 10 connected organs**

Scientists have pieced together 10 devices that mimic the functions of different organs to create a functioning Body-on-Chips platform, which can offer new and comprehensive insights into how prospective drugs will behave throughout the human body. [Read more](#)

### **Artificial pancreas uses oxygen tank to better-produce insulin**

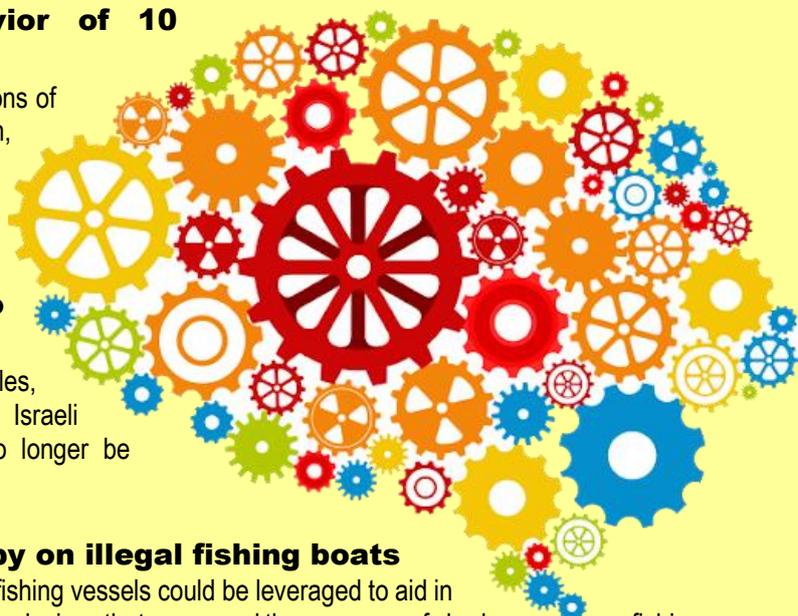
People living with Type 1 diabetes are faced with some daily hassles, such as finger-prick blood tests and insulin injections. An Israeli biomedical firm is now stating that such tasks may soon no longer be necessary, thanks to its prototype implant. [Read more](#)

### **Albatross kitted out with radar detectors spy on illegal fishing boats**

New research has shown how the tendencies of albatross to trail fishing vessels could be leveraged to aid in conservation efforts, with scientists equipping the birds with tracking devices that can reveal the presence of shady fishing operations. [Read more](#)

### **Iron nanowires serve up deadly triple threat to cancer**

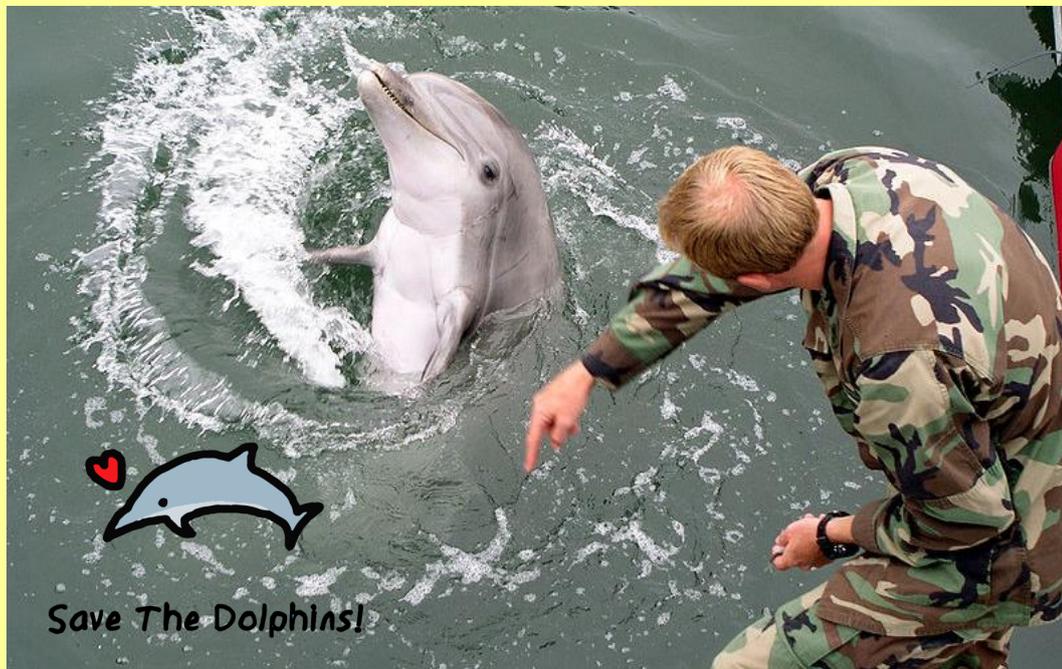
Scientists are coming up with some creative new methods to fight cancer. Now, a new study has found that iron nanowires could deliver a three-pronged attack against cancer cells, using heat, vibrations and drugs together. [Read more](#)



## Iran's Killer Dolphins

Source: <https://i-hls.com/archives/98453>

Jan 26 – It seems as though the United States' attack on Iranian General, Qassem Soleimani, played out to be a success according to American leadership. Since Soleimani was struck dead by an American drone strike, tensions between the two nations have grown



and now the United States is on high alert, keeping their eyes open against any form of Iranian retaliation.

The forms of retaliation that the United States is likely prepared for is most likely missile strikes, cyber attacks, intelligence gathering, or some form of proxy terrorism, to name a few. However, one method of retaliation may exist that nobody can see coming and that is Iran's fleet of military dolphins, that may or may not still exist today.

Over twenty years ago a Russian man named Boris Zhurid would be responsible for training swimming mammals for the Soviet Navy.

Zhurid, as well as a few other experts, would train mammals to target enemy divers, capture them, and carry explosives towards enemy ships in a suicide attack, according to Popularmechanics.com.

Eventually, funding ran out for Zhurid's program and the Ukrainian Navy adopted the program. Soon enough, Zhurid was forced to have his animals perform for tourists in order for him to be able to afford feeding and taking care of them.

Eventually, Zhurid wasn't able to afford the animals anymore and was forced to sell them. "I cannot bare to see my animals starve," he said. "We're out of medicine... and have no more fish or food supplements."

In the spring of 2000 Zhuris sold his dolphin collection, as well as several walruses, sea lions, seals, and a beluga whale, to Iran. Dolphins tend to have a lifespan of at least 50 years, so it is still very likely that Iran is still utilizing those dolphins up until today.

20 years later and we haven't heard much about the Soviet dolphins in Iran. It is very possible that the Persian nation is using them for reconnaissance missions. Deploying live mammals on the battlefield is nothing new. Russia abandoned its military dolphin program only in 2014, even though a Norwegian fisherman has spotted a beluga whale wearing a Russian harness in 2016.

The United States practically invented the concept of militarizing dolphins and other sea mammals. In the 60s, the United States researched dolphins' and beluga whales' swimming and sonar capability to see how they can support the military. Eventually, the United States Navy trained the sea mammals to transport gear to divers, search for lost objects, mark underwater mines, and spy on enemies with special cameras. Dolphins have served for the United States during the Vietnam and the Persian Gulf War. Currently, the United States Navy trains about 30 dolphins and 30 sea lions to track sea mines.

The question now is if the Iranian's dolphins are still alive, is the Persian country using them? And if so, then how?





## Soleimani's Network of Sleeper Agents in the Americas

Source: <https://www.meforum.org/60350/iran-has-terrorists-embedded-inside-the-us>

### Terrorists and Technological Innovation

By Daveed Gartenstein-Ross, Colin P. Clarke, and Matt Shear

Source: <https://www.lawfareblog.com/terrorists-and-technological-innovation>

*Often when terrorists use new technology, they bungle it—the new bomb design does not detonate or the new video technology fails to upload. Yet terrorists often quickly master new technologies and use them in unanticipated ways. Daveed Gartenstein-Ross and Matt Shear of Valens Global, along with Colin Clarke of The Soufan Center, propose a new way of thinking about this threat. They detail the terrorist learning curve and how counterterrorism agencies respond and adapt.*

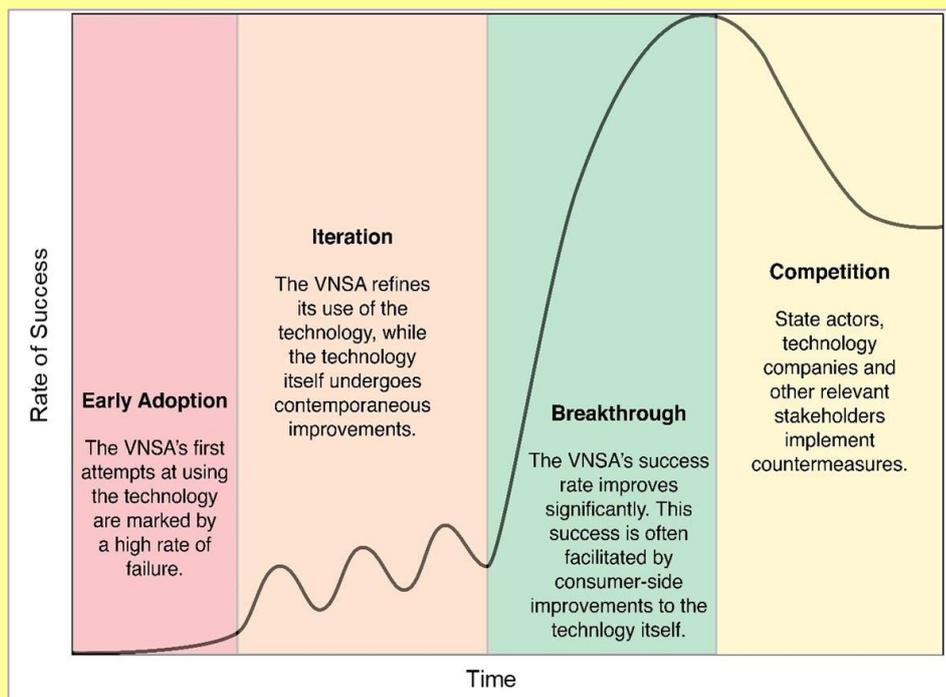
*Daniel Byman*

Feb 02 – On Oct. 9, 2019, a terrorist motivated by anti-Semitic beliefs descended on a synagogue in Halle, Germany, where people were observing the Yom Kippur holiday. Stephan Baillet had penned a [manifesto](#) describing his objective as killing “as many non-Whites as possible, Jews preferred.” Bruce Hoffman and Jacob Ware [note](#) that Baillet “allegedly used steel, wood and 3-D-printed plastic components” to manufacture three weapons. His use of homemade weapons may have helped him avoid authorities’ scrutiny, and another of his stated objectives was to “prove the viability of improvised weapons.” Fortunately, his innovation seemed to fail, as his weapons [jammed three times](#), probably saving many lives.

The fact that the attack faltered *because* of its technical innovation may lead some observers to underestimate the significance of its use of 3-D printing. Based on our research into how violent nonstate actors (VNSAs) adopt new technologies, we believe this would be a mistake: After an initial period marked by failure, VNSAs often get far more proficient, posing a host of dangers that governments move to counter only belatedly. We refer to the process by which VNSAs adopt new technologies and refine their methods as the *VNSA technology adoption curve*.

#### The Adoption Curve

Baillet’s mixed success in using an emerging technology is consistent with VNSAs’ pattern of adopting these technologies, which tends to progress in four phases:



1. *Early adoption.* A VNSA tries to adopt a new technology, but initial attempts underperform.
2. *Iteration.* The commercial technology undergoes consumer-focused improvements. These improvements aid the VNSA, but success can be inconsistent, and there are often prominent setbacks during the iteration phase.
3. *Breakthrough.* The VNSA’s success rate with the technology improves significantly.
4. *Competition.* Technology companies, state actors and other stakeholders develop countermeasures. The outcome of this phase is uncertain, as the VNSA and its competitors enter a cycle of adaptation and counteradaptation.



This process demonstrates that it is myopic to interpret a VNSA's early attempts as "failures" and later attempts as "successes" in a binary fashion. As Eric Ries writes in [The Lean Startup](#), many for-profit firms bring less-than-perfect products to market. This allows a firm to disseminate a product quickly, analyze consumers' likes and dislikes, and leverage this data to tweak the product. So, too, should early attempts in the VNSA adoption curve be understood as part of a learning process.

### **Social Media and the Virtual Plotter Model**

The Halle attack, and the Christchurch attack before it that killed 51 people, both speak to how indispensable social media has become to many VNSAs. To date, no VNSA has harnessed social media as effectively as the Islamic State. Though the group's effectiveness has declined precipitously in recent years, at its 2014 peak, Islamic State supporters operated more than 46,000 Twitter accounts and could push content to [millions](#) of people. Due in part to the strength of the Islamic State's online communications, around 42,000 foreign fighters from more than 120 countries [were drawn](#) to militant groups in the Syria-Iraq theater.

Social media was also integral to the Islamic State's [virtual plotter model](#). The group's virtual plotters—operatives in its external operations division—provided logistical and tactical support to sympathizers seeking to carry out attacks. This level of interaction between plotter and operative was once reserved solely for face-to-face meetings. This incorporation of social media technology as a medium for coordinating attacks was revolutionary, but it was not instantaneous. It built on al-Qaeda's earlier attempts.

*Early Adoption.* The late [Anwar al-Awlaki](#) was a master propagandist and high-level leader of al-Qaeda in the Arabian Peninsula (AQAP). Awlaki became influential due in no small part to his early adoption of social media, posting sermons to YouTube and maintaining a blog. Religious novices and hardened militants alike could suddenly access an authoritative extremist cleric on demand. Awlaki's use of YouTube demonstrated the promise of social media even during the early adoption phase, with his inspirational materials being connected to numerous plots. Yet Awlaki could never compete with the pace of mobilization that later virtual plotters achieved. Though YouTube is a social media platform, Awlaki used it more like a blog, refraining from constant interactions with followers. Further, though Awlaki was effective at radicalizing people, he was unable to fold attackers into al-Qaeda's overarching strategy. He put out general calls for action, but—aside from the plots like the 2009 Christmas bomb plot, which he was able to [orchestrate in person in Yemen](#)—Awlaki never specifically coordinated with attackers to ensure their efforts would help al-Qaeda achieve its long-term objectives.

*Iteration.* Though social media platforms did not drastically evolve between the period of Awlaki's prominence and the rise of the Islamic State's virtual plotters, important changes occurred. Social media capabilities became better understood, and tactics for engaging with followers became increasingly refined. These approaches to improved engagement coincided with an explosion in the number of social media users; Facebook had 608 million monthly users at the end of 2010, and by the end of 2014, that number had [soared](#) to 1.4 billion (with Twitter users [increasing](#) similarly). Additionally, the growth in end-to-end encryption permitted secure conversations between jihadist influencers and operatives.

The Islamic State's external operations division, the [Amniyat al-Kharji](#), was charged with identifying and training operatives to conduct attacks outside the group's core territory. Virtual plotters were integrated into its geographic command structure, but in the cyber realm; each was assigned areas of responsibility according to nationality, cultural knowledge and linguistic skills. The Islamic State engineered a system by which top operatives could directly, albeit remotely, guide lone attackers. Islamic State militants played an intimate role in every step of the attack process, including conceptualization, target selection, timing and execution.

The first Islamic State virtual plotter to gain international recognition was former British hacker Junaid Hussain, whose operatives were almost always arrested. One critical error was the frequency with which he engaged would-be operatives through Twitter direct messages. While Twitter was an efficient way to find potential recruits, a message between Hussain and another user could catch authorities' attention. Yet, from an alternative perspective, Hussain was a dazzling success. While his operational security left much to be desired, he mobilized operatives at an [unprecedented pace](#)—despite lacking Awlaki's charisma and credentials. Such is the power of social media. When future Islamic State operatives combined the mobilization power of social media with better operational security, the organization reached its breakthrough phase.

*Breakthrough.* The Islamic State subsequently increased its use of secure messaging platforms, including Wickr, Telegram, WhatsApp and Signal. In March 2016, after coordinating with a virtual planner in Raqqa, Najim Laachraoui led a team of suicide bombers in carrying out three suicide bombings in Brussels that killed more than 30 people and injured more than 300 others. The group's improvements in operational security are illustrated clearly by the extensive documentation of a subsequent attack in Germany in July 2016. On July 24, Mohammed Daleel detonated a suicide bomb near a music festival. Daleel and his virtual handler with the Islamic State had successfully managed to conceal the plot from authorities, and though Daleel was the only fatality, 15 others were wounded in the bombing.



Daleel was in direct contact with an Islamic State virtual plotter. In fact, absent Daleel's [ongoing discussions](#) with his handler, the attack may never have happened. Daleel was a bundle of nerves in the moments just before the attack, and the virtual plotter with whom he conversed helped him overcome his doubts:

*Daleel:* [The music festival] will be over soon, and there are checks at the entrance.

*Virtual Plotter:* Look for a suitable place and try to disappear into the crowd. Break through police cordons, run, and do it.

*Daleel:* Pray for me. You do not know what is happening with me right now.

*Virtual Plotter:* Forget the festival and go over to the restaurant. Hey man, what is going on with you? Even if just two people were killed, I would do it. Trust in God and walk straight up to the restaurant.

And that is what Daleel did, detonating his bomb at a wine bar. While an operative on his own might have aborted the attack, Daleel's anxiety was calmed by his handler. The fact that Daleel went through with his attack was directly influenced by a virtual plotter.

The Islamic State's model allowed the group to recruit and manage attacks remotely, increasing the number of attacks abroad and their likelihood of success.

*Competition.* Social media companies faced pressure to remove Islamic State content shortly after the group emerged, but their early efforts were often lackluster. Their efforts really [picked up steam in 2016](#). Companies began employing [artificial intelligence](#) to identify proscribed content, which reduced reliance on manual reporting and increased the speed of removal.

Social media companies' ability to take down material supporting violent extremist groups improved dramatically, as did their willingness to use these capabilities. As a [2016 study](#) showed, suspensions proved detrimental to both the number of social media followers and the amount of content associated with the Islamic State. For now, authorities have significantly disrupted the Islamic State's exploitation of social media, but the future of the competition phase is less clear. It is possible that a platform with libertarian principles that will not remove terrorist content could gain popularity. (On this point, it is noteworthy that Telegram [announced](#) in late 2019 that it had banned nearly 17,000 "terrorist bots and channels.") The Islamic State could also discover an effective workaround to social media companies' community standards.

### Unmanned Aircraft Systems (UAS)

Several VNSAs have tried to take advantage of the commercial availability of unmanned aircraft systems (UAS), from remote-controlled helicopters and planes marketed to hobbyists to quadcopter drones popular with videographers. VNSAs' efforts to weaponize UAS have been marked by early failures and experimentation.

*Early Adoption.* The early adoption phase was characterized by well-resourced VNSAs' first forays into unmanned systems. One of the earliest attempts was undertaken by Japanese cult Aum Shinrikyo in 1994. Aum developed a chemical and biological weapons program, and several methods of dispersal. The cult experimented with a remote-controlled helicopter retrofitted to spray sarin gas, but the helicopter [crashed](#) the second time the group tried to use it.

*Iteration.* Following Aum's unsuccessful attempt to use a do-it-yourself unmanned system in its plot, UAS technology subsequently became widely commercially available. As commercial technologies improved, so did the probability of successful weaponization by VNSAs, which could develop new modifications for more reliable platforms.

One plot illustrating the progress in VNSAs' use of UAS is that of Rezwan Ferdaus, who was arrested in 2011 for a [plot](#) to target the Pentagon and U.S. Capitol building with remote-controlled model aircraft packed with explosives. Ferdaus's key innovation was a plan to use a commercially available GPS autopilot system and Google Earth to navigate the aircraft toward its target. While the plot's likelihood of success was questionable even if Ferdaus had not been caught, it foreshadowed future threats.

*Breakthrough.* Several factors contributed to the breakthrough in VNSAs' use of UAS around 2014. Perhaps most critical was the boom in affordable, easy-to-operate quadcopter drones like those produced by [DJI Technology](#). Another factor was the Islamic State's organizational structure, as its bureaucracy played an important role in guiding the group's acquisition of complete UAS systems and specialized components.

The Islamic State's earliest known uses of UAS occurred in mid-2014, when the group released [propaganda](#) featuring aerial footage that demonstrated it had obtained a capability—aerial surveillance—that until that point had largely been limited to states. The first [known case](#) of the Islamic State successfully weaponizing a UAS occurred in October 2016, when two Peshmerga fighters died and two French soldiers were injured after a drone they shot down detonated. An explosive in the drone [had been disguised](#) as a battery. Shortly thereafter, the Islamic State's weaponized drones proliferated.

*Competition.* A multitude of counter-drone systems have emerged. A [2018 report](#) by the Center for the Study of the Drone at Bard College identified 155 manufacturers. Their systems employ various technologies, such as electronic jamming, acoustic detection, nets to entangle drone rotors, lasers, and machine guns. Despite the growth in this industry, VNSAs still appear to have the upper hand, as drone incidents are hard to thwart.



### Future VNSA Technology Adoption

While social media and drones provide insightful retrospectives of VNSAs' adoption of new technologies, these groups will continue to innovate. As the Halle terrorist demonstrated, 3-D printing poses opportunities for groups looking to obtain lethal weapons while avoiding detection by law enforcement. Artificial intelligence is another technology that [VNSAs will likely work to incorporate](#) into their operations.

VNSAs' adoption of new technologies is contingent on a number of factors, including a group's technological acumen, available resources and the proliferation of countermeasures. What is certain is that VNSAs will continue to innovate. As new technologies proliferate, there will invariably be individuals trying to figure out how to use these technologies to kill. By outlining the adoption curve, we hope to enable our colleagues to more quickly recognize danger signs and be slower to dismiss what seems like bungling, and to subsequently interdict VNSA attempts to adopt technologies that pose the greatest risks.

*The authors appreciate the support of the Canadian Department of National Defence, which provided them a Targeted Engagement Grant to fund the research that forms the backbone of this article. The technical study from which this article is adapted, which was co-authored with David Jones of the Edmonton-based Organization for the Prevention of Violence, can be found [here](#).*

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## How does MI5 track terror suspects and what is a 'subject of interest'?

Source: <https://news.sky.com/story/how-does-mi5-track-terror-suspects-and-what-is-a-subject-of-interest-11925125>

Feb 03 – Following terror attacks in the UK, MI5 will often state whether the suspected attacker was an active subject of interest to its investigative teams or if they were completely unknown to the agency. While the full range of techniques it uses to track these people are necessarily secret, a number of successful attacks have exposed the agency's processes to outside scrutiny. The following details are based on public information contained in reports into successful terror attacks, and an interview with a former MI5 surveillance officer.

### New intelligence received

As soon as the agency receives new intelligence a formal process is kicked off to triage that information and figure out what kind of priority the potential threat needs to receive.

The rise in the threat from Islamist terrorism in particular forced the agency to adopt this process in 2011.

The first thing that happens to this new intelligence is it is tested for links to existing investigations. If these links are found then it is forwarded to the team handling that investigation.

However, if there isn't a team at the agency currently looking into the threat which the intelligence suggests, then it goes through an assessment process.

If the material covers something which poses a sufficient risk to national security, if it is credible enough, and if there is a clear way forward to act based on what it says, then a new investigation may be launched.



### New investigation launched

Once a new investigation is launched then something called a "trace" is requested. This is a check across all of MI5's databases to figure out whether the agency holds any relevant information on the topic or the person being investigated.

A liaison trace could also be issued, a similar check but to or from a partner organisation - such as a foreign intelligence service - to determine if anything relevant is held in their databases.

### Establish priority

Once an investigation is opened, it is given a priority rating according to the risk it carries:

**Priority 1: Attack planning** investigations are the most urgent investigations into individuals or networks where there is a credible and actionable bit of intelligence into an attack which is being planned.

**Priority 2: Extremist activity** covers a wider range of activities, including the intention to travel overseas to fight with an extremist group through to raising money for terror activities.

**Priority 3: Uncorroborated intelligence** investigations are lower down still, these require even more investigation to determine whether the potential terrorists pose a threat.

**Priority 4: Re-engagement risk investigations** are the lowest level investigations. These are usually into individuals who were previously known to pose a serious threat to national security but are judged to no longer be involved in those activities, for instance after being released from prison.

### Subjects of interest

MI5 handles around 3,000 active subjects of interest (SOIs) at any one time, and the investigations into these people are given a priority rating.

The agency also holds roughly 20,000 files on so-called "closed SOIs" who have previously been investigated but are no longer considered to pose a threat.

The SOIs which MI5 is investigating are given priorities through the allocation of 'tiers' which can change through the course of an investigation:

**Tier 1: Main targets of an investigation**

**Tier 2: The key contacts of the main targets**

**Tier 3: Contact of Tier 1 and Tier 2 targets**

When an individual is described as an "active subject of interest" it is not always clear what tier they were allocated.

Sudesh Amman, [the Streatham attacker](#), had recently been released from prison as had the 2019 London Bridge terror attacker Usman Khan, and Khuram Butt, one of the London Bridge attackers in 2017.

Khalid Masood, the Westminster Bridge attacker, and Salman Abedi, who detonated a bomb at Manchester Arena, were both considered closed subjects of interest by the police and MI5.

The two other London Bridge attackers in 2017 were not known to the authorities.

### Conduct surveillance

A [former MI5 surveillance officer](#) who was interviewed by Sky's defence and security correspondent Alistair Bunkall explained what these activities entailed. "If we'd been briefed on a target that we needed information from, we'd go and hunt them," he said.

"We'd go and find everything we can about them, we'd watch everything they do. Essentially, as soon they come onto our grid and we need to know all information about them, our surveillance teams, myself included, would go out there and find them and make sure we control everything they do."

On one operation, the operative was nearly kidnapped by the terrorists he was tracking: "This was something we'd never, ever seen before on UK soil, and it came very, very close to them putting me into a van and taking me to an address that we later searched with Special Branch, where they found plastic sheeting on the ground and a video camera and the flag and the butcher's knife. It was really down to the wire."

On another occasion, the surveillance officer was part of an MI5 team tracking a suspected Islamist terrorist. He sat outside a London mosque during evening prayers.

He said: "It was chucking it down and I was dressed as a tramp, pretending to ask for change, my own clothes soaked in my own urine to compliment that cover.

"There were more women worshippers that had left the mosque than had gone in, so I alerted the team that there was a possibility he had changed his appearance."



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The suspect had changed into a burka and was pretending to be a woman. Following him, the MI5 team called in a Special Forces unit to arrest the terrorist. Two Range Rovers slammed into the suspect's car.

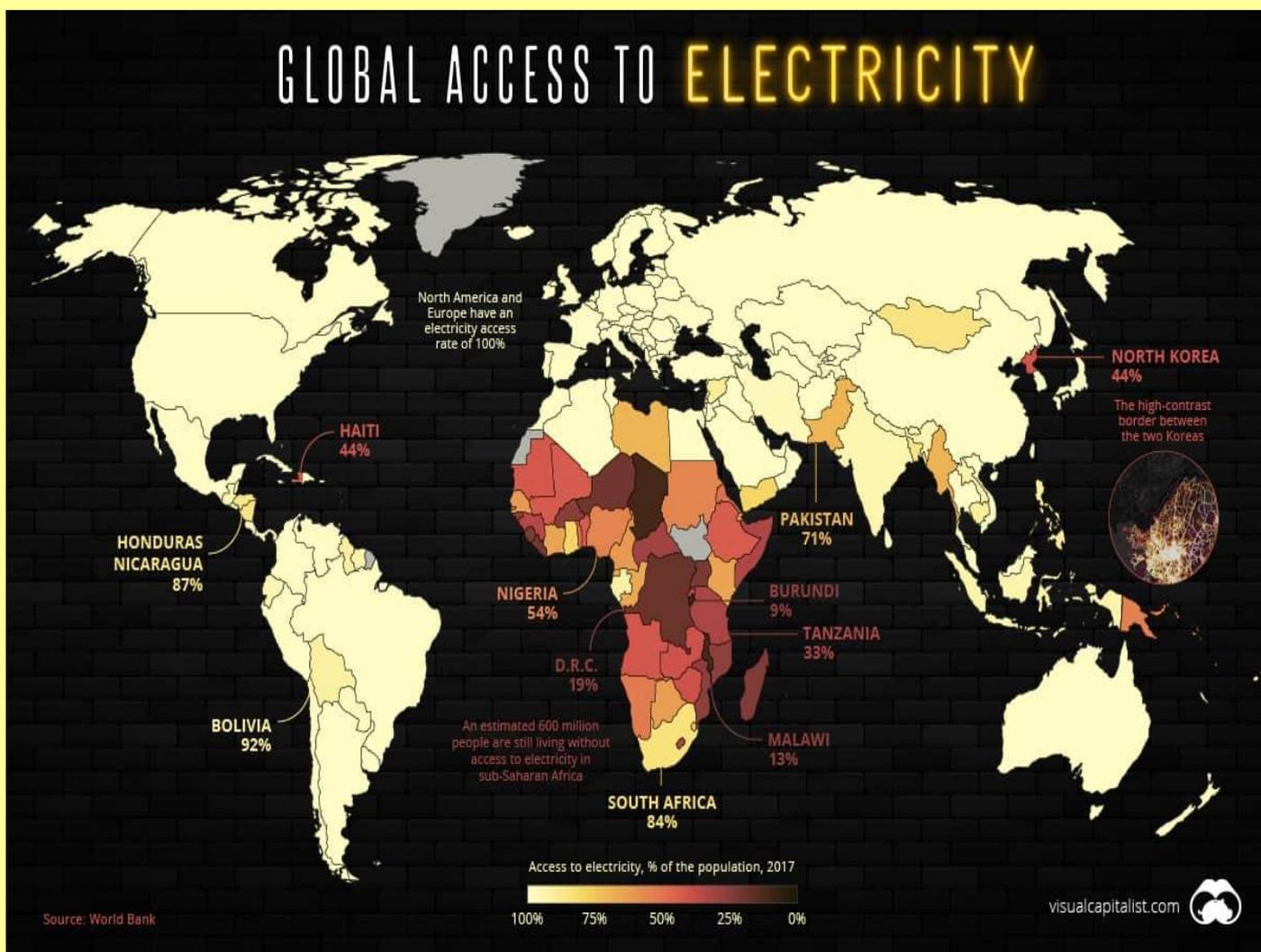
"As the team came in incredibly quick in the Range Rovers (and) dragged him out of the car, they found weapons and pipe bombs in the boot and his planned target was the very next day because this was all at night.

"To be waiting for a couple of coach loads of children returning from a trip to France and he was going to kill them, the teachers and the parents."

**EDITOR'S COMMENT:** "Active police surveillance" – That's been the case of most of the **terror** attacks over the past two or three years. Bla-bla-bla, until next time! ... and the time after!

## Map of The 1.2 Billion People Without Access to Electricity

Source: <https://britishbusinessenergy.co.uk/no-access-electricity/>



**EDITOR'S COMMENT:** What is the world doing about this? More wars?



## The Iraq War Has Cost the U.S. Nearly \$2 Trillion

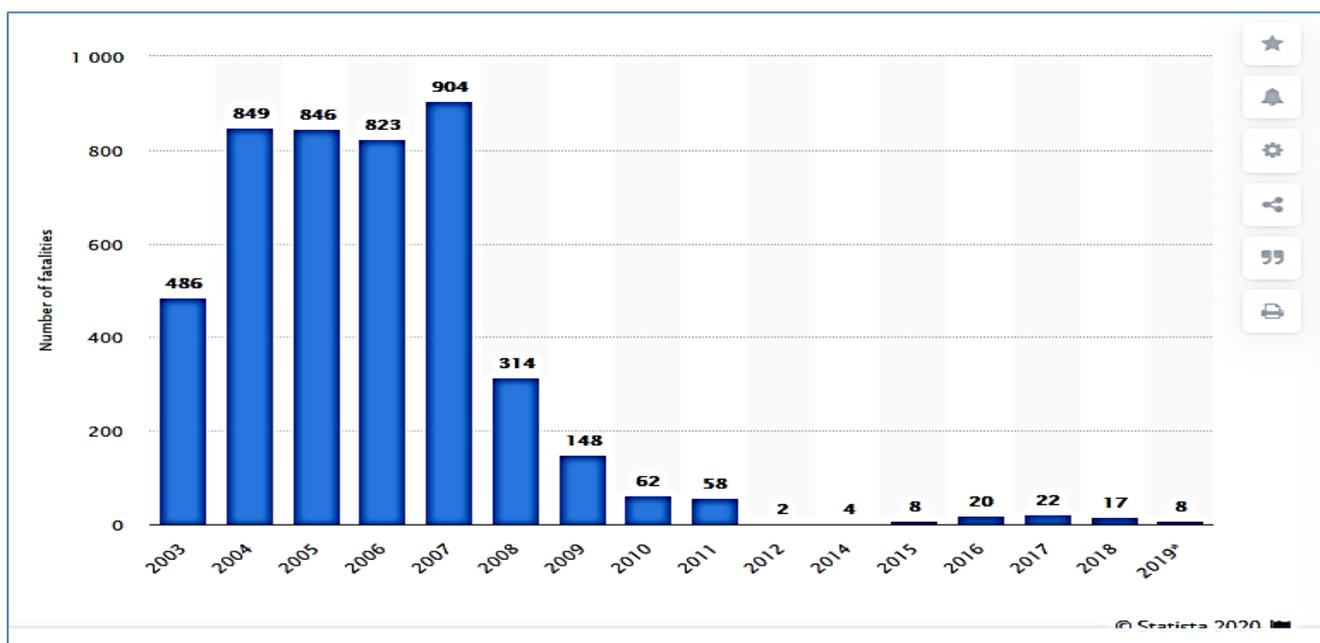
By Neta C. Crawford

Source: <http://www.homelandsecuritynewswire.com/dr20200205-the-iraq-war-has-cost-the-u-s-nearly-2-trillion>

Feb 05 – Even if the U.S. administration decided to leave — or was evicted from — Iraq immediately, the bill of war to the U.S. to date would be an estimated \$1,922 billion in current dollars. This figure includes not only funding appropriated to the Pentagon explicitly for the war, but spending on Iraq by the State Department, the care of Iraq War veterans and interest on debt incurred to fund 16 years of U.S. military involvement in the country.

*Neta C. Crawford is Professor of Political Science and Department Chair, Boston University.*

### EDITOR'S COMMENT: Nearly \$2 trillion FOR WHAT? For this?



Number of U.S. soldiers killed in the Iraq war from 2003 to 2019

## In the shadow of the games: Tokyo's homeless fear removal ahead of Olympics

Source: <https://www.japantimes.co.jp/news/2020/01/26/national/social-issues/tokyo-homeless-fear-removal-olympics/#.XjuTnyPQDIU>



Shelters made of cardboard start popping up in the basement of Tokyo's Shinjuku Station right before the shutters come down at 11 p.m., in corridors where salarymen rushing home and couples on late-night dates have just passed by.

Jan 26 – Dozens of homeless people sleeping rough in such spots worry that with Japan's image at stake authorities will force them to move ahead of the Olympics. Already, security officials have warned them they will likely have to find less visible locations by the end of March.

The former laborers, clerical workers and others sleeping in cardboard boxes are a



not-quite-invisible glimpse of a more pervasive but largely hidden underclass of poor in Japan.

**Efforts to clean up what some see as urban blight have preceded every recent Olympics, including those in Beijing, London and Rio de Janeiro.**

Tokyo officials deny they are moving to force the homeless out specially for the Olympics.

They say trying to get them into shelters is part of an overall welfare effort to get them off the streets and find them jobs and housing. "There is nothing more than the programs we already have in place to help the homeless," said Emi Yaginuma, a Tokyo Metropolitan

Government official in charge of such programs.

"We keep trying by making the rounds and talking to them, but all we can do is to try to persuade them."

In theory, overnight sleeping at train stations is trespassing. In practice, the homeless have long slept in Shinjuku Station and other spots. East Japan Railway Co. (JR East) doesn't have regulations on homeless people, and employees handle situations as they come up.

Just as the homeless arrive for the night, an announcement warns them that sleeping in the station isn't allowed.

As Olympics preparations began years ago, homeless camping in a park in Shibuya Ward were forced out to make way for development. A soup kitchen program there was moved to another, less visible park nearby. Advocates for the homeless fear it was just the start. In 2016, homeless were evicted from a park near where the National Stadium,



the main venue for the Olympics, was built.

Japan has a relatively high poverty rate for a wealthy nation. It also is less generous with social welfare than countries in Europe and lacks the sorts of private charities prevalent in the United States.

**Nearly 16 percent of Japanese are below the poverty rate, with annual income below the cutoff of ¥1.2 million, according to 2017 government data. The poverty rate for single-adult households with children is way higher, at 51 percent.**

The unraveling of extended family support networks and job insecurity have left many in Japan vulnerable to setbacks that can lead to homelessness. The nation's culture of conformity leaves many, including families, ashamed to seek help.

Most of the homeless sleeping underground in Shinjuku, a glitzy shopping area fringed by red-light districts, high-rise offices and parks, are older men.

Shigeyoshi Tozawa has a lacquer begging bowl with a few coins, three tiny, solar-powered toy figures with bobbing heads bought at a ¥100 store, and various bags filled with blankets, clothes and other items, including his poems.

"Last night / dream of a future trip / it is dark," goes one poem. Passersby sometimes give him money for the poems, he says.

"This is my community. We all help each other," Tozawa said. "There are no dirty homeless here. We are all 'trendy.'"

In what's clearly a routine, he and the others quietly prepare for the night, picking their favorite spots, neatly folding blankets. Some change into sleepwear and wipe their feet clean with wet towels, daintily placing their shoes beside their lopsided cardboard shelters.

Tozawa and the others are relatively well-dressed, wearing handout down jackets, baseball caps and camouflage sweatpants. Some have cell phones and other devices. Many have some money in the bank. They get by making the rounds of downtown soup kitchens run by church and volunteer charities, and other spots where they can get free rice balls or sandwiches.

Many of those sleeping rough are "working poor," said Daisaku Seto, who works for a nonprofit for refugees and a consumers' food cooperative called Palsystem. He says some suffer psychological trauma and need training to get better-paying jobs. Once they drop into poverty, they rarely find their way out.

"We need to come up with ways to help that empower them," said Seto, who is one of the leaders of a grassroots group called the Anti-Poverty Network.

Yukio Takazawa, executive director of a support group for the poor in Yokohama's Kotobukicho district, an area of flophouses where homeless people also tend to congregate, worries the worst is to come.

The construction boom from the Olympics will be winding down, reducing chances for odd jobs for day laborers. The younger poor, who often spend nights in internet cafes, likely will eventually end up on the streets, said Takazawa, who has been working with the poor for 30 years.



Finding affordable housing in Tokyo is tough. Rents are high and landlords tend to be finicky. Just getting a rental contract can require six months of rent or more up front.

Those unable or unwilling to get apartments camp along river banks or in parks and train stations. Welfare offices try to get people to move into shelters but many, like former construction worker Masanori Ito, resist. “They have rules,” he said, munching on a sandwich he got from a volunteer.

If he has to move, Ito said he plans to find some other warm outdoor spot. “I don’t know where we will all move next,” he said.

**EDITOR’S COMMENT:** A bit shocked and surprised! Where is the famous Japanese respect and care for the elderly?

## Release of the First French Jihadist Who Joined ISIS Raises Security Concerns

By Fayçal Benhassain

Source: <https://www.cnsnews.com/article/international/faycal-benhassain/release-first-french-jihadist-who-joined-isis-raises>

Feb 05 – The recent release from prison of a Frenchman who joined ISIS in Syria in 2012 is raising concern in France, especially after a knife attack in London on Sunday prompted British Prime Minister Boris Johnson to voice support for stopping the early release of convicted terrorists.

The attack in Britain came days after the knifeman, Sudesh Amman, was freed early from prison, after a 2018 conviction for disseminating terrorist material.

Frenchman Flavien Moreau, who was freed in mid-January, joined the Sunni terrorist group to fight against the Assad regime. His release prompted right wing politicians to call for longer detention periods for jihadists and radicalized individuals. Some have even suggested that the most dangerous people should remain incarcerated indefinitely.

**Of 550 prisoners, 70 of them women, convicted of acts of terrorism, jihad or related offenses, around 40 are expected to finish their sentences in 2020. Moreau is the first. In 2021, 107 prisoners serving terror-related sentences are due for release, while 147 are set for release in 2022, Justice Minister Nicole Belloubet said in a television interview last week.**

Also, of concern for many here is the possible repatriation of French jihadists being held by Kurdish forces in

Syria.

Moreau returned from Syria in 2013, was convicted of the “association of criminals for the preparation of an act of terrorism,” and sentenced to seven years’ imprisonment.

“His past story does not reassure, but he has served his sentence and there is no way to keep him, in one way or another, in jail,” said Jean-Charles Brisard, president of the Center for Analysis of Terrorism.

As Moreau is still considered dangerous, he will be subject to judicial surveillance for just over 11 months. He can be summoned at any time by a judge. He cannot travel outside a designated area of France, or abroad.

His name is now on the national judicial register of perpetrators of terrorist offenses, who continue to be monitored by intelligence services for as long as deemed necessary.

In a radio interview last year, Belloubet said freed jihadists would be subjected to “extremely strict follow-up.”

“When we are faced with this kind of detainee, the authorities conduct an assessment of their dangerousness and they are put in a sealed area in jails,” she said. “When they leave, there is obviously an extremely strict follow-up by the territorial intelligence services.”

### Acquittal risk

Under a 2012 law, the French justice systems is empowered to judge terrorist acts committed abroad by French citizens. A public prosecutor may initiate proceedings, but practical problems arise, including the assessment of evidence of acts committed abroad. Didier Rebut, professor of Criminal Law and Procedure at Sorbonne University, told FranceTVInfo that the main danger remains a risk of acquittal.

“We can condemn them for all the offenses qualified as terrorists by the penal code – attacks, destruction, murders, kidnappings – but we must have proof.”

“Because it encompasses many cases, the offense jihadists are often charged with in France is the association of criminals in connection with a terrorist enterprise. This charge is generally accepted because it is the easiest crime to prove,” Rebut said.



The offense Moreau was charged with enables a conviction of a person who has expressed support for a group with a terrorist purpose without necessarily having him or herself committed any terrorist act.

It has been widely used against jihadists who returned voluntarily from the ISIS region. The charge makes it possible to secure heavy sentences, in a simpler and quicker trial than would otherwise be the case.

**In a common criminal case, a detainee must be brought in front of a judge and formally charged within 24 hours. In a terror-related case, the period may be extended to 72 hours (or even 96 or 144 hours in some cases).**

Some critics worry about the fact that when it comes to terrorism cases, standard procedures relating to pre-trial detention, the adjustment of sentences, and other issues, do not apply.

In a newly-published book Marie Dosé, a lawyer who defends people and their relatives who left or tried to leave France for Iraq or Syria to join ISIS's "caliphate," denounced the emergence of what she called an exceptional system of justice, applied in the case of terror suspects since a wave of attacks in France in 2015 and 2016.

By applying that legal regime indiscriminately to all those who wanted to leave, or left the country to join radical groups, France ends up producing the opposite of an effective criminal policy, and in fact "feeds terrorism," Dosé said.

**EDITOR'S COMMENTS:** (1) Some countries will never learn! (2) Too much democracy is bad for the health of the citizens – when it comes to terrorism. Until next time that a British copy & paste incident will take place on French soil ...

## AI developed to predict age based on gut, skin and mouth microbiomes

Source: <https://newatlas.com/science/ai-ibm-predict-age-gut-skin-mouth-microbiome/>



Feb 12 – A new tool has been developed that can effectively predict a person's chronological age based on a microbiome sample. The tool, developed in collaboration between UC San Diego and IBM researchers, is most accurate at predicting a person's age when using a skin microbiome sample.

A number of intriguing studies are beginning to investigate links between aging and the billions of microbes that live within and on us. Researchers from Singapore [last year experimented with gut microbiome](#) transplants between old and young mice, with the results suggesting an aging microbiome may alter its bacterial populations to balance out the more systemic deficits of aging in an organism.

This new research set out to use modern machine learning techniques to investigate whether the human microbiome could be used as an indicator of age. Three different human microbiome populations were explored in the study – skin, mouth and gut. Mining data from 10 previously published studies, the new research gathered almost 9,000 microbiome samples from subjects aged between 18 and 90 years.

**Interestingly, the model found the skin microbiome to be the most accurate predictor of chronological age, correctly estimating age within a window of 3.8 years. The oral microbiome was similarly accurate, with correct estimates within 4.5 years. The gut microbiome was the least accurate, found on average to only be correct within a window of 11.5 years.**

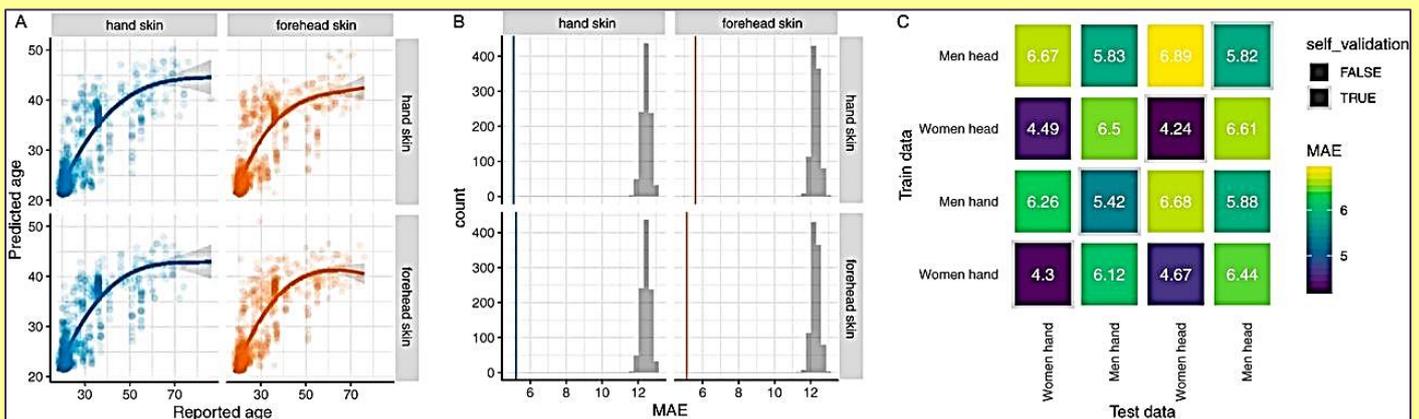
**The skin microbiome is sampled using swabs from either the hand or forehead, and the research suggests both locations offer equally accurate results. The skin microbiome samples were also the most consistent across different cohorts and geographical locations, suggesting our skin microbes are quite similar no matter where we live or what we eat.**

The researchers hypothesize the reason the skin microbiome is the most accurate predictor of chronological age is most likely due to general age-related physiological changes in skin conditions. As most people age their skin becomes drier and decreases serum production, and these changes can be explicitly reflected in alterations to superficial microbiome populations.

"The human microbiome is constantly evolving and has been observed to change with age," three of the researchers write [in an editorial](#) accompanying the newly published study. "The presence of unusually early microbiome aging patterns, relative to chronological age, could potentially signal altered susceptibility for age-related diseases. Conversely, a 'young' microbiome might offer clues on how to decelerate the aging process."

The current research is based on microbiome data from subjects in the United States, China, the United Kingdom, and Tanzania. More data, and larger studies, will be necessary to better home in on the microbiome differences between various geographical and ethnic populations. However, the researchers are confident the particular universality of the skin microbiome may help home in on a general relationship between microbes and aging that unifies humans across the globe.





“This new ability to correlate microbes with age will help us advance future studies of the roles microbes play in the aging process and age-related diseases, and allow us to better test potential therapeutic interventions that target microbiomes,” says Zhenjiang Zech Xu, co-senior author on the study.

►► The new research was published in the journal [mSystems](#).

**EDITOR’S COMMENT:** Perhaps this is the perfect solution for all illegal immigrants stating that they are minors when in reality they are adults – especially when involved in crimes of all kinds.

## Tokyo faces an Olympic Games conundrum

Source: <https://asiatimes.com/2020/02/tokyo-faces-an-olympic-games-conundrum/>

Feb 21 – As the coronavirus outbreak rages, Tokyo Olympics organizers say there’s no “Plan B.” The summer games will begin on July 24 – and what an extravaganza Shinzo Abe’s government claims to have in store for sports enthusiasts everywhere. Yet doubters have [38,000 reasons](#) to wonder if the Japanese Olympic Committee is dreaming. That’s how many runners were recently told the March 1 Tokyo marathon has been cancelled. Only an elite group of 176 – and 30 wheelchair athletes – will compete in the 42.195-kilometer event.

For Tokyo, it’s the starkest sign to date that the nation with the third-largest number of coronavirus cases after China and South Korea is bracing for the worst.

Of course, such concerns may end up looking silly 155 days from now should opening ceremony festivities come off exactly as planned. There are [promising signs](#) that the number of new cases in China is trending downward. History also hasn’t been kind to those who called for the cancellation of the 2016 Rio de Janeiro Olympics amid [Zika virus hysteria](#).

It’s impossible to say where the so-called Covid-19 outbreak will be, even 30 or 60 days from now. For those overseeing planning for Japan’s most significant foray onto the global stage in decades, though, there’s ample reason to worry.



JOC officials also are fending off warnings about threats that Tokyo’s extreme summer heat may pose to athletes.

If there is panic in Tokyo, officials aren’t letting on. About the most emotional take comes from Tokyo Olympics CEO Toshiro Muto, who admitted he’s “seriously worried” about the impact the coronavirus could have on the “momentum towards the Games.” Not on the Games themselves, but how the public discourse is focusing on whether Japan is safe for travel.

This is a deeply sensitive topic. Tokyo howled in protest last week over [posters in South Korea](#) depicting Olympic torchbearers in anti-radiation hazmat suits, a reference to the 2011 nuclear crisis in Fukushima.



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Generally, though, the mantra that [Yoshiro Mori](#), a former prime minister who heads the Tokyo Olympic organizing committee, has been repeating over the last week forms the official government line: “I want to again state clearly that cancellation or postponement of the Tokyo Games has not been considered.” The IOC line can be found in inspection team head John Coates’ take that the coronavirus is an “unexpected issue” that requires greater precautions, not panic.

Some media outlets are less sanguine. In a February 15 [editorial](#), the Asahi Shimbun warned it’s “time to face the real possibility of a coronavirus epidemic at home.” Worries around a potential pandemic arrived in Japan with the quarantined cruise ship *Diamond Princess* currently docked at Yokohama Port. Among the ranks of the 3,700 people on board was the biggest outbreak outside China. Reports of local transmissions, albeit modest in number, are making headlines abroad. Increasingly, [multinational companies](#) are avoiding travel to Japan. Prada cancelled a big Japan fashion show scheduled for May.

“We are seeing companies in several countries besides China, such as India, that are refusing business trips from Japanese partners,” said Japan Foreign Trade Council chairman Kuniharu Nakamura. “This reminds us again of the severity of the impact.” Japan’s tourism business is taking ever bigger hits. Already, Prime Minister Abe’s plan to woo 40 million tourists this year is a non-starter. And another body blow for an economy that plunged an annualized 6.3% in the fourth quarter. Mainland Chinese, it’s worth noting, account for 40% of all tourist expenditures in Japan.

Much of Abe’s ambitious tourism goal centers on Tokyo 2020, a coming-out party he hopes places Japan on the bucket-list of travelers around the globe. Instead, Japan’s media are fending off what they deem misinformation about health risks. In a [recent editorial](#), the Mainichi newspaper called on Tokyo to “provide accurate info on virus spread to prevent anxiety [and] discrimination.”

The Mainichi and other outlets have taken to quashing [social media chatter](#) about Tokyo 2020 being cancelled. Such reports have trended on and off since January 30. More recently, the media have been highlighting news that US President Donald Trump might attend the Olympics. On February 18, Trump said: “We’ll make that determination. We haven’t made it yet, but we might.”

### Coronavirus

Part of the “might” may depend on how Japan fares with the coronavirus. On February 20, Japan announced that two passengers from the cruise ship moored near Tokyo had died. Hardly news that helps Abe’s government spin the outbreak as controllable. More than 620 people on that ocean liner have tested positive so far.

Let’s say, for argument’s sake, that the coronavirus morphs into a full-blown pandemic come July. Tokyo would confront an unprecedented situation, the first time the Games were postponed or shelved for reasons other than a world war.

**By some forecasts, Tokyo may end up lavishing [some \\$26 billion](#) on the Olympics and Paralympics, dwarfing the roughly \$7 billion it was originally estimated the event would cost.**

Outright cancellation is far less of a risk than postponement. To even entertain the possibility of cancellation would require that the worst-case scenarios for the coronavirus mutating and spreading round the globe like wildfire to prove true.

Assuming today’s optimism that the virus is peaking – or already has – the question for Tokyo is whether countries from the US to China to South Korea to Great Britain will feel comfortable sending teams. Losing any top sporting nation might tarnish the validity of Tokyo’s medal tallies.

**Postponement would prove chaotic for JOC organizers and travelers holding flight and lodging reservations. Yet altering the schedule might prove most costly for NBC in the US. The network is paying [nearly \\$4.4 billion](#) to broadcast the Summer Games.**

But there’s also the issue of putting athletes at risk.

When Tokyo held the 1964 games, events were held in October to avoid the city’s harsh heat and humidity. This year’s events are in the dog days of summer so as not to collide with NBC’s sports programming in the fall. A postponement to later in the year, one can argue, could make the Games safer for runners, cyclists, rowers and other athletes competing in open-air events.

Just because there is no Plan B doesn’t mean one can’t be devised. For the time being, though, no one knows where the coronavirus story will go over the next five months. **All that the 11,000 athletes from 200 nations who are preparing to flood Tokyo can hope for is to fare better than the 38,000 marathoners who have no race to run 10 days from now.**

Sports organizers on the Chinese mainland have been busily cancelling events – basketball, the Shanghai Formula One Grand Prix, golf tournaments, track and field’s [World Indoor Athletics Championships](#), you name it.

All Team Abe can hope is for the coronavirus to burn out in time for Tokyo’s big moment in the spotlight. Even if it does, though, the economic fallout could dampen Japan’s 2020.

Abe has long predicted the Games would generate an [economic high](#) on which Asia’s No. 2 economy would ride into 2021 and beyond. Yet analysts at Fitch Solutions warn that coronavirus effects “could limit the positive spill-overs.”



Even the best-case scenarios for Japan at this moment in 2020 auger poorly for the next several months. So much for the medal-caliber economic year Abe thought was in store for Japan Inc.



## Paying ransoms to pirates

Source (in Greek): <https://www.newsauto.gr/specials/people/i-somali-pirates-agapane-tous-ellines-efoplistes/>

Negotiators reportedly get paid three thousand euros a day, and even delivering ransom is a complex process, undertaken by specialized companies staffed by former British commandos, the famous SAS. Their members receive the money requested by the shipowner, usually from Dubai, in special suitcases with a transmitter. Subsequently chartered specifically for this purpose the lear jet is transported to an African country such as Kenya and from there arranges their delivery to the pirates. Usually the ransom is transported by a Cessna airplane and the procedure followed is cinematic. The pirates take all the crew on board, the small plane makes a "dive" and throws them on board to make the count at the same time and make sure all sailors are alive. There are special codes between pirates and company members who bring ransom to avoid misunderstanding. The money is locked in a watertight pipe — one pipe can hold about three million euros — and is sometimes thrown near the ship, from which a boat descends and receives it. Once uploaded to the ship, the process is first to determine if the notes are counterfeit and immediately after counting and sharing. It is worth noting, however, that both the ransom demanded by pirates and the time taken to book a ship have almost doubled, which is of particular concern to Greek shipowners.

## Greek Islanders Want Their Lives Back

By Burak Bekdil

*Gatestone Institute*

Source: <https://www.meforum.org/60461/greek-islanders-want-their-life-back>

Feb 20 – Locals are angry. So are the migrants. Tens of thousands of migrants have illegally landed here, on the islands of Greece, since 2015. Some leave, some stay, but most wait to be "processed" in the hope of finding their ways into Europe's richer countries, such as Germany.

"*Theloume piso ta nisia mas...*, *Theloume piso ti zoi mas!!!*" echo poster slogans across Greece's northeast Aegean islands, inviting locals to debate the poisoning refugee catastrophe: "**We want our islands back... We want our lives back!!!**" Lesbos, an island situated on the easternmost corner of Europe and neighboring Turkey, is one of the victims that once was a paradise.

There is always the lighter side of things. A tavern owner recalls a 2015 dialogue with a Syrian migrant who had just disembarked from the rubber boat that carried him to a faraway corner of Lesbos after a perilous journey. The refugee arrives at the tavern and, in broken English, asks: "Tell me, quick, where does the train leave for Germany?"

Vangelis Stelianou, the owner of the beautiful tavern "*H Mouria tou Myrivili*" in Skala Sykamineas at the northern tip of Lesbos, recalls how the "refugee business" works,



## C<sup>2</sup>BRNE DIARY – February 2020

based on his conversations with hundreds of migrants who usually arrive at the doorstep of his eatery because the distance between the Turkish mainland and Lesbos is shortest here (just five miles): "It's 1,500 euros per person and one boat takes up to 60 persons. **One boat's turnover is thus 90,000 euros if it travels once a day.**"



"Usually the Turkish coast guard boats accompany illegal boats to the shores of Lesbos and leave," Syelianou says, pointing to an August 29, 2019 photo he took, showing half a dozen or so illegal boats just off Skala Sykaminea and a Turkish coast guard boat just behind them.

At [Moria](#), the largest camp on the island of Lesbos, 19,000 migrants are presently seeking shelter at a facility with a capacity for 2,840 people. The total population of Mytilini, the capital of Lesbos, is about 29,000. The result is frustration.

On February 4, Lesbos residents [barged into the government office](#) that regulates Aegean and island policy to demand a response from Athens to overcrowding at the Moria camp. "I'll admit that I am not optimistic," Northern Aegean Regional Governor Kostas Moutzouris told reporters after a meeting with residents. The previous day, Greek police in Mytilini had [clashed with protesters](#) as they sought to prevent a march of some 2,000 migrants from the camp in Moria from reaching the capital Mytilini.

"It's up to the Turkish government," said one local. "They are deliberately using the migrant card as a bargaining chip with the European Union." In 2016, Ankara and Brussels reached a deal in which the EU [committed](#) six billion euros (\$6.6 billion) in migrant [assistance](#) and a more liberal visa regime for Turkish nationals in return for Turkey stopping migrants from crossing. The deal has not stopped the refugee flow from the Turkish coast. Turkey [claims](#) that so far, only about \$2 billion has been paid.

In October, Turkey's Islamist president, Recep Tayyip Erdoğan, [vowed](#) to send millions of (more) refugees to Europe if EU countries did not back his proposal to settle them in a Syrian "safe zone." Shortly before that, Erdoğan had [threatened](#) the EU with sending "3.6 million refugees [which Turkey hosts] your way." With that threat, Erdoğan is not only imposing Turkey's "nuisance value" on the EU but is also addressing an increasingly angry Turkish population over Syrian migrants. A 2017 [survey](#) by Istanbul's Bilgi University revealed that more than 85% of Turks favored the repatriation of migrants residing in Turkey.

What to do? Apparently, there is little to be optimistic about. In an interview with the author, former Greek ambassador to Turkey Ioannis Corantis said:

*It is safe to assume that the flow of refugees -- be they political or simply economic migrants -- will continue unabated, as long as Turkey uses them as a means of pressure on Greece and the EU, in order to promote its own agenda, taking into account the obvious difficulties the Greek authorities*



*have in countering the inflow of migrants through the sea border between the Greek islands in the Aegean and the Turkish mainland.*

Corantis also said he thinks that a realistic solution to the problem should consist of two pillars. The first would consist of a set of legislative and executive measures in Greece -- some of which are being already implemented -- in order to improve border controls at sea, speed up procedures for the examination of asylum requests and thus the expulsion or repatriation of all those who see their application denied, heavy penalties for people-smugglers, and a well-organized public information campaign in the countries of origin about the fate of their nationals would be refugees.

The second pillar would consist of an overall settlement agreement between the EU and Turkey -- leaving aside the now infamous and totally ineffective EU-Turkey declaration of March 16, 2016 -- by which EU member states would commit themselves to receive directly, and not through Greece, specific numbers of refugees according to previously agreed criteria. "In exchange," Corantis concluded, "literally, Turkey should receive a financial compensation, as she has already."

Greek islanders want their islands -- and lives -- back. Sadly, they will not have them back any time soon.



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

**EDITOR'S COMMENT:** Just a "one word" addition to the comment of Ambassador Corantis -- "peacefully" (highlighted in yellow) = "... in peacefully countering the inflow of migrants ...". Because the alternative is very easy to be done and unfortunately, this is what will happen in the near future. Patience and hospitality have certain limits and these limites have benn overpassed long time ago. As for the two pilars proposed in this article, Mr. Bekdil should ask any Greek about a saying we have about "ways to paint eggs!"

## Olympic Games and Covid-19

**Why they keep on saying that the games are on**

Source: <https://globalnews.ca/news/6582956/covid-19-tokyo-olympics-coronavirus-questions-answered/>

Local Japanese companies have paid over \$3 billion for sponsorship deals to local organizers, a record amount that is at least twice any previous Olympics. Local organizers say they are spending about \$13 billion to organize the Olympics, although a national audit report puts the cost at twice that much.

U.S. television network NBC pays about \$1 billion for the broadcast rights to the Olympics. The July 24-Aug. 9 Tokyo Olympic slot is mostly determined by television. Moving the Olympics back a few months — when the weather is cooler in Tokyo — would seem impossible with the sports broadcast calendar filled with American football, college football, baseball, basketball, and ice hockey. The European soccer schedule is also packed beginning in fall.

Almost three-quarters of the income for the International Olympic Committee — \$5.7 billion in a four-year cycle — is from broadcast rights.

Any change would cause massive disruption to the 11,000 Olympic athletes and another 5,000 Paralympic athletes — and their staffs, families and coaches. Tokyo hotels are booked solid during the Olympics — not to mention flights — with 7.8 million tickets available for the Olympics, and 2.3 million for the Paralympics.



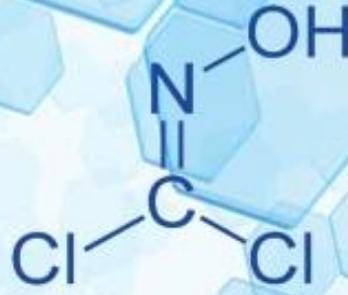
**EDITOR'S COMMENT:** Tons of money just to watch who is running faster, who is jumping higher, who is throwing something longer? Imagine what all that money could do for the suffering population of this planet! Commerce Security Games are far away from the original Olympic Games spirit! I could propose here to have the Olympics back home in the ancient Olympia, Greece. But I am not that naïve to propose utopic things ...



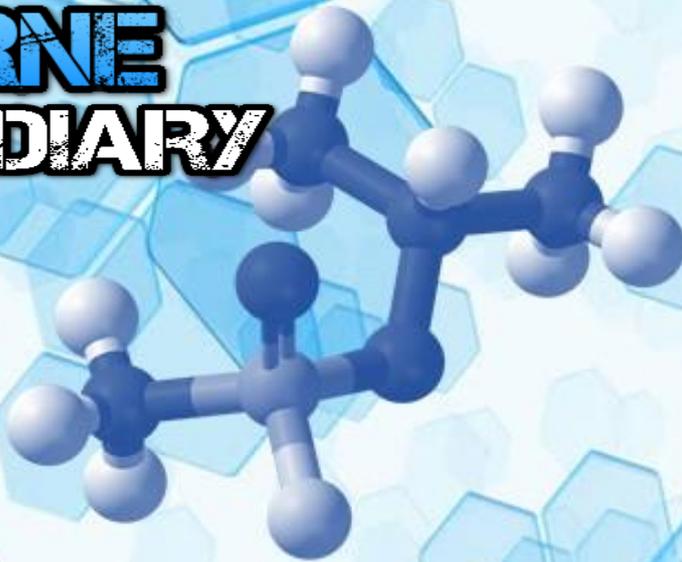
ICI

International

**CBRNE**  
INSTITUTE



**C<sup>2</sup>BRNE**  
**DIARY**



**CHEM NEWS**



## When speed and safety matters



Photo was taken on May 7, 2014 during a demonstration put on for the 40th Anniversary of the GIGN where all of their equipment and divisions were presented before the Interior Minister and many other leading government officials. The Groupe loves to show off their **airTEP system** which was developed by them to rapidly insert and exfill up to twelve fully geared operatives much quicker and safer than more traditional methods.

►► Read more on Airborne Tactical Extraction Platform (airTEP) – [here](#).

## Leveraging Cheminformatics to Bolster the Control of Chemical Warfare Agents and their Precursors

STEFANO COSTANZI, GREGORY D. KOBLENTZ, RICHARD T. CUPITT\*

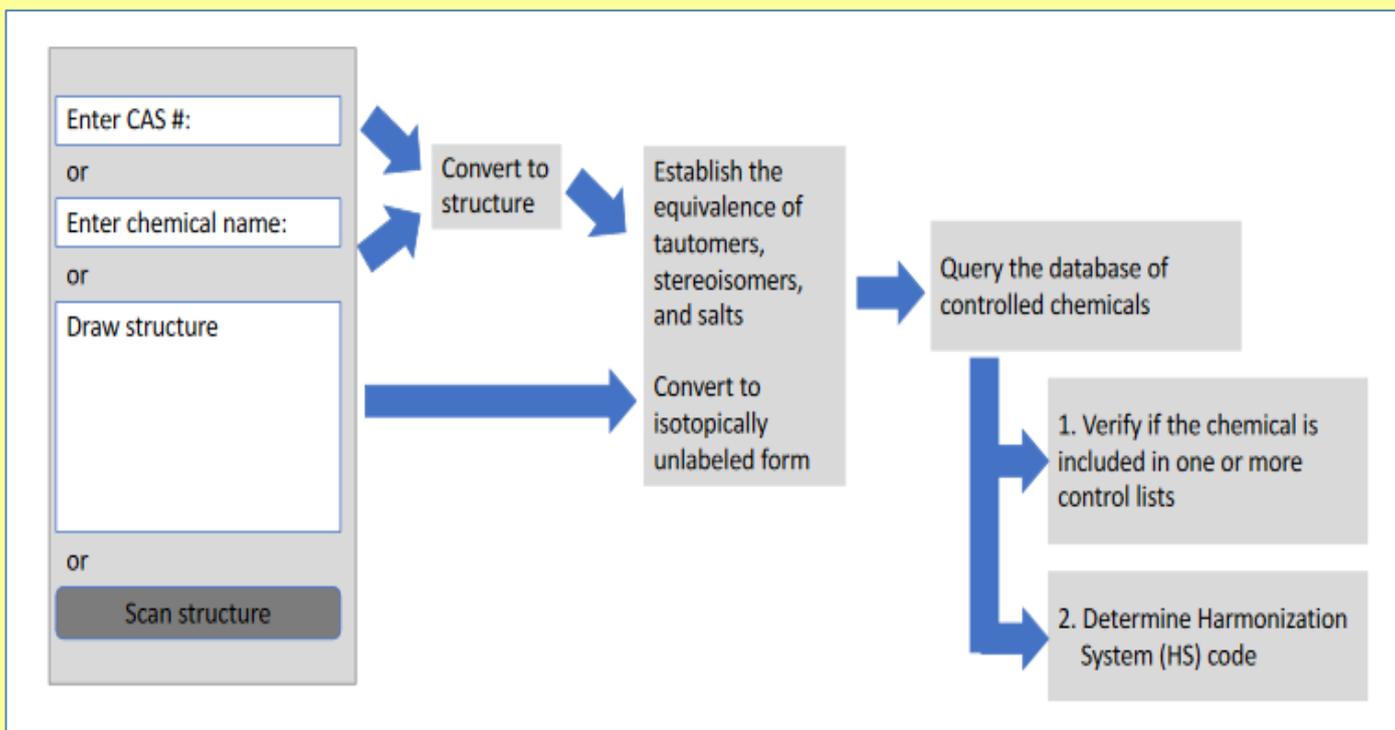
*STRATEGIC TRADE REVIEW*, Volume 6, Issue 9, Winter/Spring 2020 pp. 69–92

Source: <https://strategictraderesearch.org/wp-content/uploads/2020/01/Cheminformatics.pdf>

International frameworks and national legislation contain lists of controlled chemicals that can be employed as chemical warfare agents or precursors for their synthesis. The development and wide adoption of a cheminformatics tool could overcome several practical problems inherent to the way in which the identification of such chemicals is currently



conducted, namely: the same chemical can be identified with a multitude of synonyms; different versions of the same chemical, for instance isotopically labeled versions, have different registry numbers; some lists define whole families of related chemicals of concern in a single entry, thus complicating certification of compliance; and lists of controlled chemicals are subject to change and must be kept current. Composed of an up-to-date database of relevant lists of controlled chemicals with an associated easy-to-use software, this tool would help address these problems by converting any entered chemical name or registry number into a chemical structure, and automatically checking whether that structure matches any entry of the database. Efforts by the Pistoia Alliance for the control of regulated narcotic and psychotropic substances has led to the development of commercial software that can be used as a starting point for the development of the proposed cheminformatics tool for nonproliferation purposes. By helping frontline officers and chemical industry to handle families of chemicals, this cheminformatics tool could facilitate the inclusion of families of chemicals in control lists, thus closing potential proliferation loopholes. Finally, beyond chemical warfare agents and precursors, this cheminformatics tool could be generally used to handle any list of controlled chemicals.



Simplified, schematic representation of the cheminformatics tool. In addition to checking whether a chemical is included in one or more control lists, the tool would also determine the Harmonization System (HS) code of the query chemical.

*Stefano Costanzi is an Associate Professor of Chemistry at American University with an educational background in both the chemical sciences and international affairs. His current scholarly work is based on two research lines: the computational modeling of the interactions between chemicals and living organisms; the analysis of gaps in current policies and practices that allow the proliferation of chemical weapons and the conceptualization of solutions and tools to narrow them.*

*Gregory D. Koblentz is an Associate Professor and Director of the Biodefense Graduate Program at George Mason University's Schar School of Policy and Government. He is also an Associate Faculty at the Center for Security Policy Studies at George Mason and a member of the Scientist Working Group on Biological and Chemical Security at the Center for Arms Control and Nonproliferation.*

*Dr. Richard T. Cupitt is Senior Fellow and Director of the Partnerships in Proliferation Prevention program at the Stimson Center. He has served with the U.S. State and Commerce Departments, the United Nations, and in a variety of academic posts and consultancies. He has several books and more than 20 peer reviewed articles on nonproliferation export controls, along with dozens of other security or trade-oriented publications.*



## Chemical-Biological Terrorism and Its Impact on Children

By Sarita Chung, Carl R. Baum, Ann-Christine Nyquist and DISASTER PREPAREDNESS ADVISORY COUNCIL, COUNCIL ON ENVIRONMENTAL HEALTH, COMMITTEE ON INFECTIOUS DISEASES

*Pediatrics* February 2020, 145 (2) e20193750

Source: <https://pediatrics.aappublications.org/content/145/2/e20193750>



**PEDIATRICS**  
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Children are potential victims of chemical or biological terrorism. In recent years, children have been victims of terrorist acts such as the chemical attacks (2017–2018) in Syria. Consequently, it is necessary to prepare for and respond to the needs of children after a chemical or biological attack. A broad range of public health initiatives have occurred since the terrorist attacks of September 11, 2001. However, in many cases, these initiatives have not ensured the protection of children. Since 2001, public health preparedness has broadened to an all-hazards approach, in which response plans for terrorism are blended with those for unintentional disasters or outbreaks (e.g., natural events such as earthquakes or pandemic influenza or man-made catastrophes such as a hazardous-materials spill). In response to new principles and programs that have evolved over the last decade, this technical report supports the accompanying update of the American Academy of Pediatrics 2006 policy statement “Chemical-Biological Terrorism and its Impact on Children.” The roles of the pediatrician and public health agencies continue to evolve, and only their coordinated readiness and response efforts will ensure that the medical and mental health needs of children will be met successfully. In this document, we will address chemical and biological incidents. Radiation disasters are addressed separately.

## ABC – NBC – CBRN – CBRNE – CBRNE

Source: <https://www.babs.admin.ch/en/aufgabenbabs/abcschutz.html>

In addition to the acronym NBC commonly found in English-language texts, the acronyms ABC (atomic, biological and chemical) and CBRN (chemical, biological, radiological and nuclear) are also widely used. Radiological and nuclear (or atomic) threats differ in terms of the source of radioactive contamination. A nuclear (or atomic) threat involves the detonation of nuclear weapons and the after-effects. On the other hand, a radiological threat involves other contamination sources, principally in the form of a radioactive dispersion device („dirty bomb“). In recent years, the use of the acronym CBRNE, where „E“ stands for „explosives“, has become more widespread due to the fact that the deployment of NBC weapons always, or almost always, involves some type of explosive. The second „N“ in the acronym CBRNNE stands for „narcotics“. Given that narcotics and psychoactive substances, such as fentanyl, are also classified as „non-lethal chemical weapons“, these could present an additional NBC threat.



**EDITOR'S COMMENT:** I think there is another more precise acronym: **C<sup>2</sup>BRNE** – C<sup>2</sup> for chemical and cyber threats!

## CS Tear Gas In Hong Kong And Elsewhere: Assessing The Hazards

By Dan Kaszeta

Source: <https://www.bellingcat.com/news/2020/02/07/cs-tear-gas-in-hong-kong-and-elsewhere-assessing-the-hazards/>

Feb 07 – Tear gas has been used in a number of incidents in recent months in Iraq, France, Chile, Hong Kong, and elsewhere. Numerous allegations about tear gas have been made, and misinformation, half-truths, myth, and suppositions have been passed around on social media.

Yet there is actually a wealth of information about tear gas available in the technical literature. The purpose of this post is to dig into the health and safety concerns behind tear gas usage.

### What Is “Tear Gas”?

Generally, the term “tear gas” refers to a substance known as CS. CS, in turn, is a nickname for chemical substance 2-chlorobenzalmalonitrile. It is not a gas in normal situations for very long. CS is generally a solid, and is used in many forms.

CS is often used in burning grenades or canisters where the CS is combined with a burning filler and the resulting smoke suspends a cloud of particulates. In such form, CS can be an area-weapon, with clouds of fog or smoke used to clear buildings or large areas. Others





dissolve CS in a solvent for spraying or bursting to suspend a cloud of particulates. CS is extremely irritating to skin and eyes, and has a distinct peppery smell. It is commonly used in military training as a simulant for much more dangerous substances and to help soldiers learn to put on their protective masks quickly.

Table III-2. CS

Chemical name: O-Chlorobenzylidene Malononitrile <sup>1</sup>	
Synonym: 2-Chlorobenzalmononitrile, CS, OCBM <sup>1</sup>	
CAS registry number: 2698-41-1 <sup>1</sup>	
RTECS number: OO3875000 <sup>1</sup>	
<b>Physical and Chemical Properties</b>	
Structural formula: <sup>2</sup>	
Molecular formula: C <sub>10</sub> H <sub>5</sub> ClN <sub>2</sub>	
Molecular weight: 188.6 <sup>1</sup>	
Physical state	White crystalline solid <sup>1</sup>
Odor	Pepper-like <sup>1</sup>
Boiling point	310°C to 315°C (590-599°F) <sup>1</sup>
FP/MP	95°C to 96°C (203-205°F) (MP) <sup>1</sup>
Solid density (g/mL)	Bulk: 0.24-0.26; Crystal: 1.04 <sup>2</sup>
Vapor density (relative to air)	6.5 (calculated)
Vapor pressure (torr)	0.00034 @ 20°C <sup>2</sup>
Volatility (mg/m <sup>3</sup> )	0.71 @ 25°C <sup>2</sup>
Latent heat of vaporization (kcal/mol)	Data not available
Flash point	Data not available
Decomposition temperature	Data not available
Solubility	Insoluble in water; <sup>1,2</sup> moderate in alcohol; and good in acetone, chloroform, methylene dichloride, ethylacetate, and benzene <sup>3</sup>
Rate of hydrolysis	Data not available
Hydrolysis products	Data not available
Stability in storage	Combustible material; may burn but does not ignite readily. Containers may explode when heated; <sup>4</sup> incompatible with strong oxidizers. <sup>1</sup>
Action on metals or other materials	Contact with metals may evolve flammable hydrogen gas <sup>4</sup>

The physical characteristics of CS are shown in this table from the US Army's Field Manual 3-11-9

It should be noted that there are other riot control agents that have been used, either historically, or in modern times. CA, CN, CR, OC (aka "Pepper Spray"), and various other compounds have been used at various points. There have been situations, such as in Iraq, where hexachloroethane (HC) smoke grenades have been used, in an unacceptable off-label usage, with or instead of tear gas grenades. However, there is little evidence that anything other than CS is in use in the current situation in Hong Kong.

Terminology is important. Some social media references to CS or other riot control agents as "nerve agents" or "mustard gas" are factually incorrect. A widely circulated myth alleges that because CS and pepper spray cause pain, and pain

is transmitted by the nerves, these are therefore "nerve agents." This is not, in fact, anything close to the actual definition of nerve agents. This has been discussed at length in another [Bellingcat article](#).



### Toxicity Of CS

CS has been widely considered a relatively safe substance to use because it has a very wide margin between the concentrations at which it is intolerable or incapacitating, and the concentrations at which it is potentially lethal.

Studies and references vary somewhat, but an accepted reference work (R. Gupta, *Toxicology of Chemical Warfare Agents*, 2<sup>nd</sup> edition, 2015, El Sevier) gives well-sourced data. CS provides irritation starting at a very low threshold of 0.004 milligrams per cubic meter of air (mg/m<sup>3</sup>).

This is an extremely small amount of material. Intolerable or incapacitating levels of CS are around 3-10 mg/m<sup>3</sup>, although individual tolerances vary significantly. Estimated lethal concentration of CS range from 25,000 to 150,000 mg/m<sup>3</sup>, over the course of one minute. This level of CS is basically impossible to achieve in any kind of field conditions.

There have been very few cases of direct lethality from CS exposure in humans, and a number of those have been due to fire and blunt trauma (from CS projectiles hitting the body), not actual CS exposure. A more comprehensive study of lethality from tear gas is [here](#).

### Vulnerable Populations

Some people are more vulnerable to CS exposure than others. CS particles are known to cause eye injury and people with contact lenses can have these particles get stuck behind the lenses, causing a higher degree of irritation than “normal.”

CS is a respiratory irritant and people with pre-existing lung conditions like asthma, emphysema, or recent smoke inhalation are likely to be more vulnerable to CS exposure. The literature on CS and asthma is inconclusive. One [study](#) has shown that women are more seriously affected by the respiratory effects of CS than men. Effects on children, pregnant women, and elderly people are poorly studied as there is no way to construct a research project on this in a way that conforms to ethical standards and there is also not enough case history from which to draw conclusions.

### Four Categories Of CS Dispersal

If one examines the technical literature, not all CS is created equal, nor does every type of munition create CS with the same characteristics. The quality of CS produced by a munition appears to change depending on the method of dispersal.

#### Category 1: Sprays Of CS Liquid

First, there are devices that spray CS dissolved in solvents. These spray devices are commonly used by police. They are also legal for personal self-defence in many parts of the world. In the U.S., these are largely considered older technology and have been supplanted by pepper spray, which comes from chili peppers. In this category of device, the CS is dissolved in a solvent such as methylene chloride.

#### Category 2: Mechanical Or Explosive Dispersion Of Powder

Some devices are designed to disperse CS in powder form. One common form is the bursting grenade, of which the US M25A2 grenade is a classic example. It uses a small bursting charge to break open the grenade case and create a cloud of CS particles. Various fogger-type devices have been historically used, particularly in the Vietnam war, to make clouds of particles.

#### Category 3: Heat-Based Non-Munition Devices

In U.S. military training, CS grenades aren't often used in mask confidence training. Normal practice is to heat capsules of CS powder. One [study](#) of U.S. Army CS-generation methods cited a range of 150-300° C, with an average burning temperature of 257° C. This particular study references devices used to heat and melt CS capsules in U.S. military training chambers. However, as these are used in military training in confined spaces, but not for riot control or law enforcement uses, they are not worthy of further discussion here.

#### Category 4: Burning CS Munitions

The largest category of CS devices are munitions that disperse the CS using a burning filler to create a smoke cloud. CS melts at 93-96° C and boils at 310-315° C.

The burning fillers, which are discussed at length below, heat up the CS, which vaporises and almost immediately condenses again, forming a smoke cloud. There is some possibility



that solid CS particles also get suspended in the smoke from the burning fillers. It is this category of CS munition that poses the most hazards to health and property, for reasons that will be explained below.

### Temperature Of Burning CS Munitions

Burning CS munitions will burn at various temperatures. Again, this is not an area which has received a lot of systematic study, and there's not much reference material explaining what temperatures various CS devices reach while burning. Indeed, anecdotally, even with the same type of grenade, there will be a range of burning temperatures, as precise temperature is not one of the design specifications for such devices.

Technical literature on the burning temperature of the U.S. or other western CS grenades is sparse. The [1966 Edgewood Study](#) helpfully asserts that U.S. grenades burn at 300 to 800° C, which is truly a wide range of results. The scientists who wrote the study replicated the contents of various CS grenades and did a significant number of test burns, with temperatures in the 500s and 600s as common results. The highest was 793° C and the lowest was 493° C. Not every test burn had temperatures measured, as the authors were looking for other things, like the percentage of CS that was effectively disseminated.

Grenades from other sources can vary significantly in burning temperature. It is anecdotally reported that the Hong Kong police have been using a new type of CS grenade that burns much hotter than previously used munitions. These new grenades are alleged to have ingredients such as magnesium and aluminium powder. A limited study using thermal imaging attempted to measure the burning temperature of some of these CS devices and the highest temperature measured was 552.6° C. However, this is well within the range of U.S. devices studied in the 1966 study.

### What Is Actually In A Burning Tear Gas Shell Or Projectile?

Only a portion of the contents of a given tear gas shell will be CS. For example, a U.S. military-specification M7A3 CS grenade has about 128g of CS in pellets and about 212g of filler. A wide variety of materials appear to have been used as the burning fillers over the previous decades. These have included such materials as sugar, sulphur, magnesium carbonate, sodium bicarbonate, Fuller's earth, kaolin, potassium chlorate, and various other components. The contents of the U.S. Army CS burning munitions are discussed in the 1966 study cited above.

It should be noted that the various roles of the chemicals in the filler are usually well established. Potassium perchlorate is an oxidizer. Sugars such as sucrose or lactose work as fuels. Magnesium carbonate, sodium bicarbonate, and Fuller's earth work as moderators, slowing the rate of combustion. It is not at all clear that every CS munition has such moderating ingredients.

### CS And Human Skin

Burning CS munitions can cause burns on human skin. The majority of the cases described in medical literature are from actual direct contact with burning grenades or projectiles. This is understandable, given the temperatures discussed above.

CS particles will be hot enough to cause thermal burns for some period of time, particularly close to the actual point of discharge. Both the smoke from burning fillers and the temporarily vaporised CS emitted from a burning grenade will be hot enough to cause burns. For example, persons using oven mitts or other improvised techniques to pick up burning CS grenades can easily be exposed to CS particles and vapours hot enough to burn skin.

### Accidental And Deliberate Fires

It is very important to note that even burning grenades at the low end of the range of possible temperatures, a burning CS grenade or projectile can set other things on fire. Even spent grenades may still be hot enough under some circumstances to cause fires.

CS grenades have been known to malfunction and have a condition colloquially known as a "hang-fire" wherein the ignition fuze malfunctions in some way and the grenade or projectile starts burning later than intended. Such a grenade, swept up and put into a rubbish bin or trash-pile, can cause a significant fire long after its intended use. These scenarios raise all sorts of problems, as a complex modern urban environment has many kinds of combustible materials. Plastics, synthetic textiles and upholsteries, woods that have been treated with finishes and varnishes, cleaning chemicals, and various other materials can create a bewildering array of toxic materials when combusted.

### Thermal Decomposition Of CS

There is a serious problem with heating CS to the temperatures encountered in burning CS munitions. Some portion of the CS will degrade into other chemicals.



## C<sup>2</sup>BRNE DIARY – February 2020

This is not something that is particularly well-known or heavily studied, but I was able to find some significant scientific literature about what happens when CS is heated to very high temperatures, such as those at the middle and high end of the burning CS grenades.

Some studies occurred in the 1960s. In the late 1990s, a U.S. Army scientist, one Timothy Kluchinsky, studied this phenomenon and wrote his 2001 PhD dissertation on the subject. He has published extensively on the topic (one example is [here](#)).

In 1960, a Porton Down [study](#) in the UK identified and measured some CS thermal degradation products. CO, CO<sub>2</sub>, Cl-, NH<sub>4</sub>, N<sub>2</sub>O, C<sub>2</sub>H<sub>2</sub>, and water were all measured in CS. A 1969 U.S. Army [study](#) burnt CS and found CO, CO<sub>2</sub>, H<sub>2</sub>O, HCl, HCN, NH<sub>3</sub>, N<sub>2</sub>O<sub>2</sub> and C<sub>2</sub>H<sub>2</sub> in the smoke plume.

Kluchinsky's studies in 2000 and 2001 used gas chromatography and mass spectrometry and discovered the presence of numerous compounds in the smoke from burning-type CS canisters. These chemicals include 4-chlorobenzylidenemalononitrile (an isomer of CS), 2-chlorobenzaldehyde, 2-chlorobenzonitrile, quinoline, 2-chlorobenzylcyanide, 1,2-dicyanobenzene, 3-(2-chlorophenyl)propynenitrile, cis- and trans isomers of 2-chlorocinnamonitrile, 2,2-dicyano-3-(2-chlorophenyl)oxirane, 2-chlorodihydrocinnamonitrile, benzylidenemalononitrile, cis- and trans- isomers of 2-cyanocinnamonitrile, 2-chlorobenzylmalononitrile, 3-quinoline carbonitrile, and 3-isoquinoline carbonitrile.

The health effects and toxicology of this long list of substances are not very well studied. Kluchinsky commented that many of these compounds were created by CS molecules giving up either chlorine or cyanide. He eventually did work to quantify the amount of HCl (hydrogen chloride) and HCN (hydrogen cyanide) emitted by CS under various conditions.

### Decomposition Of Fillers

The subject of CS grenade fillers is not well-studied and product literature often does not specify the ingredients in CS grenade fillers, particularly products produced outside the U.S. and European Union. There is no comprehensive compendium of filling materials for CS grenades and the toxicology of burning fillers is an area that has received comparatively little study. It is possible that some fillers produce toxic materials when burnt.

It is also possible that poor manufacturing practices have accidentally incorporated unusual materials into fillers. This is not an area with a high degree of regulatory standards, and it would not surprise me to find that various trace amounts of rubbish, such as plastics and metals, even floor-sweepings, end up in low-budget CS munitions. The possible scope of harm from such scenarios is nearly impossible to estimate, as the numerous variables are unknown.

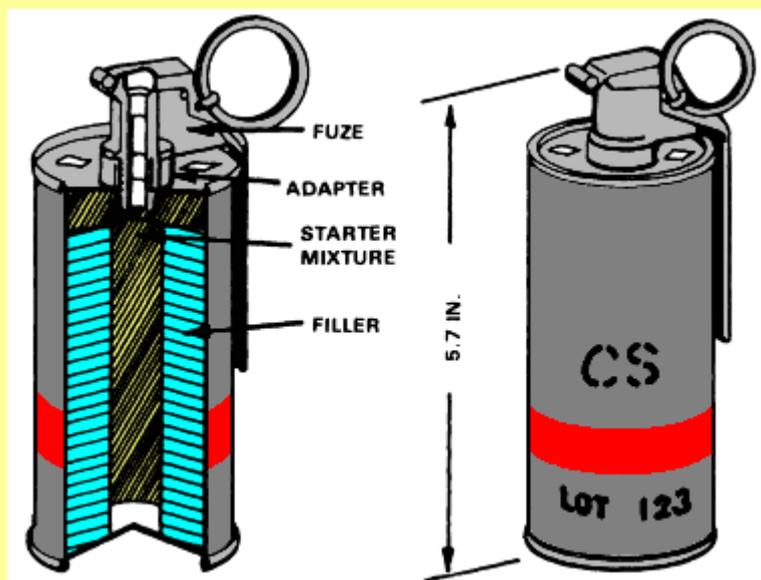
### What About Cyanides?

It is clear from the literature that HCN — that is, hydrogen cyanide gas — is one of the thermal decomposition products that can be created when CS breaks down at high temperatures. However, it is difficult to construct a hypothetical scenario whereby enough hydrogen cyanide is lighter than air.

This means that, in open air, it will rise and not build up. Not only that, the HCN produced from thermal decomposition of CS will be warmer than ambient air and rise even faster than if the HCN were at the same temperature. Cases of toxic exposure to hydrogen cyanide generally occur in confined spaces. Furthermore, HCN is flammable, and many of the situations and scenarios involved include high temperatures and open flames, so it is possible that the HCN would combust.

The concentrations of HCN that will cause injury or death in humans are reported differently in different reference books. Although there have been many deaths from HCN inhalation, there have been very few where the exact concentration of HCN was known, so these figures vary greatly based on different interpretations of laboratory tests with animals. It is not possible to take measurements on inhaled HCN in rabbits or guinea pigs and then directly use those measurements as indicative of toxicity in humans, for a variety of reasons. Scientists have argued for decades over the correct way to convert numbers from animal models into human equivalents. As a result, for HCN (and actually for many other toxic inhalation hazards), the calculated human toxicity will vary a fair bit.

A standard reference [book](#) lists the following concentrations for HCN, but does not define the effects rigorously:



Concentration in parts per million [ppm]	Effects on humans
18-36 ppm	Slight symptoms after lengthy exposure
45-54 ppm	20-60 min exposures will bring effects
110-135 ppm	Dangerous after 30-60 minutes
135 ppm	Lethal after 30 mins
181 ppm	Lethal after 10 mins
<b>270 ppm</b>	<b>Rapid death</b>

Given the variables involved, these concentrations should be considered approximate figures at best. It should be noted that the U.S. Army lists a MUCH higher concentration as a LCt50 (lethal concentration for 50% of exposed population) for HCN, 2587 ppm in Field Manual 3-11-9. It is well within the accepted scientific literature to say that there is a ten-fold variance between estimates of concentrations which are rapidly lethal.

Full toxicological reviews of HCN are [here](#) and [here](#).

It should also be noted that HCN can be produced by fires involving materials other than CS. Some plastics can burn, causing HCN. Once again, PVC, the prolifically available plastic, can cause HCN if burnt, as can other plastics. ([Link](#)) If HCN is encountered in the field, is it coming from CS munitions or burning plastics?

There are numerous videos on social media showing people using electrochemical HCN vapour monitors to attempt to measure concentrations of HCN in the field. Given that HCN is clearly one of the thermal decomposition products of CS, this is a reasonable finding. These sensors have operating temperature ranges, beyond which they cannot be expected to give a reasonably accurate reading. Sticking the sensor into the hot gas plume from a grenade burning at, say, 700° C is likely going to expose the electrochemical sensor to temperatures outside its operating range.

For example, the MSA Altair handheld detector (a common one, but by no means the only one) has an upper operating temperature of either +50° or +60° C. However, handheld devices have numerous cross-sensitivities. For example, HCN sensors are usually also sensitive to other chemicals. This varies widely by manufacturer. Therefore, field measurements taken quickly in the middle of a disturbance need to be kept in proper perspective and may not be accurate.

With regards to exposure scenarios in Hong Kong, it is important to keep a proper perspective. It seems exceedingly difficult to construct a scenario in open air in Hong Kong where a dangerous combination of concentration of HCN over a short period of time is received. This is due to several combined factors:

- Vapour density of HCN being lighter than air, all other factors being equal, makes HCN rise
- HCN produced by burning CS munitions will be hotter, thus even more buoyant
- The majority of incidents have occurred in the open air, thus allowing HCN to dissipate even more quickly
- Furthermore, in instances in confined spaces, conventional smoke and CS build up to irritating levels that will have an irritant effect more quickly than HCN
- Some HCN may be consumed by flames almost immediately after production
- Exposure times are short, usually a few minutes or less
- Measurements in the field may not be accurate due to inherent limitations, so they may be misleading
- To date, I have seen no case history of anyone with cyanide poisoning from inhaled HCN subsequent to CS exposure in Hong Kong. If any reader has this information, please contact me.

### Tear Gas, Dioxins & 'Dioxin-Like' Substances

The only evidence for the presence of dioxins in Hong Kong is circumstantial. Reporter [Chan Yu Hong](#) was diagnosed with the skin condition chloracne. Chloracne is widely associated on the internet with exposure to dioxins, including an [article](#) that refers to chloracne as the "hallmark of dioxin intoxication". A standard reference book in dermatology (*Rook's Textbook of Dermatology*, volume 4) states that the following chemicals can cause chloracne:

- Polychlorinated biphenyls (PCBs)
- Polychlorinated dibenzofurans (PCDFs)
- Polychlorinated dibenzodioxins (PCDDs)
- Tetrachloroazobenzenes



- Trifluoromethyls
- Pyrazole derivatives

It is very difficult to take one case of possible chloracne and work backwards through events and circumstances and conclude that “tear gas has dioxins” in it. Without significant additional evidence, it may be impossible to link the Chan Yu Hong case to a specific acute or chronic environmental exposure.

There are many reasons for this. First of all, the medical literature shows various differential diagnoses for chloracne, as several medical conditions look very similar. We don't know the full extent of medical testing on Chan Yu Hong or the results of any laboratory work, nor could we publish it if we did. Medical literature also has instances of chloracne being caused by unexpected sources, including excessive [tobacco smoke](#). Latency is an issue as well. Chloracne can appear weeks or months after exposure, making it difficult to establish the chronology of events and/or make it difficult to tie the exposure to one particular location or incident.

Even if we assume that the reporter was exposed to one of the usual sources of chloracne, there are many possible scenarios other than tear gas or tear gas by-products that could, in theory, cause the presence of one or more of the chemicals above. For example, PCNs were once widespread in insulators and coatings for wires. PCNs can be created by chlorination of naphthalene. Naphthalene, in turn, has many uses, such as mothballs and even can appear in pyrotechnics.

[PCBs](#) that can cause chloracne were once widespread in electrical apparatus and carbonless copy paper, as well as many other uses. [PCDFs](#) and PCDDs are certainly worth examining as a possible cause. These can be [produced by fires](#) involving PVC plastics. A fire involving PVCs or similar plastics can cause exposure to chemicals that cause chloracne. A basic internet search shows numerous vendors in Hong Kong selling wholesale and retail quantities of PVC food wrap. Fires involving rubbish bins, bags, or containers can easily be seen in various videos and photographs from demonstrations and police activity in Hong Kong. Given such information, it is difficult to presume that a single case of chloracne is directly linked to tear gas usage. It seems more likely that a fire, possibly caused by a hot CS munition, would be the cause.

It is difficult to comment upon safe or unsafe levels of exposure to the chemicals in this category. This is due to several reasons. First, there is a multiplicity of different substances in this category. Second, the depth of knowledge about the toxicology of these substances varies greatly. Third, there are differences between acute exposures to higher concentrations of substances and longer-term sub-acute and chronic exposures to lower levels. Fourth, route of exposure matters as well. Was the substance inhaled, absorbed through the skin, or ingested through food or drink? Was the food or drink contaminated, or did the person have the contaminant on their hands? Were there multiple routes of exposure? These different routes of exposure will have different toxicokinetics.

In the particular case of chloracne in Hong Kong, it is impossible to conclude that it was or was not the direct result of exposure to CS. To make such a conclusion would mean working backwards from the diagnosis of chloracne, through an unknown latent period, to either a specific acute exposure or a longer chronic exposure to one of a number of substances, which are not specifically identified to us, through a route of exposure that is not specified.

### Other Toxic Materials

There are many other potentially toxic substances that could be emitted from rubbish fires. Given the complexity of the Hong Kong urban environment and the wide variety of waste materials that could be involved, it is difficult to speculate as to what other categories of toxic chemicals might be contained in smoke from such fires.

This Australian [study](#) highlights the complexity of this issue.

There are numerous other studies on the subject of waste fires easily available on Google Scholar or through libraries, such as [this](#).

### Long-Term Effects

It is difficult to speculate about long-term effects in the Hong Kong scenarios, for the simple reason that nobody really knows the answer to the question “Exposure to what chemical(s)?”

If we cannot narrow down exposure cases to a particular chemical, there is really no easy way to discuss long-term health effects. As with the chloracne case discussed above, if someone who had been exposed to a week or a month of sporadic CS doses in Hong Kong develops a particular form of cancer five years hence, there will be no credible way to retrospectively trace that cancer back to the CS exposure.

As far as long-term health effects of exposure to CS tear gas, there have been some studies of the subject. A 2017 [review](#) of studies of injuries and deaths from riot control agents looked at 31 different studies that included 5131 people and 9261 injuries (some people had multiple injuries). This study showed only 58 persons with permanent injuries or disabilities from riot control agent exposures. However, 18 of the 58 were from physical trauma from injuries



## C<sup>2</sup>BRNE DIARY – February 2020

caused by projectiles, not from chemical exposures. Also, the review was not exclusively devoted to injuries from CS, but included other riot control agents. In addition, some of the long-term effects were psychiatric in nature, which may or may not be directly linked to tear gas exposure, as they could also be the result of other stresses during civil disturbances.

The U.S. Army's textbook [Medical aspects of Chemical Warfare](#) devotes several paragraphs to the subject of long-term effects of CS. This book identifies "reactive airways dysfunction syndrome" [RADS] — a condition which is similar to asthma — as a possible long-term complication after CS exposure. A 1996 [study](#) explores one of these cases. There are numerous articles and websites which explain RADS. It should be noted that there are many possible causes, including chronic exposures to irritants such as chlorine and ammonia. RADS is a very loose diagnosis with no one consistent set of diagnostic criteria. There are dissenting articles ([example](#)) in the medical literature that express the view that RADS is too vague of a diagnosis. Some sources identify a 1960 study on workers in a CS factory, but I was unable to locate a copy of this study. Any readers with access to this paper are encouraged to contact me via the comments section.

### Decontamination Of CS

Decontamination of CS is actually very simple. CS is easily removed by soapy water. Furthermore, CS hydrolyses readily in water. CS particles soaked in water will be neutralised within a few hours. The rate of hydrolysis is increased if the water is made more alkaline, even by a little bit. Adding some bicarbonate of soda will increase the rate at which the CS is neutralised.

The U.S. Army textbook claims that "a solution containing 6% sodium bicarbonate, 3% sodium carbonate, and 1% benzalkonium chloride was found to bring prompt relief of symptoms and to hydrolyze CS for skin decontamination."

As far as restoration of buildings and furnishings, this is a more complex subject. Vacuums with HEPA-quality filtration can be highly useful. This relatively old [paper](#) contains some useful advice. Health authorities in Scotland published this [advice](#). Additional resources are online.

## Conclusions

There are three interrelated conclusions to this review of technical information about CS tear gas.

### Conclusion 1: Not All CS Is Created Equal

This paper identifies four different ways CS can be dispersed. The method that disperses CS through high temperature burning munitions is more dangerous than other methods due to both high temperatures and the production of thermal decomposition products.

### Conclusion 2: Use Of Hot CS In A Complex Urban Environment Poses A Number Of Hazards

Use of high temperature CS munitions in large number in a complex dense urban environment such as Hong Kong poses a number of threats.

High temperature munitions can cause fires, which can cause exposure to a wide variety of exotic substances.

### Conclusion 3: Injuries And Illnesses In The Hong Kong Environment May Not Be Due Directly To CS Exposure

Injuries and illnesses that are not typically found in CS tear gas exposures or the technical literature may or may not be directly attributable to CS. A variety of possibilities exist, which include, but are not limited to the following:

- Unusual CS exposures. It should be noted that the large majority of the technical literature on CS exposure is based on exposure cases of healthy adult males or laboratory animals. The "normal range" of effects is likely to be different with females, children, the elderly, and people with medical conditions that give them extra vulnerabilities (asthma, emphysema, skin conditions, eye conditions, etc.). Given the size of the affected population in Hong Kong, it is statistically extremely likely that there will be some exposure cases that provide 1 in 100, 1:1000, 1:10000, or even hitherto undocumented signs and symptoms.
- CS decomposition products. Burning CS munitions will produce byproducts, but the toxicology is poorly understood. HCN toxicity is unlikely, due to the relatively inability of warm HCN gas to build up in open air, but there are other possibilities.
- Decomposition of fillers: Poorly made CS munitions may have ingredients that are not understood. Low quality munitions may have unknown substances in them.
- Fires causing exposures: Hot CS munitions will set things on fire. There are many possibilities for toxic exposures from various products, including plastics. Some of these may pose more health hazard than any possible CS exposure. Reports of "dioxin" exposure may be more due to fires than CS exposure.



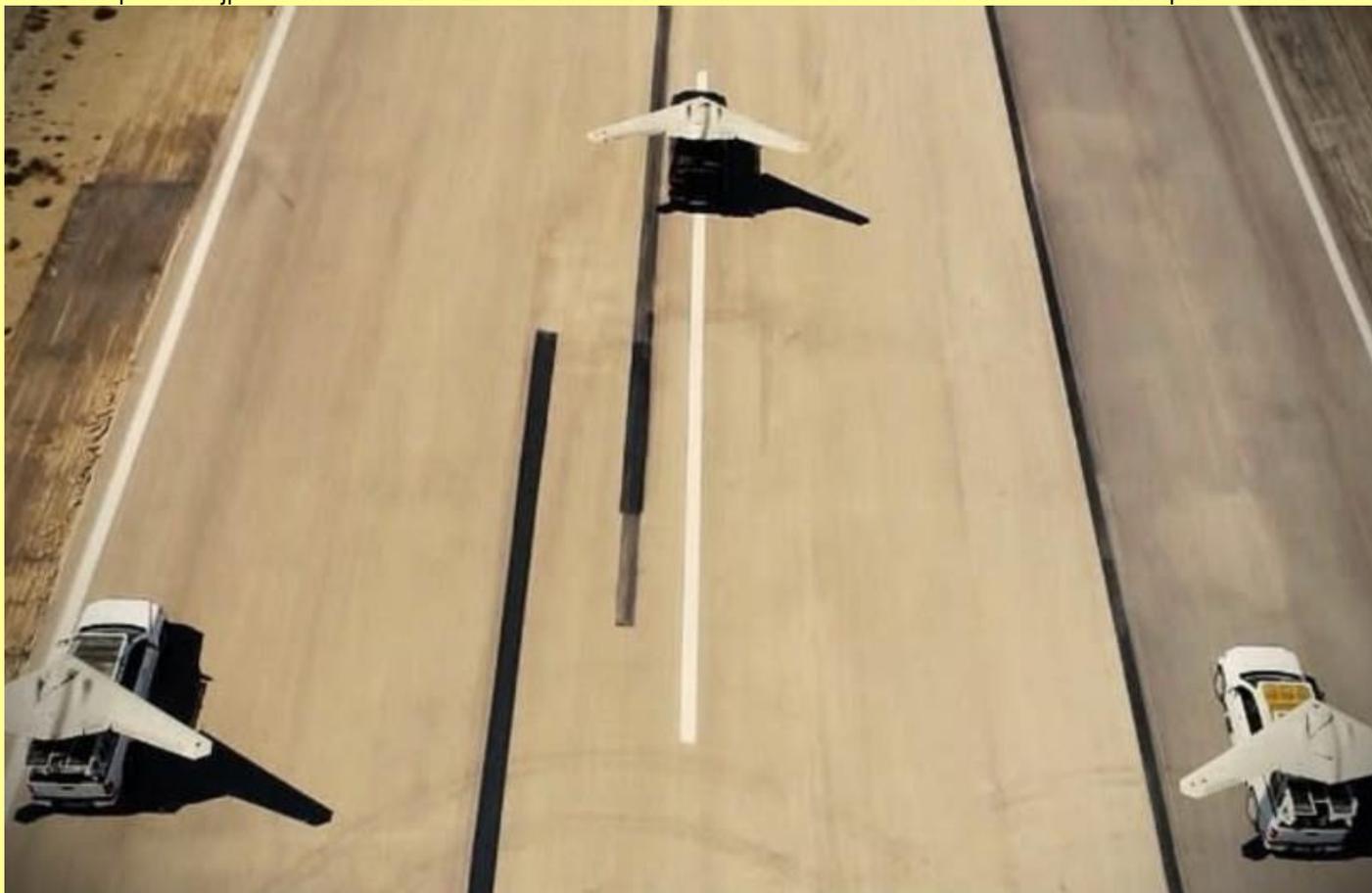
Unfortunately, working out the exposure case history of any single individual may be very difficult.

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## Ex-CIA official warns of Iran, ISIS drones armed with chemical weapons

By Yonah Jeremy Bob and Neville Teller

Source: <https://www.jpost.com/Middle-East/Ex-CIA-official-warns-of-Iran-ISIS-drones-armed-with-chemical-weapons-617132>



Iranian versions of the American RQ-170 drone which were used in a military exercise in the Gulf in Iran, involving dozens of drones, are seen on the a runway, in this undated handout photo (photo credit: REUTERS/TASNIM NEWS AGENCY)

Feb 10 – The greatest threat confronting the US and Israel may be swarms of drones armed with chemical weapons released by Iran or ISIS, an ex-CIA official has told *The Jerusalem Post*.

The warning takes on greater meaning following a call on January 28 by ISIS's new leader, Abu Ibrahim al-Hashimi al-Quraishi, to direct greater attention to [attacking Israel and Jews](#), including using chemical weapons.

Some dangerous countries and terrorist groups may already have their hands on chemical weapons – ISIS and multiple other groups used them in Syria in recent years – and anyone who does not, may be able to get them from [North Korea](#), former CIA agent Tracy Walder told the Post.

Regarding ISIS, there are “a couple of different prongs” to their interest in chemical weapons, she said.

Part of what eventually became ISIS came out of groups run by Abu Musab al-Zarqawi – “someone I followed a lot” while at the CIA, Walder said.

Zarqawi was very interested in “acquiring small-scale chemical weapons,” she said. “We are talking about anthrax, which contains spores, [and] even ricin.” Deploying the chemical weapons “is a very easy thing to do if you have access to a drone.”



Walder said she was personally involved in tracking Zargawi and those associated with him in the post-9/11 era, as well as thwarting some of their planned poison attacks in European countries. CIA secrecy rules prevent her from revealing exactly where, she said. Regarding Iran, Walder said: "You won't see a head of state such as from Iran [openly] say, 'I want to acquire' [chemical weapons], but we know Iran has been working to destabilize [the region] through proxies, the Houthis, Hezbollah. It's less about Iran as a state, but more about Iran as a state actor" which can activate proxy groups on its behalf.

Islamic Revolutionary Guard Corps Quds Force chief Qasem Soleimani, who was killed by the US in January, had been ingeniously using proxy groups to spread terrorism in the Middle East, she said, and Iran could use these groups to deliver devastating chemical-weapons attacks.

Regarding the acquisition of chemical weapons by ISIS, Iran, its proxies, Syria or al-Qaeda, Walder said that North Korea is the greatest threat as a no-holds-barred seller.

Pyongyang has stockpiled chemical weaponry and materials, and would be more than ready to sell them to any bidder, she said, adding that besides North Korea, small-scale chemical weapons and drones can all be assembled using information online.

Walder said she was particularly concerned that even the best counterterrorism efforts "wouldn't see any signs of alarm if [the weapons] were acquired using a piecemeal approach" of purchasing low-cost and seemingly unrelated parts.

Chemical weaponry could emerge in the form of a sort of dirty bomb rather than being used directly on the battlefield, as in World War I, she said.

**A NEW widening threat was Iranian drone swarms, and they could be modified to carry chemical weapons, Walder said.**

The US is even more concerned about Iran's development of sophisticated, technologically advanced drones than about its current nuclear capabilities, she said.

Part of what makes drone swarms carrying chemical weapons so dangerous is that they are uniquely capable of evading detection by radar.

Last September, Iran launched a devastating swarm of drone strikes on Saudi oil fields. The Saudis had significant air-defense capabilities against an attempted strike by Iranian aircraft, but they were not ready for low-flying drones coming in under their radar. Regarding intelligence sharing, Walder told the Post that such sharing between the US and Israel was very strong. She declined to go into detail.

Walder singled out certain African intelligence agencies as being particularly helpful in tracking down individual terrorists.

"I spent so much time there," she said. "I know a lot about them. For many of the African countries, they are just coming out of civil war and unrest."

"Look at the [Osama] bin Laden history," Walder said. "He made a lot of inroads in Africa... he was responsible entirely for a lot of the infrastructure and roads in Sudan... But after the countries' civil wars, some have scores to settle with al-Qaeda. Some couldn't wait to help the US."

African countries "can help us infiltrate [terrorist] networks in their country, she said. "They are much more familiar with the inner workings, so they can help us rid their countries of a nuisance."

Terrorist groups were sometimes less careful covering their tracks in Africa because they believed no one was paying attention to that forgotten continent, Walder said.

She endorsed recent reports about US-Netherlands intelligence cooperation leading to a successful cyber attack on Iran's nuclear program. But she had left the CIA before the operation.

After complimenting the cooperation of some foreign agencies with the US, Walder said there were chronic inefficiencies regarding US intelligence cooperation with Europe.

The relationship with Britain always was particularly close, and Brexit would not affect that, she said.

The US has to manage lines of intelligence communications with 27 different European nations to get a full picture, something that is highly inefficient, Walder said.

**Noting that the EU already has a foreign minister who coordinates policy, she said having one central hub for intelligence coordination could be even more important.** This is because thwarting threats to national security can sometimes be a question of whether information is relayed a few days or even minutes before an attack, she explained.

The 27-nation split in the EU heavily dampens the ability to share information fast enough to keep up with attackers who may be operating using a cross-border strategy to make themselves hard to track, Walder said.

The US would greatly welcome greater coordination of counterterrorism activities within the EU, she concluded.

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*weapons of mass destruction issues in Israel and internationally as well as Shin Bet interrogations and indictments. Yonah is also well-connected to all of the top Israeli ministries from his former posts in the IDF, the Foreign Ministry and the Justice Ministry. Hailing from Baltimore in the US, Yonah graduated with honors from Columbia University and Boston University Law School.*

*Born in London and educated at Oxford University, Neville Teller combined a career in the Civil Service with writing for BBC radio as dramatist and abridger. In addition, he has been commenting on the Middle East political scene for some 30 years, with four books published on the subject.*

## If You Were Gassed by Sarin Your Death Would Be Unimaginably Painful

By Sebastien Roblin

Source: <https://nationalinterest.org/blog/buzz/if-you-were-gassed-sarin-your-death-would-be-unimaginably-painful-123566>

Feb 14 – The residents of Khan Sheikhoun probably thought they were in for just another ordinary day of civil war when they woke up early in the morning of April 4 to the whine of approaching Syrian Air Force Su-22 attack jets. The town of around fifty thousand people was situated west of Aleppo in Idlib Province, long a stronghold of rebel groups opposing the government of Bashar al-Assad



since 2011. Artillery and air attacks were a horribly routine aspect of daily life there, as they are in many parts of Syria, divided by numerous warring factions.

Residents later reported that the munitions dropped by the jets released clouds of poisonous gas. Even this was hardly unheard of in Idlib Province. Even while Assad handed over his stockpiles of mustard gas and deadly nerve agents, government helicopters launched at least a dozen [chlorine-gas attacks](#) on communities in Idlib Province alone in 2014 and 2015. However, while chlorine gas causes horrifying respiratory problems, particularly in children and the elderly, it usually killed “only” a handful of people per attack, if any.

However, rescuers arriving from outside Khan Sheikhoun beheld an unexpectedly nightmarish sight: more than six hundred civilians lying paralyzed in their homes or helpless on the ground, limbs convulsing, saliva foaming from their noses and mouths as they gasped for breath. Local first responders—the lucky ones that hadn’t died or fallen violently ill when arriving on the scene—were frantically spraying the twitching bodies with hoses.

These symptoms correspond to the effects of sarin, a colorless, odorless nerve agent that disrupts acetylcholinesterase, an enzyme that helps a muscle relax once it has completed an action. By blocking the enzyme, sarin has the effect of continuously *triggering* those muscles, making breathing effectively impossible as well as causing the breakdown of other bodily functions, and leading to the discharge of bodily fluids.

Though inhalation of the vapors is the primary vector of the agent, even skin contact can transmit a fatal dose of sarin to victims, who may die within one to ten minutes of exposure due to asphyxiation and the loss of bodily functions. Those surviving initial exposure may suffer permanent brain damage if they do not receive swift treatment. Even worse, particles of the gas cling to clothing, food and water, and can remain lethal for up to thirty minutes. That was why responders were washing the victims with hoses.

Reports currently suggest that eighty to one hundred of the residents were killed, and over six hundred injured. On Thursday, a Turkish hospital [claimed](#) its examination of the victims confirmed the use of sarin gas.

Chemical weapons are often collectively labeled weapons of mass destruction, but many of them—fortunately—have a low fatality rate, serving principally as weapons of terror rather than attrition.

Sarin and other nerve agents are a notable exception. Only thirty-five milligrams of sarin per cubic meter are necessary to kill a human being after two minutes of exposure, compared to nineteen thousand milligrams for chlorine gas, or 1,500 for phosgene gas, the deadliest chemical weapon used in World War I. The latter invisible gas often killed those affected the day *after* exposure, meaning it was not especially practical for achieving battlefield objectives. Mustard gas, which was highly visible and widely



feared, caused horrible blistering injuries on contact with the skin, but killed only two percent of those it scarred.

The first nerve agent was accidentally discovered by German scientist Gerhard Schrader in 1938, who had to be hospitalized for three weeks after exposing himself to a partial dose of tabun. Realizing the gas's potential as a weapon, Nazi Germany developed four different "G-Series" nerve agents and produced tens of thousands of tons of the deadly poisons—at the cost of a dozen workers, killed by contact with the deadly liquid despite the use of protective suits.

Fortunately, Hitler ultimately shied away from using nerve agents. This wasn't because of some deeply buried shred of decency. When Hitler inquired about using sarin against the Allied powers, he was told by IG Farben chemist Otto Ambrose—who himself had tested the gas on human subjects—that the Allies probably had nerve agent stocks too, and would likely retaliate on an even greater scale. This was a fortunate misperception, as the Allies did not possess any nerve agents at all and were completely unaware the Germans had them.

After World War II, both the Soviet Union and Western nations studied up on the German poisons and developed even deadlier "V" series nerve agents, most notably the VX gas rather inaccurately depicted in the 1996 film [The Rock](#). However, the taboo against using lethal chemical weapons on the battlefield was *mostly* respected—with some notable exceptions.

Egypt [dropped mustard and phosgene gas](#) from Il-28 bombers over villages in North Yemen between 1963 and 1968, killing an estimated 1,500 people. Nerve agents may also have been used by Vietnamese troops in Cambodia, Cuban troops in Angola and the Pinochet regime in Chile. Iraq unleashed mustard and sarin gas during the Iran-Iraq War on poorly armed Iranian militias executing human wave attacks. Then on March 16, 1988, Iraqi aircraft bombed the Kurdish town of Halabja with a mixture of both gasses, massacring between three and five thousand people in just five hours.

As my colleague Paul Iddon [pointed out in a recent article](#), there's a common thread in the use of chemical weapons since World War I: they're nearly always used by governments against victims that lack the ability to retaliate in kind.

Even as far back as World War I, the opposing armies successfully phased in training and equipment that limited the effectiveness of chemical weapons. Whenever one side employed a new type of gas, the other soon copied it and retaliated. Chemical attacks failed to change the outcome of a single major battle, despite their horrifying effects. Even worse, unpredictable winds frequently blew the poisonous clouds back onto friendly troops or towards civilians, who were much less well prepared to deal with them. That explains why many armies otherwise bristling with more and more deadly weapons aren't begging to bring gas warfare back.

As early as 1925, the Geneva Protocol banned the use of chemical weapons in international conflicts, and was succeeded in 1993 by the Chemical Weapons Convention, which further forbade their stockpiling and production. (Syria is a signatory to the former but not the latter.) The United States renounced first use of chemical weapons in 1969 under Nixon, and then committed itself to destroying its stockpiles under George H. W. Bush in 1991—a process which was reportedly 89 percent complete in 2012.

Syria came to the brink of war with the United States after a sarin gas attack on August 2013 that killed hundreds of Syrians in Ghouta, a rebel-held suburb of Damascus. It was a clear violation of the international taboo against chemical weapons (which Syria denied even possessing at the time), and more specifically, the "red line" threat made by President Obama. However, Russia brokered a deal in which Assad pledged to give up his military-grade chemical arms in order to avert a U.S. attack. The process of destroying nearly six hundred tons of mustard, sarin and VX gas was officially completed in August 2014, and involved many international observers and contractors.

However, this did not bring a halt to government [air attacks using chlorine gas](#) to terrorize rebel-held communities. Because of its broad civilian applications, there is no way to "ban" chlorine. Syrian rebels—mostly, but not exclusively, belonging to ISIS—have also occasionally launched rockets laden with chlorine or mustard gas on government-held territory in Syria and [even Iraq](#).

Meanwhile, there were persistent [rumors](#) that the Syrian army's destruction of its chemical stocks was less than comprehensive, and that the Assad regime had hidden away small quantities to serve as a future deterrent. International inspectors also reported [discovering trace quantities](#) of sarin, VX and ricin in facilities that had not been listed as storing chemical weapons by the Syrian government.

Damascus admitted to launching the airstrike on Khan Sheikhoun with Su-22 fighter-bombers, but maintains its warplanes did not use chemical munitions. Predictably, Moscow claimed the chemical attack was the *opposition's* fault, alleging Syrian bombs had hit a rebel chemical-weapons workshop. This was far from the first time the allied governments have advanced some variant of the classic "they bombed themselves" defense in regards to chemical attacks that mostly land in rebel territory.

However, [chemical-arms experts don't buy it](#), pointing out that even if opposition fighters had somehow managed to produce and store sarin agents with the binary precursors side by side for rapid use, blowing them up with a bomb would simply not have dispersed the gases to such murderous effect. They argue that such a deadly attack could only have been carried out by properly deployed chemical munitions.



It is vital that the Syrian Civil War not lead to a further breakdown in international norms against chemical warfare, resulting in their more frequent use in conflicts across the world. Chemical weapons have repeatedly proven to be inherently indiscriminate terror weapons, and have killed far more civilians than combatants in the Syrian conflict.

However, the vast majority of civilian deaths in Syria occur due to [bombardments by conventional artillery, mortars](#) and aerial bombs—including those dropped by [Russian](#) and [American](#) warplanes as well as the Syrian Air Force. Even without the use of chemical weapons, the suffering experienced by Syrians on all sides of the conflict will continue for some time if a viable political solution does not silence these “conventional” death machines.

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## MUSTARD GAS TREATMENT



### US seeks to adapt Israeli pineapple-based burn gel to treat mustard gas victims

Source: <https://www.timesofisrael.com/us-seeks-to-adapt-israeli-pineapple-based-burn-gel-to-treat-mustard-gas-victims/>

Sept 2018 – Israel's MediWound Ltd., a biotech firm that makes burn and wound treatments, said that it has received a new contract for up to \$43 million from the US Biomedical Advanced Research and Development Authority (BARDA) to adapt its lead product, a gel based on pineapple enzymes for the treatment of burns, to treat mustard gas injuries in case of a mass casualty event.

Sulfur mustard is a chemical warfare agent typically dispersed as a fine mist of liquid droplets that causes thermal burns and skin injuries.

The contract will give Yavne, Israel-based MediWound some \$12 million in funding to support research and development for adapting its NexoBrid product to treat mustard gas injuries. The up to eight-year contract also contains options for additional funding of up to \$31 million for additional development activities including animal studies and necessary US Food and Drug Administration licenses, MediWound said in a statement on Tuesday.

MediWound has already received some \$132 million in funding from BARDA for the development of NexoBrid. BARDA, which is within the Office of the Assistant Secretary for Preparedness and Response in the US Department of Health and Human Services, is in charge of the development and acquisition of vaccines, drugs, therapies and diagnostic tools for public health medical emergencies. The new contract is an “endorsement” of MediWound's technology by an additional department in BARDA, and the firm will collaborate with the US body to develop NexoBrid for this new indication as part of the US efforts to prepare for mass casualty events, Gal Cohen, president and chief executive officer of MediWound, said in the statement.

“Ten decades of research has not yet produced an approved treatment for sulfur mustard skin injury,” he added. “Based on promising data from animal studies presented at the 2017 European Burn Association conference, NexoBrid has the unique potential to help victims of mass casualty events involving this chemical warfare agent, who otherwise would have to undergo radical surgical removal of contaminated skin.”

Earlier this year, the FDA agreed that the development of the new drug can be tested on animals only, as it is neither ethical nor feasible to conduct human trials with chemical warfare agents. Under the FDA's Animal Rule, the US agency “may grant marketing approval based on adequate and well-controlled animal efficacy studies when the results of those studies establish that the drug is reasonably likely to produce clinical benefit in humans,” Cohen said. “Now with the non-dilutive funding awarded by BARDA, we can move forward with animal trials in an effort to develop a non-surgical treatment option for sulfur mustard victims.”



### Pineapple healing

MediWound develops and produces therapies based on proteolytic enzymes which it extracts from the stem of the pineapple plant. **NexoBrid**, the company's first product, is the first approved pharmacological treatment for the removal of scab tissue that is associated with severe burns. Typically, this tissue — removal of which is essential to speed up healing and prevent infections — is removed surgically.

NexoBrid has received marketing authorization from the European Medicines Agency as well as the Israeli, Argentinian, South Korean and Russian health ministries. The medication has been approved for use to remove dead or damaged tissue, known as eschar, in adults with deep partial and full-thickness thermal burns.

The drug is considered a new method of burn care management, and clinical trials have demonstrated with statistical significance its ability to non-surgically and rapidly remove eschar earlier and without harming viable tissues, MediWound said.

MediWound's second product, EscharEx, is a topical biological drug being developed for debridement — the removal of dead or infected tissue — of chronic and other hard-to-heal wounds, the company said. EscharEx contains the same proteolytic enzyme technology as NexoBrid.

In May, the company, whose shares are traded on the Nasdaq, said it has hired an investment bank to help it with negotiations to sell NexoBrid. In 2017, MediWound [sales](#) jumped 60% to \$2.5 million, and net loss for the year totaled \$22 million.

## Iodine Formulation Halts Skin Damage of Mustard Gas

*Emergency Medicine News. 23(6):14, June 2001.*

Source: [https://journals.lww.com/em-news/Fulltext/2001/06000/Iodine\\_Formulation\\_Halts\\_Skin\\_Damage\\_of\\_Mustard.18.aspx](https://journals.lww.com/em-news/Fulltext/2001/06000/Iodine_Formulation_Halts_Skin_Damage_of_Mustard.18.aspx)

The first effective treatment for mustard-gas burns, a development that has been sought since tens of thousands of soldiers were incapacitated by the gas in World War I, has been reported by researchers at Ben-Gurion University of the Negev, the Hebrew University of Jerusalem, and the National Institute of Environmental Health Sciences, U.S. National Institutes of Health.

These findings were reported March 26 at the 40th Annual Meeting of the Society of Toxicology in San Francisco. The curative action of this novel and inexpensive iodine preparation also was reported in a recent issue of the journal *Toxicology and Applied Pharmacology* by Dr. Uri Wormser (HU), Dr. Amnon Sintov (BGU), Dr. Berta Brodsky (HU) and Dr. Abraham Nyska (NIH). The research team also found that the **iodine formulation** is useful in preventing blistering and skin damage following accidental contact with scalding water or hot metal and even burns from open flames. Israeli medical researchers have been particularly interested in finding an effective antidote to the severe skin damage produced by mustard gas, also known as sulfur mustard (SM), because this chemical agent is part of the nonconventional warfare stockpiles of certain Middle East nations.

In other laboratory studies, the new formulation showed much improved bacterial killing effect in comparison with the current commercially available iodine preparations. In addition to regular topical use of this new formulation for increased antiseptic results in the hospital and home, it can also be incorporated in mouthwash, toothpaste, and other oral care preparations.

Although the therapeutic mechanism operating must still be elucidated, the **researchers have shown that the iodine does not chemically inactivate SM. They are testing whether the new pharmaceutical may operate by interfering with the initiation of programmed cell death, a major mechanism responsible for mustard gas lesions.** The research concerning the development of iodine against mustard gas skin toxicity has been supported by a U.S. Army Medical Research and Materiel Command.

## FDA clears first medical product for use on mustard gas injuries

Source: <https://homelandprepnews.com/stories/35563-fda-clears-first-medical-product-for-use-on-mustard-gas-injuries/>

August 2019 – The United States has finally cleared a medical product known as **Silverlon** for use in treating mustard gas-induced blisters, marking a first for the Food and Drug Administration (FDA).

Mustard gas — or sulfur mustard — saw its most first and most devastating widespread use in World War I, but has recently seen renewed purpose in theaters such as the Iran-Iraq War and the Syrian Civil War. Among other things, the gas can cause first and second-degree skin burns, which Silverlon can be used to treat, according to the Biomedical Advanced Research and Development Authority (BARDA).

“Chemical weapons like sulfur mustard cause horrific, painful, and life-altering injuries, yet in the 100-year history of sulfur mustard use, no medical countermeasures existed – until now,” BARDA Director Rick Bright, Ph.D., said. “At BARDA, we are excited to have supported the first cleared product for use on skin injuries caused by sulfur mustard. This clearance



exemplifies BARDA's ongoing commitment to our partners and the nation as we seek out promising technologies and products to improve our nation's health security and protect Americans."

Silverlon has already been in use by Argentum Medical, LLC and in dressings utilized by healthcare professionals and first responders. BARDA has supported additional indication of the drug since 2013.

"The expanded indication for this first-of-its-kind wound contact dressing to include management of certain injuries caused by sulfur mustard vapor exposure demonstrates our commitment to working closely with our federal partners, including BARDA, to expedite the availability of medical countermeasures essential for managing responses to chemical weapons attacks in both civilian and battlefield settings," Acting FDA Commissioner Ned Sharpless said.

## Review Article

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## Therapeutic options to treat mustard gas poisoning – Review

### Abstract

Among the blistering (vesicant) chemical warfare agents (CWA), sulfur mustard is the most important since it is known as the "King of chemical warfare agents". The use of sulfur mustard has caused serious damages in several organs, especially the eyes, skin, respiratory, central and peripheral nervous systems after short and long term exposure, incapacitating and even killing people and troops. In this review, chemical properties, mechanism of actions and their effects on each organ, clinical manifestations, diagnostic evaluation of the actions triage, and treatment of injuries have been described.

Source: [https://www.researchgate.net/publication/336125166\\_Therapeutic\\_options\\_to\\_treat\\_mustard\\_gas\\_poisoning\\_-\\_Review](https://www.researchgate.net/publication/336125166_Therapeutic_options_to_treat_mustard_gas_poisoning_-_Review)

## Potential Treatment for Mustard Gas Skin Exposure

By Brian Day, Ph.D.

University of Colorado, Denver | NIEHS Grant U54ES015678

2014 – A new study, funded in part by NIEHS, demonstrates the potential of an antioxidant metalloporphyrin in treating skin lesions caused by 2-chloroethyl ethyl sulfide (CEES), a chemical similar in structure to sulfur mustard gas that is used to study toxic effects of the chemical warfare agent. The findings show the antioxidant's potential as a medical countermeasure against skin effects from exposure to chemical agents. Since previous studies showed that oxidative stress plays a role in skin injuries caused by CEES, the researchers tested the ability of the antioxidant Mn(III) tetrakis(N,N'-diethylimidazolium-2-yl)porphyrin, known as **AEOL 10150**, to treat skin effects of CEES exposure. Mouse skin exposed to CEES and then treated with AEOL 10150 showed more than 50 percent ( $p < 0.05$ ) reversal of increases in skin bi-fold and epidermal thickness and myeloperoxidase activity—all markers of CEES-induced skin injury—as well as decreased DNA oxidation. Treating cultured mouse epidermal cells and human skin cells with AEOL 10150 (50  $\mu$ M) 1 hour after CEES exposure brought about significant ( $p < 0.05$ ) reversal of decreases in both cell viability and DNA synthesis induced by CEES. The researchers also measured reactive oxygen species in the cytoplasm and mitochondria, finding that the treatment improved CEES-induced oxidative stress in both cell lines.

**Citation:** *Tewari-Singh N, Inturi S, Jain AK, Agarwal C, Orlicky DJ, White CW, Agarwal R, Day BJ. 2014. Catalytic antioxidant AEOL 10150 treatment ameliorates sulfur mustard analog 2-chloroethyl ethyl sulfide-associated cutaneous toxic effects. Free Radic Biol Med 72:285-95. (Brian Day is a consultant for and holds equity in Aeolus Pharmaceuticals, which is developing metalloporphyrins as potential therapeutic agents).*



## Elmon Release CBRN Suit

Source: [https://cbrneworld.com/index.php?option=com\\_content&view=article&id=1505:elmon-release-cbrn-suit&catid=9&utm\\_source=newsletter\\_56&utm\\_medium=email&utm\\_campaign=mitigation-january](https://cbrneworld.com/index.php?option=com_content&view=article&id=1505:elmon-release-cbrn-suit&catid=9&utm_source=newsletter_56&utm_medium=email&utm_campaign=mitigation-january)



Elmon is a leading manufacture of Ballistic (bulletproof) protection. For the last five years Elmon have been working on developing and adding CBRN suits to be included with its products, and are proud about the launching their very own CBRN protection suite with respirator, boots and gloves, manufactured in **Athens, Greece**.

The suit is compliant to NATO, EN, ISO and Finabel standards and Elmon is now supplying CBRN suits in over 30 different countries. A press release from Elmon states "Our suit offers improved protection against Mustard and soman agents. Its design is Breathable. Causing less air resistance. Lined with HIGH quality encapsulated active carbon. Also, the CBRN suit is Washable and has a Storage life of 20 years. Our amazing team of R&D has also designed the CBRN suite so that it can be Effective and user friendly in warm climates and ensuring that the end user has Protection against all type of contaminants, (vapour, liquid, aerosol, drops, solids). The ultra-lightweight designed suite also gives the end user Unassisted donning on and doffing capabilities again making it easier for them to carry out their duties. The design is Durable and able to withstand rigorous activities with Taped seams, elastic wrist and ankles. And as we are the manufacture, we have the capability to design the suit in any pattern or colour so whether you are Military in camouflage or a police officer or CTU unit in Black or blue. The fabric is easy to decontaminate is also hot gas tolerant Flame, heat, oil and fungus resistant."

## Cyanide Autoinjector Development

Source: <https://twin-cities.umn.edu/news-events/university-minnesota-twin-cities-and-windgap-medical-receive-32-million-nih-grant>

Jan 14 – The University of Minnesota Twin Cities and Windgap Medical have received a \$3.2 million grant from the National Institutes of Health (NIH) **to develop a new device to quickly administer a recently developed antidote for cyanide poisoning.**

Under the grant, researchers from the University's [Center for Drug Design](#), College of Pharmacy, and Massachusetts-based pharmaceutical company [Windgap Medical](#) are collaborating to design an autoinjector. The collaboration's goal is to develop a valuable tool for first responders to use in saving victims of cyanide poisoning. The five-year grant comes from the NIH's CounterACT program, which aims to prepare countermeasures against chemical threats that have the potential to be used as weapons.

"The risk of cyanide use in a terrorist attack is such that the U.S. Department of Homeland Security identifies cyanide among the highest priority chemical threats," said Steven Patterson, a professor in the Center for Drug Design. "Current antidotes are not well-suited for use in a mass-casualty setting. We have long recognized that a device to deliver a cyanide antidote as rapidly and easily as epinephrine would be extremely useful. It is clear that Windgap has the technology to develop such a device."

In addition to terrorist attacks, toxic levels of cyanide exposure can also come from building fires and industrial accidents. The chemical kills cells in the body by preventing them from using oxygen. Symptoms of toxic exposure, which can develop within minutes, include convulsions, loss of consciousness, and possibly death, according to the Centers for Disease Control and Prevention.

Those who survive cyanide poisoning are at risk for a severe neurological disorder similar to Parkinson's disease.

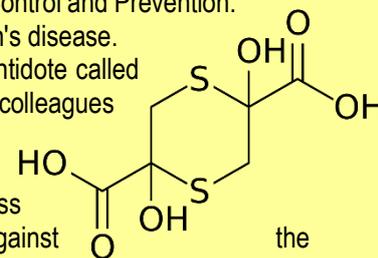
The work to develop a fast-acting, easy-to-administer autoinjector formulation will be based on an antidote called **sulfanegen**, which was recently developed and refined by Patterson as well as College of Pharmacy colleagues

Robert Vince, director of the Center for Drug Design, and Herbert Nagasawa, adjunct professor. The formulation was patented with assistance from [U of M Technology Commercialization](#).

**Sulfanegen takes effect in less than three minutes**, rapidly converting cyanide in the body into a less toxic compound. An autoinjector would deliver a single, preloaded dose of this antidote when pressed against the body, requiring much less time to administer than the current industry-standard cyanide treatment, which requires a person to be connected to an IV for 15 minutes. A faster treatment option during mass-exposure incidents, such as terrorist attacks or building fires, could allow first responders to save more lives before victims succumb to their exposure.

Windgap will design the autoinjector to fit the specific dosing characteristics needed for sulfanegen. **This will involve a dual-chamber (wet/dry) autoinjector design to ensure the powdered drug remains dry** and shelf-stable while being easy for first responders to reconstitute and administer to victims in the field.

"Windgap is excited to be working with Dr. Patterson, an authority on cyanide toxicology and antidote development, with a history of success in drug design," said Adam Standley, vice



president of R&D at Windgap. "This collaboration is a case study in the innovation that is catalyzed by academic-industry teaming, supported by CounterACT. Here we have a promising drug and an innovative delivery technology coming together to form an elegant solution, addressing a largely unmet need. We look forward to developing and commercializing this product for both defense and civilian use with Dr. Patterson and the team at the University of Minnesota."

## **Chemical-weapon use in Syria: atrocities, attribution, and accountability**

By Gregory D. Koblentz

*The Non-Proliferation Review*

Source: <https://www.tandfonline.com/doi/full/10.1080/10736700.2019.1718336>

Feb 17 – International efforts to hold the government of President Bashar al-Assad accountable for the use of chemical weapons in the Syrian Civil War have entered a new phase. For the first time, the Organisation for the Prohibition of Chemical Weapons (OPCW), the international organization responsible for implementing the 1993 Chemical Weapons Convention, has been empowered to identify the perpetrators of chemical attacks in Syria. The **Investigation and Identification Team** (IIT), which was formed to conduct the OPCW's new attribution mission, has announced its intention to investigate and identify the perpetrators of nine chemical attacks in Syria, including the April 7, 2018, attack in Douma. This article reviews recent efforts to attribute chemical attacks in Syria, describes what we know about the **nine incidents to be investigated**, summarizes what is known about the Syrian government officials, military commanders, and chemical-warfare scientists suspected of being responsible for these attacks, discusses what to expect during the next phase of the attribution process, and offers insights into how the international community can move beyond attribution to accountability. Accountability is necessary to provide justice for victims and to prevent future incidents by demonstrating that perpetrators of chemical attacks will be identified and punished.

*Gregory D. Koblentz is an Associate Professor and Director, Biodefense Graduate Program, Schar School of Policy and Government, George Mason University and Member, Scientists Working Group on Chemical and Biological Security, Center for Arms Control and Nonproliferation.*

## **Attack of the dead: How fatally wounded Russian soldiers fought off a German offensive**

Source: <https://www.rbth.com/history/328908-russian-attack-of-dead>

When the German launched a deadly poison gas attack on Russia's Russian Osowiec fortress on August 6th, 1915, it seemed certain that the Russian garrison would not survive.

The Russian troops, whose gas masks were as good as useless, seemed doomed to die. However, the German infantry's advance - or rather pleasant stroll - towards the well-defended fortress turned into a real nightmare.

Instead of finding piles of corpses, the Germans ran into enemy soldiers who were very much alive, but strongly resembled the dead. The Russians, clothed in bloody rags, coughing up blood and on their last legs, launched an attack on the shocked Germans. This attack has gone down in history as the "attack of the dead".

### **Unbreakable spirit**

The Osowiec fortress, located near the Polish town of Bialystok, was a 'bone in the throat' of the Germans as it forced them to keep troops tied up at the salient in northeast Poland.

First targeted in September 1914, the fortress withstood all enemy attacks through extensive use of planes and artillery. Following their unsuccessful attempt to seize the Russian stronghold, the Germans turned to more extreme measures.

On August 6th, 1915 they released **chlorine gas** over the fortress. Sergey Khmelkov, one of the fortress defenders who survived the gas attack, **recalled**: "Any living person stood outside on the bridgehead of the fortress was poisoned to death...the grass turned black, there were flower petals scattered everywhere...meat, butter, lard, vegetables were poisoned and deemed unsuitable for consumption."



## Disaster

"The fortress was not prepared at all to withstand a gas attack. There were no plans in place, no resources to collectively and individually protect the garrison and the gas masks sent to them were of little use," Khmelkov wrote.

Most of the barracks, dugouts and fortified posts lacked fitted with any kind of oxygen generators.



artificial ventilation and were not even

Three companies from the 226<sup>th</sup> infantry division were wiped out and only around 100 soldiers from the fourth company survived. German forces, wearing gas masks, secretly launched the attack on the fortress, confident that the garrison would be totally eradicated.



## Attack of the dead

Once the enemy had crushed the first line of Russian defense and breached the bulwark (defensive walls), they started to advance inside the fortress where the survivors of the 13<sup>th</sup> company, led by Second Lieutenant Vladimir Kotlinsky, launched its legendary attack, which is known today as "the attack of the dead".

"I can't describe the anger and fury that gripped our soldiers as they headed towards their poisoners, the Germans. Heavy rifles, machine guns, heavy shrapnel could not stop the onslaught of frenzied soldiers," an unidentified survivor [wrote](#) in the newspaper "Pskov Life" in 1915.

Sixty men opened fire with their faces wrapped in bloody cloths, trembling and coughing, literally spitting out pieces of their lungs onto their bloodstained shirts. "Although exhausted and poisoned, they advanced with the sole purpose of crushing the Germans," the eyewitness explains.

The Germans, in a state of shock, astonished by the sight of "dead" Russian soldiers and the fury of their attack, fled in a state of panic, leaving behind their machine guns and getting fatally caught up in their own barbed wire defences.

Taking advantage of the surprise, the 8<sup>th</sup> and 14<sup>th</sup> companies recaptured the main bulwark, eliminated the gap and brought the revived garrison artillery back together. The leader of the "attack of the dead" and savior of the fortress, 2nd Lt. Kotlinsky, was severely wounded and died the same evening.

## The surrender of Osowiec

Despite the bravery of the Russian soldiers, the fortress was doomed. Again, in April and May 1915 Austrian and German forces broke through the Russian front in East Prussia and Galicia.

The fortress concealed the strategic retreat of Russian forces up until August, at which point defending the fortress became pointless. On the 22<sup>nd</sup> August the Russian garrison left the fortress in an orderly and calm fashion, demolishing the main bulwarks and fortified points.

The counter-attack led by Kotlinsky prevented the fortress from falling into the hands of the Germans and saved thousands of its garrison from disaster. History would tell a different story had the German offensive of August 6<sup>th</sup> succeeded.



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## ***Bacillus anthracis* Bioterrorism Incident, Kameido, Tokyo, 1993**

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3322761/>

### **Expert admits linking pneumonia outbreak in China with biological weapons test**

Source: <https://top-news.online/expert-admits-linking-pneumonia-outbreak-in-china-with-biological-weapons-test/>

Jan 21 – An outbreak of pneumonia of unknown origin, recorded in China at the end of 2019, maybe a species of biological weapon. This opinion was expressed on Monday, January 20, by Igor Nikulin, a member of the UN Commission on Biological Weapons 1998-2003. Americans spend billions of dollars on them every year, and “it’s unlikely they’re doing it for nothing.”

“In 2010, the U.S. Navy’s laboratory was closed in Indonesia precisely because it conducted unauthorized experiments, including avian influenza, that caused the outbreak, and the Americans refused to share with The Indonesian Ministry of Health has been able to do so,” he told the Star TV channel.

According to Nikulin, it may also be malicious actions of the United States to put pressure on Chinese partners or the activities of private American corporations developing new diseases in order to profit from the sale Medicines.

Earlier in the day, it was reported that the Russian Ministry of Health’s Center for Strategic Planning (CSP) was creating an express test to detect the coronavirus 2019-nCoV, which has already spread beyond China. It is expected that the diagnosis of the virus will take 15 to 20 minutes and it can be used at airports.

An outbreak of pneumonia of unknown origin was recorded in China in late December. According to experts, a new type of coronavirus has become a causative agent. They have already infected 198 people, including those outside China, and three of them have died, RT reports.

The World Health Organization (WHO) has linked the spread of the virus to the seafood market. Rospotrebnadzor said that so far the disease does



not pose a mortal danger to people.

Coronaviruses are a family of more than 30 viruses. They are able to provoke damage to the respiratory system, gastrointestinal tract, nervous system.

### **Virus-hit Wuhan has two laboratories linked to Chinese bio-warfare program**

By Bill Gertz (The Washington Times)

Source: <https://m.washingtontimes.com/news/2020/jan/24/virus-hit-wuhan-has-two-laboratories-linked-chines/>



Jan 24 – The deadly animal virus epidemic spreading globally may have originated in a Wuhan laboratory linked to [China](#)’s covert biological weapons program, according to an Israeli biological warfare expert.

[Radio Free Asia](#) this week rebroadcast a local Wuhan television report from 2015 showing [China](#)’s most advanced virus research laboratory known the [Wuhan Institute of Virology](#), [Radio Free Asia](#) reported.

**The laboratory is the only declared site in [China](#) capable of working with deadly viruses.**

[Dany Shoham](#), a former Israeli military intelligence officer who has studied Chinese bio warfare, said the [institute](#)



is linked to Beijing's covert biological weapons program.

"Certain laboratories in the [institute](#) have probably been engaged, in terms of research and development, in Chinese [biological weapons], at least collaterally, yet not as a principal facility of the Chinese BW alignment," Mr. [Shoham](#) told The Washington Times. Work on biological weapons is conducted as part of a dual civilian-military research and is "definitely covert," he said in an email.

Mr. [Shoham](#) holds a doctorate in medical microbiology. From 1970 to 1991 he was a senior analyst with Israeli military intelligence for biological and chemical warfare in the Middle East and worldwide, holding the rank of lieutenant colonel.

[China](#) in the past has denied having any offensive biological weapons. The State Department, in a report last year, said it suspects [China](#) has engaged in covert biological warfare work.

A Chinese Embassy spokesman did not return an email seeking comment.

Chinese authorities so far have said the origin of the coronavirus that has killed scores and infected hundreds in central Hubei Province is not known.

Gao Fu, director of the Chinese Center for Disease Control and Prevention, told state-controlled media initial signs as of Thursday indicated the virus originated from wild animals sold at a seafood market in Wuhan.

One ominous sign, said a U.S. official, is the that false rumors since the outbreak began several weeks ago have begun circulating on the Chinese Internet claiming the virus is part of a U.S. conspiracy to spread germ weapons.

That could indicate [China](#) is preparing propaganda outlets to counter future charges the new virus escaped from one of Wuhan's civilian or defense research laboratories.

The World Health Organization is calling the microbe novel coronavirus 2019-nCoV. At a meeting in Geneva Thursday, the organization stopped short of declaring a Public Health Emergency of International Concern.

The virus outbreak causes pneumonia-like symptoms and prompted [China](#) to deploy military forces to Wuhan this week in a bid to halt the spread. All travel out of the city of 11 million people was halted.

The [Wuhan institute](#) has studied coronaviruses in the past, including the including the strain that causes Severe Acute Respiratory Syndrome, or SARS, H5N1 influenza virus, Japanese encephalitis, and dengue. Researchers at the [institute](#) also studied the germ that causes anthrax – a biological agent once developed in Russia.

"Coronaviruses (particularly SARS) have been studied in the [institute](#) and are probably held therein," he said. "SARS is included within the Chinese BW program, at large, and is dealt with in several pertinent facilities."

It is not known if the [institute](#)'s array of coronaviruses are specifically included in biological weapons program but it is possible, he said.

Asked if the new coronavirus may have leaked, Mr. [Shoham](#) said: "In principle, outward virus infiltration might take place either as leakage or as an indoor unnoticed infection of a person that normally went out of the concerned facility. This could have been the case with the [Wuhan Institute of Virology](#), but so far there isn't evidence or indication for such incident."

After researchers' sequence of the genome of the new coronavirus it might be possible to determine or suggest its origin or source.

Mr. [Shoham](#), now with the Begin-Sadat Center for Strategic Studies at Bar Ilan University in Israel, said the [virology institute](#) is the only declared site in [China](#) known as P4 for Pathogen Level 4, a status indicating it uses the strictest safety standards to prevent the spread of the most dangerous and exotic microbes being studied.

The former Israeli military intelligence doctor also said suspicions were raised about the [Wuhan Institute of Virology](#) when a group of Chinese virologists working in Canada improperly sent samples to [China](#) of what he said were some of the deadliest viruses on earth, including the Ebola virus.

In a July article in the [journal Institute](#) for Defence Studies and Analyses, Mr. [Shoham](#) said the [Wuhan institute](#) was one of four Chinese laboratories engaged in some aspects of the biological weapons development.

He identified the secure Wuhan National Biosafety Laboratory at the [institute](#) as engaged in research on the Ebola, Nipah, and Crimean-Congo hemorrhagic fever viruses.

The Wuhan virology institute is under the Chinese Academy of Sciences. But certain laboratories within it "have linkage with the PLA or BW-related elements within the Chinese defense establishment," he said.

In 1993, [China](#) declared a second facility, the **Wuhan Institute of Biological Products**, as one of eight biological warfare research facilities covered by the Biological Weapons Convention (BWC) which [China](#) joined in 1985.

The Wuhan Institute of Biological Products is a civilian facility but is linked to the Chinese defense establishment, and has been regarded to be involved in the Chinese BW program, Mr. [Shoham](#) said.

[China](#)'s vaccine against SARS is probably produced there.

"This means the SARS virus is held and propagated there, but it is not a new coronavirus, unless the wild type has been modified, which is not known and cannot be speculated at the moment," he said.



The annual State Department report on arms treaty compliance stated last year that [China](#) engaged in activities that could support biological warfare.

“Information indicates that the People’s Republic of China engaged during the reporting period in biological activities with potential dual-use applications, which raises concerns regarding its compliance with the BWC,” the report said, adding that the United States suspects [China](#) failed to eliminate its biological warfare program as required by the treaty.

“The United States has compliance concerns with respect to Chinese military medical institutions’ toxin research and development because of the potential dual-use applications and their potential as a biological threat,” the report added.

**The biosafety lab is located about 20 miles from the Hunan Seafood Market that reports from China say may have been origin point of the virus.**

Rutgers University microbiologist Dr. Richard Ebright told London’s Daily Mail that “at this point there’s no reason to harbor suspicions” the lab may be linked to the virus outbreak.

## U.S. ‘a Lot More Fragile Than We Realize’ on Biothreats, Experts Warn

Source: <https://www.hstoday.us/subject-matter-areas/infrastructure-security/outbreak-is-america-prepared-to-face-growing-biothreats/>

Jan 24 – The nation is critically underprepared to confront transnational biological threats ranging from DIY bioterror agents to natural pathogens that outpace current pharmaceuticals and overwhelm medical facilities, the Blue Ribbon Study Panel on Biodefense heard at the Hudson Institute. James Lawler, a retired Navy commander whose experience includes serving as director for medical preparedness policy on the National Security Council and director for biodefense policy on the White House’s Homeland Security Council, warned that the country is “woefully unprepared for these biological threats” in an increasingly interdependent world. “Events halfway around the world have rapid effects,” he said, and the nation suffers from a “lack of threat awareness and poor situational awareness as it comes to biological threats.”

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## Can Government Keep Up with Innovation Pace to Save Us from Pandemics, Bioattacks?

Source: <https://www.hstoday.us/subject-matter-areas/infrastructure-security/outbreak-is-america-prepared-to-face-growing-biothreats/>

Jan 24 – The chairman of the Senate Intelligence Committee said a critical challenge in confronting the threat of pandemics or biological attacks is acknowledging that “the architecture of government is not designed in a way that allows innovation to happen and for it to be deployed quickly.” In an address to the Texas A&M University and the Scowcroft Institute of International Affairs Pandemic & Biosecurity Forum in Washington, Sen. Richard Burr (R-N.C.) characterized the state of pandemic research and response in this country as “a lot of people jumping up saying ‘why the hell won’t you let me try’... When we talk about Washington stovepipes, we’ve got a stovepipe when it relates to pandemics.”

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## Pandemic Pandemonium Would Lead to Emergence of a New World

Source: <https://www.hstoday.us/subject-matter-areas/infrastructure-security/outbreak-is-america-prepared-to-face-growing-biothreats/>

Jan 24 – A HCl virus strain emerges suddenly on a rural poultry farm west of an Asian city. Numerous cages of infected chickens shipped from that farm arrive at several legal and illegal live markets within the dense urban districts of the city. A child wanders about the market climbing and peering into cages as his mother barter for a chicken to boil that evening. The merchant butchers the chicken and sells it to the woman, who leaves with her son. This process repeats itself numerous times. The merchant’s direct contact with live and butchered birds results in his infection and within days he starts to show symptoms. His symptoms worsen, but he continues to work in the market selling his infected birds so he can provide for his family. The air in the market is stagnant as chickens and ducks move about their cages, kicking up contaminated dust and flapping their wings. The merchant is ignoring his growing aches and cough, thinking that the dust, cool mornings, and cigarette smoking are causing his asthma to flare up.

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## Entry Screening: Stopping the Global Spread of Novel Coronavirus

By Kylie Bielby

Source: <https://www.hstoday.us/channels/global/entry-screening-stopping-the-global-spread-of-novel-coronavirus/>

Jan 24 – Several countries are screening air passengers traveling from China and Hong Kong for the deadly Novel Coronavirus, also called 2019-nCoV.

[The U.S. initially announced that three airports would be screening passengers](#) arriving from Wuhan in Hubei province – the region where the outbreak has claimed more than 20 lives and infected hundreds. Entry screening for passengers traveling from or via Wuhan to San Francisco, New York-JFK, and Los Angeles airports began on January 17. On January 21, the Centers for Disease Control and Prevention (CDC) announced that it will expand screening of passengers arriving from Wuhan, to two more U.S. airports: Atlanta's Hartsfield-Jackson International and Chicago's O'Hare International Airport.

In order to manage the screenings and contain the spread of the virus, all travelers flying between Wuhan and the United States will be rerouted through one of the five airports with screenings if they aren't already scheduled to fly there.

Thailand's Department of Disease Control has been implementing its surveillance protocol by fever screening of travelers from all direct flights from Wuhan to the Suvarnabhumi, Don Mueang, Chiang Mai, Phuket and Krabi airports, with the screening protocol starting at Krabi Airport on January 17.

Japan, which has had one confirmed case of Novel Coronavirus to date, said it has been screening passengers at all Japanese airports for respiratory issues since January 7. South Korea's only airport to receive passengers from Wuhan, Incheon International Airport, is operating two special gates for passengers arriving from Wuhan where official check travelers' temperatures.

Meanwhile, air travelers arriving from China at seven airports in India will be screened for the virus. Passengers arriving at Bengaluru, Chennai, Cochin, Delhi, Hyderabad, Mumbai, and Kolkata airports will undergo thermal screening. Additionally, passengers experiencing acute onset of fever, cough and shortness of breath have been directed to report to the health units at the airport.

On January 22, the U.K. Department of Health announced that it will be taking a "series of precautionary measures" for flights arriving from Wuhan to London Heathrow airport. These measures include the aircraft landing in an isolated area of the airport where it will be met by a health team. Public Health England said on January 24 that it is "highly likely" the U.K. will see cases of Novel Coronavirus. An incident team has been established in Scotland where a small number of people are being tested for the virus and a man who recently returned from Wuhan is being treated for respiratory illness. There are as yet no confirmed cases in the U.K.

Sheremetyevo, Vnukovo, Yekaterinburg and Irkutsk airports in Russia have also commenced screening. Bangladesh, Italy, Malaysia, Nigeria and Singapore have also introduced various measures to identify potentially affected passengers. Many other countries also have year-round health screening at airports for arriving passengers.

In the country of origin, China has installed 35 infrared thermometers at airports, railway stations, long-distance bus stations, and ferry terminals. Authorities initially advised against travel into and out of Wuhan, and on January 23 it was announced that all flights, trains and other public transport out of Wuhan would be suspended. Similar measures will take effect in the nearby city of Huanggang and other areas.

It is not yet clear how long these suspensions will last, but millions of people are preparing to travel around the country for the upcoming Lunar New Year this coming weekend. It is likely that airports around the world that have introduced additional screening measures for flights from Wuhan, will retain these measures for some time after the suspension has lifted. In the meantime, it may be prudent for those who focused on screening arrivals from Wuhan to broaden the process to flights from other affected areas.

Entry screening is part of a layered approach used with other public health measures already in place to detect arriving travelers who are sick to slow and reduce the spread of any disease. Methods include thermal imaging, taking temperatures, and requiring passengers to fill out a questionnaire that asks about symptoms. Passengers may be quarantined in special areas at the airport or close by should their health pose a concern to the public. There is currently no global standard for disease screening at airports.

A woman has been posting on social media, claiming that she travelled from Wuhan before flights were stopped with symptoms of Novel Coronavirus, but managed to pass through the thermal imaging screening by taking medication to lower her temperature. She is now on vacation in France and her social media claims have been referred to the Chinese embassy in Paris.

The World Health Organization is not currently recommending any specific health measures for travelers and considers entry screening to offer "little benefit while requiring considerable resources". Instead it urges anyone with respiratory symptoms to seek medical advice before they travel.

The concern with the present outbreak is that while countries focus on flights from Wuhan, the virus is potentially spreading further across China. Several cases have already been confirmed in the Guangdong province, for example, which has three international airports.



CDC describes coronaviruses are a large family of viruses, some causing illness in people and others that circulate among animals. Rarely, animal coronaviruses can evolve and infect people and then spread between people such as has been seen with MERS and SARS. Past MERS and SARS outbreaks have been complex, requiring comprehensive public health responses.

Initially, many of the patients in the outbreak in Wuhan, China reportedly had some link to a large seafood and animal market, suggesting animal-to-person spread. However, CDC has confirmed that a growing number of patients reportedly have not had exposure to animal markets, suggesting limited person-to-person spread is occurring, though it's unclear how easily or sustainably this virus is spreading between people. Chinese Health Authorities [have reported two suspected cases of human-to-human transmission](#).

A meeting hosted by the World Health Organization assessed the severity of the outbreak and determined that while it is a national emergency for China, it is not yet to be classified as a global health emergency. This may alter as more information becomes available.

Work on a vaccine is underway as there is currently no vaccine for this particular strain of coronavirus. The National Institutes of Allergy and Infectious Diseases, which is developing a vaccine, says it would take months for it to advance into clinical trials and more than a year until it is available. Another team of scientists from the U.S. and China are also working on a vaccine, and the University of Saskatchewan in Canada has requested to work on the virus in order to develop a vaccine, according to Canadian media reports.

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

## **Smallpox Bioattack 'Would Quickly Spiral Out of Control and Become a Pandemic'**

Source: <https://www.hstoday.us/subject-matter-areas/infrastructure-security/outbreak-is-america-prepared-to-face-growing-biothreats/>

Preparedness could be the difference between a contained local outbreak and a global pandemic if there was a smallpox attack in the Pacific today, a bioterrorism exercise held at UNSW Sydney discovered. The hypothetical scenario, designed to test preparedness and response globally to a smallpox attack in our region, brought together key international representatives from departments of health, foreign affairs, defense, police, non-government agencies, vaccine manufacturers and other global stakeholders. The simulation uncovered that for a disease as infectious as smallpox, every day counts.

[READ MORE](#)

## **Terror groups with help of Pak establishment may launch bio-warfare: How prepared are we?**

Source: <https://www.oneindia.com/india/terror-groups-with-help-of-pak-establishment-may-launch-bio-warfare-how-prepared-are-we-3019792.html>

Jan 23 – There has been no conclusive evidence found as yet, but there are allegations that China could have unleashed the SARS like virus as part of a biological warfare campaign. A few years back, Union Minister Rajnath Singh had said that the armed forces must be properly trained and equipped to combat chemical and biological threats. He said that the forces are deployed in many regions where the adversaries may use such weapons.

While it is extremely difficult to launch a chemical or biological warfare without the backing of the establishment, terror groups are constantly upgrading their capabilities in this field. A high degree of surprise: Terrorists have also learnt to inject a high degree of surprise, speed and deniability in their

operations. This has led to the Intelligence agencies constantly revamping their style of functioning. Slain Hizbul Mujahideen terrorists were wanted for complicity in terrorist acts Intelligence has over the years become more proactive. Moreover, there is a dire need to be constantly informed and upgraded about the new threats so that the Intelligence can prepare itself accordingly. When one speaks about the future of terror attacks, there is a need to mention biological warfare here. There are several terror groups, which have this capability, but have not launched a full-



fledged attack as yet. Pakistan's capabilities: While terror groups in Pakistan have the capability of launching biological strikes, none of them can independently launch biological warfare or use weapons unless and until there is a definitive nod from the government or the ISI. To this, the National Security Advisor Ajit Doval had once pointed out that Pakistan would do everything under the sun to exercise necessary restraint and control over terrorist groups in order to restrain them from using WMDs or Weapons of Mass Destruction against India. While Pakistan may exercise restraint, the threat however still looms large. A recent Intelligence report stated that nuclear and biological terrorism are the primary concerns today, with cities like Mumbai and Delhi being the most vulnerable. Testing the waters: While no one has gone all out in the use of biological warfare, terrorist groups have used such weapons in tested doses.

They are still testing the waters and it may be a while before they decide to completely go biological in their warfare. Security experts say that the biggest user of the biological and the nuclear weapons will be the Taliban and the ISIS. These are not run of the mill terrorist groups and both are trying to establish a government in Afghanistan, Iraq and Syria. The danger of nuclear smuggling is immense today. Security officials working in both India and Pakistan have identified the routes through which nuclear weapons could be smuggled. Punjab, Assam, Kashmir and Balochistan and the danger routes identified by the Intelligence Bureau officials. There is a lot of demand for nuclear and biological weapons in these areas as they are conflict torn zones. The demand for

stronger weapons: As the battle intensifies, the demand for stronger weapons will only increase and terrorist groups may go that extra mile to source such material. While it is extremely difficult to source such weapons and the costs are extremely high, groups such as the ISIS and the Taliban can afford it. They are making the right contacts in Pakistan and will target rogue scientists to lay their hands on these weapons. The challenge ahead for the security agencies in India is immense. The threat of a biological warfare cannot be ignored or taken lightly at all. Intelligence Bureau officials are aware of the capabilities of groups such as the Lashkar and Taliban which used very sophisticated weapons.

The threat of nuclear and biological weapons being smuggled had started in the year 1998 itself. The threat of biological warfare has to be nipped in the bud itself. If terrorists manage to contaminate water with biological agents the damage will be immense. Primis Player Placeholder The routes to watch out for: IB officials say that the routes in Assam and Kashmir have to be monitored at all times. The threat of these weapons coming in through these routes is immense. We cannot afford a slip up even once on this front, the officer says. Intelligence agencies say that the target cities for terrorist groups to use biological weapons in India will be Delhi and Mumbai. In Pakistan there is a chance of the same being used in Khyber Paktunkhwa, Singh, Islamabad and Karachi. Recently intelligence bureau inputs suggested that the Lashkar-e-Tayiba too had been working on a unit to deal with biological weapons. They have been making attempts to launch a biological warfare on India.

## Outbreaks of Lethal Diseases Like Ebola and the Wuhan Coronavirus Happen Regularly. The U.S. Government Just Cut Funding for the Hospitals that Deal with Them

Source: <http://www.homelandsecuritynewswire.com/dr20200124-outbreaks-of-lethal-diseases-like-ebola-and-the-wuhan-coronavirus-happen-regularly-the-u-s-government-just-cut-fundin>

Jan 24 – The U.S. response to the 2014-2015 Ebola crisis has been to create a “tiered” hospital approach to the treatment of epidemics: Saskia Popescu writes in the [Bulletin of the Atomic Scientists](#) that the expectations are that frontline facilities should be able to quickly identify and isolate potential patients and transfer them to an assessment or treatment hospital if necessary. “At the top of the tiered structure, the 10 regional facilities have the capabilities to simultaneously treat at least two Ebola patients and to isolate at least 10 patients with a respiratory special pathogen like SARS or Middle East respiratory syndrome (MERS),” she writes:

*The tiered approach ensures there are hospitals and healthcare workers equipped to handle special pathogen cases, but like many public health responses to infectious diseases, it’s a Band-Aid, meant to deal quickly with outbreaks before they spiral out of control.*

*The tiered structure addresses this problem by having some hospitals (i.e., the frontline facilities) prepare simply to assess a patient who might have a special pathogen. But this approach means maximum exposure of healthcare workers.*

....  
*To be clear, many dangerous pathogens, including the disease now spreading in China, can be treated at run-of-the mill hospitals in the United States. A cost*



*of over a million dollars per treatment center is no easy pill for hospitals to swallow, even as many have adapted their specialized bio-containment units for uses other than the care of an Ebola patient. My own experience, echoed in surveys and studies, is that hospitals are unlikely to invest the necessary resources to prepare for somewhat improbable events like an Ebola epidemic in the United States. It's easy to imagine administrators asking, "Why worry about Ebola when we are running out of influenza testing kits?"*

*The next epidemic could start with a patient checking in at a local urgent care clinic. Congress needs to ask if its current plan for special pathogen response prepares the country for that. It's likely the answer is no.*

## Coronavirus spotlights Japan contagion risks as Olympics loom

Source: <https://www.reuters.com/article/us-olympics-2020-china-virus/coronavirus-spotlights-japan-contagion-risks-as-olympics-loom-idUSKBN1ZM0YJ>

Jan 24 – An outbreak of a new virus in China has raised fears of a global pandemic, forcing Japan to confront the possibility of deadly contagion and disruption as it prepares to host the 2020 Summer Olympics.

The disease that has killed 17 people and infected almost 600 has already affected Olympics-related events in China, with the cancellation of boxing matches set for the city of Wuhan, seen as the epicenter of the outbreak, and women's soccer qualifiers shifted to Nanjing.

Although Japan has seen just one case, the outbreak highlights the risk of contagion given the millions of visitors expected for the Summer Games.

"We have to be very careful about what kind of infectious diseases will appear at the Tokyo Olympics," Kazuhiro Tateda, president of the Japanese Association for Infectious Diseases, told a briefing on Wednesday.

**"At these kinds of mass gatherings, the risks increase that infectious diseases and resistant bacteria can be carried in."**

Organizers of the Summer Games said they were working with authorities.

"Countermeasures against infectious diseases constitute an important part of our plans to host a safe and secure games," Tokyo 2020 said in a statement.

It would not be the first time that fears of disease have clouded Olympic preparations.

In 2016, the Zika virus prompted some health experts to call for the postponement or relocation of the games in Brazil. They went ahead as scheduled.

Japan on Thursday raised its infectious disease advisory level for Wuhan, urging citizens to avoid non-urgent trips.

### Patchwork vaccination

Until recently, Japanese health authorities were more concerned about beefing up routine vaccinations before foreign visitors arrive this summer. A patchwork policy toward inoculation over the past few decades has left large portions of the Japanese population unprotected against common diseases.

Outbreaks of rubella, which can cause birth defects, prompted the CDC to warn pregnant women about traveling to Japan in 2018. Ahead of the Olympics, the health ministry has been conducting catch-up vaccinations of middle-aged men who were left out of rubella vaccinations in the 1970s and 1980s.

Japan has no mandatory vaccination for mumps, which in other parts of the world is usually bundled with measles and rubella in MMR shots. Japan is fourth in the world in mumps cases, after China, Nepal and Burkina Faso, according to WHO data.

As for the coronavirus, the dangers of public panic and the resulting economic fallout may be greater than the disease itself, said Ikuo Tsunoda, professor of microbiology at Kindai University.

He compared it to the mad cow disease scare in the early 2000s that prompted Japan to ban beef imports from the United States and other countries despite little evidence of human transmission.



## Health experts issued an ominous warning about a coronavirus pandemic 3 months ago. Their simulation showed it could kill 65 million people.

Source: <https://www.businessinsider.com/scientist-simulated-coronavirus-pandemic-deaths-2020-1>

Jan 23 – Eric Toner, a scientist at the Johns Hopkins Center for Health Security, wasn't shocked when news of a mysterious coronavirus outbreak in Wuhan, China, surfaced in early January.

Less than three months earlier, Toner had [staged a simulation of a global pandemic](#) involving a coronavirus.

Coronaviruses typically affect the respiratory tract and can lead to illnesses like pneumonia or the common cold. A coronavirus was also responsible for the outbreak of severe acute respiratory syndrome in China, which affected about 8,000 people and killed 774 in the early 2000s.

"I have thought for a long time that the most likely virus that might cause a new pandemic would be a coronavirus," Toner said.

The outbreak in Wuhan isn't considered a pandemic, but the virus has been reported in Thailand, Japan, South Korea, Taiwan, Vietnam, Singapore, and Saudi Arabia. The US reported its first case on Tuesday: a man in his 30s living in Washington's Snohomish County, north of Seattle, who recently visited China.

"We don't yet know how contagious it is. We know that it is being spread person to person, but we don't know to what extent," Toner said. "An initial first impression is that this is significantly milder than SARS. So that's reassuring. On the other hand, it may be more transmissible than SARS, at least in the community setting."

Toner's simulation of a hypothetical deadly coronavirus pandemic suggested that after six months, nearly every country in the world would have cases of the virus. Within 18 months, 65 million people could die.

### A viral pandemic could kill 65 million people

Toner's simulation imagined a fictional virus called CAPS. The analysis, part of a collaboration with the World Economic Forum and the Bill and Melinda Gates Foundation, looked at what would happen if a pandemic originated in Brazil's pig farms. (The Wuhan virus [originated in a seafood market that sold live animals](#).)

The virus in Toner's simulation would be resistant to any modern vaccine. It would be deadlier than SARS, but about as easy to catch as the flu.

The pretend outbreak started small: Farmers began coming down with symptoms that resembled the flu or pneumonia. From there, the virus spread to crowded and impoverished urban neighborhoods in South America.

Flights were canceled, and travel bookings dipped by 45%. People disseminated false information on social media.

After six months, the virus had spread around the globe. A year later, it had killed 65 million people.

The Spanish flu [pandemic](#) of 1918, by contrast, claimed as many as 50 million lives.

Toner's simulated pandemic also triggered a global financial crisis: Stock markets fell by 20% to 40%, and global gross domestic product plunged by 11%.

"The point that we tried to make in our exercise back in October is that it isn't just about the health consequences," Toner said. "It's about the consequences on economies and societies."

He added that the Wuhan coronavirus could also have significant economic effects if the total number of cases hits the thousands.

On Tuesday, [Hong Kong's stock market fell](#) by as much as 2.8%. The drop was led by the tourism and transportation sectors, including airlines, tour agencies, hotels, restaurants, and theme parks.

### An age of epidemics

In the CAPS simulation, scientists were unable to develop a vaccine in time to stop a pandemic. That's a realistic assumption: Even real coronaviruses like SARS or MERS (a virus that has [killed more than 840 people](#) since 2012) still don't have vaccines.

"If we could make it so that we could have a vaccine within months rather than years or decades, that would be a game changer," Toner said. "But it's not just the identification of potential vaccines. We need to think even more about how they are manufactured on a global scale and distributed and administered to people."

If scientists don't find a way to develop vaccines quicker, he said, dangerous outbreaks will continue to spread. That's because cities are becoming more crowded and humans are encroaching on spaces usually reserved for wildlife, creating a breeding ground for infectious diseases.

"It's part of the world we live in now," Toner said. "We're in an age of epidemics."





### JHCHS Statement about nCoV and the pandemic exercise

In October 2019, the Johns Hopkins Center for Health Security hosted a pandemic tabletop exercise called [Event 201](#) with partners, the World Economic Forum and the Bill & Melinda Gates Foundation. Recently, the Center for Health Security has received questions about whether that pandemic exercise predicted the current novel coronavirus outbreak in China. To be clear, the Center for Health Security and partners did not make a prediction during our tabletop exercise. For the scenario, we modeled a fictional coronavirus pandemic, but we explicitly stated that it was not a prediction. Instead, the exercise served to highlight preparedness and response challenges that would likely arise in a very severe pandemic.

**We are not now predicting that the nCoV-2019 outbreak will kill 65 million people. Although our tabletop exercise included a mock novel coronavirus, the inputs we used for modeling the potential impact of that fictional virus are not similar to nCoV-2019.**

▶▶ Read also: <https://hoax-alert.leadstories.com/3471541-fake-news-high-level-exercise-conducted-3-months-ago-did-not-show-that-a-coronavirus-pandemic-could-kill-65-million-people.html>

## Doctors 'cure' coronavirus patient using HIV wonder drugs

Source: <https://www.thenational.ae/world/asia/doctors-cure-coronavirus-patient-using-hiv-wonder-drugs-1.970084>

Jan 27 – Antiretroviral drugs, which were used during the SARS outbreak, have 'somewhat successfully' stopped the spread of the disease to cells

Doctors in China are claiming to have cured a patient suffering from the Wuhan coronavirus using a HIV wonder drug.

The Chinese authorities said the patient, who received the medication during a drug trial, had fully recovered and has since been discharged from hospital.

Shanghai's Municipal Health Commission said the drug "somewhat successfully" stopped the spread of the disease to cells, the Xinhua News Agency reported.

The news was also carried on Wam, the UAE's news agency.

Beijing Municipal Health Commission confirmed the use of the HIV drugs to treat patients suffering from the Wuhan coronavirus on Sunday.

Three Beijing hospitals began administering **lopinavir/ritonavir** – two antiretroviral drugs used in combination to treat HIV – to patients suffering from the coronavirus, according to a statement published by Chinese media.

**The drugs work by blocking HIV's ability to reproduce by binding to healthy cells.**

The medication was used to "substantial clinical benefit" on patients suffering from SARS, another coronavirus which swept through China in 2002 and 2003. There are seven known coronaviruses, the majority of which result in symptoms no more severe than the common cold.

**However, SARS – that killed almost 800 people from 2002 to 2003 – had a fatality rate of 14 to 15 per cent. Another coronavirus, MERS, kills about 35 per cent of people it infects.**

It is not yet clear how severe the Wuhan coronavirus is. There could be many infected who develop such mild symptoms they do not know they even have it. It is currently believed to be much less severe than SARS and MERS, with a fatality rate of about 3 per cent. On Sunday, Minister of Health and Prevention Abdulrahman Al Owais, [confirmed the country was free](#) of the virus.

Mr Al Owais called on the public to rely on updated information from the government and avoid "giving heed to rumors".

On Sunday, Cleveland Clinic Abu Dhabi issued a statement after unfounded rumors about suspected cases appeared on social media.

"Cleveland Clinic Abu Dhabi can assure the community that, to date, no patients have been diagnosed with the 2019 Novel Coronavirus (2019-nCoV), the virus originating in Wuhan, China and currently causing global concern," the hospital said.

"There are numerous forms of coronaviruses, including more prevalent human coronaviruses, and the majority of these are not considered public health risks."



## What the Coronavirus Means So Far for the Travel Industry

Source: <https://skift.com/2020/01/24/what-the-coronavirus-means-so-far-for-the-travel-industry/>

Jan 24 – The coronavirus has rapidly become a serious global concern after first being detected in the final days of 2019 in the



Chinese city of Wuhan. The travel industry is increasingly bracing for its impact.

Chinese officials reported Friday that there are 830 cases and 26 deaths, and there are confirmed cases in [countries including](#) the U.S., Thailand, Japan, South Korea, Taiwan and others. The quarantine has been expanded to 12 cities including the epicenter of Wuhan — an area representing an astonishing 35 million people.

The World Health Organization [on Thursday](#), called for precautions, but fell short of declaring a “a global emergency,” at least for now.

Stay up-to-date on the business of travel in Asia with our weekly newsletter straight from Skift's Singapore bureau.

The travel industry may

experience an outsize impact and disruption from efforts to contain the spread of the virus. Here's a breakdown of coronavirus' impact so far on key travel sectors: tourism, aviation, hotels, and business travel.

### Tourism

When it comes to the tourism sector, the damage of the coronavirus is as much about the seriousness of the virus itself as its inauspicious timing. China's Lunar New Year begins on Friday, which under normal circumstances would kick off the biggest annual mass movement of people in China, and indeed the world.

An estimated 400 million Chinese travelers totaling [three billion trips](#) were expected to travel for the several-weeks-long holiday period to other areas of China and countries across the Asia-Pacific region. It can be the only time of the year that some rural [Chinese workers](#) see their families.

This creates a major challenge for the destinations bracing to receive (and now, monitor) all those arriving tourists. In keeping with World Health Organization advice, screening for passengers arriving from China with the use of thermal scanners has been [ramped up](#) at airports across the world, the Associated Press reported. In the UK, universities [warned Chinese](#) students that they may be quarantined upon return from China if they choose to travel home.

Another challenge is the expected loss of revenue that will occur as a result of many travelers staying home. The quarantine means that millions of people are unable to leave the region, including on flights. As such, a significant drop in the volume of people traveling for the season from that region is to be expected. In other regions, it's likely that people will stay home or cancel trips out of fear or precaution. This could have economic implications similar to the SARS crisis of 2003, [wrote Rajiv Biswas](#), chief economist for IHS Markit's Asia-Pacific region.

“The 2003 SARS crisis created a severe negative impact on GDP growth for the Chinese economy and also hit the economies of a number of Southeast Asian nations, including Malaysia, Singapore, and Vietnam. However, other economies are also vulnerable, with the SARS epidemic having also had a negative impact on the economies of Canada and Australia.



Since the 2003 SARS crisis, China's international tourism has boomed, so the risks of a global SARS-like virus epidemic spreading globally have become even more severe."

He added that in addition to tourism, sectors including retail, restaurants, conferences, sporting, and aviation were at risk. Of particular concern was the effect on this year's Tokyo Summer Olympics if the epidemic proved to be as persistent as SARS, which in 2003 lasted for months.

On the bright side, [observers have said](#) that China's response time to this virus is much improved compared to the SARS crisis. European Tourism Association CEO Tom Jenkins said in a statement today that while the situation is in flux, "we do know that the factors that led to the rapid spread of SARS are not being repeated. The Chinese authorities have been prompted in highlighting the problem, and are supplying daily updates on the situation." He added that precautions are in place across Europe and that while "the virus is of major international concern; it remains a very remote threat — effectively no threat — for any traveler in Europe."

The foreign offices of many nations including the U.S. and the UK have advised citizens not to visit Wuhan. The U.S. State Department issued its highest alert — level four, meaning "do not travel"— in regards to Hubei Province and pointed to the CDC's guidance on the matter.

— Rosie Spinks, *Global Tourism Reporter*

### Aviation

For air travel, authorities at first were most concerned about flights to and from Wuhan, China, where the virus is thought to have originated. The airport there is now closed, but flights operated for several days after the virus was identified, including nonstops to San Francisco and New York.

Other flights in China remain active, though the country's aviation sector is in flux as regulators wrestle with how best to contain the virus. Air China, like all airlines, is offering free waivers and changes to customers who planned to visit Wuhan in the near future. But even in the airline's other markets, some customers are skittish.

"These are trying times, as you can imagine," Zhihang Chi, Air China's vice president and general manager for North America, told Skift. "Yes, we're watching it around the clock. There have been changes in our policies and procedures. ... Our goal is to do our part to help stem the spread of the virus and lessen its impact on those who are affected."

With Wuhan on lockdown, airlines must no longer worry about carrying passengers from the source of the outbreak. Since coronavirus has spread quickly and is now no longer only in Wuhan, they must be prepared to contain it wherever they fly.

Past evidence suggests this is nearly impossible. Airlines and public health officials will end up quarantining people who are no threat — they might only have regular influenza, or a similar illness — while letting others go through. But being vigilant is their best defense, unless regulators want to shut down the world's air links, which seems impossible.

In a memo earlier this week, Los Angeles World Airports, operator of Los Angeles International Airport, outlined how the screening process works. First, it said, the Centers for Disease Control notifies the airline it wants to screen a passenger. Then, using a Mandarin interpreter, the CDC spends about five minutes examining the passenger. "If someone is symptomatic at the initial screening," the memo stated, "they are referred to a secondary screening to determine if the likely cause is common illness like the flu, or if tertiary screening is warranted." If it is, the memo stated, the fire department will transport the patient to a local hospital.

Airlines are also trying to be vigilant as they prepare flight crews for possible outbreaks.

In an internal memo this week, United Airlines told flight crews it was stocking all China flights — the carrier flies to Chengdu, Beijing, and Shanghai — with two virus response kits, one for the inbound flight and one for the return. Each kit is stocked with 100 nitrile gloves, one bottle of hand sanitizer, one bottle of hand soap, 20 sanicoms, and 20 face masks. The airline told members of the flight crew they may take face masks to use on layovers for their own safety.

While the kits could be effective in containing virus on board, it's also likely meant to assuage employee fears. The president of the flight attendants union at American Airlines this week urged that carrier to protect members against any chance of exposure. "We will continue to speak out to ensure airlines are erring on the side of caution and putting our members' health first in these dangerous times," Lori Bassani, the union president, said in a statement.

American has been issuing hand sanitizer wipes to its China-bound flight attendants, according to the airline. The carrier's medical director also has been giving information to crews about how to protect themselves. An airline spokesman said, "The safety of our customers and team members is our top priority."

As the virus spreads, airlines likely will be under further pressure. In the near term, most of the panic is coming from passengers and crews headed to or from China. As more cases pop up elsewhere — a case was confirmed in Chicago on Friday — fear may expand. Eventually, passengers and crews even may have concerns about boarding domestic U.S. flights.



Longer term, there may be concern about airline finances, particularly among Asian airlines that do significant business in China. Between April 2002 and April 2003, when the SARS epidemic hit, Asian carriers in affected countries lost about 44 percent of their traffic, [according to numbers published at the time by IATA](#), an industry trade group.

John Jackson, vice president for the Americas for Korean Air Lines, which has an enormous presence in mainland China, said he's watching the situation carefully. So far, he said, the airline temporarily has canceled Wuhan flights, offering refunds to passengers through Feb. 29.

"We're watching it closely, but it's a little soon to see a big demand issue," he said. "I'm hopeful that the aggressive actions taken in Wuhan will keep it from becoming like SARS."

Among U.S. carriers, United has the most exposure to China, and airline officials said on last week's earnings call that revenue to Shanghai and Beijing had fallen 4 percent over the past 12 months, even before coronavirus. In a phone interview on Friday, a United spokesman said it's too soon to assess the financial affect of the coronavirus.

— *Brian Sumers, Senior Aviation Business Editor*

## Hotels

Hotels are waiving cancellation fees for travelers in affected regions.

Hilton has a waiver in place for guests who want to modify or cancel reservations at any Hilton-branded property in China. Guests traveling from China to Hilton-branded properties globally will also receive a waiver. For now, the waiver will apply to reservations through Feb. 8.

Guests are being encouraged to contact the Hilton Guest Assistance team if they have any questions. So far, Hilton has not seen any increase in questions from employees and guests, said company spokesman Nigel Glennie.

Hilton has four hotels in Wuhan and 5,980 hotels worldwide as of the third quarter of 2019.

"Guest and team member welfare is a focus, and we are keeping a close eye on official updates from the World Health Organization," Glennie said.

Hyatt said it would waive cancellation or change fees for guests who have booked stays though Feb. 10 at any greater China Hyatt hotel through the company's official channels. That includes Hyatt.com, the World of Hyatt app, WeChat Mini Program, and the global contact center.

Guests from greater China who have booked stays through Feb. 10 at any Hyatt hotel in the Asia-Pacific region including Australia, Cambodia, greater China, Guam, Indonesia, Japan, Malaysia, Maldives, Philippines, Saipan, Singapore, South Korea, Thailand, and Vietnam through official Hyatt channels will also be able to postpone or cancel reservations without paying a fee.

Those who have booked through an online booking site or other third parties will have to contact them.

"In light of the recent cases of novel coronavirus, we are closely monitoring the situation and fully understand the concerns around traveling during this time," a Hyatt spokesperson said.

InterContinental Hotels Group (IHG) said it would also waive cancellation or change fees at any IHG hotels in mainland China, Hong Kong, Macau, or the Taiwan region until Feb. 3. The waiver applies to bookings made directly with the hotel, through IHG.com, the IHG app, or IHG's central reservations center.

"The health and well-being of our guests and employees is our top priority," said IHG spokesperson Jacob Hawkins. "We are monitoring the situation and working very closely with local authorities."

Marriott International spokesperson Jeff Flaherty said it would waive cancellation fees until Feb. 8 for guests at its China hotels and guests from China who are traveling to other destinations globally.

The company is monitoring the Centers for Disease Control and Prevention and World Health Organization's statements regarding the cases. A company spokesman said it would follow the guidelines from those agencies and the local health departments.

"The well-being of our guests and associates are of paramount importance," the spokesperson said. "Our hotels are following the guidelines of local authorities and reinforcing recommended measures on appropriate hygiene standards."

— *Nancy Trejos, Hospitality Editor*

## Business Travel

Thus far, major corporations have yet to limit travel across Asia in response to the spread of the virus.

"These infectious disease outbreaks at local, regional, and global levels are cyclical in that they happen every once in a while," said Dr. Robert Quigley, senior vice president and regional medical director of the Americas region for International SOS and MedAire. "We saw similar outbreaks with H1N1, SARS, and the like. Now we have this coronavirus, and we don't know what the severity or the magnitude will be. This is another reminder for



travelers to stay vigilant and aware of their surroundings. It is easy to become lackadaisical when it comes to personal care, but it is crucial to always practice universal health precautions when traveling.”

If business travelers are experiencing any flu-like symptoms, continued Quigley, they should immediately contact their company and avoid traveling. Having a flexible itinerary will be key as cancellations continue to mount in the effort to contain the virus.

— Andrew Sheivachman, Senior Enterprise Editor

## Coronavirus: Could it damage the global economy?

By Andrew Walker (BBC World Service economics correspondent)

Source: <https://www.bbc.com/news/business-51239745>



Jan 26 – China is struggling with a new virus that has already killed more than 20 people.

It is a serious health issue. The World Health Organization has called it an emergency for China, though not for the world, not so far at least.

Inevitably, it will have economic consequences. But how severe and how far will they spread?

Economists are very wary about putting any figures on it at this early stage.

But it is possible to identify what form the impact will take and to look at the economic damage done by previous similar episodes, notably the outbreak of severe acute respiratory syndrome - better known as Sars - in 2002-3, which also began in China.

It is within China that there already is some economic damage. Travel restrictions have been imposed in parts of the country at a time [the Chinese New Year] when many people travel. So the tourism business is already being hit.

### Transport hub

Consumer spending on entertainment and gifts will also be affected. For entertainment, many will be reluctant to take part in activities outside the home that could lead to exposure to the virus. Many people are sure to have cancelled plans of their own volition to avoid risks of exposure to the disease.

The impact is magnified by the fact that Wuhan, the city where it began, is an important transport hub.

Travel restrictions are also a problem for any business that needs to move goods or people around. Industrial supply chains will be affected. Some deliveries may be disrupted and some will become more expensive.

There will be lost economic activity as a result of people not being able or willing to travel to work.

### Recovery rate

There will also be a direct financial cost from treating patients borne by health insurers (public and private) and by patients. Outside China, much will depend on the spread of the disease. If there are outbreaks elsewhere some of the same effects may be apparent, although almost certainly on a much smaller scale.

The extent of these effects will depend to a large degree on how easily transmissible the virus proves to be and the death rate among those infected. Encouragingly many people so far have made full recoveries, though there have been tragic exceptions.

It is often the case that economic problems are quickly reflected by financial markets, where traders' views about what assets are worth are affected by their expectations about future developments.

### Vaccine chance

On this occasion that have been some negative consequences for stock markets, particular in China. But they have not been large. Even the Shanghai Composite Index is higher than it was six months ago.

There are some businesses who could gain, such as drugs makers. What is immediately available is symptom relief. In the longer term there might be



profitable opportunity in developing a vaccine against the virus.

Paul Stoffels, chief scientific officer at Johnson & Johnson told the BBC that his teams had already done the "basic work" on a vaccine. He thought it could be available in about a year.

[There has also been a surge in demand](#) for surgical masks and gloves to protect against becoming infected. Shares in Chinese companies that make these items - drugs and protective equipment - have seen some sharp price rises.

#### Quick recovery?

The best historical example to give guidance is probably the Sars outbreak.

[One estimate](#) suggested a cost to the global economy of \$40bn (£30.5bn).

Jennifer McKeown of Capital Economics, a London based consultancy, suggests that global growth was a full percentage point weaker in the second quarter of 2003 than it would have been without Sars. That is quite a substantial hit, but she also says it made up the ground quite quickly afterwards.

She says the picture is complicated by other factors that affected global growth at the time but she concludes "it is very hard to pick out any lasting damage to global GDP (economic activity) from Sars, which was an unusually severe and widespread virus".

## Outbreaks of lethal diseases like Ebola and the Wuhan coronavirus happen regularly. The US government just cut funding for the hospitals that deal with them

By Saskia Popescu

Source: <https://thebulletin.org/2020/01/outbreaks-of-lethal-diseases-like-ebola-and-the-wuhan-coronavirus-happen-regularly-the-us-government-just-cut-funding-for-the-hospitals-that-deal-with-them/>



Nina Pham, a nurse who contracted Ebola while treating a patient in Texas, recovered and was discharged from the National Institutes of Health's Clinical Center in October, 2014. Credit: National Institutes of Health.

Jan 22 – **When a Liberian man named Thomas Duncan first showed up at a Dallas hospital in September 2014 with a fever and abdominal pain, he was sent home with some antibiotics. Days later, Duncan was dead from Ebola.** Outbreaks of dangerous diseases like Ebola or the new respiratory coronavirus that's killing people in Wuhan, China—cases of the latter now have appeared in other countries, including the United States—are a feature of modern life, not a bug. And it's only a matter of time before a patient shows up at a doctor's office somewhere in the United States suffering from what could be the next epidemic disease.

Hospital practices can expose healthcare workers and others to infection. The type of failures that resulted in two of Duncan's nurses becoming infected with Ebola were prolific in the US healthcare system, even before [the 2014 crisis](#). According to Nina Pham, one of the nurses who contracted Ebola, her preparation for caring for an Ebola patient "consisted of what her manager 'Googled' and printed out from the internet."

After Duncan died, US health officials put in place a strategy to prepare hospitals to deal with patients who had diseases like Ebola, caused by so-called special pathogens. This tiered response system consists of frontline and assessment hospitals that determine whether or not patients have a serious infectious disease and higher-level hospitals that can treat patients with these dire infections. The tiered approach has significant flaws, but it's a whole lot better than the haphazard structure that was previously in place. Unfortunately, federal funding for the program is set to expire this year, and save for a small number of



specialized treatment facilities and an Ebola education center, Congress did not include funding for the program in the 2020 budget.

### The US response to Ebola

During Duncan's hospitalization and following his death, the federal government issued interim guidance to hospitals asking them to prepare for and respond to potential Ebola cases. Later, federal officials created instructions for a tiered system of healthcare facilities based on what level of care different hospitals would provide.

The federal guidance instructed hospitals, laboratory personnel, clinicians, and other responders on wide array of safety practices. For many healthcare providers, the Ebola crisis required them to play catch up. They had to acquire the most current protective gear, to implement patient movement algorithms (programs that determine how to expose as few people as possible to a disease when moving a patient through a facility), and to ensure proper environmental disinfection and waste removal.

Staying abreast of the latest recommendations and ensuring frontline healthcare staff were properly trained was a daunting task and for many hospitals, not a sustainable one. Maintaining such a high level of preparedness was also extremely costly. The US hospitals designated as Ebola treatment centers (there are now 60, up from an initial 55), spent an average of [\\$1.2 million per hospital](#) in about a year. There is little data on how much the frontline hospitals—the facilities that were at least prepared to assess whether or not patients might have Ebola—spent preparing for disease. But nationally, a 2017 study found that Ebola preparedness efforts cost US hospitals \$361 million in 2014-2015.

In 2015, Congress finally funded the tiered framework of Ebola care facilities. For me and others in the field, the announcement of a new approach provided much needed relief. The Department of Health and Human Services was tasked with creating a regional strategy for caring for patients infected with special pathogens, a category which also includes diseases such as severe acute respiratory syndrome, or SARS, an often-fatal viral illness first identified in Asia, and Lassa Fever, a viral hemorrhagic disease endemic in parts of West Africa. The Department of Health's Hospital Preparedness Program built out a four-[tiered network of hospitals](#). The tiers include 10 Regional Ebola and Other Special Pathogens Treatment Centers, which can provide enhanced care and receive a patient within eight hours, dozens of other Ebola treatment centers spread out across the country, 217 Ebola assessment hospitals, and some 4,800 frontline healthcare facilities.

The expectations are that frontline facilities should be able to quickly identify and isolate potential patients and transfer them to an assessment or treatment hospital if necessary. Assessment hospitals need to have the necessary personal protective equipment and capabilities to manage a patient for 96 hours until a diagnosis is confirmed or ruled out via a laboratory evaluation. The treatment centers provide treatment to confirmed Ebola patients. At the top of the tiered structure, the 10 regional facilities have the capabilities to simultaneously treat at least two Ebola patients and to isolate at least 10 patients with a respiratory special pathogen like SARS or Middle East respiratory syndrome (MERS).

### A problematic solution

The tiered approach ensures there are hospitals and healthcare workers equipped to handle special pathogen cases, but like many public health responses to infectious diseases, it's a Band-Aid, meant to deal quickly with outbreaks before they spiral out of control. The tiered structure addresses this problem by having some hospitals (i.e., the frontline facilities) prepare simply to assess a patient who might have a special pathogen. But this approach means maximum exposure of healthcare workers. Should a patient with diarrhea and nausea walk into a frontline healthcare facility after having travelled to a country like the [Democratic Republic of the Congo](#) and having possibly interacted with someone with Ebola, he or she would be considered at high-risk for having the disease. A patient could be transferred from that frontline facility to an assessment hospital and then on to a treatment center, increasing the risk that others become exposed along the way. Moving a so-called wet patient who is suffering from diarrhea and nausea, [common symptoms of Ebola](#), is even riskier. Even when hospitals use isolation pods developed for this very reason, as a rule, transferring a patient translates to putting more healthcare workers at risk.

A second issue with the tiered framework: There are simply not enough beds within the treatment centers to manage a large outbreak. If each treatment or regional center has two to three beds for a patient with a disease like Ebola, the entire system would have beds for only about 200 patients. In a larger outbreak, the system would not be able to keep up.

Finally, there is a flip side to relying on the specialized treatment centers during an outbreak: Expertise gets concentrated in the higher-tier hospitals, and there is little incentive for frontline facilities—the majority of hospitals in the United States—to maintain costly preparedness for events they view as unlikely. These are also the hospitals most likely to have a patient like Duncan—or someone with the novel coronavirus from China—walk through their doors. The frontline hospitals weren't a major focus of the 2015 funding and are likely to let their special pathogen preparedness efforts slip further as the tiered program is dismantled.



### Better than nothing

Despite the flaws with the existing tiered system for dealing with special pathogens, it's a more comprehensive and better resourced approach than what was in place before the 2014-2016 Ebola epidemic. As it stands, Congress has funded the 10 advanced treatment facilities and the National Ebola Training and Education Center but not the 60 treatment centers included in the tiered network. (The nearly 5,000 frontline hospitals never got much federal funding for their special pathogen-related efforts.) Trump signed the bill into law in December.

Caring for patients with a disease caused by a special pathogen can be extremely costly. Each patient requires more staff, supplies and administrative resources. And many professionals with experience working in Ebola treatment centers worry that without continued federal funding, the network will deteriorate. "Funding is running out in 2020, and this creates a real risk of decreasing our national preparedness," Jennifer Andonian, a project manager for Massachusetts General Hospital's Center for Disaster Medicine, says. "Even after hospitals have developed good ... plans and facilities, there are ongoing costs to keep staff trained and to use their equipment in practice."

A [quick survey](#) of the World Health Organization website is all it takes to understand just how frequent outbreaks of serious pathogens are. Syra Madad, a senior director at NYC Health + Hospitals, New York's public hospital system, says that maintaining support for the tiered network of special pathogen treatment facilities "is vital not just for health security but for national security."

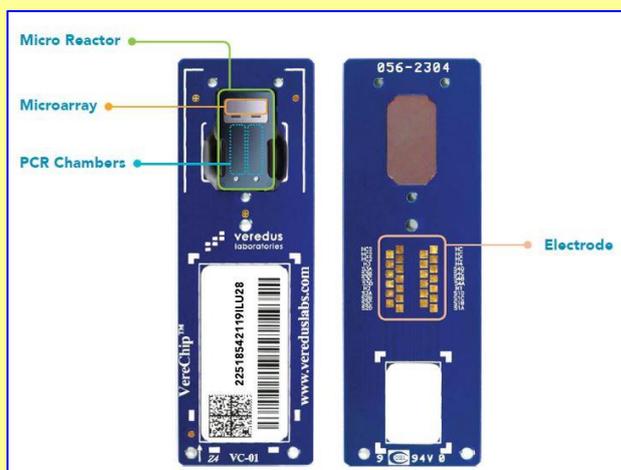
To be clear, many dangerous pathogens, including the disease now spreading in China, can be treated at run-of-the mill hospitals in the United States. A cost of over a million dollars per treatment center is no easy pill for hospitals to swallow, even as many have adapted their specialized bio-containment units for uses other than the care of an Ebola patient. My own experience, echoed in surveys and studies, is that hospitals are unlikely to invest the necessary resources to prepare for somewhat improbable events like an Ebola epidemic in the United States. It's easy to imagine administrators asking, "Why worry about Ebola when we are running out of influenza testing kits?"

The next epidemic could start with a patient checking in at a local urgent care clinic. Congress needs to ask if its current plan for special pathogen response prepares the country for that.

It's likely the answer is no.

*Saskia Popescu holds a doctorate in biodefense from George Mason University and is an infection prevention epidemiologist. Her research focuses on infection prevention as a health security measure and works to explain the poor utilization of infection prevention and control within the United States through political economy. She has a master's in public health in infectious disease epidemiology, a Master of Arts in international security studies, and is certified in infection control.*

**EDITOR'S COMMENTS:** (1) Patients' history should be taken by a physician instead of a nurse (common practice in the US). The simple question "have you travelled abroad recently?" could have saved patient's life. Do not expect patients to say everything if not specifically asked! (2) Hospitals' personnel should receive special training regarding "exotic diseases or exposure to CBRN agents" – done only in few emergency departments in every country – worldwide.



### VerePLEX Biosystem

Source: <https://overtch.com.sa/vereplex-biosystem/>

VerePLEX™ Biosystem combines molecular biology, microfluidics and microelectronics to bring the future of diagnostics and surveillance to you today. The VerePLEX™ Biosystem, along with the VereChip™, is a breakthrough in innovation, integrating two powerful molecular biological technologies: PCR and Hybridization.



# VerePLEX™ Biosystem

Touch Monitor (TOM)

Optical Reader (OR)

Temperature Control System (TCS)

3D Barcode Reader



## JUST TWO (non-conspiracy) QUESTIONS

1. Could 2019-nCoV be an “ethnic bomb”?
2. Can a virus be genetically engineered to produce spores?

## Russian Media Spew U.S. Coronavirus Conspiracies for Domestic Audience

Source: <https://www.polygraph.info/a/russia-coronavirus-conspiracy-fact-check/30402622.html>

Jan 28 – “China is surrounded by American military labs, and there is a U.S. consulate in Wuhan, the staff of which could have delivered the dangerous cargo to the PRC.”

On Jan. 28 the World Health Organization (WHO) [reported](#) that the coronavirus 2019-nCoV had spread from China to about 11 countries, had killed 80 people and had infected 2,798 worldwide.

The day before, stories [propagated](#) in a large number of Russian domestic news outlets began suggesting the United States might be behind the outbreak.

“The Chinese believe the coronavirus is created by the Americans,” the popular Komsomolskaya Pravda [reported](#), citing as proof that the virus was “genetically shaped in the American laboratories,” the claim that “all the infected are Asians!” and there are “no Europeans.”

The virus has been [confirmed](#) in the U.S., Australia, Canada and France, where reports of three cases incited fear of a contagion in European capitals, according to reports by the [Guardian](#) and [Bloomberg](#).

The U.S. Centers for Disease Control and Prevention (CDC), as of Jan. 27 also had [confirmed](#) five cases of 2019-nCoV in the United States with 73 pending diagnosis.

Some Russian media reports suggested U.S. bioterrorism.

“The expert saw signs of the American bioterrorism in spreading of the coronavirus,” Moskovsky Komsomelets newspaper [reported](#).



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The story featured Igor Nikulin, a Russian biochemical and military expert and former adviser to the United Nations commission on biological and chemical weapons.

Nikulin was the same scientist who [claimed](#) the United States, not Russia, was behind the March 2018 poisoning, using a military grade nerve agent, of the ex-KGB spy Sergey Skripal and his daughter in the U.K.

(Amid Moscow's denials, a U.K. investigation determined that [Russian military intelligence](#) was behind the Skripal poisoning.)

Russia's oldest state-owned news agency, RIA Novosti, [reported](#), "The spread of coronavirus might have been a sabotage, the expert [Nikulin] thinks."

The RIA Novosti report, citing Nikulin, speculated that U.S. diplomatic staff may have "delivered" the dangerous cargo from the "American lab" to Wuhan.

Others joined in.

Leonid Savin, [featured](#) as a foreign policy expert at the [shadowy](#) Strategic Culture Foundation, [speculated](#) that the Bill and Melinda Gates Foundation may have helped finance creation of the "coronavirus bioweapon."

Vladimir Zhirinovskiy, the leader of the Liberal Democratic Party and a popular veteran politician, [told](#) Moscow radio that Americans were "surely" behind the outbreak. He suggested pharmacists were gaining billions while the U.S. military reaped an "opportunity to test" weaponizing the virus.

A Screenshot of Russian Media Reports Promoting U.S. Coronavirus Conspiracy

The Russian media reports appeared to be part of a domestic disinformation campaign.

The coronavirus conspiracies did not appear in the Kremlin's foreign language news agencies.

Anti-U.S. conspiracies are common in Russia. They include a thoroughly refuted story about the Central Public Health Reference Laboratory, known as the "Lugar lab," in Georgia, the former Soviet republic.

Russian sources claimed the Pentagon was using the lab to create and test biological weapons, causing hundreds of deaths in the local population.

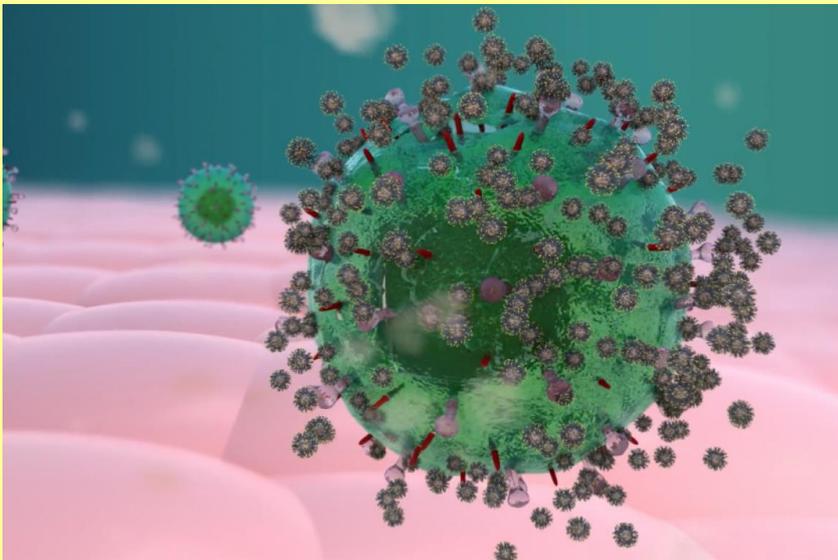
That conspiracy was proven [completely fabricated](#) by multiple investigations and fact checks, including by Polygraph.info. In reality, the U.S. Centers for Disease Control and the drug company Gilead were working a joint project with Georgian health officials to combat hepatitis C using antiviral medicines.

Other discredited conspiracy theories [circulated](#) by Russian media claimed the U.S. created the [Ebola virus](#) as a biological weapon and tried to infect Latin American leaders with a deadly [cancer virus](#).



## Sugar-derived molecules kill viruses in groundbreaking new treatment

Source: <https://newatlas.com/medical/sugar-molecules-kill-viruses/>



An artist's impression of a virus being attacked by the new antiviral molecules (EPFL)

Jan 29 - Viruses are surprisingly difficult to kill – most of the drugs and chemicals that do the job are also harmful to human health. But now, scientists have developed a new virucidal substance derived from sugar, making it deadly to a wide range of viruses but safe for us.

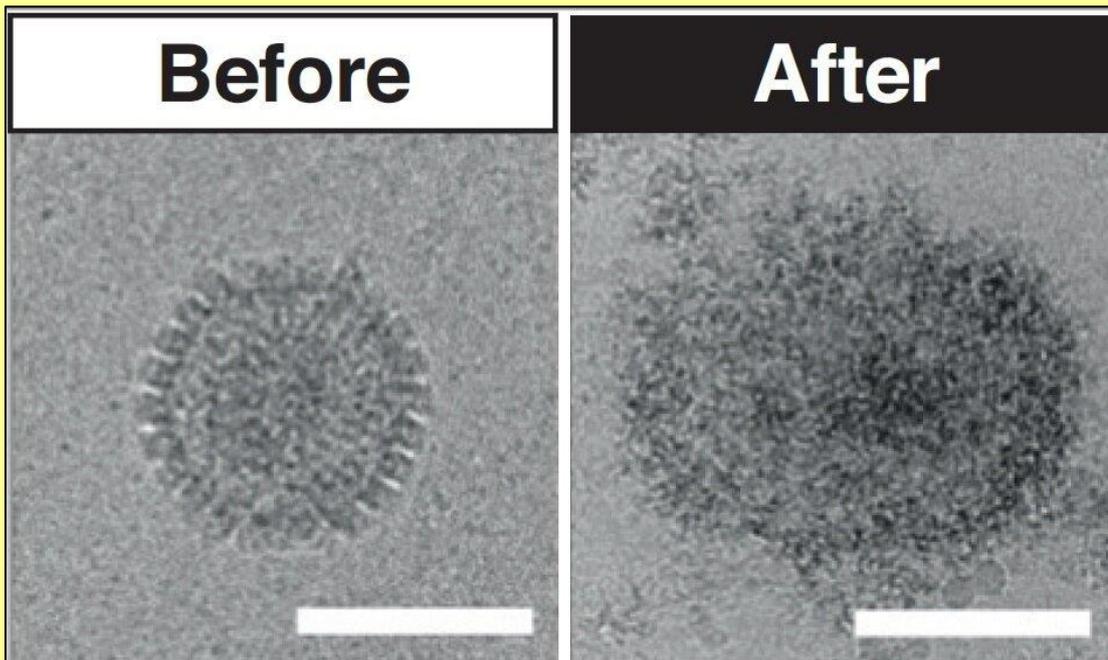
The vast majority of existing [antiviral treatments](#) don't actually kill the bugs – they instead slow down their growth or reduce their [ability to infect cells](#). While this can be an effective method of staving off illness, viruses evolve quickly, so they often mutate new defenses against these drugs.

What's needed are new virucidal treatments that will do away with viruses properly, and ideally work

against different types. Now, researchers from the University of Manchester, the University of Geneva (UNIGE) and EPFL have managed to create a promising new virucidal drug.

The team started with molecules called cyclodextrins, which are natural derivatives of glucose. They engineered these molecules to

attract viruses, then cling to their surface and tear open their outer membranes, effectively destroying them.



A microscope image of a virus before and after treatment by the antiviral molecules (EPFL)

The researchers tested the new treatment on several types of viruses, including herpes, HIV, hepatitis C, Zika and respiratory syncytial virus, and saw strong results across the board. The molecules were tested in lab dishes of

the viruses and tissue cultures, as well as in mice, and were found to be effective. Importantly they didn't harm cells in the tissue cultures or the mice, and other tests showed that the viruses weren't able to mutate resistance to the drug.

"We have successfully engineered a new molecule, which is a modified sugar that shows broad-spectrum antiviral properties," says Samuel Jones and Valeria Cagno, lead researchers on the study. "The antiviral mechanism is virucidal meaning that viruses struggle to develop resistance. As this is a new type of antiviral and one of the first to ever show broad-spectrum efficacy, it has potential to be a game changer in treating viral infections."



The team says that this molecule could be useful against viruses that have developed resistance against other treatments, and even future threats similar to the emerging [coronavirus](#). The molecules have been patented and the team is currently setting up a spin-off company in order to bring it to market. The eventual goal is to develop them into ointments, nasal sprays and other treatments.

▶▶ The research was published in the journal [Science Advances](#).

## Event 201 exercise

Source: <http://www.centerforhealthsecurity.org/event201/about>

Event 201 was a 3.5-hour pandemic tabletop exercise (The Pierre hotel New York – Oct 18, 2019) that simulated a series of dramatic, scenario-based facilitated discussions, confronting difficult, true-to-life dilemmas associated with response to a hypothetical, but scientifically plausible, pandemic. 15 global business, government, and public health leaders were [players](#) in the simulation exercise that highlighted unresolved real-world policy and economic issues that could be solved with sufficient political will, financial investment, and attention now and in the future.

The exercise consisted of pre-recorded news broadcasts, live “staff” briefings, and moderated discussions on specific topics. These issues were carefully designed in a compelling narrative that educated the participants and the audience.

The Johns Hopkins Center for Health Security, World Economic Forum, and Bill & Melinda Gates Foundation jointly propose these [recommendations](#).

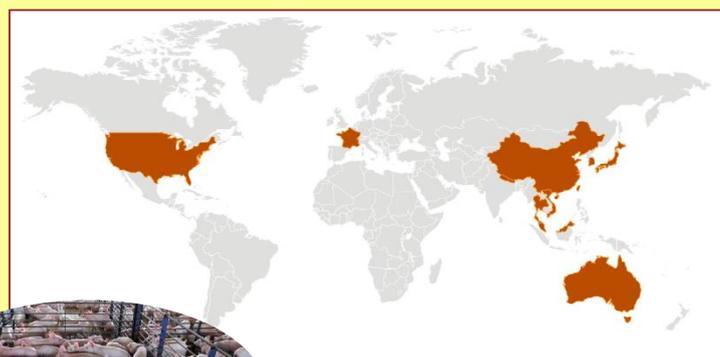
### Purpose

In recent years, the world has seen a growing number of epidemic events, amounting to approximately 200 events annually. These events are increasing, and they are disruptive to health, economies, and society. Managing these events already strains global capacity, even absent a pandemic threat. Experts agree that it is only a matter of time before one of these epidemics becomes global—a pandemic with potentially catastrophic consequences. A severe pandemic, which becomes “Event 201,” would require reliable cooperation among several industries, national governments, and key international institutions.

[Recent economic studies show that pandemics will be the cause of an average annual economic loss of 0.7% of global GDP—or \\$570 billion.](#) The players’ responses to the scenario illuminated the need for cooperation among industry, national governments, key international institutions, and civil society, to avoid the catastrophic consequences that could arise from a large-scale pandemic.

Similar to the Center’s 3 previous exercises—[Clade X](#), [Dark Winter](#), and [Atlantic Storm](#)—Event 201 aimed to educate senior leaders at the highest level of US and international governments and leaders in global industries.

It is also a tool to inform members of the policy and preparedness communities and the general public. This is distinct from many other forms of simulation exercises that test protocols or technical policies of a specific organization. Exercises similar to Event 201 are a particularly effective way to help policymakers gain a fuller understanding of the urgent challenges they could face in a dynamic, real-world crisis.



mild symptoms.

The disease starts in pig farms in Brazil, quietly and slowly at first, but then it starts to spread more rapidly in healthcare settings. When it starts to spread efficiently from person to person

in the low-income, densely packed neighborhoods of some of the megacities in South America, the epidemic explodes. It is first exported by air travel to Portugal, the United States, and China and then to many other countries. Although at first

### Scenario

Event 201 simulates an outbreak of a novel zoonotic coronavirus (CAPS) transmitted from bats to pigs to people that eventually becomes efficiently transmissible from person to person, leading to a severe pandemic. The pathogen and the disease it causes are modeled largely on SARS, but it is more transmissible in the community setting by people with



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some countries are able to control it, it continues to spread and be reintroduced, and eventually no country can maintain control. There is no possibility of a vaccine being available in the first year. There is a fictional antiviral drug that can help the sick but not significantly limit spread of the disease.

Since the whole human population is susceptible, during the initial months of the pandemic, the cumulative number of cases increases exponentially, doubling every week. And as the cases and deaths accumulate, the economic and societal consequences become increasingly severe.

**The scenario ends at the 18-month point, with 65 million deaths (fatality rate:10%).** The pandemic is beginning to slow due to the decreasing number of susceptible people. **The pandemic will continue at some rate until there is an effective vaccine or until 80-90 % of the global population has been exposed. From that point on, it is likely to be an endemic childhood disease.**

### Recommendations

The next severe pandemic will not only cause great illness and loss of life but could also trigger major cascading economic and societal consequences that could contribute greatly to global impact and suffering. The Event 201 pandemic exercise, conducted on October 18, 2019, vividly demonstrated a number of these important gaps in pandemic preparedness as well as some of the elements of the solutions between the public and private sectors that will be needed to fill them. The Johns Hopkins Center for Health Security, World Economic Forum, and Bill & Melinda Gates Foundation jointly propose these [recommendations](#).

### Audience

An invitation-only audience of nearly 130 people attended the exercises, and a livestream of the event was available to everyone.

## TROXX, the drug which will be never used

Source: <http://www.toinnov.com/news/fda-approved-the-troxx-th/>

July 2018 – FDA approved a drug that suppresses the development of the **smallpox virus**. The last case of smallpox observed in the wild was happened in 1977. WHO considers smallpox totally eradicated since 1980. An effective vaccine against smallpox was the first one developed and served well since 1798. It was proclaimed as inefficient as a mean of biological warfare and in fact finds their only use in fiction books and political propaganda, such as accusation of Iraq in manufacturing smallpox.

TROXX, erroneously named 'a vaccine against smallpox' in the press is **Tecovirimat** (ST-246). It is antiviral with specific activity against orthopoxviruses. The reason the ST-246 was quickly and without required tests passed by the FDA is a special schedule granted to Siga Technologies, a bio-defense contractor. The TROXX will be **stored in a quantity of two million doses** as a preventive measure in case of bio-terrorism attempt.

December 2019

Perspective  
EXPERT INSIGHTS ON A TIMELY POLICY ISSUE

KATHRYN E. BOUSKILL, ELTA SMITH

## Global Health and Security

### Threats and Opportunities

RAND  
CORPORATION

Source: [https://www.rand.org/content/dam/rand/pubs/perspectives/PE300/PE332/RAND\\_PE332.pdf](https://www.rand.org/content/dam/rand/pubs/perspectives/PE300/PE332/RAND_PE332.pdf)

Imagine a bioterrorism attack in which a genetically engineered pathogen is unleashed to pandemic proportions. Public health institutions would face a rapid and large inf lux of patients—both the sick and those who worry that they might be. Scientists would scramble to identify the unknown disease. Flows of people and goods would be disrupted. Political leaders would be faced with the job of containing both the pathogen and the mis- and disinformation that would proliferate as mortality rates increased. The social, economic, and political consequences could be catastrophic.



►► Read the full paper at source's URL.

*Kathryn “Casey” Bouskill is a social scientist and associate director of the Center for Global Risk and Security at the RAND Corporation. As an anthropologist with training in public health, she uses qualitative and quantitative methods to study how health and well-being are being shaped by emerging technologies. Bouskill has performed multiple collaborative and interdisciplinary projects in the United States, the European Union, sub-Saharan Africa, the Middle East, Southeast Asia, and South America, and she holds a Ph.D. in anthropology.*

*Elta Smith is director of the Innovation, Health and Science research group at RAND Europe. Smith has conducted research on the human and animal dimensions of antimicrobial resistance, the use of novel and controversial technologies in the food supply chain, including genetically modified foods and animal cloning, and the role of open science practices in research. Smith's research interests include better regulation, food safety, food security, open science, and the governance of science and technology, and she holds a Ph.D. in public policy.*

## The Geopolitics of the Novel Coronavirus

By George Friedman

Source: <https://geopoliticalfutures.com/the-geopolitics-of-the-novel-coronavirus/>

Feb 04 – Geopolitics is a fairly slow-moving process that unfolds in predictable ways. This is usually the case. There are then moments when a wild card enters the system from the outside, unpredictable yet significant. At the moment, we can't tell if the [new coronavirus](#) is such an event. We don't know exactly how it is transmitted, how lethal it is, whether it causes long-term illness and so on. We know it has broken out in a Chinese city, Wuhan; that the Chinese government regards it as serious enough to impose significant controls on movement in and out of Wuhan; and that a small number of cases in China, relative to the population, and a smaller number of cases outside of China have been reported. For this we depend on media reports, since our own knowledge of viral medicine is limited.

Geopolitically, communicable disease ranges from the common cold to the Black Death. The former is ever-present but of little consequence; the latter massively disrupted European society and, in some cases, shifted the regional balance of power. There is a trigger point between these two diseases where the political system erects disruptions in everyday life and commerce designed to limit the effect of the disease. To some extent these actions are effective, and to some extent they can be sufficiently disruptive to cause economic problems. We are at the moment teetering between these points, with the consequence of the disease and the consequence of protecting against the disease uncertain.

The major threat would appear to be travelers carrying the virus. The United States has banned travel to the U.S. for foreigners who have traveled to infected regions, while U.S. citizens may return but are quarantined for two weeks. Major U.S. airlines are starting the process of suspending all flights to and from China, but Chinese airlines and U.S. cargo carriers are still flying to the U.S. Other countries like Russia have also imposed travel bans. The U.S. government has imposed very limited barriers, through which the disease is likely to pass. Most important, maritime shipments to and from China have not been significantly disrupted. This is vital, because if they were to be suspended, the situation would transform from a problem to a crisis.

China is dependent on exports to maintain its economy. About 20 percent of its gross domestic product derives from exports, and its single largest customer is the United States, despite the trade dispute. Assume for the moment that the new coronavirus were closer to the bubonic plague than the common cold, or assume that the panic that arises from the fear of the unknown compelled the governments of multiple advanced countries to place China under quarantine. It is an unlikely but far from impossible outcome.

The Chinese government has been under intense pressure in three ways. First, the crackdown on Xinjiang province generated a massive negative response from Europe and the United States. Alongside that, the United States imposed significant tariffs on China. The contraction in exports hit a financial system that the Beijing government was already struggling to stabilize. This led to fear among Chinese authorities of unrest over economic and financial issues. The result was increasing security, from recognition technology to intrusion into the internet and periodic arrests of those considered dissidents. Economic insecurity led to increased security. This in turn led to Hong Kong. The Hong Kong riots were triggered by a bill that authorized China to extradite Hong Kong residents. This was a desire Beijing did not have before. But as the situation intensified, the desire to assure stability in Hong Kong increased. With the bill, some in Hong Kong recognized that extradition could be carried out for things legal in Hong Kong and could lead to extreme sentences. It represented an existential threat to many in Hong Kong, and the results were transmitted around the world.



A chief responsibility of the Chinese president is to manage relations with its most important customer, the United States. China has deflected American demands to open its markets and not manipulate its currency since the George W. Bush administration. It was expected that President Xi Jinping could continue this process. He failed to manage U.S. President Donald Trump, and the result was that an exporting nation faced a challenge from a consuming nation. To put it more simply, there is a rule in business that you should never have a fight with your best customer. Xi violated this rule by winding up in a tariff fight with the United States.

There is no evidence – but then, there wouldn't be – of a fight in the Central Committee of the Chinese Communist Party over Xi's stewardship. The Central Committee is packed with Xi supporters, of course, but a situation like what has developed must cause concern and generate ambitions. The idea that the Central Committee was content with the financial situation, trade war, Hong Kong and Xinjiang is to me the least likely situation.

Now, to the coronavirus. Assume that the fears that are being expressed do not turn out to be exaggerated. Assume that in response to this, massive trade restrictions and embargoes were imposed on China and that freighters were not permitted to dock in Long Beach or Rotterdam, nor would they be permitted in Shanghai. With the Russians already screening China's northern border, China would be isolated.

China is a nation whose core dynamic is based on international trade. Under pressure from the United States, a dangerous virus would inevitably cripple that trade at best. At this point, the Chinese government, like any government, would be blamed for what went wrong, and it would be blamed for mismanaging the virus and failing to understand the economic consequences. From here you can play out the game.

The reason for this exercise is to point out that the coronavirus is neither a geopolitical nor a political event. Diseases emerge with some frequency. But given the Chinese dynamic and China's current condition, the virus could readily evolve into a geopolitical and political event, in which tension within China might explode, with the coronavirus the last straw and China's international position transformed.

To emphasize, I have no idea what "2019-nCoV" is or what it will do, but judging from what is being said about it and the level of anxiety, I will assume for the sake of argument that it is more dangerous than not. Then, given the evolution of the past year or two, and given the fear that always follows new, deadly diseases, we could see a fundamental transformation of the international system. Not all events are geopolitical. They do not arise out of relations between nations. But events that are unconnected to geopolitics can connect themselves to the system and disrupt it. This is meant as an exercise in geopolitical theory. It is not insignificant in the case of China, which has had a difficult period and doesn't need to be quarantined by the world.

*George Friedman is an internationally recognized geopolitical forecaster and strategist on international affairs and the founder and chairman of Geopolitical Futures. Dr. Friedman is a New York Times bestselling author and his most popular book, The Next 100 Years, is kept alive by the prescience of its predictions. Other best-selling books include Flashpoints: The Emerging Crisis in Europe, The Next Decade, America's Secret War, The Future of War and The Intelligence Edge. His books have been translated into more than 20 languages. Dr. Friedman has briefed numerous military and government organizations in the United States and overseas and appears regularly as an expert on international affairs, foreign policy and intelligence in major media. For almost 20 years before resigning in May 2015, Dr. Friedman was CEO and then chairman of Stratfor, a company he founded in 1996. Friedman received his bachelor's degree from the City College of the City University of New York and holds a doctorate in government from Cornell University.*

## Experts envision two scenarios if the new coronavirus isn't contained

By Sharon Begley

Source: <https://www.statnews.com/2020/02/04/two-scenarios-if-new-coronavirus-isnt-contained/>

Feb 04 – With the new coronavirus spreading from person to person (possibly including from people without symptoms), reaching four continents, and traveling faster than SARS, driving it out of existence is looking increasingly unlikely.

It's still possible that quarantines and travel bans will first halt the outbreak and then eradicate the microbe, and the world will never see 2019-nCoV again, as epidemiologist Dr. Mike Ryan, head of health emergencies at the World Health Organization, [told](#) STAT on Saturday. That's what happened with SARS in 2003.

Many experts, however, view that happy outcome as increasingly unlikely. "Independent self-sustaining outbreaks [of 2019-nCoV] in major cities globally could become inevitable



because of substantial exportation of pre-symptomatic cases,” scientists at the University of Hong Kong concluded in a [paper](#) published in The Lancet last week.

Researchers are therefore asking what seems like a defeatist question but whose answer has huge implications for public policy: What will a world with endemic 2019-nCoV — circulating permanently in the human population — be like?

“It’s not too soon to talk about this,” said Dr. Amesh Adalja, an infectious disease specialist at the Johns Hopkins Center for Health Security. “We know that respiratory viruses are especially difficult to control, so I think it’s very possible that the current outbreak ends with the virus becoming endemic.”

**Experts see two possibilities, each with unique consequences:**

### Just another coronavirus

2019-nCoV joins the four coronaviruses now circulating in people. “I can imagine a scenario where this becomes a fifth endemic human coronavirus,” said Stephen Morse of Columbia University, an epidemiologist and expert on emerging infectious diseases.

“We don’t pay much attention to them because they’re so mundane,” especially compared to seasonal flu.

Although little-known outside health care and virology circles, the current four “are already part of the winter-spring seasonal landscape of respiratory disease,” Adalja said. Two of them, OC43 and 229E, were [discovered](#) in the 1960s but had circulated in cows and bats, respectively, for centuries. The others, HKU1 and NL63, were [discovered](#) after the 2003-2004 SARS outbreak, also after circulating in animals. It’s not known how long they’d existed in people before scientists noticed, but since they jumped from animals to people before the era of virology, it isn’t known whether that initial jump triggered widespread disease.

OC43 and 229E are more prevalent than other endemic human coronaviruses, [especially](#) in children and the elderly. Together, the four are responsible for an estimated one-quarter of all colds. “For the most part they cause common cold-type symptoms,” said Dr. Richard Webby, an influenza expert at St. Jude Children’s Research Hospital. “Maybe that is the most likely end scenario if this thing becomes entrenched.”

All four, in particular HKU1, can cause pneumonia, and sometimes death. It is rare enough that researchers do not have good estimates of its prevalence or virulence, but two of the others have been better studied. In one of the few close looks at OC43 and 229E, researchers [measured](#) their infection rates during four winters (1999-2003) in Rochester, N.Y., among 2,897 healthy outpatients, adults with cardiopulmonary disease, and patients hospitalized with acute respiratory illnesses.

They identified 398 coronavirus infections (four people had both OC43 or 229E). Infection rates ran from 0.5% among healthy elderly adults to 15% among healthy young adults (where “healthy” means they had no viral symptoms), with the highest rates coming in the winter of 2000-2001, for no obvious reason — suggesting that coronavirus infection rates will rise and fall unpredictably, much like seasonal flu, and that its consequences will also be similar: some serious illness, some mild, and a lot of asymptomatic infections. The most common symptoms were runny nose, cough, and congestion, for about 10 days; no one even ran a fever. All told, 35% of infections with 229E and 18% with OC43 were asymptomatic. “Asymptomatic infection ... [meaning] without respiratory symptoms was fairly common,” the authors concluded.

But sometimes symptoms were nothing to sneeze at. There were 96 coronavirus infections among the 1,388 hospitalized patients. OC43 caused more severe disease than 229E, requiring intensive care for 15% of those infected. About one-third of the patients admitted to the hospital with either coronavirus developed pneumonia; one of the 229E patients and two of the OC43 patients died. On the bright side, if a coronavirus infects enough people regularly there will be greater business incentive to develop a vaccine and other countermeasures. That never happened with SARS because it died out, leaving no market for such products.

On the decidedly darker side, a fifth endemic coronavirus means more sickness and death from respiratory infections.

**Odds:** Moderate. “I think there is a reasonable probability that this becomes the fifth community-acquired coronavirus,” Adalja said, something he expanded on in his [blog](#). Webby agreed: “I have a little bit of hope that, okay, we’ll put up with a couple of years of heightened [2019-nCoV] activity before settling down to something like the other four coronaviruses.”

### 2019-nCov returns repeatedly like seasonal flu

The “seasonal” reflects the fact that viruses can’t tolerate high heat and humidity, preferring the cool and dry conditions of winter and spring, Webby said. That’s why flu, as well as the four coronaviruses, are less prevalent in warm, humid months. If the new coronavirus follows suit, then containment efforts plus the arrival of summer should drive infections to near zero.

But also, like flu viruses, that doesn’t mean it’s gone.

The “bad” reflects the fact that the number of 2019-nCoV cases and deaths so far suggests that the new coronavirus has a fatality rate around 2%. That’s almost certainly an overestimate, since mild cases aren’t all being counted. But even 2% is less than SARS’ [10%](#) and nowhere near the [37%](#) of MERS (Middle East respiratory syndrome coronavirus).



On the other hand, seasonal flu kills fewer than 0.1% of those it infects, though that's still tens of thousands of deaths a year just in the U.S. The global disaster that was the 1917 "Spanish flu" pandemic killed [2.5%](#).

"One scenario is that we go through a pandemic," as the current outbreak may become, said Columbia's Morse. "Then, depending what the virus does, it could quite possibly settle down into a respiratory illness that comes back seasonally."

The toll that would take depends on how many people it infects and how virulent it is. Virulence reflects the viruses' genetics.

The genome of the novel coronavirus consists of a single stand of RNA. Microbes with that kind of genome mutate "notoriously quickly," said biologist Michael Farzan of Scripps Research, who in 2005 was part of the team that [identified](#) the structure of the "spike protein" by which SARS enters human cells.

But SARS has a molecular proofreading system that reduces its mutation rate, and the new coronavirus's similarity to SARS at the genomic level suggests it does, too. "That makes the mutation rate much, much lower than for flu or HIV," Farzan said. That lowers the chance that the virus will evolve in some catastrophic way to, say, become significantly more lethal.

The coronavirus "may not change [genetically] at all," said biologist Andrew Rambaut of the University of Edinburgh, who has been analyzing the genomes of the 2019-nCoV's from dozens of patients. "It is transmitting quite well already so it may not have to 'evolve' to be endemic."

Any evolution that does take place in an endemic coronavirus, including one that spikes seasonally, might well be toward less virulence. "It doesn't want to kill you before you transmit it," Farzan said. "One would therefore expect a slow attenuation" of virulence if the virus becomes like seasonal flu. Dead people don't transmit on viruses, "and even people sitting in their beds and shivering" because they are seriously ill "don't transmit that well," he said.

The toll of a seasonal-flu-like coronavirus also depends on immunity — which is also scientifically uncertain. Exposure to the four endemic coronaviruses produces immunity that lasts longer than that to influenza, Webby said, but not permanent immunity. Like respiratory syncytial virus, which can re-infect adults who had it in childhood, coronavirus immunity wanes.

"Everyone, by the time they reach adulthood, should have some immunity to some coronavirus," said Tim Sheahan, a coronavirus researcher at University of North Carolina's Gillings School of Global Public Health. But because it doesn't last, older people can get re-infected. The elderly also has a higher death rate from coronaviruses such as SARS and MERS, a pattern 2019-nCoV is following. "There is some evidence that people can be re-infected with the four coronaviruses and that there is no long-lasting immunity," Dr. Susan Kline, an infectious disease specialist at of the University of Minnesota. "Like rhinoviruses [which cause the common cold], you could be infected multiple times over your life. You can mount an antibody response, but it wanes, so on subsequent exposure you don't have protection." Subsequent infections often produce milder illness, however.

The common-cold-causing coronaviruses are different enough that an infection from one won't produce immunity to another. But the novel coronavirus overlaps enough with SARS that survivors of the 2002-3003 outbreak might have some immunity to the new arrival, Sheahan said: "Is it enough to prevent infection? I don't know."

How widespread even limited immunity would be, and therefore how many people would become ill from the next go-round of 2019-nCoV, also "depends on how many people get infected the first time around," Webby said. That number is certainly higher than the more than 20,000 identified cases, since people with no or mild symptoms escape the attention of health care systems.

Since 2019-nCoV is new, "this first wave will be particularly bad because we have an immunologically naïve population," Adalja said. Future waves should pass by people who were exposed (but not necessarily sickened) this time around, Morse said, "but that assumes this virus doesn't develop the tricks of flu," which famously tweaks the surface molecules that the immune system can see, making itself invisible to antibodies from previous exposures.

**Odds:** Pretty good. What we may be seeing "is the emergence of a new coronavirus ... that could very well become another seasonal pathogen that causes pneumonia," said infectious disease expert Michael Osterholm of the University of Minnesota. It would be "more than a cold" and less than SARS: "The only other pathogen I can compare it to is seasonal influenza."

*Sharon Begley, senior science writer, covers genetics, cancer, neuroscience, and other fields of basic biomedical research. She was previously the senior health and science correspondent at Reuters, the science columnist at the Wall Street Journal, and the science editor at Newsweek. Among her favorite awards are an honorary doctorate from the University of North Carolina and the Public Understanding of Science Award from the Exploratorium in San Francisco. She is delighted to have moved to Boston but wonders why no one warned her about the Green Line.*

*Helen Branswell and Andrew Joseph contributed reporting.*



## The Trump Administration Has Made the U.S. Less Ready for Infectious Disease Outbreaks Like Coronavirus

By Linda J. Bilmes

Source: <http://www.homelandsecuritynewswire.com/dr20200204-the-trump-administration-has-made-the-u-s-less-ready-for-infectious-disease-outbreaks-like-coronavirus>

Feb 04 – As coronavirus continues to spread, the Trump administration has [declared a public health emergency](#) and imposed [quarantines and travel restrictions](#). However, over the past three years the administration has weakened the offices in charge of preparing for and preventing this kind of outbreak.

Two years ago, Microsoft founder and philanthropist Bill Gates warned that the world should be “preparing for a pandemic in the same serious way it prepares for war.” Gates, whose foundation has [invested heavily in global health](#), suggested staging [simulations, war games and preparedness exercises](#) to simulate how diseases could spread and to identify the best response.

The Trump administration has done exactly the opposite: It has slashed funding for the federal [Centers for Disease Control and Prevention](#) and its infectious disease research. For fiscal year 2020, Trump proposed [cutting the CDC budget by \\$1.3 billion, nearly 20 percent below the 2019 level](#).

As a [specialist in budgeting](#), I recognize that there are many claims on public resources. But when it comes to public health, I believe it is vital to invest early in prevention. Starving the CDC of critical funding will make it far harder for the government to react quickly to a public health emergency.

### Cutting Funds and Staff

Every year since taking office, Trump has asked for deep cuts into research on emerging diseases – including the CDC’s small center on [emerging and “zoonotic” infectious diseases](#) that jump the species barrier from animals to humans. The new coronavirus is just the latest example of these threats.

The CDC’s program focuses on infectious diseases ranging from foodborne illnesses to anthrax and Ebola. It manages laboratory, epidemiologic, analytic and prevention programs, and collaborates with state and local health departments, other federal government agencies, industry and foreign ministries of health.

In 2018, Trump tried to [cut \\$65 million](#) from this budget – a 10% reduction. In 2019, he sought a 19 percent reduction. For 2020, he proposed to cut federal spending on emerging infectious and zoonotic diseases [by 20 percent](#). This would mean spending \$100 million less in 2020 to study how such diseases infect humans than the U.S. did just two years ago.

Congress reinstated most of this funding, with bipartisan support. But the overall level of appropriations for relevant CDC programs is still [10 percent below what the U.S. spent in 2016](#), adjusting for inflation.

Even worse, in 2018 the administration [disbanded its own global health security team](#), which was supposed to make the U.S. more resilient to the threat of epidemics. This unfortunate decision was part of a reorganization that former national security adviser John Bolton carried out shortly after arriving at the White House.

Bolton eliminated the National Security Council’s global health security and biodefense directorate, and reshuffled its team of world-class infectious disease experts. In response, two highly respected leaders in the field – [Rear Admiral Tim Ziemer](#), the NSC’s senior director for global health security and biodefense, and [Homeland Security adviser Tom Bossert](#) – left the White House.

Under Presidents George W. Bush and Barack Obama, Ziemer had served as the U.S. point person for a coordinated global anti-malaria campaign that helped reduce deaths from the disease by 60 percent over 15 years. In 2016 he estimated that funding initiatives to reduce malaria generated a [36 to 1 return on investment](#) because it averted so many deaths and debilitating illnesses. In 2018 Ziemer was instrumental in fighting the [reemergence of Ebola](#) in the Democratic Republic of Congo, traveling there and working with public health officials to reduce the spread of the dreaded disease.

### A Clear and Present Danger

There is no wall high enough to keep virulent pathogens from crossing national borders, and when they emerge there is a potential for widespread illness and death. Containing the first major Ebola epidemic in 2014-2016, which [killed 11,000 people in West Africa](#), required an enormous global effort. Only 11 patients were treated for Ebola in the U.S., but that was because President Obama took the threat seriously, appointing an [“Ebola czar”](#) to coordinate U.S. preparedness and assistance.



Now that the White House has evicted the NSC's global health security experts, it is not clear who in the Trump administration will be responsible for coordinating U.S. efforts in the event of a global pandemic.

The new coronavirus that emerged in Wuhan, China, has already [spread to 25 countries](#). The CDC has confirmed that [person-to-person transmission has occurred](#) in the U.S. It will take a large-scale effort to contain this outbreak, and battling the virus requires money.

Although the Gates Foundation and other charities give away [billions of dollars to promote public health](#), such gifts are no substitute for the kind of specific, targeted scientific research into emerging diseases that the CDC and [other federal agencies](#) are uniquely designed to conduct. Fighting epidemics also requires planning to prepare and coordinate with hospitals, medical professionals, pharmacies, airlines, local government and the general public, which also requires funding.

President Trump recently signed a [\\$738 billion dollar defense budget](#) – the highest level since World War II. It creates a new [Space Force](#) and funds research into dozens of remotely possible military threats. Relative to defense spending, the \$6.5 billion CDC budget is tiny. But as I see it, deadly global pandemics and emerging biological and viral threats pose an equal or greater threat to our national security.

As climate change warms the Earth, thousands of [long-frozen dormant diseases are defrosting](#). And the World Health Organization reports that 75 percent of all emerging pathogens over the past decade are zoonotic diseases, [most of which are understudied](#). **As Bill Gates warned in 2018, "If history has taught us anything, it's that there will be another deadly global pandemic." I believe the U.S. must allocate more resources to research, detection and global prevention and communication efforts, not less.**

*Linda J. Bilmes is Daniel Patrick Moynihan Senior Lecturer in Public Policy and Public Finance, Harvard Kennedy School.*

**EDITOR'S COMMENT:** Global leadership and power is good. But what if there are no people to practice them onto?

## Scientists create artificial virus in the fight against superbugs

Source: <https://phys.org/news/2020-02-scientists-artificial-virus-superbugs.html>



Feb 05 – Scientists at NPL, working with partners from the University of Cambridge, University of Exeter, King's College London and University College London have developed a mechanism of antibacterial persistence to combat persistent and resistant bacterial infections.

The rise of superbugs is a serious concern in the [medical community](#) as bacteria evolve to evade existing treatments faster than new antibiotics can be developed. Rather than seeking out antibiotics that exist in nature, as has been the case with previous advances, the team of experts have designed one from the group up, inspired by viruses.

Maxim Ryadnov, area science leader at NPL said: "Viruses are geometric objects. They are like solid cages built from tiny blocks glued together with an atomistic precision. We take that shape, strip off their [viral proteins](#), and are left with a template."

To pursue such a feat, this interdisciplinary research team adopted the geometric principles of the virus architecture to engineer a synthetic biologic—protein  $\Psi$ -[capsid](#)—which assembles from a small molecular motif found in [human cells](#). This motif can recognize pathogen-associated molecular patterns on bacterial surfaces but by itself is weakly antimicrobial. By contrast, each capsid, which comprises multiple copies of the motif, delivers an influx of high antimicrobial doses in its precise binding position on a bacterial cell. Using a combination of nanoscale and single-cell imaging the team demonstrated that the capsids inflict [irreparable damage](#) to bacteria, rapidly converting into nanopores in their membranes and reaching intracellular targets. The capsids were equally effective in either of their chiral forms, which can render them invisible to the immune system of the host, killing different bacteria phenotypes and superbugs without cytotoxicity in vitro and in vivo.

At UCL, the scientists visualised how the capsids landed on their targets and next created nanometer-size holes, which ultimately are lethal to the bacteria. According to Katharine Hammond, research scientist at NPL and Ph.D. student at UCL: "By scanning a sharp tip over the membrane surface, just like a miniature finger would read Braille, we could trace the contours of the capsids on the membranes and observe in real time how they punctured holes in their target membranes."

Ibolya Kepiro, Higher Research Scientist, National Physical Laboratory (NPL) states: "This research culminates our joint efforts to identify an antibacterial mechanism that could be free



from the frustration of bacterial persistence. We believe that these findings hold promise for the systemic assessment of antimicrobial efficacy."

The findings are reported in *ACS Nano* and demonstrate how bioengineering and multi-modal measurements can offer and validate innovative solutions to healthcare, building on natural disease-fighting capabilities.

**EDITOR'S COMMENT:** Fantastic breakthrough! Why don't they make a virus that can sense the binding site of 2019-nCoV (and alike) and block it thus inactivating the virus?

## Ten 135 passengers on quarantined cruise ship test positive for coronavirus

Source: <https://www.japantimes.co.jp/news/2020/02/05/national/science-health/quarantined-japanese-cruise-ship-infected-coronavirus/#.XjsL5yPQDIU>

Feb 05 – Fear of possible coronavirus infections on a cruise ship carrying about 3,700 people became reality Wednesday as 10 of 31 passengers tested were confirmed to have positive results, fueling unease among officials that the number could go much higher.



The outcome was based on the results available after 273 people aboard the vessel were examined, health minister Katsunobu Kato said Wednesday morning. The 10 disembarked the Diamond Princess, which is docked at Yokohama port, and were taken to four hospitals in Kanagawa Prefecture.

The development suggests more passengers and crew members on the cruise ship could be infected and may not know it — at least four asymptomatic cases have been reported in Japan. Remaining passengers and crew will be confined to the ship for at least two weeks, Kato confirmed.

The operator of the ship, Princess Cruises, revealed in a statement that the 10 are three Japanese passengers, two Australian

passengers, three passengers from Hong Kong, one passenger from the United States and one Filipino crew member. Their ages range from 50 to 80, according to the health ministry.

The operator said 3,711 people — 2,666 passengers and 1,045 crew members — were currently on board. Kyodo News said about half of the passengers were Japanese citizens.

The health ministry said it had checked the health condition of all those aboard, and collected samples from individuals with symptoms as well as those who had close contact with those individuals.

"We are going to adopt carefully thought-out measures to prevent the virus from spreading," Prime Minister Shinzo Abe said. "The passengers' and crew members' health checks are our highest priority."

In response to a concern raised by a ruling coalition lawmaker that those aboard may have to wait on the ship much longer than 14 days if more people test positive, the prime minister said authorities were asking them to stay inside their rooms to limit the risk of contact with the virus.

Initially, passengers were told they would be allowed to leave the ship once they received negative results for the coronavirus test. But Chief Cabinet Secretary Yoshihide Suga said the decision was reversed when more of the tests than expected produced positive results.



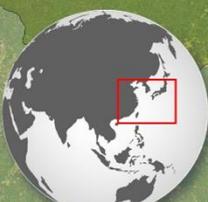
The ship became a subject of medical scrutiny when it was revealed that a man who disembarked in Hong Kong on Jan. 25 was infected with the virus. The vessel returned to Yokohama on Monday evening to undergo a quarantine inspection.

The operator said it had provided internet and phone availability for its passengers, adding that the cruise ship plans to “go out to sea” to perform tasks such as producing fresh water before bringing aboard food and necessities. “Princess Cruises will continue to fully cooperate with and follow the instructions of global medical authorities and the Japanese government,” the statement said.

## CORONAVIRUS CRUISE SHIPS

Thousands of passengers have been quarantined





Sea of Japan

**JAPAN • YOKOHAMA**

**WUHAN**

**HONG KONG**



**DIAMOND PRINCESS**

**3,700 PASSENGERS AND CREW**

**10 CONFIRMED CASES QUARANTINED FOR TWO WEEKS**



**DREAM WORLD**

**3,600 PASSENGERS AND CREW**

**THREE PASSENGERS FROM EARLIER VOYAGE DIAGNOSED**

**30 CREW MEMBERS WITH FLU LIKE SYMPTOMS TAKEN OFF**

### UPDATE Feb 11 – Cases on board Diamond Princess: 135

Meanwhile, Foreign Minister Toshimitsu Motegi said a fourth charter flight was scheduled to leave Japan on Thursday to pick up about 200 people who wish to come back to the country.

Tokyo is working with Beijing to ensure Chinese nationals with ties to Japanese citizens, such as spouses, will be allowed to travel on the flight, Motegi said.



A man carries a box that appears to contain samples from people aboard the Diamond Princess, a cruise ship anchored off Daikoku Pier in Yokohama, on Wednesday. | KYODO

All 565 people who returned to Tokyo from Wuhan, the outbreak's epicenter, via three charter flights last week were Japanese citizens. An overwhelming majority of them who are not hospitalized are staying at lodgings the government has provided.

Suga briefed reporters Wednesday morning that all those who have already returned to Japan have undergone medical testing. If they test negative on the last day of the 10-day health monitoring period, they will be able to go home, the top government spokesperson said.

The health ministry disclosed criteria Tuesday for the discharge of coronavirus patients from medical facilities in the nation. Patients will be discharged from hospital once they clear medical tests taken 48 and 60 hours after symptoms cease.

Meanwhile, in China, the number of cases of the new coronavirus has surpassed 24,000 and the death toll stood at 490 as of Wednesday.

## How Tourism should Confront Coronavirus?

By Dr. Peter E. Tarlow

Source: <https://www.eturbone.com/541775/how-tourism-can-confront-coronavirus/>

Feb 03 – The travel and tourism industry depends on visitors being able to travel freely from one location to another. When a health crisis occurs, especially one for which currently there is no vaccine, visitors naturally become afraid. In the case of the [Coronavirus](#), not only has the Chinese government now taken action but much of the world has also acted.



With the first reported death outside of China, once again the world of tourism is facing another health crisis. [The World Health Organization](#) has declared the Coronavirus to be a worldwide crisis. Governments have prepared quarantine centers and closed borders. Airlines and ships have canceled flights or calls at international ports and medical personnel is scrambling to find new vaccines before the coronavirus spreads and possibly mutates.

Nations around the world have restricted or forbidden their national carriers to fly to China. Other nations have closed their borders or demand health records before allowing foreigners to enter. Depending on how the virus mutates, spreads, the consequences of these cancellations might last for years. The results are not only a loss of money but also prestige and reputation. Many parts of China already suffer from a perceived lack of hygiene and the spread of this virus has made a bad situation appear even worse.

Additionally, we live in an age of twenty-four, seven-day-a-week worldwide news. The result is that what happens in one location around the world is almost instantaneously known throughout the entire world.

Media pressure not only means that individuals will shy away from such locations but also that local governments throughout the world feel obliged to take added precautions, so as not to suffer reputational or political consequences. From the perspective of tourism, a health crisis quickly becomes a tourism crisis.

As of the writing of this article, public health officials and scientists are unclear as to the science behind the Coronavirus. What medical personnel do know is that this virus is related to the S.A.R.S. virus, a virus from the early part of the twenty-first century that had devastating effects on tourism in such places as Hong Kong and Toronto, Canada.

Concerning the Coronavirus, we know that it is spread from one human to another. What health officials still do not know is if those carrying the disease are aware that they are carriers or not. The fact that large numbers of infected people might be carriers without knowing creates whole new problems for both the medical and for the tourism industry.

The fact that we still do not have a clear understanding as to how the Coronavirus spreads or mutates can become the basis for both rational and irrational behavior.

The tourism industry may feel both localized and large-scale travel reluctance by large numbers of people. This reluctance to travel could result in some, or all, of the following:

- Lower numbers of people flying,
- Decrease lodging occupancy resulting not only in the loss of income but also jobs,
- Decreased taxes being paid with governments having to find new revenue streams or be faced with the cutting of social services,
- Loss of reputations and confidence on the part of the traveling public.

The tourism and travel industry is not helpless and there are a number of responsible ways that the industry can confront this newest challenge. Tourism professionals are reminded that they need to review and remember some of the basics when dealing with a tourism crisis. Among these are:

- Be ready for any changes. To be ready is to have good passenger and employ screening at points of international entry and departure, and locations in which people come in close contact with one another, Then
- Develop the best responses possible. To accomplish this task, tourism officials have to be up-to-date on the facts, highlight preventative actions being taken within their part of the tourism industry to protect travelers.
- Create as many alliances as possible between the government sector, medical sector and tourism organizations. Create ways that you work with the media to get real facts into the public and to prevent unnecessary panics.

Tourism professionals cannot afford to be unaware of the crisis changeable aspects and as such tourism security specialists need to know that:

- ❖ Tourism is highly vulnerable to panic situation. The days after September 11, 2001 ought to have taught the tourism industry that for most people travel is a leisure purchase based on want rather than need. If travelers become afraid they may simply cancel their trips. In such cases, there may be massive layoffs of tourism workers whose jobs suddenly disappear.
- ❖ The importance of caring for sick employees and their families. The people staffing the tourism industry are also human. That means that their families and they are also susceptible to illnesses. Should large numbers of staff (or their families) become sick, hotels and restaurants may have to close simply due to manpower shortages. Tourism industry people need to be developing plans on how they will maintain their industry while suffering from manpower shortages.
  - the importance of having a plan to take care of visitors who fall ill may not know how to contact local medical authorities or even speak the language of the local doctors. Another problem to be considered is how the tourism industry will aid people who fall sick while on vacation. Medical notices will need to be distributed in multiple languages people will need ways to communicate to loved-ones and to describe symptoms to medical personnel in their own language.



- ❖ Preparation to fight against a pandemic not only from the medical perspective but also from the marketing/information perspective. Because the public may well panic it is important that the tourism industry be prepared to offer concrete and credible information. This information should be given to the public almost immediately. Every tourism office should have an information plan ready should a pandemic occur in its area. Develop creative websites so that people can gain information any time of the day and without regards to where they may be located.
- ❖ Tourism personnel must be prepared to counter negative publicity with an action program. For example in areas that have been impacted by a disease make sure to advise travelers to stay current with their vaccinations and create medical information sheets. It is essential that the public know where to go for information and what is real versus what is rumor. For travelers who may not be up-to-date with current shots, offer lists of doctors and clinics willing to accept traveler's insurance.
- ❖ Medical kits at hotels and other places of lodging must always be up-to-date. Make sure that their employees use anti bacterial hand wipes and encourage hotels to provide these for travelers.
- ❖ Preparation to work with travel insurance companies. In case of a pandemic, travelers may not receive value for money and may desire to either cancel a trip or cut it short. The best way to maintain good will is by working with such organizations as the United States Travel Industry Association (in Canada it is called Travel and Health Industry Association of Canada). Develop travel health programs with these organizations so that visitors feel financially protected.
- ❖ Working with the media. A pandemic is like any other tourism crisis and should be treated as such. Prepare for it before it strikes, if it should occur set your action plan in place and make sure that you work with the media, and finally have a recovery plan set so that once the crisis has abated you can begin a financial recovery program.
- ❖ Listed below are a number of additional things that tourism and travel professionals will need to consider. It must be emphasized that because this virus is dangerous and rapidly changing and/or spreading, tourism professionals should be in constant contact with local medical and public health officials.
- ❖ Seek daily medical updates. There is no place immune from this disease and it might only take one person who has been to an infected area or has been in close contact with an infected person to bring the Coronavirus to your locale. Vigilance is necessary and work closely with local public health officials.
- ❖ Be aware of the news. Governments are reacting quickly and decisively to quarantined problems and stop them before potential problems become realities. That means that if you are in travel or tourism you need to have alternative plans in case borders are closed, flights are cancelled, or new illnesses develop.
- ❖ Do not panic but be vigilant. Most people will not be infected by the coronavirus, but without good data panic tends to set in. Statements such as: "I think", "I believe" or "I feel that..." are not helpful. What counts is not what we think but what facts we know.
- ❖ Know and have cancellation policies in place. This might be especially important for tourism group organizers and travel agents. Make sure that you share this information with clients and have full refund policies in place should they be needed.
- ❖ Cleanliness and good sanitation are essential. That means that sheets need to be changed regularly, public devices need to be disinfected on a regular basis, and personnel who feel ill should be encouraged to stay home. The tourism and travel industry need to reconsider its policies vis-à-vis such issues as:
  - Lack of public sanitation
    - **Recycled air on airplanes**
    - Issues of blankets both at hotels and on airplanes
    - Additional employee washing of hands
    - Public restroom cleanliness
    - Personnel in direct contact with the public such as wait-staffs, hotel cleaning services, and front desk personnel need to be checked to assure the public that another colleague or guest has not inadvertently infected them.
- ❖ Check ventilation systems and make sure that the air being breathed is as pure as possible. Good air quality is essential and that means that air conditioner and heater filters need to be checked, airlines need to increase outside airflows, and windows should be opened and sunlight should be able to enter into buildings whenever and wherever possible.
- ❖ Understand the impact of time. In a national or international crisis, the media or our members are likely to know about it before us or at least as soon as we do.

*Dr. Peter Tarlow is one of the most recognized safety and security experts for the global travel and tourism industry.*



## Triggered Collapse, Part 2: Viral Pandemics

By Drew Miller

Source: <https://www.domesticpreparedness.com/commentary/triggered-collapse-part-2-viral-pandemics/>

Feb 05 – The nation currently faces an age of bioengineered viral pandemics and collapse. Advances in biotechnology enable nations, terrorist groups, or even lone wolves to create genetically modified organisms ([GMOs](#)) such as a human-to-human transmissible version of avian flu or to modify a lethal virus to facilitate a longer period of contagion and undetected spread before symptoms manifest. Bioengineering enables almost anyone to modify and release a new virus that, in addition to a pandemic, could cause an ensuing collapse in economic activity as well as loss of law and order as people react to the threat. Some experts say that the threat of a natural or bioengineered viral pandemic is already here. As it becomes increasingly easier to modify existing pathogens, the threat will also rise as these pathogens are made to be more lethal and more transmissible.

In 2012, [scientists](#) from the Center for Biosecurity of UPMC, Baltimore, warned that H5N1 avian influenza kills about 60% of its victims, compared to just 2% (or 50 million people) for the 1918 Great Spanish Flu Pandemic. With some cases of [unsustained human-to-human spread of H5N1](#), scientists are concerned that the virus will eventually mutate to a form that is easily spread from person to person:

*Like all influenza strains, H5N1 is constantly evolving in nature. But thankfully, this deadly virus does not now spread readily through the air from person to person. If it evolves to become as transmissible as normal flu and results in a pandemic, it could cause billions of illnesses and deaths around the world.*

### Dual-Use Research, Increasing the Threat

History shows that there is an increasing ability to modify viruses and access laboratories to create new and more lethal pathogens. In some cases, research begins with good intentions but, in the hands of someone with nefarious intentions, could be extremely dangerous. Laboratory accidents, do-it-yourself biologists, and individuals conducting virus experiments at their homes or in small rent-a-lab spaces introduce many intentional or unintentional safety and security concerns. In addition to the following examples, other legitimate lab incidents have likely occurred without being publicized:

- In 2001, Australian researchers attempting to make a contraceptive vaccine for pest control inserted a “good” gene into mousepox virus and accidentally created a lethal new virus that resisted vaccination.
- In 2002, a team of researchers at SUNY Stony Brook created a live polio virus as part of a Department of Defense (DOD) project to prove the [threat of synthetic bioweapons](#). The head of the team, [Eckard Wimmer](#) said that, “You no longer need the real thing in order to make the virus and propagate it.”
- In 2011, a team of [researchers at the Erasmus Medical Center](#) in The Netherlands attempted to turn H5N1 virus into a human-to-human flu. The goal was to repeatedly infect ferrets until a new form of H5N1 emerged that could spread through the air from one mammal to another. Although human-to-human transmission was not reached during that study, the lesson learned from this research is that high-tech bioengineering is not required to alter current pathogens. In this case, researchers used a simple process of swabbing the noses of the infected ferrets and using those samples to infect other ferrets.
- In 2011, international media reported that scientists had created a virus with 60% lethality. The U.S. government expressed concern about the risk of terrorists exploiting this information if the results were published.
- In 2013, at China’s National Avian Influenza Reference Laboratory, scientists combined H5N1 with genetic attributes found in dozens of other flu strains. The results included “man-made super flu strains” with lethal airborne transmission between guinea pigs. Scientists around the world condemned such experiments as “[appalling irresponsibility](#).” Those scientists recognized the threat this experimentation poses should a new viral strain (mixed with human influenza) escape.
- In recent years, scientists continue to make advances in their ability to manipulate DNA and create new GMOs. New technology emerges monthly, with universities and research labs selling the old, but still very capable machinery – enabling terrorists or do-it-yourself amateurs to obtain advanced, inexpensive bioengineering tools.

A lone terrorist releasing the virus would likely be detected and thwarted to limit the devastation. However, a nation state would be more capable of launching a bioattack that not only has high lethality and transmissibility but also: (1) a longer dormant period; or (2) carriers who do not exhibit the illness or symptoms. This scenario could infect and kill millions, leaving survivors with social and economic instability as well as radically disrupted security for months or possibly years.



### *Incentivization for a Bioattack*

If a country like North Korea were to launch a successful nuclear attack on another country, the worldwide response would be swift and devastating for that nation. Alternatively, North Korea could secretly release a deadly virus in the United States or elsewhere that could kill hundreds of millions. Even with strong speculation of responsibility, the origin of such an attack would be difficult to prove.

The effects of a weaponized virus versus a nuclear weapon are much greater: more lethal, less expensive, and easier to create and launch. In addition to the massive number of fatalities that an avian flu modified for human-to-human transmission could cause, the secondary and tertiary effects also need to be considered. Economic and social chaos coupled with a breakdown in law and order would contribute to the fatalities, perhaps even more so.

In the case of North Korea, another benefit of such an attack is that the country is relatively isolated from the rest of the world. As the virus spreads from country to country, North Korea's limited international travel compared to countries like the United States could protect residents from the threat. North Korea would be ideally situated to not just survive, but actually benefit from a global pandemic. As South Korea and the United States experience widespread devastation, North Korea would be little affected by a pandemic.

Similarly, Iranian Revolutionary Guards could decide that preparing and spreading a human transmissible form of avian flu in Israel and the United States would be more beneficial than investing in a small nuclear attack, which would have a low probability of success but high probability of devastating retaliation against Iran. Releasing a slow-acting virus in busy airports would ensure that the contagion could spread for a few days before those infected would show symptoms. By the time the Centers for Disease Control and Prevention (CDC) detects and issues a warning, it would be too late for the millions of Americans who would already be infected in cities and states across the country. At that point, as the spread continues, quarantine would not be possible. In this scenario, Iran would likely be affected as the pandemic spreads. However, they would have time to quarantine and may have developed a vaccine before the initial release. Again, determining where the virus originated would be difficult to prove.

Scientists have warned for years that weaponized biotechnology and genetically modified organisms pose an "existential threat" to humans. A [May 2011 National Defense University study](#) concluded that "there are tangible opportunities for many potential adversaries to acquire, modify, and then manufacture to scale a potential GMO pathogen." Despite warnings from scientists and experts of the "existential threat" that biotechnology and GMOs pose, the warnings have yet to be fully heeded. The controversial issues raised by this threat create political and bureaucratic barriers to governmental action.

Many known and yet unknown terrorist groups and bad actors around the world could be working on manual or high-tech bioengineering ways to develop deadly new viruses. The threat could originate from a broad range of actors – from one dedicated, deranged individual (a "biological Unabomber") to a highly moral biologist. For example, a kindly scientist who believes that overpopulation is destroying the planet and future generations could develop and release a bioengineered viral pandemic to reset the human population to a sustainable level. In 1998, biologist [Lynn Margulis](#) warned:

*We need to be freed from our species-specific arrogance. No evidence exists that we are "chosen," the unique species for which all the others were made. Nor are we the most important one because we are so numerous, powerful and dangerous.*

*Our tenacious illusion of special dispensation belies our true status as upright, mammalian weeds.*

Although biotechnology promises great new treatments and advances in medicine, it also could be used to design new and more deadly viruses. It appears to be too late to stop the spread of this technology and its inevitable misuse. With or without advanced biotechnology, the potential of causing a global pandemic capable of killing millions of people could incentivize terrorists and nation states to tamper with pathogens to make them highly transmissible within the human population. There is no way to forecast the odds of a bioengineered viral pandemic, but many experts believe it is inevitable and could happen very soon.

**This article is Part 2 of a six-part series on closing disaster recovery gaps and preparing for triggering events that could cascade into long-term societal disruptions:**

[Triggered Collapse, Part 1: A Nation Unprepared](#)

Triggered Collapse, Part 2: Viral Pandemics

Triggered Collapse, Part 3: Lessons in Lawlessness

Triggered Collapse, Part 4: Cascading Consequences Beyond the Event

Triggered Collapse, Part 5: Gaps in National Disaster Planning Scenarios

Triggered Collapse, Part 6: A Nationwide Call to Action

*Drew Miller, Ph.D., a former intelligence officer, Pentagon Senior Executive Service official, and retired Air Force Reserve Colonel, business executive, management consultant. He was an honor graduate of the Air Force Academy,*



receiving an academic scholarship to Harvard University, where he earned a master's degree and Ph.D. in public policy. He has published articles on the bioengineered pandemic threat and presented at national conferences on disaster preparedness. He served as a part-time elected official, county commissioner, and University of Nebraska Regent for 16 years, and continues to serve in the Civil Air Patrol.

## ***Contagion* Is Extremely Smart About Outbreaks, but Humans Are Extremely Dumb**

Source: <https://slate.com/culture/2020/01/contagion-movie-coronavirus-lessons-steven-soderbergh.html>

Jan 30 – *Contagion*, Steven Soderbergh's 2011 movie about a deadly pandemic, [hit the top 10](#) on the iTunes movie rental chart this week. But in light of the ongoing coronavirus outbreak, jokes and references to *Contagion* have probably been in your Twitter timeline for longer. [Jan. 23](#): "Texas A&M students be like 'my life is a movie' yeah bro *Contagion*." [Jan 25](#): "I sound conspiracy theory AF but don't trust major media outlets they aren't giving us all the info, look at all underground media sources and what actual ppl in Wuhan are saying because this legit could be like the fucking movie *Contagion*." [Jan. 30](#): "The movie *Contagion* is now a documentary." With the World Health Organization's [announcement on Thursday afternoon](#) that the coronavirus 2019-nCoV qualifies as a global health emergency, *Contagion* references aren't going anywhere. And with them comes a very 2020 irony: A movie that warned against the corrosive effects of fear and misinformation during a pandemic is now being used to spread ... fear and misinformation. An epidemiologist and consultant for Soderbergh [said when the film came out](#) that the team behind it was "not trying to scare people." That may be the case, but the only thing most people seem to remember about *Contagion* now is the terrifying opening sequence,

featuring Gwyneth Paltrow as the Minnesota businesswoman Beth Emhoff, who's the index case for the outbreak.

In the film, Emhoff comes back from a trip to Hong Kong harboring a bad cough and flu-like symptoms, caused (we later find out) by the novel virus MEV-1. Emhoff quickly collapses in a seizure in her gorgeous kitchen, leaving her husband (Matt Damon) in shock. Watching the movie again recently, I was surprised to be reminded of how little time Paltrow spends on screen—she's dead before you know it. But because Paltrow has since built an image that depends on the projection of a kind of ultra-clean glamour, Beth Emhoff's gruesome death made a big impact. [The gif that's most often attached to \*Contagion\* tweets](#) features Paltrow writhing grayly on a hospital bed. (I suppose we should feel lucky that people are using that one, and not [another one they might pick!](#))

***A movie that warned against the corrosive effects of fear and misinformation during a pandemic is now being used to spread ... fear and misinformation.***

Even if people mostly remember the movie for Paltrow's death, and for the ominous way the camera lingers on elementary-school door-handles and hotel-bar peanut bowls after infected people touch them, *Contagion* wasn't supposed to be a horror story about the perils of global air travel. The movie is as much about the way disease gets amplified by people's relationships to the truth, as it is about viral transmission.

The movie's slimy blogger character, Alan Krumwiede (Jude Law), spreads misinformation in service of selling a homeopathic "cure" called Forsythia. He goes onto his website "Truth Serum Now," pretending to have the sickness, and gives

himself a dose of "Forsythia," telling his viewers to do the 2011 equivalent of hitting "like" and "subscribe": "If I'm here tomorrow, you'll know it works."

The Krumwiede subplot of *Contagion* is about one man's manipulation of a climate of fear in order to make money. But it's also about the way that the social conditions of the pandemic create an opening for the blogger to rise.

[Chaos is a ladder](#) for this man, who goes from pathetically begging an editor to assign him a story before the pandemic hits, to appearing in a talking-head spot on a major news show at the height of the sickness. Krumwiede appears opposite the head of the CDC (Laurence Fishburne) in the role of skeptical gadfly, accusing the CDC and the WHO of concealing the



“truth of the virus” from people “to benefit friends of the current administration.” And it isn’t just Krumwiede whose human failures abet the virus’ spread. Fishburne’s CDC chief gives privileged information to his fiancée, trying to save her from infection—a very human slip that gives Krumwiede his opening.

Watching *Contagion* in 2020, the damage Law’s character does, and the movie’s outrage at his actions, seems almost quaint. Compared to a single blogger selling a “cure,” the misinformation we’re facing today is far worse. BuzzFeed’s Jane Lytvynenko is keeping a [running list](#) of coronavirus hoaxes and misinformation, from the tweet claiming that the coronavirus was patented in 2018, to the false claims circulated on Facebook that taking vitamin C will cure or prevent coronavirus, to the photo—supposedly of a new coronavirus hospital in Wuhan—that’s actually of an apartment building. (That one was apparently spread by Chinese state media.)

**Our coronavirus is, so far, not nearly as bad as the fictional MEV-1. But our information environment is way more toxic.**

Indulging the occasional “we’re in *Contagion* now, baby!” gallows joke is nowhere near as bad, obviously, as passing on misinformation—even if it’s personally exhausting to me to see an empty reference get worked over so mercilessly. But, nine years and countless gifs later, it’s become ever clearer that the parts of this movie that probably mattered most have taught us nothing.

## The Synthetic Biology Companies Racing to Fight Coronavirus

By John Cumbers, Kevin Costa, and Marianna Limas

Source: <https://synbiobeta.com/the-synthetic-biology-companies-racing-to-fight-coronavirus/>

Feb 10 – On December 31, 2019, the 2019-nCoV coronavirus was [first reported](#) from Wuhan, China. Fast-forward one month: China is making urgent calls for help, the global death toll is climbing, and stock markets are dipping. The world seems to be bracing itself for what could be the next great pandemic.

There are plenty of [misconceptions about coronavirus](#), including how quickly it spreads, and how lethal it is. Whether this coronavirus turns out to be a one-time killer like the Spanish Flu, or something more similar to [the seasonal flu that kills hundreds of thousands every year](#), the rise of coronavirus has put a lot of attention on global biotech’s ability to respond to deadly new diseases.

Nowhere else is that response happening like it is within the synthetic biology community.

If you’re new to my column, you may be asking what is synthetic biology. [Simply put, synthetic biology aims to make biology easier to engineer](#), using DNA as a programming language for our physical world. Made possible by advances in automation, AI, and our ability to read-write-edit DNA, synthetic biology is accelerating design-build-test cycles in biological engineering. It enables us to synthesize food from thin air, store all the world’s data in a teaspoon of DNA, design smart medicines for individual patients, and program matter itself.

With today’s coronavirus outbreak, synthetic biologists are applying cutting-edge tools and technology to help responders go from detection to cure with unprecedented speed and scale. Here are just a handful of companies working behind the scenes of the coronavirus pandemic:

### Distributed Bio

Collaborating with the World Health Organization and the U.S. military, researchers at Distributed Bio are developing [Centivax, a new kind of universal vaccine](#). Their computational approach finds the unique molecular features on the surface of a range of different pathogens, then uses antibody the immune response against the parts of those pathogens that do not mutate over time.

In early tests, the vaccine has shown promise against 39 viral strains of influenza spanning the last century, including all the big pandemic strains to hit the world (1918 H1N1 Spanish flu, 1957 H2N2 Asian flu, 1968 H3N2 Hong Kong flu, 1977 H1N1 Russian flu, 2002 H3N2 Fujian flu, and 2009 H1N1 Swine flu).

This technique allows for Distributed Bio to create vaccines for almost any virus, at a fast pace, and in a safe environment. Distributed Bio’s work was recently featured in [the new Netflix series Pandemic](#), which looks at the teams who are fighting to prevent a global outbreak of disease.

### GenScript

The 2019-nCoV is difficult to detect during the first two weeks after infection. Infected individuals may not be aware of their contagiousness, thus putting others at risk of contracting the virus. There are cases reported that people can be infectious without showing symptoms. A fast and reliable detection method is needed to help researchers better understand the biology of the disease and potentially guide future diagnostics and treatment.



## C<sup>2</sup>BRNE DIARY – February 2020

To address this, GenScript is [freely offering to researchers](#) a high-tech test for the coronavirus. The test is based on a qRT-PCR detection assay, which uses precise DNA strands to accurately detect and measure the amount of an infectious agent like coronavirus in the bloodstream, for example.

GenScript also synthesized the genes that can be used as positive control for the detection of 2019-nCoV [for vaccine and antibody development](#). According to GEN, GenScript has received “urgent requests from partners to synthesize the [genes of nCoV-2019 as quickly as possible](#), so that companies, universities, and government agencies can get to work on the vaccine and therapeutic development.”

### Inovio and Twist Bioscience

The Coalition for Epidemic Preparedness Innovations (CEPI) awarded [Inovio Pharmaceuticals received a \\$9 million grant](#) to develop a vaccine against the new coronavirus (2019-nCoV). They have already demonstrated positive clinical outcomes with their vaccine against MERS-CoV, another coronavirus. Working with Inovio is Twist Bioscience, which will provide DNA synthesis.

Kate Broderick, senior vice-president of research and development at Inovio, [told the BBC](#): “Our DNA medicine vaccines are novel in that they use DNA sequences from the virus to target specific parts of the pathogen which we believe the body will mount the strongest response to. We then use the patient’s own cells to become a factory for the vaccine, strengthening the body’s own natural response mechanisms.” Inovio has plans for its vaccine to enter human trials by the early summer.



### Moderna

Moderna also announced a new collaboration with CEPI to produce a vaccine against coronavirus. The funding will cover manufacturing costs of an mRNA vaccine candidate against the new strain. The work is also supported by federal researchers at the National Institute of Allergy and Infectious Diseases (NIAID), who will conduct preclinical tests and a phase 1 study.

The project builds on four years of work, including six positive Phase 1 clinical readouts.

Moderna has a mature technology platform, fully integrated manufacturing site and

development experience, and established relationship with the NIH, which situates it well to respond to public health threats. Moderna and CEPI hope to create a world in which “epidemics are no longer a threat to humanity,” according to Richard Hatchett, M.D., CEO of CEPI.



### Mammoth Biosciences

[Mammoth Biosciences](#), a company developing a toolbox for the [next generation of CRISPR-based diagnostics](#), is partnering with UC San Francisco researchers who are developing a diagnostic test to identify people infected with the new [coronavirus](#). As Leah Rosenbaum of Forbes [reports](#), testing for suspected coronavirus now requires shipping samples to the Centers for Disease Control and Prevention, where it can take six or more hours to complete the test. The new test from Mammoth Bioscience will work by taking a sample from a nasal swab, putting it into a tube with the CRISPR-Cas system, and then dipping in a color-changing strip of paper to determine whether the test result is positive or negative. The whole thing should take one or two hours and could be done in a doctor’s office.

UCSF researcher and Mammoth collaborator Charles Chiu say that the coronavirus test could be ready in a matter of weeks, and that the big bottleneck is a lack of human samples with which to test it. He said that very few if any technologies compare to Mammoth Biosciences’ CRISPR platform when it comes to speed, turnaround, and accuracy.



### Sherlock Biosciences

[Sherlock Biosciences](#) is another synthetic biology start-up developing a fast, reliable test for coronavirus. Founded by two of synthetic biology’s leading academics—Feng Zhang and Jim Collins—Sherlock is advancing CRISPR-based and synthetic biology platforms to diagnose many diseases.

Sherlock CEO Rahul Dhanda [recently told](#) STAT News that Sherlock’s CRISPR-based platforms are “tailor-made for outbreaks like coronavirus.” Sherlock’s tests would require a simple blood, urine, or saliva sample.



### Abcellera

[Abcellera is working to identify antibodies](#) that can neutralize the virus and potentially block its transmission. Since 2018, under the [DARPA Pandemic Prevention Platform \(P3\) program](#), AbCellera has been developing a “technology platform for pandemic response capable of developing field-ready medical countermeasures within 60 days of isolation of an unknown viral pathogen.”

Abcellera told us that a key aspect of this work is to “deliver an antibody countermeasure as a nucleic acid vector instead of recombinant purified protein.” In other words, the patient’s own cells will manufacture the therapeutic instead of it being manufactured in a lab outside of the patient. This is a relatively new way to deliver the drug — or more precisely, the genes to make the drug.



### Integrated DNA Technologies (IDT)

IDT is another DNA synthesis company finding itself involved in the very early stages of addressing emerging diseases. As a long-time player in the field, IDT [says](#) it was quickly engaged by researchers with interests in both diagnostic assays and vaccine development. IDT has already shipped [synthetic genes for use in the pursuit of coronavirus vaccines](#), as well as customized oligonucleotide probes and primers that will facilitate more sensitive and accurate detection of the Wuhan virus.

IDT has set up a [dedicated page](#) to help researchers testing for the disease or developing a vaccine for it. The company notes that both the CDC and Chinese government have sequenced and submitted the coronavirus genome to the US NCBI GenBank database. Because IDT has world-wide manufacturing capabilities, it says it can provide reliable testing abilities anywhere in the world, avoiding contamination issues that can occur during transportation.



INTEGRATED DNA TECHNOLOGIES

### It takes a global village

These companies illustrate how, in a sense, the synthetic biology community has been working toward this moment for a long time, a moment that puts to the test whether we have made biology easier to engineer—whether we can design, build, and test solutions to an unanticipated challenge like coronavirus, and do it better, faster, and more scalable than anything we could ever do before.

There are many other examples of companies working to bring a coronavirus vaccine to market in record time, including **Novavax and Johnson & Johnson**. In academia, there are countless labs working to understand the Wuhan coronavirus at a basic science level, providing vital knowledge about what makes this coronavirus unique, what traits it shares with its cousins, and how to anticipate the next pandemic. And even though biotechnology is fundamental to beating coronavirus, the success of any disease prevention program depends on a strong public health system.



**In other words, it takes a broad range of industry, academic, and government players to mount a successful defense against a deadly disease that knows no borders and affects so many. History will judge how well all these components come together in responding to the 2019-nCoV coronavirus. I hope what we learn from this pandemic will help us develop the tools, technology, and infrastructure to better anticipate the next global health threat.**

*John Cumbers is the founder of SynBioBeta. John is passionate about education and on the use and adoption of biological technologies. He has received multiple awards and grants from NASA and the National Academy of Sciences for his work in the field. John has been involved in multiple startups such as those producing food for space, microbes to extract lunar and martian resources, and hoverboards! John is an active investor through the DCVC SynBioBeta Fund and his synthetic biology syndicate on AngelList.*

*As Editor and Program Manager, Kevin Costa leads SynBioBeta's digital media content, with the goal of telling the story of the amazing innovators building the future with biology. Before joining SynBioBeta, Kevin managed the Synthetic Biology Engineering Research Center. His interests include public engagement, science writing, community building, and bikes!*

*Marianna Limas plays a critical role in displaying and communicating SynBioBeta's message to the world. She manages SynBioBeta's social media channels and newsletter, and works with the editorial, website, research and marketing teams.*



## Clinical characteristics of 2019 novel coronavirus infection in China

By Wei-jie Guan, Zheng-yi Ni, Yu Hu, Wen-hua Liang, et al.

Posted February 09, 2020.

Source: <https://www.medrxiv.org/content/10.1101/2020.02.06.20020974v1>



This article is a preprint and has not been peer-reviewed. It reports new medical research that has yet to be evaluated and so should *not* be used to guide clinical practice.

**Background:** Since December 2019, acute respiratory disease (ARD) due to 2019 novel coronavirus (2019-nCoV) emerged in Wuhan city and rapidly spread throughout China. We sought to delineate the clinical characteristics of these cases. Methods: We extracted the data on **1,099 patients with laboratory-confirmed 2019-nCoV ARD from 552 hospitals in 31 provinces/provincial municipalities** through January 29th, 2020.

**Results:** The median age was **47.0 years**, and **41.90% were females**. Only 1.18% of patients had a direct contact with wildlife, whereas 31.30% had been to Wuhan and 71.80% had contacted with people from Wuhan. **Fever (87.9%) and cough (67.7%)** were the most common symptoms. Diarrhea is uncommon. **The median incubation period was 3.0 days (range, 0 to 24.0 days)**. On admission, ground-glass opacity was the typical radiological finding on chest computed tomography (50.00%). Significantly more severe cases were diagnosed by symptoms plus reverse-transcriptase polymerase-chain-reaction without abnormal radiological findings than non-severe cases (23.87% vs. 5.20%,  $P < 0.001$ ). Lymphopenia was observed in 82.1% of patients. 55 patients (5.00%) were admitted to intensive care unit and 15 (1.36%) succumbed. Severe pneumonia was independently associated with either the admission to intensive care unit, mechanical ventilation, or death in multivariate competing-risk model (sub-distribution hazards ratio, 9.80; 95% confidence interval, 4.06 to 23.67).

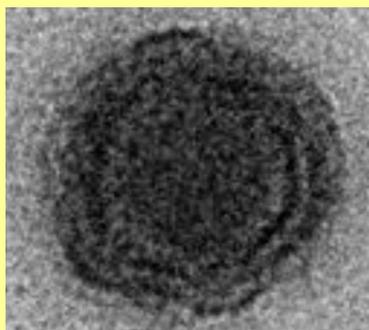
**Conclusions:** The 2019-nCoV epidemic spreads rapidly by human-to-human transmission. Normal radiologic findings are present among some patients with 2019-nCoV infection. The disease severity (including oxygen saturation, respiratory rate, blood leukocyte/lymphocyte count and chest X-ray/CT manifestations) predict poor clinical outcomes.

## Scientists Discover Mysterious Virus in Brazil with No Known Genes They Can Identify

Source: <https://www.sciencealert.com/mysterious-virus-discovered-in-brazil-has-no-known-genes-scientists-can-identify>

Feb 10 – Scientists have identified an enigmatic [virus](#) whose genome seems to be almost entirely new to science, populated by unfamiliar genes that have never before been documented in viral research.

The so-called Yaravirus, named after [Yara](#) – or *Iara*, a water-queen figure in Brazilian mythology – was recovered from Lake Pampulha, an artificial lake in the Brazilian city of Belo Horizonte.



While Yaravirus (***Yaravirus brasiliensis***) may be no supernatural siren, the virus could prove to be just as mysterious as the water nymph of legend.

That's because the virus constitutes "a new lineage of amoebal virus with a puzzling origin and phylogeny," the research team [explains in a new pre-print paper](#) about the discovery.

Two of the senior members of that team – virologists Bernard La Scola from Aix-Marseille University in France, and Jônatas S. Abrahão from Brazil's Federal University of Minas Gerais

– ought to know what they're talking about.

Two years ago, the pair helped to discover another water-dwelling viral novelty: [Tupanvirus](#), a giant virus found in extreme aquatic habitats.

[Giant viruses](#), as opposed to the regular variety, are so-called because of their huge capsids (protein shells that encapsulate virions - virus particles).

These much larger viral forms were only [discovered this century](#), but they're not only notable for their size. They also possess more complex genomes, giving them the [ability to](#)



[synthesise proteins](#), and therefore perform things like DNA repair, plus DNA replication, transcription, and translation.

Prior to their discovery, it was thought that viruses couldn't do things like that, being regarded as relatively inert, [non-living entities](#), only capable of infecting their hosts.

We now know viruses are [much more complex than was once believed](#), and in recent years, scientists have uncovered [other kinds of viral forms](#) that similarly challenge our thinking about [how viruses can spread](#) and [function](#).

**The new discovery, Yaravirus, does not appear to be a giant virus, composed as it is of small 80 nm-sized particles. But what's notable about it is how seemingly unique its genome is.**

"Most of the known viruses of amoeba have been seen to share many features that eventually prompted authors to classify them into common evolutionary groups," [the authors write](#).

"Contrary to what is observed in other isolated viruses of amoeba, Yaravirus is not represented by a large/giant particle and a complex genome, but at the same time carries an important number of previously undescribed genes."

In their investigations, the researchers found over 90 percent of Yaravirus genes had never been described before, constituting what are known as [orphan genes](#) (aka ORFans).

Only six genes found bore a distant resemblance to known viral genes documented in public scientific databases, and a search through over 8,500 publicly available metagenomes offered no clues as to what Yaravirus might be closely related to.

"Using standard protocols, our very first genetic analysis was unable to find any recognisable sequences of capsid or other classical viral genes in Yaravirus," [the researchers explain](#).

"Following the current metagenomic protocols for viral detection, Yaravirus would not even be recognised as a viral agent."

As for what Yaravirus actually is then, the scientists can only speculate for now, but suggest it could be the first isolated case of an unknown group of amoebal virus, or potentially a distant kind of giant virus that may somehow have evolved into a reduced form.

Either way, it's clear we still have an awful lot to learn, the researchers say.

"The amount of unknown proteins composing the Yaravirus particles reflects the variability existing in the viral world and how much potential of new viral genomes are still to be discovered," [the authors conclude](#).

►► The findings are reported in [bioRxiv](#).

## Bioweapons, Secret Labs, and the CIA: Pro-Kremlin Actors Blame the U.S. for Coronavirus Outbreak

By Eto Buziashvili

Source: <http://www.homelandsecuritynewswire.com/dr20200210-bioweapons-secret-labs-and-the-cia-prokremlin-actors-blame-the-u-s-for-coronavirus-outbreak>

Feb 10 – A previously unknown variant of coronavirus that appeared in the Chinese city of Wuhan in December 2019 has [already infected](#) thousands of people, with cases confirmed in at least 20 countries. While epidemiologists work to identify the exact source of the outbreak, officially known as 2019-nCov, pro-Kremlin actors are already blaming the United States for supposedly using bioweapons to disseminate the virus. So far, their efforts have gained very little traction.

The practice of spreading disinformation about public health threats is nothing new. During the Cold War, a Soviet disinformation campaign blamed the United States for the AIDS virus. Known as [Operation Infektion](#), the campaign began in 1983 when a little-known Indian newspaper — later exposed to be financed by the Soviet leadership — published an anonymous letter with the headline, "AIDS May Invade India: Mystery Disease Caused by U.S. Experiments." The column pushed a conspiracy theory that the virus causing AIDS was developed in an underground U.S. biological weapons lab. Over several years, the false narrative was picked up by other media, before [eventually making its way to the United States](#), including CBS Evening News. In 1992, Russia's Foreign Intelligence Service [admitted](#) that Operation Infektion had been backed by the KGB.

A similar pattern of spreading disinformation appears to be evolving alongside the current outbreak. Narratives blaming the United States for the coronavirus outbreak first appeared on fringe pro-Kremlin outlets, and are spreading to well-established Kremlin media, Russian politicians, and social media platforms including YouTube and VKontakte (VK). While it is not as far along as Operation Infektion, the mechanisms available to spread narratives quickly are much larger and faster in today's media environment than they were during the Cold War.

Multiple Narratives Get Things Rolling



Fringe pro-Kremlin outlets have accused the United States of using bioweapons against China, claiming the U.S. is using economic and military tools to pressure its competitor China. The economic version of the narrative, [published](#) by Topcor.ru, suggested that the ongoing trade war with China has cost the U.S. billions of dollars, and the latter would benefit from the virus undermining the former's economy.

An alternate version of the narrative, [disseminated](#) by Katushya.org, states that the Chinese military is claiming the virus was artificially produced in U.S. laboratories with the goal of breaking China from within. The fringe outlet suggested that the outbreak is essentially a U.S. bioweaponry reconnaissance operation with the goal of testing the capabilities of Chinese biological weapons defenses.

Additional outlets referred to statements by pro-Kremlin military expert Igor Nikulin on *TV Zvezda*, who claimed that the appearance of the virus looked like sabotage. According to [Nikulin](#), the United States actively researches lethal disease vectors to test them within a population while simultaneously developing cures for them. Similar narratives have begun to appear on more mainstream pro-Kremlin outlets, including *Pravda TV* and *Izvestia*.

Another narrative being peddled attempted to make a connection to the Richard Lugar Center for Public Health Research, a U.S.-supported research lab based in Tbilisi. In this version of the story, which [Mythdetector.ge](#) attributed to the outlet [REN TV](#), the lab is one of many U.S. bases around the world for bioweapons manufacturing, implying it could be doing so again in the current outbreak. It is not the first time that the Lugar Center has been targeted by disinformation campaigns. As previously reported by EUvsDisinfo, the lab has also been blamed for an [accidental hepatitis C outbreak](#) and the processing of blood transported by U.S. diplomats to [create bioweapons](#) against Russia.

### Zhirinovskiy Weighs In

Russian nationalist Member of Parliament Vladimir Zhirinovskiy has also picked up these narratives, amplifying stories originating from fringe outlets and amplifying them on other channels. In one case he claimed the virus appeared in China because U.S. pharmaceutical companies want to cash in on the vaccine, while in the other he said the U.S. has allegedly used biological weapons against China. In both instances, Zhirinovskiy claimed that the main goal of the U.S. would be to undermine the Chinese economy.

### Amplification on Social Platforms Making Little Progress

In addition to news outlets, small Russian YouTube channels are beginning to share videos which narrators discuss the coronavirus outbreak and link its appearance in China to the U.S. Central Intelligence Agency as well as U.S. bioweapons research. So far the spread on YouTube appears to be limited to relatively unknown Russian channels with little to no audience.

The Russian social network VK has is also being employed to spread the same disinformation narratives blaming the United States for the outbreak. At the time of publishing, engagement also appears limited, with some stories attracting hundreds or thousands of views and others attracting close to zero.

### Conclusion

It is unknown whether these narratives blaming the United States for the coronavirus outbreak will spread alongside the outbreak itself, but it serves as a reminder of Russia's long history of employing anti-U.S. influence operations during public health crises. While Operation Infektion took years to spread, ultimately it sowed doubt regarding the origins of the AIDS virus. Their current efforts to create disinformation narratives for coronavirus have so far been more successful than their ability to amplify them. The DFRLab will continue to monitor the information environment around coronavirus.

*Eto Buziashvili is a Research Associate, Caucasus, with the Digital Forensic Research Lab. He is based in Georgia.*

## Coronavirus – natural phenomenon, accident or well-planned bio-terrorist attack?

Source: <http://www.ft.lk/columns/Coronavirus-natural-phenomenon-accident-or-well-planned-bio-terrorist-attack/4-695369>

*“The Western mass media have discussed the new corona virus that began in the city of Wuhan in Central China but, apart from repetitive small details and the inevitable China-bashing, not much light has been shed on the circumstances. My initial commentary here is composed from a medley of nearly 100 Western news reports, primarily ABC, CBS, CNN, AFP, and from some Chinese media.*



*Officially called the novel coronavirus (2019-nCoV), the contagion is a respiratory illness, a new type of viral pneumonia, in the same family of infections as SARS and MERS” – Larry Romanoff*

Feb 10 – When this article is published, the number of people affected with the virus would probably have exceed 30,000 and the number of deaths more than 700. There is no doubt this virus is spreading and fatalities are increasing.

In a well-researched article, Larry Romanoff, a retired management consultant, businessman and a visiting professor at Shanghai's Fudan University, seems to pose the possibility that this virus, like SARS, was man-made and designed not to benefit mankind but harm it.

The following part of his article summarises the intent of these potentially man-made viruses.

“In a thesis on biological weapons, Leonard Horowitz and Zygmunt Dembek stated that one clear sign of a genetically-engineered bio-warfare agent was a disease caused by an uncommon (unusual, rare, or unique) agent, with lack of an epidemiological explanation. i.e. no clear idea of source. **They also mentioned an ‘unusual manifestation and/or geographic distribution’, of which race-specificity would be one.** Recent disease outbreaks that would seem to possibly qualify as potential bio-warfare agents are AIDS, SARS, MERS, Bird Flu, Swine Flu, Hantavirus, Lyme Disease, West Nile Virus, Ebola, Polio (Syria), Foot and Mouth Disease, the Gulf War Syndrome and Zika. In fact, thousands of prominent scientists, physicians, virologists and epidemiologists on many continents have concurred that all these viruses were lab-created and their release deliberate. The recent swine flu epidemic in China has the hallmarks as well, with circumstantial evidence of the outbreak raising only questions.”<sup>1</sup>

While there is no doubt that many researchers are engaged in finding causal reasons for diseases and ways and means of preventing and eliminating them, it appears that like the Dark Web, research is at work behind the scenes on how to eliminate and cause hardship to humankind in a selective manner.

In this instance, as far as the coronavirus is concerned, what one might conclude from Romanoff's article is that this virus or mutants of it were being developed as bioweapons and were released either deliberately or accidentally. Either way, it appears that the coronavirus was developed as a bioweapon and not as some research tool for the benefit of mankind.

Given the obvious amount of research that has been and is being done, there is some degree of certainty that several countries are probably engaged in developing bioweapons of this nature to launch bio-terrorist attacks.

The reaction to the current outbreak and the consequent economic aftermath for China, as well as for the other countries that benefitted from China's economic surge, are evident. It is stated that the economic impact to China could be as much as a 1-2%, if not more, drop in their GDP. This would not only affect China badly but several other countries as well, including Sri Lanka.

Although the number of cases affected with the virus is presently 25,000 and the number of fatalities is 500 and of course increasing, in context, this is in a country with a population of nearly 1.4 billion with a mortality rate of around 7.13 per 1000 people which works out to nearly 10 million deaths annually.

While there is no doubt, question or challenge that all necessary precautionary measures need to be taken to halt the spread of the virus, **the reaction worldwide appears disproportionate in comparison to deaths that occur and have been occurring globally for decades and longer, with the latest statistics released by the WHO showing worldwide deaths annually from influenza as 290,000-650,000, malaria 1-3 million, TB 1-3 million, and AIDS 770,000.** The disease spread from malaria, TB, AIDS, influenza and many other diseases and mortality rates do not make headlines in the news media, as these deaths have been happening for a long time and one more death where a million or more die every year is not news.



**In this instance, as far as the coronavirus is concerned, what one might conclude from Romanoff's article is that this virus or mutants of it were being developed as bioweapons and were released either deliberately or accidentally. Either way, it appears that the coronavirus was developed as a bioweapon**

The aftermath of this reaction to the coronavirus will impact millions of people when the economic consequences set in. China's GDP is perhaps in excess of \$12.3 trillion today (it was \$12.27 trillion in 2017). The projected impact to China on account of the forecast drop in GDP (1-2%), would be \$122 billion, even if the impact is taken as 1% of the GDP. For Sri Lankans, in context, the country's total GDP is about \$88 billion (it was reported as \$87.17 billion in 2017). The impact on countries that have high economic dependency on China will be equally significant, and in some cases acute.

In the context of the statement made by Prime Minister Mahinda Rajapaksa in Parliament on 5 February on the current dire state of the economy in Sri Lanka, the economic hit that China will face will surely aggravate the situation outlined by the Prime Minister. He stated that the economy was growing only at 3%, the lowest in the South Asian region, and warned that the budget deficit could be high as 7%, debt high as 80% of GDP.



The result of all this is not just a numbers game, but how it translates to the average household in China and in other countries including Sri Lanka.

Romanoff also makes the point “unusual manifestation and/or geographic distribution”, of which race-specificity would be one”.

The Western media certainly seems to have a penchant for focusing on news in select parts of the world, one of which is China. The fact that this outbreak, like SARS, happened in China and is taking a big economic hit as a consequence surely cannot be lost on strategic thinkers outside the West.

In his article dated 25 January, Romanoff writes in detail about the many preventive measures that China had taken after the first case was declared on 31 December 2019. All the evidence suggests the Chinese authorities acted effectively as soon as they realised the danger they might be facing. Medical authorities immediately declared the outbreak, and within a week they had identified the pathogen and also determined and shared the genome sequence with the WHO and other parties, a sufficiently speedy response that earned praise from the WHO and scientists around the world.

Remembering the SARS troubles, they did much more. In most large centres in the country, all sports venues, theatres, museums, tourist attractions, and any other locations that attract crowds have been closed, as have all schools. All group tours have been cancelled. Not only the city of Wuhan but virtually the entire province of Hubei has been locked down, with all trains, aircraft, buses, subways and ferries grounded and all major highways and toll booths closed. Thousands of flights and train trips have been cancelled until further notice. Some cities like Shanghai and Beijing are conducting temperature tests on all roadways leading into the cities. In addition, Wuhan is building (in five days) a portable hospital of 25,000 square meters to deal with infected patients. As well, Wuhan has asked citizens to neither leave nor enter the city without a compelling reason, and all are wearing face masks.

While it is the human element that is of prime concern to all concerned, Romanoff’s article touches on some interesting, and also frighteningly concerning possibilities regarding this outbreak.

He starts by saying “While there is no evidence of bio-warfare, a virus outbreak in the city of Wuhan immediately prior to the Chinese New Year migration could potentially have dramatic social and economic repercussions. Wuhan, with a population of about 12 million, is a major transport hub in central China, particularly for the high-speed train network, and with more than 60 air routes with direct flights to most of the world’s major cities, as well as more than 100 internal flights to major Chinese cities.

“When we add this to the Spring Festival travel rush during which many hundreds of millions of people travel across the country to be with their families, the potential consequences for the entire country are far-reaching.”

**What follows in his article accentuates what is frightening. Some key parts are noted here.**

- Comparison with SARS – This is a novel Coronavirus (2019-nCoV), an entirely new strain related to the MERS (MERS-CoV) and the SARS (SARS-CoV) viruses, SARS was proven to be caused by a strain of the coronavirus, a large family of mostly harmless viruses also responsible for the common cold, but SARS exhibited characteristics never before observed in any animal or human virus, did not by any means fully match the animal viruses mentioned above, and contained genetic material that still remains unidentified – similar to this new coronavirus in 2019.
- Virologist Dr. Alan Cantwell had stated that the mysterious SARS was a new virus never before seen by virologists. This was an entirely new illness with devastating effects on the immune system, and there is no known treatment. Dr. Cantwell also noted that the genetic engineering of coronaviruses has been occurring in both medical and military labs for decades. He wrote that, when he searched in PubMed for the phrase “coronavirus genetic engineering”, he was referred to 107 scientific experiments dating back to 1987. To quote Dr. Cantwell: “I quickly confirmed that scientists have been genetically engineering animal and human coronaviruses to make disease-producing mutant and recombinant viruses for over a decade. No wonder WHO scientists identified the SARS/coronavirus so quickly. Never emphasised by medical news writers is the fact that for over 40 years, scientists have been “jumping species” with all sorts of animal and human viruses and creating chimera viruses (viruses composed from viruses of two different species). This unsupervised research produces dangerous man-made viruses, many of which have potential as bioweapons. Certainly SARS has the hallmarks of a bioweapon.”
- Almost immediately upon receiving the genome sequence, several Russian scientists suggested a link between SARS and bio-warfare. Sergei Kolesnikov, a member of the Russian Academy of Medical Sciences, said the propagation of the SARS virus might well have been caused by leaking a combat virus grown in bacteriological weapons labs. According to a number of news reports, Kolesnikov claimed that the virus of atypical pneumonia (SARS) was a synthesis of two viruses (of measles and infectious parotiditis or mumps), the natural compound of which was impossible, that this mix could never appear in nature, stating, “This can be done only in a laboratory.” The head of Moscow’s epidemiological services Nikolai Filatov was quoted in the Gazeta daily as stating he believed SARS was man-made



because, “there is no vaccine for this virus, its make-up is unclear, it has not been very widespread and the population is not immune to it.”

- The final conclusion of the Chinese biochemists was the same, that the SARS virus was man-made. This conclusion wasn't a secret, but neither was it promoted to the international media since they would simply have used the claim to heap scorn on China, dismissing this as a paranoid conspiracy theory. The Western media totally ignored this aspect, except for ABC news who reported that the SARS “mystery virus” was possibly “a Chinese bio-weapon that accidentally escaped the laboratory”.

The following part of Romanoff's article raises serious concerns about clandestine research activities that seem to be happening. He says, “We might in other circumstances pass this off as an unfortunate coincidence, but for some major circumstantial events that serve to alter our focus.”

One of these is the history of American universities and NGOs having come into China in recent years to conduct biological experiments that were so illegal as to leave the Chinese authorities enraged. This was particularly true when it became known that Harvard University had surreptitiously proceeded with experiments in China that had been forbidden by the authorities' years earlier, where they collected many hundreds of thousands of Chinese DNA samples and then left the country. The Chinese were furious to learn that Americans were collecting Chinese DNA. The government intervened and prohibited the further export of any of the data. The conclusion at the time was that the ‘research’ had been commissioned by the US military with the DNA samples destined for race-specific bio-weapons research.

**The aftermath of this reaction to the coronavirus will impact millions of people when the economic consequences set in. China's GDP is perhaps in excess of \$12.3 trillion today (it was \$12.27 trillion in 2017). The projected impact to China on account of the forecast drop in GDP (1-2%), would be \$122 billion, even if the impact is taken as 1% of the GDP. For Sri Lankans, in context, the country's total GDP is about \$88 billion (it was reported as \$87.17 billion in 2017). The impact on countries that have high economic dependency on China will be equally significant, and in some cases acute**

The Western media have already staked out their claim that the virus was transferred to humans from animals or seafood. The media have added fuel to the fire by claiming the virus emerged from “illegally traded wildlife” in a market “where offerings reportedly include wild animals that can carry viruses dangerous to humans”, and that this virus “jumped into the human population from an infected animal”. Chinese officials stated that the virus appears to have originated at a seafood market in Wuhan, though the actual origin has not been determined nor stated by the authorities, and is still an open question perhaps primarily since viruses seldom jump species barriers without human assistance.

The very unfortunate conclusion one can draw from Romanoff's paper is that bio-weaponry is real and that human beings have the capability and the mindset to carry out the vilest of acts in order to destroy fellow human beings.

While Romanoff does not say there is certainty that this virus spread is deliberate, or even accidental, he does present a background that makes one uncertain that this was a natural phenomenon. The lesson for Sri Lanka is perhaps to ponder whether there is more to this than what meets the eye.

Another lesson perhaps, is not about who makes which bioweapon, but what might act like a viral bioweapon that causes death and destruction arising from one community being poisoned against another by external elements. The recent Easter Sunday attacks appears to be an attempt by such to cause disharmony, death and destruction, and an attack on the economy of the country. This is not a hypothetical situation, as all these in fact happened.

The lesson is that Greeks or any other bearing gifts should not be trusted if there is evidence and even suspicion that such gift bearers, in their self-interest, have caused harm and destroyed countries and the amity amongst its people. The Middle East and countries like Iraq and Libya, others like Afghanistan comes to mind. Those who came supposedly to help these countries have left them in absolute chaos.

## Coronavirus: A Flashback to Biological Warfare of a Bygone Era

By Ameen Izzadeen

Source: <http://www.ipsnews.net/2020/02/coronavirus-flashback-biological-warfare-bygone-era/>

Feb 10 – In the wake of the latest coronavirus outbreak, movie buffs are drawing an eerie parallel with the film Contagion, a 2011 thriller based on a lethal airborne virus called Nipah and how the world's medical community battled to find a cure for the pandemic.

The movie, which is much in demand on streaming sites, attributes the origin of the virus to a bat.





It took 22 years after the end of World War II for the so-called civilised world to acknowledge the evil of biological weapons that fall into the category of weapons of mass destruction, along with chemical weapons and nuclear weapons.

Some 179 states have ratified the 1972 Biological Weapons Convention, the first multilateral disarmament treaty banning an entire category of weapons. It requires the parties to give an undertaking that they will “never in any circumstances develop, produce, stockpile or otherwise acquire or retain” biological weapons.

But the convention allows nations to conduct ‘defensive’ research so that they will be prepared to face or survive an attack or a virus outbreak. In other words, they are allowed to make a virus to kill a virus.

Laboratories in Australia, Hong Kong and Europe say they have cultured the coronavirus — 2019-nCoV in a race to develop a medicine as the death toll from the outbreak reached over 800 in China alone, as of February 9, while the number of cases stood at more than 28,000 in China — mainly in the Hubei Province — and nearly 200 elsewhere.

However, it is believed that some countries also develop offensive biological weapons and chemical weapons. There is little distinction between the chemical and biological weapons from a definitional aspect.

For instance, Agent Orange the United States used during the Vietnam War may be a chemical weapon, but the harm it caused was no different from that of a biological weapon. Similarly, the use of depleted uranium by the US in Iraq also falls into the grey area between chemical and biological warfare.

**During the Bosnian war, the Serbs used shells containing the Cold War-era nerve agent benzilate in the bombing of Srebrenica, and in the ongoing Syrian conflict, the government forces are accused of using similar weapons.**

The US is not the only big power which stands accused of using banned weapons. Take Russia. Despite its accession to the 1972 BWC and the 1993 Chemical Weapon Convention, it drew worldwide condemnation for the killing of a dissident Russian spy in 2006, by using a highly radioactive polonium-210 poison and a similar attack in 2018 on another dissident spy and his daughter.

The possibility of terrorists using portable biological weapons topped the international agenda after more than a dozen people were killed in the Sarin nerve gas attack carried out by the Japanese doomsday cult Aum Shinrikyo in three Tokyo subway stations in 1995.

Adding to the concerns is the anthrax scare that hit the US days after the September 11, 2001 terror attacks. Letters containing anthrax spores were mailed to media offices and politicians.

Five people died and 17 were infected in the bioterrorism attack that continued for weeks. Suspicion fell on two bioweapon experts. One was cleared; the other committed suicide before he was formally charged.

All this indicates the ineffectiveness of the BWC, a gentlemen’s agreement which largely requires the parties to submit only annual reports of compliance. The convention lacks a formal investigation mechanism to deal with violations.

And what better time than now to reinforce the convention when the world is gripped by the coronavirus threat?

*Ameen Izzadeen is Editor International and Deputy Editor, Sri Lanka Sunday Times.*

## Study Shows the Huge Impact Our Gross Airport Hygiene Has on The Spread of Pandemics

Source: <https://www.sciencealert.com/we-can-help-stop-pandemics-if-we-just-wash-our-hands-better-at-airports-study-shows>

Feb 11 – People really suck at washing their hands. In fact, research shows that [only about 70 percent](#) of people wash their hands after going to the toilet.

The inescapable grossness of that staggering statistic borders on being comical. But there’s really nothing funny about it, considering people around the world die every day from infectious diseases that could be dramatically mitigated if only people bothered to [practise good hand hygiene](#).

**"Seventy percent of the people who go to the toilet wash their hands afterwards," [says](#) physicist and data scientist Christos Nicolaides from the University of Cyprus and MIT. "The other 30 percent don't. And of those that do, only 50 percent [do it right](#)."**

What are the real-life consequences of this abject failure to keep our hands clean? They’re dire, new research from Nicolaides and his team suggests – particularly with regard to the way that contagion can rapidly spread throughout the world due to air travel, which has the power to turn epidemics into pandemics, and frighteningly quickly.



That's something health authorities around the world are desperately trying to prevent right now in the grim midst of the Wuhan coronavirus. And it's something we can help with, the new study finds, if only people washed their hands better at airports. Previous research has [demonstrated](#) that as few as one in five people in airports have clean hands at any given moment, meaning they've washed their hands with soap and water, for at least 15 seconds, within the last hour.



That's a pretty huge problem, given the vast number of things people touch with their hands in airport environments, including trays, railings, touch panels, doors, and much more.

Using epidemiological modelling and [Monte Carlo simulations](#), the researchers calculated **that increasing the amount of people with clean hands in airports would significantly lower the transmission of infections, lowering the likelihood of epidemics turning into pandemics.**

"Our simulation results suggests that, if we were able to increase the level of hand cleanliness at all airports in the world from 20 percent to 30 percent ... a potential infectious disease would have a worldwide impact that is about 24 percent smaller," [the authors write in their study](#).

"Increasing the level of hand cleanliness to 60 percent at all airports in the world would have a reduction of 69 percent in the impact of a potential disease spreading."

Even though we should all be washing our hands already (and should know the importance of it), the authors acknowledge that due to reasons of practicality and cost, it wouldn't be easy to quickly ramp up hand hygiene practice and awareness in all airports.

But the study also looked at the hypothetical effects of improving hand cleanliness at just the 10 most pivotal airports in the world for reducing infection transmissibility. Even if hand-washing was only increased at those 10 locations, disease spreading would decrease significantly, from 45 percent to 37 percent.

The researchers acknowledge their estimates involve numerous limitations and assumptions that may not accurately reflect real-life infection transmission, but hope their findings may encourage health authorities and decision-makers to consider the case for simply increasing the promotion of hand-washing in airports.

"[It] could help hindering any infection within a confined geographical area during the early days of an outbreak, inhibiting its expansion as a pandemic," [the researchers say](#).

"Population engagement with proper hand hygiene could be a simple and effective solution for preventing transmission of infections and reducing the risk of massive global pandemics."

►► The findings are reported in [Risk Analysis](#).

## Study: To Slow an Epidemic, Focus on Handwashing

By David L. Chandler

Source: <http://www.homelandsecuritynewswire.com/dr20200212-study-to-slow-an-epidemic-focus-on-handwashing>

Feb 12 – A new study estimates that improving the rates of handwashing by travelers passing through just 10 of the world's leading airports could significantly reduce the spread of many infectious diseases. And the greater the improvement in people's handwashing habits at airports, the more dramatic the effect on slowing the disease, the researchers found.

The findings, which deal with infectious diseases in general including the flu, were published in late December, just before the recent coronavirus outbreak in Wuhan, China, but the study's authors say that its results would apply to any such disease and are relevant to the current outbreak.

[The study](#), which is based on epidemiological modeling and data-based simulations, appears in the journal *Risk Analysis*. The authors are Professor Christos Nicolaidis PhD '14 of the University of Cyprus, who is also a fellow at the MIT Sloan School of Management; Professor Ruben Juanes of MIT's Department of Civil and Environmental Engineering; and three others.

People can be surprisingly casual about washing their hands, even in crowded locations like airports where people from many different locations are touching surfaces such as chair armrests, check-in kiosks, security checkpoint trays, and restroom doorknobs and faucets. Based on data from previous research by groups including the American Society for Microbiology, the team estimates that on average, only about 20 percent of people in airports have clean hands — meaning that they have been



washed with soap and water, for at least 15 seconds, within the last hour or so. The other 80 percent are potentially contaminating everything they touch with whatever germs they may be carrying, Nicolaides says.

“Seventy percent of the people who go to the toilet wash their hands afterwards,” Nicolaides says, about findings from a [previous ASM study](#). “The other 30 percent don’t. And of those that do, only 50 percent do it right.” Others just rinse briefly in some water, rather than using soap and water and spending **the recommended 15 to 20 seconds washing**, he says. That figure, combined with estimates of exposure to the many potentially contaminated surfaces that people come into contact with in an airport, leads to the team’s estimate that about 20 percent of travelers in an airport have clean hands.

Improving handwashing at all of the world’s airports to triple that rate, so that 60 percent of travelers to have clean hands at any given time, would have the greatest impact, potentially slowing global disease spread by almost 70 percent, the researchers found. Deploying such measures at so many airports and reaching such a high level of compliance may be impractical, but the new study suggests that a significant reduction in disease spread could still be achieved by just picking the 10 most significant airports based on the initial location of a viral outbreak. Focusing handwashing messaging in those 10 airports could potentially slow the disease spread by as much as 37 percent, the researchers estimate.

They arrived at these estimates using detailed epidemiological simulations that involved data on worldwide flights including duration, distance, and interconnections; estimates of wait times at airports; and studies on typical rates of interactions of people with various elements of their surroundings and with other people.

Even small improvements in hygiene could make a noticeable dent. Increasing the prevalence of clean hands in all airports worldwide by just 10 percent, which the researchers think could potentially be accomplished through education, posters, public announcements, and perhaps improved access to handwashing facilities, could slow the global rate of the spread of a disease by about 24 percent, they found.

Numerous studies (such as [this one](#)) have shown that such measures can increase rates of proper handwashing,

Nicolaides says.

“Eliciting an increase in hand-hygiene is a challenge,” he says, “but new approaches in education, awareness, and social-media nudges have proven to be effective in hand-washing engagement.”

The researchers used data from previous studies on the effectiveness of handwashing in controlling transmission of disease, so Juanes says these data would have to be calibrated in the field to obtain refined estimates of the slow-down in spreading of a specific outbreak.

The findings are consistent with recommendations made by both the U.S. Centers for Disease Control and the World Health Organization. Both have indicated that hand hygiene is the most efficient and cost-effective way to control disease propagation. While both organizations say that other measures can also play a useful role in limiting disease spread, such as use of surgical face masks, airport closures, and travel restrictions, hand hygiene is still the first line of defense — and an easy one for individuals to implement.

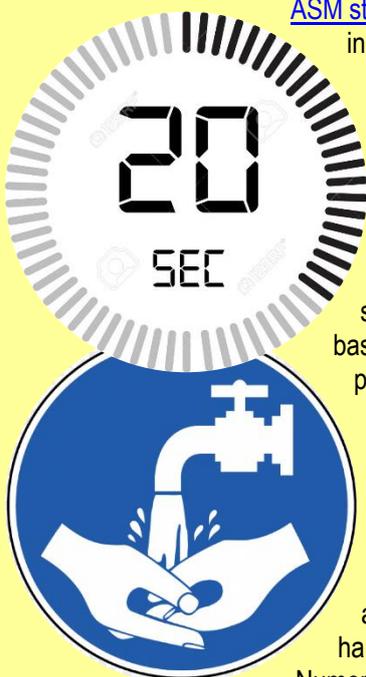
While the potential of better hand hygiene in controlling transmission of diseases between individuals has been extensively studied and proven, this study is one of the first to quantitatively assess the effectiveness of such measures as a way to mitigate the risk of a global epidemic or pandemic, the authors say.

The researchers identified 120 airports that are the most influential in spreading disease, and found that these are not necessarily the ones with the most overall traffic. For example, they cite the airports in Tokyo and Honolulu as having an outsized influence because of their locations. While they respectively rank 46th and 117th in terms of overall traffic, they can contribute significantly to the spread of disease because they have direct connections to some of the world’s biggest airport hubs, they have long-range direct international flights, and they sit squarely between the global East and West.

For any given disease outbreak, identifying the 10 airports from this list that are the closest to the location of the outbreak, and focusing handwashing education at those 10 turned out to be the most effective way of limiting the disease spread, they found.

Nicolaides says that one important step that could be taken to improve handwashing rates and overall hygiene at airports would be to have handwashing sinks available at many more locations, especially outside of the restrooms where surfaces tend to be highly contaminated. In addition, more frequent cleaning of surfaces that are contacted by many people could be helpful.

The research team also included Demetris Avraam at the University of Cyprus and at Newcastle University in the U.K., Luis Cueto-Felgueroso the Polytechnic University of



Madrid, and Marta Gonzalez at the University of California at Berkeley and MIT. The work was supported by startup company Smixin Inc and MIT International Science and Technology Initiatives.

*David L. Chandler writes about energy, engineering, and materials science for the MIT News Office.*

## What is Military Role in Coping with Coronavirus?

Source: <https://i-hls.com/archives/98807>

Feb 09 – Concerns have been rising regarding the spread of the Coronavirus outside the boundaries of China, and the World Health Organization has already defined the situation as “Public Health Emergency of International Concern.” Alongside preparedness at the civilian level, what is the role of military forces in coping with this peril?

In Israel, the IDF and the Medical Corps are prepared for the possibility of a contamination, according to the IDF website, however, no details were disclosed regarding the role of the military in the preparations. In spite of caution measures, the IDF Radio reported that Asian soldiers have been training with IDF soldiers. IDF Spokesman commented that there was no risk of contagion.

What role is the US military fulfilling with this regard if an outbreak were to occur in the U.S? The military has substantial medical and logistical assets, from hospital ships to heavy lift transport, and the Pentagon can help civilian authorities respond to a medical emergency — both on US soil and abroad.

According to [popularmechnics.com](http://popularmechnics.com), the use of the U.S. military within American borders is a tricky exercise. Due to an aversion to the domestic use of armed troops reaching back to the Revolutionary War, the military can by law only perform certain missions, and is usually prohibited from law enforcement tasks. Other missions, including transportation, search and rescue, and medical support could be undertaken without legal restriction. The Air Force’s C-5M Super Galaxy, C-17 Globemaster III, and C-130J Super Hercules transports can move huge amounts of supplies by air.

The U.S. Navy also has substantial medical assets. Most large ships, including aircraft carriers and amphibious assault ships, have extensive medical facilities, including operating rooms, recovery rooms, x-ray machines, and other equipment.

The Navy also has two hospital ships, USNS Mercy and USNS Comfort.

The U.S. Army and U.S. Marine Corps also maintain dedicated units designed to operate in chemical, nuclear, radiological, and most importantly biological environments. The **Marines’ CBIRF** – Chemical Biological Incident Response Force is a battalion-sized unit based at Indian Head, Maryland. The CBIRF is a high readiness force capable of deploying quickly to respond to crises. It can deploy one initial response force of 150 personnel within 24 hours, and the second force within 48 hours.

These are only several aspects of the military role in the likelihood of a contagion in the US.



## The coronavirus outbreak: 3 ways the United States was (and is) unprepared

By Matt Field

Source: <https://thebulletin.org/2020/02/the-coronavirus-outbreak-3-ways-the-united-states-was-and-is-unprepared/>

Feb 11 – Much like the person who has already forgotten the pain of last week’s hangover and returns to the bar, the government tends to go back to its old ways after a crisis begins to ebb. The memory of the emergency fades. Plans, programs, and funding fall [off the agenda](#). That’s a particularly unfortunate phenomenon when it comes to a public health crisis like the deadly coronavirus that’s spreading in China and has already made it to 24 other countries and a cruise ship, an emergency that is shining a spotlight on some of the ways the United States is unprepared for an epidemic.

In a wide-ranging discussion, Asha George, a biosecurity expert and executive director of the Bipartisan Commission on Biodefense and a member of the *Bulletin’s* [Science and Security Board](#) talked about where she thinks the government is falling short [in its response](#) to the coronavirus and other biological threats.

### Funding for public health isn’t keeping up with the need

It’s hard to put a number on how much the US government should be spending on biodefense; various departments have programs that could fall under that broad umbrella.



When it comes to public health preparedness efforts, however, like fighting the coronavirus, the funding isn't enough. Last week, the Health and Human Services Department notified Congress that it may need to reallocate [\\$136 million](#) in funding to combat the disease, a sign of unmet need.

"They're going to be robbing Peter to pay Paul in order to do this response," George says. "I think we can say that. If the CDC (Centers for Disease Control and Prevention) itself is having to move more than \$100 million to respond to something, and that's just now, what happens when two more weeks goes by? They can't continue to do that."

Renewed funding of a government account that's been around since the 1980s could help.

"We have had in the past a public health emergency response fund. And it was never really funded particularly well in the first place," George says. "The Congress did say this is something that should be done. It just didn't get a whole lot in the way of appropriations. Now, [the Bipartisan Commission on Biodefense] said that there needs to be \$2 billion in that fund so that people can immediately draw from it and then replenish it later, instead of trying to respond and then belatedly going and asking Congress for an appropriation."

One prominent congressperson, Connecticut Rep. Rosa DeLauro, issued [a call for \\$5 billion](#) to be placed in the Public Health Emergency Fund. She'd made the same request in 2016, during a Zika epidemic. At that time, according to her press release, the account had only been [funded twice](#) since it was set up in 1983. An NPR report from 2016 found that the fund had about [\\$57,000 in it](#), down from \$30 million when it was created. The government has other pots of money, and the Health and Human Services Department has been drawing money from an infectious disease response fund.

"I'm not saying that we're that many billions of dollars short," George says. "But if we had a whole lot of money, if the public health community were replete with dollars, I don't think we would be talking about billions being put into a response fund."

### **The Strategic National Stockpile isn't sufficiently prepared to deal with emerging diseases like the coronavirus**

The government maintains [a stockpile](#) of medicine, vaccines, and health supplies. There's growing concern that some US supplies [like masks](#) and [drug ingredients](#) could be threatened. China, for example, makes a lot of the surgical masks that might play a part in slowing the spread of a disease like the coronavirus. But in addition to addressing threats to the supply chain, George says, the [national stockpile](#) needs to emphasize broader tools. Right now, a lot of what's in the stockpile, George says, is there to combat narrow threats.

"As an example, people were worried about the threat of weaponized smallpox being used against the United States. So, what do we have in the stockpile? We have a whole bunch of smallpox vaccine," she says. "Obviously, we had our anthrax events in 2001. So what do we have in the stockpile? We have a whole bunch of anthrax vaccines. It's very specific things. Not to say we should just throw all that out, and that there's no value in trying to have some targeted countermeasures for specific threats in there, but that stuff's not going to do us any good when it comes time to dealing with coronavirus."

### **The US has a biodefense strategy—it just isn't following it**

In 2018, the Trump administration released a National Biodefense Strategy which was supposed to help coordinate government-wide efforts like detecting and responding to diseases. George says the implementation of the strategy has fallen short of expectations.

"The implementation of a national strategy, it was slow to begin, and it was slow to continue," she says. "And it's our understanding that it sort of ground to a halt during the assessment phase."

Both of Trump's immediate predecessors, former presidents George W. Bush and Barack Obama, released broad strategies on biodefense, only to see them get bogged down in the implementation. In 2018, RAND researcher Daniel Gerstein chalked these failures up partly to [lack of funding](#). None of the strategies, he wrote, "including the new Trump strategy, explicitly stated where the necessary resources would come from."

Even a federal assessment of the Trump biodefense strategy is behind schedule. The GAO, a government agency that investigates the effectiveness of federal programs, announced last June it would release a comprehensive report by the end of 2019. A spokesperson said Friday that the report was now expected during the week of Feb. 17, because of the difficulty of working with "so many different federal agencies."

The administration [released the strategy](#) in September 2018.

At the end of January, the Trump administration announced a coronavirus task force headed by Secretary of Health and Human Services Alex Azar. The announcement came a month after China reported cases of the new disease to the World Health Organization. George said that if the cabinet-level biodefense committee called for in the strategy were fully



functional, then the administration wouldn't have had to put together a specific coronavirus task force in the first place.

"We would have obviated the need for a coronavirus task force because The White House naturally would have said, 'Well, we have steering committee, you guys just take it, it's your thing.'"

Major disease outbreaks have been frequent in recent decades. After all, the 2014-2016 Ebola pandemic was only four years ago. The outbreaks of SARS, Zika, and the H1N1 flu, aren't distant events either.

"We're not talking about 5,000 mutations and 10, 20, 30 years before we're dealing with a potentially horrible pandemic that kills millions and millions of people," George says. "We're maybe one or two mutations away from something like that. And I think we just need to do a better job taking that sort of risk into consideration."

*Matt Field is an associate editor at the Bulletin of the Atomic Scientists. Before joining the Bulletin, he covered the White House, Congress, and presidential campaigns as a news producer for Japanese public television. He has also reported for print outlets in the Midwest and on the East Coast. He holds a master's degree in journalism from Northwestern University.*

## Scientists Discover Giant Viruses With Features Only Seen Before in Living Cells

By Tessa Koumoundouros

Source: <https://www.sciencealert.com/giant-bacteria-infecting-viruses-have-features-previously-only-seen-in-living-cells>

Feb 14 – Sifting through a soup of genes sampled from many environments, including human saliva, animal poop, lakes, hospitals, soils and more, researchers have found hundreds of giant viruses - some with abilities only seen before in cellular life.

The international team, led by scientists from University of California, Berkeley, has discovered entire new groups of giant phages (viruses that infect bacteria) and pieced together 351 gene sequences.

Within these they found genes that code for unexpected things, including bits of the cellular machinery that reads and executes DNA instructions to build proteins, also known as [translation](#).

"They have an unusual number of components of the translation machinery that you do not find on a typical virus," microbiologists Basem Al-Shayeb and Jill Banfield from UC Berkeley told ScienceAlert.

The translation process takes place in molecular structures known as ribosomes, and the researchers actually found genes that code for some of their components - [ribosomal proteins](#).

"Typically, what separates life from non-life is to have ribosomes and the ability to do translation; that is one of the major defining features that separates viruses and bacteria, non-life and life," [said microbial ecologist Rohan Sachdeva](#) from UC Berkeley.

"Some large phages have a lot of this translational machinery, so they are blurring the line a bit."

The team also found sequences for [CRISPR](#) systems, which also happens to be the 'immune system' bacteria use against viruses, the very same system we humans have co-opted for our own gene manipulation purposes.

The newly discovered viruses all have genomes more than 200,000 [base pairs](#) long, whereas the average known phage size is more along the lines of 52,000 base pairs.

Some phage genomes identified by the team were true whoppers; the researchers have named one group Whopperphage, and designated the other nine new groups after the word "big" in the different languages of the contributing authors.

"The genomes of these phages are at least four times the size of a typical phage, and the largest is 15 times larger - 735,000 bases of DNA," Al-Shayeb and Banfield said.

These larger phages are thought to infect [Bacteroidetes](#), a group of bacteria widely dispersed in our environment, from soil to our intestines.

The genomes of these hefty phages are large enough to rival those of small bacteria, but the amoeba-infecting pandoraviruses still hold the title of [the largest viral genome](#) at 2.5 million base pairs.

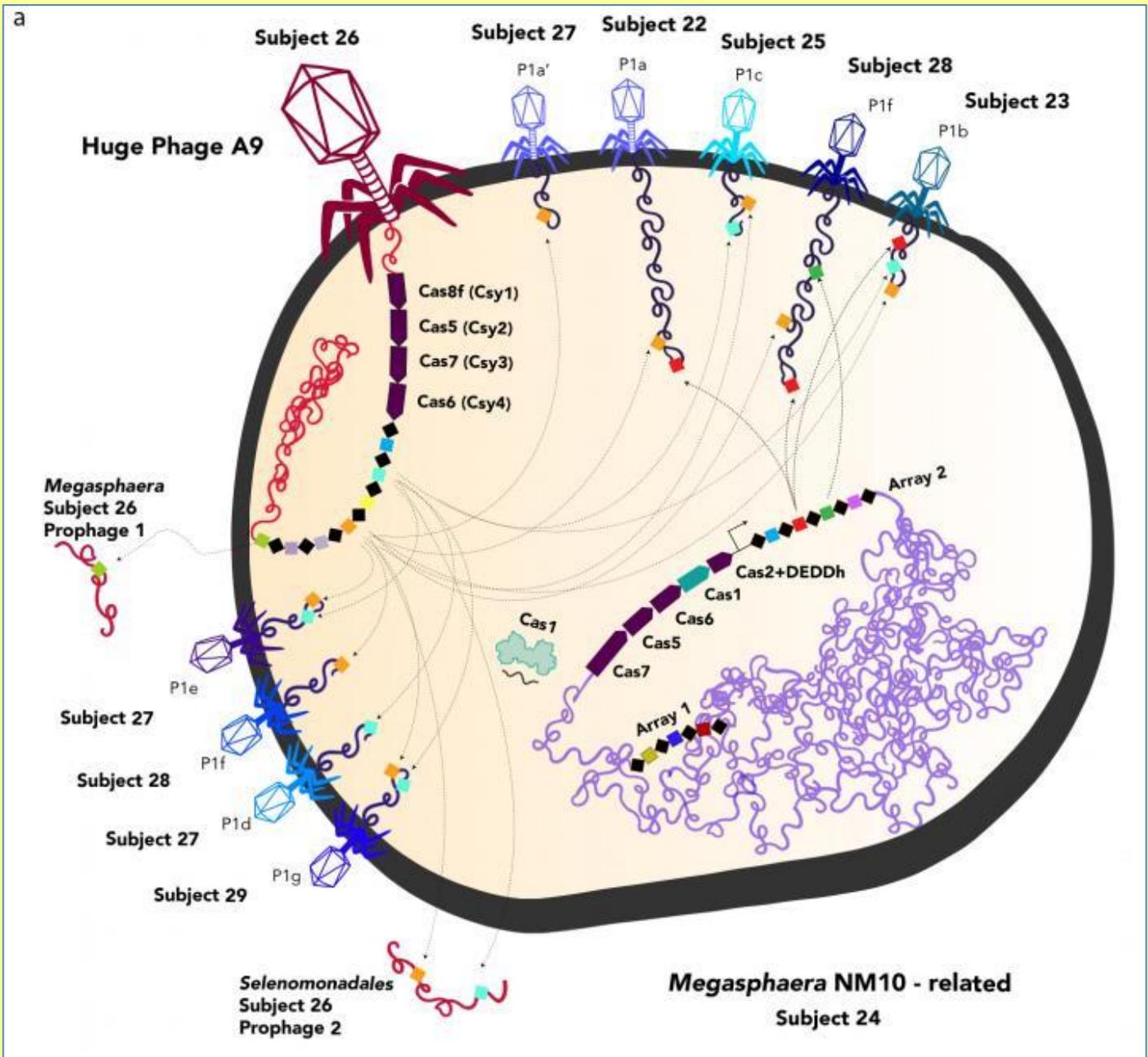
"Large phages [have been found before](#), but they were spot findings," Sachdeva [told the Innovative Genomics Institute](#). "What we found in this paper is they are essentially ubiquitous. We find them everywhere."

Like other phages, these chonkers inject their DNA into their bacterial host, hijacking the victim's gene replication equipment to make copies of themselves.

The researchers suspect that while this is happening, the giants also use some of their additional genes to derail early stages of translation inside the bacteria, and divert protein production to suit their own needs. Such control of protein creation has [also been observed in animal viruses](#).



Al-Shayeb explained that giant phages use their CRISPR system for phage-on-phage warfare, by specifically targeting competing viruses that try to infect the same host bacterium. [A study from last year](#) shows how some phages use this system to thwart anti-phage measures their host bacteria may deploy.



A huge phage (Subject 26) infecting a bacterium and manipulating its response to other phages. (Jill Banfield Lab/UC Berkeley)

"The sense we have looking at these large genomes is that phages have acquired a lot of different genes and pathways - some of which we can predict, some of which we can't for really taking control of bacterial hosts' function during infection," Banfield [told the Innovative Genomics Institute](#).

As we learn more about the links between our [physical](#) and [mental health](#) and the [microbes](#) we share our bodies and environments with, it is clear that what affects them can also profoundly impact us.

"Phages are also known to transfer genes for bacterial toxins and antibiotic resistance between bacteria, which contribute to disease," Al-Shayeb said.



"Since we have both harmful and useful bacteria living on us and within us, understanding what kinds of phages coexist with them in humans and animals and how they affect those environments is of great value."

The researchers suggest that the interesting CRISPR systems some of these phages possess may have the potential to help us control our own microbiomes, by altering the function of bacteria or eliminating the troublesome ones.

They now hope to grow some of these whopper phages in the lab, to learn more about these phage-associated CRISPR systems and "discover their roles and test for value in genome editing", according to Al-Shayeb and Banfield.

Biochemist Christoph Weigel, who was not associated with the study, [suggested on Twitter](#) that the paper provides "strong support" for considering viruses living "virocells".

"These huge phages bridge the gap between non-living bacteriophages, on the one hand, and bacteria and Archaea," [explained Banfield](#).

"There definitely seem to be successful strategies of existence that are hybrids between what we think of as traditional viruses and traditional living organisms."

Whatever else this huge addition to our knowledge of viral biodiversity brings, it's already sparking further [discussion on what it means to be alive](#).

►► This study was published in [Nature](#).

## The Coronavirus: Is China using it as a weapon?

By John Cote

Source: <https://sofrep.com/news/2019-ncov-is-it-a-weapon/>

Feb 14 – Television and radio news outlets are providing updates on the current spread of the Coronavirus.

The Coronavirus first presented itself to the medical researchers in 1960 when it was found in the respiratory tract of a patient with



a common cold. It gets its name from the crown-like spikes which radiate out from all over the surface of the virus. Its discovery created the new form of virus, Coronaviridae.

**EDITOR'S COMMENT:** Why this photo in an article on bioterrorism? No protection for skin and heads; some have canisters, others not. Most probably, no PPEs as well! Who are these people? A US veteran should know better and choose the right photo.

Two other forms of Coronavirus exist and they are the Severe Acute Respiratory Syndrome or SARS, which was introduced into the human population in 2003 when a farmer in Guangdong China got it

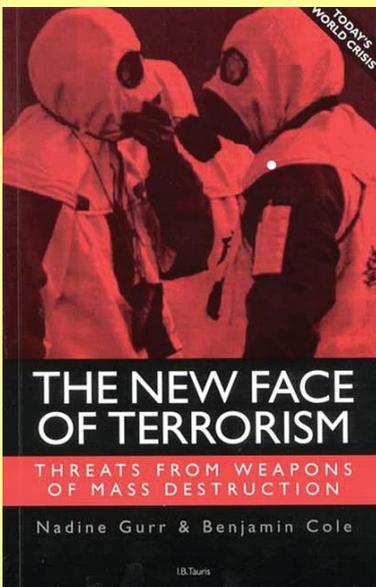
from a civet — a cat-like animal. Then in 2012, the Middle East Respiratory Syndrome MERS virus was isolated in a patient in Saudi Arabia. SARS spread to 37 different countries infecting a total of 8,448 patients and killing 858; the spillover came from Camels.

[The current form of coronavirus](#) is called Novel Coronavirus (2019-nCoV). It presented itself to the human population sometime in the early part of December 2019. We still do not know



the origin of its jump from an animal to a human. Originally, the Chinese government claimed that the first case came from a Chinese Wet market located in Wuhan.

- **Fact:** The Wuhan Wet market was inspected by government officials two months before the outbreak.
- **Fact:** Wuhan Institute of Virology of the Chinese Academy of Sciences was established in 2015 in Hubei China. This facility is the only Level BSL4 laboratory in China.
- **Fact:** The Wuhan Institute is currently conducting studies with the coronavirus. This is known by the scientific papers published by staff members.
- **Fact:** This new illness presented itself during the largest human migration of the year: the Chinese New Year celebration. Over 1.5 billion people are on the move across the globe visiting family members.
- **Fact:** This illness presented itself during the normal flu season.
- **Fact:** This illness appears to have a 14-day incubation period and the illness can be spread asymptotically meaning it can be contagious even before the symptoms present themselves.
- **Fact:** 2019-nCoV has no natural immunity.
- **Fact:** There is **no vaccine** available.
- **Fact:** Chinese officials have now stated it spreads by way of droplets and aerosols.



Nadine Gurr and Benjamin Cole stated in their book *The New Face of Terrorism, threats from weapons of mass destruction*: “Outside of war situations, states have used NBC weapons for covert operations many times.” As an example, they mention that “in the 1970s, Cuba accused the U.S.A. of being responsible for blue mold found on their tobacco crops, and cane smut on sugar cane. But since these blights are not unknown to Cuba, it’s impossible to tell if this was a covert [Biological Weapons \(BW\) attack](#).”

The mayor of Wuhan was told by the Central Government of China to keep the outbreak of this new virus secret. He allowed five million people to leave Wuhan before steps were taken to restrict travel from the infected region. These five million people were the initial carriers of 2019-nCoV.

My contention is that this outbreak was a test to see how effectively this new weaponized virus would spread. History has shown that the Central Government of China cares little about its population. I would not be surprised if this were a test that has spun completely out of control.

The reason I believe that 2019-nCoV has been weaponized is that it is highly contagious even before symptoms start appearing in the victims. The one major diagnostic test used by officials to control the spread of the disease is checking the temperature of the patient and if they have a fever then they are suspected of having the virus. However, 2019-nCoV can be spread by patients who are asymptomatic, which means that symptoms wouldn’t show yet. Passengers

carrying 2019-nCoV can easily pass through airport checkpoints undetected and they are still contagious.

[Time will tell if I am correct or not.](#)

*John Cote is a US Navy Veteran of Desert Storm, living in the Czech Republic for the past 25 years. Running his own Security Consulting Firm since 2000. Currently he is lead terrorism analyst at the Terrorism Tactical Intelligence Cell.*

## Coronavirus: Are cruise ships really 'floating Petri dishes'?

Source: <https://www.bbc.com/news/world-asia-51470603>

Feb 12 – The largest coronavirus outbreak outside mainland China is not in a country, but on a cruise ship.

It’s been more than a week since the Diamond Princess went into lockdown, after a previous passenger tested positive for the virus after disembarking.

With almost 500 out of 3,700 people on board tested, 174 people have now tested positive for coronavirus. Those still on board are in quarantine for another week.

But it’s not just the Diamond Princess.

On another cruise ship in Hong Kong, 3,600 passengers were quarantined because of fears that people on board might have the virus.

They were only allowed to disembark after tests came back negative.



## C<sup>2</sup>BRNE DIARY – February 2020

And a cruise ship carrying more than 1,450 passengers, which left Hong Kong on 1 February, was turned away from ports in Japan, Taiwan, Guam and the Philippines, despite having no infections on board. It has now been told it can dock in Cambodia. Cruise ships have for years been referred to as "floating Petri dishes" - places ripe for the exchange of germs, and the spreading of illness.

But is the accusation true?

### Do viruses spread more easily on cruise ships?

There is an increased risk of respiratory and gastrointestinal diseases on ships, says Prof Sanjaya Senanayake, an infectious diseases specialist at the Australian National University.

"In general, you've got passengers and crew members from different parts of the world mixing intimately and intensely for a short period of time," Dr Senanayake says.

"They've all got varying levels of immunity and so that does set things up for an infection outbreak."

With coronavirus, which is believed to spread through droplets - such as from mucus or saliva - people could be infected without direct contact with a carrier.

"Say if someone sneezed on to a table, and then someone else immediately touches that table, that could lead to infection," Dr Senanayake says.

"People might not all be talking to each other - but they are in shared spaces like swimming pools, spas, dining rooms and auditoriums."

However, Stewart Chiron, a cruise expert, says "the reality onboard a cruise is very different to the perception of it".

"So, for example, people think that when you're queuing up at buffet lines that there's a lot of interaction and contact between passengers," says Mr Chiron, who has been on board more than 250 cruise ships.

"For the major cruise lines, that's not true. There are stations - if you want eggs you go to the egg station, a gloved crew member will do that for you.

"The point is that you're rarely waiting in a line, and not everyone passes by every piece of food - what that does is minimise the interaction between people."

Media caption Sea urchins and Swiss rolls: Quarantine around the world



### But what about crew members?

If passenger interaction is minimised, crew interaction is another story.

On the Diamond Princess, at least 10 crew members are among the infected. According to the New York Times, more than 1,000 crew members "live and work elbow-to-elbow".

"It's likely crew members will be in very close contact with each other, perhaps even sharing facilities," says Dr Senanayake.

"People will disembark the ship but the crew members often may not change. So, if there is ongoing transmission from the crew, when the next set of passengers come on that may continue."

### How are the risks mitigated?

According to Mr Chiron, cruises have extremely stringent cleaning and screening processes.

"Cruises are always taking thorough readings of passengers. If you look ill then you are subject to a secondary medical screening." Probably the disease most associated with cruise ships is norovirus, a vomiting illness caught via contaminated food or water, or by touching contaminated surfaces.

"Cruises have various protocols that are enabled when a norovirus case is reported," says Mr Chiron.

"There's extensive scrubbing that goes on, all the surfaces are continuously cleaned. During the buffets there will be no food like bread baskets. The crew are specially trained for this."

He adds that things have become more stringent since the outbreak of the coronavirus.

"You can tell now they're much more observant of passengers' appearances. If you look at how well ships are cleaned and maintained - they are extremely thorough."

According to Dr Senanayake, there is an official Vessel Sanitation Program at the US Centre for Disease Control and Prevention (CDC) that advises ships on how to prevent and control the spread of illnesses.



## G<sup>2</sup>BRNE DIARY – February 2020

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"I believe cruise ships now have got a lot of disinfection stations, and are also advising patients or crew members who are sick not to come on board," he says.

"There is that risk of going on a cruise ship but everything in life comes with risks. [People just have to] practice simple [precautionary] measures."

For the Diamond Princess, Dr Senanayake says the ship is employing "good isolation measures" by keeping people in their rooms (passengers are allowed onto the outdoor decks at certain times).

However, he adds: "[The ship] needs to make sure people understand why this is happening and understand their concerns.

"You've gone from having the time of your life to being isolated in your room feeling very scared. The quarantine should always be done in a very humane and compassionate way."

### Is the industry suffering?

The cruise industry will definitely take a "financial hit" - but these cases aren't going to stop people from taking cruises, says Mr Chiron.

"The damage they're going to take specifically is from the cruises around China and South East Asia. The lines themselves are cancelling routes.

"Cruise Norwegian, for example, are cancelling all their Asia sailings. They are going to have to issue refunds, credits - we're talking hundreds of millions of dollars.

"But when you look at the rest of the world, Europe, Alaska, the US - people are still travelling. Royal Caribbean revealed that just 1.5% of enquiries they received were about people asking the virus.

"People are concerned, yes, but they are still travelling. Elsewhere in the world the ships are full and they are going to continue to be full."

## A Coronavirus Quarantine in America Could Be a Giant **Legal Mess**

By Polly J. Price

Source: <https://www.theatlantic.com/ideas/archive/2020/02/coronavirus-quarantine-america-could-be-giant-legal-mess/606595/>

Feb 16 – For observers in the United States, it was **shocking enough** when, in January, the Chinese government effectively sealed off Wuhan, larger in population than New York City. Officials shut down public transportation and blocked highways, confining residents and visitors alike in an attempt to stop the spread of the new coronavirus.

But in the weeks since, the measures have become more drastic still. The quarantine-style lockdown has since been extended to include more than 50 million people elsewhere in China. Officials have ordered [door-to-door](#) checks in Wuhan to round up the infected for further isolation. Anyone who hides infections, one official said, "[will be forever nailed to history's pillar of shame.](#)"

Putting aside the question of whether such radical measures are even effective, China's government generally has much more authoritarian control over its population than the American government has over its. **If a fast-spreading, deadly epidemic should threaten the United States, could the U.S. government do the same? The answer is yes:** American government officials do have [extensive authority](#) to implement public-health measures to stop an epidemic, as the Americans on the Diamond Cruise ship in Yokohama, Japan, are now learning. [According to The Washington Post](#), they were told on Saturday that following their two-week quarantine aboard the ship they would face an additional two-week quarantine back in the United States.

**In the U.S., quarantine is the most extreme use of government power over people who have committed no crime.** As a legal matter, the U.S. Supreme Court recognized a seemingly unlimited local power to quarantine as early as 1824, in the case [Gibbons v. Ogden](#). It reaffirmed this power in [1900](#), noting that "from an early day the power of the States to enact and enforce quarantine laws for the safety and the protection of the health of their inhabitants ... is beyond question."

Government officials can prevent travel, require vaccinations, make people submit to medical exams, and commandeer private property. Even those who are not sick can be ordered into quarantine—confined to their home or another location with others who may also have been exposed to a virus. When quarantine is medically justified, individual rights give way to the greater good. As the Court stated in [Jacobson v. Massachusetts](#) in 1905, "Upon the principle of self-defense, of paramount necessity, a community has the right to protect itself against an epidemic of disease which threatens the safety of its members." The constitutional structure tolerates such substantial restriction of liberties for at least a limited time in a true public-health emergency. That said, [constitutional protections](#) during quarantine do exist. For example, health officials must use the least restrictive means



consistent with medical guidance, and the government must have good reason to believe you've been exposed.

**But the average American may be surprised to learn *who* holds the authority to order such public-health measures.** Except at the nation's borders, the federal government, with the expertise of the Centers for Disease Control and Prevention, is *not* in charge. America's defense against epidemics is divided among [2,684 state, local, and tribal public-health departments](#). Each one is responsible for monitoring people within its jurisdiction, imposing isolation or quarantine as needed. CDC officials are "[preparing as if \[the new coronavirus\] is the next pandemic](#)," but in reality, the laboring oar falls to state and local health departments.

The federal government's quarantine powers at U.S. borders are indeed extensive. The Department of Homeland Security has implemented a travel ban on noncitizens who have been anywhere in China recently. U.S. citizens, by contrast, cannot be turned away at the border, but they can be ordered into quarantine to be monitored, at present for up to two weeks. The secretary of health and human services [announced quarantine measures](#) for returning citizens not long after the [CDC](#) issued its first federal quarantine order in more than 50 years—for the first planeload of people evacuated from Wuhan by the U.S. State Department.

**Federal quarantine orders, however, are implemented and enforced by state health authorities, not federal officials.** That means state and local health departments provide the labor, set the rules, monitor people who might have been exposed to the virus, and trace the contacts of those who fall ill. The federal quarantine order for the 195 evacuees from Wuhan? That order was able to prevent them from leaving the plane they arrived in. The federal government could also order the quarantine of an entire cruise ship at one of the nation's seaports—as Japan has done. But otherwise, federal quarantine orders have a pretty limited effect. When [one of the Wuhan evacuees](#) wanted to leave the military base in California where the group was under quarantine, a state-level quarantine order was necessary to prevent that from happening. This is because the quarantined group was no longer at a point of entry, or in an airplane, and was thus subject to the jurisdiction of the local health department where they were quarantined.

Despite extensive federal measures to protect the U.S. from threats originating abroad, inevitably a virus will get through screening (as indeed the Wuhan coronavirus [already has](#)). This is where the weakness of a federalist system of national health defense is exposed. States may choose to ignore federal quarantine guidelines, or they may decide that more drastic measures are required, such as a lockdown against a neighboring city or region. Extreme measures may be necessary in a public-health emergency, but the variation from one location to another could also make an epidemic worse as each state makes its own rules, looks out for its own interests, and relies on its own resources. Jurisdictional boundaries are enforced, among other reasons, to preserve limited budgets.

This unique brand of public-health federalism can make implementing a national strategy in the event of a threatened epidemic very difficult. **During the [2014 Ebola scare in the U.S.](#), fierce public debate ensued about what measures to take.** Panic set in as political leaders squabbled and it became clear that there was no single, national plan to follow. State and local health officials are the final authority on what preventive measures to take within their jurisdiction. With this setup, having an effective national strategy when one is needed is complicated if not impossible.

**Does the U.S. Constitution in fact prevent a larger role for the CDC in setting quarantine policy within the country? At least when this question was previously asked, more than a century ago, Congress thought the answer was no.**

The question emerged in the late 19th century, when yellow-fever epidemics in the southern U.S. sent panicked citizens fleeing, and cities and towns throughout the region closed their borders to one another. The nascent U.S. Public Health Service set up camps in Alabama and Florida for refugees, as they termed them, who had nowhere to go but did not wish to return to a place in the midst of an epidemic. After long debate, Congress responded with [the 1890 Epidemic Diseases Act](#), providing federal authority over state and local quarantine, though many senators at the time did vote against it, believing it to be unconstitutional. As a result (on paper at least), the federal government may impose (or lift) quarantines in the interior whenever specified contagious diseases threaten to spread "from one state ... into any other state." The CDC's modern-day interstate authority is limited primarily to "[do not board](#)" orders to prevent air travel within the U.S. by persons known to be ill, and rely on state health departments to request the order.

**But the question has not been tested, or even debated, in modern times.** Until we have a need to test the limits of the federal government's interstate quarantine authority (and let's hope we don't), who is in charge of setting national policy in the event of an epidemic emergency? The surgeon general of the United States? The CDC? And will that authority be believed?

It needs to be, because with public health under local political control, one state or local government's failure could mean the more rapid spread of a virus anywhere in the nation. State and local jurisdictions have limited medical and scientific resources to understand the transmission of complex diseases and to form independent judgments about the best means to control spread. Quarantine policies or other emergency measures set by the federal government are not better just because they can provide uniform rules throughout the nation—federal officials, too, can overreact in counterproductive and rights-threatening ways. But clear lines of authority may be needed.



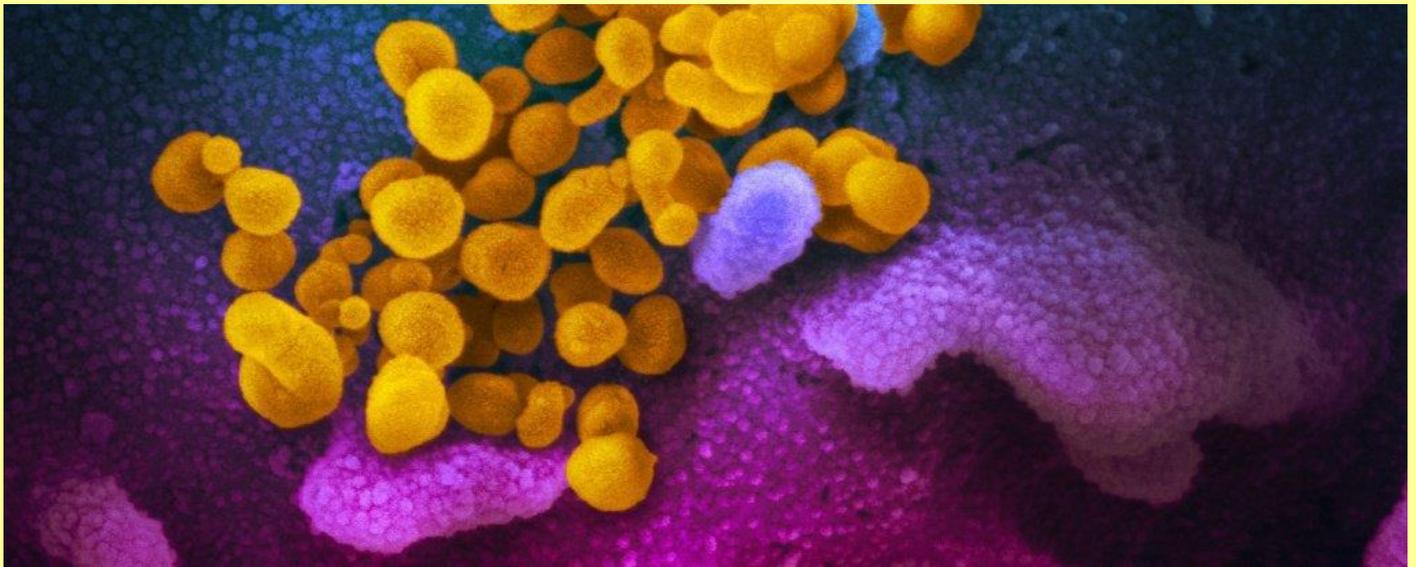
This is where the world-leading scientific expertise of the CDC is essential. With a SARS-like virus or pandemic flu with the ability to spread through the air, the potential exists for constitutional conflict that could be too fast-moving for courts to intervene, either in favor of measures that state or local governments wish to take or to elucidate the boundaries of interstate quarantine authority such that a federal quarantine order would take precedence over contrary state or local measures. If it comes to that, the CDC's credibility will be necessary to coordinate the responses of all the different jurisdictions, or something much worse than a constitutional dispute could befall the country.

*Polly J. Price is a professor of law and global health at Emory University. She is the author of the forthcoming book [Plagues in the Nation](#).*

## Here's Why It's Taking So Long to Develop a Vaccine for The New Coronavirus

By Rob Grenfell and Trevor Drew

Source: <https://www.sciencealert.com/who-says-a-coronavirus-vaccine-is-18-months-away>



Feb 17 – **The World Health Organisation said this week it may be 18 months before a vaccine against the coronavirus is publicly available.**

Let's explore why, even with global efforts, it might take this long.

[China shared publicly](#) the full RNA sequence of the virus – [now known as](#) SARS-CoV-2 rather than COVID-19, which refers to the disease itself – in the first half of January.

This kickstarted efforts to develop vaccines around the world, including [at the University of Queensland](#) and institutions in [the US and Europe](#).

By late January, the virus was successfully grown outside China for the first time, by Melbourne's [Doherty Institute](#), a critically important step. For the first time, researchers in other countries had access to a live sample of the virus.

Using this sample, researchers at CSIRO's high-containment facility (the [Australian Animal Health Laboratory](#)) in Geelong, could begin to understand the characteristics of the virus, another crucial step in the global effort towards developing a vaccine.

Vaccines have historically taken [two to five years](#) to develop. But with a global effort, and learning from past efforts to develop coronavirus vaccines, researchers could potentially develop a vaccine in a much shorter time.

### Here's why we need to work together

No single institution has the capacity or facilities to develop a vaccine by itself. There are also more stages to the process than many people appreciate.

First, we must understand the virus's characteristics and behaviour in the host (humans). To do this, we must first develop an animal model.



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Next, we must demonstrate that potential vaccines are safe and can trigger the right parts of the body's immunity, without causing damage. Then we can begin pre-clinical animal testing of potential vaccines, using the animal model.

Vaccines that successfully pass pre-clinical testing can then be used by other institutions with the capacity to run human trials.

Where these will be conducted, and by whom, has yet to be decided. Generally, it is ideal to test such vaccines in the setting of the current outbreak.

Finally, if a vaccine is found to be safe and effective, it will need to pass the necessary regulatory approvals. And a cost-effective way of making the vaccine will also need to be in place before the final vaccine is ready for delivery.

Each of these steps in the vaccine development pipeline faces potential challenges.

### Here are some of the challenges we face

The international [Coalition for Epidemic Preparedness Innovations](#) has engaged our team in those first two steps: determining the characteristics of the current virus, then pre-clinical testing of potential vaccines.

While Melbourne's Doherty Institute and others have been instrumental in isolating the novel coronavirus, the next step for us is growing large amounts of it so our scientists have enough to work with. This involves culturing the virus in the lab (encouraging it to grow) under especially secure and sterile conditions.

The next challenge we face is developing and validating the right biological model for the virus. This will be an animal model that gives us clues to how the coronavirus might behave in humans.

Our previous work with SARS (severe acute respiratory syndrome) has given us a good foundation to build on.

SARS is another member of the coronavirus family that spread during 2002-03. Our scientists developed a biological model for SARS, using ferrets, in work [to identify the original host](#) of the virus: bats.

SARS and the new SARS-CoV-2 [share about 80-90 percent of their genetic code](#). So our experience with SARS means we are optimistic our existing ferret model can be used as a starting point for work on the novel coronavirus.

We will also explore other biological models to provide more robust data and as a contingency.

### What good will a vaccine be if the virus mutates?

There's also the strong possibility that SARS-CoV-2 will continue to mutate.

Being an animal virus, it has already likely mutated as it adapted – first to another animal, and then jumping from an animal to humans.

Initially this was without transmission among people, but now it has taken the significant step of sustained human-to-human transmission.

As the virus continues to infect people, it is going through something of a stabilisation, which is part of the mutation process.

This mutation process may even vary in different parts of the world, for various reasons.

This includes population density, which influences the number of people infected and how many opportunities the virus has to mutate. Prior exposure to other coronaviruses may also influence the population's susceptibility to infection, which may result in variant strains emerging, much like seasonal influenza.

Therefore, it's crucial we continue to work with one of the latest versions of the virus to give a vaccine the greatest chance of being effective.

All this work needs to be done under stringent quality and safety conditions, to ensure it meets global legislative requirements, and to ensure staff and the wider community are safe.

### Other challenges ahead

Another challenge is manufacturing proteins from the virus needed to develop potential vaccines. These proteins are specially designed to elicit an immune response when administered, allowing a person's immune system to protect against future infection.

Fortunately, recent advances in understanding viral proteins, their structure and functions, has allowed this work to progress around the world at considerable speed.

Developing a vaccine is a huge task and not something that can happen overnight. But if things go to plan, it will be much faster than we've seen before.

[So many lessons](#) were learned during the SARS outbreak. And the knowledge the global scientific community gained from trying to develop a vaccine against SARS has given us a head-start on developing one for this virus.



*Rob Grenfell, Director of Health and Biosecurity, CSIRO and Trevor Drew, Director of the Australian Animal Health Laboratory (AAHL), CSIRO.*

## QUESTION

How can a doctor or a nurse use their stethoscopes while donned in personal protective equipment?



## A clever solution

Source: <https://www.thinklabs.com/ppe>

### Wireless Bluetooth communication into PPE

Thinklabs **One** can be used with Bluetooth, enabling the clinician to auscultate wirelessly while sound is transmitted directly to ear buds. Ear buds and Bluetooth remain protected inside of PPE.

Stethoscope remains with patient; ear buds are disposable.



Stethoscope and Bluetooth transmitter



Bluetooth receiver and ear buds remain inside PPE.

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## Coronavirus or antibiotic resistance: Our appetite for animals (wild and domestic) poses big disease risks

By Laura H. Kahn

Source: <https://thebulletin.org/2020/02/think-chinas-wet-markets-for-wildlife-spread-diseases-industrial-meat-production-is-worse/>

Feb 14 – In 2017, after years spent looking into the SARS epidemic that tore through China a decade-and-a-half earlier, a team of researchers thought they may have discovered the origins of the disease: a cave in Yunnan province crowded with different species of horseshoe bats. The researchers wrote that they had discovered in the bats the genomes of several different coronaviruses, and in these genetic codes, the [“building blocks”](#) of the virus that had infected more than 8,000 people years earlier, killing 774 of them. There was uncertainty about how SARS had travelled [1,000 kilometers](#) from the Yunnan cave to Guangdong, where it was first reported in late 2002. But one thing is clear: Bat coronaviruses can infect humans. Some villagers around Yunnan bat caves [had antibodies](#) to the bat diseases. In the case of SARS, researchers think the civet, a cat-like wild animal that’s [a delicacy](#) in some parts of China, played the role of intermediary host, spreading the bat virus to



humans.

humans.

The wildlife trade may also have played a part in spreading the new coronavirus, formally called COVID-19, to people Wuhan, China, where the first cases were reported. Given the alarming headlines about the [coronavirus outbreak](#) and the consumption of wildlife, the tradition of so-called wet markets, where wild animals are sold, now faces harsh scrutiny. But eating wildlife is not the only way diseases can spread from animals to people, nor are respiratory viruses like the new coronavirus the only diseases that we should be concerned about when it comes to eating meat. The world’s system of animal husbandry, food production, and food distribution has certainly been linked before to deadly microbes, such as strains of E.coli.

Selling and eating wild animals, disrupting ecosystems, and destroying forests all contribute to the risks of novel deadly microbes spreading [into human populations](#). Just as worrisome is the impact that raising hundreds or thousands of domesticated animals in densely packed quarters has on the worsening problem of drug-resistant microbes.

While the new coronavirus in China has killed more than 1,300 people, about [35,000 people](#) in the United States die each year after developing drug-resistant infections.

Antimicrobial resistance is a growing problem in China, as well. The country’s appetite for meat has increased as it becomes more affluent, as is the case in other developing countries. Meat provides essential micronutrients and is an important part of many cuisines. People in the United States and other rich countries consume much more meat per capita than individuals living in the developing world. Indeed, the affluent are in no moral position to make demands about what others [can or cannot eat](#).

Does the consumption of wild animals (aka bushmeat) pose special risks with regard to public health? Bushmeat consumption is common in African and Asian countries, especially



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in China. It's an important source of protein and provides food security for poor people living in rural areas. Outbreaks of diseases like Ebola, however, have been linked to [eating it](#). (While domesticated animals harbor microbes that can cause foodborne illnesses such as Salmonella, Campylobacter, and E. coli, wild animals harbor deadly microbes, including novel viruses such as influenza, Ebola, and Nipah, that can spill over into domesticated animals and humans.)

China may now be clamping down on the wet markets that sell wild animals, something that has been tried on a temporary basis before. The emergence of SARS in 2003 prompted the government to ban the wet markets, but that effort failed, and led to a rise in [black markets](#). In the current crisis, China has once again [banned wild animal sales](#), at least until the epidemic is over. **But there are signs that the government may adopt more stringent policies going forward.**

Meat production has grown 68 percent in Asia over the last 20 years, and the continent is home to a majority of the world's chicken and pigs. Asian countries like India and China are working to improve poor sanitation and hygiene, but both of them also use massive [amounts of antibiotics](#) and have very high rates of [antimicrobial resistance](#). China's decisions on wildlife in wet markets won't change that.

Consuming less meat (and raising fewer animals for food) could [ease the problem](#). (Interestingly, India, which has, by far, the highest percentage of vegetarians in its population, at 38 percent, hasn't had the same coronavirus spillover events like China, despite also having wet markets.) China's decision on how to handle the wildlife trade could affect the likelihood of another outbreak of something like the coronavirus. How the world handles the production and distribution of domesticated animals, however, may be just as consequential a decision.

**Antimicrobial resistance doesn't receive the same intense level of media coverage as the new coronavirus. Nevertheless, the global demand for animal proteins, whether from domesticated or wild animals, is growing and becoming unsustainable. Promoting [meat alternatives](#) or vegetarian diets might be a step in the right direction.**

*Laura H. Kahn is the author of [One Health and the Politics of Antimicrobial Resistance](#), published in 2016 by Johns Hopkins University Press. A general internist who began her career in health care as a registered nurse, Kahn is a research scholar with Princeton University's Program on Science and Global Security. Her expertise is in public health, biodefense, and pandemics. In 2009, she published [Who's In Charge? Leadership during Epidemics, Bioterror Attacks, and Other Public Health Crises](#). Princeton University awarded her undergraduate course "Hogs, Bats, and Ebola: An Introduction to One Health Policy" a 250th Anniversary Fund award for Innovation in Undergraduate Education. In 2016, the American Veterinary Epidemiology Society awarded her their highest honor, the K.F. Meyer-James H. Steele Gold-Headed Cane Award, for her work on One Health.*

## Strengthening the U.S. System of Care for Infectious Diseases

Source: <http://www.homelandsecuritynewswire.com/dr20200217-strengthening-the-u-s-system-of-care-for-infectious-diseases>

Feb 17 – What does experience with past outbreaks suggest about the strengths and gaps of the current system of care for rare but serious infectious diseases? How might the current system be strengthened or more formalized to address those gaps? How could a more formalized system be financed, both in terms of initial investments and long-term sustainability? A study published by [RAND](#) in 2018 offers answers which relevant to the present.

## The Next Deadly Pathogen Could Come from a Rogue Scientist. Here's How We Can Prevent That

Source: <http://www.homelandsecuritynewswire.com/dr20200217-the-next-deadly-pathogen-could-come-from-a-rogue-scientist-here-s-how-we-can-prevent-that>

Feb 17 – **In the past few years, something new has become possible in biology: cheaply "printing" DNA for insertion into a cell.**

Kelsey Piper writes in [Vox](#) that this means a scientist who needs a particular DNA sequence to, say, create new bacteria for research can now order that DNA sequence from a lab. That might seem like a niche technology — how many biologists need to custom-print their own DNA? — but DNA synthesis and assembly (as the "printing" process is called) are actually



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useful for an astonishing variety of research uses, and could have far-reaching implications for how we live.

Piper notes that as is often the case, the coordination, control, and the development of safety guidelines is lagging far behind the potential – for good and bad – of the technology of synthetic biology.

*As a private individual, I can send a DNA sequence I'd like synthesized to dozens of labs around the world that can print it out and send it to me.*

*But what if I asked them to print for me the genetic code of the influenza that caused the [1918 flu that killed millions of people](#)? What if I sent them the instructions for a new disease that I have reason to believe is dangerous? What if I was doing legitimate research, but my lab didn't adhere to modern safety standards?*

***The answer is that a few DNA synthesis companies will send me what I asked for, with no screening to check whether they're sending out a pathogen that ought to be carefully controlled.***

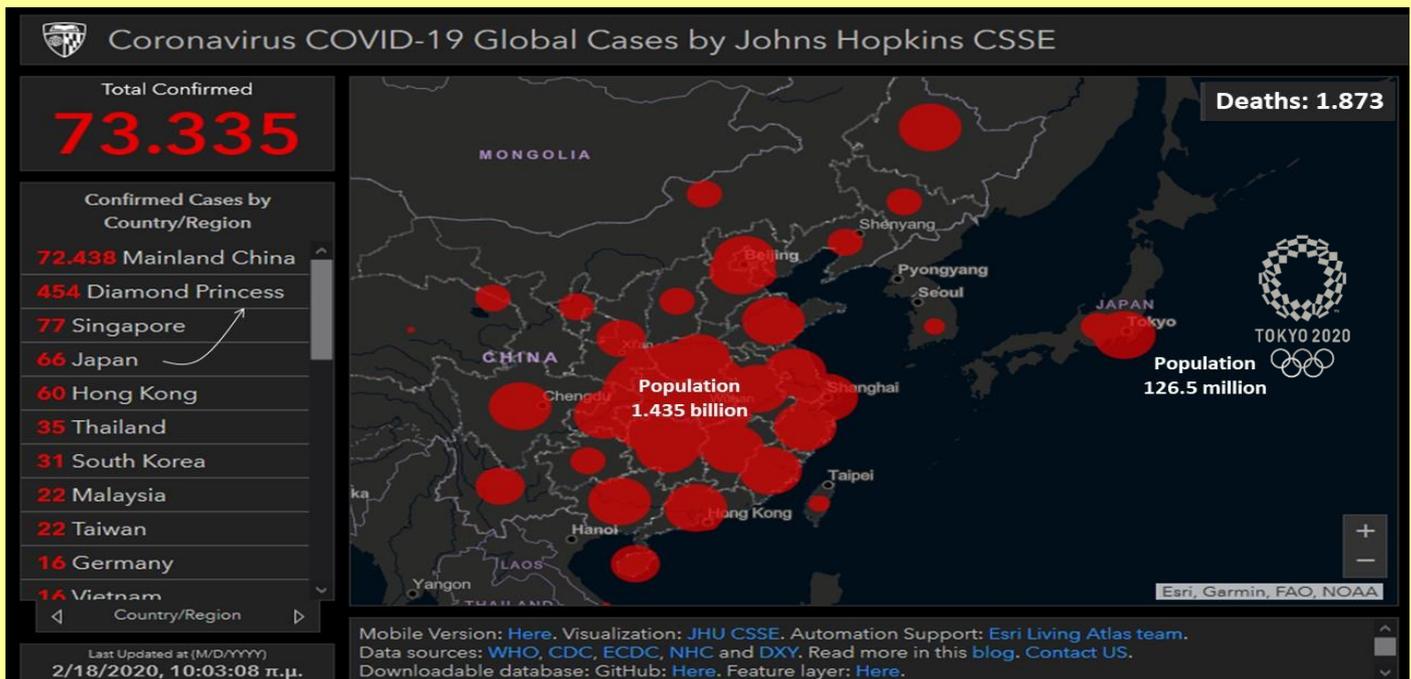
*Some companies — including most industry-leading ones — do follow US guidelines that require a background check and also check the DNA sequence against a list of known hazardous ones and would stop me from making this dangerous order — but a [recent report](#) found no evidence of any laws requiring laboratories to follow those guidelines in any country in the world. Doing so adds some time and expense to the ordering process, so there is some incentive to cut corners.*

*That's why many experts argue that we need to do better. Their proposals on how to fix the system vary, but they all agree on one thing: I shouldn't be allowed to order myself the 1918 influenza or a new coronavirus off the internet and have it delivered to my home.*



## Common sense and Tokyo2020 Olympic Games

By the Editor C<sup>2</sup>BRNE Diary



On February 6, Japanese Prime Minister Abe Shinzo told the Diet, or Japan's parliament, the 2020 Olympics won't be canceled or postponed despite fears about Covid-19 infections. "I want to make it clear that the Organizing Committee and the International Olympic Committee are not holding any discussions whatsoever about whether or not to hold the Tokyo Games," Abe emphasized. It is well understood what the multilevel impact for Japan would be. On the other hand, there is something called "common logic" still available in millions of people. And logic dictates "why should I travel to a country that is so close to the epicenter of the Covid-19 epidemic and submitted to all the check-ups from my homeland all the way to the entrance of the stadiums – again and again, the moment that I can watch the games from my sofa? Not to mention



that I can be infected out of nowhere – even from a spectator sitting 2 rows behind me? And if affected, that means hospitalization while those who travel with me will be quarantined for 14 days or maybe longer?” If the Japanese can take logic into consideration, it will either postpone or transfer the games. And despite the economic loss, the people from all over the world will appreciate this brave decision because this might happen in any country organizing mega-events. Of course, another option is to have the games but only with Japanese spectators but also this is not a 100% guarantee recipe. In addition, in the back of the head of logic brains, there is also the issue of radiological pollution from the Fukushima era and its consequences to the atmosphere, food, and water. But this is another issue though an important one.

Based on the above approach there is no room for stubborn tenacity when facing invisible threats despite the huge pressure expected from all the gigantic companies sponsoring the Olympic Games. It will be the biggest competition between Logic and Profit ever!

## More Outbreak Details Emerge as COVID-19 Cases Top 70,000

Source: <http://www.homelandsecuritynewswire.com/dr20200218-more-outbreak-details-emerge-as-covid19-cases-top-70-000>

**Feb 18** – As cases passed the 70,000 mark today, China published a detailed picture of its COVID-19 outbreak, which now shows signs of declining; however, officials warned cases could rebound as people return to work and school after the extended Lunar New Year break.

In other developments, the number of infected people on the Diamond Princess cruise ship in Japan continued to soar, as infections were detected in 14 Americans who were just evacuated from the ship.

### Large Epi Study Notes 14% Severe Rate

China's [report](#) on the outbreak's epidemiologic patterns covers all COVID-19 cases reported through Feb 11 and appears in the *China CDC Weekly*, a publication that is similar to the US Centers for Disease Control and Prevention's *Morbidity and Mortality Weekly Report*.

The team analyzed more than 72,000 patient records, of which 44,672 were lab-confirmed cases, 16,186 suspected cases, 10,567 clinically diagnosed cases, and 889 asymptomatic cases. Of the confirmed cases, 80.9% cases were mild, and the vast majority (86.6%) of confirmed cases were in people ages 30 to 79 years old.

About 14% of the illnesses were severe, which included pneumonia and shortness of breath, and about 5% have critical disease, marked by respiratory failure, septic shock, and multi-organ failure. The overall case fatality rate was 2.3%, and of 1,023 deaths included in the study, the majority were in people age 60 and older or those with underlying medical conditions.

CIDRAP [reports](#) that epidemiologic curve analysis shows a common source pattern in December, which shifted to a propagated source pattern starting in early January, which the researchers said might reflect several zoonotic events at the outbreak market in Wuhan. Around Jan 23 to Jan 26, the epidemic peaked and began to decline, according to the data.

Though 1,716 healthcare workers were infected in the outbreak, 5 of them fatally, there is no evidence of super-spreader events in healthcare facilities caring for COVID-19 cases, the group wrote. Those events were hallmarks of outbreaks involving severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome coronavirus (MERS-CoV). So far, it's not clear if the difference is due to the virus or prevention tactics, they noted.

China's massive control measures, which started on Jan 23 with limiting travel in and out of Wuhan, slowed China's epidemic and its spread to the rest of the world, the authors note. But they warn that officials need to prepare for the epidemic to rebound when huge numbers of people in China return to work and school.

### Caution Urged in Interpreting Outbreak Decline

At a media telebriefing today, World Health Organization (WHO) Director-General Tedros Adhanom Ghebreyesus, PhD, said the new data from China gives health officials a better understanding about the affected age range, the severity of the disease, and the mortality rate, which he said helps the WHO deliver evidence-based guidance to countries.

However, [he said](#) the report's indication of a decline in cases should be interpreted with caution. "Trends can change as new populations are affected," he said. "It's too early to tell if this reported decline will continue. Every scenario is still on the table."

Tedros said relatively few cases have been reported in children, but more research is needed to understand why. Though the new report fills in some gaps for understanding the outbreak,



others remain. He added that the international expert team is now on the ground in China to answer more questions and to get an even clearer picture of the outbreak.

China's [National Health Commission](#) today reported 2,048 new cases, a slight increase from the 2,009 it reported yesterday. It also reported 628 fewer severe cases as it adjusts those totals and 105 more deaths. The country's totals now stand at 70,548 cases, 10,644 severe cases, and 1,770 deaths.

### Cruise Ship Cases Grow by 99

Japan's [health ministry](#) today reported that 99 more people on the Diamond Princess cruise ship have tested positive, raising the total to 454. The ship has been quarantined in Yokohama port since Feb 3.

Meanwhile, the [US State Department](#) said it evacuated more than 300 US citizens and their family members who had been on the Diamond Princess, and all were evaluated by medical officials from the Department of Health and Human Services and deemed asymptomatic and fit to fly.

However, between getting off the ship and heading for the airport in Japan, US officials learned that 14 passengers who had been tested 2 or 3 days earlier were positive for COVID-19. They were moved to a specialized part of the aircraft and isolated according to standard protocol.

The whole group flew back to the United States, with passengers slated to arrive at either Travis Air Force Base in California or Joint Base San Antonio in Texas.

In other developments in Japan, the country's health ministry reported two more local cases, one involving a health ministry official who worked as a liaison on the Diamond Princess and the other a nurse who worked at a hospital near Tokyo, where she took care of a woman in her 80s who died from the disease, [Kyodo News](#) reported today.

### Singapore, UAE Report More Cases

Singapore's [health ministry](#) today reported 2 more cases, raising its total to 77. The patients include an individual who was evacuated from Wuhan on Feb 9 and a person who is a contact of an earlier case.

The United Arab Emirates (UAE) [health ministry](#) yesterday reported 1 more COVID-19 case, which involves a 37-year-old Chinese man. The infection brings the UAE's total to 9, of whom 3 have recovered and 6 are still receiving treatment, 1 of them in an intensive care unit.

### Gene Analysis Debunks Lab-Made Claims

In a [preprint publication](#) yesterday, an international group of virologists detailed the evidence that the virus that causes COVID-19 is not lab made or artificially manipulated.

Based on their analysis of the genome, they described its notable features and scenarios that likely led to its evolution. They proposed two scenarios: natural selection in a host animal before the virus jumped to humans, or natural selection in humans following transmission from animals to people.

They also looked at whether selection during passage in culture could have produced the same genetic features they observed.

## Wuhan-400 bioweapon in Dean Koontz thriller and Coronavirus: More than just coincidence?

Source: <https://www.ibtimes.sg/wuhan-400-prediction-bioweapon-form-coronavirus-coincidence-koontzs-thriller-39557>

Feb 18 – In 1981, the famous suspense thriller writer from America Dean Koontz didn't know the spiral of coincidence he was weaving while writing the *Eye of Darkness*. The interesting read caught the attention of the netizens and hardcore Koontz fans when they pointed out one of the most important detail in the story. The chilling literary coincidence follows the outbreak of a deadly virus from Wuhan.

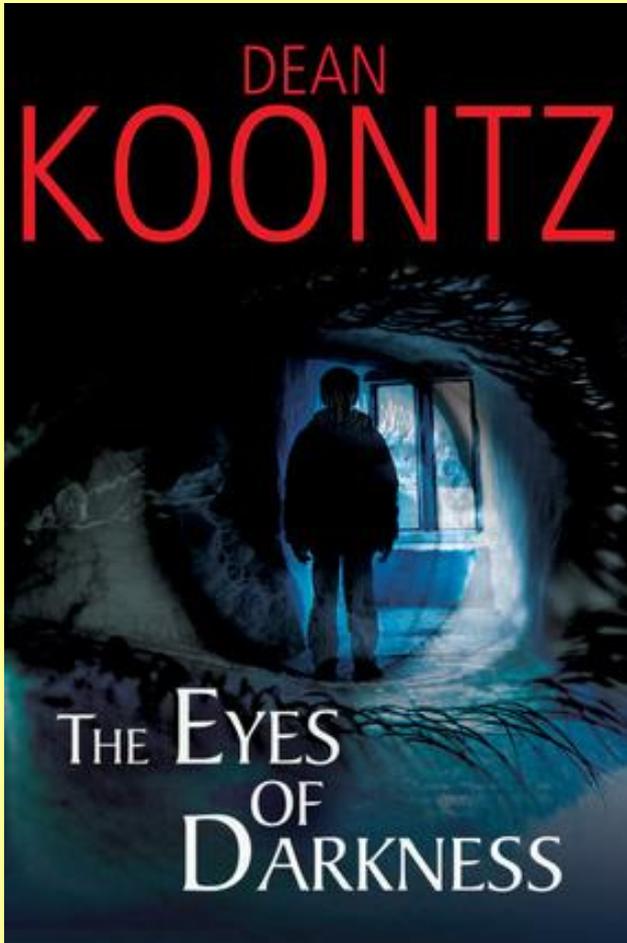
In the book, Koontz talks about a bioweapon that takes the lives of thousands and comes from the labs of Wuhan. The virus was called Wuhan-400 in the book and the Koontz readers were left speechless by the prediction made by the writer 39 years ago. The media wasn't too far behind in catching up with the Koontz fans.

The conspiracy theories are rounding up along with the search for answers by several people across the globe about the coronavirus in reality. One of the most discussed conspiracy theories out of the lot is about the virus being from a lab in China and not the animal market.



It is being addressed as a bioweapon even though experts say that the virus does not display any of the characteristics of a biological weapon.

The story follows a mother who goes in search of her son who had gone camping and was presumed dead after he goes missing.



The mother believes that her son is alive because there was no explanation for the death of the members who went for the camping trip. The story ends with the mother finding her child in a lab after he was tested positive for the virus. The story is said to have made people stand on their toes in the 1980s. The strong storyline has an uncanny resemblance to the new coronavirus. What caught the attention of the people while reading the book was a simple sentence:

"It was around that time that a Chinese scientist named Li Chen moved to the United States while carrying a floppy disk of data from China's most important and dangerous new biological weapon of the past decade. **They call it Wuhan-400** because it was developed in their RDNA laboratory just outside the city of Wuhan."

The story talks about the virus as a perfect weapon that only affects humans. The story details a biological weapon built by Chinese scientists in their biological weapons program. One excerpt from the book defines what the disease is it talks about how the title of the book refers to what the disease is. The disease attacks motor functions in the brain and the scientists were not able to develop an antibody for the disease but the woman's son was able to survive the disease.

There are several coincident details that can be highlighted. Apart from the detail about the Wuhan-400, the novel talks about a lab in the city which comes into focus because of the virus. The strange thing is that the Wuhan Institute of Virology is just 32 kilometres from the epicentre of the virus in reality. It is the country's level four biosafety laboratory, the highest-level classification of labs that study deadly viruses.

There are several such details that made the story popular in the 80s and the present situation is bringing the thriller back.

Earlier on Sunday during an interview with Fox News, Senator [Tom Cotton](#) discussed without evidence that the virus was a bioweapon. But, under one

such tweet posted by the Senator was a netizen's comment about the book. This has led to the internet to go back and read the 80s classic thriller.

### Is it a biological weapon?

There have been several questions about the new virus being a [weapon of mass destruction](#). One of the earliest uses of a biological weapon happened in 1347 by the Mongols. It was also common during the world wars.

During the Cold War, there was a large initiative that led to the signing of the Biological Weapons Convention. Even in the present day and age several countries work on bioweapons and are said to have an active R&D team for it. Along with this, there are rumours about bioterrorism as well.

The definition of bioweapon says that it is 'an item of material which projects, disperses, or disseminates a biological agent; including arthropod vectors'. The characteristics of the bioweapons detail that it has the ability to multiply in the body over time and actually increase its effect. Experts strongly believe that there are no links between the Covid-19 and bioweapons.

### The COVID-19

Chen Qiushi was one of the first whistleblowers from China who recorded the sickness and deaths in the country even before the government talked about the spreading virus. Since then there has been a considerable amount of changes and attention brought by the virus. Presently The disease which began in December has led to the death of more than a thousand people and at least 70,000 people were infected by the virus.



## Inside the Hot Zone: A Soldier on the Front Lines of Biological Warfare

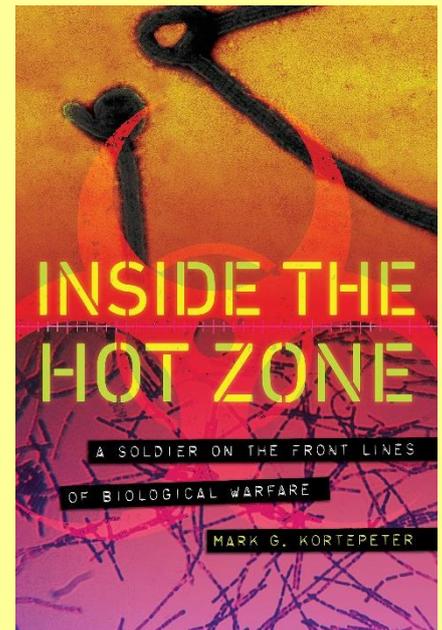
Author: Mark G. Kortepeter

Source: <https://www.goodreads.com/book/show/44294969-inside-the-hot-zone>

*Inside the Hot Zone* is an insider's account of one of the most dangerous workplaces on earth: the United States Army Medical Research Institute of Infectious Diseases (USAMRIID) in Fort Detrick, Maryland. Retired U.S. Army Col. Mark G. Kortepeter, a leading biodefense expert, recounts his journey from the lecture hall to the role of department chief, to the battlefield, to the Biosafety Level-4 maximum containment lab, and finally, to the corner office.

During Kortepeter's seven and a half years in leadership at USAMRIID, the United States experienced some of the most serious threats in modern germ warfare, including the specter of biological weapons during the Iraq War, the anthrax letters sent after 9/11, and a little-known crisis involving a presumed botulism attack on the president of the United States. *Inside the Hot Zone* is a shocking, frightening eye-opener as Kortepeter describes in gripping detail how he and his USAMRIID colleagues navigated threats related to anthrax, botulism, smallpox, Lassa, and Ebola.

Kortepeter crafts a rich and riveting narrative as he wrestles with life-and-death decisions managing biological weapon exposures. The stories are real, but they could just as easily serve as plotlines in popular fiction or Hollywood thrillers. He gives the reader a seat at the table as each crisis unfolds, with an unvarnished and personal perspective on the dangers, the drama, the fear, the frustrations, the irony, and the uncertainty he encountered as a physician in the role of "Biodefender."



## Bioterrorism in a advanced technologically world

By Christina M. Flowers

Source: <https://www.domprep.com/preparedness/bioterrorism-in-a-technologically-advanced-world/>

**2015** – Recent advances in genetics, genomics, and biotechnology could have devastating implications for bioweapons and genetically engineered diseases. As such, these developments raise the question of whether it makes sense to pull attention away from “classic” biothreat targets, in favor of more technologically advanced options. Immediacy and ease of use may be determining factors.

Terrorism over the past few decades has accelerated into a major strategy of contemporary conflict, and those who utilize its tactics will continue to exploit developments in emerging technologies. It is imperative then to advance preparedness practices as well as to meet this increased sophistication.

However, with constrained budgets, limited time, and so many other threats to plan for, it can be difficult to determine where to best localize efforts. Bioterrorism especially raises concerns because biological pathogens can be difficult to understand even in their most basic, natural state. Still, it can be argued that advances in genetics, genomics, and biotechnology could have disturbingly equal impacts on things like prion-based bioweapons, agroterrorism, and genetically engineered diseases, just to name a few. This raises the question, “Does it make sense to pull attention away from ‘classic’ biothreat targets in favor of the more technologically advanced options?”

### Prion-Based Bioweapons

Transmissible spongiform encephalopathies (TSEs) are diseases caused by prions, which are misfolded proteins devoid of nucleic acids (DNA or RNA), yet still highly infectious. Prions are known to cause fatal neurodegenerative disease and are highly resistant to heat, harsh chemical treatments, and irradiation. [Recombinant prions](#) can be bound to other substances in order to be spread through the air, or persist for years in the soil.

[Symptoms of infection](#) are a byproduct of brain degeneration, where “spongy” holes in brain matter cause sudden personality changes, impaired thinking, difficulty in performing normal functions such as speaking or swallowing, and sudden movements such as twitching or tremors. There are no treatments to halt the progression of TSEs, only to alleviate symptoms



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as the disease progresses. Fatality rates are described as 100 percent. The most notable TSEs in humans are Creutzfeldt-Jakob disease, kuru, and fatal familial insomnia.

With such a destructive resume, prions appear initially to be a relatively ideal terrorist weapon, except that their **incubation periods prior to manifestation of clinical symptoms can take up to 40 years or more**. With such an extended latency, the risks associated with handling the infectious particles relative to the immediate effects associated with their dissemination do not add up. In addition, because terrorists traditionally prefer to announce their involvement within a timely manner after an attack, it would be theoretically just as psychologically impactful to institute a hoax event, or to defer to something immediate or broadly recognized by the general population.

### Agroterrorism

Diseases in agriculture have far-reaching economic impacts on any country affected. For example, the 2001 British outbreaks of hoof-and-mouth disease ([HFM](#)) – a highly infectious aphthovirus spread through cloven-hoofed animals – resulted in the slaughter of over 6 million livestock and the loss of an estimated \$5.4 billion in tourism revenue. In the United States, farmers are currently battling highly pathogenic avian influenza ([HPAI](#)) H5 infections in poultry – shedding light on the biosecurity issues surrounding mass poultry production facilities, which could serve as entry points and transmission routes for previously unknown diseases.

As devastating as these losses are, it is not highly likely that responses to such incidents would change if terrorists as opposed to natural causes perpetrated these events. The HFM outbreak in Britain had a net economic effect of less than [0.2 percent](#) of the country's gross domestic product, and the HPAI outbreak in the Midwestern United States has gone relatively unreported, except in relation to the increased price of eggs and Thanksgiving turkeys. This is not to say that the effects are not damaging, or that the media would not have a field day with alternate reporting strategies, or that formal retaliation of some kind (as a direct result of the terrorist action) would not be pursued. It is just not "ideal" in the scope of a terrorist weapon deployed in search of policy change, or to illicit massive amounts of fear.

There would be a higher likelihood of destruction and coercion possible in certain foreign nations where specific cash crops contribute heavily to the overall gross domestic product (GDP). In these scenarios, it would be feasible that an invasive species bioweapon could cause significant loss, and thereby make more sense as a potential weapon. The problem (for terrorists) then is that no nation that relies on the same product would likely release such a weapon unless they had the safeguards themselves to counteract it. In traditional bioterrorism, this is typically seen as vaccines, antivirals, or antibiotics. In the scope of agroterrorism, it would have to take on the form of resistance mechanisms – innate or applied to the plants or livestock affected – or through some other medicinal cure. The amount of time, money, and effort required for such safeguards leaves the use of such tactics questionable.

### Genetically Engineered Diseases

Of course, the above scenarios assume that an unscrupulous geneticist has not already dedicated his or her life's work to addressing these caveats. Therein lies the real concern, which is probably the hardest one to plan around in regards to preparedness efforts: genetically engineered diseases.

There are multiple ways biothreat pathogens could be potentially manipulated using modern technology. These range from inserting a small piece of plasmid DNA into bacteria with the intention of changing the bacteria's virulence or pathogenic properties, to replacing a single gene (otherwise known as gene therapy) with the intention of possibly eluding existing vaccines. There is even the theoretical possibility of cutting and pasting gene sequences together to create brand new [synthetic organisms](#).

However, swapping genes is also not as easy as it sounds. Molecular pathways influence many different components of the bacteria or viruses' life cycles, and in many unpredictable ways. What might make the virus more virulent might also hinder its ability to evade the immune system. What might make the bacteria more environmentally hearty might also prevent them from replicating so quickly. The possibilities are endless, and not likely to yield mutations that "Mother Nature" herself has not already taken into consideration. For example, [RNA viruses](#) – such as Ebola – circumvent deleterious mutations by replicating with mutations in such high numbers that problematic mutations are able to "revert" to their original states. Influenza virus is also highly genetically variant (hence why flu shots are needed every year, as opposed to only once or twice as a child), and has found many opportunities to jump from one type of organism to another – such as from a bird or pig to a human.

### The Next Step

Still, these topics vastly underrepresent the broad scope of what communities could potentially face in the future. It is difficult to determine what needs to be done next and, frankly, it depends on one's job profile. At the highest levels of the military and government, scientists will continue to conduct investigative research. It is imperative for the brightest



minds to use their knowledge for good and to preserve humanity. In the private sector, security-based companies will continue to innovate, provide recommendations, and work with the highest echelons of preparedness leadership across the country and the world. All efforts must stay “one step ahead” of whatever warfighters, responders, and citizens are faced with in the future.

At the routine surveillance and response levels, though, little can be accomplished by worrying about the specifics of such threats until they have been deemed credible by higher authorities. After all, many agencies and organizations have difficulty executing effective detection and response mechanisms for the existing “traditional” bioterrorism threats – for example, Ebola, anthrax, botulism, ricin, smallpox, plague, tularemia, Q-fever, and Marburg. These threats are the ones that are current, viable, and persistent. As such, continued training and exercises in handling biohazardous substances and other infectious agents – such as sample collection methods, specimen handling, isolation and quarantine procedures, field-forward detection and identification of biothreat agents, and interagency coordination plans for large-scale biohazard attacks – will be the most essential tactics for combating all future incidents as they occur.

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## Coronavirus: We Need to Start Preparing for the Next Viral Outbreak Now



By David E. Bloom and Daniel Cadarette

Source: <http://www.homelandsecuritynewswire.com/dr20200220-coronavirus-we-need-to-start-preparing-for-the-next-viral-outbreak-now>

Feb 20 – **The coronavirus outbreak is officially a crisis – let’s not waste it.**

Undeniably, the international community is taking the matter very seriously, as it should, given that the death total from the COVID-19 epidemic [already well surpasses that from SARS](#) in the early 2000s.

The World Health Organization [declared](#) the outbreak a public health emergency of international concern, researchers across the globe [are furiously working](#) on [vaccines](#) against COVID-19, and governments including the U.S. and U.K. [have allocated](#) more funds to [boost research and development](#).

However, even if the international response to COVID-19 has been relatively strong, it may rightfully be considered too little too late, with the epidemic already underway. That’s a mistake we shouldn’t repeat.

As global health researchers, [we study](#) the full societal value of vaccination and other interventions to combat infectious disease. Given the [tremendous costs](#) associated with epidemics, it’s vital that we begin working to prevent the next outbreak, even as the world struggles to fight COVID-19.

### A Predictable Scenario

What’s remarkable about the current situation is its predictability.

[It was predictable](#) that the outbreak would emanate from [contact between humans and animals](#) – and that bats may have been involved. It was predictable that its epicenter would be in a densely populated urban area and that it spread rapidly via international air travel.

And it was even predictable that an unknown pathogen would be just as likely to spring an epidemic as a known one.

As was the case with [SARS](#) and [Zika](#), the pathogen responsible for the current epidemic [was not on anyone’s radar](#) before it began wreaking havoc in China and beyond.

It was also predictable that a rapidly progressing epidemic [would have significant and wide-ranging](#) health, [economic](#) and social impacts.

Less than two months into the epidemic, China’s health system [has already experienced major strain](#), with Wuhan in particular struggling to provide quality care to coronavirus patients. In addition, this may be crowding out treatment of other conditions.



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The [economic impacts](#) include major disruptions to manufacturing, supply chains, [retail sales](#), [international travel](#) and [education](#). And the resulting political and social challenges continue to pile up, such as [mass quarantines](#), [discrimination](#), the spread of [misinformation](#), [mistrust in government](#) and [extra strain](#) on already tense international relations. The total costs of this epidemic [are already significant](#) and [could get much worse](#).

### The Inevitability of Epidemics

The predictability of the current situation reflects the inevitability of outbreaks and epidemics.

We may not be able to say with certainty where and when they will occur – or what the causative pathogen will be – but we know that another is always lurking. There are also many reasons to believe that their frequency will increase.

Even as global population growth slows, [it continues apace](#) in the world's most economically and politically fragile regions. Increasing urbanization is leading to the proliferation of large, dense population centers that act like giant petri dishes for infectious diseases. And population aging [is increasing the share of people](#) who are more susceptible to infection and disease.

The geographic ranges of some pathogens and important disease carriers like mosquitoes [are expanding due to climate change](#). And [humans keep encroaching](#) on animal habitats, increasing the likelihood of cross-species spillovers.

International travel continues to become more common, and globalization ensures that the economic effects of an outbreak anywhere will ripple across distant reaches of humanity.

### Preparing for the Worst

Given all of the costs of epidemics – and all the factors favoring their repeated occurrence – stable and large-scale investments in organizations and activities dedicated to outbreak preparedness, prevention, mitigation and response are likely to pay tremendous dividends.

The [Coalition for Epidemic Preparedness Innovations](#), an alliance to finance and coordinate the development of new vaccines, certainly merits substantial funding, as does [development of vaccine platforms generally](#). Likewise, [greater funding](#) for [novel antimicrobial treatments](#) and improved diagnostics is desperately needed. [Increased pathogen surveillance](#) in both humans and animals is another urgent priority.

Perhaps what is lacking more than funding, though, is a sufficient level of coordination among the many players in the loose network of international and country-level organizations responsible for controlling and responding to infectious disease outbreaks. The [fragmented nature of the global health system](#) creates the possibility for considerable research and functional gaps as well as wasteful duplications of effort.

[We've argued before](#) for the establishment of a global technical council on infectious disease threats to improve collaboration and coordination across organizations, carry out needed research and make high-level, evidence-based recommendations for managing global risks. Such a council would be composed of experts from a wide range of disciplines – including epidemiology, vaccinology, public policy and economics – and could either be affiliated with the WHO or stand alone.

**The bottom line is that more and sustained resources are sorely needed to prevent, or at least mitigate, the next outbreak and its impact – whether caused by another coronavirus, a hemorrhagic fever like Ebola, pandemic influenza or a pathogen not yet discovered.**

**Taking these measures may be expensive, but it will be more costly to sit on our hands. The next outbreak assuredly lies just around the bend.**

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