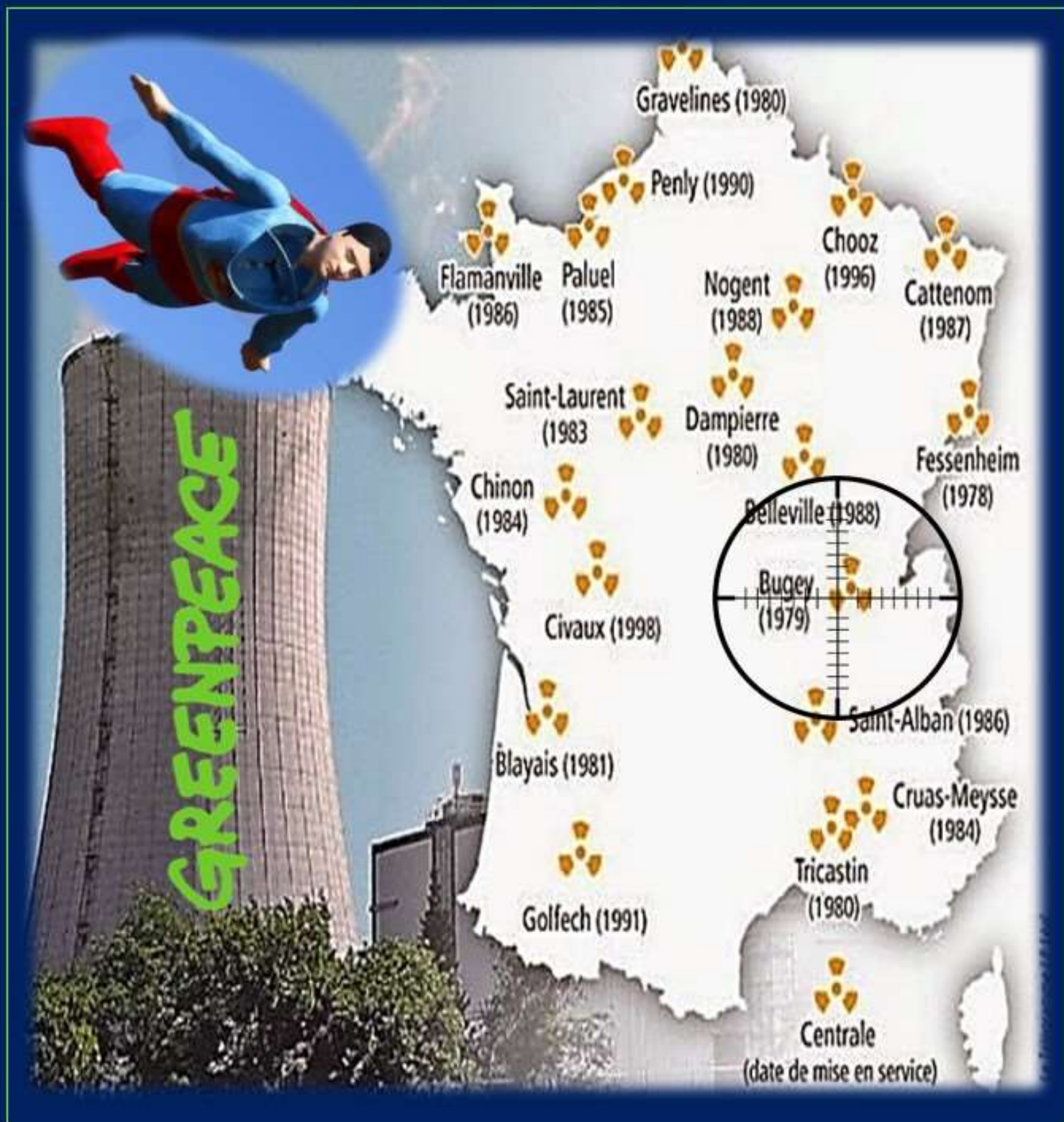


# <sup>2</sup> CBRNE

*Dedicated to Global  
First Responders*

# DIARY



C<sup>2</sup>BRNE DIARY – 2018<sup>®</sup>

July 2018

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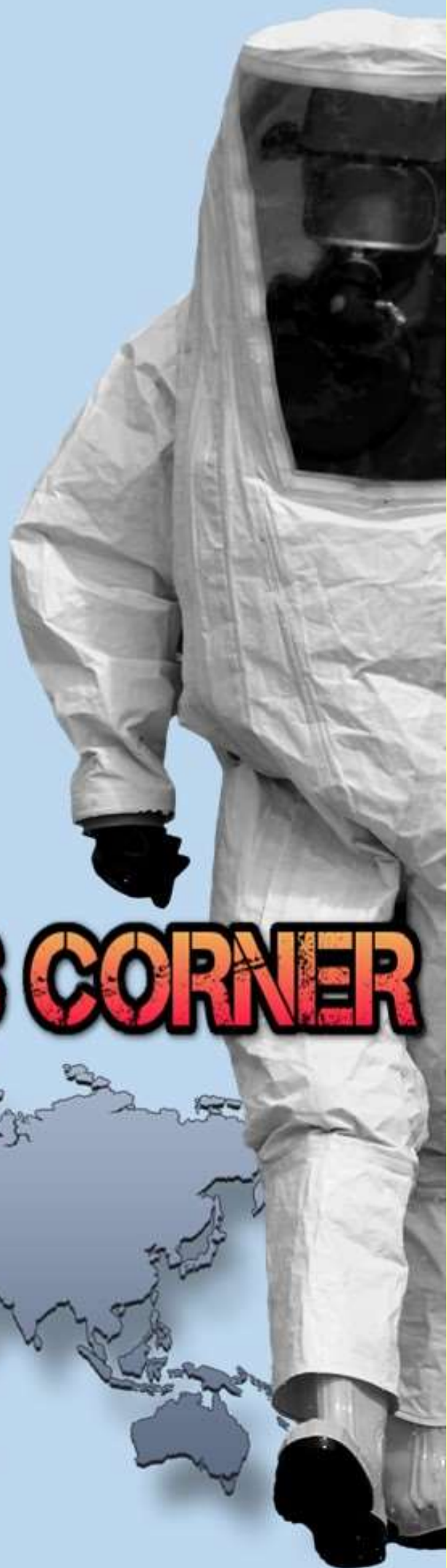


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# EDITOR'S CORNER





**Editorial****Brig Gen (ret'd) Ioannis Galatas, MD, MSc, MC (Army)***Editor-in-Chief*  
C<sup>2</sup>BRNE Diary*Dear Colleagues,*

Good news and bad news in July:

- Amesbury incident (UK): Skripal novichok may be behind new Wiltshire poisoning
- Japan executed Shoko Asahara, the doomsday cult leader convicted for the 1995 sarin-gas attack on Tokyo's subway that killed 13 people and sickened thousands – justice after 23 years!
- Soligenix Inc. receives European, Canadian patents for its ricin toxin vaccine (RiVax) formulation
- New smallpox oral formulation (tecovirimat, brand name TPOXX) got FDA approval
- Greenpeace France crashes remotely piloted drone at French Bugey nuclear plant near Lyon – perhaps a taste from the future?
- Personal info of 1.5m SingHealth patients, including PM Lee, stolen in Singapore's worst cyber attack
- Magnificent Thailand rescue operation – when international solidarity becomes a reality!
- Greece wildfires: At least 76 [update: 24 July] killed (and 11 in critical condition) near Athens as residents and tourists flee or jump into the sea – perhaps the second worst wildfire ever. A case study for emergency crisis management and all the things that we must not do but we repeat them every summer.

I would like to say happy summer vacations but sorrow is too heavy to wish something nice. Just take care First Responders!

*The Editor-in-Chief*

## Perspectives on Terrorism

June 2018



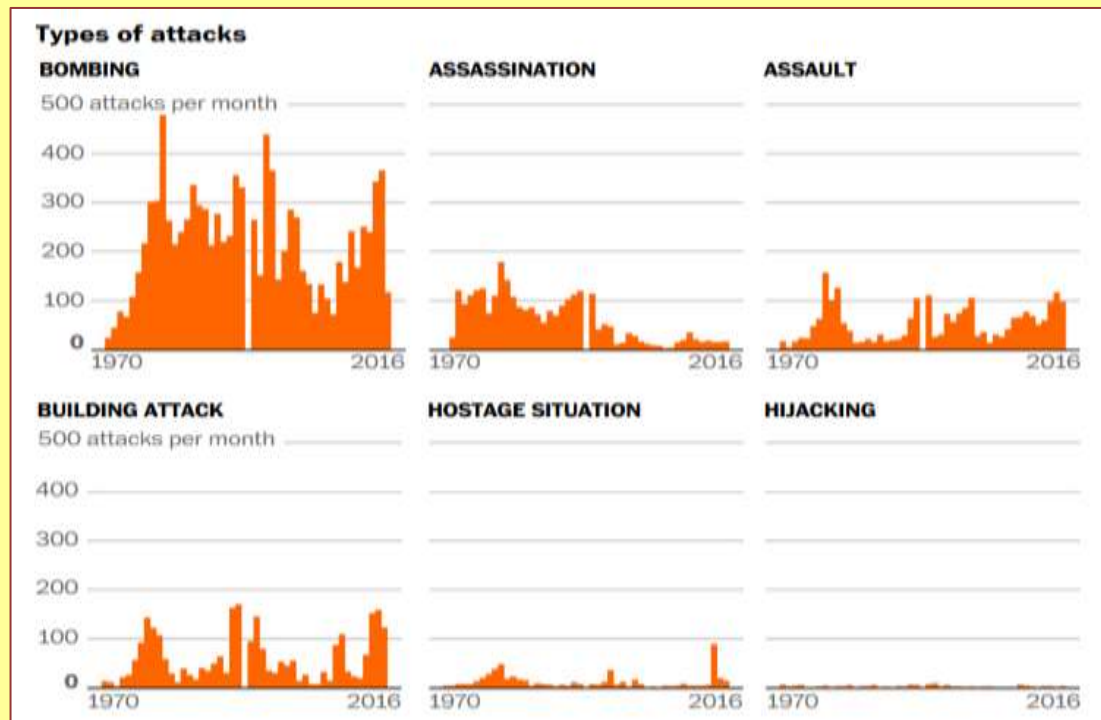
Available at the NEW online home: <https://www.universiteitleiden.nl/pot>. Please note that the journal's old website (<http://www.terrorismanalysts.com>) will remain online as an archives only site for a while longer, but will eventually be closed down. Readers will want to update bookmarks and reference links accordingly.

## 46 years of terrorist attacks in Europe, visualized

Source: <https://www.washingtonpost.com/graphics/world/a-history-of-terrorism-in-europe/?noredirect=on>



The attacks can happen anywhere: In a [holiday market](#) outside a historic church in Berlin, on the [street](#) during a national holiday in France, in an [airplane](#) over Scotland or during the first day of [school](#) in



a small town in Russia. Sometimes, a plot fails – a detonator malfunctions or authorities make an arrest – and no one is injured. Other times, an attack leaves a trail of death and destruction that can shake a nation, even a continent. But these incidents are nothing new.

►► Read the full article at source's URL.

## Story of Libyan-born Muslim man fostering terminally ill children to become documentary

Source: <https://www.dailysabah.com/life/2018/04/03/story-of-libyan-born-muslim-man-fostering-terminally-ill-children-to-become-documentary>

April 2018 – The inspiring story of a 63-year-old U.S. national of Libyan origin, who has been a foster parent to 80 terminally-ill children, will be a documentary by Turkish director Ensar Altay.



Speaking in an interview with Anadolu Agency on his first visit to abroad since he has started to take care of children, Mohamed Bzeek said: "My story changed the way the American thinks about Muslims."

Muslims in the U.S. are seen as "criminals, killer, we are not good and Islam is just the religion of blood and devastation," he said.

"[But] after my story, I showed them the true Islam. Islam is about love and compassion and sympathy towards other people."

Bzeek's story became public after he was interviewed by Los Angeles Times last year. He has been taking care of abandoned or terminally-ill children since 1989.





Recalling the words of an atheist in the U.S. to him, Bzeek said he told him: "After reading your story I hope there is god so he can reward you."

Bzeek said he had taken care of 80 children in the U.S. since the 90s and he now wants to reach out to children in need in other parts of the world as well.

"Ten of them died; I was holding them [when they died]," he said.

Some of the babies he took care of did not even have names, he said, so he gave them Muslim names. "I raise them as Muslims."



### **Turkey acknowledges contribution**

The man with a heart of gold has been acknowledged by Turkey and an award was given to him by the Turkish president himself; even a Turkish filmmaker is planning to turn his inspiring story into a documentary.

Speaking at a ceremony in capital Ankara where Bzeek was given the International Benevolence Award, President Recep Tayyip Erdoğan said stories like that of Bzeek gave people hope despite the violence and brutality across the globe.

About the difficulties he faces in helping terminally-ill children, Bzeek said it is not easy to raise children who require special care.

"It is a very hard job," he said: "They have a lot of medication, they have a lot of machines."

Some nights you cannot sleep because you have to take care of them during the night, he adds.

"This is my first vacation in seven years," he added.

An electronic engineer by profession, Bzeek, who himself has a disabled son, remembers his first foster child.

"A Mexican girl," he recalled.





**C<sup>2</sup>BRNE DIARY – July 2018**

"She was just a month old," when Bzeek began looking after her. In 1991, she died after living for two-and-a-half years with the family.

"It was very hard and it was my first experience of death with a little kid that you have at home for two years.

**People 'afraid' to care**

"When she died it really hit me hard and I was so sad, I was crying for three days," Bzeek said.

Bzeek, who is a devout Muslim, said he cares for children regardless of their religion, nationality or skin color.

"I just take them as human beings, I consider them as my own children, I don't think them as foster children," he said.

In 1995, Bzeek and his wife decided to take care of terminally-ill kids.

"I was told that I am the only house in the LA that is taking [care of] kids knowing they are going to die," he said.

People do not want these kids because they are dying, he added.

"They are afraid if they take them home and they die in their house it will be devastating for their family and kids. That's why people don't like to take kids that are going to die."

He said children under his care are made to feel at home.

"When I take them, I make them feel at home. I make them feel they have family, brothers and sister.

They are safe and somebody will take care of them.

"And somebody will be with them until the last minute of their lives."

**Mass attacks in public space**

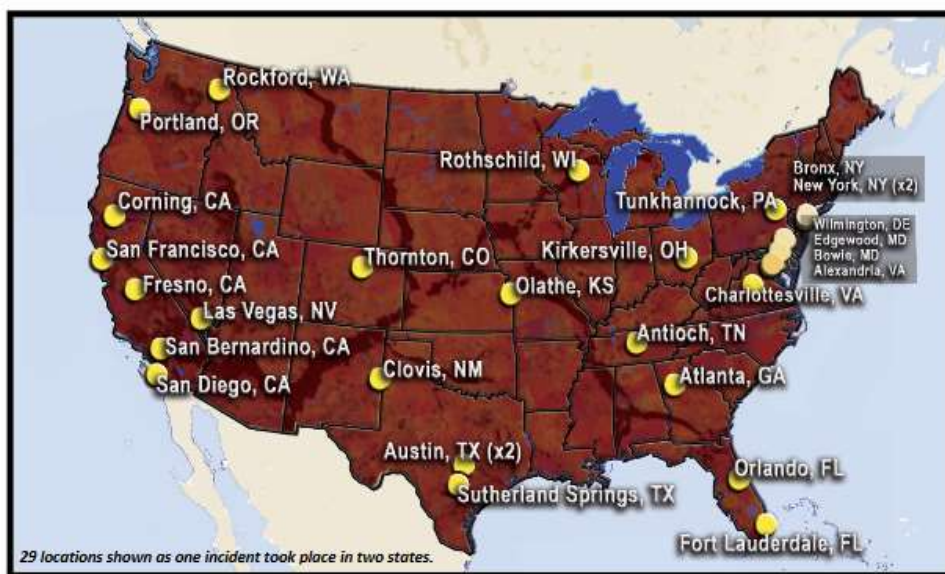
Source: [https://www.secretservice.gov/forms/USSS\\_NTAC-Mass\\_Attacks\\_in\\_Public\\_Spaces-2017.pdf](https://www.secretservice.gov/forms/USSS_NTAC-Mass_Attacks_in_Public_Spaces-2017.pdf)



DEPARTMENT OF HOMELAND SECURITY  
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NATIONAL THREAT ASSESSMENT CENTER

**MASS ATTACKS IN PUBLIC SPACES - 2017**

March 2018

**INTRODUCTION**

## Major Shift Expected in **Underground Warfare**

Source: <https://i-hls.com/archives/83814>

June 30 – The U.S. military is considering adding a new warfighting domain to U.S. military doctrine: the underground realm. The underground sphere is particularly important in cities, where nearly two-thirds of the world's population will live by 2040 — and where the Pentagon expects to see more combat. The military doctrine's domains currently include land, sea, air, space, and cyber — the latter added in 2012. Adding another would reshape spending and strategy, evaluates defenseone.com. Urban environments pose significant challenges for infantry forces. **A report published in 2017 by RAND**

**think-tank suggests that the rise of urbanization increases the likelihood that at least some future conflicts will take place in cities.** RAND evaluates that when light and mechanized infantry along with armor forces cooperate as effective combined arms teams, they can adapt and apply creativity to produce a decisive effect on urban combat operations.

For this new type of warfare, infantry units will need to know how to effectively navigate, communicate, breach heavy obstacles and attack enemy forces in underground mazes ranging from confined corridors to tunnels as wide as residential streets. Soldiers will need new

equipment and training to operate in conditions such as complete darkness, bad air and lack of cover from enemy fire in areas that challenge standard Army communications equipment.

In 2017, the U.S. Army accelerated its push to outfit 26 of its 31 active combat brigades with new tools and training to "fight in large-scale subterranean facilities that exist beneath dense urban areas around the world," according to military.com. In December, the Defense Advanced Research Projects Agency, or DARPA, launched a new Grand Challenge to develop new technologies for underground warfare and intelligence gathering, in order to "rapidly map, navigate, and search underground environments".

## **Dedicated to hard working First Responders risking their lives**

Cristiano Ronaldo (2018): "If I'm worth only 100 million euros, it means that they (Real Madrid) don't love me".



## **Piracy attempt against Greek vessel**

July 04 – Greek vessel Chios Freedom (gross tonnage: 23,435; 180X30.3m; crew 22), was attacked by pirates **off shore Fujairah, UAE**. Fujairah is one of the seven emirates that make up the United Arab Emirates, and the only one of the seven that has a coastline solely on the Gulf of Oman and none on the Arab Gulf.

Pirates used four speed boats carrying 12 armed men firing with AK-47s. The security team of the boat (3 ex Hellenic Navy

SEALS) returned fires causing many casualties to the assailants that finally abort and retreat.







Bullets fired against the Greek vessel (red circles)

**EDITOR'S COMMENT:** Armed guards on board. The only solution against piracy. Pirates are always flexible in tactics and choose to attack vessels away of guarded areas like Gulf of Aden. **Good job Navy SEALS!**



## Abu Dhabi's first medical school set to open this year

Source: <https://www.thenational.ae/uae/abu-dhabi-s-first-medical-school-set-to-open-this-year-1.747144>



July 04 – Khalifa University of Science and Technology is launching Abu Dhabi's first medical school in September - helping the capital to become a training hub to develop the next generation of doctors.

The facility, which will offer a bridging course allowing students to switch career paths to medicine and an American-style doctor of medicine (MD) programme starting next year, is something the city has been "crying out for", says the president of the university.

**The College of Medicine and Health Sciences will be based at the main campus of the university.**

Students in the medical programme will receive hands-on training at hospitals in Abu Dhabi and will train in clinics from year one. After graduation, students will have the opportunity for residency with a partner hospital in UAE.

"It's the first medical school in Abu Dhabi city and that is significant. If you look at the healthcare industry growing around here or at the healthcare needs of the population, this is a city that cries out for having its own medical college," said Dr Tod Laursen, president of Khalifa University.

"Medical centres are important to attract physicians to the societies they are in. The medical profession depends on continuing education and research possibilities for the physicians to be able to retain people. If Abu Dhabi is going to be a destination for top-flight doctors our medical school is part of that story," said Dr Laursen.



The medical programme will be closely styled along the lines of the American model. In the UK you can start medical school as an undergraduate or join a postgraduate programme. In the US the model is to take Medicine as a post graduate course, including training at hospitals.

A collaborating partner in the US will work with Khalifa University to design and implement the academic programme, in addition to assisting with recruiting and training the academic staff.

In the past, *The National* has shed light on the need for locally-trained doctors and nurses to cope with ever-increasing healthcare demands.

The UAE's first medical school is The College of Medicine and Health Sciences, part of UAE University, which opened in Al Ain in 1984.

It pioneered public medical education in the emirate and has graduated hundreds medical students since 1993.



The Dubai Medical College has also been undertaking the important task of educating female doctors for the past three decades.

Fiona McKenzie, director of Gabbitas Middle East, an educational consultant based in Dubai, said: "This is a hugely exciting development for Abu Dhabi to have a medical teaching programme which will be training doctors on the ground here. I am sure that there will be strong collaborations between the existing hospitals in Abu Dhabi and the post graduate programme at Khalifa University.

"I think there will be a lot of interest in this MD programme."

Ms McKenzie says the school will be at the forefront of medical advancement, with students with a background and AI high on their radar.

"It is interesting to note that they are keen to recruit students with an engineering background who will be familiar with AI and robotics as they are obviously keen to prepare future students for the constantly evolving world of medicine. They are also offering a bridging programme for students who wish to transition to medicine which I am sure will also be popular as it will open up another pathway to training to become a doctor.

"This is a great opportunity to take a degree in an affiliated subject first and then to choose to specialise in Medicine later," she said.

"Having a medical school creates a great ecosystem of research and training and learning in and around the medical environment. Being qualified to offer a medical school is always highly regarded in university circles so it will be good news for the academic ranking of the





Scholarships will be offered to successful candidates, while additional incentives will be offered to Emiratis.

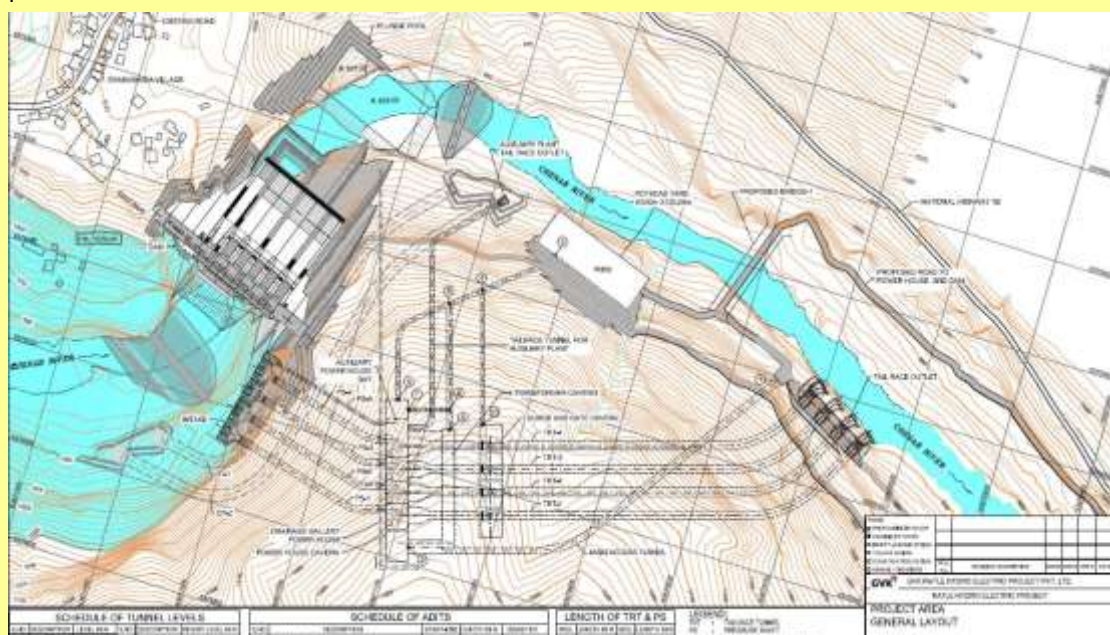
**Khalifa University is the top rated university in the country as well as the nation's youngest public university.** The university was formed last year by the merger of Masdar Institute of Science and Technology, the Petroleum Institute and Khalifa University of Science, Technology and Research (Kustar).



## India doesn't need weapons, it can kill us with water

Source: <https://dailytimes.com.pk/263688/india-doesnt-need-weapons-it-can-kill-us-with-water/>

**The construction of the Kishanganga and Ratledams by India did not start yesterday.** Kishanganga Hydroelectric project started in 2007. In 2011, Pakistan protested at Hague's Permanent Court of Arbitration (CoA) due to which the construction of the dam was halted temporarily before India got the permission to divert water from River Neelam.



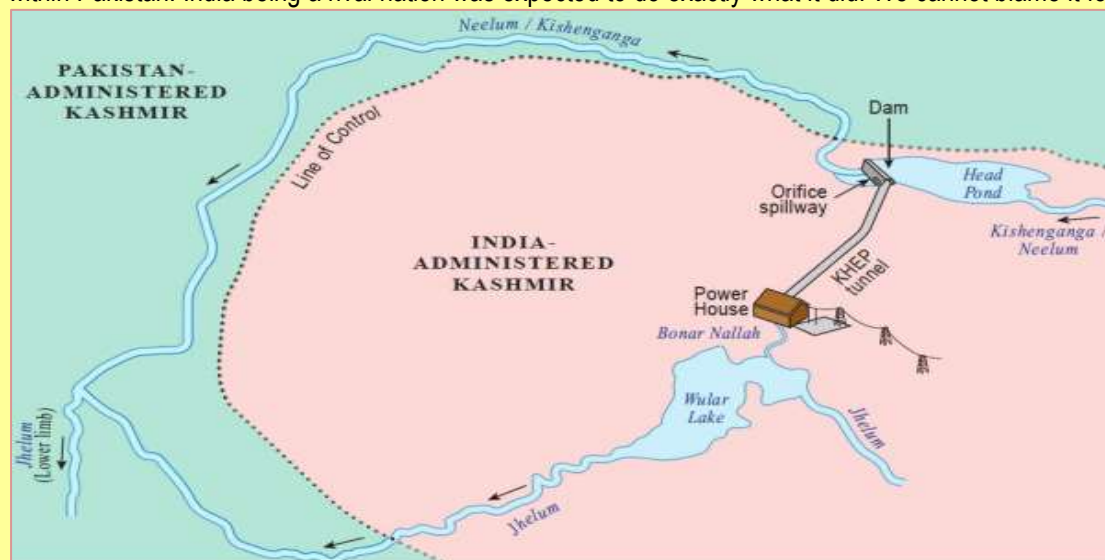
Similarly, in 2013, India started its Ratle hydroelectric project to divert the stream of River Chenab to four different power stations with the help of 400m long underground tunnels. Pakistan did protest against these dams, but sadly enough it was never adequately prepared and hence lost the cases. In 2018, Pakistan rushed to World Bank when Kishanganga was inaugurated.

Today when our politicians should be talking about issues like dams, power plants, future water and food security, all parties are instead, without exception, busy with cheap tricks.

There is no doubt that both these dams and many other smaller ones are a straight violation of Indus Water Treaty (IWT). If one reads the whole document of IWT in detail, it is evident that India has no right to restrict or interfere with the flow of the three western rivers, the Indus, Jhelum and Chenab.

In 2013, when Pakistan lost its case and references were made to the annexures of IWT for allowance of these dams, those provisions when looked at clearly state that India is allowed to use water for agricultural use with specified quantity per crop with dates of months mentioned precisely for Chenab and area of irrigation for Indus. As far as hydroelectric power plants were considered, India was allowed only to construct such a plant on any western river to a total 250 cusecs, and that too with the clear condition that the water will be returned to the respective river and the flow of the river will not be violated.

This, however, is not the issue. The problem is the slow and weak reaction of concerned officials from within Pakistan. India being a rival nation was expected to do exactly what it did. We cannot blame it for



its damaging attitude towards Pakistan. Why would India not try to destroy Pakistan with drought and water scarcity when it can? Won't this be the easiest way of tackling an enemy without having to fight a direct war? India and its people are working together for their long-term development. If they have strong lobbying at the international level, if they are always prepared when they reach such meetings, if they are diplomatically much stronger than Pakistan, then we should not try and stop them from being this strong a patriot to their country? It is their national pride that wins. It is high time Pakistani people realised their role in self-survival and national spirit.

We have failed as a nation on multiple fronts. Today, when our politicians should be talking about the issues like dams, power plants, future water and food security, all parties without exception are instead busy in cheap tricks, even if they have to sacrifice water survival projects like the Kalabagh Dam.

In India, during summer semesters, professors from top global universities like Harvard, Yale, and Stanford etc. are recruited so that an average Indian also gets the chance to get international standard education and exposure. Whereas the HEC in Pakistan gives individual scholarships to Pakistani citizens for self-growth and learning, many of whom eventually stay abroad, seeking their personal growth over national benefit.

We need to open our eyes to the issue of water scarcity. If we don't, India is right on target, and her dams have the potential to act as weapons of mass destruction.





In India, documents like IWT and WTO are taught as a part of syllabus so that a common Indian is aware of their national interests. We, on the other hand, are sleeping; and I can bet not many educated Pakistanis would have had a chance of reading both these documents even once.

There may be many such comparative examples between the two countries. The purpose for writing this article is not to praise Indian policies but to create awareness of the fact that we are facing an enemy, which is not only clever but well-connected and well-researched.

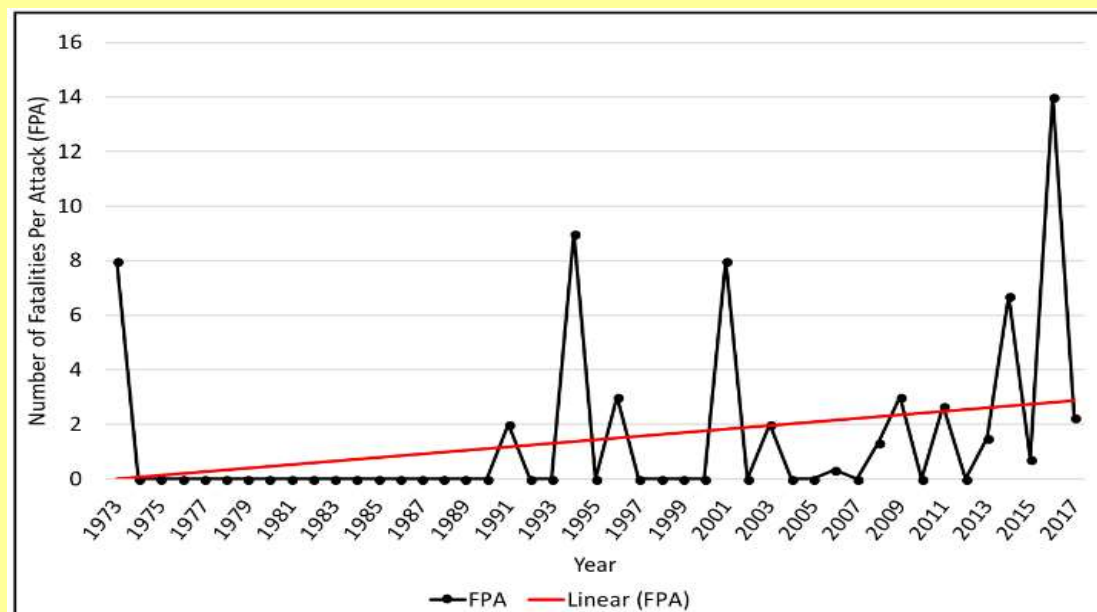
If we are not going to open our eyes to the issue of water scarcity, India is right on target, and her dams have the potential to act as weapons of mass destruction against our beloved country.

*Dr Taseer Salahuddin has a PhD in Economics from NCBAE, Lahore.*

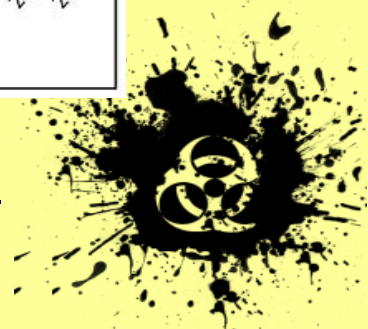
**EDITOR'S COMMENT:** I was talking to a Pakistani worker the other day and he told me exactly the same things. During previous years tens of people died due to severe floodings. Now with the Indian dams, the problem is not the excess water but the lack of water leading to drought! And there is always the threat of open the dams and flood the land in Pakistan.



Source: <https://transweb.sjsu.edu/sites/default/files/SP0518%20Vehicle%20Ramming%20Terrorism.pdf>



Vehicle Ramming Lethality Over Time, 1973-2017



## 40 Genes Associated with Aggression Identified

Source: <https://neurosciencenews.com/aggression-genetics-9533/>

July 09 – The origins of the violent behaviour are multifactorial and respond to the interaction of several factors –biological, cultural, social, etc. – which can modify the expression of the human behaviour. Now, an international study published in the journal **Molecular Psychiatry** has identified forty genes related to aggressive behaviour in humans and mice.

Participants in the study, which could contribute to shape future pharmacological targets, are the researchers Bru Cormand and Noèlia Fernández Castillo, from the Faculty of Biology and the Institute of Biomedicine of the University of Barcelona (IBUB), the Research Institute Sant Joan de Déu (IRSJD) and the Rare Diseases Networking Biomedical Research Centre (CIBERER). Both are experts in the field of genomic data analysis and genic interaction network. The new study, led by the expert Stephen V. Faraone, from the State University of New York (United States), provides a deeper and integrative view on the genetic basis of aggressiveness and the common functional ways that alter the brain circuit of violent behaviour in different species.



### On mice and humans: genes, evolution and aggressiveness

According to the lecturer Bru Cormand, head of the Research Group on Neurogenetics at the Faculty of Biology of the UB, “aggressive behaviour is a present feature over the biological evolution since it has some benefits for the survival of species (accessing resources, breeding, etc.). In these lines, our study focuses on the biological basis of aggressiveness, i.e. those endogenous factors that tend to show certain antisocial behaviours”.

“However -says Cormand- aggressiveness has a significant environmental element, which was not considered in this scientific study. Therefore, it would be interesting to combine genetic and environmental data from the same individuals to consider the interactions that can occur between the same risk factors that influence this kind of behaviour”.

Humans and mice share a common genetic base regarding violent behaviour, authors note. In particular, they identified forty genes in humans and mice that can lead to a risk of aggressive behaviours “and that take part in biological processes that are related to the development and function of the central nervous system, communication within cells and cellular function maintenance”, adds researcher Fernández Castillo (IBUB-CIBERER-IRSJD). “Some gens are likely to function as important nodes of the genic networks prone to a violent behaviour, and those would be probably related

to other genes which play a minor role”, adds the researcher.

“If any of those central genes is altered, it could affect the other genes and lead to the aggressive phenotype. For instance, RBFOX1 gene, identified in the new study and cited in a previous article by our team (European Neuropsychopharmacology, 2017), regulates the expression of fifteen out of the forty genes that we identified in the study. Another gene we marked -MAOA, which codes a metabolizing enzyme of the serotonin neurotransmission-, is related to drugs used to treat several psychiatric pathologies, sycg as selective inhibitors of serotonin reuptake or SSRIs”.

### Aggressiveness: from ADHD to major depression

The study reveals a shared genetic base between the aggressiveness in children and adults and the Attention Deficit Hyperactivity Disorder (ADHD), and the aggressiveness in adults and major depression. However, there is no genetic correlation with other psychiatric disorders -schizophrenia, bipolar disorder, autism or post-traumatic stress disorder-, so everything suggests these pathologies would not share risk genetic factors with aggressiveness.

The experimental protocol of the new study combines several analysis evaluating the genetic basis of aggressiveness from different perspectives. Regarding



humans, they analysed several association studies -between patients and healthy volunteers- at a genomic scale (GWAS), to identify risk genetic variants that are common among the general population, as well as transcriptome data showing alterations in the genic expression related to certain aggressive phenotypes. In murine models, researchers studied genes expressed differentially in aggressive animals and non-aggressive animals from the same strain, and other genes that, once they are inactive -in transgenic mice-, form an aggressive phenotype, sometimes related to a broader symptomatology.

Working globally on the involved functional pathways in violent behaviours enabled researchers knowing more about the details of the molecular mechanisms that work behind aggressiveness. "The most relevant verification of the study is that many genes are related to aggressiveness according to the results of very different experimental methodologies, which strengthens the idea of those participating in the behaviour profile", highlight Cormand and Fernández Castillo, members of the international multidiscipline consortium Aggressotype for the study of biological and environmental causes of aggressiveness.

The UB experts have published several articles shaping candidate genes -in humans, in murine models, zebra fish and in insects- as prone factors to alterations in behaviour.

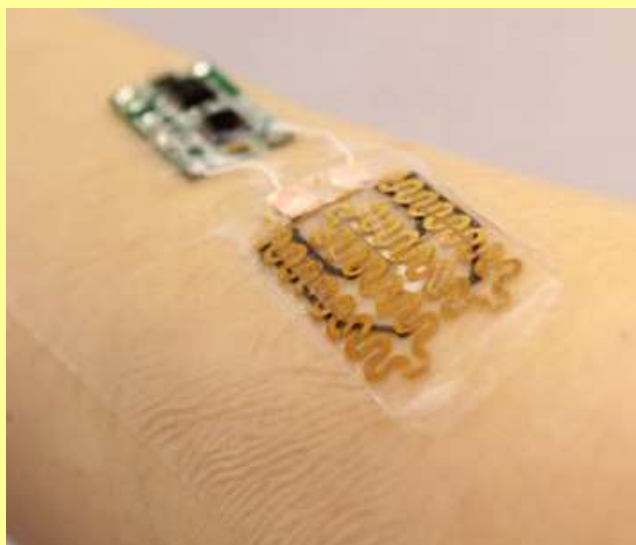
### **Violence: government, communities, and individuals can change the situation worldwide**

"The 20st century will be remembered as the century of violence. Many people live with it daily and regard it as something consubstantial to the human condition, but it is not so. We can avoid it. Governments, communities and individuals can change the situation", said Nelson Mandela, politician and Nobel Peace Prize awardee in 1993, in the world report on violence and health of the World Health Organization (WHO, 2002). In 2014, the WHO report on the world situation regarding prevention of violence quoted Nelson Mandela's words and called all countries to improve preventive measures against violent behaviours. In this world scenario, facing a problem that affects all the layers of society, scientific research will become more and more important in the knowledge of the basis of antisocial behaviours and the improvement of the prevention of episodes of violence and aggressiveness in the 21st century society.

## **Smart bandage could monitor and medicate chronic wounds**

Source: <https://newatlas.com/smart-bandage-chronic-wounds/55350/>

July 06 – Chronic skin wounds may be notoriously difficult to treat, but at the same time they shouldn't be



over-treated, subjecting patients to more antibiotics than is necessary. That's why scientists have developed a "smart" bandage that only dispenses medication as needed.

The prototype smart bandage, with its microprocessor visible at left (Credit: NanoLab – Sameer Sonkusale, Tufts University)

Developed by a research team at Massachusetts' Tufts University, the prototype bandage is just 3 mm thick, and consists of transparent medical tape, a heat-activated antibiotic gel, and

flexible electronic components.





One of those components is a sensor that measures the pH value of the wound – if the figure is significantly above 6.5, it indicates that the wound is infected. The bandage also contains a temperature sensor, which detects the heat associated with inflammation. Additionally, the scientists have developed sensors that could be added to measure oxygenation, which is a sign of healing.

An integrated microprocessor analyzes the readings from the sensors, to gauge how the wound is doing. If infection and/or inflammation are detected, the processor responds by temporarily activating heating elements that are built into the bandage. This raises the temperature of the gel, causing it to release more antibiotics into the wound.

Most of the components are relatively inexpensive, and would simply be discarded when the bandage was removed. One exception is **the microprocessor, which could be disinfected and reused.**

Pre-clinical trials of the technology are now underway.

"The smart bandage we created, with pH and temperature sensors and antibiotic drug delivery, is really a prototype for a wide range of possibilities," said Prof. Sameer Sonkusale, corresponding co-author of a paper on the study. "One can imagine embedding other sensing components, drugs, and growth factors that treat different conditions in response to different healing markers."

The paper was published this Friday in the journal [Small](#).

Another team is working on a [different smart bandage](#) that delivers antibiotics to chronic wounds on a preset schedule, and that *could* conceivably dispense medication in response to readings from onboard sensors.

## UK 2018

*O tempora o mores!*



## A new intelligence ecosystem to fight terrorism and organised crime

Source: <https://www.journalism.co.uk/press-releases/a-new-intelligence-ecosystem-to-fight-terrorism-and-organised-crime/s66/a724480/>

July 10 – While organised crime and terrorist (OCT) groups are often at the forefront of technological innovation for planning, executing, and concealing their criminal activities, law



enforcement agencies (LEAs) lag behind when tackling criminal activities. Within this “cat and mouse” scenario, the use of new information and communication technologies by OCT groups, or criminals is a key challenge for policy-makers and LEAs due to the complexity of the phenomenon, the quantity of factors and actors involved, and the great set of criminal technological activities used to finance and support criminal and terrorist actions. “Technological development is the great game changer of our present and future. Anticipation is the way forward for LEAs to change the situation from lagging behind innovation in criminal behaviour to being ahead of the curve,” says Raquel Pastor, senior consultant at Ingeniería de Sistemas para la Defensa de España (ISDEFE) and co-ordinator of the COPKIT project.

On 20-21 June 2018, researchers from 16 different organisations (from law enforcement, academia, industry, legal, ethics and privacy committees) in 13 European countries met in Madrid to launch the EU-funded COPKIT project which aims to create an intelligence and knowledge ecosystem for LEAs, in order to support prevention, investigation and mitigation in the context of the fight against OCT organisations. The two-day event was attended by 40 people who spent the first day of the meeting reviewing the objectives and structure of the project, including management, internal procedures, external advisory boards and LEAs’ involvement. The first day was also dedicated to ethics, privacy and data protection, as well as to the plans for dissemination, exploitation and communication of COPKIT results. The partners addressed the specific tasks and approaches of each of the work packages on the second day of the event.

The COPKIT project focuses on the problem of analysing, preventing, investigating and mitigating the use of new information and communication technologies by organised crime and terrorist groups. This question is a key challenge for policy-makers and LEAs due to the complexity of the phenomenon, the quantity of factors and actors involved, and the great set of criminal and terrorist technological activities in support of OC and terrorist actions. EUROPOL, the European Policy Agency, is the head of COPKIT’s Advisory Board. In its Serious and Organised Crime Threat Assessment (SOCTA) report (“Crime in the Age of Technology”) last year, EUROPOL said that “This is now, perhaps, the greatest challenge facing LEAs around the world.”

“To be able to act earlier, earlier and better knowledge and intelligence are required. That’s why we will develop a toolkit supporting the Early Warning (EW)/Early Action (EA) methodology and enabling LEAs to stay ahead of the curve of new developments in the use of technology by organised crime and terrorism groups,” says Ms Pastor. EW explains how crimes are evolving, identifying “weak signals”, warnings, new trends, and forms a basis for assisting decision-makers, at both strategic and operational levels, in order to develop EA (preparedness, mitigation, prevention and other security policies). With the involvement of technical, academic (criminology) and LEA partners from various EU countries, the COPKIT project will adopt the EW/EA methodology and the required technical support to make the approach implementable by LEAs.

### About COPKIT

The COPKIT project – Technology, training and knowledge for Early-Warning/Early-Action led policing in fighting Organised Crime and Terrorism – has received grant agreement No 786687 under the European Union’s H2020 research and innovation programme. COPKIT will focus on several aspects: (1) developing and applying an EW/EA system and applying it to use-cases, (2) developing a toolkit for knowledge production and exploitation, tested by LEAs in their premises, (3) ensuring respect of EU legal and ethical principles, (4) developing innovative curricula for all aspects of the EW/EA methodology and eco-system to facilitate the uptake by LEAs.

### Meet the team

COPKIT is co-ordinated by Raquel Pastor, Ingeniería de Sistemas para la Defensa de España (ISDEFE), Spain. **Its partners include** Thales Nederland BV (Netherlands), IBM Ireland Limited (Ireland), Trilateral Research LTD (United Kingdom), Legind Technologies AS (Denmark), Universidad De Granada (Spain), **Kentro Meleton Asfaleias - KEMEA (Greece)**, Law and Internet Foundation (Bulgaria), AIT Austrian Institute of Technology GMBH, (Austria), Ministerio Del Interior (Spain), Hochschule Fur Den Offentlichen Dienst In Bayern (Germany), Inspectoratul





General al Politiei Romane (Romania), Glavna Direksia Borba S Organiziranata Prestupnost, (Bulgaria), Iekslietu Ministrijas Valsts Policija Sta Te Police Of The Ministry Of Interior (Latvia), Ministere De L'interieur (France), Police Federale Belge (Belgium).

►► More information on the COPKIT website: [www.copkit.eu](http://www.copkit.eu)

## Danish Official Rings Alarm as Half of Young Men Unfit for Military Service

Source: <https://sputniknews.com/military/201807171066419859-denmark-military-unfit-men/>



July 17 – **In 2017, 48 percent of young Danes were considered unable to serve, which is not only a record high, but a rise of 20 percent within a matter of two decades.** This triggered the concern of the head of a soldiers' union about the general health of young men in the Scandinavian country.

Despite interest in joining the Danish Armed Forces remaining high, many of the conscripts are physically unsuited for military service. Last year, only 46 percent of young Danes were found to be suited for military service, the lowest proportion ever, the daily newspaper [Berlingske](#) reported.

The fact that almost one in two young Danish men is now found to be unsuited for military service was a cause for concern with regard to the general health of young people, according to Flemming Vinther, who chairs the Society for Army Privates and Corporals.

"This tells me first and foremost that we as a society should be worried about the health situation among our young people," Vinther told [TV2](#). "I don't actually think that basic entry requirements for the military are either unfair or extremely high," he added.

In 2017, as many as 48 percent were considered unable to serve, while only 46 percent of young Danes were found suited for military service, the lowest proportion ever according to Berlingske. This marks is an increase of 20 percent since 1995, when fewer than 30 percent were deemed unsuitable.

**Of those found incapable of military service, 22 percent of the cases reflected psychological health issue diagnoses, such as ADHD, anxiety or depression,** Berlingske reported, citing figures from the Danish Ministry of Defense Personnel Agency. The agency also noted that "more diagnoses" are made today than in the past.

While expressing hope that the military will be okay, Vinther stressed that the high numbers were concerning as an indicator of age groups in which many people don't make the cut to be accepted as soldiers.





"That should switch on warning lights for people who work with young people's health in general," Vinther said.

**Denmark, a Scandinavian country of 5.7 million, runs a conscription-based armed forces that numbers 15,500 active soldiers.** After turning 18, all young men are summoned for assessment of their suitability for military service. **Those deemed suitable or partially suitable then proceed to draw lots to determine who will actually get to serve.** Each year, about 40,000 young Danes reach military age. Women are not legally obliged to serve but can opt in to military service under the same terms as men.

**EDITOR'S COMMENT:** Denmark supposed to be a country enjoying excellent living conditions, high incomes, excellent social security, and education. But it seems that 22% have a different opinion! Even in Greece where living conditions are difficult to tragic, drop-outs are by far lower. It seems, if you have everything, your mind explores other pathways, not always compatible with real life demands.

## An immigrant workforce leads to innovation: Study

Source: <http://www.homelandsecuritynewswire.com/dr20180717-an-immigrant-workforce-leads-to-innovation-study>

July 17 – New federal restrictions on the temporary H-1B visa, which allows high-skilled foreign workers to be employed by U.S. companies, have increased debate on the economic impacts of the program, but little is known about its effect on product innovation—until now. **New research** from the University of California San Diego School of Global Policy and Strategy **shows that hiring high-skilled workers from abroad may have a meaningful impact on the birth of new products and phasing out of older ones, with implications on both firm profits and consumer welfare.**

UCSD [says](#) that in a National Bureau of Economic Research working paper by Gaurav Khanna and Munseob Lee, both assistant professors of economics at the School of Global Policy and Strategy, the authors outline how these findings were uncovered through the use of a novel data set that combined data on H-1B workers and firm production.

"We found companies with higher rates of H-1B workers increased product reallocation—the ability for companies to create new products and replace outdated ones, which in turn, grows revenue," said Khanna. "This discourse could have far reaching implications for U.S. policy, the profitability of firms, the welfare of workers, and the potential for innovation in the economy as a whole."

The authors merged publicly available H-1B data on Labor Condition Applications (LCAs), which companies have to file every time they want to hire an H-1B employee, with firm-level data from the Nielsen Retail Scanner, which provides information on products. Once combined, this new dataset at the firm-by-year level between 2006 and 2015, allowed for comprehensive examination of the impact of hiring foreign workers on firm production.

The authors also point to previous studies revealing a link between immigration flows and increased patenting. Together, these findings have striking implications for the overall consequences of H-1B migration on the U.S. economy.

"There's been a lot of work by economists on the impacts of the H-1B program mostly focused on the wages and employment of native born workers, but little is known about how immigration affects production at the firm level," Lee said. "We find that hiring more immigrant workers is associated with firms introducing new products on the market."

For instance, hiring more engineers and programmers from abroad, at perhaps a lower cost, allows firms to implement incremental innovations that may lead to newer products on the market, enhancing profitability and consumer welfare.

The authors noted while previous studies of high-skill immigration impacts on innovation have focused solely on patent production, which can be a good measure of newer production processes, the advantage of this study that looks at product reallocation is that it captures incremental innovations that are not usually patented. Product reallocation—the entry and exit of products—has long been seen as an important determinant of firm-level innovation.



“We demonstrate that changes in a firm’s production portfolio is connected to both high-skilled immigration and profitability,” the authors wrote. “In addition, changes in consumer goods products affect the welfare of U.S. consumers.”

— Read more in Gaurav Khanna and Munseob Lee, “High-Skill Immigration, Innovation, and Creative Destruction,” *NBER Working Paper No. 24824* (July 2018).

**EDITOR’S COMMENT:** Yeah! Sure! US limited the visas for skilled immigrants but they allow Cubans (especially women) who came to the US via lottery draws to work and misled future high skilled immigrants for profit (personal experience). You do not need a study to prove how usefull this new scientific blood would be for the country, any country and any continent (but Europe). Just common logic!

## K9s For Warriors trains shelter dogs to heal PTSD Veterans, gives new life

By Jeanne McKinney

Source: <https://www.commdiginews.com/politics-2/k9s-for-warriors-trains-shelter-dogs-to-heal-ptsd-veterans-gives-new-life-104587/>

July 21 – The moment an improvised explosive device exploded on a busy road near Baghdad, Iraq,



2005, SSgt Randy Dexter, one of many Veterans with PTSD, had his life abruptly re-programmed. Dexter, at 19, joined the Army to be a combat medic. He studied military medicine at Brooke Army Medical Center, where he acquired advanced skills to treat people with any combat-related trauma. This U.S. Soldier, trained to save lives, received his own rescue by K9s For Warriors.

On April 05, 2005, a few months after landing in Iraq, Dexter was with a squad of ten in three Humvees which rolled out from Camp Liberty. When the IED exploded, the only member of the squad injured was the lead gunner, who fractured his forearm on the turret.

IRAQ, 2005. As Coalition Forces respond to a car bombing in South Baghdad, Iraq (IRQ), a second car bomb is detonated, targeting those responding to the initial incident. The attack, aimed at the Iraqi police force, resulted in 18 casualties, two of which were police officers, during Operation IRAQI FREEDOM. SPC Ronald Shaw Jr., U.S. Army – DOD Defense Visual Information Center. This image is a work of a U.S. Army soldier or employee, taken or made as part of that person’s official duties. As a work of the U.S. federal government, the image is in the public domain.



Due to the blast that reached across a six-lane road, a small sedan on the opposite side went through Dexter’s convoy and slammed into a tree. Dexter provided aid to the car occupants, who were frantic, speaking Arabic. The right side passengers suffered injuries, with lacerations, and some burns. The left side driver lay slumped over in the front passenger’s lap.



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*"He had a hole in the side of his head that was about the size of my fist, if not a softball," said Dexter.*

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The man took one deep, deep breath every 5-10 seconds while Dexter tried to open his airway and get him breathing better. But the daunting hole in his head froze Dexter momentarily, but then snapped out of it. An Iraqi National Guard ambulance extracted their wounded. Dexter learned the man with the gaping injury passed away later that day.

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*Dexter ruminated, "Did I do the right thing? The guilt knowing he died really played on me."*

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### **Combat PTSD is a silent hell of suffering for many Veterans**

That night Dexter started having nightmares. The next day they were back on the road, in a game of deadly war roulette. Troops braced for the 'pucker factor' – "Is today 'the day?'" and that is life out there. John Musgrave, USMC Ret., a Vietnam Veteran, shares his war-induced fears in NPR's episodic series: The Vietnam War by Ken Burns.

Musgrave made a chilling admission while describing his experience at a listening post at Con Thien, South Vietnam, 1967 (near the DMZ). He said it 'was like getting a death sentence at a trial'. Three Marines out there with a radio, so close to the enemy at times – he could hear them whispering to one another.

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*"When my kids were growing up and that's the first time they found out daddy had been in a war they said, "Why do we need to outgrow our nightmares, when daddy's still got one?"*

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### **A former military contractor with PTSD finds a way to help Veterans**

Brett Simon, president, and co-founder of K9s For Warriors, understands the fallout of combat. Simon was one of a group of 15 handlers and dogs fulfilling a contract Vohne Liche Kennels had with the Army to test the first dual-purpose trained [explosives and tracking] military working dogs in the theater of war. Consequently, they went to Mosul, Iraq in 2005.

Simon and his group integrated with several units, including 2nd Infantry Division. During the first year Iraqi citizens had a voice in their government, Simon and his canine searched election polls in Mosul prior to the elections to make sure the Iraqis could come in and vote safely.

All handlers and dogs returned safely home, but Simon brought back PTSD. His mother had read about how dogs were helping people with PTSD. Simon's background was law enforcement where he trained dogs for 10 years. Simon and his mother came up with the idea of service dogs for Veterans.



They didn't have a large budget to start a purpose-bred dog program but similarly believed that shelter or rescue dogs could do this job. A local veteran in Jacksonville, FL, and a big black dog named Sarge, found on Craigslist, were the first to go into the program in 2010.

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*"We never looked back," said Simon. "Our mission is just to help dogs and Veterans."*

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June 2014. K9s For Warriors owner, Brett Simon with first service dog Reagan. Photo K9s For Warriors, released

A shelter dog must meet K9s' parameters and graduate their structured program.

The age must be two years or younger – for the longevity of the handler. Weight must be 50 to 55 pounds and height must be 22-24 inches tall in order to teach a mobility command called 'brace' for warriors of all sizes.





Shelter, rescue, or owner-surrendered canines undergo an initial temperament assessment. If they pass the tests for anxiety/fearfulness, food motivation (for training purposes), they go back to K9s For Warriors Ponte Vedra, FL, campus for a complete medical workup and wellness check.

Once assigned to a trainer, dogs go through a 4-6 month program of more temperament assessment plus obedience and task training. Also, the pressure is placed on the dog to handle public access, busy places, noise, and vehicles – ensuring the dog is sound. The dogs learn mobility commands to brace, block, and cover.

When a dog graduates – K9s matches attributes of both dog and warrior. The final paring happens the day a warrior arrives. “We have a year and a half wait list,” said Simon.

### **Stitches, chest tubes, morphine – the pledge to serve a nation tests the best**

Certainly, troops experience shock and awe, whether in intimate brawls, surprise attacks, or any lethal encounter. Combat medics run through bullets, deafening explosions, choking smoke and blinding fire, to get to the injured. A medic’s training is second nature – yet war causes extraordinary injuries.

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*“I had to be prepared to make sure I could keep them alive long enough to get them either on a Blackhawk (MEDEVAC), a Humvee ambulance or whatever was to come. That was my job...which is pretty stressful, if you can imagine,” said Dexter.*

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Noteworthy is the eagerness, patriotism, selflessness, and a will to fight cruelty and evil that sends our men and women to battle. Expertly trained, they topple and deter oppressive regimes, quell chaos, keep world economies free-flowing, and assist with humanitarian crises.

They are very good at it – saving us from the dirty work. A medic can stop the bleeding, assist the breathing, and dull excruciating pain, yet in contrast, a fix for trauma in combat is elusive. Haunting, gripping, instant recall can be life-long.

### **The brain records war atrocities**

Bodies torn apart, people displaced, livelihoods destroyed, along with battle sounds and smells are absurdly foreign, morally disturbing, and physically challenging.

A Viet Cong shot Musgrave in the chest with a machine gun, causing a permanent disability. The enemy shot two other Marines trying to get to him. The average age of a Vietnam Soldier was 22, dropped into an unfamiliar jungle environment, hit by waves of skilled and determined executioners who tunneled, tracked, hid and struck with fury. Consequently, this kind of survival grinds into brain networks and is hard to forget.

“My hatred for them [Viet Cong] was pure. Pure. I hated them so much. And I was so scared of them...and the scarer I got, the more I hated them,” said Musgrave.

Out of 2.7 million that served, over 58,000 American troops died and another 304,000 wounded. How many of them received treatment for PTSD is unknown. For their tremendous sacrifices, these weary warriors faced an indifferent and hostile America.

### **Like Vietnam, insurgents fight for oppressive control over real estate in the Middle East**

Dexter deployed again to Iraq in 2007-2008, when sectarian violence fueled a growing insurgency. President Bush increased the number of American troops in Baghdad and Al Anbar Province to assist local forces. Dexter served as a medic and personal security for General Rick Lynch, Commander, 3rd Infantry Division.

To avoid the stigma, Dexter bore his PTSD in silence.

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*“I wanted to be a soldier, and I felt like if I said anything, I wouldn’t be able to do my job.”*

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Things worsened after his second deployment. Dexter self-medicated with alcohol. He met his second wife Becky in 2008, who didn’t know the details of Dexter’s combat experiences. Dexter didn’t talk to anyone about it except soldier buddies who were there.



**C<sup>2</sup>BRNE DIARY – July 2018**

Becky inspired Dexter to ask the Army for help.

"I had to go into detox, but lost my position. Had to work night shift hours where I couldn't touch patients," said Dexter.

Four years later the Army said, 'Okay you can't do this anymore'. This Soldier served over ten years as a combat medic, including 27 months deployed.

**As Captain was learning mobility commands, Dexter was shoring up for civilian life**

Dexter spent the last year of military service at Balboa Naval Hospital, San Diego, to get healthy and transition out of the Army. A non-drug multi-pronged approach of varied therapies and recreational

activities helped more than pills that made Dexter feel 'like a zombie'.

For one therapy he paired up with a beautiful Golden Retriever named Ricochet, a service dog.

Ricochet helped Dexter transition from not talking about his PTSD, to someone who 'would not shut up'. Having loved dogs all his life, he and his wife realized this was something that was going to work. Ricochet's handler, Judy, introduced Dexter to K9s For Warriors.



Service dog Captain. Photo courtesy Randy Dexter

In August 2014, Dexter woke up on K9s campus 'freaking out with anticipation'. He was led to the kennels and introduced to his new service dog, Captain.

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*"I will never forget that day, I love that day. Before that I'd spent the nine years living in hell," said an emotionally-charged Dexter. "Since that moment we've been inseparable, spending every second of every day together." History had changed. "Dogs want you to smile and be happy."*

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Dexter and Captain traveled the country as advocates for PTSD service dogs.

They also completed a college degree in Communications Studies at the University of Nevada, Las Vegas and won student Veteran honors and accolades.

**K9s keeps track of Veterans and service dogs**

Randy Dexter and service dog Captain lecture at an event.  
Photo courtesy Randy Dexter

Dexter got a call from K9s, who follows up on their 445 graduates (to date). It was an offer to head up K9s' new training facility in Alachua, FL. Dexter excitedly accepted and hence joined K9s 'peer to peer' mentoring. He and Captain now 'paw it forward' to other Vets in need.

"The great thing about K9s For Warriors is it's free for Veterans," says Dexter.



**C<sup>2</sup>BRNE DIARY – July 2018**

The only expenses are travel to the K9s For Warriors campus and home. Each service dog costs K9s \$27,500 due to expenses for rescue, housing, food, healthcare, training to graduation, equipment for the warrior, and a 21-day period of bringing the Veteran through the program with their dog.

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*K9s For Warriors relies on the giving spirit of donors, volunteers, and corporate sponsors. Visit the [K9s for Warrior website](#) to help support their work.*

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**Stryker Orthopaedics is crazy about what K9s For Warriors is doing for America's Veterans**

Jack Benecke wanted to play football for the Army and participate in an Army-Navy football game. He attended West Point and because of his experience there he pursued a military commitment. While at school, Benecke saw the opportunities to work with diverse men and women, 'get dirty, jump out of airplanes, slide down ropes, play with weapons, travel and be adventurous'.

As a result, he did airborne, air assault and Ranger School, the Army's premier direct action raid force. He joined the infamous 101st Airborne division and worked in 2nd Brigade of the 101st as a field artillery officer, who controlled fire support assets for a light infantry maneuver company.

In the Army, Benecke got an MBA, which led to his current role as a General Manager with Stryker Orthopaedics, Great Lakes Branch – a world leader in medical technology. He oversees sales and marketing functions logistics, customer service, for distribution of total knees, hips, shoulders, ankles, trauma and extremity implants.

Though never in combat, he understands the hardships of today's military,

"Stryker's involvement and commitment to support all Veterans, government installations and VA facilities make me proud. Additionally, these efforts offer some peace of mind for many of the great leaders I worked with throughout my active-duty. Great leaders like General Robert Caslen, Col Greg Gadsden, and Col Pat Work. I am sure these Stryker priorities give some reassurance and confidence for their soldiers upon return from deployments," said Benecke.

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*"I feel like K9s For Warriors is an incredible opportunity to rescue Soldiers...and frankly there's never been a support like this that I'm aware of for our Vets when they go back to their homes," added Benecke."*

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**Benecke remembers the first K9s service dog Stryker sponsored for a female Air Force Veteran**

She had the heart-wrenching job of getting those killed in action on an airplane to fly back to the United States. The dog sensed her anxiety telling her story at Stryker's military appreciation ceremony in front of a large audience – that her cortisol levels were going up. "That canine got right up next to her and was beside her the entire ten-minute presentation," he said.

Stryker integrates internal resources to support K9s for Warriors handing a leash to a serviceman or woman suffering from PTSD, traumatic brain injury or other military trauma as a result of military service post 9/11.

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*"It's a palpable culture. Everybody is excited about it," said Tommy Gray, Stryker Associate Communications Manager and former U.S. Marine.*

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ILLINOIS, July 2018. Stryker sponsors 19th service dog during SENIOR PLAYERS Championship at Highland Park. (Left to right) Jack Benecke, General Manager, Stryker's Great Lakes Branch, Veteran Tyler and Bella, Milwaukee Sales manager and Army veteran Tim Sebald. Photo Tommy Gray for Stryker

At a national sales meeting, Benecke relates Sales Representative Stephen Vincent's challenge. Vincent, with Stryker for 20 years, stood up in front of 1600 sales reps with executive leaders, saying, "This K9s For Warriors program – it resonates with me. I never served.





**C<sup>2</sup>BRNE DIARY – July 2018**

I might never have been deployed, but I'm so proud to be a part of what Stryker is and what they do for our Veterans." Money to sponsor four more service canines was raised in a single meeting.

Stryker, as a corporation, has donated 19 service dogs since partnering with K9s For Warriors in 2015. At the July 2018 SENIOR PLAYERS Championship in Highland Park, IL, Stryker made its seventh donation of the year at their Patriots Outpost venue. That's over \$120,000 in seven months. More dogs are on the way, thanks to Stryker employees who catch K9s fever and give to something greater than profit.



K9s For Warriors is the largest provider of service dogs to Vets in the country and the second largest service dog provider.

February 2018. K9s For Warriors owner, Brett Simon with current service dog, Lincoln. Photo K9s For Warriors

"It's a good feeling to watch the handlers grow with that dog, because PTSD is isolation, depression and things are so bad with these guys we have an epidemic of 22 Vets a day committing suicide," stated Simon. "We have multiple stories of guys that attempted suicide who are now one of our graduates. Their suicidal thoughts have not disappeared, but have dramatically gone down."

Young men and women enter the military getting their first crack at life on their own. They come from small towns and big cities, all very different and unique.

Yet when you put them in uniform and on the worst of battlefields, they

forge togetherness and surpass our limited ideas of valor.

America's warriors follow orders and do it well. For those left with the scars,

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***"I'm not sure if we'll ever find a cure for PTSD, but we can definitely help them recover and get back to life and live it." Brett Simon, K9s For Warriors.***

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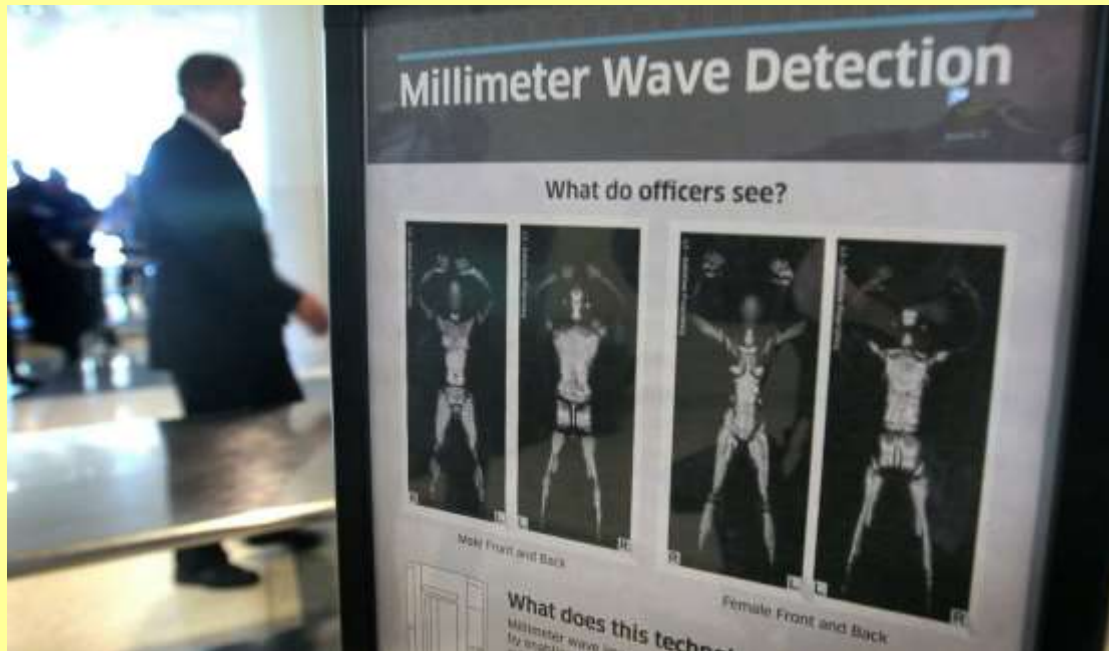
*Jeanne McKinney is an award-winning writer whose focus and passion is our United States active-duty military members and military news. Her Patriot Profiles offer an inside look at the amazing active-duty men and women in all Armed Services, including U.S. Marine Corps, Navy, Army, Air Force, Coast Guard, and National Guard. Reporting includes first-hand accounts of combat missions in Iraq and Afghanistan, the fight against violent terror groups, global defense, tactical training and readiness, humanitarian and disaster relief assistance, next-generation defense technology, family survival at home, U.S. port and border protection and illegal interdiction, women in combat, honoring the Fallen, Wounded Warriors, Military Working Dogs, and much more. McKinney has won*



ten San Diego Press Club “Excellence in Journalism Awards”, including five First Place.

## China introduces millimeter wave tech into airports security checks

Source: [http://www.xinhuanet.com/english/2018-07/01/c\\_137294056.htm](http://www.xinhuanet.com/english/2018-07/01/c_137294056.htm)



July 01 – **China has officially introduced a human imaging device with millimeter wave technology into its airports security checks**, according to civil aviation authorities.

The Civil Aviation Administration of China (CAAC) issued its latest official technical standards and testing program for the millimeter wave human-imaging technology used for airport security checks.

Following the United States and the European Union, China is the first in Asia to issue the related technical admission standards.

The new technology will gradually replace current metal detectors, which have been in Chinese airports for 26 years, according to CAAC.

The millimeter wave human-imaging technology is the most advanced technology for global security checks, helping improve airport efficiency.

The technology is harmless to the human body and has a strong imaging capacity. It can detect hidden objects found on a person no matter the size or location, even non-metallic ones.

The new-tech is used in airport security checks in several countries such as the United States, Britain, Netherlands, Australia and Japan.

Chinese civil aviation authorities began trial tests of the technology in four airports in August 2017.

## Counter-Drone Protection at FIFA World Cup Games

Source: <https://i-hls.com/archives/83996>

July 06 – The Russian Ministry of Interior uses counter-drone guns to protect from UAVs during the FIFA 2018 World Cup. Moscow police received two such guns from LokMas. The **anti-drone guns Stupor** are currently undergoing tests in different Russian security agencies, including the Syrian campaign. In Moscow, they are already used for protection of infrastructure of the world football cup.

According to the weapon's designers, no special training is needed for the Stupor operator, only aiming at an aerial vehicle and pressing the button to activate the suppression system



is required. The maximum operating range is about 2 km. The gun successfully suppresses a copter's navigation system at the distance of 1.8-2.2 km. Command links are suppressed at the range of 400-600 meters. The Stupor gun weighs 5.5 kg and is 1.16 meters long.

The major facilities of the world championship are protected by several 'defense lines', there is both detection and electronic suppression of potential violator drones. Moreover, the anti-drone gun operates



in the line-of-sight conditions, so it can handle approaching drones in case of the system's failure.

The weapon developers told mil.today that the anti-drone gun can is designed to prevent the drones from reaching such point where they could drop explosives or other payloads.

The Stupor anti-drone gun designed by LokMas is a man-portable system intended for electromagnetic and optoelectronic suppression of unmanned aerial vehicles. It neutralizes drones by cutting control, data exchange and navigation links using electromagnetic waves and laser emission. A drone getting under gunpoint is disoriented and runs emergency safe landing. The target locking time until full suppression is 4 – 30 seconds, depending on the drone type. The gun does not harm the drone's hardware, so it can be restarted after suppression.







# CHEM NEWS



## How to keep first responders safe in chemical warfare agent incidents

By Steven Pike

Source: <http://www.argonelectronics.com/blog/how-to-keep-first-responders-safe-in-chemical-warfare-agent-incidents>



June 19 – Training for [chemical warfare agent](#) (CWA) incidents relies on providing first response personnel with realistic, safe and flexible learning opportunities that accurately reflect the diverse variety of CW threats.

With the increasing frequency of CW incidents being carried out in civilian settings, there is recognition of the growing reliance on civil response teams to be able to confidently take the helm prior to specialist military units arriving on scene.

### Are first responders equipped for CWA events?

The role of first responders, and how they collaborate with the military, was at the heart of a recent article published in the April 2018 edition of the [CBRNe World](#) magazine.

As its author, former Assistant Chief Constable and member of the [Resilience Advisors Network](#), Chris Singer, explains: in the wake of the Novichok nerve agent attack in Salisbury, United Kingdom, there are some crucial lessons that can be learned.

In his article, Singer places particular emphasis on the crucial role that first responders play in managing the initial response to CW events in civilian settings.

And he raises some key questions - most specifically:

- Is enough being done to protect the civil defence teams who may be tasked with CW response?
- Are existing arrangements and training opportunities sufficient to manage a mass casualty event in the UK?
- And do the personnel operating within civil authorities have (or require) access to the same capabilities as the military?

As Singer emphasizes, "It is critical to ensure that those providing first and specialist response to incidents are properly equipped and benefit from the best and [latest training](#) to keep them safe and enhance the effectiveness of response."

### Lessons learned from Salisbury, UK

Events such as the nerve agent attack in Salisbury are a reminder of the need to prepare non-military personnel with the knowledge to be able to identify and contain a threat and to be able to carry out initial decontamination of themselves and those around them.





It's not uncommon for an initial incident response to be facilitated by fire personnel, for example, who may have access to only the most basic of self-contained breathing apparatus.

In many instances, it's only once the first response team has completed their initial assessment of the incident, and identified the presence of a CW threat, that specialist, and suitably equipped response teams will be summoned to the scene.

In the meantime there is the potential for a considerable delay, depending on how quickly those specialist units are able to arrive - which puts the burden of responsibility on first responders to be able to identify the threat, contain the area and keep people safe.

With the onus on civilian first responders, comes the necessity for appropriate CW training. And, as we have explored in previous blog posts, [realism](#) has a vital role to play successful learning outcomes.

### **Chemical warfare agent training using simulants**

The dispersal of CWA simulants, while offering a higher degree of realism, can also be problematic to put into practice.

In most cases there will be the need to comply with environmental regulations that can limit or restrict the dispersal of chemical simulants.

Exercises that are designed to take place indoors can also present challenges, and especially in confined spaces where the small quantities that are permitted can restrict the effectiveness of the scenarios.

Many modern CW detectors have also been programmed with interference rejection which means they can often provide a limited response to chemical simulants.

### **CWA training using electronic simulator detectors**

In contrast to the multiple challenges of simulant training, safe training systems that use electronic simulator detectors and electronic sources can take all of the headache out of training exercises -whilst also ensuring the highest levels of trainee safety.

Intelligent [computer-based training tools](#) provide CWA instructors with the ability to recreate all the realism of a live incident whilst removing all environmental and health and safety risk.

And perhaps most importantly, exercises using electronic simulators can be set up quickly (and repeated with ease) to ensure optimum student learning outcomes.

With the growing threat of CWA events in civilian settings, the reliance on the experience and expertise of civilian first response teams is only likely to increase.

The provision of realistic, hands-on training using electronic simulator detectors can play a key role in ensuring the safety of first responders, both in their training scenarios and in the context of live CW incidents.

## **A guide to 6 simulator detectors for use in realistic CWA training**

By Steven Pike

Source: <http://www.argonelectronics.com/blog/a-guide-to-6-simulator-detectors-for-cwa-training>

May 17 – Electronic simulator detectors can be used in a wide range of chemical warfare agent (CWA) exercises to create realistic, [hands-on training experiences](#) for police, first responders and the military.

Unlike other traditional forms of CWA training that may rely on the use of live agents or simulants, [simulator detectors](#) and their electronic sources offer the advantage of offering complete safety for trainees, their instructors, the environment and the general public.

Electronic simulator detectors combine the look and functionality of an actual CWA detector with intelligent computer-based simulation tools, to replicate how real devices react when confronted by a range of chemical agents.

Life-like scenarios can be set up in any location, including inside public buildings, and multiple devices can be deployed to represent a range of different substances within the same training exercise.

In this blog post, we highlight the features and capabilities of 6 electronic simulator detectors that can be used in the delivery of effective and engaging CWA training scenarios.





**1) LCD3.2e-SIM**

The Smiths Detection LCD3.2e is a compact and lightweight chemical detector which is deployed by armed forces and first responders across the globe to test for traces of Toxic Industrial Chemicals (TICs), Nerve, Blister, Blood and Choking agents. The device has been designed to be hand-held or can be clipped to a belt or harness for ease of use.

The LCD3.2e-SIM is a high-fidelity detector simulator that replicates all of the functionality and response of the actual device, providing CWA instructors with the opportunity to simulate a wide variety of real-world scenarios and conditions which include:

- The detection of nerve, Blister, Blood, Choking Agents, Toxic Industrial Chemicals (TICs) and False Positives
- An understanding of cumulative dose and dose alarms
- The effects of contamination, decontamination and persistency
- The effects of wind direction and temperature on the device
- The depletion of LCD3.2e sieve packs and batteries
- The changeover of a sieve pack / missing sieve pack / attempted use with storage sieve pack
- LCD3.2e Confidence testing to ensure functionality
- The use of a survey nozzle (to survey cargo, equipment, facilities and personnel)
- Compatibility with the wide-area training system

[PlumeSIM](#)

**2) S4PE Chemical Hazard Detection Simulator**

The S4PE Chemical Hazard Detection simulator is a training device that looks and functions just like the Proengin S4PE surface sampler and confidence tester, when used with AP2C and AP4C detectors. The SIM operates with both AP2C-SIM and AP4C-SIM simulation sample pipe and features programmable, and re-usable, sample collection scraper heads which enables electronic simulation of a wide variety of chemical agents, TICS and false positives.

The simulator provides trainees with the opportunity to experience and understand:

- Contamination, decontamination and persistency
- The effects of wind direction and temperature
- Confidence testing and the use of S4PE for sampling
- The depletion of batteries and hydrogen cells
- Collection of a surface sample
- The warm up cycle of a collected sample

**3) RAID-M100 Chemical Hazard Detection Simulator**

The RAID-M100 is a dedicated simulation instrument for training in the correct use of the Bruker RAID M100 in virtually any scenario and environment.

CWA instructors can define the simulated threat to represent specific CWAs (GB, GD, GF, HD etc). The device responds to safe, environmentally friendly electronic simulation HazMat sources and simulates actual identification of detected substances.

Among the device's key features are the ability to:

- Simulate the contamination of a probe during contamination monitoring
- Work without the need for an ionizing radiation source



- Monitor and report back on user errors such as a missed confidence test
- Replicate the effects of inlet nozzle contamination
- Simulate the replacement of a sieve pack and filter
- Simulate both persistent and non-persistent CWAs
- Work in conjunction with [PlumeSIM](#)

#### 4) [M4 JCAD Simulator](#)

The M4 JCAD SIM is a high fidelity simulator for the Smiths Detection M4 JCAD. As a training tool it can play a vital role in helping to reduce sieve pack consumption and in preserving actual JCAD detectors for operational readiness. It is also compatible with the wide area training system [PlumeSIM](#).

The M4 JCAD SIM enables the simulation of:

- Nerve, Blister, Blood, Choking Agents, TICs and False Positives
- Contamination, decontamination and persistency
- Effect of wind direction and temperature
- Depletion of sieve packs and batteries / user changeover of sieve pack / missing sieve pack / attempted use with storage sieve pack
- Cumulative dose and dose alarms
- Confidence testing and the use of a survey nozzle

#### 5) [GID-3 Chemical Warfare Detection Simulator](#)

A chemical hazard simulation training system that allows safe and comprehensive training in the correct use of the Smiths Detection GID-3, without external simulants or other consumables.

Key attributes of the GID-3 SIM include:

- No requirement for an ionizing radiation source
- No need for consumables other than standard commercial batteries (Lithium or rechargeable Lithium Ion batteries)
- Low cost of ownership due to no necessity for preventative maintenance or regular calibration
- A powerful instructor remote which can control up to 8 simulators from a distance of up to 800 meters
- The ability to work with an M42 remote alarm
- Simulation of CW alarms and detector faults
- Simulation of mode 16 output data from RS232 port
- Compatibility with [PlumeSIM](#)

#### 6) [ChemPro 100/100i-SIM](#)

The ChemPro 100/100i system enables the training of first responders and CBRN troops in the use of the ChemPro100 and the correct action to take in the event of a chemical attack.

They can then monitor user actions or errors by means of a powerful instructor remote.

Simulated alarms can also be initiated using a point source or long range vapour simulator.

The system is [PlumeSIM](#) compatible and also enables simulation of:

- Confidence testing
- Filter changing
- The CP100 / CP100i menu structure
- Contamination of the sensor head

The ability to create realistic and innovative CWA training scenarios is key to ensuring the operational readiness of military crews and first response teams.

Electronic simulator detectors can be an invaluable asset when the most life-like experience is desired, but with zero risk of harm to human health or the environment.



## 6 questions to ask before upgrading your CWA training equipment

By Steven Pike

Source: <http://www.argonelectronics.com/blog/8-questions-to-ask-before-upgrading-your-chemical-warfare-agent-training-simulators>



June 13 – The risk of a deliberate or unintentional hazardous material or [radiological](#) release is an acute and all too real challenge for military and civil emergency response teams across the globe.

In most cases the responsibility for effective handling of such events lies in the hands of individual national, regional and local government agencies who must develop their own chemical warfare agent (CWA) training procedures in order to be able to effectively respond to any threat.

Rapid detection and response is critical, as is the ability for personnel to be able to accurately interpret and relay their findings.

With this in mind, increasing numbers of military agencies, civil response teams and [CBRNe](#) instructors are looking to innovative simulator training tools and strategies to assist with their teaching.

And with this in mind it can be useful to have consider a few key questions when deciding which [CWA training](#) system offers the best fit:

### 1) Is the CWA training system safe?

Human safety, environmental concerns, administrative burden and cost inevitably restrict or preclude the use of simulants or live sources in training exercises.

But by replacing the potentially harmful source with a harmless electronic substitute, it's possible to remove the risk of saturating a training area or of posing any potential Health and Safety hazard to personnel, infrastructure or the environment.

### 2) How realistic will the simulator equipment be?

Detectors are used to collect vital information that is used to make life-saving decisions, so having access to [simulator equipment](#) that replicates every feature of the real device is going to be crucial.

Knowing how to monitor cumulative dose, how to identify false positives, how to understand the effects of wind direction and temperature and how to recognize the depletion of sieve packs and batteries are all key elements of realistic and effective training.

### 3) Is the equipment usable in a range of environments?

CBRNe or [HazMat](#) incidents can occur in an unlimited range of settings, both indoors and outdoors and in any number of potential weather conditions. And ideally instructors





will want to be able to control every element of the exercise

The ability to be able to quickly set up a scenario (and for all conditions of that scenario to remain as you leave them) can also impact on the success of a training exercise.

Repetition is well understood to be a key to effective learning, so the ease with which the equipment can be reset to enable scenarios to be repeated is another significant factor that can [optimise the training](#) experience for both students and their instructors.

#### 4) Does it have AAR to assist post-exercise learning?

An important outcome of training with simulator detectors is that students are able to demonstrate their ability to set up and use the device in exactly the same way as they would the real instrument.

If any stage of the process isn't followed correctly, or isn't completed to a sufficient standard, then instructors will want to be able to obtain that information and report it back to the trainees, either during or after the exercise.

#### 5) Will it be expensive to maintain the equipment?

A driving factor in the decision to purchase simulator technology is the fact that it prevents

wear-and-tear or damage to real detectors during training exercises.

But equally it's important to establish that your simulator equipment won't require any expensive maintenance or recalibration that could render it 'out of action.'

It will also be crucial to establish that there's no requirement for the ongoing use of costly consumables which would increase the total cost of ownership.

#### 6) Is the training system customizable?

With the increasing number of new [CBRN threats](#) it's even more important that simulator technology can implement a wide range of technologies (ultrasound, electromagnetics, fluorescence, virtual modelling etc) in order to simulate a diversity of sources.

The ability for simulator detectors to be able to be used with actual devices is another key factor, as could be the capacity for the simulators to be able to interface with third party Instrumented Training Systems.

**There's no doubt that an investment in electronic simulators warrants serious consideration, however if the right questions are asked then CBRNe instructors can be reassured that the decision will lead to tangible and calculable CWA training outcomes.**



## The Chemical Munitions Used By the Syrian Government 2012-2018

By Eliot Higgins

Source: <https://www.bellingcat.com/news/mena/2018/06/14/chemical-munitions-used-syrian-government-2012-2018/>

June 14 – The conflict in Syria has seen the widespread use of chemical weapons by Syrian government forces since the end of 2012, with a surprising, and often very unusual, range of chemical munitions used. This article examines the chemical

munitions documented through open sources, primarily used to deploy Sarin and chlorine gas.

**Eliot Higgins** is the founder of Bellingcat and the Brown Moses Blog. Eliot focuses on the weapons used in the conflict in Syria, and open source investigation tools and techniques.

**EDITOR'S COMMENT:** Read the full article at source's URL. It is a big article with lots of videos, photos, and diagrams. It is also of interest to read the comments at the end of the article.



## Omitted details from UN report implicate Syria, Iran in use of chemical weapons

Source: <http://www.homelandsecuritynewswire.com/dr20180626-omitted-details-from-un-report-implicate-syria-iran-in-use-of-chemical-weapons>

June 26 – **Details removed from a United Nations report that had been released last week implicate Syria and Iran for a series of chemical weapons attacks in January and February,** the *New York Times* [reported](#) Wednesday.

A UN commission investigating war crimes during the seven-year-old Syrian civil war uncovered evidence of chemical attacks perpetrated by the regime.

The specifics of a number of these attacks, however, were omitted from the final report that was released. They were summarized at the end of the report.

One of the investigators asserted that the omitted details needed further corroboration and could be included in a future report. He also said that there was no pressure to leave the details out.

**The leaked draft documented “in meticulous detail,” according to the *Times*, six chemical weapons attacks between January and 7 April of this year.**

In attacks that occurred on 22 January and 7 February, the commission found that the deadly chemicals were delivered on “industrially produced Iranian artillery rockets,” which are “only known to have been used by Government forces, and rarely, affiliated militias.”

The attacks on the Damascus suburb of eastern Ghouta followed a pattern previously reported of chemical weapons use by the regime of Syrian President Bashar al-Assad. None of the attacks appeared to have been committed by other armed groups.

The presence of Iranian weapons in the Syrian conflict are an indication that Iran is violating United Nations Security Council Resolution 2231, which implemented the 2015 nuclear deal, and had provisions [extending](#) the ban on Iran exporting arms until at least 2020.

In January of this year, a UN panel [found](#) that Iran was violating the export ban by sending weapons, including ballistic missiles, to the Houthi rebels in Yemen.

In one documented attack, a shell struck an apartment building near the last functioning hospital in the Douma section of Ghouta on 7 April. According to the report:

*“Statements and material evidence received and analysed by the Commission in relation to the deceased within the apartment building revealed an array of symptoms consistent with exposure to a choking agent, including signs of foaming at the mouth and nose, blue skin indicating impaired blood circulation, meiosis (constriction of the pupils), as well as some cases of dilated (wide open) pupils. Numerous victims unable to flee the building collapsed shortly after exposure.”*

Forty-nine people, including eleven children, were killed in the attack. While the report observed that the attack had signs consistent with the use of chlorine,” the symptoms displayed by the victims were consistent with “another chemical agent, most likely a nerve gas.”

## GPs should lock out patients in the event of chemical terror attack

By Laura Donnelly (Health Editor)

Source: <https://www.telegraph.co.uk/news/2018/06/26/gps-should-lock-patients-event-chemical-terror-attack/>

June 26 – **GPs should lock their doors and not let patients in,** in the event of a [chemical terror attack](#), medics have said.

Dr Peter Holden, a medical advisor to the Government's emergency Cobra committee, said doctors should protect themselves and their premises if victims of an incident came to them for help.



Speaking in a debate about [the poisoning of Sergei Skripal, in Salisbury](#), the medic said patients should be kept away from surgeries so they did not spread contamination.

Dr Holden, a GP from from Matlock, in Derbyshire, said: “People have got this overblown idea of what GPs can and can’t do.

“Clinically, we can do an enormous amount but remember, every one of those buildings, we own ourselves.

“So, if you contaminate my building, you make me bankrupt – I do not want you in there.”

Doctors overwhelmingly carried a motion which “deplored the failure of government communication” following the poisoning in March.

In particular, they criticised the 12-day delay before GPs were given advice on managing potential conflict with an unknown toxic substance. And they attacked the failure to quickly establish a dedicated poisons helpline.

Dr Holden said dealing with [sudden terrorism threats](#) was difficult for the NHS.

But he said if people had been contaminated by toxins, GPs were unlikely to be able to provide help.

Such patients should be sent to decontamination shelters, he said.

“With these types of attacks, if somebody is going to fall over, they will fall over pretty quickly.

“If you were to have a Japanese sarin attack you wouldn’t go to a GP.”

He raised fears that worried members of the public could end up spreading contamination.

“It’s the age old problem of not frightening the women and the horses,” he said.

“The problem is getting the message around. You say to people, ‘Please do not come into the building – we are going to arrange for you all to be seen at one place’.”

“What’s the point if they contaminate my surgery? That one person comes in a shuts down a facilities for 9,000 others,” said the doctor, who advises the Government’s emergency Cobra committee, via the Department of Health’s Emergency Preparedness Resilience and Response Clinical Reference Group.

The GP was at [the Hillsborough disaster in 1989](#), led rescue operations at the [Tavistock Square bus bombing in 2005](#) and led the [2009 Pandemic Flu preparations for the BMA](#).

“It’s very important for people not to panic,” he said. “Their collection of symptoms may just be a bug that’s doing the rounds in the area at that time.”

Those who die tend to die in the immediate incident and they are not going to get anywhere near a GP surgery.

“They will be dealt with by the ambulance service.”

“If somebody comes to my door covered in white powder, they are not coming in until they have been decontaminated and for that we have the fire service and the hazardous area rescue team.

“If a person does just walk in on a Tuesday after an attack on the Sunday, it’s unlikely they are going to contaminate anything.”

“What you don’t want in a town of 20 GP surgeries is for all 20 buildings to be contaminated because you have then written off the entire primary care facility. So you corral them all to one.”

The same was true if an area was contaminated, he said.

“It does not have to be a terrorist attack – it could be a road tanker that’s crashed with chemicals on board.

“What you don’t do is contaminate every facility. You say to people, ‘If you think you are contaminated, go to this place and we will deal with it from there’.

“And if it means certain GP practices have to close their doors and lock them, then yes. GPs are not an emergency service.

The GP said the NHS was “absolutely on top of” its emergency planning, defending the response to Salisbury.

He told the annual meeting in Brighton: “Colleagues worked like Trojans and are still working like Trojans on this, which is a criminal investigation.

Proposing the motion, Baroness Finlay of Llandaff, a cross-bench peer, said: “When an incident like this happens, and we all hope it won’t, but we all know it might, concerned people in the periphery of the incident go to the GP.”





She added: “The lack of central information left them guessing in the dark as the worried came seeking advice.”

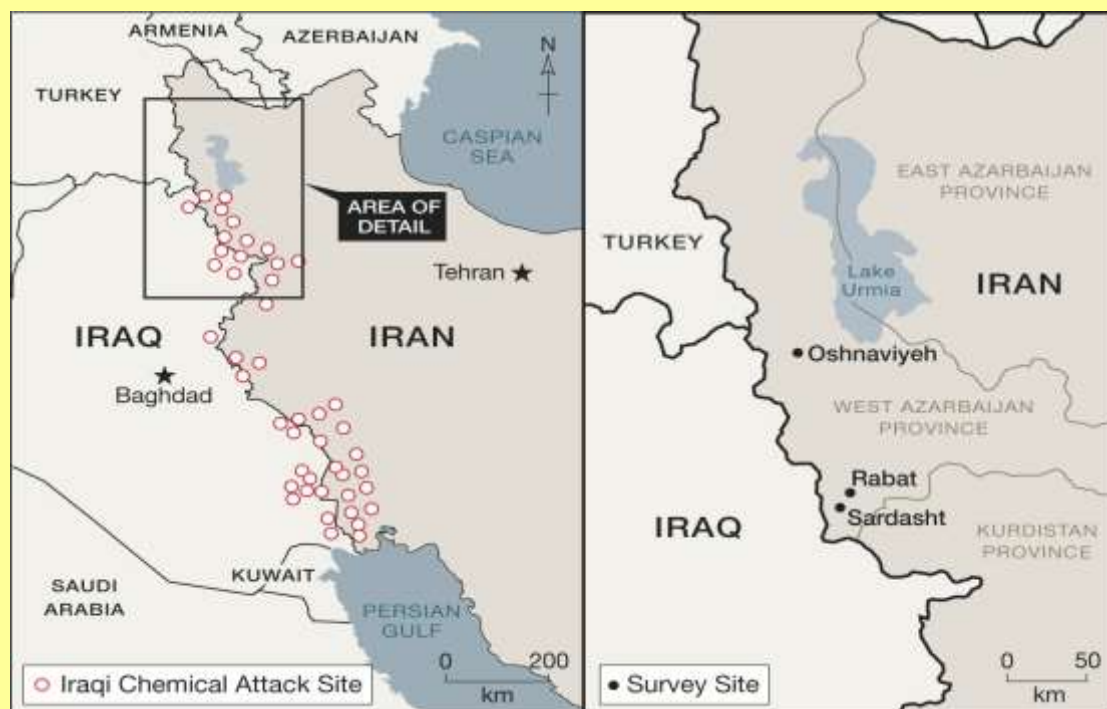
**EDITOR’S COMMENT:** Locking down GPs’ offices is logical. In small towns the local hospital (usually one hospital) should shoulder mass casualties and worried well citizens. On the other side, there is no single line in this article about educating GPs on CBRN threats and agents. Chemical and radiological incidents are acute emergencies but what about bioterrorism that is a gradually emerging emergency? Are they able to recognize a biological attack in their area? It is clear that GPs do not want to be involved with another hidden specialty (CBRN Medicine); they have a lot on their heads and going back to school for a specialization without any profit is not very appealing. Besides, during London2012 Olympic Games, GPs were not adequately prepared to deal with asymmetric threats. Most probably 2018 physicians are the same 2012 GPs so no change in mentality is expected. But the unexpected did not happen then; it happened in Salisbury! Because the unexpected always happens!

## Iranian Minister Warns against Formation of Chemical Terrorism in West Asia

Source: <https://www.tasnimnews.com/en/news/2018/06/29/1763497/iranian-minister-warns-against-formation-of-chemical-terrorism-in-west-asia>

June 29 – In a statement released on Friday to commemorate the anniversary of the 1987 chemical bombing of the northwestern city of Sardasht by the Iraqi army under former dictator Saddam Hussein, Brigadier General Amir Hatami described Iran as the biggest victim of chemical weapons.

Months before the chemical attack on Sardasht, the US as a self-proclaimed human rights defender vetoed a statement (not a resolution) by the majority of UN Security Council members, which condemned the use of chemical weapons by the Iraqi government, the defense minister noted.



“Two decades after the establishment of the Organization for the Prohibition of Chemical Weapons (OPCW), we are faced with concerns about peace and security in the region,” he stated.



He further pointed to the cooperation of some Western and Arab countries as well as the Zionist regime of Israel with terrorist groups in the West Asia region and warned against “the formation of organized chemical terrorism” in the region.



Located in Iran's northwestern province of West Azarbaijan, **Sardasht** was the third city in the world after Japan's Hiroshima and Nagasaki to become a target of Weapons of Mass Destruction. On June 28 and 29, 1987, Iraqi bombers attacked 4 crowded parts of Sardasht with chemical bombs and engulfed its residents, women and children, young and old, with fatal chemical gases. The attacks killed 116 citizens and injured over 5,000.

## AQUILES CBRN Decontamination

Source: <http://www.hispanovema.com/en/cbrn-decontamination-cbrn-decontamination-decont-apparatus/aquiles-decontamination-equipment>

First Responders and Hazmat Response Teams has as main objective in an Hazmat Incident: **Mitigate Risks and Save Lives**. In this aim, decontamination of people contaminated is primary and fundamental. Both to save the life of person contaminated and to prevent it from contaminating other people.

Decontamination Equipment **AQUILES** is designed solely and exclusively for decontamination of people, which allows it to provide a greater capacity and performance decontamination. Due to its higher flow and pressure compared with multipurpose decontamination equipment

- Flow: 71 liters/minute
- Pressure: 4 Bar



**C<sup>2</sup>BRNE DIARY – July 2018**

- Decon Capacity: Up to 6 Decontamination Lines (subject to climate conditions)
- 2 deployment alternatives: Autonomous (in combination with Decontamination Shower) or integrated in Decontamination Tents (Mass Decon Stations)
- Compact and Light design: 762x610x831 mm, weight: 129 kg

**Decontamination of People**

- ◆ AQUILES provides a low-pressure output (4 bars) to carry out People decontamination in a large variety of Hazmat incidents: large casualties incidents, urban areas, critical infrastructures, open field, etc due to AQUILES design to be adaptable to multiple decontamination accessories.
- ◆ Its modular design allows to carry out both decontamination phases: decontamination and rinsing at the same time.
- ◆ Decontamination Equipment AQUILES provides a versatile Decontamination Solution to First Responders and Hazmat Response Teams, as AQUILES could be used as autonomous system (in combination with Decontamination Showers), as part of CBRN Rapid Deployment Systems or integrated into Massive Decontamination Stations.

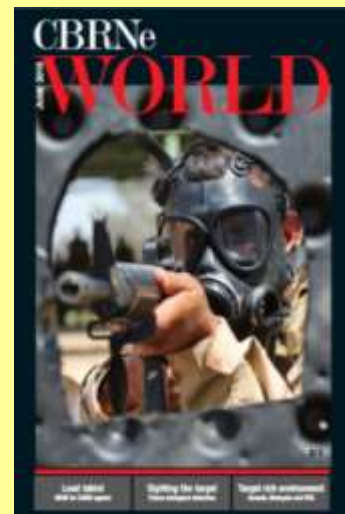
**CBRNe World**

June 2018

Source: <http://www.cbrneworld.com/magazine>

Lots of different topics in this issue, from Rick Bright talking about future medical countermeasures, to Dr Alzamani talking on the assassination of Kim Jong Nam and all points in between! Interviews with the Czech team currently doing CBRN training in Iraq, Professor Falah from Al Nahrain and Ottawa Fire Service.

**EDITOR'S COMMENT:** The cover photo is from the article on CBRN training of Iraqi forces by Czech experts. But I have to say that wearing a gas mask without PPE is kind of peculiar regarding CWAs...



## Iran's fear of 'DANGEROUS' US ship containing 'CHEMICALS' spotted near Syria and Iraq

Source: <https://www.express.co.uk/news/world/982345/Iran-s-fear-of-DANGEROUS-US-ship-containing-CHEMICALS-spotted-near-Syria-and-Iraq>

July 02 – Brigadier General Bolfazl Shekarchi accused Washington of a "dangerous plot" and claimed the loaded ship with chemicals arrived in the Persian Gulf waters under the escort of a US warship. Mr Shekarchi noted the past records of the American ship show that it has been present in some coasts of Iraq and Syria, where the US has taken military action under in response to alleged chemical attacks





He said: "Checking the records of the US cargo vessel MV Cape Ray revealed that the vessel had been present in the coasts near Iraq and Syria, where the Americans had launched a military aggression under the pretext of the use of chemical weapons by those countries."

Brigadier General Shekarchi went on warning about the possible consequences of American action and



said by offering "alleged" allegations, the US and its regional allies have already blamed Syrian President Bashar al-Assad's government for chemical attacks in Syria.

He said: "We have more accurate details about the US vessel, such as the number of crew members and the chemicals cargo in their possession, which will be disclosed to the public in the future."

The Pentagon has not yet released any official statements on the Iranian military's claim.

Tensions between Iran and the US exacerbated after President Trump decided to withdraw from the 2015 Iran nuclear deal and impose fresh sanctions on the

country last month.

Washington and Tehran also find themselves on opposite sides in the Syrian war.

Iran has supported the Assad government since at least 2012, giving the regime extensive military aid in the form of training, weapons and intelligence sharing.

It has also deployed Iran's elite military force, the Islamic Revolutionary Guard Corps (IRGC), and Shiite militia from across the region.

Syria has long been Iran's chief ally in the Middle East because propping up President Assad ensures an ally against Iran's regional rivals, Israel and Saudi Arabia.

Tehran also needs Syria to transport weapons to Hezbollah, which also opposes Israel, in neighboring Lebanon.

Iran's larger goal is to create a land corridor extending from Iran to Lebanon through Iraq and Syria.

The US has given moderate rebel factions fighting against government forces loyal to President Bashar al-Assad weapons and military training.

It also seeks to block Iran and the Lebanese Shiite militia Hezbollah from establishing permanent presence in Syria that could threaten Israel - the US' close ally and Iran arch-enemy.

## DHS wants PII on persons at all 'high-risk' chemical facilities; but where's the biometrics?

Source: <https://www.biometricupdate.com/201807/dhs-wants-pii-on-persons-at-all-high-risk-chemical-facilities-but-where-the-biometrics>

July 03 – The Department of Homeland Security's National Protection and Programs Directorate's (NPPD) Office of Infrastructure Protection, Infrastructure Security Compliance Division is seeking an information collection request program revision to the Chemical Facility Anti-Terrorism Standards (CFATS) to obtain approval to collect information about affected individuals from all high-risk chemical facilities rather than only Tier 1 and Tier 2 high-risk chemical facilities, and to update the estimated number of annual respondents from 195,000 to 72,607 based on historical

information collected since DHS implemented the CFATS Personnel Surety Program (PSP) in December 2015 as mandated by the Securing Chemical Facilities from Terrorist Attacks Act of 2014.

NPPD previously published this information collection request (ICR) in the *Federal Register* on December 27, 2017, for a 60-day public comment period.

However, the new [ICR notice NPPD published in the Federal Register](#) is in "responding to seven commenters that submitted



comments in response to the 60-day notice previously published for this ICR and soliciting public comment concerning this ICR for an additional 30 days.”

Additional comments will be accepted until July 18, 2018.

According to DHS, the department received approximately \$911 million for the CFATS program for the period beginning fiscal year 2007 through fiscal year 2018, a recent Government Accountability Office (GAO) audit report disclosed.

NPPD said, “Identifying affected individuals who have terrorist ties is an inherently governmental function and requires the use of

information held in government-maintained databases that are unavailable to high-risk chemical facilities. See 72 FR 17688, 17709 (April 9, 2007). Thus, under RBPS

12(iv), [DHS] and high-risk chemical facilities must work together to satisfy the ‘terrorist ties’ aspect of the Personnel Surety performance standard.”

Critics are puzzled by the lack of specific references to use of, and access to, biometric databases.

“Other than authorizing the use of the Coast Guard’s Transportation Worker Identification Credentials [TWIC], which is only indirectly addressing biometrics, the PSP program does not specifically address biometrics. I cannot even find mention of ‘biometrics’ in the Risk Based Performance Standards guidance documents that provides the limited guidance on what types of security measures that a facility should consider,” Biometric Update was told by Patrick Coyle, who after 15 years in the US Army began working in the chemical industry, getting his BSc Chemistry degree while working as a technician. He then spent 12 years working as a process chemist in a specialty chemical company, and most recently worked as a QA/R&D Manager in a specialty chemical manufacturing facility.

Section 550 of the Department of Homeland Security Appropriations Act of 2007, Section

550, provided (and the CFATS Act of 2014 continues to provide) DHS with the authority to identify and regulate the security of high-risk chemical facilities using a risk-based approach. On April 9, 2007, DHS issued the CFATS Interim Final Rule (IFR), implementing this statutory mandate.

Section 550 required, and the CFATS Act of 2014 continues to require, DHS to establish risk-based performance standards (RBPS) for high-risk chemical facilities. Through the CFATS regulations, DHS promulgated 18 RBPS. Each chemical facility that has been finally determined by DHS to be high-risk must submit, for DHS approval, a Site Security Plan (SSP), or an Alternative Security Program (ASP), whichever the high-risk chemical facility chooses, that satisfies each applicable RBPS.

RBPS 12 requires high-risk chemical facilities to perform appropriate background checks on and ensure appropriate credentials for facility personnel, and, as appropriate, unescorted visitors with access to restricted areas or critical assets. RBPS 12(iv) specifically requires high-risk chemical facility to implement measures designed to identify people with terrorist ties. For the purposes of the CFATS PSP, “people” in RBPS 12(iv) is in reference to affected individuals (i.e., facility personnel or unescorted visitors with or seeking access to restricted areas or critical assets at high-risk chemical facilities).

“In response to multiple comments on the current ICR,” DHS said it “agreed to a ‘phased implementation’ of the CFATS PSP to Tier 1 and Tier 2 high-risk chemical facilities,” but that, “based on lessons learned and the near completion of the implementation at Tier 1 and Tier 2 high-risk chemical facilities,” DHS “now seeks to close a security gap by implementing CFATS PSP at all high-risk chemical facilities.”

“As implemented at Tier 1 and Tier 2 high-risk chemical facilities,” DHS said it “will roll out the CFATS PSP in a ‘phased implementation’ to Tier 3 and Tier 4 high-risk chemical facilities.”

Since DHS implemented the CFATS PSP in December 2015, the department said “it has evaluated many of the assumptions it used when estimating the burden estimate of [the ICR] collection. As a result, several of the assumptions can be revised using



actual data rather than assumptions. The burden methodology and revised estimates are described in” DHS’s *Methodology in Estimating the Burden for CFATS PSP Information Collection*.

Pursuant to the Homeland Security Act of 2002, as amended by the CFATS Act of 2014, the following options are available to enable high-risk chemical facilities to facilitate the vetting of affected individuals for terrorist ties:

- **Option 1.** High-risk chemical facilities may submit certain information about affected individuals, which DHS will use to vet those individuals for terrorist ties. Specifically, the identifying information about affected individuals will be compared against identifying information of known or suspected terrorists contained in the federal government’s consolidated and integrated terrorist watch list, the Terrorist Screening Database (TSDB), which is maintained by the FBI in the Terrorist Screening Center (TSC). TSDB data, which includes personally identifiable information (PII), is necessary for DHS to effectively and efficiently assess the risk and/or threat posed by a person or their related goods and cargo entering or exiting the country, but the degree of biometric PII it contains is unclear. DHS has said the Electronic System for Travel Authorization (ESTA) continuously vets applicants’ biographic – including biometric – information against TSDB, the biometric PII of which are argued to be incomplete and fractured, partly due to information-sharing gaps.
- **Option 2.** High-risk chemical facilities may submit information about affected individuals who already possess certain credentials or documentation that rely on security threat assessments conducted by DHS that will enable the department to verify the continuing validity of these credentials or documentation.
- **Option 3.** High-risk chemical facilities may comply with RBPS 12(iv) without submitting to DHS information about affected individuals who possess TWIC identification if a high-risk chemical facility electronically verifies and validates the affected individual’s TWICs through the use of TWIC readers (or other technology that is

periodically updated using the Canceled Card List).

- **Option 4.** High-risk chemical facilities may visually verify certain credentials or documents that are issued by a federal screening program that periodically vets enrolled individuals against the TSDB. However, DHS said, it “continues to believe that visual verification has significant security limitations and, accordingly, encourages high-risk chemical facilities choosing this option to identify in their SSPs the means by which they plan to address these limitations.”

In addition to the options described above for satisfying RBPS 12(iv), a high-risk chemical facility can propose alternative or supplemental options in its SSP that are not described in the new ICR options on a facility-by-facility basis in the course of evaluating each facility’s SSP.

“Under Option 3 and Option 4,” DHS said, “a high-risk chemical facility would not need to submit information about an affected individual to [DHS]. These Options are only mentioned in this notice for informational purposes, and there will be no analysis of Option 3 and Option 4 in this information collection request.”

DHS emphasized that, “This information collection request does not propose changes to who qualifies as an affected individual. There are certain groups of persons that the department does not consider to be affected individuals, such as: Federal officials that gain unescorted access to restricted areas or critical assets as part of their official duties; state and local law enforcement officials that gain unescorted access to restricted areas or critical assets as part of their official duties; and emergency responders at the state or local level that gain unescorted access to restricted areas or critical assets during emergency situations.”

Other than seeming to imply biometrics as part of the vetting process using federal databases that include biometric identifiers, critics believe it would be easy enough to give facilities’ security departments access to DHS’s TSDB and others, containing known persons of threats.

“Ignoring for the moment concerns about the efficacy and accuracy of data in the TSDB, it is currently the only centralized government database of information identifying





persons with 'known or suspected ties to terrorists.' Vetting personnel with unaccompanied access to critical infrastructure against that list would seem to be a no brainer," Coyle said, noting, though, that "it would certainly be helpful if the TSDB had a strong biometric component, but it does not seem to have that at this point."

So, what about incorporating the Defense Department's Biometrics Enabled Watch List (BEWL), which contains the fingerprints of "high-threat persons of interest" and is linked to other national terrorist watch lists, like Customs and Border Protection's Automated Biometric Fingerprint Identification System?

Coyle explained that, "The big problem with biometric identification in the CFATS PSP is that

all data submissions by the facility to DHS go through the CSAT website. Collecting the biometric data at the facility site would be a high-cost, high-time activity that would be vigorously opposed by the CFATS regulated community," and, "DHS would have a hard time justifying the cost when the TSDB is the current standard for DHS," never mind TSDB is part of a jumbled intelligence collection system with equally as convoluted biometric data.

Walter Haydock, a former staff member for the House Committee on Homeland Security and a targeting officer at the National Counterterrorism Center, last year made [a compelling case for consolidating the terrorist watchlisting bureaucracy](#).

## Centre plans CRBN treatment facility in BBSR

Source: <https://www.dailypioneer.com/state-editions/bhubaneswar/centre-plans-crbn-treatment-facility-in-bbsr.html>

May 2018 – The Union Government has proposed to establish a treatment facility in Bhubaneswar for people exposed to chemical, biological, radiological, and nuclear (CBRN) attacks as part of its comprehensive disaster management plan.

The Ministry of Health and Family Welfare has intended to set up the project, to be funded fully by the Centre, in the capital city here.



Union Health Ministry Joint Secretary Lav Agarwal has sought permission of the State Government in this regard, said sources in the State Government.

The health facility would come up as per the International Health Regulations (2005) that mandates its signatories to address health emergencies caused by CBRN hazards. The regulations were made in view of accidents occurred at different places, including Bhopal (gas tragedy), across the world.

Agarwal said the Central scheme of Health Sector Disaster Preparedness and Response envisages setting up of secondary-level CBRN Medical Management Centres in existing health facilities in the off-site plans of nuclear power-plants and in cities vulnerable to

terrorism.

As Odisha has no facility for treating CBRN victims, the Centre has decided to set up such a facility in Bhubaneswar. This would require land of about 2,500 square metres, preferably within the vicinity of an Emergency Trauma Centre in a health facility, to be identified by the State Government.



The Health Ministry would train medical personnel from various states to handle CBRN victims in collaboration with agencies such as the Bhabha Atomic Research Centre in Mumbai. These trained personnel then become a part of State Rapid Response Team.

The proposed centre would be manned by a medical physicist.

The State Government would inform the Centre about the identified site for setting up the proposed secondary level CBRN Centre in Bhubaneswar, according to Agarwal.

Sources said that now the Health and Family Welfare Department and the Odisha State Disaster Management Authority (OSDMA) are now examining the proposal in details and would take a decision in this regard.

**EDITOR'S COMMENT:** I hope this time plans will become reality because last year's plans for four dedicated CBRN hospitals – personal experience from the pilot hospital in Chennai [Eastern India] – proved just good ideas on paper (at least so far).

## Amesbury incident: Skripal novichok may be behind new Wiltshire poisoning

Source: <https://www.independent.co.uk/news/uk/home-news/amesbury-poisoning-latest-novichok-skripal-salisbury-wiltshire-victims-russia-a8431711.html>

July 04 – A couple poisoned by the nerve agent novichok may have been exposed to residue from the attack on Sergei and Yulia Skripal, according to defence and security sources.

However on Friday – the day before they collapsed – Dawn Sturgess and Charlie Rowley had been near roads sealed off during the investigation in March, sparking concern over decontamination of the area.

Initial investigations have found nothing to indicate Ms Sturgess and Mr Rowley, who collapsed hours apart, had any link with the Russian father and daughter or are likely to have been targeted in an assassination attempt.

The security agencies and Scotland Yard's counterterrorism command say they are keeping an open mind about what lay behind the couple's sudden illness as they remain in a critical condition in hospital.

But there will be deep concern about public safety if the novichok connection is proved after authorities declared the area safe following the March attack, reopening businesses in Salisbury ahead of a royal visit. Police initially believed Ms Sturgess and Mr Rowley had ingested contaminated heroin or crack cocaine, which have been reported in the Wiltshire area. However, the symptoms shown by the couple and their rapid deterioration made them realise that other factors were at work.

**The couple were, it is believed, in Salisbury on Friday near roads which had been sealed off during the Skripal inquiry.**

Police confirmed the pair had been left critically ill in hospital by the toxin used in the attempted assassination of the former MI6 spy and his daughter. Initial investigations found the couple – who live in Amesbury, nine miles from the site of the Salisbury attack – had no link to the Skripals.



However, at least one other person who was with them at the time is yet to show any symptoms.

Tracing Ms Sturgess and Mr Rowley's movements may help the continuing police investigation into the Skripal case, sources said. They are both being treated in isolation and under police guard at Salisbury district hospital, which previously treated Mr Skripal and his daughter Yulia for exposure to novichok.

The assistant commissioner of specialist operations Neil Basu at Scotland Yard said: "Following the detailed analysis of these samples, we can confirm that the man and woman have been exposed to the nerve agent Novichok, which has been identified as the same nerve agent that contaminated both Yulia and Sergei Skripal."

Mr Basu said that around 100 detectives from the Counter Terrorism Policing Network are now working on this investigation, alongside colleagues from Wiltshire Police. He confirmed that Ms Sturgess and Mr Rowley remained in a critical condition in hospital.

Downing Street confirmed that home secretary Sajid Javid will chair a meeting of the Cobra emergency committee today.

Mr Javid said: "The police must be given the space they need to continue establishing the full facts. My thoughts at this time are with the two individuals affected. The government's first priority is for the safety of the residents in the local area but as Public Health England has made clear, the risk to the general public is low."

A Downing Street spokesperson said: "This is an incident which understandably is being treated with the utmost seriousness. Ministers and the prime minister are being kept updated and there was a meeting this morning of officials to receive updates on the facts of the situation." Police have cordoned off several sites visited by the pair, including a park and supported accommodation for homeless people in Salisbury, Mr Rowley's home in Amesbury, and a chemist and Baptist church he visited before falling ill.

Queen Elizabeth Gardens sits just metres away from where the Skripals were found unconscious on a bench in The Maltings shopping district of Salisbury, while John Baker House is just a four-minute walk from a Zizzi's restaurant where the victims ate.

Professor Dame Sally Davies, chief medical officer for England, said the March incident meant officials had a "well-established response" in place. She said: "I understand that those in Salisbury and in surrounding areas will be concerned at this news, particularly those who recently visited areas now cordoned off by police."

The risk to the public remained low, she said, but issued "highly precautionary" advice to those with concerns.

"As before, my advice is to wash your clothes and wipe down any personal items, shoes and bags, with cleansing or baby wipes before disposing of them in the usual way," she said. "You do not need to seek advice from a health professional unless you are experiencing symptoms, as any individual who had been significantly exposed at the same time would by now have symptoms."

When decontamination work started in April, a Department for Environment, Food & Rural Affairs (Defra) official revealed that novichok had been spread on Mr Skripal's front door in liquid form and spread around Salisbury by infected people. He said the nerve agent could "move between sites by direct transfer by a contaminated person or item" and warned that it "doesn't just disappear".

Defra's chief scientific adviser, Ian Boyd, confirmed that the substance could still be toxic in some locations but in May officials reopened The Maltings shopping area and declared it safe.

Ms Sturgess and Mr Rowley spent Friday evening in Salisbury with friend Sam Hobson, who saw them both fall ill the following day. The 29-year-old said he witnessed Ms Sturgess being carried into an ambulance on a stretcher at around 11am after she fell unconscious. "She was having assistance with her breathing," he said. "Paramedics said they needed to do a heart and brain scan and so Charlie and I were told we couldn't see her. Charlie was fine at first."

Mr Hobson said the "great couple" aged in their 40s, have one daughter each from previous relationships and have been together for several months. He recalled taking Mr Rowley to collect a prescription from Boots in Amesbury and on to eat lunch at





Amesbury Baptist church fair, before returning to his friend's home in Muggleton Road. Both the church and chemist have now been cordoned off.

Mr Hobson said Mr Rowley started falling ill around four hours after Ms Sturgess was taken to hospital, while they were preparing clothes to take to her. "He felt ill and went for a shower. Then his eyes went bloodshot and like two pin pricks, he began garbling incoherently... he was making weird noises and acting like a zombie. It was a zombie-like state. He slumped against the wall."

Mr Hobson described frantically calling an ambulance for his friend, adding: "This doesn't make any sense, I can't see why they'd be targeted... they are a great couple and always there for me." He has not been tested for

possible exposure but said authorities are making regular checks on his health.

Residents near Mr Rowley's home described seeing police cars, fire engines and people in "green suits" arrive on Saturday night. Chloe Edwards said families were told to stay in their homes for several hours and had connected a hosepipe to the water mains – a procedure that is commonly used for decontamination.

Chief Constable Paul Mills, of Wiltshire Police, urged members of the public with concerns to call a dedicated helpline. "Our priority at this time remains to understand the circumstances surrounding how these two individuals became unwell," he added. "I would like to appeal to anyone who might have information concerning the circumstances surrounding this incident to come forward."

**EDITOR'S COMMENT:** The second incident reveals the need of ALL hospitals nation-wide to be prepared to receive contaminated casualties. Not one or two specialized hospitals in major cities or capitals – all hospitals or health centers! Be prepared to avoid unpleasant surprises!

## LEAKED: The 4 ridiculous slides UK used to "convince" US that Russia was "guilty" of Novichok poisoning

By Alex Christoforou

Source: <http://theduran.com/the-4-ridiculous-slides-uk-used-to-convince-us-that-russia-was-guilty-of-nerve-agent-poisoning/>



March 29 – The UK Novichok poisoning hoax continues to unravel, even as European puppet states expel Russian diplomats, so as to provide some cover and legitimacy to the UK government's false flag nerve agent attack.



Russia's Kommersant newspaper has obtained the document used by the British government to convince EU and NATO allies to expel Russian diplomats over the Skripal poisoning hoax.

The slideshow PPT presentation called, the **"Salisbury Incident"** summarizes the UK's version of events.

The Salisbury Incident PowerPoint presentation was reportedly sent out to 80 top-level foreign embassy officials in Moscow, including US Ambassador Jon Huntsman, who [told Kommersant](#) that he found Britain's evidence **"very convincing."**

Russian Foreign Ministry spokeswoman Maria Zakharova [called](#) the slideshow a **"massive manipulation of world public opinion" on the basis of "6 pictures."**

The document is far from "convincing", and resembles something that a 12 year old science student would put together, summarizing the Theresa May government's propaganda over the last two weeks, into powerpoint (bullet point) format.

**Anyone that says these four slides are "convincing" is a complete moron.**

[Sputnik News](#) examines the facts behind the UK slide show PPT presentation.

We encourage our readers to take a look at these four slides and judge for yourselves as to how "convincing" the case is that Russia is behind the Novichok poisoning.

### Faulty Timelines

The [slideshow](#), which London has since confirmed is authentic, starts with a timeline, from Sergei and Yulia Skripal's poisoning in Salisbury on March 4, to Prime Minister May's declaration on March 12 that the substance used was the 'Russian' Novichok nerve agent and demand that Moscow provide an explanation.

Slide 1 of the Salisbury Incident presentation:

Slide 1 of the presentation, titled "HM Government Timeline", displays a chronological list of events from March 4 to March 20, 2018, alongside a map of Salisbury, UK, highlighting key locations.

**Timeline:**

- 4 March:** Three people exposed to a nerve agent in Salisbury
- 8 March:** UK Delegation to the OPCW informed the Technical Secretariat that two people had been taken seriously ill
- 12 March:** Prime Minister publicly identified the substance used as a Novichok nerve agent. Russian Ambassador asked to explain
- 13 March:** Midnight deadline expired. No explanation received
- 14 March:** Prime Minister set out the UK's response
- 14 March:** Prime Minister wrote to the OPCW
- 18 March:** Russia announced retaliatory action
- 19 March:** OPCW team arrived in the UK
- 20 March:** 23 undeclared Russian intelligence officers expelled from the UK

**Key Locations Map:**

- Skripal's house
- Zizzi restaurant
- Shopping centre
- Bishop's Mill pub

But a British High Court investigation into the incident was not so categorical, [concluding](#) Thursday that new blood samples needed to be taken from the Skripals to be sent for analysis by the Organization for the Prohibition of Chemical Weapons (OPCW). **Court evidence from the Porton Down chemical weapons facility, cited by May in her attack on Russia, showed that scientists were not absolutely certain that the chemical the Skripals were exposed to was indeed Novichok. Nor could they rule out that the ex-spy and his daughter were poisoned by a "closely related agent."**



Court evidence aside, the PowerPoint presentation itself points out that Prime Minister May wrote to the OPCW asking for assistance on March 14, two days AFTER accusing Russia. The same day, London announced its 'response' to the poisoning, including the expulsion of 23 Russian diplomats, a break in high-level diplomatic contacts, and a ministerial and royal family boycott of the upcoming World Cup. Finally, the slideshow confirms that the OPCW investigative team arrived in the UK a full week after May gave Moscow its 24-hour 'ultimatum' to Russia. On Tuesday, the organization confirmed that it has finished collecting samples from the scene of the crime, but [stressed](#) that its analysis would only be completed in two to three weeks' time.

### Contentious Claims

Slide 2 of the presentation, titled 'A New Phase of Russia Aggression', repeats London's claim (debunked above) about Novichok being "positively identified by experts" at Porton Down. It goes on to say that Novichok is "developed only by Russia," again, not true. Not only has the New York Times [reported](#) that the US has had access to the chemical since the late 1990s; on Sunday, the Russian Defense Ministry said it had [evidence](#) to show that A-234, the agent believed to have been used to poison Skripal, has also been created by the US. Russia itself [stopped](#) all research and development on the weapon after the collapse of the Soviet Union, and [destroyed its stockpiles](#) of the deadly agent.

### Slide 2 of the Salisbury Incident presentation, titled 'A New Phase of Russia Aggression':



HM Government

**A New Phase of Russia Aggression**

Slide 2

- Military-grade Novichok nerve agent positively identified by experts at the UK's Defence Science and Technology Laboratory at Porton Down, an OPCW-accredited and designated laboratory
- Novichok is a group of agents developed only by Russia and not declared under the CWC
- A violation of the fundamental prohibition on the use of chemical weapons (Art. 1 CWC)
- First offensive use of a nerve agent in Europe since the Second World War
- We are without doubt that Russia is responsible. No country bar Russia has combined capability, intent and motive. There is no plausible alternative explanation
- As of Sunday 18 March, we count over thirty parallel lines of Russian disinformation



*"Based on this capability, combined with their record of conducting state sponsored assassinations – including against former intelligence officers whom they regard as legitimate targets – the UK Government concluded it was highly likely that Russia was responsible for this reckless and despicable act."*

Prime Minister Theresa May, 14 March

Ignoring these facts, the document goes on about the Skripal case being the "first offensive use of a nerve agent in Europe since the Second World War," and concludes that Russia is "without doubt...responsible" for the crime. "There is no plausible alternative explanation," it insists.

In other words, instead of offering evidence, waiting for the conclusion of an in-depth investigation, or taking up Russia's proposal to conduct a full-scale joint investigation into the crime, London simply blames Russia. [To Moscow's consternation](#), the British government has even rejected Russia's requests to provide it with investigative materials into the Skripal case, even though the attack also targeted Yulia Skripal, a Russian citizen.

Slide 3 summarizes the consequences of the poisoning attack, and offers a graphic showing what nerve agents do to the body; again, no evidence to suggest Russian involvement is offered.



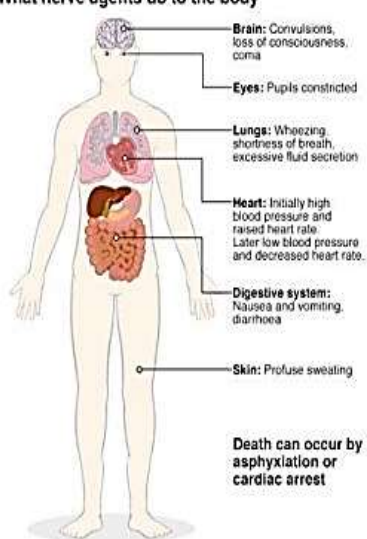


## Slide 3 of the Salisbury Incident presentation:

HM Government Effects of Novichok Slide 3

- Novichok interferes with the normal functioning of the nervous system. If untreated, it will cause death by asphyxiation or cardiac arrest
- Sergei Skripal, his daughter Yulia Skripal, and UK policeman Detective Sergeant Nick Bailey remain in hospital
- 51 people have been assessed in hospital
- 131 civilians have potentially been in contact with the nerve agent
- 250 specialist counter-terrorism officers involved in the investigation
- 180 military personnel were deployed

**What nerve agents do to the body**



**Brain:** Convulsions, loss of consciousness, coma  
**Eyes:** Pupils constricted  
**Lungs:** Wheezing, shortness of breath, excessive fluid secretion  
**Heart:** Initially high blood pressure and raised heart rate. Later low blood pressure and decreased heart rate.  
**Digestive system:** Nausea and vomiting, diarrhoea  
**Skin:** Profuse sweating

**Death can occur by asphyxiation or cardiac arrest**

**Blame It on the Bogeyman**

Slide 4 of the government slideshow is the most audacious, adding eleven other egregious claims about “malign Russian activity” across the globe, without any evidence to back them up. Debunking these claims isn’t hard:

Slide 4 of the Salisbury Incident presentation, accusing Russia of a slew of crimes going back over a decade:



- ◆ The claim that Russia was behind the 2006 assassination of ex-spy Alexander Litvinenko has been contested not only by the Russian government, but by Litvinenko's own father, who believes his son was killed by Alex Goldfarb, chairman of Boris Berezovsky's Civil Liberties Fund.
- ◆ The claim about a Russian "invasion of Georgia" in 2008 is equally absurd. Not only did Georgian President Mikheil Saakashvili start the conflict by using artillery against his own people, but the Russian response was limited to protecting the Abkhazian and Ossetian minorities and recognizing these regions' independence, and didn't include marching to Georgia and toppling the Saakashvili government (which collapsed on its own in 2013, after which Saakashvili fled the country over embezzlement charges).
- ◆ The assertion that Russia 'occupied' Crimea and 'destabilized' Ukraine in February 2014 is not only factually wrong (Crimea broke off from Ukraine in March 2014), but ignores that Crimeans voted overwhelmingly to join Russia after the Maidan coup in Kiev in a referendum organized by Crimean authorities. As for the 'destabilization of Ukraine' claim, it would probably be more appropriate to consider Kiev's actions in the aftermath of the coup, including its decision to send troops into the Donbass to attack independence supporters, and its continuing rejection of constitutionally-guaranteed autonomy for its eastern regions. As for Russia, it is a guarantor, not a participant, in the conflict in eastern Ukraine.
- ◆ The claim that Russia was responsible for the July 2014 downing of Flight MH-17 ignores Russian investigators' conclusion that the Boeing was shot down from territory controlled by the Ukrainian military.
- ◆ As for the slideshow's claim about Russian meddling in the US presidential election in 2016, it would be interesting to hear President Trump's take on the allegation, which implies that he owes his victory to Russian interference. Furthermore, a recently concluded comprehensive report by Congressional investigators found no evidence of collusion between the Trump campaign and Russia.
- ◆ For the remainder of the claims, from Russian DDoS and hacking attacks, to its alleged support for a coup attempt in Montenegro in 2016, it is sufficient to point out that they all follow a consistent pattern: Step 1) accusations are made, with no evidence provided, followed by a political, media and diplomatic scandal. Step 2) the scandal blows over, the public forgets, and those making the accusations are never reprimanded.

### Fake Claims, Real Consequences

As this article has pointed out, the Salisbury Incident document is not only light on facts, but contains absolutely no hard evidence about any Russian complicity in the crime against the Skripals. Instead, it's limited to guesswork and easily disprovable stereotypes. Unfortunately, facts or not, the document has played its part in the decision of nearly 30 countries to expel over 100 Russian diplomats.

*Alex Christoforou is President and writer for The Duran.*



## Amesbury poisoning is a terrorist attack, secondary contamination impossible

Source: <https://www.rt.com/uk/431858-amesbury-terrorism-not-accidental/>

July 06 – **The poisoning of a UK couple in Amesbury was a terrorist act**, a chemical weapons expert told RT. The victims couldn't have been affected by the toxin from the **Skripal attack in March, as Novichok can't remain stable that long**.

Former UN inspector in Iraq Anton Utkin said he "wasn't at all surprised" by the news reports of a new chemical poisoning in the UK, which emerged earlier this week.

"Several months ago I said when the responsibility for the use of chemical weapons is assigned before the investigation it actually provokes more use of chemical weapons," he said.



By blaming Russia for using the so-called Novichok nerve agent against former double agent Sergei



Skripal and his daughter in Salisbury without providing any proof, *"the UK government, actually, put its own population in danger because if there are some enemies of Russia, who would like to create problems for the country, they would find incentives in conducting terrorist acts with the use of chemical weapons because they know for sure who would be blamed after such incidents,"* the chemical arms expert explained.

Utkin ruled out the possibility that the Amesbury couple, who currently remain in critical condition after being affected by what Britain claims is the same nerve agent, got poisoned as a result of secondary contamination.

*"The Novichok chemical is an organophosphorus compound, and I can't imagine how organophosphorus compounds of such structure could stay in an environment for months and still be effective,"* he said.

*"The VX nerve agent, which is one of the most stable organophosphorus compounds, can stand for ten days, two weeks, maybe three weeks if the environment conditions are good enough for it. But [remaining] for four months in an environment – it's impossible,"* the expert added.

In order to be contaminated, the UK couple must have *"found a container [with the nerve agent], opened it and drank from it or touched it, or something,"* Utkin said.

*"But such a version of events takes us away from the real facts. I believe the real facts are that it's a terrorist act and it was conducted against British citizens,"* he added.

**The new poisoning case will produce more accusations by London against Moscow, as "the British government is trapped in its own policies. It's very hard for them to say: 'This isn't the Russians,'" the expert said.**

However, this time it would be equally hard to explain why Moscow would use a chemical weapon against two British citizens with drug problems and no connection to either the Skripals or Russia.

*"Even those who believe the British government, now will probably start thinking and asking questions because, remember, in four months the British police haven't come up with any results on the Skripal case,"* Utkin said.

The only option for Prime Minister Theresa May is to "blame Russia for losing control of its chemical arsenal," which could endanger British citizens and security.

The odds of recovery for the Amesbury couple are "around 95 percent," Utkin estimates. *"The medical treatment is going to be, probably, very professional because the medical personnel [in Salisbury] is already aware of this problem" after treating the Skripals, who "were discovered unconscious, but still survived,"* he said.





On Wednesday, Wiltshire Police declared a "major incident" in Amesbury, which is around 12km from Salisbury, after a British man and woman in their 40s were hospitalized following "suspected exposure to an unknown substance."

Medics evacuated **Charlie Rowley and Dawn Sturgess, who reportedly had problems with alcohol and drugs**, from a property in Muggleton Road on Saturday; but the incident remained unreported for a few days.

**EDITOR'S COMMENT:** Correct assumption! But the clue that both victims have problems with drugs (and alcohol) brings into surface a "similar" case with drugs (heroin) contaminated with anthrax spores. Injection anthrax is a rare disease that affects heroin users and is caused by *Bacillus anthracis*. In 2012, there were four cases in Germany, one of which was fatal, as well as a small number of cases in other European countries, including Denmark, France, and the United Kingdom. Three cases among drug users occurred in Germany in 2009/2010, in the setting of a larger outbreak centered on Scotland, where there were 119 cases.

►► Read more at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3528063/>

## The Key to Saving Lives in CBRNE Events

By Bobby Baker

Source: <https://www.domesticpreparedness.com/preparedness/the-key-to-saving-lives-in-cbrne-events/>

March 2018 – In January 2018, in New York City, a group of professionals – representing entities including the Department of Homeland Security, private contractors, hazardous materials/weapons of mass destruction (hazmat/WMD), law enforcement officers, and intelligence experts – gathered to discuss the [emerging threats to U.S. passenger rail service](#).

Not only are these threats pertinent to passenger rail service, but they also may potentially affect all mass gatherings and large venues across the country on any given day. Emergency planners and responders must determine the best way to mitigate such threats. Although any attack on a mass gathering would be catastrophic, passenger rail service presents a far more complex challenge. With widespread and frequent use by millions of passengers each day – coupled with distinct access to other forms of the critical infrastructure matrix – a chemical, biological, radiological, nuclear, and high-yield explosive (CBRNE) event affecting mass transit would immediately affect passengers and require significant recovery investment, further influencing the financial impact of such a catastrophe.

The Department of Homeland Security lists [16 major categories of critical infrastructure](#) in its matrix – of which, mass transit is just one. Despite all its benefits, the fact that passenger rail service has contiguous access and/or direct

access to other critical infrastructure in U.S. communities further complicates and increases the importance of prevention. This persistent, challenging dynamic makes the prevention and response to incidents involving passenger rail service a major hurdle for most departments' daily operations.

### Protection Measures & Deployment Models

In addition to prevention and protection of the actual access venues themselves (such as Penn Station in New York and or Union Station in Washington, D.C.), communities must also protect the other critical infrastructure that these passenger rail lines connect. Protection measures must extend to passenger trains and rail lines serving local and national rail services that run above and below ground in major cities' urban central business districts. Protecting these venues and surrounding entities with physical security measures remains a priority to be considered not only in the context of traditional security and law enforcement routines, but also active shooter and other unconventional threats to U.S. cities.

Today's special event security planners employ a concept called Joint Hazard Intervention Teams (JHIT) for deployment in protecting major special events across the United States. This popular deployment



model brings multiple emergency services'

to combat CBRNE attacks and early trauma



metrics together to form an all hazards detection and mitigation team. Although this model is not a new concept to special events and events rated with the Special Event Assessment Rating (SEAR) around the country, this deployment model is not commonly utilized on a daily basis for the protection of critical infrastructure. Implementing this concept with specially trained cross-metric first responders in a unified command concept is the missing link in the early detection and classification of a CBRNE attack. Whether the threat emanates from homegrown violent extremists or foreign terrorist groups, the deployment model would be comprised of multiple, specially trained individuals. These individuals would be trained and sorted across categories including:

- Counterterrorism;
- Hazmat/WMD technicians for early CBRNE detection, classification, and early mitigation tactics;
- Law enforcement officers for interdiction, arrest, and force protection.
- Intelligence analysts in the command post.
- Tactical paramedics who are specialized toxicological medics with countermeasures

intervention.

- Explosive ordinance disposal experts with ordinance detection canines.

These small teams allow for assessment of an incident at the lowest possible level without interruption of the event itself. This approach allows venues, such as large daily gatherings, to be more resilient in a proactive response model rather than the usual mundane and antiquated response model commonly seen in the United States.

In this deployment model, if the team makes the determination after a quick screen and assessment process that a full-scale response and/or evacuation is necessary, the team leader would notify the incident command post with the level of assets needed to mitigate the situation as safely as possible to prevent further escalation and harm to the people and the venue. Overall, these assets allow daily response forces to continue service as usual without putting excess stress on resources in other parts of the city. This deployment model would ultimately save lives and resources, promoting a common



balance that most incident commanders and emergency managers seek.

#### *A Real-World Solution for Asset Protection*

As more data become available about emerging threats to critical infrastructure, the need for quick and decisive preventive countermeasures will increase to meet the growing demand for such countermeasures in public venues. Protecting the public from population and critical infrastructure perspectives are vital components to incident stabilization.

The Joint Hazard Assessment Team (JHAT)/JHIT models should be deployed into critical infrastructure locations such as passenger rail terminals, federal buildings, airports, and shopping malls to provide local jurisdictional authority the ability to detect and classify the actual threat, whether it be chemical, biological, radiological, nuclear, or explosive. The faster the local assessment team can deploy detection and classification monitors and provide feedback to the local emergency operations center and fusion centers; the more lives would be saved, and the faster critical infrastructure could bounce back and remain vibrant from an economic standpoint.

This JHAT/JHIT model should be deployed in a daily, unified command under the National Incident Management System (NIMS) nomenclature and each team should deploy encrypted communications with predetermined channels under the daily incident action plan. Before each operational period, the unified command would present any credible and general threats to the venue and/or subjects present in the venue and would conduct a site safety plan and review the event action plan. This model brings a real-world solution utilizing highly trained assets from the local jurisdiction to form a preventive all hazards team that can immediately transition to a response and mitigation team. This concept would offer every major Urban Areas Security Initiative (UASI) city the ability to protect both physical assets and human assets at a high level.

#### *Scientific Technology & Resilience*

This deployment model would bring much-needed resilience to passenger rail terminals and airports such as Grand Central Station, Penn Station, Union Station, and all major

aviation hubs around the United States. These teams would detect radiation and provide early warning and prevention using radiological exposure devices or radiological dispersal devices – in a prevent passive detection mode with the ability to transfer into a response and survey mode in the event of an IED or other dissemination tool that could be used to target a venue. The ability to rapidly distinguish between naturally occurring radioactive materials and medical radiological isotopes by constantly conducting area inspections of these critical venues only adds to the overall security measures in place.

Such teams can also carry chemical warfare agent detection equipment and basic sampling equipment to sample solids, liquids, and gasses. This allows them to give a quick classification of the incident and report efficiently. Adding a biological detection capability within field polymerase chain reaction (PCR) could help classify and prevent the presence of biological incidents such as Ebola and anthrax. However, these threats could cause a widespread economical shutdown of a public transportation system and/or office buildings while waiting for the screening process and assets to be delivered to the scene. These teams would have the ability to give incident commanders a quick and scientific process to determine whether or not to protect in place, evacuate, and/or transport to local hospitals. This delivery model offers a proactive and scientific approach to consequence management utilizing the best-trained personnel and detection equipment available. Public safety sampling and the ability to rapidly deploy accepted scientific technology to give the incident commander a public safety decision matrix is quickly becoming an accepted and best practice among first responders and hazmat teams nationwide. Having law enforcement capabilities allows the team to interdict and detain individuals or coordinated terrorist groups that pose possible threats.

Combining the capabilities and technological assets of major cities should be at the top of the next resilience list. Focus on passenger rail service is an important part of critical infrastructure planning to ensure an enjoyable and safe environment that many people expect. Community stakeholders should





**C<sup>2</sup>BRNE DIARY – July 2018**

collaborate with local emergency management teams and emergency response entities to discuss the prevention deployment model and utilize it on a daily basis to protect high-traffic areas and critical infrastructure, where incidents may become mass casualty events. Utilizing these highly trained assets in a proactive manner, rather than waiting for an incident,

could be the key element to saving countless lives due to the constant synergy created by deploying and training together on a daily basis. Emergency planners should examine the critical infrastructure within their jurisdictions and determine whether deploying this model could break down the emergency response organizations' silos.

*Captain Bobby Baker is a 20-year veteran of Dallas Fire Rescue and currently serves as the WMD/HAZMAT coordinator for the Dallas Fire Rescue Department Special Operations Division. He also is the founder and president of Emerging Threat Solutions LLC in Dallas, Texas. He currently serves on: the NCRP 179 Dosimetry for First Responders commentary committee; the FEMA-CBRNE Chemical Operations Support Specialist advisory panel; and the Texas State PRND advisory committee with the Texas State Homeland Security division. He is very active with the Department of Homeland Security SAVER program, in conjunction with the National Urban Security Laboratory in New York City. He holds numerous critical infrastructure protection certifications and incident management of WMD events from the Department of Homeland Security. He is a graduate of the FEMA Radiological Operations Support Specialist program and serves as an instructor for the Counter Terrorism Operations Support at the Nevada National Security Site. He holds a Master Fire Fighter certification and certified Hazardous Materials Technician through the Texas Commission on Fire Protection and is a certified Incident Safety Officer through the National Fire Academy and the Texas Commission on Fire Protection. He is a Pro-Board certified NFPA 472 Incident Commander of Hazardous Materials Incidents.*

## Japan executes cult leaders of 1995 Sarin attack

Source: <https://www.thenational.ae/world/asia/japan-executes-cult-leaders-of-1995-sarin-attack-1.747591>



Japanese media reports say Asahara, who has been on death row for masterminding the 1995 deadly Tokyo subway gassing and other crimes, has been executed at the age of 63. Kyodo News via AP

July 06 – **Japan executed Shoko Asahara**, the doomsday cult leader convicted for the 1995 sarin-gas attack on Tokyo's subway that killed 13 people and sickened thousands, national broadcaster NHK reported.



Asahara, 63, whose real name was Chizuo Matsumoto, was hanged Friday, the reports said. The founder of the sect formerly known as Aum Shinrikyo was also found guilty in an earlier attack that killed eight people in the city of Matsumoto and had exhausted all appeals since his 2004 conviction for the crimes.

**Japan also carried out executions of several other leaders of the cult, NHK said, without giving details.** The justice ministry's public relations department said it wasn't aware of Asahara's execution.

On March 20, 1995, five Aum members carried plastic bags filled with liquid sarin onto trains on Tokyo's Hibiya, Marunouchi and Chiyoda subway lines, which were converging in the city's government district during morning rush hour and punctured them using the sharpened tips of umbrellas.

The attacks shattered post-war myths of a united, peaceful Japan and prompted tougher public security laws.

Japan's Supreme Court rejected a final appeal against Asahara's death sentence in 2006. A 17-year manhunt for the last three remaining suspects in the sarin attacks ended in 2012.

Japan discloses little information on its execution process, and it's not uncommon for convicted inmates to spend years or even decades on death row.

**EDITOR'S COMMENT:** It is amazing how the civilized world took more than 2 decades to eradicate this weed that once upon a time was willing to murder thousands of innocent people

## **Novichok poisoning victim Dawn Sturgess dies in hospital as murder probe launched after nerve agent scandal claims first life**

Source: <https://www.mirror.co.uk/news/uk-news/breaking-novichok-poisoning-victim-dawn-12881077>

July 08 – Novichok poisoning victim Dawn Sturgess has died in hospital as police launch murder probe into her death.

Mother-of-three Dawn, 44, who was exposed to the [nerve agent Novichok](#) in Amesbury, Wiltshire, just over a week ago died in hospital this evening, Sunday, 8 July.



Her family has been informed and is receiving support from specially trained family liaison officers and a post-mortem will be scheduled to take place in due course. Prime Minister Theresa May said her "thoughts and condolences" are with Dawn's family.

Angus Macpherson, Wiltshire police and crime commissioner, said Dawn "was an innocent member of the public...who became an unwilling victim in such an unprecedented, international incident".

**Charlie Rowley, 45, who was also taken ill following exposure to the nerve agent remains critically ill in hospital.**

The investigation is being led by detectives from the Counter Terrorism Policing Network and around 100 detectives are working round the clock alongside colleagues from Wiltshire police.

**It is believed Dawn and Charlie came into contact with a container used to transport the deadly chemical weapon for the attempted murder of Sergei and Yulia Skripal in March.**

Prime Minister Theresa May said: "I am appalled and shocked by the death of Dawn Sturgess, and my thoughts and condolences go to her family and loved ones.

"Police and security officials are working urgently to establish the facts of this incident, which is now being investigated as a murder.

"The Government is committed to providing full support to the local community as it deals with this tragedy."

Meanwhile Jeremy Corbyn MP, Leader of the Labour Party, said: "I'm shocked by the death of Dawn Sturgess. My thoughts are with her family and friends at this terrible time.



"A full and thorough police investigation must now establish the facts, provide support to the local community and bring those responsible to justice."

Dawn's death is the first in the Novichok scandal that began in March when former Russian spy [Sergei Skripal](#) and his daughter Yulia were poisoned in Salisbury.

Her family had been hoping Dawn would pull through as [she was about to reconcile with her son Ewan Hope, 19.](#)

Assistant Commissioner Neil Basu, the head of UK Counter Terrorism policing said: "This is shocking and tragic news. Dawn leaves behind her family, including three children, and our thoughts and prayers are with them at this extremely difficult time.

"The 45-year-old man who fell ill with Dawn remains critically ill in hospital and our thoughts are with him and his family as well.



"This terrible news has only served to strengthen our resolve to identify and bring to justice the person or persons responsible for what I can only describe as an outrageous, reckless and barbaric act.

"Detectives will continue with their painstaking and meticulous work to gather all the available evidence so that we can understand how two citizens came to be exposed with such a deadly substance that tragically cost Dawn her life.

"Dawn's family has asked the media to kindly respect their privacy at this difficult time."

Wiltshire Police Chief Constable Kier Pritchard said: "Today is the day we hoped would never come. It is with great sadness that we have learned of the tragic death of 44-year-old Dawn Sturgess.

"On behalf of all officers, staff and volunteers working for Wiltshire Police I wish to pass on our condolences to the family and friends of Dawn at this terrible time.

"I cannot begin to imagine the pain and suffering they must be feeling, coupled with all the questions they need answers to."

Pritchard reiterated that the risk to the general public "remains low".

He continued: "We continue to support the ongoing Counter Terrorism Policing Network investigation in addition to co-ordinating the multi-agency local response.

"The investigation team continue to work tirelessly to establish the sequence of events that have led to this tragic incident.





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"Our thoughts and prayers continue to be with the 45 year old man who remains in hospital in a critical condition and his family and friends at this most difficult of times.

"I would urge anyone in either Amesbury or Salisbury who have questions, following today's sad news, to speak to one of our officers out and about in the community. If they cannot answer your questions, they should be able to direct you to the most appropriate organisation who can.

"Our helplines are also open - please call us if you have any concerns. The numbers are 0800 0920 410 or 0207 158 0124."

He added that the possibility that the two Novichok incidents are linked is a key line of inquiry for police.

Angus Macpherson, Wiltshire police and crime commissioner, said: "Foremost in my thoughts are the family and friends of Dawn Sturgess at this terribly sad and difficult time.



"I send my condolences to them as they attempt to come to terms with what has happened over the last number of days.

"Ms Sturgess was an innocent member of the public who should have been able to go about her daily life without becoming an unwilling victim in such an unprecedented, international, incident.

"I am horrified and appalled that an illegal and lethal nerve agent has been used on the streets of our county.

"And while the city of Salisbury has bounced back so resiliently, it saddens me greatly that Ms Sturgess, and now her family, are bearing the devastating impact of this incident."



Professor Paul Cosford, director of health protection and medical director for Public Health England (PHE), said: "We would like to offer our sincere condolences to the family of Dawn Sturgess at this very sad time.

"We fully recognise that this news will cause great concern among residents of Salisbury and Amesbury. However our assessment remains that the overall risk to the general public remains low.

**"As a precaution we still advise the public not to pick up any strange items such as needles, syringes or unusual containers** and we would ask that you continue to follow our advice if you were in any of the locations identified by the police from 10pm on Friday 29 June.

"This is to wash your clothes in a washing machine and to keep your items double-bagged and securely fastened, if they are dry-clean only."

**The nerve agent has more than 100 formulations but [Novichok](#) is dispersed as an ultra-fine powder rather than a gas or vapour.**

**It can easily be inhaled, ingested or absorbed through the skin and is very hard to see.**

The medical director of Salisbury District Hospital said staff "did everything they could" to save Dawn.

Dr Christine Blanshard said in a statement: "The death of Dawn Sturgess is desperately sad news.

"I want to express my condolences - and those of everyone here at Salisbury District Hospital - to Dawn's family. We will work with the police to give them all the support that they need."

British diplomat Julian King, the European Commissioner responsible for the EU's security union, said: "Those behind this are murderers."

John Glen, Conservative MP for Salisbury and South Wiltshire, said: "Deeply saddened to hear that Dawn Sturgess has died at Salisbury District Hospital.

"I can assure the people of South Wiltshire that the police will be given all necessary resources to find out exactly what has transpired and bring those responsible to justice."

Mike Gapes, Labour and Co-operative MP for Ilford South, said: "Sad news that Novichok victim Dawn Sturgess has died.

"This was a murder of a British citizen as a result of use of a chemical nerve agent produced by the Russian state."

Officers were first called to a property on Muggleton Road, Amesbury on Saturday, June 30 when Ms Sturgess collapsed.

Later that afternoon, the ambulance service returned when Mr Rowley fell ill and started displaying symptoms of Novichok poisoning.

Forensic investigators are continuing to comb for clues in Wiltshire after the couple fell ill.

Investigators wearing camouflage protective clothing entered the John Baker House assisted-living accommodation in Salisbury, where mother-of-three Ms Sturgess lives, after they took a sample from the outside of the building on Friday.

Other sites visited by the couple in the lead-up to their hospitalisation are also being looked at, as detectives piece together a timeline of their movements.

Officers have spoken to several key witnesses and are trawling through more than 1,300 hours of CCTV footage which has been collected so far.

There has also been a heavy operational presence at Mr Rowley's flat, where they were both taken ill.

The Defence Science and Technology Laboratory at [Porton Down](#) confirmed on Wednesday, July 4 that Ms Sturgess and her friend had been exposed to Novichok.

No-one else has presented with the same symptoms linked to this incident.

Home Secretary Sajid Javid said: "The death of Dawn Sturgess is shocking and tragic news and I want to express my sincere condolences to her family and friends.

"This has now become a murder investigation and police and security officials are working around the clock to establish the full facts.

"This desperately sad news only strengthens our resolve to find out exactly what has happened.

"As I said earlier today when I visited Amesbury and Salisbury, the Government will continue to provide the local community all the support it needs."





## Task Force Spartan, Kuwait Land Forces soldiers continue chemical weapons response training

By Sgt. 1st Class Doug Roles

28th Infantry Division, Task Force Spartan Public Affairs

Source: <https://www.dvidshub.net/news/283503/task-force-spartan-kuwait-land-forces-soldiers-continue-chemical-weapons-response-training>



June 25 – U.S. and Kuwaiti soldiers sharpened their chemical and biological weapons defense skills during a recent training that focused on decontaminating and caring for casualties of a weapons of mass destruction event. Chemical officers with the Kuwait Minister of Defense Weapons of Mass Destruction Defense Directorate joined Soldiers with the 300th Chemical Company, 40th Brigade Engineer Battalion, 2nd Armored Brigade, Task Force Spartan, for the June 25-27 series of lectures which were followed by a practical exercise.

Personnel with Headquarters and Headquarters Battalion, 28th Infantry Division/TFS and the 75th Combat Support Hospital also participated, along with soldiers; 35th Engineer Brigade, Missouri Army National Guard; 65th Field Artillery Brigade, Utah Army National Guard; and 31st Air Defense Artillery Brigade.

Trainings such as this one are critical to maintaining readiness, event organizers said, since medical providers, medics and soldiers in chemical and biological defense sections do not frequently exercise these skillsets jointly. This Medical Management of Chemical and Biological training event was hosted by U.S. Army Central (ARCENT) and marked the latest in a series of trainings designed to improve interoperability between Kuwaiti and U.S. Soldiers for chemical, biological, radiological and nuclear (CBRN) cooperative defense.

"The purpose of the training was to build capability for treatment of chemical and biological weapons casualties," said Lt. Col. Andrew Franzone, 28th Infantry Division/Task Force Spartan chemical officer. "It's a capability that is not routinely exercised but is very important, particularly for units, like ours, with a defense support of civilian authorities (DSCA) mission."





So, it was a good opportunity to train and exchange techniques with our Kuwaiti counterparts.” Task Force Spartan personnel leveraged the planned ARCENT training of U.S. personnel by inviting Kuwaiti chemical and medical soldiers to participate, thus turning the event into an informal information exchange.



**EDITOR’S COMMENT:** I looked around to find more photos on gear used – no luck. But I see some Kuwait soldiers with beards... I see no hoods but regular masks (Level-C). Baby saving: truth or just a military myth?

The overall goal of the series of training events is to ensure appropriate procedures are in place for decontamination, evacuation and treatment of chemical and biological contamination casualties in the event of a WMD attack. Capt. Abdul-Aziz Hamad Al-Muteri, a Kuwaiti chemical officer, said the training is valuable because it provides an opportunity to share knowledge.

“We have the same goals and the same procedures,” he said. “I think it is important to continue training together.”

The participants reacted to different patient decontamination scenarios that required them to follow specific procedures for protecting themselves while treating casualties. Soldiers had to communicate and work together to treat simulated casualties while wearing protective gear such as gas masks and chemical-protective suits.

Lt. Col. Dr. Donald Kimbler, deputy chief, Chemical Casualty Care Division, U.S. Army Medical Research Institute of Chemical Defense (USAMRICD), served as the lecturer. He stressed that responders need to quickly recognize the symptoms of CBRN poisoning and treat casualties while also protecting themselves. Kimbler reviewed persistent and non-persistent nerve agents and explained how nerve agents attack the body.

He also reviewed the administration of ATNA (antidote treatment nerve agent) and CANA (convulsant nerve agent antidote) using auto-injectors carried by soldiers. “If a soldier becomes a casualty, you use their ATNAA and their CANAA; **yours is for you,**” he said.



"Immediate decontamination is very important for treatment and care of a nerve agent," Kimbler said. "Protect yourself. Get used to your MOPP gear," Kimbler said of practicing in the chemical-protective mission oriented protective posture suit. "All this treatment can be done in MOPP four. Practice starting IVs with your gloves on."

Breaks during the two days of lecture gave participants a chance to get to know each other and discuss material presented during the classroom portion of the training. The simulated-casualty exercise was conducted in a nearby parking area to take advantage of an overhead canopy as morning temperatures quickly climbed into triple digits.

"Participants' attitudes were strong for the duration of the training simulations despite the challenging conditions," Franzone said.

## Wmd/Cbrne/Decon Full Body Trainer

Source: <https://www.simulaid.com/product/101-088FB>

This 5' 5", full-body trainer combines our standard intubation head and IV arm with a non-electronic body. BLS services utilizing advanced skills, like airway maintenance and IV administration, will appreciate this unit. The addition of a casualty simulation kit to this manikin broadens its use for MCIs. Couple those options and a WMD (Weapons of Mass Destruction) or CBRNE (Chemical, Biological, Radiological, Nuclear, Explosive) scenario where DECON (decontamination) processes are scheduled and you have the perfect setup for use in processing through decontamination stations.



Water won't hurt this trainer, and you can initialize advanced life support treatment as you are flushing contaminants. No ECG features.

WMD/CBRNE/DECON Full-Body Trainer. Size: 65" x 23" x 9". Ship weight 52 lbs.

## Aum Shinrikyo's legacy of toxic terror

By Declan Sullivan

Source: <https://www.aspistrategist.org.au/aum-shinrikyos-legacy-of-toxic-terror/>

July 13 – The execution of Shoko Asahara, the former leader of the Japanese doomsday cult Aum Shinrikyo, is a reminder of one of the most unsettling chapters in modern terrorism. Asahara, who was [hanged last Friday](#) alongside six other cult members, was convicted of directing and organising Japan's worst terror attack—the 1995 sarin nerve gas attack on Tokyo's subway system.

Aum Shinrikyo members have also been tied to a range of other terror incidents and murders in Japan, including small-scale chemical and biological attacks. [The cult was the first terror group to successfully use chemical weapons](#), and its ability to independently make large quantities of toxins demonstrated that producing weapons of mass destruction (WMDs) isn't beyond the capabilities of non-state actors. The cult's legacy is especially relevant today, with the use of chemical weapons on the rise.

Asahara, born Chizuo Matsumoto, [started Aum Shinrikyo as a yoga school](#) in the mid-1980s and rode a wave of new religious revival in Japan, quickly recruiting thousands of members. The group mixed Buddhist and Hindu teachings with Christian apocalyptic writings and modern science fiction like Isaac Asimov's *Foundation* series. [Among its members were top students in technical and scientific fields](#), including chemical and organic scientists. They donated much of their wealth, time and expertise to the cult and its increasingly bizarre objectives.

Aum Shinrikyo sought to infiltrate elite Japanese society, targeting major corporations, the government and the military. Those seen as opposing the group were put under surveillance, with wiretaps placed in their homes. This grew into a campaign of intimidation and then



violence; a lawyer investigating the group was [murdered along with his family in 1989](#), although police didn't make the connection until after the subway attack.

Failure to gain influence in elections in 1989 prompted the group to pursue more violent alternatives. In 1990, the cult [established its first weapons laboratory](#), focusing initially on biological weapons. Large amounts of botulinum toxin were produced, and then sprayed from trucks near US military bases, the Imperial Palace, Japan's National Diet and other locations. Crude production methods, however, meant that the toxin was harmless and the 'attacks' in 1990 went unnoticed.

By 1992 the group had switched to researching and producing anthrax, but its scientists were again

unable to effectively weaponise the toxin. When anthrax spores were released over a neighbourhood in 1993, some pets and birds died, and locals complained of a noxious smell and strange residue, but no human injuries occurred.

Aum Shinrikyo was more successful in its attempts to develop chemical weapons, which [started in earnest in 1993](#) with the production of sarin and other toxins, including VX. In the same year, the group bought [Banjawan Station, 800 kilometres northeast of Perth](#), and tested the sarin on sheep. Satisfied with the potency of the toxin, in 1994 the cult sprayed it on the homes of three judges ruling



on a case against the cult in the city of Matsumoto. The judges survived, but the attack killed eight and injured hundreds. Again police failed to make the connection to Aum Shinrikyo.

On 20 March 1995, cult members carried liquid sarin onto the Tokyo subway, leaving punctured bags of the toxin on busy trains. Thirteen people died and over 5,000 were admitted to hospital, though serious injuries were limited. The failure of the gas to cause the catastrophic effects the cult desired has been blamed on the unsophisticated dispersal method.

Following the attacks, Aum Shinrikyo's compounds were [raided by police](#), revealing disturbingly large stocks of chemical and biological toxins and the means to manufacture more. Raids also revealed the extent of the cult's operations, including involvement in the Matsumoto attack, and other assassinations and attacks.

The most alarming lesson to be taken from Aum Shinrikyo's campaign is not the way the cult used WMDs, but that it didn't have to steal them and was able to produce the toxins independently. With perhaps only a little more time or luck in its research, the cult could have killed tens of thousands across Japan.

Prior to the 9/11 attacks, counterterrorism experts were sceptical that terror groups had either the ability or the desire to independently develop WMDs. RAND expert [Brian Jenkins' 1975 maxim](#) that 'terrorists want a lot of people watching, not a lot of people dead' was the prevailing view. Aum Shinrikyo's attacks called that view into question, but there was still [scepticism](#) about the capability of terror groups to develop WMDs without a state sponsor.

Modern terrorists have proved that they are willing to kill on a large scale, and that they will seek to acquire or develop WMDs to do so. Aum Shinrikyo's toxic legacy and the threat of such an attack will only grow as technologies and expertise in chemistry, medicine and biology become more globalised in the 21st century.





*Declan Sullivan has a masters in strategic studies from the Strategic and Defence Studies Centre at the Australian National University.*

## Study Aum case to prevent future attacks

Source: <http://the-japan-news.com/news/article/0004568170>



*From left, Keiichi Tadaki, Kunimitsu Kawamura and Katsuhiko Ikeda*

*The Yomiuri Shimbun Former Aum Supreme Truth cult leader Chizuo Matsumoto, also known as Shoko Asahara, and six followers who were senior leaders of the cult were executed on July 6 for their involvement in a series of horrendous crimes. To learn how Japan's legal system, antiterrorism measures and other aspects have changed since the incidents, and to examine the links between religion and terrorism, interviews were conducted with former heads of the Public Prosecutors Office and Tokyo Metropolitan Police Department and a religious studies scholar. The following are excerpts from the interviews.*

**(From The Yomiuri Shimbun, July 7, 2018)**

July 13 – Victims' voices reflected in criminal trials

The attacks carried out by the Aum Supreme Truth cult were unprecedented acts of indiscriminate murder aimed at overthrowing the state. These crimes were unimaginable in what the public thought was a peaceful country.

The Aum attacks led to major changes in the criminal justice system, with the victims being the driving force behind these changes. After previous incidents, victims and bereaved family members rarely spoke publicly.

In the Aum attacks, people and their parents, spouses and children suddenly had taken away from them their lives and livelihoods, by a religious organization they had nothing to do with. The victims and their families expressed their sadness and anger in the media.

Seeing this, the public confronted anxiety and fear that they, too, could become victims, and

public sympathy for the victims became widespread. At the same time, there was a surge of interest in investigations and trials.

Under public scrutiny, several flaws in how investigations and trials were conducted came to light.

For example, victims and family members were sometimes unable to view trials because of full courtroom galleries, and they had no opportunities to speak in court. The prosecutors and judges who had prided themselves on working for the sake of victims realized this was just a preconceived notion.

Following these considerations, starting in the 2000s improvements to the system were undertaken to better reflect the views of victims and the public. These included making trials faster, giving victims preferential seating and providing redress to victims. This



also played a role in helping to realize the lay judge system, which enables the public to participate in criminal trials, and a system that allows victims to participate in the process, such as by directly questioning defendants in court. In investigating the Aum attacks, investigators used an understanding of the cult's doctrines to obtain confessions from former senior cult members and others, which helped them solve the cases. The strong bonds among conspirators in organized crime make obtaining objective evidence difficult, which can hinder investigations.

Nevertheless, I hope investigators will become more proficient in new methods of countering organized crime. These include the use of "digital forensics" to analyze electronic data from computers and smartphones.

It can't be stated unconditionally that the system for suppressing terrorist organizations is sufficient. After the attacks, the Subversive Activities Prevention Law was not applied to forcibly break up Aum. The group's continued existence leaves us with a feeling of discomfort. The "new Aum law," which allows for the surveillance of groups that could carry out terrorist attacks, has so far only been applied to the Aum group. It remains to be seen if it can effectively be used against other groups attempting to carry out indiscriminate terrorism. The problems we were forced to confront after the Aum attacks should not be treated like things of the past. Society as a whole needs to learn lessons from them.

■ This interview was conducted by Yomiuri Shimbun Staff Writer Katsuro Oda.

■ Keiichi Tadaki / Former Prosecutor General Tadaki, 75, is a lawyer who served as administrative vice minister and deputy vice minister of the Justice Ministry before being appointed prosecutor general in 2006. After retiring, he served on a panel to study how prosecutors should perform their duties that was created at the ministry in response to scandals involving prosecutors.

Turning point in police antiterrorism policies

The sarin nerve gas attack on the Tokyo subway system carried out by the Aum Supreme Truth cult was an unprecedented, indiscriminate act of terrorism using chemical weapons in Japan.

Such a terrorist attack was made possible with the "money" collected from followers and the

"scientists" among the cult's leadership who had graduated from universities of science.

When the attack occurred, I was head of the security department at the Osaka Prefectural Police Department. The idea that terrorism could be bought with money was shocking. At the time, we were implementing antiterrorism measures as Osaka prepared to host a meeting of the Asia-Pacific Economic Cooperation forum.

I remember that after the attack, we quickly checked the flow from air vents at the hotels where important figures would be staying, envisioning a terrorist attack with chemical weapons.

Until the subway attack, the police's antiterrorism measures were mainly concerned with domestic extremists. These focused on protecting government-related facilities and important foreign visitors that could be targeted by extremists as a means of conveying their messages.

This terrorist attack by a religious group, however, was not so much based on any ideology, to state it radically, but was dependent on the mood of cult leader Chizuo Matsumoto, and thus more difficult to deal with.

The cult had gotten into trouble in several places and was seen by the police as a "suspicious religious group," but not as having the capacity to carry out a major terrorist attack. The label of religious group caused the [law enforcement] authorities to hold back, and the lack of intelligence on the cult made the authorities ill-prepared to realize the present danger.

We never envisioned that sarin nerve gas would be used in a terrorist attack. We paid attention to weapons such as bombs and firearms, but chemical weapons were not seen as a realistic threat.

The subway attack was a turning point for antiterrorism policing. Security measures were no longer limited to important facilities and were strengthened at so-called soft targets where large numbers of people gathered. The private sector also became involved in antiterrorism efforts, which until then had been seen as only the job of the police.

Special units for exclusively dealing with nuclear, biological and chemical terrorism were created in nine prefectures. However,



because chemical weapons such as sarin nerve gas are considered military weapons, they cannot be dealt with by the police alone. Collaboration with the Self-Defense Forces has increased, such as through joint training and knowledge sharing on the strong points of various materials and resources available to the SDF and police.

The group that succeeded Aum seems to treat Matsumoto as a subject of worship. His deification must be prevented. The police need to focus on how believers are treating Matsumoto's death and make sure they do not utilize it to attract more followers.

The Tokyo Olympics and Paralympics will be held in two years. Intelligence capabilities must be strengthened to ensure a second Aum does not appear. As time has passed since the subway attack, the number of people who know little about it is increasing. The lessons on what allowed this terrorist attack to occur should not be left in the past.

■ This interview was conducted by Yomiuri Shimbun Staff Writer Go Tateishi.

■ Katsuhiko Ikeda / Former Metropolitan Police Department Superintendent General  
Ikeda, 65, entered the National Police Agency in 1976. After holding posts that included chief of the security department at the MPD and of the security bureau at the NPA, he was appointed MPD superintendent general in 2010. From 2012 to 2015, he served as the first secretary general of the Secretariat of the Nuclear Regulation Authority.

**Fight exclusivism, hostility toward society**

The Aum Supreme Truth cult first appeared as a yoga group that encouraged meditation for health, beauty and other purposes. Young people were attracted by mystical experiences. They gathered in dark rooms and their sleep and food intake were restricted to reach extraordinary states of consciousness.

It was Chizuo Matsumoto who cleverly systematized such experiences of a world outside the mundane as "religious training."

Normally, humans live by compromising with other people in everyday life. Our society is a multidimensional world made up of a wide variety of values. Since the Meiji era (1868-1912), religious organizations have carried out their activities as part of social order and have

continued to exist by compromising with the nation.

However, Aum, which introduced a live-in community system, rejected relations with the outside world. Followers closed themselves off in their own world and sought bliss by training to reach higher stages. Through this process, they deepened their dependence on Matsumoto and Aum.

Though initially a yoga group, Aum became radicalized in its own enclosed society, transforming into an abnormal group that treated murder as a positive doctrine it called "poa."

I was cross-examined as a witness for the defense during appeal hearings for Kiyohide Hayakawa, an Aum member [who was executed on July 6]. I gave my analysis and opinions on the Aum Supreme Truth cult from my position as a religious studies scholar. Hayakawa and many other believers left their homes to live together in the closed space where Matsumoto's unified sense of values could be purely cultivated.

It seems likely that Matsumoto came to perceive himself as a charismatic, absolute figure through the process of being approved by senior members of the cult. With this in mind, Aum's dangerous doctrines were not the result of Matsumoto's notions alone, but were created out of the relationships between followers and the cult's leadership.

Aum's exclusivism and unified values led to conflict with society. When this was combined with a sense of victimhood, Aum became even more hostile to regular society. Because they saw regular society as hindering their true faith, they carried out a variety of attacks.

While some may have thought twice about carrying out crimes, followers considered the crimes a form of training that would help elevate them to higher stages. Broadly speaking, therefore, their participation was voluntary. It appeared quite rare in the world to conduct terrorism by claiming that it is a form of religious training.

After the Aum attacks, concern about religious terrorism increased in Japan. Yet religious terrorism continues around the world, as seen in the attacks perpetrated by the Islamic State of Iraq and the Levant militant group. Even in Japan, words and deeds stemming from





discrimination or bias could lead to another incident.

We need to ask questions such as how religion became linked with terrorism and what happened in the process for words and deeds to become radicalized. To prevent another attack, we need to keep examining the path that Aum took and to inform later generations about what we have learned.

■ This interview was conducted by Yomiuri Shimbun Staff Writer Kyohei Ishii.

■ Kunimitsu Kawamura / Professor Emeritus at Osaka University

Kawamura, 68, served as a professor at Tenri University and Osaka University. In April 2016 he became professor emeritus of Osaka University. He specializes in religious studies. He coauthored a book with Kiyohide Hayakawa titled “Watashi ni Totte Aum to wa Nan datta no ka” (What was Aum for me?).

## Software beats animal tests at predicting toxicity of chemicals

Source: <https://www.nature.com/articles/d41586-018-05664-2>

July 11 – Machine-learning software trained on masses of chemical-safety data is so good at predicting some kinds of toxicity that it now rivals — and sometimes outperforms — expensive animal studies, researchers report.

Computer models could replace some standard safety studies conducted on millions of animals each year, such as dropping compounds into rabbits’ eyes to check if they are irritants, or feeding chemicals to rats to work out lethal doses, says Thomas Hartung, a toxicologist at Johns Hopkins University in Baltimore, Maryland. “The power of big data means we can produce a tool more predictive than many animal tests.”

In a paper published in *Toxicological Sciences*<sup>1</sup> on 11 July, Hartung’s team reports that its algorithm can accurately predict toxicity for tens of thousands of chemicals — a range much broader than other published models achieve — across nine kinds of test, from inhalation damage to harm to aquatic ecosystems.

The paper “draws attention to the new possibilities of big data”, says Bennard van Ravenzwaay, a toxicologist at the chemicals firm BASF in Ludwigshafen, Germany. “I am 100% convinced this will be a pillar of toxicology in the future.” Still, it could be many years before government regulators accept computer results in place of animal studies, he adds. And animal tests are harder to replace when it comes to assessing more complex harms, such as whether a chemical will cause cancer or interfere with fertility.

### Computer says: not toxic

Industry and academia have used computer models for decades to predict toxicity. These models typically incorporate a molecule’s chemical structure, an understanding of how it might react in the body and data from animal tests or *in vitro* studies. Companies also infer the toxic effects of untested substances by comparing them with other structurally or biologically similar compounds whose effects are known — a method known as ‘read-across’. But regulators set a high bar for accepting these methods and tend to ask for animal studies instead, Hartung and other toxicologists say.

To improve the software, Hartung’s team created a giant database with information on roughly 10,000 chemicals based on some 800,000 animal tests. These data were originally

collected by the European Chemicals Agency (ECHA) in Helsinki as part of a 2007 law known as REACH (registration, evaluation, authorization and restriction of chemicals), which requires companies to register safety information for most chemicals marketed in the European Union. As of May 2018 — the closing date for registrations — the agency had received information on more than 20,000 substances.

The ECHA makes those data public, but not in a format that allows computers to easily analyse them. So, in 2014, Hartung’s team extracted the available data into a machine-readable database. [This led to a legal dispute between Hartung and ECHA](#), because the agency said the study details belonged to the



companies that conducted the tests. In 2017, Hartung agreed not to publish his own database. The ECHA also released key study outcomes — but not all data — in a separate public file.

Using the read-across method, Hartung's software compares a new chemical to closely related compounds and assesses the probability of toxic effects by reference to the properties of these known chemicals. Effectively, says Hartung, the software mimics how a toxicologist would size up a new chemical but in automated fashion.

Hartung's database analysis also reveals the inconsistency of animal tests: repeated testing of the same chemical can give different results, because not all animals react the same way. For some types of toxicity, the software therefore provides more-reliable predictions than any individual animal test, he says. "This couldn't have been done five years ago. Chemical regulation has pushed out to the public a tremendous amount of toxicology and physical performance data," says Craig Rowlands, co-author on the latest paper and scientist at Underwriters Laboratories, a US safety-science firm in Northbrook, Illinois that is commercializing the software.

Hartung and other co-authors consult for the firm, and receive shares of its profits; although the underlying database has been shared with other researchers and government agencies who have asked for it, Hartung says.

#### Regulatory acceptance

Other researchers and firms are developing machine-learning algorithms, too, although they have not published papers about their work. And chemical-safety agencies are paying close attention. In April, the Interagency Coordinating

Committee on the Validation of Alternative Methods, which is developing methods to replace animal-safety testing on behalf of 16 US government agencies, invited dozens of academic and commercial research groups to the National Institutes of Health (NIH) in Bethesda, Maryland. There, each team used its own software to predict 'lethal-dose' toxicity for 40,000 chemicals previously tested on rats.

Combining the best software (including Hartung's) produced a consensus computational model that "performed just as well as the animal tests", says Nicole Kleinstreuer, who coordinated the exercise and develops alternative toxicity-testing methods for the US National Toxicology Program in Durham, North Carolina. Later this year, the US Environmental Protection Agency (EPA) plans to release the consensus model online for free download.

US agencies are particularly keen to promote non-animal testing methods, after [historic 2016 legislation gave the EPA the authority to insist that chemicals be proven safe](#) before they go on the market. Last month, the EPA published a strategic plan to promote animal-free testing methods, including software.

In the EU, the ECHA has also encouraged companies to avoid animal tests by using read-across and methods based on analysis of lab cells where possible, says Mike Rasenberg, head of computational assessment at the agency.

The new paper is "a good initiative", Rasenberg says, but "scientifically, there is a lot of work to be done". He adds: "No one wants animal tests, but we can't yet do all toxicology with a computer."



## Soligenix receives European, Canadian patents for its **ricin toxin vaccine (RiVax)** formulation

Source: <http://www.homelandsecuritynewswire.com/dr20180713-soligenix-receives-european-canadian-patents-for-its-ricin-toxin-vaccine-rivax-formulation>

July 13 – [Soligenix, Inc.](#), a late-stage biopharmaceutical company, [announced](#) that it has received notice of allowance for European and Canadian patent applications further extending protection around ThermoVax including coverage of the company's ricin toxin vaccine, RiVax. ThermoVax is a proprietary vaccine heat stabilization platform technology and the patent, titled "Thermostable vaccine compositions and methods of preparing same," has been



previously allowed in Japan, Australia and New Zealand with applications pending in China, United States, and other jurisdictions.

The company notes that the issued patent is complementary to previous patents, including U.S. patents 8,444,991 granted on 21 May 2013 and 8,808,710 granted on 19 August 2014, which include claims for methods of making stabilized vaccines and their attendant compositions. In this new patent, the main claims cover formulations of Soligenix's proprietary thermostabilized ricin toxin vaccine, RiVax. The thermostable formulation of RiVax has been shown to be stable for at least 12 months at temperatures up to 40 degrees Celsius (104 degrees Fahrenheit) and to provide 100 percent protection to non-human primates exposed to aerosol ricin challenge in preclinical studies.

Recent developments in the RiVax program have also described immune correlates of protection for the ricin toxin vaccine, which are important to facilitating potential approval of thermostabilized RiVax via the U.S. Food and Drug Administration (FDA) "Animal Rule." As a biodefense vaccine, RiVax also has the potential to qualify for a priority review voucher (PRV) upon FDA approval. Recent PRVs have sold for as much \$350 million.

"Soligenix continues to advance its RiVax program with funding from the U.S. government," stated Christopher J. Schaber, President and Chief Executive Officer of Soligenix. "Soligenix is a world leader in ricin toxin vaccine development, with a Phase 2 clinical trial planned to begin this year."

### About ricin toxin

Ricin toxin is a lethal plant-derived toxin and potential biological weapon because of its stability and high potency, and the fact it is readily extracted from by-products of castor oil production. Ricin comes in many forms including powder, mist or pellet. Ricin can also be dissolved in water and other liquids. The U.S. Centers for Disease Control and Prevention estimates that the lethal dose in humans is about the size of a grain of salt. Ricin toxin illness causes tissue necrosis and general organ failure leading to death within several days of exposure. Ricin is especially toxic when inhaled. Ricin works by entering cells of the body and preventing the cells from making the proteins it needs. Without the proteins, cells die, which is eventually harmful to the entire body. There are currently no effective treatments for ricin poisoning. The successful development of an effective vaccine against ricin toxin may act as a deterrent against the actual use of ricin as a biological weapon and could be used to vaccinate military personnel and civilian emergency responders at high risk of potential exposure in the event of a biological attack.

### About RiVax

RiVax is Soligenix's proprietary heat stable recombinant subunit vaccine developed to protect against exposure to ricin toxin. With RiVax, Soligenix is a world leader in the area of ricin toxin vaccine research.

RiVax contains a genetically altered version of a Ricin Toxin A (RTA) chain containing two mutations that inactivate the toxicity of the ricin molecule. A Phase 1A clinical trial was conducted with a formulation of RiVax that did not contain an adjuvant. This trial revealed dose dependent seroconversion as well as lack of toxicity of the molecule when administered intramuscularly to human volunteers. The adjuvant-free formulation of RiVax induced toxin neutralizing antibodies that lasted up to 127 days after the third vaccination in several individuals.

To increase the longevity and magnitude of toxin neutralizing antibodies, RiVax was subsequently formulated with an adjuvant of aluminum salts (known colloquially as Alum) for a Phase 1B clinical trial. Alum is an adjuvant that is used in many human vaccines, including most vaccines used in infants. The results of the Phase 1B study indicated that Alum-adjuvanted RiVax was safe and well tolerated and induced greater ricin neutralizing antibody levels in humans than adjuvant-free RiVax. In preclinical animal studies, the Alum formulation of RiVax also induced higher titers and longer-lasting antibodies than the adjuvant-free vaccine. Vaccination with the thermostabilized Alum-adjuvanted RiVax formulation in a large animal model provided 100 percent protection ( $p < 0.0001$ ) against acute exposure to aerosolized ricin, the most lethal route of exposure for ricin. The protected





animals also had no signs of gross lung damage, a serious and enduring ramification with long-term consequences for survivors of ricin exposure. These results are described in a publication available [here](#).

Heat stabilization of RiVax is achieved with the Company's proprietary ThermoVax technology, designed to eliminate the cold-chain production, distribution and storage logistics required for most vaccines. The technology utilizes precise lyophilization of protein immunogens with conventional aluminum adjuvants in combination with secondary adjuvants for rapid onset of protective immunity with the fewest number of vaccinations. By employing ThermoVax during the final formulation of RiVax, the vaccine has demonstrated enhanced stability and the ability to withstand temperatures at least as high as 40 degrees Celsius (104 degrees Fahrenheit) for up to one year.

The development of RiVax has been sponsored through a series of grants from both National Institute of Allergy and Infectious Diseases (NIAID), and the FDA and ongoing development is sponsored by NIAID contract. The Phase 2 clinical trial planned for the second half of 2018

is contingent upon exercise of the final option by the U.S. government under NIAID contractor through other funding sources. RiVax potentially would be added to the Strategic National Stockpile and dispensed in the event of a terrorist attack. RiVax has received orphan drug designation in the United States and in Europe. As a new chemical entity, an FDA approved RiVax vaccine has the potential to qualify for a biodefense PRV, which allows the holder accelerated review of a drug application. Approved under the 21<sup>st</sup> Century Health Cures Act in late 2016, the biodefense PRV is awarded upon approval as a medical countermeasure when the active ingredient(s) have not been otherwise approved for use in any context. PRVs are transferable and can be sold, with sales in recent years ranging between \$125 million to \$350 million. When redeemed, PRVs entitle the user to an accelerated review period of six months, saving a median of seven months' review time as calculated in 2009. However, the FDA must be advised 90 days in advance of the use of the PRV and the use of a PRV is associated with an additional user fee (\$2.7 million in 2017).



## The World's Worst Industrial Disaster Is Still Unfolding

Source: <https://www.theatlantic.com/science/archive/2018/07/the-worlds-worst-industrial-disaster-is-still-unfolding/560726/>

July 10 – In old Bhopal, not far from the small Indian city's glitzy new shops and gorgeous lakes, is the abandoned Union Carbide factory. Here, in one ramshackle building, are hundreds of broken brown bottles crusted with the white residue of unknown chemicals. Below the corroding skeleton of another, drops of mercury glitter in the sun. In the far corner of the site is the company's toxic-waste dump, shrouded in a sickly green moss. Not 15 feet away, a scrawny boy of about 6 tries to join a game of cricket. A few skinny cows graze next to a large, murky puddle. Strewn on the ground are torn plastic bags, yellowed newspapers, stained paper cups. And in the air, the pungent fumes of chlorinated hydrocarbons.

On December 3, 1984, 40 tons of a toxic gas spewed from the factory and scorched the throats, eyes, and lives of thousands of people outside these walls. It was—still is—the world's deadliest industrial disaster. For a brief time, the Bhopal gas tragedy, as it became known, raised urgent questions about how multinational companies and governments should respond when the unthinkable happens. But it didn't take long for the world's attention to shift, beginning with the Chernobyl nuclear accident a little more than a year later.

In the decades since, many other sites of industrial waste—in [New Jersey](#), [Missouri](#), [Ohio](#)—have been cleaned up. But this 70-acre site in Bhopal has, apart from the riotous jungle basil, remained mostly unchanged. Union Carbide Corporation (UCC); its former Indian subsidiary; its current owner, DowDuPont; the state government of Madhya Pradesh; and the central Indian government have all played an endless game of pass the buck. While this charade plays on,



and people continue to think of Bhopal's tragedy as one horrific night in 1984, the site still hosts hundreds of tons of contaminated waste. The Bhopal disaster is, in fact, still unfolding.

From the wooden bed outside her two-room house, Munni bi, the *grande dame* of Annu Nagar, has a wide lens on the devastation. Munni bi's bed is less than 200 feet from a massive pit that UCC filled with toxic sludge, close enough to witness the damage the *ganda pani*—dirty water—has wrought.

Right next door is 15-year-old Fiza, who didn't speak for the first five years of her life, and still has heart palpitations, dizzy spells, and headaches. The young woman who grew up two doors down, Tabassum, now has a toddler who doesn't eat much or speak or cry and has seizures. Down the street is Obais, a spindly legged 13-year-old with black pustules all over his body—so painful and grotesque that he rarely leaves the house. Across the street from him is 12-year-old Tauseeb, who is intellectually disabled. And there's Najma, the sweet, young woman who lost her mother to tongue cancer and now sits in front of her house all day, smiling and occasionally shouting out guttural gibberish to passersby. And then there is the house where one daughter has fused bones in her legs, and another has a hole in her heart.

If people were to paint a red cross on every door that harbors illness, as they did during the bubonic plague in England, few doors in Annu Nagar, a small slum in Bhopal, would remain unmarked. The houses of Munni bi's two sons would each display a cross—in the house behind her bed is Bushra, her 14-year-old granddaughter, who is "not quite right" and whose "eyes hurt." Across the street, her grandson, Anees, was born with skin that looked burned and limbs that lay flaccid and useless; he died five years ago at age 4, never having spoken a word. Three years ago, Munni bi was diagnosed with bladder cancer, a common complaint in these parts. When I visit her on a blisteringly hot day in March of last year, her cancer is temporarily under control, but the diabetic sores on her thighs keep her in bed, where she can do little but lie still, rail against fate, and survey the desolation.

Annu Nagar is one of 22 communities where the groundwater has been known for nearly 20 years to contain toxic levels of chlorinated solvents. Six years ago, responding to relentless efforts from activists, the Indian Supreme Court ordered the city to install pipes that bring in clean water from the Narmada River. But the pipes coming into some houses run right through sewers, and on rainy days, filth and feces mingle with the clean water. In the meantime, each monsoon may be carrying this toxic plume farther. The most recent survey suggests there are [20 more communities](#) where the water is contaminated. In March of this year, the Supreme Court ordered that the city ensure clean water to these areas, too—and that it undertake a project to lay down sewage and drainage networks for the entire city.

"This is not the way you run a huge corporate plant handling lethal chemicals."

These are reactive solutions to an enduring—and expanding—problem, but the bigger question is: What would it take to clean up the waste?

When I posed this question to Vishvas Sarang, the state minister charged with caring for these communities, he told me plans for the cleanup are underway. He said he had written to the Central Pollution Control Board, India's equivalent of the EPA, and that he was confident it would be finished quickly. "It's just a matter of two, three months. It will get done, it's not a big job."

That was more than a year ago.

The factory in Bhopal launched at a time when India was facing severe food shortages. The country launched its Green Revolution in the early 1960s in an urgent bid to feed its growing population. UCC was one of the early beneficiaries of this new commitment to technology, and began marketing its pesticides with the slogan "Science helps build a new India." In 1969, UCC built a plant in Bhopal to manufacture carbaryl (sold under the brand name Sevin) and alidcarb (Temik). At first, the company imported methyl isocyanate, the toxic gas required to make the pesticides, but by 1980, it had begun manufacturing the gas on site. MIC is colorless and heavier than air, is extremely toxic, and irritates the skin, eyes, and mucous membranes of the respiratory tract.

The company proceeded carefully, ensuring that the Bhopal plant had all the same modern technologies as its sister plant in West Virginia. The staff held rigorous training sessions for the workers, and installed a sophisticated, computerized system, just like the one in West Virginia, to alert workers to a leak. They set up loud alarm systems that could be heard for miles, distributed fact sheets about MIC to all the local hospitals, and held seminars for medical personnel on





treating MIC exposure. By 1984, even as sales of Sevin tanked and the plant was operating at a loss, the company retained the full number of skilled workers and kept up its safety systems. At least, that would have been the responsible way to run a plant producing a highly toxic substance. But UCC didn't do any of this.



The abandoned Union Carbide factory in Bhopal (Raj Sarma)



In fact, says Kumkum Modwel, a physician based in Connecticut who was a medical officer at the factory from 1975 to 1982, UCC's operation "was a case study in how not to do things." (When reached for comment, the company's current owner, DowDuPont, directed me to





previous statements [on their website](#).) Modwel (née Saxena) joined the company as a starry-eyed youngster, excited to be a part of this booming American company in her sleepy hometown. Things were sunny at first, but then small accidents and safety lapses began niggling at her. She was troubled by the company's cutbacks on safety as profit margins plunged and truckloads of unsold pesticide returned to the factory. Her turning point came in 1981, when a worker she knew well, Ashraf Mohammed Khan, died horribly after being drenched in phosgene, a precursor to MIC. Shaken, Modwel says she tried to get her superiors to improve the safety procedures, but to no avail. "I left because no one would listen to me. I left in utter disgust," she says. "This is not the way you run a huge corporate plant handling lethal chemicals. This is how not to do things."

Even more damning is the account of T. R. Chouhan, an MIC plant operator at the time of the disaster and a vocal critic of UCC. Chouhan and others told government investigators that months before the leak, managers shut down a refrigeration unit that was intended to keep the MIC tank cool enough to prevent accidents. One of the three safety systems in place had been out of service for weeks; the other had broken down days before the accident. Small leaks of MIC had become so commonplace that on December 2, a supervisor discovered a leak of MIC around 11:30 p.m., and put off dealing with it till after his tea break. The alarm that did sound was the same one the workers heard many times a week for other reasons, so they paid it no heed. Within an hour, the runaway reaction had generated enough pressure to break open the safety valve and release 40 tons of MIC and other chemicals into the air.

The swift wind that blew that night delivered the lethal fumes to an area of 40 square kilometers near the site. Those who didn't choke to death woke gasping for breath, their eyes burning from the toxic gas and their mouths frothing. If only they had known, all they had needed to do was climb to a higher spot. Or covered their faces with a wet cloth. As it was, because MIC is twice as heavy as air, children were affected most. With no training and no knowledge of what they were treating, the doctors could do little to help. Overnight, the city turned into a mausoleum.

No one knows exactly how many people died that night. The official government estimates began around 3,000 and have since been revised to 5,295. (Officials from India's Central Pollution Control Board did not respond to numerous requests for interviews.) But other sources, including Amnesty International, say at least 7,000 people died just within the first three days, and about 25,000 people overall have succumbed to MIC exposure. Another 500,000 have lingering health problems.

The government's estimates for deaths makes no sense, notes Rachna Dhingra, who has been an activist in Bhopal since 2003. "Look at it this way," she says: The government has approved pensions for 5,000 widows. "If you are giving pensions to 5,000 widows, then how can the figure of deaths be only 5,295 overall? It's not just that only men died, yeah? Women too must have died, young children would have died."

Against this chaotic backdrop, UCC settled in 1989 for \$470 million in damages, with each gas-exposed person getting 25,000 Indian rupees (roughly \$2,200 at the time). Under the terms of the settlement, UCC continued to deny liability for the incident. Dhingra and others have been trying ever since to get more compensation for those affected, to get the site cleaned up, and to prevent the devastation from spreading.

So far, they've had little luck. Dow Chemical Company acquired UCC in 2001. But Dow, which in September 2017 merged with DuPont to form a \$130 billion behemoth, says its purchase of UCC excludes liabilities from Bhopal. In a [series of statements](#) addressing the disaster, Dow says responsibility for the cleanup really lies with UCC's Indian partner at the time of the leak, Union Carbide India. That company, now called Eveready Industries India, places the blame squarely at UCC's feet, saying, "The obligation and liability of the cleanup, if any, should be that of the [erstwhile owners of UCIL, viz, UCC U.S.](#)" UCC, for its part, says UCIL really owned and managed the factory (even though UCC owned 50.9 percent of UCIL), and that the state of Madhya Pradesh, which owns the land, is [responsible for cleaning up](#) the site. The state of Madhya Pradesh says it is unequipped for cleanup and defers to the federal government. The federal government has named Dow in a "curative petition" intended to make up for the inadequate 1989 settlement, and is asking for \$1.2 billion (compared with the \$8 billion the activists are demanding). And around it goes.



Every few years, a new character enters this theater of the absurd. Two years ago, that was Sarang, the now-46-year-old minister of gas-tragedy relief and rehabilitation—that's really his title, though most people drop the *tragedy* when talking about him—and a native Bhopali. His job is to make sure that people exposed to the gas, and those still affected by the disaster, are taken care of. (Most people who live in Annu Nagar and thereabouts are Muslim, and Sarang's group, an ardent champion of Hindus, is often vehemently anti-Muslim.) Sarang is not the first gas-relief minister, but unlike his predecessors, he tweets, holds frequent press conferences, and loves to engage with the public. "Sarang is a different creature altogether," says Dhingra. "He is very concerned about his image—very, very ... and he has big political aspirations."

When I asked for a meeting with Sarang, he summoned me to his house. Raj Sarma, the photographer I was traveling with, and I arrived at Sarang's house on a balmy evening to find a horde of people waiting to speak to him. An aide showed us into a spacious room with bright-pink seats. When Sarang joined us about 20 minutes later, he was polite and charming: He insisted I have some food and tea, worried the snacks were too spicy for me, and complimented me on my Hindi—my protestations that I was not hungry, am no stranger to spicy food, and am fluent in Hindi because I grew up in India seemed to make no difference.

Every Bhopali older than 33 has a story about the leak, so I wasn't surprised when Sarang told me his: He and his parents escaped to safer grounds in one car, but a mob hijacked the car his sisters were in, leaving them exposed to the gas; they survived. (In India, in those days especially, only wealthy families could afford two cars.) Because he is also a gas victim, Sarang said, he understands the plight of the people in the affected communities, and is committed to bettering their lives. He has made many promises along these lines: to introduce "smart cards" for everyone so that the local hospitals can track and coordinate their care; to renew the widows' pensions, which stopped arriving around the time he began, then restarted for a limited number of widows this January; to build roads and parks in the neighborhoods and improve their quality of life; to offer better jobs and economic opportunities.

I told Sarang about Munni bi's problems with getting medicines she needed from the hospital intended to serve that community. He immediately called an aide, threatened to fire whoever was in charge at the



hospital, and told me Munni bi would get her meds. (When I went back to Annu Nagar the next day, her neighbor Sakina had been able to pick up the medicines.)

Munni bi lies on her bed outside her house in Annu Nagar (Raj Sarma)

Not all of Sarang's promises come true, however. In a follow-up phone interview in December, Sarang told me that the pensions were

starting up again, that parks were under construction, and that gas-exposed people who needed bone-marrow transplants would soon be able to get them for free at private hospitals in Bhopal. When I asked Dhingra about this, she laughed outright. "What lies he's spreading," she said. The hospitals are nowhere near sophisticated enough to offer bone-marrow transplants, she said, and apart from the inaugural "prayers" offered at the sites of construction, nothing new had sprung up. When Sarang first became minister, she said, she and other activists were optimistic that this savvy, energetic young man could shake up the status quo. "We were fooled for many months, too" she says. "It's all a big facade he puts up." When I asked Sarang about skepticism about these projects from locals, he insisted that the initiatives were all moving forward.



At his house that evening in March 2017, every time I probed why the site hasn't been cleaned up yet or what his plans are for remediation, Sarang asked me to turn off my recorder. On the record, he told me his main goal is to establish a Hiroshima-like memorial on the factory site—because, he said, that would first require a cleanup. He lamented how difficult it can be to get things done in India. But he also told me I have a responsibility to make India look good in the world press. He said the cleanup could be dealt with quickly, but also that it's extremely complicated. Like a skilled politician, he supplied different answers at different junctures, and seemed to believe himself each time. But he became visibly agitated when I questioned his sincerity. "Do you know who I am? You don't know who I am," he said. "I am a man of the land."

The gas leak and its aftermath have split Bhopal's residents: those who could afford to get away, either that night or later; and those who stay bound to the soil by their financial circumstances. At the boutique inn we stayed in, about a 20-minute drive from the factory, the air was fresh and there was mineral water aplenty. The proprietor's daughter-in-law, a fashionable young woman in her 20s, laughingly told us she had never been to the site and wasn't sure where it was.

Munni bi is the richest of her neighbors, but that's not saying much. The houses her sons built are small and dark, with an inescapable stench of sewage and sickness. Like many of Annu Nagar's residents, Munni bi was never exposed to the gas. Her family moved in years after UCC decamped, lured by the cheap land. At first they lived in makeshift homes of corrugated metal and tarps. But several years ago, they saved enough money to build *pukka* homes of cement and concrete.

She and her neighbors quickly realized that the soil around the solar evaporation pond is dangerous: People who tried to make stoves from the mud broke out in horrific rashes and spiked fevers. "If you dig there in the evening, you'll be sick at night, you'll get fevers; there's that much poison in the mud," says Sakina, 38, who lives three doors down from Munni bi. "Some kids died in that pond, too, so our kids don't go there."

Sakina, her husband, and her three children live in a small shack with walls painted purple and white, and a bright-purple door that's always open. The family moved to the neighborhood about a decade ago, when their daughters Sana and Shamaiya were 5 and 3. A year later, Sakina gave birth to a son. From the start, the boy seemed ill and threw up constantly; he died before he was a year old. The following year, she had another boy, Aris. This child, too, developed "brain fever" two days after birth and, although he recovered, is still often sick. Soon after the family moved to Annu Nagar, little Sana had slowly begun losing her voice. She spoke softer and softer, until one day, when she was 8, her parents found her with big blisters all over; she had been scalded, but hadn't been able to cry out.

With help from Munni bi and other neighbors, Sakina gathered money to take her daughter by train to New Delhi. Doctors there diagnosed Sana with respiratory papillomatosis—a rare condition in which a virus infects the voice box—and inserted a tube through a hole in her neck to help her breathe.

Like Munni bi, Sakina is convinced that the water she and her children drank for many years is to blame for all these ills. "When we brought normal kids here who had no problems before, and then we drank the water and this happened, of course we think it's because of the water," she says.

Munni bi's relative affluence and age may have given her pole position in the neighborhood, but Sakina's physical stamina and fearlessness make her formidable. In 2008, Sakina was one of the women who, along with Dhingra, marched 700 kilometers (about 435 miles) to New Delhi. The women fasted outside the prime minister's house until he listened to their demands. It took the government many more years to take action. In 2014, in response to an order from the Supreme Court, the city finally installed pipes that bring clean water to these communities.

"The water before was really dirty," says Nasreen, 38, who lives down an alley across from Munni bi's house. After Nasreen moved to Annu Nagar about 15 years ago, she had one child who was stillborn; the other, 12-year-old Tauseeb, has a low IQ and attends a special school. Nasreen recalls that the water was often yellow, sometimes red, and smelled foul. It looks and smells better now, but comes for only an hour a day. "Sometimes it's 2 p.m., sometimes 12, sometimes in the evening ... the tap has no time," she says. "We have to sit and wait."

On days when the pipes don't sing at all, people still boil the contaminated water from the hand pumps to bathe and wash clothes—as they were doing on one of the days I visited





Annu Nagar. “The clean water hasn’t come for three days,” Mohammed Akhtar, 56, told me. “We drink this because we have no choice.”

When I asked Sarang about this, he flatly denied any problems with the water supply. “Pipes break sometimes,” he said. “That happens even in my house. This is not America.” He also told me he does not believe any of the reports of water contamination, and has asked the Central Pollution Control Board to conduct a fresh analysis. As of late May, they had yet to respond.

There’s also little official attention to the health effects of the gas or water. The only large epidemiological project on people exposed to the gas was abandoned for 15 years. The project changed hands several times and so the scientists lost track of 88 percent of the initial cohort. Activists were able to prove that some of the people who were sent out to conduct government health surveys never did so, and instead filled out the forms with bogus answers.

There is one rigorous study underway that might provide some answers. Over the past five years, the Canadian researcher Shree Mulay and volunteers working with Sambhavana, a nonprofit clinic set up by activists, have been collecting data on mortality, birth defects, fertility, cancer, and many other aspects of people’s health. The study includes data from people exposed to the gas who then moved away and did not drink the water; those who, like Munni bi and Sakina, moved into the neighborhoods after the leak and so were only ever exposed to the water; those who were exposed to both; and those who were exposed to neither. The researchers also tried to include controls matched by socioeconomic class, income, level of education, and family size. With about 5,000 families in each group, the study includes 100,000 people in all. Mulay’s team is still analyzing the data, but preliminary results indicate that people exposed to the gas or the water or both have a higher incidence of cancer, tuberculosis, and paralysis than those exposed to neither. They also suggest that gas-exposed people have 10 times the rate of cancer, particularly liver, lung, abdominal, throat, and oral cancers, compared to the other groups.

Mulay declined to discuss these results because they are being submitted for publication—and because she first wants to make sure the analysis accounts for all the confounds that may skew the data. “One has to be able to say, ‘What is due to the general poverty of the entire population and what is specifically due to the gas or the water that they have been exposed to?’” Mulay says. “That’s why it is such a complicated study.”

For example, Mulay notes that in the heart of Bhopal is a metalworks factory that likely spews toxic gases. It might be difficult—if not impossible—to tease out how much exposures like that contribute to the illnesses in Annu Nagar.

Still, it’s hard to ignore the most obvious possibility—the cesspool of toxic sludge right next to the neighborhood.

In the early years of the factory, UCC dumped its waste into [21 unlined pits](#) within the site. This was not, at the time, an unusual practice, although companies in the United States had begun to move away from it. In 1977, UCC built three solar evaporation ponds about 400 meters north of the factory, and piped untreated waste directly into the ponds. Thin liners were put in to keep the chemicals from seeping into the ground, and the strong Bhopal sun was supposed to take care of the rest. But the liners quickly fell apart. Memos in 1982 from the Bhopal plant to the company’s headquarters warned that the ponds were leaking, and might contaminate the groundwater. And local farmers lodged complaints that the company’s runoff was killing their cattle and their crops. The 1984 disaster derailed the conversations. After the tragedy, UCC closed down the factory. The tanks and vats on the site were finally emptied in 1989, and about 360 tons of the most hazardous waste was locked up in 2005. But the rest—corroding pipes, bottles of unnamed chemicals, and the massive waste pit—have remained untouched.

Today the factory is guarded by a staff of 14, although they only see a few visitors a month—except in December, around the anniversary of the disaster. When Sarma and I visited the site in March 2017, two guards accompanied us on the tour. For 200 rupees (about \$3), they looked the other way as we took photos. Chouhan, who gave us a tour of the site, pointed out the drops of mercury sparkling in the soil. He gestured at the brush all around and said: “If you cut down this grass, you’ll find a pond of mercury.”

As we approached the farthest corner of the site from its entrance, we discovered several visitors—men and cattle—who were smarter than us and had simply walked in through



gaping holes in the wall. One of the young men playing cricket was 22-year-old Zubaid, who said he has been sneaking into the site since he was a child. “There isn’t really anywhere else for us to go,” he said. His parents had both been exposed to the gas. His father died years ago of respiratory problems; his mother still struggles to catch her breath. I asked him whether he knew that the soil and water might be dangerous. He shrugged and said, “We’re all fine.”

Everyone knows that the gas left a lasting mark on people’s health. But it took years for people to acknowledge that the water may be contaminated. In the mid-1990s, the solar ponds were once again covered with a plastic liner and topped with soil in an attempt to convert them into primitive landfills. But the liner is visibly torn in multiple spots, and they turn into cesspits with every monsoon.

Since 1990, multiple organizations have documented unsafe levels of pesticides and chlorinated solvents in the soil and water. Unfortunately, none of the reports validates the others; each sampled different locations at different times.

The lack of consensus even within the government agencies stalled all talk of the key problem: who should clean up the site, how, and when. The government’s response to the disaster has been slow, inept, and crippled by corruption—predictably so for this country. But administration after administration has also been bafflingly resistant to offers of help from international groups.

Experts in waste management are flabbergasted to learn that the site of the world’s largest industrial disaster has yet to be decontaminated. “Hoo boy, it sounds like somebody with some money and some understanding has to come in there and clean the place up,” says Robert Chinery, who served as acting director of the Center for Environmental Health at the New York State Department of Health.

At least some of the problems have clear solutions, based on experiences at other sites. In 2004, Greenpeace [commissioned](#) waste-management experts based in Germany, Switzerland, and the United States, who came back with a plan for cleaning up the soil.

One possible solution is simply to move the waste to a secure landfill, but no such location exists in India. Another is to incinerate the waste in a plant set up to handle this sort of material—a plan under discussion for the Bhopal waste for more than a decade. Done right, the waste would need to be burned at an extremely high temperature, say 800 degrees Celsius, then the gases given enough time to decompose, mostly into carbon dioxide. An air-pollution control system would trap particulates that are given off during the process. And the air would be closely monitored afterward for hazardous emissions.

This was a common way to deal with industrial waste until the 1990s, but the fear of hazardous emissions has almost put a stop to it in the United States, says Jurgen Exner, a waste-management expert and one of the authors of the Greenpeace report. There are only a few such plants remaining in the United States and elsewhere. Over the years, many plans have been proposed and halted: shipping the waste to Germany or to a site in the neighboring state of Gujarat, neither of which happened because of protests in those areas.

In 2015, the government conducted a test run of incineration with 10 tons of the locked-up waste at a plant in Pithampur, about a three-hour drive from Bhopal. There are serious concerns about the plant’s ability to handle this waste, and the report from that test is not public (similar tests in the United States usually are)—but Sarang says it was a success. In fact, he told me in March 2017, the rest of the waste would also be incinerated in a matter of two to three months. “That’s not an issue,” he said. “It’s not a big job.” As of December, there had been no progress on this front.

Sarang was speaking about the 360 tons of locked-up waste. There’s still the matter of all of the soil, not to mention the groundwater.

To assess the scale of the groundwater contamination, what’s required is a geological study. The way to do that is to sink several wells around the site and sample the wells both vertically and laterally to analyze the water and the toxic plume. “If you just go out and take random samples from existing wells, maybe even drinking-water wells, then that doesn’t necessarily tell you what’s going in the groundwater,” Chinery says. “It’s usually the job of the government to make sure that’s done correctly.”

Chinery and Exner both say it would not be at all surprising if, as the activists say, the chemicals have traveled as far as three kilometers from the site. If there are fissures in the ground under the surface, chlorinated solvents would collect in those fissures and slowly dissolve into the groundwater. Exner says he once saw chlorinated solvents three miles from



where they had been dumped at a site in Missouri. “That’s why chlorinated solvents in groundwater are such a big problem,” he says. “It takes years and years for it all to dissolve out of there.” For example, he says, a small amount of carbon tetrachloride can contaminate millions of gallons of water.

Cleaning up the water is a daunting task. These chemicals would be difficult to treat in the ground, so the solution—once the source and the direction of the plume are known—would be to pump it all out and treat it, says Chinery. That process could take many years and run up to millions of dollars. But “if the source is still there, and the plume is still there, it’s just going to keep moving.”

All told, the Greenpeace report estimated that it would cost \$30 million over four years. DowDuPont’s [revenue for 2017](#) was \$62 billion.

The people of Annu Nagar, meanwhile, stay rooted to their homes, unable to muster the money or resources to move their families out of the danger zone. With help from Dhingra and other activists, Sakina and the other women and children are learning how to fight for their rights—either by calling bureaucrats repeatedly, protesting on the streets, or talking to the press.

For Munni bi, however, it is all already too late.

“What will you do for me? You won’t come back; 50 people have come and gone,” she told me last year.

“From drinking the water, the public is dying, that’s what’s happening. Our suffering is slowly killing us. And I don’t want to die.”

Munni bi died five months later.

## New Resources for Patient Decontamination Walk First Responders Through Mass Chemical Incidents

By Hira Qureshi

Source: <https://www.hstoday.us/federal-pages/dhs/new-resources-for-patient-decontamination-walk-first-responders-through-mass-chemical-incidents/>

July 11 – The Office of the Assistant Secretary for Preparedness and Response (ASPR) partnered with DHS and other agencies to develop two resources for managing exposure in mass chemical incidents.

The two science- and evidence-based guides are the Patient Decontamination in a Mass Chemical Exposure Incident: National Planning Guidance for Communities and [Primary Response Incident Scene Management \(PRISM\) Guidance](#).

“(National Planning Guidance for Communities) draws on expertise in emergency response, emergency medicine, toxicology, risk communication, behavioral health, and other relevant fields and covers mass casualties, chemical release, external contamination, and decontamination of people (not animals, inanimate objects, or facilities),” said the Department of Health and Human Services.

The guidance is meant for primary personnel within the incident, such as commanders, emergency management personnel, and trainers of local response organizations and healthcare facilities.

First responders, researchers and others in response management can also use this guidance.

The National Planning Guidance for Communities emphasizes six key principles: determine decontamination needs of an individual, choose appropriate patient decontamination methods, prioritize patients for decontamination in a mass exposure incident, determine decontamination effectiveness, coordinate entire system-wide response, and communicate crisis and emergency risk messages to the community.

PRISM guidance tackles some knowledge gaps in National Planning Guidance for Communities. Evidence for PRISM was gathered in the United States and at the University of Hertfordshire in the United Kingdom, under research sponsored by Biomedical Advanced Research and Development Authority (BARDA).

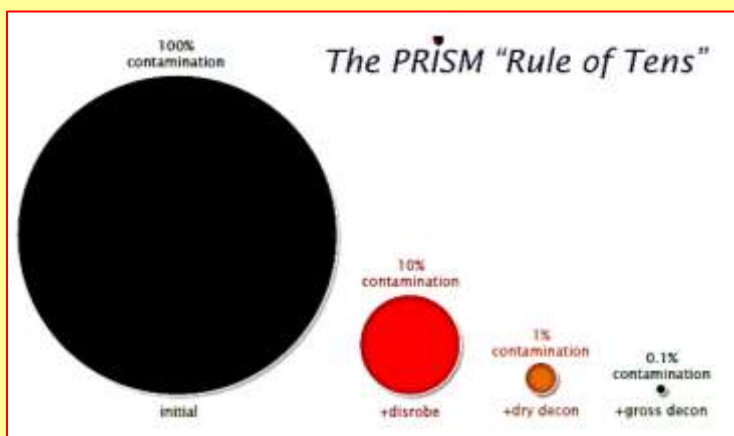




Key Messages	Primary Actions	Critical Aspects
"If you can hear me, follow me". Emphasize importance of cooperating for casualty's own benefit	Evacuate to Safe Distance	<ul style="list-style-type: none"> <li>Time critical</li> <li>Snatch rescue non-ambulant casualties</li> </ul>
Time critical, very effective and prevents transfer of contaminant from clothing to skin of casualty	Disrobe	<ul style="list-style-type: none"> <li>Failure to disrobe is dangerous</li> <li>Time critical</li> </ul>
Time critical, effective and safest method for removing non-corrosive chemicals	Improvised Decontamination	<ul style="list-style-type: none"> <li>Time critical</li> <li>Proven efficacy</li> </ul>
Time critical, effective and safe method for removing all chemicals after dry decontamination	Gross (LPS) Decontamination	<ul style="list-style-type: none"> <li>Proven efficacy</li> <li>Effectiveness for hair unknown</li> <li>Failure to disrobe is very dangerous</li> <li>Be wary of hypothermia</li> </ul>
Most important stage of decontamination – removes the most contamination following showering	Active Drying	<ul style="list-style-type: none"> <li>Not drying properly may increase skin absorption of contaminant</li> <li>Towels may be heavily contaminated</li> </ul>
"Wash yourself from head to toe"	Technical Decontamination	<ul style="list-style-type: none"> <li>Proven efficacy</li> <li>Ensure casualties actively dry</li> <li>Be wary of hypothermia</li> </ul>



"The aim of PRISM is to ensure that all patients exposed to potentially hazardous chemicals receive the most effective treatment possible during the initial stages of an incident," said HHS. "Prompt decontamination is the best way to prevent the serious health consequences of exposure to toxic chemicals."



*... rapid and effective completion of each stage of the incident response procedure yields a ten-fold reduction in the level of casualty contamination*

Theoretical reduction in the level of casualty contamination following primary response incident scene management (PRISM). This figure is for guidance only: the actual amount of contaminant removed at each stage will be incident-dependent.

The program did lab studies on effects of water temperature, flow rate, detergents and delayed decontamination. First responders in 35 municipalities across 21 states developed the guidance with their input on decontamination.



PRISM recommends three steps to reduce exposure and 99 percent of chemical contaminants: move quickly away from the hazardous area, carefully remove all clothes and wipe skin with paper towel or dry wipe.

ASPR and DHS plan to develop further guidance, specifically on decontaminating pediatric and pregnant patients in a mass chemical incident. BARDA and the University of Hertfordshire are currently updating PRISM guidance based on recent data.

"The primary objective is to generate appropriate evidence to allow focused revision of existing PRISM guidance to facilitate a fully optimized, generic, and standardized response by first responders to chemical incidents," said HHS.

The revised PRISM will contain a user-friendly algorithm for first responders to rapidly assess the severity of the incident so that response is effective and proportionate.

*Hira Qureshi is a summer intern at Homeland Security Today. She attends the University of Memphis. She is majoring in journalism and minoring in political science and French. She has lived in Memphis, Tennessee for 19 years. She has previously interned at Congressman Steve Cohen's office, a Muslim non-profit, Teen Appeal, Islamwich and Islamic Horizon Newspaper. She currently works for the Daily Helmsman and Pleasant View School.*

## Considerations When Selecting Tactical Response Gear

By Jason Horowitz

Source: <https://www.firehouse.com/safety-health/ppe/chemical-hazmat-gear/blog/21013009/considerations-when-selecting-firefighter-tactical-response-gear>

July 15 – Responding to events that potentially involve hazardous materials or chemical, biological, radiological, or nuclear (CBRN) agents require specialized garments. With recent updates to the NFPA 1994 Standard on Protective Ensembles for First Responders to Hazardous Materials Emergencies and CBRN Terrorism Incidents, selecting the right gear for these types of missions now includes several new options you should consider.



### Certified protection

The NFPA 1994 Standard differentiates the type of protection based on whether the level of contaminant concentration is above or below a level that is immediately dangerous to life and health (IDLH). Garments certified to classes 1 and 2 deliver protection above IDLH and require the use of a self-contained breathing apparatus (SCBA), whereas those certified to classes 3 and 4 provide protection below IDLH and allow the use of an APR/PAPR.

If you respond to calls that require tactical entry or search and rescue, you may be interested in the addition of the ruggedized categories (Type R) for NFPA 1994 Class 2, 3, and 4 certifications. To be certified as a ruggedized garment, material samples are rigorously preconditioned and then must pass barrier testing and higher levels of physical property performance. With this more rigorous testing, a Type R garment is designed for more challenging environments.

### Durability and design

Once you are confident that the garment will provide protection against the hazardous chemicals or CBRN agents you might encounter, you should also evaluate its durability and design.

Certified to NFPA 1994, Class 3R, 4R, and NFPA 1992 Standards, the Ruggedized Class 3 suit made of GORE® CHEMPAK® selectively permeable fabric, enables you to respond confidently during tactical entry and search & rescue missions.

Are the stress points reinforced or padded? For tactical entry or search & rescue missions that may include collapsed structures or confined spaces, you need a suit that can withstand



the harsh surroundings found in these types of environments. You should consider what type of abrasion and mechanical strength testing has been performed on the garment. For example, W. L. Gore & Associates' development team wanted to ensure that its Ruggedized Class 3 Suit made with GORE® CHEMPAK® selectively permeable fabric could withstand the rigorous use associated with these types of operations better and provide a greater level of cut and puncture resistance than the current Class 3 ensembles. They confirmed **the fabric's durability by using both the Mullen burst test and the aggressive Taber abrasion test.**



Also, wearing a more form-fitting garment can increase your operational effectiveness and reduce the possibility of cuts and tears that can compromise your protection. Therefore, it is important to consider the design of the garment. How form-fitting is it? Will you be able to crawl through tight spaces easily? Will your visibility be compromised?

Being able to focus on the mission and respond confidently that the suit will remain intact is crucial for CBRN responders.



### Staying actively involved

Responding to large-scale events can require extended hours in environments with high temperatures and humidity. Also, materials used in protective clothing can interfere with the flow of sweat vapor into the environment. Both of these can increase heat stress, resulting in shorter times of on-scene engagement. Therefore, having a suit that is more breathable can help reduce heat stress and increase your time on scene.

The 2018 edition of the NFPA 1994 Standard requires that Class 3/3R and Class 4/4R ensembles meet specific breathability requirements. The evaporative resistance test (Ret), measures material breathability by determining the amount of resistance that sweat vapor encounters when passing through a fabric: the lower the resistance value, the more breathable the fabric is.

It is important that you consider the testing done to determine whether the fabric used in a suit's construction is breathable. Gore's development team knew that tactical response and search & rescue events can be extensive, so they wanted to ensure that the fabric was as breathable as possible while maintaining the durable protection needed. When tested for NFPA 1994 component certification, the GORE® CHEMPAK® selectively permeable fabric measured almost 2.5 times better than what was required for the Ret test. This translates to lower heat stress provided by a highly breathable suit, which allows for longer mission times when compared to an impermeable suit.

In conclusion, specialized garments are critical for protecting you when responding to events that potentially involve hazardous materials or chemical, biological, radiological, or nuclear (CBRN) agents. The NFPA 1994 Standard, 2018 edition includes several changes that can





affect your gear selection. The definitions of garment classes have been expanded to allow new considerations for certified protection, durability, garment design, and breathability — enabling you to choose the right gear to accomplish your mission.

*Jason Horowitz is currently a product manager for GORE® CHEMPAK® fabrics, chemical biological protective fabrics for first responders to CBRN and hazmat incidents. Jason is committed to delivering personal protective equipment with enhanced functionality to first responders in military, law enforcement, and fire and safety markets. Jason is an active member of the National Fire Protection Association and serves on the Hazardous Materials Protective Clothing & Equipment (NFPA 1991, 1992, & 1994 Standards) Technical Committee. Jason has a Bachelor of Science in chemical engineering from Lehigh University and a Masters of business administration from Villanova University.*



## CBRN Threat Analysis

By Bergo Jongman (CBRNe Consultant)

Source: <http://nct-magazine.com/july18/threat-analysis/>

This is the 35th issue of the feature called the IBC Threat Assessment (IBC-TA) that was initiated in November 2014. It is intended to inform our readers about ongoing and emerging CBRNe-threats that need the attention of policymakers, experts and ordinary citizens. If left unattended these threats may result in grave consequences for different sectors of our societies and/or the security of ordinary citizens. As the threat environment is constantly changing; existing regulations, crisis plans or security protocols are often insufficient and in need of adaptation or review. Every TA will cover threats for several CBRNe categories. The TA's are based on open sources.

### Topics covered

- Special OPCW meeting is expected to vote on mechanism for attributing blame for recent chemical weapon attacks
- Foiled ricin plot in Cologne may trigger new debate on the expansion of authorities for German intelligence agencies to monitor the Internet
- Uncertainty about possible game-wreckers of the agreement on denuclearization following historic summit in Singapore by leaders of US and DPRK
- The use of swimming pool cleaner as the basic ingredient for the production of the explosive TATP for the suicide belts used in 2015 Paris attacks

►► Read more at source's URL

**In the German ricin case the authorities indicate that a quantity of 84,3 milligrams (theoretically sufficient 250 to 1,000 lethal doses) for had been produced.**

## New nerve gas detector made of a smartphone and Lego bricks

Source: <http://www.homelandsecuritynewswire.com/dr20180718-new-nerve-gas-detector-made-of-a-smartphone-and-lego-bricks>

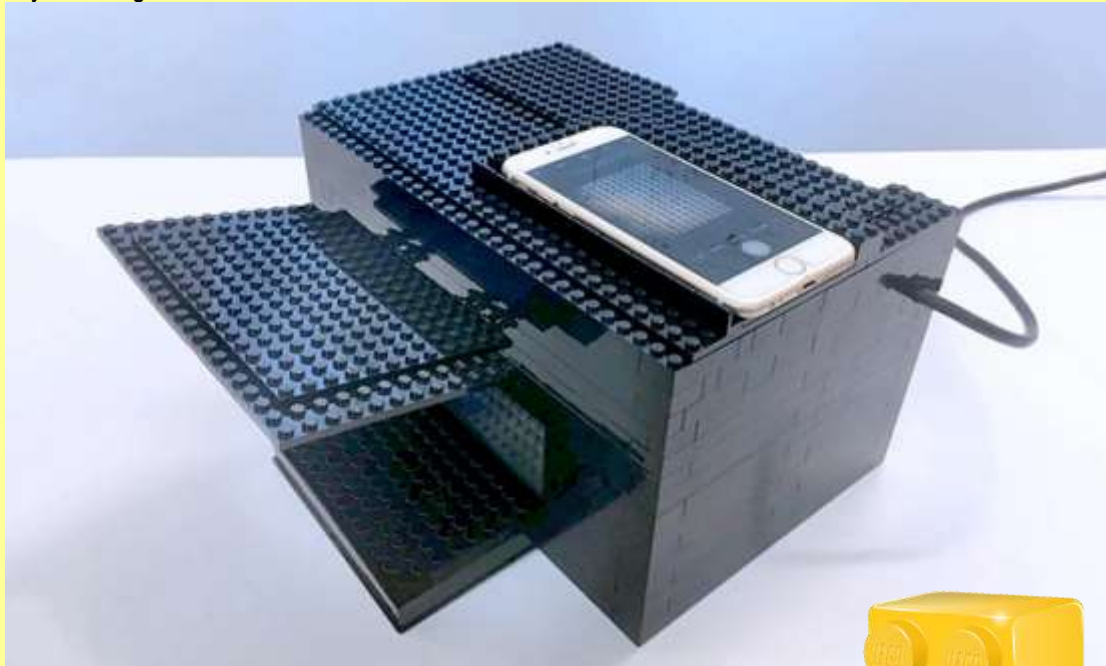
July 17 – Researchers at the University of Texas at Austin have designed a way to sense dangerous chemicals using, in part, a simple rig consisting of a smartphone and a box made from Lego bricks, which could help first responders and scientists in the field identify deadly and difficult-to-detect nerve agents such as VX and sarin. The new methodology described in a [paper](#) published Wednesday in [ACS Central Science](#) combines a chemical sensor with



photography to detect and identify different nerve agents — odorless, tasteless chemical weapons that can cause severe illness and death, sometimes within minutes.

[Eric Anslyn](#), a chemistry professor at UT Austin, has been studying nerve agents for nearly twenty years, using safe chemical compounds that behave in the same way as nerve agents and can mimic them in testing. He previously developed chemical compounds that neutralize nerve agents and at the same time create a glow bright enough to be seen with the naked eye.

“Chemical weapons are dangerous threats to humanity,” Anslyn said. “Detection and neutralization are key to saving lives.”



Texas [says](#) that the new device uses affordable, accessible materials to make Anslyn's earlier compound more useful in real-world scenarios. The chemical sensors, developed by Xiaolong Sun in Anslyn's lab, generate fluorescence, which is key to the analysis. Different colors and brightness can signal to first responders which of several nerve agents are present and how much. Because different categories of nerve agents require different decontamination procedures and different treatments for victims — and because the weapons act swiftly, making time of the essence — these variations are key.

“Unfortunately, it can be difficult to see differences in the level of fluorescence with the naked eye in the field. And instruments used in the lab to measure fluorescence are not portable and cost **\$30,000**,” said Sun. “This device essentially takes photographs of the glowing.”

The camera on a smartphone is sensitive enough to detect the differences in color and brightness in the glowing reaction. The team used an iPhone in the lab. Software, developed by graduate student Alexander Boulgakov and available for [free on GitHub](#), analyzes the color and brightness to identify the type and concentration of the nerve agent. The software can be adapted for multiple smartphone systems.

But researchers also needed a light-tight space to get a good reading on the camera. They considered 3D-printing a box, but realized that 3D printers and the materials used in them can be inaccessible, uneven or cost-prohibitive in some parts of the world. That's when Pedro Metola, a clinical assistant professor at UT, thought of using Legos.

“Legos are the same everywhere you go,” Metola said.

The only other pieces of equipment needed are an ultraviolet light and standard 96-well test plate. The solution is inexpensive, portable and adjustable on the fly.



Other authors on the paper are undergraduate researcher Leilani Smith and molecular bioscientist Edward Marcotte. All authors are at UT Austin, and Boulgakov and Marcotte are both researchers at the university's [Center for Systems and Synthetic Biology](#). Smith is a student researcher in the Practical Sensors research stream, a for-credit course and program led by Metola that is linked to the Freshman Research Initiative, an award-winning UT Austin program that allows undergraduate students to have early experiences with finding solutions to real-world scientific problems.

**EDITOR'S COMMENT:** What is the purpose of this article other than to advertise Lego? In addition, how ruggedized the new detector is for field use? Could a shoe box be good enough to be used as a case for the electronics? What is the cost of this "cheap" detector? No, I am not going to buy one!



## Suspects in Novichok case flew out of UK in wake of attack, source says

Source: <https://edition.cnn.com/2018/07/19/uk/novichok-poisoning-suspects-identified-intl/index.html>

July 21 – Police have identified two suspects in the poisoning of former Russian double agent Sergei Skripal and his daughter Yulia, **a source with knowledge of the investigation told CNN** on Thursday. The pair left the UK in the wake of the attack on what is believed to have been a commercial flight, the source added.

Their departure was revealed in a coded Russian message to Moscow sent after the attack, which was intercepted by a British base in Cyprus, **the source said**. The British government blames the Skripals' poisoning on Russia.

The suspects were identified by UK police, who have been combing through months of **surveillance camera footage from UK airports and from Salisbury**, the town where the Skripals were poisoned on March 4.

Using facial recognition technology, authorities discovered **two "fresh identities"** -- individuals not known to have been spies or used in other attacks -- the source added.

Investigators cross-checked that information with the manifest of the flight on which the suspects were believed to have left Britain. They traveled under aliases, the source said. **It is not clear whether the pair are Russian.**

An Aeroflot flight at Heathrow airport in London was searched on March 30, an action the British government described at the time as "routine."

**EDITOR'S COMMENT:** Read carefully the text in red to make your own conclusions and then compare them with the title of this article...





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International  
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# BIO NEWS



## Nature's remedies: Using viruses against drug-resistant bacteria

Source: <http://www.homelandsecuritynewswire.com/dr20180626-nature-s-remedies-using-viruses-against-drug-resistant-bacteria>

June 26 – With microbial resistance to antibiotics growing into a major global health crisis, researchers at University of California San Diego School of Medicine, in collaboration with national research institutions and private industry, are leveraging hard-won expertise to exploit a natural viral enemy of pathogenic bacteria, creating North America's first [Center for Innovative Phage Applications and Therapeutics](#) (IPATH).

**Bacteriophages, or phages, are viruses that specifically target and consume bacteria.** They are ubiquitous, found wherever bacteria exist and were once considered a promising therapeutic tool. The advent of modern antibiotics in the 1930s redirected research interests, but with 10 million people estimated to die from "superbug" infections by 2050, they are getting a second look.



In 2016, UC San Diego School of Medicine physicians and scientists conducted a dramatic, last-ditch effort to save the life of [Tom Patterson](#), then a 69-year-old professor in the Department of Psychiatry at UC San Diego School of Medicine who had become systemically infected by a multidrug-resistant bacterium during a vacation in the Middle East. Comatose and dying, a team that included experts from UC San Diego, the U.S. Navy, Texas A&M University, San Diego State University and private industry developed experimental cocktails of bacteriophages to treat Patterson. The approach worked; Patterson awoke within days and fully recovered. UCSD [says](#) that he was the first U.S. patient with a systemic multidrug-resistant bacterial infection to be successfully treated intravenously with bacteriophages. In the two years since, physicians at UC San Diego Health have treated five other patients with phages for bacterial infections under emergency investigational new drug approval from the Food and Drug Administration (FDA).

"All of the patients tolerated phage therapy well without adverse effects," said Saima Aslam, MD, associate professor of medicine and medical director of the solid organ transplant infectious diseases service at UC San Diego Health. "Phage combinations were given by direct instillation into the infected site, intravenously and/or by inhaled routes. This led to resolution of infection in three cases. In two others, it helped ameliorate the infection. In one case, treatment came too late in the course of infection and the patient was transitioned to hospice."

Encouraged by the broadly positive results observed in these first patients, UC San Diego Chancellor Pradeep Khosla has announced a three-year, \$1.2 million grant to help launch the center.

"The story of how phages saved Tom's life and have helped others, the tremendous depth of scientific knowledge and medical practice, combined with intuition, innovation and just sheer guts, is what UC San Diego is all about," said Khosla. "IPATH captures many of our most cherished ambitions: a robust, interdisciplinary research that advances science, but also delivers tangible benefits to patients and society. Phage therapy has the potential to save millions of lives."

Steffanie Strathdee, associate dean of global health sciences and Harold Simon Professor in the Department of Medicine, and Robert Schooley, MD, professor of medicine and an infectious disease expert at UC San Diego School of Medicine, will be co-directors of IPATH. It was Strathdee, who is married to Patterson, who collaborated with Schooley and others to seek an emergency compassionate-use exemption to experimentally treat her husband with phages after all standard antibiotic treatments failed.

"IPATH builds upon what we've learned and will apply rigorous principles that span from bench to bedside to better understand the potential role for phage therapeutics in the treatment of patients with infections that cannot successfully be treated with currently available antibiotics," said Strathdee.

"It taps into and enhances a wide range of existing clinical and translational research programs — there are few places in the world with similar resources to treat multidrug-resistant bacterial infections — and fosters emerging collaborations with the U.S. Navy





Medical Research Center, industry partners and the strengths of the UC San Diego Health system.”  
Strathdee and Schooley said IPATH will use existing resources at UC San Diego Antiviral Research Center to build the infrastructure needed to validate phage therapy for treating multidrug-resistant bacterial infections in clinical settings.

It will also partner with other like-minded institutions, including the Center for Phage Technology (CPT) at Texas A&M University, San Diego State University and two biotechnology companies specializing in the development of therapeutic bacteriophages: AmpliPhi Biosciences, based in San Diego, and Adaptive Phage Therapeutics, Inc. or APT, based in Maryland.

“The CPT has been developing phages as agents for combating bacterial infections in plants, animals and humans since 2010, and promoting best practices for the ethical and sustainable use of this technology,” said Ryland F. Young III, CPT director and Regents Professor at Texas A&M. “The CPT fully supports the establishment of IPATH at UC San Diego, and based on our past collaboration that resulted in successful application of phage therapeutics, we look forward to fruitful interactions in the future.”

Schooley said a primary goal of IPATH is to conduct rigorous clinical trials of phage therapies, thus advancing their potential to practical application: “The clinical research will be integrated with leading-edge translational and basic research that will provide critical insights into the mechanisms by which phage selectively kill their bacterial targets, and that will accelerate the development of more advanced clinical research that we hope will lead the FDA to make phage therapeutics more widely available.

“That requires a lot of things: clinical trial infrastructure and design expertise, microbiome expertise, a patient population needing novel interventions like phage therapy who wish to join us in this journey. Although all of these elements are here, we plan to work with a wide range of partners around the world to advance phage therapeutics from anecdote to a globally available tool to combat the rising tide of multidrug resistant infections.”

Initial research will focus on patients with multidrug-resistant chronic infections associated with cystic fibrosis, organ transplantation and implantable hardware, such as pacemakers or joint replacements.

“The launch of IPATH is a momentous and gratifying step,” said Hubert Mazure, the great-grandson of Félix d’Herelle, the French-Canadian microbiologist who discovered bacteriophages in 1917 at the Pasteur Institute and was the first to experiment with them in treating human diseases caused by pathogenic bacteria. “This is the kind of effort needed to truly and fully explore the healing potential of bacteriophages in the modern era.”

## Biodefense World Summit Coverage — Biodetection Technologies

Source: <https://www.contagionlive.com/contributor/saskia-v-popescu/2018/07/biodefense-world-summit-biodetection-technologies>



July 01 – Last week, Bethesda, Maryland hosted the 3-day [Biodefense World Summit](#) during which experts from around the world gathered to discuss everything from food safety to point-of-care (POC) testing. We know that from the hospital to an emergency treatment center at the epicenter of an outbreak, POC testing is critical for rapid diagnoses and medical interventions. In fact, such efforts can be life-saving, which makes their presence in biodefense efforts that much more critical. Two such presentations discussed the potential for early diagnostic testing for certain infectious diseases, as well as the application of POC for more emergent, biological event situations.





The first presentation, "Far-forward early diagnosis of biothreat agents," by Charles Young (Johns Hopkins Applied Physics Laboratory) raised a question many of us have been asking; how can we improve the diagnosis of an infectious disease through earlier detection? Current diagnostics for biological weapons pose a problem as they only diagnose a disease after symptoms have begun or near the invasive stage. By the time that most tests pick up on a disease, like Ebola, an individual is already experiencing symptoms and thus, contagious. To circumvent this, Dr. Young is working to reduce the delay from exposure to infection and subsequent diagnosis. If we can cut down the time to diagnosis, especially in the event of a biological weapons attack, we can not only treat patients more effectively but also reduce the spread of disease.

Imagine if we could test for Ebola before the patient was symptomatic; proper isolation, treatment, and contact-tracing could occur days earlier than they are happening now, which could drastically reduce the risk of disease transmission. Unfortunately, a field-forward molecular diagnostic instrument has not been achieved, yet, however, and there are still many hurdles to overcome. Dr. Young pointed to several early exposure markers that are promising for immunoassay detection, like GP1 in Lassa Fever Virus and sGP in Ebola virus, which indicates that there might be a window during the early stages of infection that the viral glycoproteins can be detected (before the whole virions are rampant in the bloodstream), which would give medical providers a chance for earlier isolation, treatment, etc. These exposure markers mean that we have a window of opportunity during the early stage of infection and the exploitation of this window could truly make a difference in future outbreaks or in the event of a bioterrorism attack.

The potential for future tests to identify an exposure before a full-blown infection is exciting, but what about our current tests? Moreover, what is about the use of POC testing during an outbreak or during a public health crisis like a biological attack? A presentation entitled, Application of Point-of-Care Testing for Pathogen Detection and Patient Management, by Kent Lewandrowski and Elizabeth Lee-Lewandrowski (Harvard Medical School and Massachusetts General Hospital) addressed this very issue. POC testing is important as it helps reduce turnaround time for results, reducing administrative work and the chances of a delay in the lab, or a mix-up. Unfortunately, such tests are also more expensive and carry with them more operator errors, and regulatory requirements to consider. Consider the application of a glucose meter with a single-use disposable test strip or a pregnancy test, etc. In their presentation, Drs. Lewandrowski highlighted the expanding menu of POC testing—dipstick urinalysis, metabolic panels, HIV and hepatitis C testing, influenza A/B testing, complete blood counts, coagulation testing, etc. Such efforts are available for hospitals during a biothreat event, bio-surveillance efforts, disasters settings, biothreats in a remote environment, or in the event of bioterrorism. The speakers discussed the challenges of labs during such events or those required for highly-infectious diseases. From the costliness to limited space, personal protective equipment requirements, and user knowledge required, the availability of such tests (and the labs able to analyze them) can be limited.

Still, POC tests like the rapid malaria test were hugely beneficial during the Ebola virus outbreak in West Africa to help rule-out malaria as a potential cause of the, at the time, unknown disease. Because of their added value, such POC tests should be utilized and expanded upon for future health crises and public health events.

## Anti-Ricin Monoclonal Antibody Licensed for Development

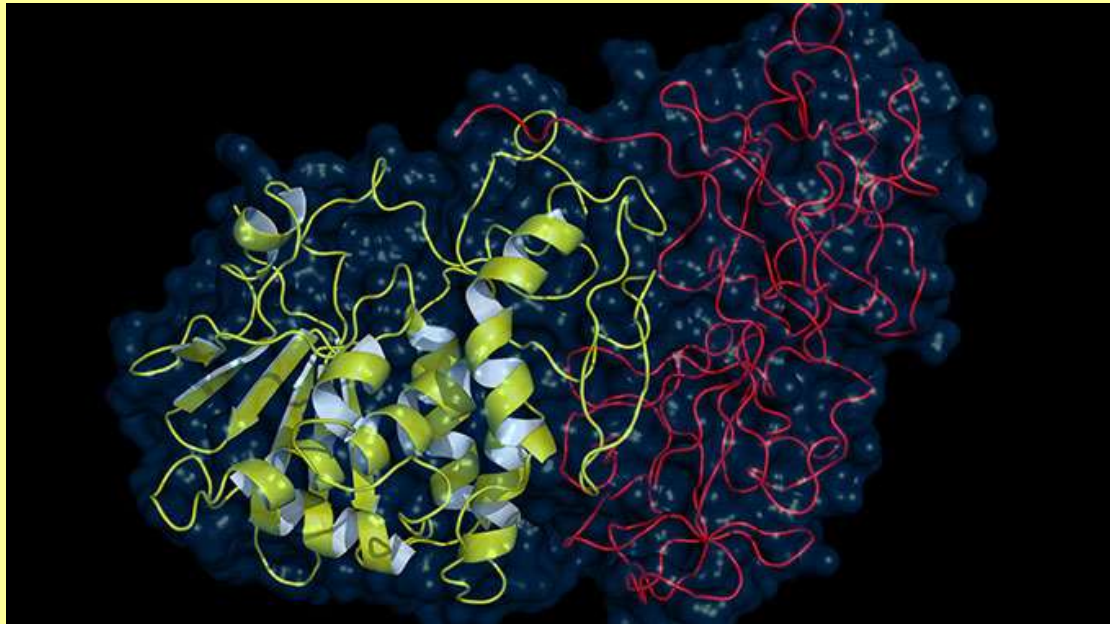
Source: <https://globalbiodefense.com/2018/04/29/anti-ricin-monoclonal-antibody-licensed-for-development/>

April 2018 – AntoXa Corporation has obtained a license from Defence Research & Development Canada (DRDC), an Agency of the Canadian Department of National Defence, to develop and produce an anti-ricin monoclonal antibody for sale in markets worldwide.

The licensing agreement follows work AntoXa and the J.C. Hall laboratory at the University of Guelph conducted with DRDC to develop and produce the **plant-made antibody PhD9** as a medical countermeasure for ricin exposure, a program that has received more than \$600,000 (CAD) from the Government of Canada since 2014.



The Phd9 antibody drug candidate prevents ricin from penetrating cells. DRDC conducted in vitro and in vivo studies that found the plant-made version of the antibody showed therapeutic efficacy against ricin intoxication.



“We anticipate market entry for the Phd9 anti-ricin antibody within two to three years, a timeline that is dependent on raising the necessary funds for scale up and other activities necessary to obtain regulatory approvals,” said Ashley Meyers, AntoXa Chief Technical Officer.

Next steps for the commercialization of Phd9 are transitioning to large-scale GMP manufacturing, product characterization, animal safety and efficacy studies, and a Phase 1 human clinical trial. Medical countermeasures do not require Phase 2 and Phase 3 human efficacy trials for ethical reasons, therefore the path to regulatory approval is shorter than for other pharmaceuticals.



## Smallpox Treatment Moves Closer to FDA Approval

Source: <https://www.contagionlive.com/news/smallpox-treatment-moves-closer-to-fda-approval>

July 06 – New study results on SIGA Technologies’ small molecule antiviral treatment for smallpox (**tecovirimat, brand name TPOXX**) indicate that the oral formulation is both safe for humans and efficacious in animals.

Although declared to be eradicated around the world in 1980, the virus that causes smallpox—variola virus—still exists. The existence of the virus along with the fact that administration of [the smallpox vaccine was discontinued](#) in the general population (in the United States) in 1972 presents the potential for a serious public health emergency should the virus reemerge, or if a bioengineered form of the virus was used for a mass bioterrorism attack. Historical data indicate that about two-thirds of individuals who were infected with the virus survived; however, there was no treatment for the infection. Until now.

According to the results of a new study, recently published in the *NEJM*, twice-daily dosing of **600 mg of tecovirimat was found to be safe in humans**. Furthermore, following the Food and Drug Administration (FDA) “Animal Rule” interpreted for smallpox therapeutics by an expert advisory committee, the investigators on the study found that the minimum dose of tecovirimat needed to achieve over 90% survival in a monkeypox/nonhuman primate (NHP) model was 10 mg/kg for 14 days. A dose of 40 mg/kg for 14 days was found to be similarly efficacious in the rabbitpox/rabbit model. These results suggest that the conservative NHP model would be an appropriate model for estimation of human drug exposure.

A total of 851 human volunteers were screened for the safety trial.



Of these volunteers, 452 were chosen to participate in the trial and subsequently randomized into 2 groups: 361 participants were assigned to receive 600 mg of tecovirimat twice-daily for 14 days, while the other 91 participants were assigned to receive a matching placebo twice daily for 14 days. According to the authors on the study, “the demographic and baseline characteristics of the trial participants were well balanced in the trial groups. A total of 431 participants completed the trial. The overall rate of adherence was 94.4% in the placebo group and 93.6% in the tecovirimat group; the corresponding rates among participants in the pharmacokinetic portion of the trial were 100% and 96.9%.” The majority of adverse events were deemed to be nonserious by the investigators. “Adverse events of grade 3 or higher occurred or worsened during treatment at a frequency of 1.1% in both the tecovirimat group and the placebo group and included headache, osteoarthritis, and hidradenitis,” study authors write.

Based on these findings, SIGA is continuing to move tecovirimat forward as a treatment for smallpox. “Smallpox is both highly contagious and highly lethal and there is growing concern that smallpox could be used as a potential bioweapon,” said Phil Gomez, PhD, SIGA’s Chief Executive Officer in a [statement](#) from the company. “A smallpox bioterror attack could be

especially damaging because the majority of today’s population is not immune to the virus, as routine vaccination ended in the 1970s. Rapid spread from person-to-person can occur through speaking, breathing or touching, and smallpox also can be transmitted by direct contact with infected fluids and contaminated objects. These factors underscore the need for an effective smallpox antiviral therapy, and we believe that TPOXX can address this need.”

Although the standard smallpox vaccine is still available, in the untimely event of an outbreak or bioterrorist attack, the investigators state that tecovirimat could be used as an “an important stopgap measure until the standard vaccine can be effectively deployed, while complementing the protective efficacy of the vaccine once it has been deployed.” The US government’s Biomedical Advanced Research and Development Authority (BARDA) funded the advanced development of oral tecovirimat in partnership with SIGA. Additionally, under Project Bioshield, SIGA has already delivered 2 million courses of oral tecovirimat to the Strategic National Stockpile.

FDA [NDA acceptance and priority review of tecovirimat](#) occurred in February 2018 and was swiftly followed by [unanimous support by the FDA’s advisory committee](#). The target approval date for the treatment is currently August 8, 2018.

## Unique Challenges Makes Biosecurity a Top Priority for New Zealand

By Brad Allen

Source 1: <https://www.hstoday.us/subject-matter-areas/pandemic-biohazard/unique-challenges-makes-biosecurity-a-top-priority-for-new-zealand/>

Source 2: <https://www.mpi.govt.nz/dmsdocument/13143/loggedIn>

July 05 – **New Zealand has the world’s fourth-largest economic exposure zone and 10th-largest coastline, and its heavy reliance on agriculture, aquaculture and international trade make biosecurity a priority.**

Martyn Dunne, director of New Zealand’s Ministry for Primary Industries, which oversees biosecurity efforts, fisheries, food safety, operational responses to health concerns and regulation for forestry, argued that protecting against biothreats is as big of a concern as other threats to national security.

“In New Zealand, it has become one of the top five higher-risk issues for our country,” said Dunne, who moderated a biosecurity panel at the 2018 International Summit on Borders in Washington last month. “And because our country very much depends on the importance of agriculture, the threat to biosecurity is fundamental.”

The island nation has taken measures in recent years to combat threats including pests, diseases or potentially contaminated baby formula by identifying specific risks and





developing improved communication with global trade partners to resolve issues that pose serious threats.

Dunne was previously New Zealand's ambassador to Australia, an official in New Zealand's customs service, chairman of the World Customs Organization (WCO) and a senior military officer for three decades in the New Zealand Defense Force (NZDF).

Biosecurity and strong national security are linked to food surpluses, overall economic conditions, household wealth and nations' international reputations, Dunne said, adding that food insecurity threatens national stability as "hungry people tend not to be peaceful people."

With weak biosecurity controls, significant bioterror can occur whether due to corruption in supply chains or deliberate sabotage of products, Dunne said.

**In 2015, packages containing powdered milk laced with 1080 poison and threats to unleash it on a wider scale were sent to the Fonterra and Federal Farmers companies and an undisclosed politician.**

The controversial animal extermination product is typically used for control of possums in Australia and New Zealand and is banned in most countries, according to the World League for Protection of Animals.

"The threat was that in three months' time, if we didn't discontinue the use of 1080 poison to wipe out pests, the individual would put 1080 poison into infant meal formula, both in the country and in an optional market," Dunne said.

New Zealand's government first worked privately to identify the source of the threat. The prime minister's office informed the infant formula industry of the threat, and global suppliers and formula manufacturers developed methods for testing the product to ensure it was safe for consumption.

The nation's leaders eventually went public in early March 2015, one week short of the timeline to resolve the threat.

**Short on options to prevent contamination in stores, New Zealand's government ordered infant formula to be pulled from supermarket shelves and stored in secure locations guarded by pairs of soldiers from the NZDF.**

"That's how seriously [the threat] had to be taken," Dunne said. "I always remember [former] Prime Minister [John Key] saying to the senior people in the industry who didn't want us to go public, he said, 'Well, gentlemen, what happens if a child dies?'"

The room was silent, Dunne recalled. "You couldn't hear a pin drop. He said, 'If so, I would have to resign and, gentlemen, so would you.'"

As a result of that conversation and the government's response over several months, Dunne said the threat did not materialize because the suspect had gone underground. In October 2015, a 60-year-old businessman from Auckland was [arrested](#). It was later reported that the suspect's actions were financially motivated.

Threats to biosecurity can be increased by a growing tourism industry or global trade.

"The increase in people crossing our borders leads to a higher risk in pests and diseases," Dunne said.

New Zealand saw six million passenger arrivals in 2016, an increase of about 50 percent from 4.5 million visitors in previous years. "Twelve thousand passengers were issued with infringement notices last year after they were found to have undeclared biosecurity-risk goods."

Shipping containers entering New Zealand's ports have also been steadily increasing, and foreign stowaways such as seeds or stinkbugs pose unique risks.

Stinkbugs have caused problems for the nation's agriculture industry. Nearly 600 vessels found to be unwittingly transporting stinkbug populations have been stopped by New Zealand's authorities before entering the country, in an effort to prevent further spread.

**New Zealand is one of two countries that does not have confirmed cases of hand, foot and mouth disease – the other being Norway.**

To combat the potential spread of the disease, officials and animal-control experts have put down more than 150,000 animals, such as cattle or goats, which can contract the airborne disease and transmit it to humans.



Australia has also struggled to contain biosecurity threats. In 2015 and 2016, outbreaks of E. coli shut down some food industries and caused ripples in the nation's agricultural economy. Such diseases, in some cases, pose the risk of wiping out entire farms within 72 hours.

The price tags on dealing with such outbreaks is significant. Biological threats cost billions of dollars to contain and research, and in some cases airborne diseases can spread quickly without physical barriers to contain them.

Dr. Ciro Ugarte, director of the Pan American Health Organization (PAHO), said international regulations mandate countries to self-report spread of diseases in order to receive aid from PAHO, an international organization that primarily administers aid and regulates health among North and South American countries.

But many countries choose not to immediately report because of the widespread ramifications that can have on their economies or international trade partnerships.

"This is something that all the countries in the world are committed to," Ugarte said. "They have to report on what they are having in their countries beforehand so other countries can be protected ... the impact we've heard of those diseases is very low, medically, but very big on economies, politically and on social impact. That is why many countries will delay or will prevent on reporting several things that are happening within their countries because it will cause huge impact."

This applies to many global diseases, such as Ebola or cholera outbreaks in Africa.

While borders are not necessarily physical barriers to disease or other biosecurity hazards, Ugarte said health officials can act as a sort of border by being the first to administer aid.

"Looking beyond our borders, harvesting science and technology will transform the way we work," Dunne said. "Countries cannot achieve this alone ... many of our deadliest threats are impervious to national borders. As agencies and countries, we also have to look beyond political to ensure better collaboration and information-sharing with like-minded countries."

Many of the nation's global trade partners have been cooperative in helping prevent the spread of the disease by subjecting to a policy of using canine units to inspect shipments entering New Zealand's economic zone to determine threats and identify measures to deter them.

*Brad M. Allen is a young journalist from Janesville, Wisconsin. He is currently studying Political Journalism and Economics at George Mason University, and he has recently completed his eighth semester of college at UW-Whitewater, where he studies Journalism.*



## Officials to announce \$750K funding for bioterrorism response center

Source: <https://eu.lohud.com/story/news/local/westchester/2018/07/08/funding-bioterror-center/766420002/>

July 08 – A center at New York Medical College that deals with bioterrorism and disaster responses will get \$750,000 from New York State to help expand programs.

One of the sophisticated mannequins used for training in New York Medical College's Center of Excellence in Precision Medicine and Responses to Bioterrorism and Disasters. Mark Lungariello/The Journal News

College officials will join with members of the state Legislature and law enforcement to announce the new funding at a news conference Tuesday.



The Center of Excellence in Precision Medicine and Responses to Bioterrorism and Disasters was dedicated last summer. It was the 11th “Center of Excellence” in the state and first in the Hudson Valley. On a tour of the dedication, officials demonstrated on high-sophisticated dummies that simulate injuries. They simulate breathing and crying while their vital signs are monitored.



## Anti-Vaxxers Are Targeting a Vaccine for a Virus Deadlier Than Ebola

By Brendan Borrell

Source: <https://www.theatlantic.com/science/archive/2018/07/anti-vaxxers-horses-hendra/559967/>

July 09 – Cedars Ernest was a certifiable goofball. He was a purebred Shire, a type of British draft horse that once specialized in hauling carts of ale. Nicknamed Ernie, he tipped the scales at more than a ton, and had a chocolate-brown coat with luxuriant white hair feathering his hooves. His owner, Nicole Carloss, a horse trainer in Queensland, Australia, adopted him in 2013, when he was 7 years old, and he immediately found his place in her family.

“He would burst open the screen door and try to do the dishes with you,” Carloss said. When her children played in their sandbox, Ernie would plop his front hooves down next to them. Carloss took Ernie to compete in shows throughout the state, where he would strut around with a sequined browband. “He stole everybody’s heart,” she said.

In August 2016, Carloss came home from work and headed out to the fenced pasture to visit Ernie. He lifted his head dolefully, like Eeyore from *Winnie-the-Pooh*. His eyes were empty, his breathing was strange, and he wobbled when he walked. Carloss suspected he might have been bitten by a snake, but she saw no fang marks on his legs.

She called a local veterinarian and described Ernie’s symptoms. The vet asked Carloss if her horse had been vaccinated for Hendra.

“No,” she replied.

Carloss had anticipated the question, but that didn’t make it any less unsettling. Hendra is a deadly virus that is endemic in Australia and is spread by bats. Since the first documented outbreak in horses in 1994, Hendra has killed 102 of the animals. It kills people, too: On seven occasions, it has crossed from sick horses to the veterinarians and other professionals attending them, leading to four excruciating deaths. For the last six years, the animal-pharmaceutical company Zoetis—previously a Pfizer subsidiary—has sold a vaccine called Equivac to prevent horses from contracting the virus.

A lot of horse owners, however, don’t vaccinate against Hendra, citing its expense, the rarity of the disease, or anecdotal reports of severe side effects. According to a [survey](#) published last year in the journal *PLOS One*, approximately 43 percent of horse owners in Queensland haven’t vaccinated their horses. In some inland parts of the state, that number is as high as 70 percent.

“I don’t believe in injecting chemicals into horses, especially if it’s not tested,” Carloss said, referring to the fact that regulators, citing the danger posed by an outbreak, initially allowed the vaccine to be sold under a provisional license. “More people get hit by cars or shark attacks.”

Many vets see the situation differently. Because Hendra is ranked in the same biosecurity category as Ebola, vets called out to treat unvaccinated horses are [legally required](#) to don protective masks and clothing, and the amount of care they can provide is limited until Hendra can be ruled out with a test—a process that typically takes a day or more. The vaccine has divided the horse community, pitting owners against vets and revealing that science alone is not enough to prevent the next global pandemic. “People are very complex,” says Raina Plowright, a disease ecologist at Montana State University who studies Hendra. “You can’t roll out a vaccine and think everything will be okay.”

After the first vet declined to see Ernie, Carloss called a clinic in the next town, where the lead veterinarian was president of Equine Veterinarians Australia. He, too, refused. “I rang every vet from Harvey Bay to Gatton,” Carloss recalled this April as I sat with her on her front porch.





She told me that as night fell, Ernie's behavior became more erratic. He would rear up and fall onto his back into the scrub. By 2 a.m., Ernie lay on his side in the grass. Carlross stroked his head as he let out his last breath. "When you can't help your horse," she said through tears, "what are you supposed to do?"

Hendra was once just the name of a suburb of Brisbane, tucked between the international airport and the horse racetrack. Then, on September 7, 1994, Vic Rail, a 49-year-old horse trainer, brought a pregnant mare named Drama Series back to his stable. She wasn't looking good, and Rail suspected she might abort her foal. He called his vet, Peter Reid, to examine her. Reid found that she had a high temperature,

swelling around her lips and jaws, and a partially paralyzed tongue. "I wasn't sure what the diagnosis was," he says.

The next morning before dawn, Rail checked on Drama Series. When he opened the stable door, she staggered out, collapsed onto the ground, and died on the spot. Twelve days later, Reid got a call from Rail's fiancé, Lisa. More of the stable's horses had fallen ill. "How many?" Reid asked.

"Twelve," she said.

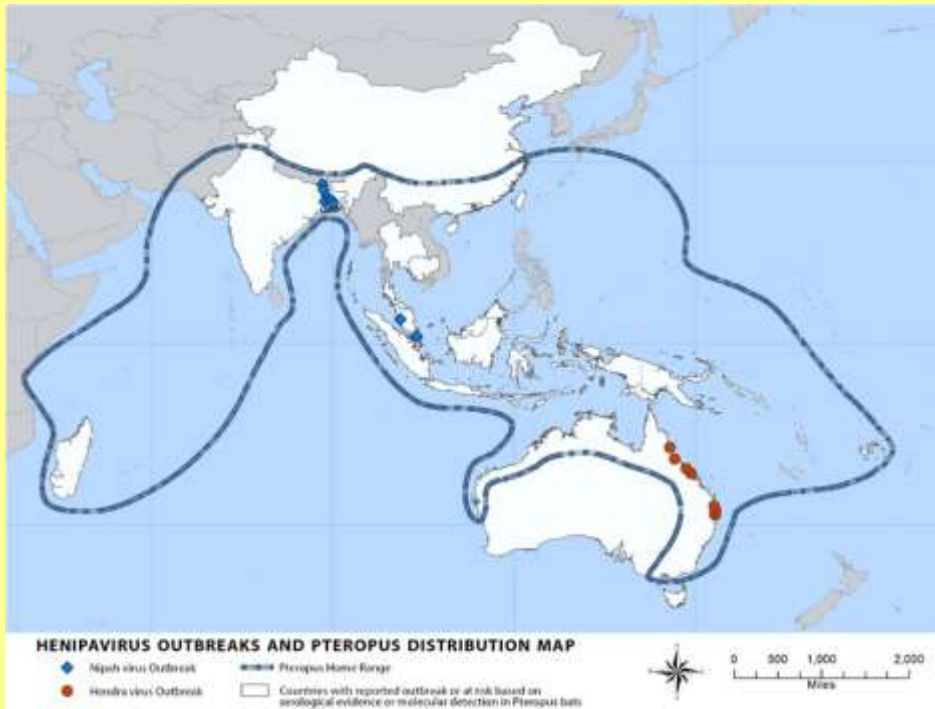
Some horses were so sick that they were drowning from fluid in their lungs, and Reid had to euthanize them immediately. Reid conducted autopsies in Rail's front yard and sent samples to a pathology lab. The

lab tested for [African horse sickness](#) and for toxins, including strychnine. The tests kept coming back negative. As the scientific hunt unfolded, Rail himself began to feel as though he had caught the flu. He was admitted to a hospital and, within a week, his organs were shutting down. On September 27, he died of cardiac arrest.

Scientists at the Australian Animal Health Laboratory in Geelong, near Melbourne, one of the country's highest-level biosecurity laboratories, soon isolated a never-before-seen paramyxovirus—the virus family that includes measles and canine distemper—from the horse tissue. They christened it Hendra. When the outbreak finally waned, at least 20 horses had been infected and 13 of them had died or were so sick they had to be euthanized.

Researchers eventually determined that flying foxes, a large fruit bat common around Brisbane, were the natural reservoir for the disease. Based on the four human deaths, Hendra's fatality rate equals or exceeds that of Ebola. Unlike Ebola, however, Hendra is not highly contagious: Horses only cough in the final stages of infection, and human-to-human transmission has never been documented. But if the virus mutates, it could spread beyond Australia's shores and become the next global plague. Nipah, a closely related virus from flying foxes in Southeast Asia, is already considered a pandemic threat because of its ability to spread from person to person. A [Nipah outbreak](#) that struck India in May killed 13 people, bringing that virus's [death toll](#) to 196 people since 2001.

In 2011, after Hendra killed 24 more Australian horses, veterinarians and horse owners clamored for a solution. The president of the Thoroughbred Breeders Queensland Association suggested in a newspaper op-ed that the state should consider culling bats. "It is no different to culling kangaroos to protect farming land, or netting sharks to protect



swimmers,” he [wrote](#). “When human lives are at stake these types of measures need to be taken.” Others thought a vaccine was the answer. Building off work conducted by the U.S. military to fight Nipah, Australian scientists pursued several vaccination strategies. They posited that a horse vaccine, rather than a human one, would have a larger commercial market and would be able to meet regulatory approval more quickly, while also achieving the goal of preventing the infection from spilling over into people. Early results from the trial were promising: Seven horses given the vaccine [proved](#) impervious to infection. The government fast-tracked its release in November 2012, allowing Zoetis to market it under a so-called minor-use permit, which required veterinarians to administer it in order to collect safety and efficacy data. Now, there’s no question that it works. Since the 2012 release, 20 horses have died of Hendra. None of them were vaccinated.

In early April, I met Reid in Hendra and we drove out to the site of Rail’s old stable. “I’m going to take you where it all started,” he told me. Although Rail’s stable has been replaced with a spare, modern home, the neighborhood is still a hub for racehorse activity. Down at the end of the street, we saw three thoroughbreds clop-clopping down the pavement behind their strappers, out for their afternoon walk. Reid, who is 70, still practices horse medicine, but he also remains deeply involved in Hendra-related research and policy. Back in 2010, he flew to the Australian capital of Canberra to plead with Parliament to fund the vaccine trials. “My goal was that we would never see another case of Hendra virus again,” he told me. “This vaccine seemed to be the answer.”

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Anti-vaccine movements have existed for almost as long as there have been vaccines. That’s in part because one unintended consequence of a successful vaccination campaign is that few remember just how bad the disease actually was.

Since the 1970s, when the threat of childhood diseases began to wane, anti-vaxxers have raised the alarm about potentially toxic ingredients in vaccines, and about unproven side effects such as autism, irritable bowel syndrome, and neurological problems. These fears, amplified by social media, have led to declines in vaccination coverage and outbreaks of measles, mumps, and whooping cough in the affluent, educated communities where anti-vaccination sentiment tends to concentrate.

Similarly inflated concerns have begun to turn some pet owners away from mainstream veterinary medicine. An article last year in the *Brooklyn Paper* quoted a vet who had an owner refuse to vaccinate her dog for fear it would develop autism. “We’ve never diagnosed autism in a dog,” the vet [said](#). “I don’t think you could.”

No anti-vaccine movement among animal owners has ever gained quite as much traction—or posed such a threat—as the one surrounding the Hendra cases in Australia. Initially, Australian horse owners were reluctant to vaccinate simply because of the cost—about \$100 every six months, a significant burden for breeders and rural owners with dozens of animals. But when horse owners began to feel that they were being forced to do something that might just harm the animals they loved, a full-fledged anti-Hendra-vaccine movement blossomed.

In early 2013, a woman named Wendy Sullivan purchased a horse named Reveleus Golden Appeal. Sullivan was told that in order for her horses to receive veterinary treatment, she would need to have them vaccinated against Hendra. After Appeal’s initial injection, Sullivan noticed that his hooves looked flaky and dry, like crocodile skin, and she used a homemade herbal ointment to try to manage the condition. After Appeal’s booster shot six weeks later, things got worse. Appeal’s heels swelled up like balloons. When she tried to ride him, they bled. In September 2015, Sullivan took Appeal to the University of Queensland at Gatton, where a veterinarian named Andrew Van Eps diagnosed him with an autoimmune disease called coronary band dystrophy.

Sullivan had heard murmurings online about adverse reactions, and she became convinced that the vaccine was responsible. “Do not vax your horse!” she warned other equestrians on Facebook. “I know this boy like I know my children,” she wrote. “I saw the change. The time frame. His feet after the booster. It is like when you notice something ‘different’ in a child. Once you have kids with needs you are more alert to ‘change’ than others. You see things ... others miss. I saw the change. I know ... but cannot prove.”



Her suspicions were reinforced when Van Eps advised her not to give Appeal any further vaccinations. Now at the University of Pennsylvania School of Veterinary Medicine, Van Eps says his recommendation was standard for any animal with an autoimmune disorder, and that there's no way for Sullivan to know whether the vaccine was a trigger or if Appeal would have developed it anyway. "Anything that happens within a few months after the vaccine gets blamed on the vaccine," he says. "She's made that leap, not me."

To date, the Australian Pesticides and Veterinary Medicines Authority has recorded 918 probable or possible vaccine reactions from the half-million doses of vaccine that have been administered, a figure that places it among the safest vaccines sold. These reactions range from mild swelling and muscle stiffness to colic. Seven horse deaths are "possibly" associated with the vaccine. In addition to serious side effects, horse owners have also expressed concerns that the vaccine impacts performance in track races and endurance rides. (Peter Reid recently published a [study](#) of thoroughbred horses that showed no performance differences.)

These statistics hold little sway with vaccine opponents, who see a conspiracy at every turn. "It's the money," one horse breeder, Kathy Drew, told me. "Look at Zoetis's shares, look at their growth!" Horse owners started Facebook groups with names like "Hendra Vaccine Reaction" and "[Pro Choice for Hendra](#)" to share their own takes on science and news related to the vaccine.

Horse owners began attacking other horse owners. When a popular long-distance riding event in Queensland, the Far-a-Way Easter Endurance Carnival, began requiring all horses to have a Hendra vaccination certificate last year, one riding club went rogue, launching an "unvaccinated-only" ride the same weekend. "They were pretty dirty with the whole thing," says Saasha Grogan, one of the organizers of the Far-a-Way ride. "They went to the media and slammed our club, saying nasty things about how we were excluding people from our event." Lyndell Abercrombie, the organizer of the competing event in the Lockyer Valley, counters that it was the vaccine opponents who have been mistreated. "We respect their right to vaccinate, but they don't respect our right not to vaccinate," she says, adding, "There is a big cloud over the vaccine. It has not been proven 100 percent safe."

The brunt of the anger of vaccine skeptics has been reserved for veterinarians, some of whom began refusing to treat unvaccinated horses or attend unvaccinated events. Vaccine opponents argued that because the virus is so hard to catch, vets should just put on masks and protective gear. "The virus is so fragile, that you need to be stupid enough to wade in heaps of bodily fluids without wearing proper KIT approved and made to meet stringent workplace health and safety standards," Wendy Sullivan wrote in one Facebook comment.

The pro-vaccine camp hasn't sat quietly, either. One post on the pro-vaccination Facebook group "Hendra Virus and Refuting Pseudoscience" featured a picture of an unvaccinated horse that had fallen into a septic tank. "Isn't it pathetic when people who let their unvaccinated horse get trapped in a septic tank continually criticize vets?" the post read. Excrement-related puns followed. That page also featured screenshots of posts from anti-vaxxers, marking them up like failing exams. The potshots irritated the anti-vaxxers enough that they started rooting out "moles" from their own groups. "Is this site being run by vets?" one anti-vaxxer asked about the "Pseudoscience" page. "If it were left to me, I would be locked up for assault," said another.

In 2014, tensions reached a breaking point. In June, Janine Dwyer, who runs All Horses Veterinary Services south of Brisbane, went to examine an unvaccinated horse that was rocking back and forth, exhibiting symptoms consistent with Hendra. When Dwyer arrived at the farm, she put on her protective gear and took a blood sample for analysis. Because the horse's high temperature suggested that it could potentially harbor a bacterial infection, she also left several doses of penicillin that the owners could inject themselves. By the time she got home that night, however, the owners called to tell her that horse was thrashing around on the ground and they planned to euthanize it. Ten minutes after the animal's heart stopped, the Hendra test came back positive.

Later that week, a representative from Queensland's Department of Workplace Health and Safety called Dwyer and asked a few apparently routine questions about the case. Six months later, she found an envelope on her veranda. The government was prosecuting her





and two other veterinarians for violating biosecurity protocols related to their handling of Hendra cases. Dwyer's fatal mistake was leaving penicillin with the owners—a once prudent move that the government now considered unacceptably risky. Dwyer was crushed. "I really try to do the right thing," she said.

The impact of the three prosecutions rippled across the veterinary community, leading some to abandon horse medicine completely or to implement blanket policies against seeing unvaccinated horses. Even those who were still willing to attend sick, unvaccinated horses were cautious about treating suffering animals until they had been tested, leading to a breakdown of trust with horse owners. To make matters worse, one worker [contracted](#) Hendra from a horse that showed no signs of disease. No one felt safe.

On a recent afternoon, I joined Dwyer as she made house calls. Dwyer estimates she delivers between 20 and 40 Hendra vaccines a month, making her one of the most prolific vaccinators in all of Queensland. As we headed out to the first farm in her pickup truck, she surprised me by saying that she's still willing to attend to sick, unvaccinated horses. Most of the vets in the area refuse, partly out of concern for their own safety and partly because they believe it's the only way to exert pressure on vaccine holdouts.

"It doesn't really help, in my experience," Dwyer said. "The horse suffers, and the horse doesn't deserve it." She charges an extra \$500 on top of her usual \$100 examination fee to cover the costs of protective gear and cleanup, and says she's seen the elaborate safety measures change owners' minds: "If you go out there and people can see what a difficult situation it is, that you're nervous about their welfare, nervous about the horse's welfare, and nervous about your own welfare, then 70 percent of them will come around."

At our first stop, a woman named Lisa welcomed us at the gate with a trio of rambunctious dogs. "Shall I go and get the beast out of the mud?" she asked, pointing toward a paddock where a white thoroughbred named Stanno was waiting. We followed her up there, and Stanno greeted us by sniffing our clothing in search of carrots. Dwyer pulled out a microchip reader and waved it across his neck, so that she could input his ID in the official vaccine registry.

Then, she pulled out the orange Zoetis box containing the vial of Equivac. She pierced the vial with a hypodermic needle and withdrew the plunger. She pointed the needle skyward and squirted a few drops of fluid out to expel air bubbles. When she pricked Stanno's neck, he didn't flinch. "Very light riding for a couple days," Dwyer told Lisa. "Just to have rest while they respond to the vaccination."

Later, as we drove back to Dwyer's place, she commented on all the vegetation being cleared and the real-estate billboards advertising new developments on Brisbane's southern fringe. "We get bats all through here," she said, pointing out some flowering trees the bats visit. "We've all got a right to live here," she added. "We've just got to learn to live together."

Most Australians are not very fond of their flying foxes. The bats raid fruit crops, and they roost in such large numbers that they strip trees of their leaves. Their noise can be unbearable to people who live nearby, and the smell—the acrid, musky odor of their urine and feces—is not something residents want wafting through their windows.

Towns have cut down roost trees and blasted colonies with loud noise. Some fed-up homeowners have taken to killing the bats, with or without official permission. "I put them in the class of mosquitoes," one cantankerous dairy farmer told me. "The animals stink, and all the crap on the floor of their roost is putrid." People will tell you that the bats are becoming more common around their homes.

One of the lingering questions in the Hendra story is whether the changes locals are seeing in the bats explain the timing and spread of the outbreak. Before dawn one morning, I met Alison Peel, a veterinarian and wildlife-disease expert at Griffith University, at a neighborhood park in south Brisbane, where 10,000 screeching bats were coming home to roost. Peel had a pair of binoculars around her neck and her head craned toward the treetops. One large black bat swooped overhead and made a wide, banked turn, expelling its liquid payload above us. "That one just weed!" Peel exclaimed, flinching and guarding her face with her arm.

Hendra, it turns out, is transmitted through flying-fox urine. Horses are thought to catch it when they sniff contaminated forage before eating. Though no human has ever caught Hendra directly from a bat, inhaling urine is one way that a spillover could happen. According to Peel's research, as many as 8 percent of black-headed flying foxes in this park carry



Hendra during the cooler months. Peel says that bats do seem to be spending more time in urban areas and backyards as many of the flowering native trees they depend on in winter are cleared for agriculture or development. In some parts of subtropical Australia, more than 95 percent of their winter foraging area has been destroyed. The bats, which were once nomadic and roosted in large numbers in dense rain forest or swamp forest, are now living in smaller colonies and relying on cultivated fruit trees and weed species to avoid starvation.

In August 2017, Peel and a bat researcher named Peggy Eby drove out to Byron Bay, a bohemian surf town in New South Wales, to visit a music producer named Rachel Sullivan, who lives there with her family in a funky hobbit house amid drooping fig trees. One of the family's unvaccinated ponies, Willow, had recently died of Hendra. (Both of Sullivan's daughters, ages 11 and 13, were hospitalized and given an experimental antibody treatment because they had put their hands in Willow's mouth. Neither showed symptoms of the disease, and both returned home healthy.) Eby found small bite marks on mandarin fruits near the corral—evidence that bats had been nearby.

Horse owners can reduce the risk of Hendra transmission by covering fruit crops with netting or bringing horses into stables at night, but few are diligent about these measures. Peel and Eby are collaborating on a study, funded by the U.S. National Science Foundation, that tests whether protecting native forests can also reduce Hendra's risk to communities. Peel says that learning the answer to this is critical because the risk of Hendra—and the resulting temperature of the vaccination debate—will only increase with climate change. One recent study has estimated that the number of horses living in the Hendra hot zone could [double](#) by 2050 as black flying foxes expand their range south.

The controversy over the vaccine shows no signs of waning. On March 20, horse owners filed a [class-action lawsuit](#) against Zoetis, alleging that the company exaggerated the vaccine's ability to prevent Hendra outbreaks and that it failed to properly test the vaccine's effectiveness or risk of side effects. Days later, Equestrian Australia, the national horse owners' association, made an ill-timed [announcement](#) of a new partnership—with Zoetis. "As we continue our focus on the welfare of both horse and rider, this partnership with Zoetis fits firmly in line with our vision and strategy regarding the love of the horse," Equestrian Australia's CEO, Paula Ward, said in a press release. After an outcry from anti-vaxxers, the deal was [shelved](#). Zoetis has denied the allegations in the lawsuit.

The Queensland government has considered making the Hendra vaccine mandatory, but the proposal was formally abandoned in 2017 amid opposition from horse owners. The development of a human vaccine could end the standoff. Following news of the latest Nipah outbreak in India last month, the Coalition for Epidemic Preparedness Innovations, a global partnership between governments, companies, and NGOs, announced a \$25 million commitment to speed the development of a vaccine that could work against both Nipah and Hendra.

Had a vaccine been available back in 2008, Natalie Beohm's life would have taken a very different course. Beohm, a soft-spoken woman in her late 20s, is one of three people known to have survived a Hendra infection. Back in 2008, she was a novice vet nurse working at the Redlands Veterinary Clinic, which would experience one of the country's worst Hendra outbreaks that year. Beohm believes she caught the virus while working to treat a fungal infection in a horse with nasal cancer. The horse died a few days later, and Beohm fell ill. She knew that Hendra was a possibility, and checked in to the Princess Alexandra Hospital in Brisbane.

The doctors there wore orange face masks and treated her like a biosecurity hazard, as one might treat a sick horse of unknown provenance. She could barely move; she couldn't wash herself without assistance. As she lay in bed, she learned that the doctor she had worked with had become Hendra's third fatality. She imagined she would be next.

Instead, she gradually improved. After six weeks, test results showed that the virus was no longer detectable in her system. She got up from her hospital bed and went home, but her saga was far from over. "I was 21 and my whole life had changed," she said when I met her recently. "I keep pushing on." She lost hearing in one ear, and has reduced mobility in her right hand due to nerve damage from the virus.



She frequently gets headaches, and often feels weak and tired. If there's a bright side to any of this, she has now become something of a superhero, one of the few human beings on Earth who are likely immune to Hendra. If the pandemic ever strikes, she's almost guaranteed to survive it.

Since Beohm's life has been deeply affected by Hendra, she has given talks for Zoetis about the importance of the horse vaccine, because, for the time being, that's all we have. "It's quite amazing what it can do—that it can protect people and horses from dying," she said. Today, she works with the veterinarian Janine Dwyer at All Horses Veterinary Services, where Beohm believes her own efforts are fighting Hendra one injection at a time. I asked Beohm how she handles it when she meets people who refuse to vaccinate their horses. "We just try to teach people about it," she sighed. "But at the end of the day, it's their decision."

*Brendan Borrell is a correspondent at Outside magazine. His work has appeared in Scientific American, National Geographic, and Nature.*



## Drug to Treat Smallpox Approved by F.D.A., a Move Against Bioterrorism

Source: <https://www.nytimes.com/2018/07/13/health/smallpox-drug-fda-bioterrorism.html>

July 13 - The Food and Drug Administration on Friday approved the first drug intended to treat smallpox — a move that could halt a lethal pandemic if the virus were to be released as a terrorist bioweapon or through a laboratory accident.

The antiviral pill, tecovirimat, also known as Tpoxx, has never been tested in humans with smallpox because the disease was declared eradicated in 1980, three years after the last known case.

But it was very effective at protecting animals deliberately infected with monkeypox and rabbitpox, two related diseases that can be lethal. It also caused no severe side effects when safety-tested in 359 healthy human volunteers, the F.D.A. said.

"This new treatment affords us an additional option should smallpox ever be used as a bioweapon," said Dr. Scott Gottlieb, the F.D.A.'s commissioner.

Having a drug that usually cures smallpox is an important medical breakthrough, according to several medical experts not associated with the F.D.A. or the company making the drug.

F.D.A. approval is "definitely a good thing," said Dr. Anthony S. Fauci, director of the National Institute of Allergy and Infectious Diseases.

Research on tecovirimat — originally designated ST-246 — began at the institute after the 9/11 terrorist attack on the World Trade Center, Dr. Fauci said. The research accompanied efforts to stretch the national

stockpile of smallpox vaccine by safely diluting it.

"It all started back then, but developing a licensed product took until today," he added.

The F.D.A. approval of the drug went to Siga Technologies of Corvallis, Ore., a private company that developed the medicine under a federal biomedical defense contract.

Although circulating smallpox has been eradicated, two known stores of the virus exist in laboratory freezers — one in Russia and one at the Centers for Disease Control and Prevention in Atlanta.

Bioterrorism experts fear that other stocks may exist; for example, in 2014 [several forgotten vials containing smallpox were found](#) at the National Institutes of Health.

More worrisome, experts say, is the possibility that a terrorist lab or even a sophisticated amateur could use modern gene-editing techniques to rebuild the virus and then unleash it, deliberately or accidentally, on an unprepared world.

Because routine smallpox vaccination stopped after 1980, almost everyone under the age of 40 is unprotected. The disease kills almost a third of people who get it, and is even more lethal to babies.

Finding a medicine was vital because — unlike, for example, measles or whooping cough vaccine — smallpox vaccine is too dangerous to give everyone, said





Dr. Peter J. Hotez, president of the Sabin Vaccine Institute and dean of the National School of Tropical Medicine at Baylor College of Medicine.

The vaccine is now routinely given only to some members of the military, lab workers and others likely to come in contact with the virus in a bioterrorism event. It cannot be given to pregnant women, or to anyone with H.I.V., under cancer treatment or with any other immunosuppressive condition; nor can the vaccine be given to anyone with eczema or several other skin diseases, Dr. Hotez said.

So a medicine like tecovirimat would be useful for treating anyone infected in the first wave of any release of the virus, as well as the millions of Americans who cannot be vaccinated.

Dr. William Schaffner, a professor of preventive medicine at Vanderbilt University Medical School, noted tecovirimat also could be useful for treating monkeypox, which infects humans and has been increasing rapidly in Africa since smallpox vaccination ended.

Monkeypox sometimes travels internationally; [in 2003, there was an outbreak](#) of 47 confirmed and suspected cases in the United States. According to the C.D.C., the virus arrived in a shipment of 800 small mammals from Ghana, including African giant pouched rats and rope

squirrels intended for the pet trade. They infected prairie dogs at an Illinois pet warehouse; the prairie dogs in turn infected children who bought them as pets.

Despite its fearsome reputation, smallpox actually spreads slowly compared with more common diseases like measles or chickenpox, Dr. Schaffner said.

Symptoms like fever, exhaustion and headache typically begin 10 to 14 days after infection. These are followed by a rash of small bumps that become pus-filled sores, which can cause permanent scarring.

In severe cases, the infection causes loss of large areas of skin and bleeding. The virus can also reach the brain, leading to encephalitis, and can cause blindness by blistering the eyeballs.

When tecovirimat was tested in humans, the most common side effects it caused were headache, nausea and abdominal pain, the F.D.A. said.

Results of testing by Siga Technologies were [published in the New England Journal of Medicine](#) on July 5.

The F.D.A. gave Siga several valuable incentives toward its application for approval, including fast-track and priority review designations.

## Changing health messaging to help stop the next pandemic

Source: <http://www.homelandsecuritynewswire.com/dr20180711-changing-health-messaging-to-help-stop-the-next-pandemic>

July 11 – **Changing public health messaging to focus on the impact of our actions — for example, the potentially harmful impact of infecting a colleague with a cold, rather than whether we will infect them if we go into work in the first place — could have significant implications for how we deal with global threats**, according to a new study from City University of London, the Oxford Martin School (University of Oxford), and Yale University.

Uncertainty about how our choices will affect others is a common occurrence in our social lives, with previous research suggesting that such uncertainty leads to solely selfish decisions and actions. However, the new study found for the first time that uncertain situations do not always lead to selfish behaviour. Appealing to people to think about the impact of such

potentially harmful actions can lead to decisions which err on the side of caution. The paper is published in [Nature Human Behavior](#).

When it comes to social decisions, the uncertainty we face can be split into two types, known as outcome uncertainty (i.e., uncertainty about the outcomes of decisions) and impact uncertainty (i.e. how an outcome will impact another person).

City [says](#) that the researchers found that by focusing on messaging which appeals to impact uncertainty, and not outcome uncertainty, participants reported that they would be more willing to adopt behavior that would help contain the threat of infectious disease, highlighting the relevance of the findings for addressing global threats. This discovery could



also enable public health officials and policy makers to nudge people towards less selfish decisions when faced with such issues.

To explore how people responded to impact and outcome uncertainty, the researchers carried out a series of experiments which varied the information participants received about the people potentially affected by their decisions. The results suggest that outcome uncertainty activates self-focused narratives that enable people to tell themselves that it is very unlikely their actions will harm another person, allowing them to reap the benefits of self-interested actions without feeling selfish. Such self-focused narratives can lead to selfish behavior by downplaying the potential social costs of self-interested actions.

However, the findings suggest impact uncertainty activates other-focused narratives that include potential social costs, leading participants to adopt behaviors that preserve others' welfare. Notably, these narratives may

cater for self-image concerns (e.g., "only a horrible person would risk infecting a vulnerable other").

Dr. Andreas Kappes, a researcher at the Department of Psychology at City, University of London and lead author of the study, said:

"Uncertainty about how our choices will affect others is prevalent in all our lives, and we frequently are faced with such decisions. In our new study we found that when we are faced with uncertainty it does not always lead to selfish behavior, as instead, the type of uncertainty matters.

"Our findings suggest that when people consider the impact of their actions in such uncertain situations, such as harm they may cause by passing on a cold or flu, it can lead them to err on the side of caution. As a result, our findings offer new insights into communicating uncertainty to the public, especially in contexts in which behavior that preserves others' welfare is paramount, such as infectious disease."

— *Read more in Andreas Kappas et al., "Uncertainty about the impact of social decisions increases prosocial behavior," [Nature Human Behavior](#) (9 July 2018).*

## Predicting epidemics

Source: <http://www.homelandsecuritynewswire.com/dr20180716-predicting-epidemics>

July 16 – Ecologists at the University of Georgia have taken an important step in their efforts to develop an early warning system for infectious disease outbreaks.

A team led by Eamon B. O'Dea created a mathematical model that analyzes statistical patterns in public health reports to identify when a population is approaching an epidemic threshold—the point at which a disease outbreak is possible. Their findings, recently published in the Royal Society journal *Interface*, help pave the way for a disease forecasting system that could one day be used by public health officials.

"Currently the state of the art is to just have very rapid detection once disease emergence occurs," said O'Dea, a postdoctoral researcher in the Odum School of Ecology and Center for the Ecology of Infectious Diseases at UGA. "So it would be advantageous to have some way of predicting the point when emergence is possible, because then you could possibly introduce some interventions."

These could include the timely distribution of vaccines, if available, or adding hospital capacity in areas likely to need it.

Georgia says that the crux of the approach is to quantify the "critical slowing down" that occurs as a system approaches a tipping point—a threshold beyond which it will undergo drastic and potentially irreversible change. As the tipping point nears, characteristic patterns in the system's dynamics can be observed.

Much of the earlier work on critical slowing down has been based on models with a single variable.

"The progress we've made here is addressing the multidimensional nature of lots of real-world systems," said O'Dea.

He and his co-authors built a "susceptible-infected-removed" model, commonly used to understand epidemic dynamics. It takes into account the number of individuals in a population who are susceptible to a disease, having neither contracted nor been



vaccinated against it; the number who are currently infected; and the number who've been removed from the susceptible group, either because they were vaccinated or because they caught the disease and recovered.

But in the real world, disease surveillance information is often incomplete, and data about infections may be broken down by age group or city within a larger population.

O'Dea said such complexities made it important to determine which variables are most useful in estimating the distance to an epidemic threshold.

**To find out, they analyzed and simulated a model of acute infectious diseases such as pertussis, also known as whooping cough. They found that of all the variables they considered, patterns in the number of infected individuals over time provided the best estimate of an approaching tipping point.**

**Furthermore, gleaning that number from public health case reports worked just as well as directly counting infected individuals.**

"That's kind of fortunate," O'Dea said, because while it's rare for such a count to happen, public health departments routinely report new cases as part of regular surveillance.

The finding that the model's estimates proved accurate even in the absence of complete data has practical implications as well.

"When you're analyzing infectious disease data, if you see an upward trend in the number of cases it's hard to tell if it's due to increased reporting rates or if there's actually more transmission going on," said O'Dea. "So it's nice to have some way of disentangling those two, which the slowing down approach lets you do." O'Dea cautioned that the team's results aren't yet translatable to a real-world disease forecasting system.

"I think it's still a long way from practical use, but at the same time I do think we have made important progress," O'Dea said. "What we really need before there's any kind of routine use in public health is empirical validation, which is not something we've attempted in this paper but it's something we're actively working on in the project as a whole."

— Read more in Eamon B. O'Dea et al., "Estimating the distance to an epidemic threshold," *Journal of the Royal Society Interface* 15, no. 143 (27 June 2018).

