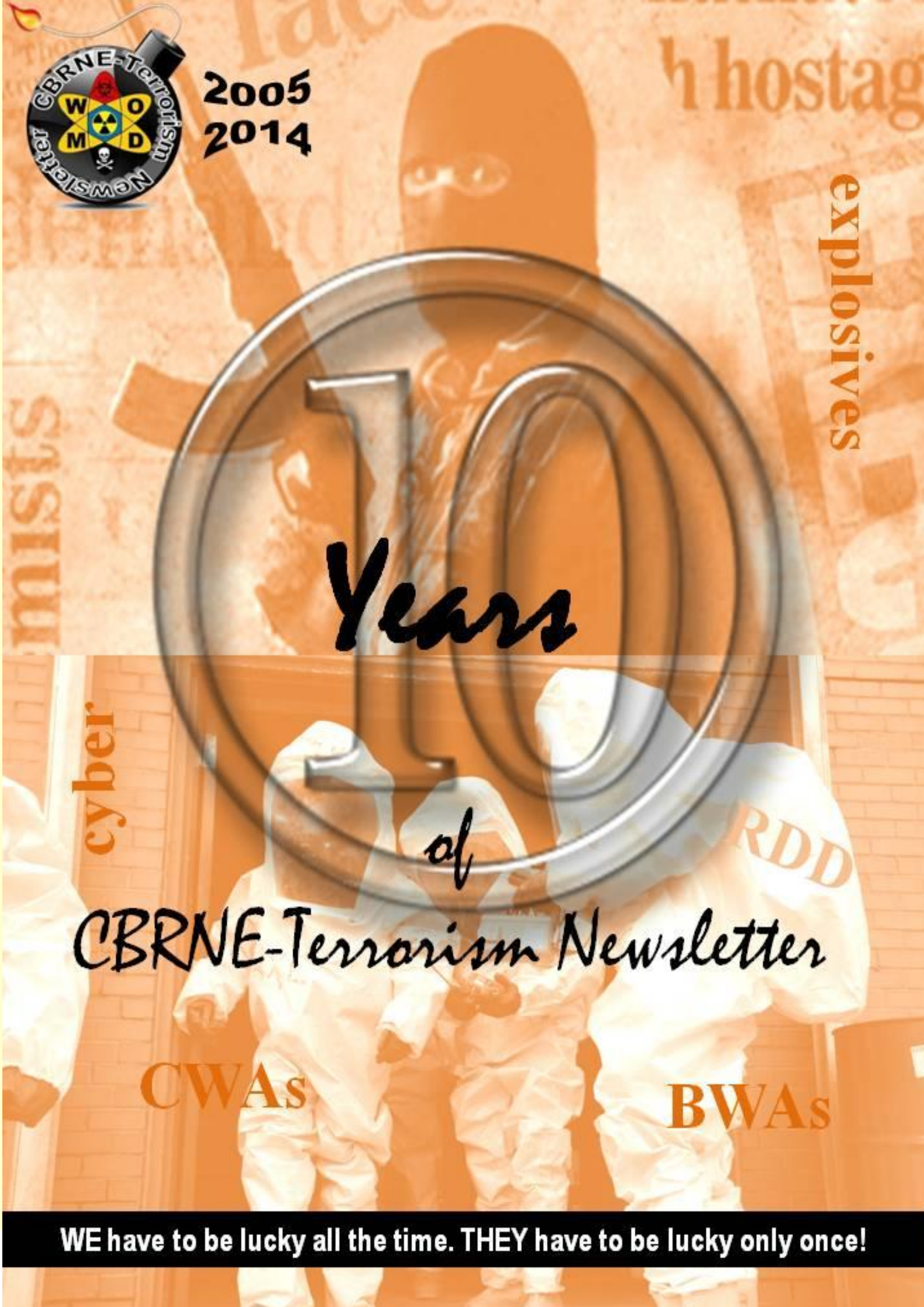
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▶ **Cover:** Nicotiana benthamiana, the plant from which ZMapp is derived.

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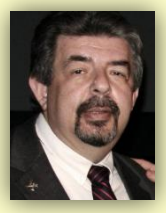
1. Read by First Responders in more than 80 countries around the globe (below right: top-20 countries);

2. Distributed to more than 700 institutions, organizations, state agencies, think tanks, defense companies, institutions and universities.



Editorial

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

Editor-in-Chief
CBRNE-Terrorism Newsletter

Dear Colleagues,

Another year is about to expire and a new one waits to take over unfortunately without bringing peace and hapiness on Earth…

2014 was characterized by two equally deadly virus – the Ebola Virus and the IS virus. And if there strong evidence that we are going to beat the first one, I am not sure about the second mainly due to its extraterrestrial origin. Because it is for sure that brains behind IS are not human – they cannot be human. One might argue by saying: "why is it important the way a human being is killed?" Although I have no clever answer to that, we get to believe that there is dignity even in killing wether it is in wars or even terrorism. Perhaps we had been so desensitized though time that we thought that dying or killing for a cause is natural whether it is from a bullet, a drone or a bomb. Whether victims are soldiers, insurgents or just innocent bystanders (or collateral damages – the official terminology). But IS shaked our mindsets and insulted our aesthetics on killing. The wise person who quoted that there is no animal more savage than men was so right! Now our problem is how to cope with this viral movement and synchronize our response in a fast and effective way. But as we responded to Ebola (late) the same way we are still "planning" to respond. What I am afraid of is that we need a huge man shlauhgter to (same as 9/11) to mobilize our forces and start another "war on new terrorism". There are signs that this big event is slowly (?) approaching as recent events (Canada [memorial], Australia [café], Pakistan [school]) indicate. What if tomorrow is not about some guards in a monument, some shooting in a parliament building or few hostages in a Sydney café? What if it is a hijacked plane-bomb (again) or a dirty bomb (made in Mosul) or a survived Ebola terrorist who spreads the virus following intercourse with innocent women/men (virus remains in semen for 70 to 90 days)? What if commuters in a busy metro station are attacked by a group of terrorists with knives and hatchets? If we do not realize that terrorists are equally smart with us and more innvative/adaptive compared to us then the battle is lost even without a shot! The "know yur enemy to win" was never taken seriously by all of us fighting for our own. In the recent attack (with AK-47s) against the Israeli Embassy in Athens, attackers choose a very rainy day (bad CCTV captures) and used a car with blue lights (mimic a patrol police car) to escape. Other examples? Many! But we continue to exlore problems identified without proceeding to lessons learned. We only take measures at global scale when a clever plot is revealed (even without been executed) and make our lives miserable not to mention the huge costs these adaptation processes require (i.e. with liquid explosives, shoes or underwear bombs).

In that global security turmoil our response remains a step back (as always) and our attitude continues to be civilized. We debate about torturing methodologies; we advocate about rehabiliatation strategies; we have modern fantastic jails (with facilities better than those in our homes); we "follow" suspects joining IS and many other "sauces" over a tasteless meal called global terrorism and clash of civilizations. It is easy to critisize unconventional methods of collecting information but nobody – until now – have answered the simple question: "What would you do to have results or to uncover a plot resulting in hecatombs of victims?" Of course there are limits but is life less important than polite/civilized behavior?

Big nations continue to play their bloody chess; global organizations act the same way and get Nobel Prizes for destroying a few tones of chemical weapons. Only when national interests are at stake big nations decide to take action to guard oil fields, strategic

points and rear earths necessary for their new most advanced weaponry. They do not really care for Somali people that starve to death or the Syrian, Gaza, N Guinea, Thibet (to name a few) people who fight to survive their miserable lives. What they care of is more oil, more gas, more power and influence, more territorial occupation instead of spending for drinking water, sanitary solutions, basic food and the most important of all: more peace and stability based on mutual respect and humanity.

Sometimes I think that people we are not specialized in our line of work are so happy because they have no idea who catastrophic we can become and how easily we can destroy the planet not only once but many times at any time! I envy simple people we only care about their daily problems with work, family and their micro-environment during their life span. People who appreciate that we live only 70 years (if we are lucy enough) and try to make the best of it! But if it is us to stay awake and vigilant for them to have a good life then our own anxiety and sleepless nights worth it!

In Greece, our new problem is to choose a new President of Hellenic Democracy and to define a date for elections. Politicians are so absorbed with their new toy that they do not really care about people and their efforts to survive in a very hostile living environment created by those ruling the country for the last 30 years or so. Same peope that are now willing to save us! We are so angly that the whole thing might turn out to be an ugly situation. Traditional values like homeland, family and religion are left aside and they only care how to satisfy the international banking system and the invisible money that we borrowed for our own shake (really?)

Despite the overall unhappy situation at home, the CBRNE-Terrorism Newsletter continues to be in the front-line of knowledge dispersion. As of January 2015 the Editor will start delivering the first series of lectures at the International CBRNe Master Courses organized by the University of Rome "Tor Vergata", Department of Engineering. A very ambitious project approved by both NATO and OPCW. This project will create a pool of experts with deep knowledge of all aspects of CBRNE defense with special focus on urban operations and terrorism.

In a few days we will celebrate Christmas and soon after 2014 will be a memory. Not a good one unless we learn something from all the events and incidents happened in the past 12 months. I would like to write that it is in our hands to change the world in 2015 but you know that this would be utopic. At least let us protect our societies and ruins of our civilization as best as possible. I am confident that CBRNE-CT First Responders will fortify their efforts on doing so and those of us not in the front-line anymore will continue to support them in any way possible.

The Editorial Team of the Newsletter is sincerely wishing you all (and your families) a Merry Christmas and a Happy New Year! We will be here for you and support you 100%!

The Editor-in-Chief

Architecture of doom: DIY planning for global catastrophe

By Lee Stickells

Source: http://www.homelandsecuritynewswire.com/dr20141124-architecture-of-doom-diy-planning-for-global-catastrophe

Environmental catastrophe, economic collapse, global pandemic … does it feel like the world is ending? If you think Armageddon is near and are trying to get ready, you are not alone.

National Geographic Channel's Doomsday Preppers — a reality TV series that profiles various "survivalists" readying themselves to survive a range of apocalyptic circumstances — is the network's most-watched series. It has prompted a slew of similar programming such as Discovery Channel's rival Doomsday Bunkers.

Of course, even after an apocalypse one needs a place to live.

Since it first aired in 2012, Doomsday Preppers has featured survival retreats ranging from pre-fabricated steel shelters and decommissioned missile silos, to hand-built forest cabins and buried shipping containers. What has emerged is a picture of the ideal survival retreat (or "bug-out location" to use prepper slang) as rural, secluded, self-sufficient, and fortified.

The show has even spawned an app that challenges you to "design a multi-level dream bunker complete with everything you need for post-apocalyptic bliss."

The roots of the survivalist industry

The idea of a domestic structure for emergency protection is not new. The Cold War nuclear fall-out shelter programs of the late 1950s and early 1960s provide an example of this as a mass phenomenon.

The kind of survival retreat we can see in Doomsday Preppers emerged a bit later. It solidified around the concept of a dedicated, self-sufficient ("off-grid"), secluded, and secure home.

The late-1960s saw a surge in publishing and communication networks that disseminated discussion and advice on designing for this ideal. These networks also helped establish the roots of the present-day survivalist industry.

In the late 1960s, the American architect Don Stephens ran seminars on how to build and equip a remote survival retreat. Publications such as Joel M. Skousen's *The Survival Home Manual: Architectural Design, Construction and Remodeling of Self-Sufficient Residencies and Retreats* (1977) also appeared.

Today, an Internet search will find dozens of similar titles, such as *Dirt Cheap Survival Retreat* (2011) and *The Everything Guide to Living Off the Grid* (2011).

There are also any number of survivalist (or prepping) blogs, forums, expos, equipment suppliers, consultants, and even celebrities such as bestselling author James Wesley Rawles (who wrote the *Patriots* novel series), editor of SurvivalBlog.

A thriving industry has grown up around planning for apocalypse, with the design and equipping of the ideal home as a key element.

Discussion of survival retreat design focuses on issues such as strategic location, energy self-sufficiency, water supply, waste treatment, food production, and home security.

Survivalists and preppers spend a lot of time arguing over the virtues of stainless steel versus plastic water drums, the best way to fortify a house, whether to use a passive solar heater or wood stove, and what size basement is required for all that canned food.

The effect is something like Swiss Family Robinson with methane-harvesting septic systems and electrified fences. It is the wilder examples of survival retreat design that tend to catch our eye.

Rawles sees the "crushroom" (a kind of foyer "mantrap") as a key element of retreat architecture. One Doomsday Prepper episode featured a family who, fearing the

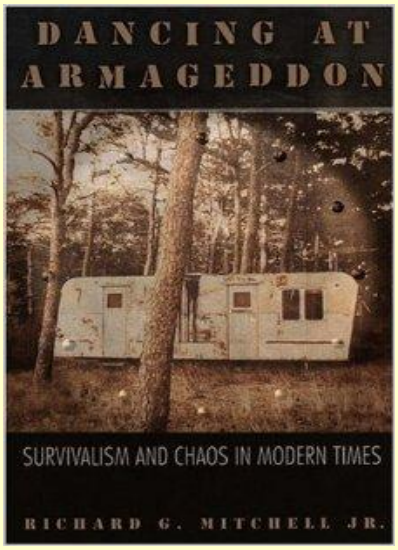
fallout from a nuclear event, retreated to a replica medieval castle (and gained their own TV series, Doomsday Castle).

Survivalists can easily be caricatured as lonely lunatics sitting on piles of freeze-dried food and exotic armaments in their foil-lined bunkers. The typical TV survivalist rhetoric also suggests an intense pessimism about the future.

The *New York Times* critic Neil Genzlinger bemoaned in 2012 "how offensively anti-life these shows are, full of contempt for humankind".

But is Doomsday Preppers simply a freakish version of Grand Designs? Is there something other than voyeuristic smirking to be gained from watching?

DIY gone wild



Anthropologist Richard G. Mitchell's ***Dancing at Armageddon*** (2001) is, I think, one of the most level-headed studies of survivalist culture. His work points to the way survivalism is rarely about extremist action. Rather, it is more often about tinkering with tools, exchanging ideas, and creative storytelling.

We can see the design of the survival retreat as a wilder version of the more familiar impulse towards DIY and home renovation.

Survivalists use these projects as a focus for developing the personal skills, knowledge, and praxis needed to embrace a radically changing world. Potential chaos and crisis are embraced as the opportunity for developing personal autonomy.

Seen in this way — and put in the context of global climate change, ongoing financial crises, and episodes such as the current Ebola epidemic — the survival retreat starts to seem to be an eccentric but understandable reaction.

Going further, survivalists may be more connected to the chaos of modern life many of us experience than their reputation suggests. Discussions about the need for developing personal "resilience" in communities facing the effects of climate change often resonate with survivalist concerns. Preppers start to seem prescient rather than loopy.

The new survivalism

In fact, something like the survivalist dream has become a compelling vision of sustainable future living. Environmental concerns, rising power prices, and the progress in alternative technologies have seen a growing number of people opting to disconnect and live "off grid."

This trend often shares a common picture of the ideal retreat; including, for instance, micro-hydro power, methane digester, water tanks, passive solar design, and a vegetable garden.

Rawles has suggested that his SurvivalBlog has "an increasing number of stridently green and left-of-center readers". Off grid housing is even being talked of as the "new normal."

This can be read as liberating moves towards sustainability, personal, autonomy and self-determination. Survivalists also tend to privilege privatized, self-regulated, individualist modes of living.

The Australian off-grid advocate Michael Mobbs has recently suggested rethinking the state's responsibility for sewage. He argues that "mature citizens" should take care of their own waste.

If it becomes the "new normal," what could this sort of thinking mean for the way we live together?

Common services and cooperative social institutions have helped form the city as a public good. When looking at the overlapping discussions of being "prepped" and "off grid," or "resilient" and "sustainable," we should perhaps be wary. Who has the capacity to be off grid and who remains dependent?

Exit from the grid challenges the collective infrastructures that have been so vital to more equitable urban environments. What, then, of our public networks such as water, electricity, transport, and telecommunications?

What of our common urban future?

Lee Stickells *is Associate professor at University of Sydney.*

The secret life of baggage: Where does your luggage go at the airport?

By Ashley Halsey III

Source: http://www.washingtonpost.com/local/trafficandcommuting/where-oh-where-did-my-luggage-go/2014/11/24/16d168c6-69da-11e4-a31c-77759fc1eacc_story.html

Memo to the lady with the hot pink luggage tag: The six cans of Libby's pumpkin pie filling that you carefully knotted in that plastic supermarket bag for your flight to Australia are not going to explode.

And to the Boise, Idaho-bound photographer with the double-locked "Golf Guard" case packed with tripods, you couldn't have squeezed a bomb or much of anything else in there if you tried.

By now you both know that your bags seemed suspicious enough to be tested for explosives by inspectors for the Transportation Security Administration before you flew Delta Airlines out of Baltimore-Washington International Marshall Airport recently.

The TSA leaves a calling card inside every bag it opens. Which isn't many, and that's a good thing, given that about 14 million checked bags will pass through TSA hands nationwide during the extended Thanksgiving holiday weekend, when an estimated 24.6 million people plan to fly.

Many will feel a palpable tremor of trepidation as they crowd around the baggage carousel, praying that their bag appears and fearing a visit to the dreaded missing-baggage-claim office.

Fewer bags go missing — and even fewer get touched by the TSA — than was the case before bar-coded tags. And the slick new systems to keep terrorist explosives off airplanes have reduced the need for agents to open them for further scrutiny.

"The TSA isn't even touching the vast majority of these bags," the TSA's spokeswoman, Lisa Farbstein, says.

The question of how the TSA goes about its business behind the scenes at airports arose last month with an e-mail from an angry doctor. He had flown home to Mumbai via Los Angeles and Hong Kong. When his bag tumbled onto the carousel in India, his TSA-approved lock had been torn off and the bag was held together with packing tape.

Though he had flown about 10,000 miles — and there was no TSA card indicating that his bag had been opened by American screeners — he pointed the finger at the TSA, charging agency personnel with "arrogance borne of the certainty that no one will question them."

Federal data shows that every month an average of 352 people question the TSA about real or perceived sins against their luggage.

What happens in Hong Kong or Mumbai may be a different story, but once you wave bye-bye to your bag at the ticket counter at BWI, and in most large U.S. airports, here's where it goes:

After trundling along the conveyor belt for a bit, it descends into the labyrinthine system of the TSA.

And into the clutches of the Dickensian pack of thieves imagined by Dr. Mumbai?

Not likely. Sensors placed on the belt every few feet track the progress of a bag, setting off an alarm if a bag goes missing in the second or two that elapses between one sensor and the next.

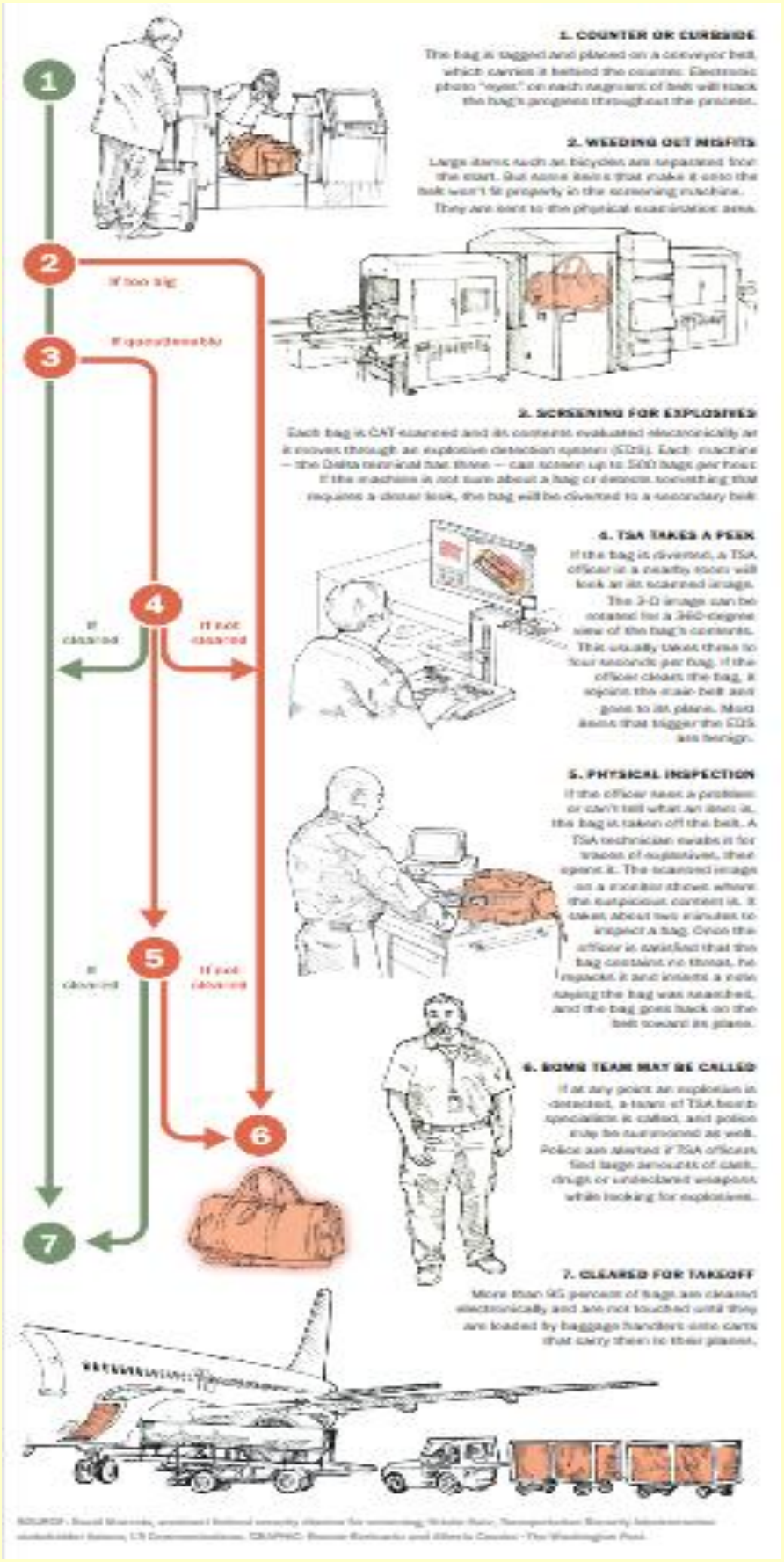
The machinery has identified some bags that are too big (this might be your golf clubs) for what comes next. Those it sends down another belt to a TSA inspector with a bomb-detecting wand. Still bigger boxes (like the one with your bike in it) go down a different belt and are wrestled onto a steel table, where they are opened.

Most likely, however, your bag rumbles along toward a boxy beige device that looks a bit like the scanners you put your carry-on bag through, only about twice as big. As the bag approaches, something that looks like a rubber rumble strip gets it properly aligned, and a metal curb gives a shove if that fails.

In it goes.

The bag passes through something in the machine — called an Examiner 3DX — that resembles the rotating collar in a medical MRI system. The machine does two things: decides whether there might be a bomb inside, and sends a three-dimensional image of any suspect bag to a nearby control room.

Exactly what makes the machine worry that a bag may have a bomb?



"It's sniffing it, so to speak," Farbstein says.

A bag that has been cleared — a green light flashes the good news — heads on down the conveyor belt and back into the airline's luggage system in the hope of getting on the same plane that you do. But when a bag emerges after drawing a red light or a white one — white is the machine basically saying "I dunno" — the bottom drops out of the belt and the bag moves to a lower conveyor.

Bomb-screening system takes bags for a ride – have a better view at:

http://apps.washingtonpost.com/g/page/national/bomb-screening-system-takes-bags-for-a-ride/1471/

Then the race is on.

Can the TSA inspector in the control room study the images of the bag flashing on the computer screen and in less than a minute make a definitive decision that it poses no risk?

If the answer is yes, the inspector pushes a button and your bag pops up to the conveyor taking all the green-lighted bags to the airline and your airplane. If the inspector sees something distressing or isn't quite sure, your bag heads down the belt to the TSA inspection team.

A team member takes a look at the computer monitor to see what caught the control room inspector's attention and then opens the bag.

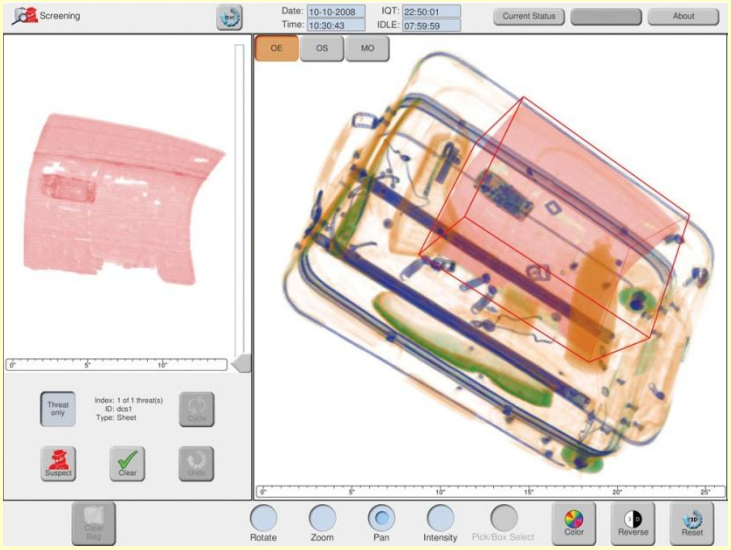
It's locked? No problem, Dr. Mumbai, the inspector has a key ring full of master keys for TSA approved locks. The photographer headed for Boise had two locks on the golf case containing his

tripods, and both yielded readily to the inspector's keys.

Whether it's something in a case of tripods or six cans of pumpkin pie filling, the offending item is ferreted out. The inspector unknots the bag with the pie filling and pulls out the cans. Everything is tested with a swab that detects explosives.

Repacked, locks and straps snapped into place, the bag goes back onto the conveyor that carries it to the airline system, where bags are loaded onto carts that will be towed to the airplane.

A bag that gets green-lighted will zip from counter, through the TSA system and to the airline luggage cart in about five minutes. Bags that are opened take longer. How much longer depends on whether you are a careful packer or one whose bags spill stuff when opened. Locks slow things down too, and non-approved locks get sheared off with bolt cutters.



But few bags suffer the indignity of inspection. While the TSA doesn't want to reveal exactly how many set off the alarm, one security official said it's about 4 percent nationwide.

Each of the "sniffing" **Examiner 3DXs** (photo above) can take the scent of 500 bags an hour. In the $38 million TSA baggage-handling area that serves Delta at BWI, three of the machines can handle 1,500 bags an hour. Southwest Airlines, BWI's biggest airline, has six 3DXs.

You're thinking, this sounds like things click along like a Swiss watch, so why didn't my bag show up on the carousel when I flew home for Thanksgiving last year?

For starters, bad luck. The number of bags that get lost — or "mishandled," as the federal Transportation Department prefers to call it — has been cut by more than half in the past seven years.

Volume also could be a factor during peak travel times. Last year, BWI scanned 97,243 checked bags the week before Thanksgiving, 118,787 Thanksgiving week and 108,249 the week after Thanksgiving.

There also are a few irksome things that can go wrong in one of the TSA's "in-line" baggage systems, like Delta's at BWI and those at 118 other big airports.

A bag refuses to align properly for the scanner. A bag is placed on the belt with its wheels down so it squirms around, causing confusion for the bags behind it. A bag's strap or name tag gets snared in a belt.

Crunch, and there's suddenly a jam all the way up the line.

"We can go a whole day without one," said Kristin Katz, the TSA's liaison with the airlines at BWI. "Then we can have numerous jams in an hour."

Even with workers standing by to clear jams, several within an hour can muck up the system and make bags late for their flights.

And on some flights, baggage raises more red flags than others. "At JFK in New York, with Air India, virtually every bag alarms," Farbstein says. "They bring home — bless their hearts — things for friends, families, everybody."

Memo to Dr. Mumbai: The TSA has keys for that lock you think they ripped off. There's a stack of TSA calling cards next to every station where they open bags. (Just check with the pumpkin pie lady or the Boise photographer.) Your bag passed through airports in Hong Kong and Bombay bearing a big "Priority baggage" sticker that some might see as an indication it contained something important. But you point a finger squarely at the "shocking and shameful" conduct of the TSA? Hmmmm.

Ashley Halsey reports on national and local transportation. Although he has had a fairly extensive number of interesting experiences, collectively they've not transformed him into a particularly interesting person. He was, for instance, the first person to learn who the real "Sam" was for "Son of Sam" killer David Berkowitz. He once drank moonshine with Orville McCoy of the infamous Hatfields-and-McCoys deadly feud. He came with in a hair of death after being hit by a speeding Studebaker. He was on a biplane that crash landed on the runway at Reagan National Airport. He has met several presidents and not been able to offer any of them an original thought.

Muslims discovered America before Columbus, claims Turkey's Erdogan

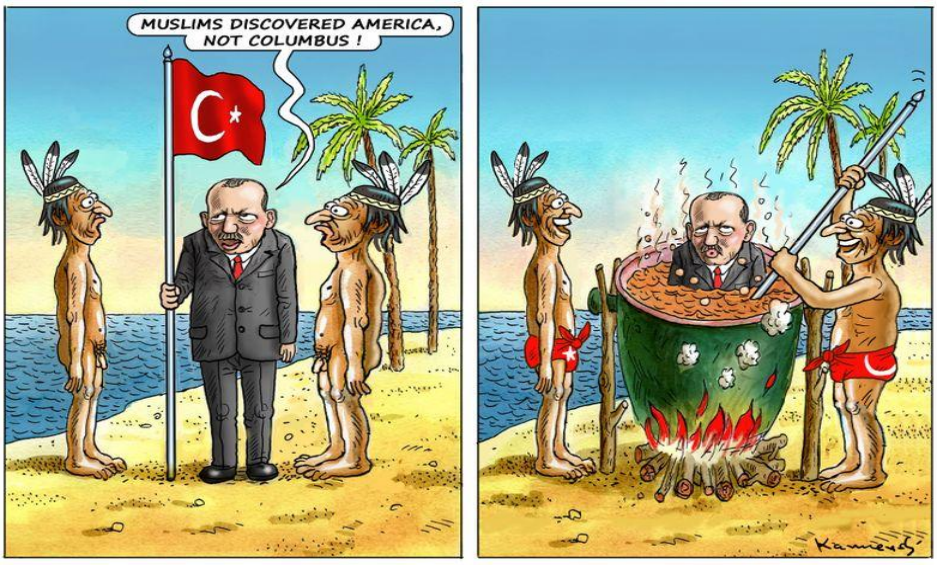
By Ishaan Tharoor

Source: http://www.washingtonpost.com/blogs/worldviews/wp/2014/11/15/muslims-discovered-america-before-columbus-claims-turkeys-erdogan/

BREAKING NEWS

In a televised speech in Istanbul, Turkish President Recep Tayyip Erdogan claimed that Muslims had discovered the Americas three centuries before the voyages of Christopher Columbus. He was addressing a summit of Muslim leaders from Latin America.

"Contacts between Latin America and Islam date back to the 12th century. Muslims discovered America in 1178, not Christopher Columbus," Erdogan said. "Muslim sailors arrived in America from 1178. Columbus mentioned the existence of a mosque on a hill on the Cuban coast."



Erdogan is not shy of making provocative statements, whether it's about his political rivals, ethnic minorities or social media Web sites. His latest remarks are, in comparison, less incendiary.

They echo the research of a small coterie of scholars who believe there's archaeological and documentary evidence of Muslims in pre-Columbian America. Erdogan is apparently citing the disputed work of Youssef Mroueh, an academic affiliated with the As-Sunnah Foundation of America.

In a 1996 paper, Mroueh referred to the presence of a mosque spotted by Columbus along the Cuban coast. "Columbus admitted in his papers that on Monday, October 21, 1492 CE while his ship was sailing near Gibara on the north-east coast of Cuba, he saw a mosque on top of a beautiful mountain," writes Mroueh.

Most scholars insist the "mosque" mentioned was a metaphorical allusion to a striking land feature. There have been no archaeological discoveries of Islamic structures pre-dating Columbus's arrival in the New World.

Mroueh, who is not listed as a historian at any institution of higher learning, suggests that explorers from Muslim kingdoms in West Africa made the same journey across the Atlantic from the Canary Islands well before the Italian seafarer did in the employ of the Spanish Crown.

Others cite the work of a noted geographer in Muslim Spain, who

produced a map in the 10th century that may show the outline of South America, and referenced the journey of an Arab sailor who traveled westward through an "ocean of darkness and fog."

It should go without saying that the first peoples to "discover" the Americas were the ancestors of the continents' indigenous population.

But there is all sorts of speculation of other peoples in other eras finding the Americas long before Columbus. Did Polynesians rowing catamarans make it to the American Pacific coast? What about the great treasure fleets of the Chinese Ming emperor? Or Basque fishermen, chasing streams of Atlantic cod?

The most established narrative of pre-Columbian encounter involves explorers and settlers from Scandinavia, who arrived on the shores of Newfoundland and Canada some five centuries before the Spanish expedition of 1492.

Yet Erdogan's insistence upon the presence of Muslims in the New World is worth taking into consideration, if not for the reasons that he would intend.

The Spanish exploration and colonization of the Americas followed the bloody battles of the Reconquista – the Catholic campaigns against the last Muslim states on the Iberian peninsula. Many of the Spanish soldiers and officers who crossed the Atlantic were animated by the zeal of the Spanish Inquisition, and in some accounts refer to the indigenous populations they encounter as "moors" and "infidels" and their ziggurats as "mosques." The profusion of towns in Mexico called "Matamoros" -- death to the Moors, a name associated with a mythic Christian saint who battled Muslims -- speaks of that legacy.

Apart from the Arabs and converted Muslims aboard Spanish ships, Islam may not have been present in the New World. But it still haunted the imagination of Europeans as they ventured into the alien unknown.

***Ishaan Tharoor** writes about foreign affairs for The Washington Post. He previously was a senior editor at TIME, based first in Hong Kong and later in New York.*

Ferguson, Racism and Pro-Law Enforcement Bias

By James I. Meyerson

Source: http://www.huffingtonpost.com/james-meyerson/ferguson-prosecutor_b_6225898.html

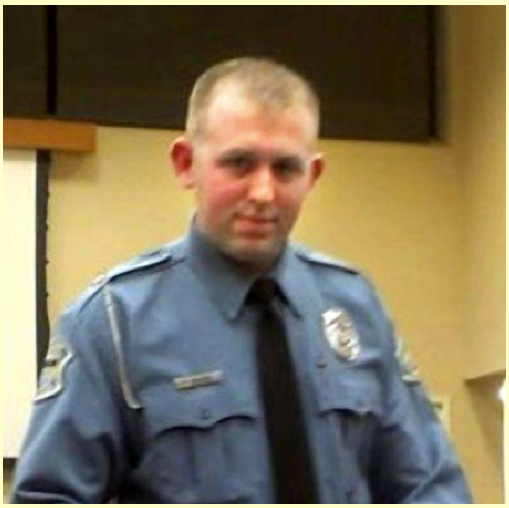
It's not rocket science. The question for the grand jury was not whether Ferguson, Missouri Police Officer Daren Wilson was guilty of a crime when he shot and killed Michael Brown. No, the sole and only question before the grand jury was whether there was probable cause to believe that Ferguson, Missouri Police Officer Daren Wilson engaged in a criminal act when he shot and killed Michael Brown (probable cause is an objectively reasonable belief that it was likely that a crime has been committed). They are vastly different questions.

Ultimately, the latter question simply required the grand jury to determine whether it was objectively reasonable for Officer Wilson to believe that shooting Mr. Brown -- multiple times at a significant distance from where Officer Wilson was situated and causing Michael Brown's death, was necessary in order to protect himself (Officer Wilson), or others, from the imminent use of deadly force by

Michael Brown against Officer Wilson or others or the imminent infliction of serious bodily harm by Michael Brown against himself (Officer Wilson) or against others.

As the Prosecuting Attorney himself acknowledged in his own statement to the world, the least reliable and least relevant evidence before the grand jury in performing its function respecting

it's analysis of Wilson's conduct and making its determination whether it was more likely than less likely than Wilson's conduct was criminal,



was Wilson's self-serving statement to the grand jury precisely because it was Wilson's conduct that was the subject of the grand jury proceeding. The prosecutor was obligated to tell the grand jury of that fact.

It is sad, indeed tragic, to say, however, that, because a smorgasbord of evidence was presented to the grand jury by the prosecutors rather than a presentation of a narrowly constructed relevant universe of evidence, it appears that the prosecutor was attempting to make Michael Brown's conduct the focus of the grand jury's investigation and was attempting to make Officer Wilson the victim of some unlawful conduct-crime on the part of Michael Brown.

That's a classic criminal defense attorney's tactic (turning the table on the victim of a crime and making the perpetrator of the crime the victim of a crime). It is not, however, an honest prosecutor's grand jury strategy whose mission as a prosecutor, in doing justice and thereby carrying out his duty to the public, is to obtain an indictment against whoever engaged in more likely than less likely criminal conduct, police officers included (in this case Officer Wilson).

So, the sole issue at this grand jury phase of the criminal "justice" process was, independent of why Officer Wilson testified he was supposedly justified in engaging in homicidal conduct, whether, based on the other relevant evidence, it was objectively reasonable for Wilson to discharge his gun and kill Michael Brown or whether it was more likely than less likely that his conduct was criminal.

The relevant evidence in this regard establishes that, at a relatively long distance from Michael Brown, Officer Wilson discharged twelve shots at Michael Brown from Wilson's Ferguson Police Department issued gun; and that, without any objectively reasonable basis to believe that Brown was armed with a gun or any other weapon or that Michael Brown was close enough to Wilson to inflict serious bodily harm against Wilson, Wilson intentionally shot and killed the unarmed Michael Brown. Whether Wilson's self-serving testimonies, including his testimonies that Brown supposedly reached into his waist band, eventually rules the day at a public trial as to whether Wilson is guilty or non guilty beyond a reasonable doubt of the indictment's homicide charge, was, at this point, irrelevant. It's that simple.

The only question for this grand jury, then, was what degree of homicide should have been encompassed in the grand jury's indictment of Wilson. That is what the Prosecuting Attorney's office should have instructed that grand jury: that it was his judgment (the prosecutor's judgment) that the grand jury should return some form of homicide charge against Wilson (preferably a higher degree of homicide rather than a lesser manslaughter degree). If the Prosecutor had performed his function as he ordinarily would do in a case under like circumstances but not involving a

police officer, the grand jury would have done so.

Wilson's defense to the criminal charge, properly presented to a jury in the full light of an open courtroom at a trial on the charge for which he should have been indicted for some degree of homicide, would, ultimately, be the determinative factor in an independent jury's determination of whether Wilson was guilty or not guilty beyond a reasonable doubt, but only after that jury saw and heard all of the evidence and weighed the credibility of all of the witnesses, Wilson included; and only after vigorous cross examination by Wilson's defense attorney of witnesses produced at the trial and, as well, by the people's prosecutor, performing his function in the full light of day and an open courtroom, of Wilson should

Wilson have elected to take the witness stand in the full light of the open courtroom and not, as he did, in the secrecy and darkness of a grand jury room closed to the public scrutiny of how the process played out inside of that room.

Why didn't the grand jury do its job and issue a true bill of some form of homicide against Wilson, preferably an intentional homicide charge but, at the very least, a voluntary manslaughter charge? The grand jury failed to do so because the prosecutor failed to do his job. The prosecutor's function was to navigate the grand jury members to return a criminal homicide charge and indictment against Wilson. In failing to do so, the prosecutor violated the trust which he owed not simply to Michael Brown's parents and family but as well to the Ferguson community and to each and every one of us in this nation. The prosecutor should be held accountable for such and he should be recalled and removed from office for the gross dereliction of his duty.

Why didn't the prosecutor do his job as he would ordinarily do so in a non-police shooting case where a death resulted and some form of a homicide charge was being sought? The prosecutor didn't do so because he didn't want to do so. And he didn't want to do so because he had a conflict. He believed in the innocence of the officer because, among other reasons, he relies on Wilson and his fellow Ferguson Police Department colleagues to successfully prosecute crimes, often times of African American males, in St. Louis County

In effect, Wilson was a member of the prosecutor's law enforcement family. There was, if not actual conflict in his function in this grand jury process, a very visible perception of conflict. And so the case was intentionally blown up by the prosecutor. It's not rocket science. It's really that simple. Just as the prosecutor would be derelict in investigating and presenting a case in the grand jury against his cousin, because of the obvious fact of conflict, so, too, in this case he was derelict when he declined to remove himself from this matter (as was the governor when he declined to remove the prosecutor from this matter).

When you add the factor of race into the equation as one is absolutely required to do in the everyday reality of American life, what you have is a toxic mix that can lead to the only one place it could lead: explosive injustice. If the subject of the grand jury had been a young African American police officer who had shot a young white male, would we be having this discussion? Be honest when you answer this question. Don't be in denial.

That is why an office of special prosecutor is required in these cases. Such therefore necessarily now becomes the role of the federal government. If there is ever to be justice in these kinds of cases and in this case particularly, nothing less than that will do. That is why the United States government should return an independent standing indictment on a federal civil rights charge (no double jeopardy does not apply because it will be for an independent standing federal

crime not a state law crime), however difficult it will be to obtain a conviction (remember the Rodney King case); and the United States Justice Department should move to have the Ferguson Police Department placed in receivership because of the systemic failures over time to protect the minority residents and citizens of Ferguson.

James I. Meyerson is a former Assistant General Counsel in the Office of the General Counsel of the NAACP (1970-1981); and since and at present an active civil rights attorney whose focus is law enforcement misconduct.

The new threat: 'Racism without racists'

By John Blake (CNN)
Source: http://edition.cnn.com/2014/11/26/us/ferguson-racism-or-racial-bias/

In a classic study on race, psychologists staged an experiment with two photographs that produced a surprising result.

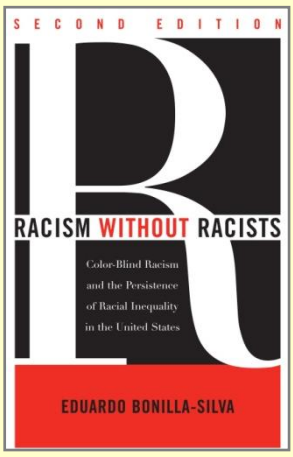
They showed people a photograph of two white men fighting, one unarmed and another holding a knife. Then they showed another photograph, this one of a white man with a knife fighting an unarmed African-American man.

When they asked people to identify the man who was armed in the first picture, most people picked the right one. Yet when they were asked the same question about the second photo, most people -- black and white -- incorrectly said the black man had the knife.

Even before the Ferguson grand jury's decision was announced, leaders were calling once again for a "national conversation on race." But here's why such conversations rarely go anywhere: Whites and racial minorities speak a different language when they talk about racism, scholars and psychologists say.

The knife fight experiment hints at the language gap. Some whites confine racism to intentional displays of racial hostility. It's the Ku Klux Klan, racial slurs in public, something "bad" that people do.

But for many racial minorities, that type of racism doesn't matter as much anymore, some scholars say. They talk more about the racism uncovered in the knife fight photos -- it doesn't wear a hood, but it causes unsuspecting people to see the world through a racially biased lens.



It's what one Duke University sociologist calls "racism without racists." Eduardo Bonilla-Silva, who's written a book by that title, says it's a new way of maintaining white domination in places like Ferguson.

"The main problem nowadays is not the folks with the hoods, but the folks dressed in suits," says Bonilla-Silva.

"The more we assume that the problem of racism is limited to the Klan, the birthers, the tea party or to the Republican Party, the less we understand that racial domination is a collective process and we are all in this game."

As people talk about what the grand jury's decision in Ferguson means, Bonilla-Silva and others say it's time for Americans to update their language on racism to reflect what it has become and not what it used to be.

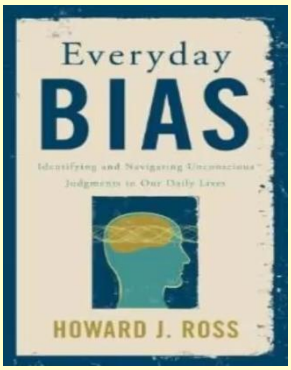
The conversation can start, they say, by reflecting on three phrases that often crop up when whites and racial minorities talk about race.

'I don't see color'

It's a phrase some white people invoke when a conversation turns

to race. Some apply it to Ferguson. They're not particularly troubled by the grand jury's decision to not issue an indictment. The racial identities of Darren Wilson, the white police officer, and Michael Brown, the black man he killed, shouldn't matter, they say. Let the legal system handle the decision without race-baiting. Justice should be colorblind.

Science has bad news, though, for anyone who claims to not see race: They're deluding themselves, say several bias experts. A body of scientific research over the past 50 years shows that people notice not only race but gender, wealth, even weight.



When babies are as young as 3 months old, research shows they start preferring to be around people of their own race, says **Howard J. Ross, author of "Everyday Bias,"** which includes the story of the knife fight experiment.

Other studies confirm the power of racial bias, Ross says.

One study conducted by a Brigham Young University economics professor showed that white NBA referees call more fouls on black players, and black referees call more fouls on white players. Another study that was published in the American Journal of Sociology showed that newly released white felons experience better job hunting success than young black men with no criminal record, Ross says.

"Human beings are consistently, routinely and profoundly biased," Ross says.

The knife fight experiment reveals that even racial minorities are not immune to racial bias, Ross says.

"The overwhelming number of people will actually experience the black man as having the knife because we're more open to the notion of the black man having a knife than a white man, " Ross says. "This is one of the most insidious things about bias. People may absorb these things without knowing them."

Another famous experiment shows how racial bias can shape a person's economic prospects.

The first thing we must stop doing is making racism a personal thing.

Doreen E. Loury, director of Pan African Studies at Arcadia University

Professors at the University of Chicago and MIT sent 5,000 fictitious resumes in response to 1,300 help wanted ads. Each resume listed identical qualifications except for one variation -- some applicants had Anglo-sounding names such as "Brendan," while others had black-sounding names such as "Jamal." **Applicants with Anglo-sounding names were 50% more likely to get calls for interviews than their black-sounding counterparts.**

Most of the people who didn't call "Jamal" were probably unaware that their decision was motivated by racial bias, says Daniel L. Ames, a UCLA researcher who has studied and written about bias.

"If you ask someone on the hiring committee, none of them are going to say they're racially biased," Ames says. "They're not lying. They're just wrong."

Ames says such biases are dangerous because they're often unseen.

"Racial biases can in some ways be more destructive than overt racism because they're harder to spot, and therefore harder to combat," he says.

Still, some people are suspicious of focusing on the word bias. They prefer invoking the term racism because they say it leaves bruises. People claiming bias can admit they may have acted in racially insensitive ways but were unaware of their subconscious motivations.

"The idea of calling it racial bias lessens the blow," says Crystal Moten, a history professor at Dickinson College in Carlisle, Pennsylvania.

"Do you want to lessen the blow or do you want to eradicate racism? I want to eradicate racism," she says. "Yes I want opportunity for dialogue, but the impact of racism is killing people of color. We don't have time to tend to the emotional wounds of others, not when violence against people of color is the national status quo."

'But I have black friends'

In the movie "The Godfather," the character of Michael Corleone, played by Al Pacino, hatches an

audacious plan to kill a mobster and a crooked cop who tried to kill his father. Michael's elders scoff at his plans because they believe his judgment is clouded by anger. But in a line that would define his ruthless approach to wielding power, Michael tells them:

"It's not personal. It's strictly business."

When some whites talk about racism, they think it's only personal -- what one person says or does to another. But many minorities and people who study race say racism can be impersonal, calculating, devoid of malice -- such as Michael Corleone's approach to power.

"The first thing we must stop doing is making racism a personal thing and understand that it is a system of advantage based on race," says Doreen E. Loury, director of the Pan African Studies program at Arcadia University, near Philadelphia.

Loury says racism "permeates every facet of our societal pores."

"It's about more than that cop who targets a teen while 'WWB' (walking while black) but the system that makes it OK to not only stop him but to put him in a system that will target and limit his life chances for life," she says.

Racial bias is so deeply engrained in people that it can manifest itself in surprising places, says Charles Gallagher, a sociologist at La Salle University in Philadelphia. He gave a hypothetical example:

"A white police officer in Ferguson may be married to a black woman and have black and Latino friends, but that doesn't mean the officer is above racial profiling," Gallagher says.

These old and new ways of talking about racism can be seen in how some whites and blacks perceive the events in Ferguson.

Many have already looked at them as something beyond a personal interaction between a white police officer and a young black man. They point out that two-thirds of Ferguson's population is black, yet the mayor, police chief and five of six city council members are white -- as are 50 of the 53 people in its Police Department.

Ferguson is like countless multiracial communities, they say: calm on the surface but seething with racial disparities beneath.

But those disparities are invisible to many whites, who often see themselves as victims of discrimination, writes Jamelle Bouie of Slate magazine in a recent essay, "The Gulf That Divides Us."

"Median income among black Americans is roughly half that of white Americans. But a narrow majority of whites believe blacks earn as much money as whites, and just 37% believe that there's a disparity between the two groups. Likewise, while 56% of blacks believe black Americans face significant discrimination, only 16% of whites agree," he writes.

"Many whites -- including many millennials -- believe discrimination against whites is more prevalent than discrimination against blacks."

But as Nicholas Kristof recently pointed out in The New York Times, **the U.S. has a greater wealth gap between whites and blacks than South Africa had during apartheid.**

The main problem nowadays is not the folks with the hoods, but the folks dressed in suits.

Eduardo Bonilla-Silva, author of "Racism without Racists"

Such racial inequities might seem invisible partly because segregated housing patterns mean that many middle- and upper-class whites live far from poor blacks.

It's also no longer culturally acceptable to be openly racist in the United States, says Bonilla-Silva, author of "Racism Without Racists."

Overt racism is so widely rejected in America that a white supremacist in Montana recently announced that he is creating a new inclusive Ku Klux Klan chapter that will not discriminate against people because of their color or sexual orientation. Instead, according to one report, the chapter's new mission will be to prevent a "new world order" where one government controls everything.

Another recent article revealed how white supremacists in America are facing such hostility at home that some have moved to Europe in an attempt to link up with far-right groups.

"The new racism, like God, works in mysterious ways and is quite effective in maintaining white privilege," Bonilla-Silva says. "For example, instead of saying as they used to say during the Jim Crow era that they do not want us as neighbors, they say things nowadays such as 'I am concerned about crime, property values and schools.' "

'Who you calling a racist?'

When protests erupted in Ferguson after the shooting this summer, various white and black residents tried to talk about race, but such discussions didn't bear fruit because of another reason:

People refuse to admit their biases, research has consistently shown.

Ross, author of "Everyday Bias," cited a Dartmouth College survey where misinformed voters were presented with factual information that contradicted their political biases.

There were voters, for example, who were disappointed with President Obama's economic record and believed he hadn't added any jobs during his presidency. They were shown a graph of nonfarm employment over the prior year that included a rising line indicating about a million jobs had been added.

"They were asked whether the number of people with jobs had gone up, down, or stayed about the same," Ross wrote. "Many, looking straight at the graph, said down."

Ross says it's even more difficult to get smart people to admit bias.

"The smarter we are, the more self-confident we are, and the more successful we are, the less likely we're going to question our own thinking," Ross says.

Some of the nation's smartest legal minds aren't big believers in racial bias either, and that could complicate efforts in Ferguson to reduce racial tensions.

Some say they could be eased by hiring more officers of color in Ferguson's police force.

But the conservative majority on the U.S. Supreme Court, led by Chief Justice John Roberts, has been suspicious of efforts to achieve diversity in workforces, believing that they amount to reverse racism or racial preferences, legal observers say.

Some fear the court is about to get rid of one of the most effective legal tools for addressing racial bias.

The court recently took up a fair housing case in Texas where the conservative majority could very well rule against the concept of "disparate impact," a legal approach that doesn't try to plumb the racist intentions of individuals or businesses but looks at the racial impact of their decisions.

Disparate impact is built on the belief that most people aren't stupid enough to openly announce they're racists but instead cloak their racism in seemingly race-neutral language. It also recognizes that some ostensibly race-neutral policies could reflect unintentional bias. A disparate impact lawsuit, for instance, wouldn't have to prove that a police department's white leaders are racist -- it would only have to show the impact of having all white officers in an almost all-black town.

Roberts distilled his approach to race in one of the court's most controversial cases in 2007. The court ruled 5-4 along ideological lines that a public school district in Seattle couldn't consider race when assigning students to schools, even for the purposes of integration.

"The way to stop discrimination on the basis of race is to stop discriminating on the basis of race," Roberts said in what is arguably his most famous quote.

Roberts has equated affirmative action programs with Jim Crow laws, says Erwin Chemerinsky, author of "The Case Against the Supreme Court."

"Chief Justice Roberts has expressly said that the Constitution and the government should be colorblind," Chemerinsky says. "He sees no difference between government action that discriminates against

minorities and one that benefits minorities."
What that means for Ferguson is that any aggressive attempt to integrate the police force could be struck down in court, says Mark D. Naison, an African-American Studies professor at Fordham University in New York City.

Unless a lawyer can find smoking-gun evidence of some police department official saying he won't hire blacks, people won't have much legal leverage to make the police department diverse, he says.

Racial biases can in some ways be more destructive than overt racism.

Daniel L. Ames, UCLA researcher

"Once the doctrine of disparate impact is weakened, you have to prove discriminatory intent in order to declare a practice discriminatory," Naison says. "Huge racial disparities in law enforcement can be tolerated if they are the result of policies which are race-neutral in how they are written in the law even through the implementation is anything but."

The courts may ignore colorblind racism, but ordinary people ought to be aware of it when they talk about racism, others say. Ross, author of "Everyday Bias," says being biased doesn't make people bad, just human.

He says people are hardwired to be biased because it helped keep our ancestors alive. They survived, in part, by having to make quick assumptions about strangers who might prove threatening.

"We need to reduce the level of guilt but increase the level of responsibility we take for it," he says. "I didn't choose to internalize these messages, but it's inside of me and I have to be careful."

Part of being careful is expanding our definition of racism, says Bonilla-Silva, author of "Racism Without Racists."

Racism has evolved, but our language for describing it hasn't, he says.

"Colorblind racism is the new racial music most people dance to," he says. "The 'new racism' is subtle, institutionalized and seemingly nonracial."

How long before another Ferguson erupts is anyone's guess. But if and when it does, the knife fight experiment suggests that before people look at videotapes, read police reports and listen to radio talk shows to form their opinions, they should do something else first:

Look within themselves.

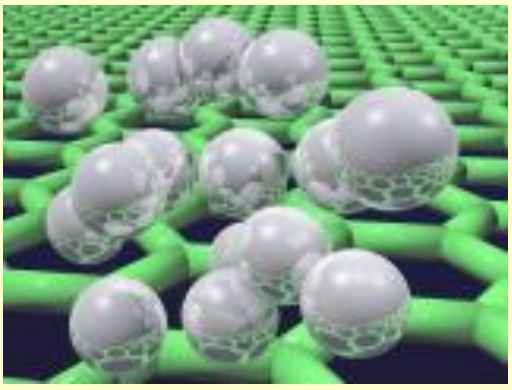
Future Military Sensors Could Be Tiny Specks of 'Smart Dust'

By Steve Weintz for War is Boring

This article was originally published by War is Boring on 28 September, 2014.

Source: http://www.isn.ethz.ch/Digital-Library/Articles/Detail/?ots591=4888caa0-b3db-1461-98b9-e20e7b9c13d4&lng=en&id=184160

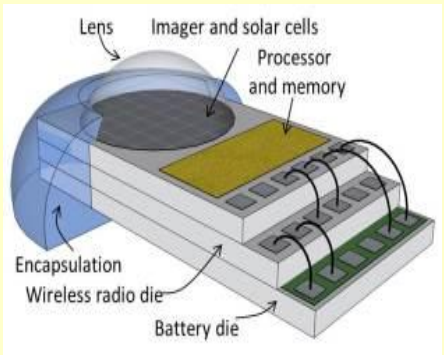
In the 1972 science fiction story *The Unknown* by Christopher Anvil, three space pilots find themselves plagued by "ultra-miniature spy-circuits." Tiny computers used for espionage and no bigger than a speck of dust.

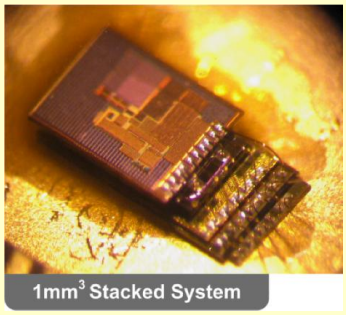


"They drift in like dust motes," one space pilot says. "But you have no control over where they drift. An air current, or a static charge, can completely foul up your arrangements."

In 1972, dust-sized electronic spies were far-out stuff. But in 2014, it's not so far out at all.

Coined by University of California, Berkeley professor Kristofer Pister, the term " smart dust" refers to tiny electronic bundles of power, sensors, computing and communications electronics that are cheap and abundant enough to scatter like, well, dust.





These tiny machines sense their environment, perform basic data processing and communicate with each other—to serve medical, industrial and military purposes.

Once a science-fiction idea, the smart dust concept caught the imaginations of geeks and investors a few years ago. When Pister coined the term in the late 1990s, the concept attracted funding from DARPA, the Pentagon's advanced research outfit.

It's easy to see why the military wants smart dust. During the Vietnam War, the military deployed a slew of remote sensors to detect and track North Vietnamese troops. Although the planned "McNamara Line" along the DMZ never fully materialized, the sensors proved their worth during the Siege of Khe Sanh in early 1968.

Better sensors airdropped over the Ho Chi Minh Trail—capable of detecting motion, sound, metal and even smell—guided the massive U.S. air campaign against North Vietnamese supply lines.

But these sensors were huge in comparison to what's possible now. Over the past dozen years, miniature sensor network technology progressed enough to bring specialized commercial devices to market. Used to monitor high-value packages, monitor machinery and building environments, these units are more cigarette-box sized than dust-sized.

Teeny tiny sensors

In 2001, Pister and his colleagues conducted a field demonstration for DARPA at the Marine Corps' base at Twentynine Palms. A small drone dropped six "motes" the size of a pill bottle near a road.

After synchronizing with each other, they detected the presence, course and speed of a Humvee and a heavy transport truck. When the drone passed overhead, the motes transmitted their data to the drone, which then beamed the information down to a base station.

Last year, a University of Michigan team showed off its **Michigan Micro Mote**, a solar-powered wireless computer (photos, left) not much bigger than a coarse grain of salt. A few years ago, Hitachi showed off experimental radio-frequency chips the size of dandruff flakes.

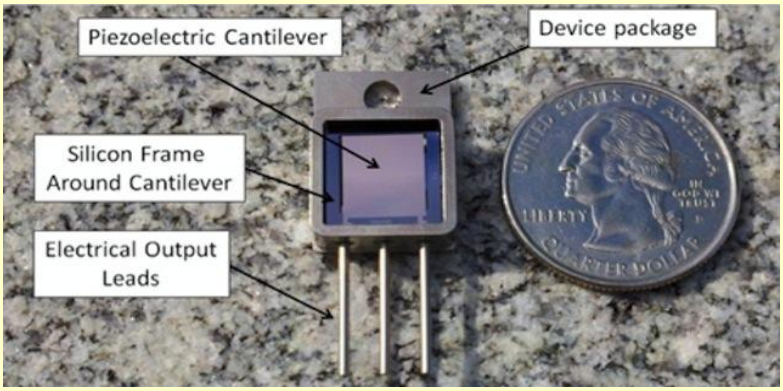
There are still big engineering constraints on such tiny devices—such as how to provide enough

power and how to broadcast communications signals. But new approaches may solve these problems.

Antennas need to be of sufficient size enough to operate, but it's theoretically possible to build antennas from graphene only a few atoms thick**.** Solar cells also require enough space to collect energy, and sunlight isn't reliably available.

However, tiny motes require very little power.

Clever software algorithms can also dramatically extend operating lives. This can mean turning on a mote for milliseconds, transmitting its sensor data before shutting off.



This saves lots of energy over time.

Tiny vibration motors can harvest power from anything that moves or shakes—strides, heartbeats and active machinery. Flaps, weights and supports created using chip-fabricating techniques turn mechanical vibrations into power for as long as the machine holds up. Perhaps years.

Even nuclear power can play a role in energizing smart dust. During the 1970s, plutonium powered a lot of pacemakers sewn into human chests. A tiny, long-lived power source meant fewer dangerous surgeries to replace the pacemaker's juice over a patient's lifetime.

Though huge by nano standards, these tiny medical devices are still ticking decades after their manufacture. But better chemical batteries and worries about tracking thousands of little nukes—not health concerns—led to the withdrawal of nuclear-powered pacemakers from the market.

In 2005, University of Wisconsin researcher Jake Blanchard demonstrated a tiny system that used the electron-spitting quality of radioactive nickel to attract a springy, hair-sized lever of copper. When the copper lever shorted the circuit, it sprang back and generated an infinitesimal amount of electricity.

Dusting off

Smart dust requires cheap, plentiful motes able to withstand environmental challenges. However ingenious their design, they must be cheap as dust to or their cost will be prohibitive. But long-term trends in microelectronics suggest these low costs are on their way.

Dust is also dirty, irritating and sometimes toxic. Smart dust can't be ubiquitous like real dust—we've already got enough of that stuff to worry about. That's why DARPA is thinking about how to get smart dust to die off on its own. This means intentionally restricting its battery life.

Challenges to the baseline technologies—power, communication and sensing—is harder work. There's also the possibility an enemy electronic warfare team could scramble the tiny sensors.

A widespread sensor mesh of smart dust that relies on radio waves to communicate will be just as vulnerable to electronic countermeasures as any other radio-based technology.

But smart dust might overcome such obstacles by using *swarm* behavior.

Thousands of motes, each generating a tiny bit of laser light, could transmit information to overhead drones by working together as a big distributed "flashlight." Or they could link up into a big low-frequency radio antenna to beam out their signals.

Ultimately, it might be the software behind smart dust that becomes the smartest thing about it.

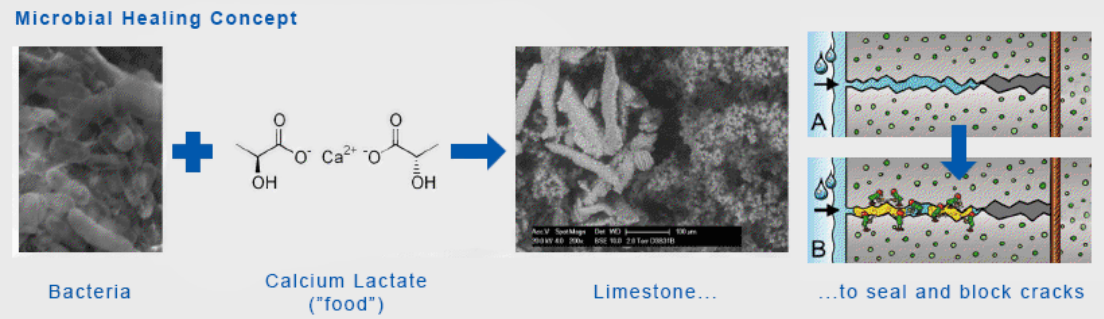
Which makes sense. The security, networking and processing algorithms able to bind together the motes in our minds' eyes are the key to this promising technology, just as our smartphones are nothing but shiny bricks without the software and cell networks behind them.

But the worst thing that could happen to your smartphone is dropping it on a sidewalk. Smart dust doesn't have this problem. Though as Anvil hypothesized in his science-fiction story, ultra-miniature spy sensors might just drift away in the wind instead.

Micro-capsules and bacteria used in self-healing concrete

Source: http://www.homelandsecuritynewswire.com/dr20141204-microcapsules-and-bacteria-used-in-selfhealing-concrete

Researchers from Bath are aiming to develop a novel self-healing concrete that uses an inbuilt immune system to close its own wounds and prevent deterioration. The project featured in the U.K. press this week in the *Telegraph* and *Financial Times*.



The life of concrete structures is reduced when the material cracks and water is able to get at the steel reinforcement, causing rust and degradation.

The project is funded by a £2 million EPSRC grant, matched by an additional industrial contribution of just over £1 million, and will involve our researchers in collaboration with partners Cardiff University (the lead partner) and the University of Cambridge.

A University of Bath release reports that the U Bath team aims to develop a concrete mix that contains bacteria within microcapsules, which will germinate when water enters a crack in the concrete to produce limestone (calcite), plugging the crack before water and oxygen has a chance to corrode the steel reinforcement.

Self-healing concrete could vastly increase the life of concrete structures, and would remove the need for repairs, reducing the lifetime cost of a structure by up to 50 percent.

Over seven per cent of the world's CO2 emissions are caused by cement production, so reducing the amount required by extending the lifetime of structures and removing the need for repairs will have a significant environmental impact.

Dr. Richard Cooper, from the Department of Biology & Biochemistry, said: "Cement is highly alkaline, making it a hostile environment for bacteria. **We'll be assessing different species of bacteria to find one that is able to form abundant spores and which will survive and germinate in this environment. The work will involve finding alkaline-tolerant isolates and testing their biology and physiology."**

Dr. Kevin Paine, from the Department of Architecture & Civil Engineering, said: "Concrete densifies as it hardens, so the pore size decreases to a level where bacteria may be crushed. We're looking at enclosing the bacteria in micro-capsules, along with nutrients and calcium lactate which the bacteria will convert when water becomes present and use to fill cracks in the concrete."

Dr. Andrew Heath, also from the Department of Architecture & Civil Engineering, said: "Self-healing materials are particularly suited to situations where safe access for maintenance is costly, so the outputs of this extended research program could reduce the life-cycle costs of infrastructure."

Dr. Cooper added: "Including bacteria in concrete offers a double layer of protection in preventing steel corrosion. Not only do the bacteria work to plug cracks in the concrete, the process of doing so uses oxygen present which would otherwise be involved in the corrosion process of the steel bars."

The research team will assess the survival of different species of bacteria in the concrete over time. They'll allow the concrete to mature over certain time periods and then grind it down to create a suspension which can be assessed by biologists for surviving bacteria.

Athens on fire as rioters mark anniversary of police killing of teen

Source: http://rt.com/news/212199-greak-clashes-water-gas/

Greek police used tear gas and water cannons to disperse crowds during clashes in the capital. Athens was gripped with protests marking six years since police shot dead an unarmed teenager during an anti-austerity rally.

At least 8,000 demonstrators marched in Athens on Saturday commemorating the sixth anniversary since the police slaying of Alexandros Grigoropoulos. Grigoropoulos' murder on December 6, 2008

sparked violent clashes across Greece, with cars being burned, shops looted, and police attacked in a number of Greek cities.

The violence on Saturday began at 19:30 in the evening by a group of some 200 black-clad masked men, local media reported. They started setting on fire cars and bank ATMs

and threw Molotov cocktails and other projectiles at police in the bohemian neighborhood of Exarchia, where Grigoropoulos was killed.

Police in anti-riot gear engaged the rioters firing tear gas at the demonstrators and deploying the water cannons.

At least two shops were set on fire amid the rioting while dozens of others were damaged. Athens police said they detained 211 demonstrators.

Clashes also broke out between police and demonstrators in the northern city of Thessaloniki, the second-largest in Greece. Police fired tear gas and stun grenades after a crowd of activists beat up two plainclothes policemen observing the protest.

Saturday's protests were also held in solidarity with a jailed anarchist, Nikos Romanos who witnessed the death of Grigoropoulos. He was sentenced in October for robbery and is now on hunger strike in prison demanding he be allowed to attend university classes. Lately his condition became critical.

Romanos was good friends with Grigoropoulos. He was fifteen when he witnessed his friend being killed. Romanos then became one of the focal points of public rage against the authorities and police brutality, which escalated into nationwide rioting.

EDITOR'S COMMENT: Romanos – the epicenter of recent riots in Athens – is a young man from a "nice" family with substancial financial background. He witnessed his friend dying; he did not appear in court to testify and had "contacts:" with anarchists (?) until he was arrested for (heavily) armed robbery in Kozani (Northern Greece – Feb 1t, 2013). The big issue here is this: will he be able to "rehabilitate" through university studies? His overall behavior until now suggests that he will not! But nobody can guess the future! On the other hand it is better to be prepared than sorry! He is not just a thief. Greek prisons are full of them and they do not act/behave like this. And his "hot" supporters that burn, riot, steal and turn Athens into a flaming city are not just supporters of a yound man wishing to fulfil his dreams via education and future hard work. When using urban warfare strategies seen in Maidan, Kiev (bocking streets with flaming barricades and through Molotov bombs from the top of nearby high buildings) then for sure the overall background of Athens' riots differs from a conventional opposition against an "unfair" system preventing education and prosperity.

Army castrates heraldic lion

Source: http://www.thelocal.se/20071213/9398

Before After (ouch!)

December 13, 2007 – **Protests from female soldiers have led to the Swedish military removing the penis of a heraldic lion depicted on the Nordic Battlegroup's coat of arms.** The armed forces agreed to emasculate the lion after a group of women from the rapid reaction force lodged a complaint to the European Court of Justice, Göteborgs-Posten reports.

But although the army was eventually happy to make the changes in the interests of gender equality, the artist who designed the insignia was less than pleased.

"A heraldic lion is a powerful and stately figure with its genitalia intact and I cannot approve an edited image," Vladimir A Sagerlund from the National Archives told Göteborgs-Posten.

Sagerlund blasted the army for making changes to the coat of arms without his permission.

"The army lacks knowledge about heraldry. Once upon a time coats of arms containing lions without genitalia were given to those who betrayed the Crown," said Sagerlund.

But the castrated lion has already won the day and is now worn on the arms of all soldiers in the battle group's Swedish battalions.

"We were given the task of making sure the willy disappeared," Christian Braunstein from the army's 'tradition commission' told Göteborgs-Posten.

"We were forced to cut the lion's willy off with the aid of a computer," he added.

The Nordic Battlegroup is one of eighteen such military groups in the European Union. Some 2,000 of its 2,400 soldiers come from Sweden, with the rest coming from Finland, Norway, Ireland and Estonia.

Golani "Mental trainer"

Source: http://i-hls.com/2014/12/golani-mental-trainer/

IDF's Golani Brigade has begun using Neurofeedback a in the framework of training. This innovative treatment tool is designed to train combat fighters in functioning under stressful situations, in order to improve their ability to withstand stress in combat, and cope with fighting conditions in the field.

According to the IDF's Technological and Logistics Directorate (Hebrew acronym: ATAL), training is carried out using a new technology**: the trainee is fitted with a head dress akin to a swimming cap.** This cap is attached to an electronic system complete with sensors and a computer, which follows his or her brainwaves and creates a graph indicating their brain activity.

The trainee uses an on-screen simulator and experiences various situations which call for decisions as well as simulate challenges the soldier must handle.

At the end of the session, the soldier and a therapist sit down together for a meeting during which they draw conclusions concerning the soldier's mo., stress and performance, including the quality of his or her decision making.

The simulator comprises various missions and tasks which simulate the battlefield. Soldiers must prove the level of their ability to carry out these tasks both mentally and physically.
The new simulator was first used by Golani Brigade cadets. Colonel Dr. Keren Ginat, head of IDF mental health department, this phase was a qualified success. She explained the method is used by athletes worldwide ahead of sporting events, even the Olympics. The IDF plans to have commanders, even senior commanders, tasked with making quick, tough decisions, which are at times fatal, to use the simulator.
One of the scenarios simulates a busy hospital with many people waiting to receive treatment, amid stressful chaos and noise. Trainees must overcome this stressful environment and decide who should be prioritized as part of sorting the situation out. This is one of the methods to train soldiers to make educated decisions and overcome stressful situations.

What's behind the astonishing rise of an anti-Islam movement in Germany?

By Rick Noack
Source: http://www.washingtonpost.com/blogs/worldviews/wp/2014/12/16/whats-behind-the-astonishing-rise-of-an-anti-islam-movement-in-germany/

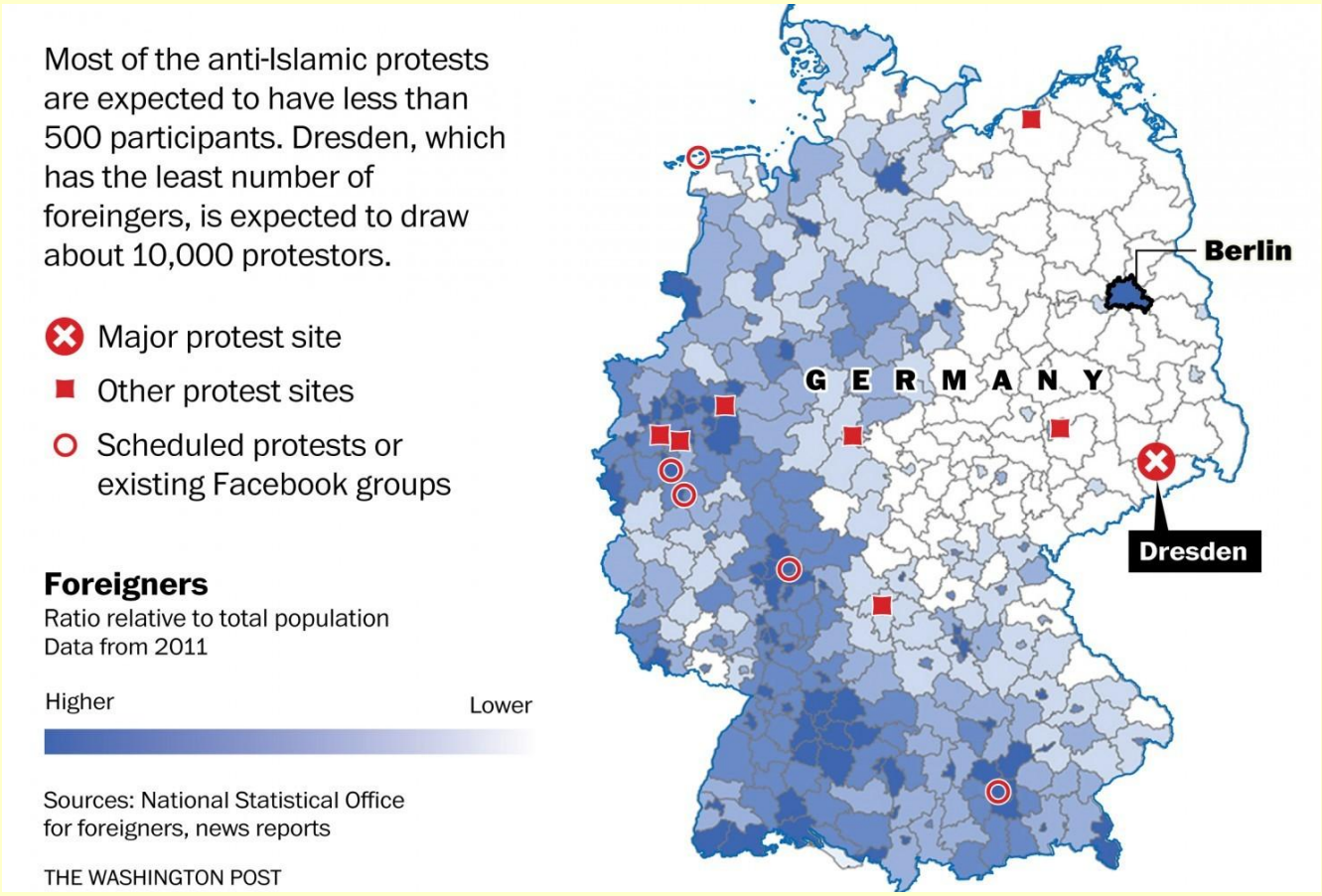
Supporters of the Pegida movement protest at another of their weekly gatherings on December 15, 2014 in Dresden, Germany. Pegida is an acronym for 'Patriotische Europaeer Gegen die Islamisierung des Abendlandes,' which translates to 'Patriotic Europeans Against the Islamification of the West.' (Photo by Sean Gallup/Getty Images)

Carrying German flags and banners saying "We're against religious fanaticism," an increasing number of German protesters, known as the Pegida movement, have taken to the streets in recent weeks to voice their concerns about an influx of Muslim immigrants.

On Monday, 15,000 came to the eastern German city of Dresden to march through the historic city center. Anti-Islam protesters have been chanting "We are the people!" – a slogan that was used in 1989 when eastern Germans rallied to bring down the communist regime. The movement's members have repeatedly emphasized that they are not extremists, but civil rights groups are accusing them of being "pinstriped Nazis."

In a country that is still haunted by World War II, the protests have come as a shock to many politicians and left-leaning activists. In an interview on Monday, Germany's justice minister Heiko Maas called the movement "a shame for Germany" and warned of a new "level of escalation of agitation against immigrants and refugees." About 6,500 human rights campaigners joined two separate counter-demonstrations on Monday that were organized in opposition to the anti-foreigner movement.

The protests have revealed a deep divide between many citizens and their political elite. Half of



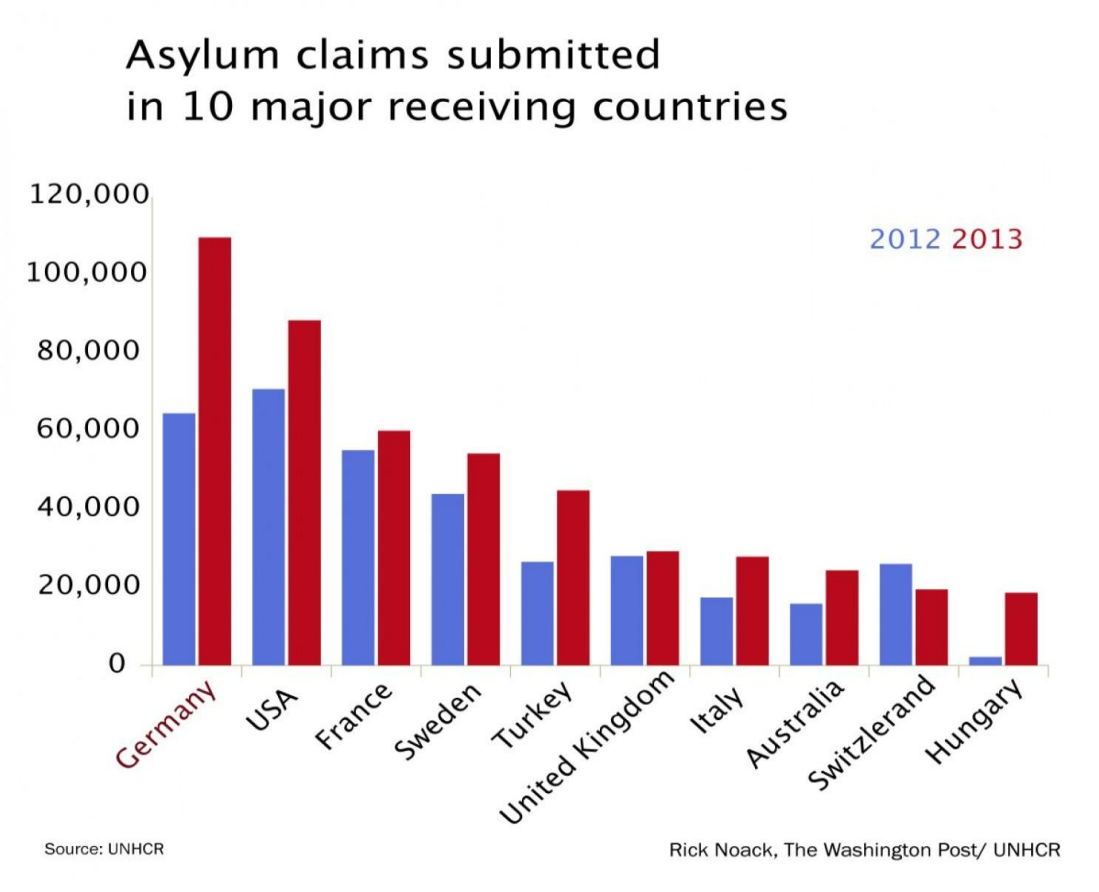
Germany sympathizes with the anti-Islam protesters, according to a ZEIT ONLINE-YouGov poll that was released on Monday.

Supporters can be found all over the country, but protests in western Germany have so far failed to attract large numbers of supporters. In eastern Germany, however, the rallies against immigrants have quickly gained steam – despite the fact that only few foreigners currently live there.

In the center of the protests – a region called Saxony – only 2.5 percent of all inhabitants do not have German citizenship. Many western German regions, however, have a much higher foreigner ratio of about 10 percent.

"Many eastern Germans know only few or no foreigners; they are scared because they have no idea what to expect from the influx of refugees," political scientist Werner Patzelt told The Washington Post.

The differences have historical origins, as well: Most foreigners in the west are from Turkey and came to Germany in the 1960s under a guest worker arrangement – at that time, east and west Germany were already split.
Both in the east and in the west, some citizens fear that immigrants might exploit the relatively generous German welfare system. The Guardian quoted a middle-aged female protester, who said at Monday's rally in Dresden that she was shocked to see that "asylum seekers in Germany have expensive mobile phones, while I cannot afford such luxury".
German Chancellor Angela Merkel – who grew up in eastern Germany herself – voiced harsh criticism of the popular anti-Islamic movement, saying there was "no space for hate campaigns and slander."



She warned protesters that they were being "exploited" by the organizers of the demonstrations.
Others have been more cautious. "The people who have taken to the streets are a minority, but they have found support among a majority of Germans," political scientist Patzelt said. Politicians, he says, are to be blamed for the surge of xenophobia. In 2013 and 2014, more asylum claims were submitted in Germany than in any other country – but the nation lacks a vision how to integrate refugees and immigrants into German society, according to Patzelt.
Last week, the conservative party Christian Social Union (CSU) proposed a law that would have forced foreigners to speak German at home. The idea was widely mocked by members of other parties and CSU quickly dropped it. Other proposals have been equally unsuccessful and encouraged the recent protests.
Although Pegida movement campaigners say they want to protest peacefully, some of their supporters are considered to be right-wing extremists.
German authorities estimate that there are about 10,000 right-wingers all over the country who are prone to use violence, and officials have observed a recent rise in politically motivated attacks against foreigners and other minorities.

So when Australian Twitter users created the hashtag **#Illridewithyou** to show solidarity with Australian Muslims on Monday, some German users felt the need to export the idea to their country.
On Dec. 22, both Pegida supporters and human rights groups will take to German streets again. The number of outspoken Pegida supporters might have risen further by then – but so will the number of Germans who protest in support of foreigners, human rights activists hope.

Counter protesters are silhouetted under a banner during a demonstration called by anti-immigration group PEGIDA, a German abbreviation for "Patriotic Europeans against the Islamization of the West", in Dresden December 15, 2014. REUTERS/Hannibal Hanschke)

Rick Noack *writes about foreign affairs. He is an Arthur F. Burns Fellow at The Washington Post.*


Merry Christmas
and a Happy New Year
2015
CBRNE-Terrorism Newsletter
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Lebanese hospitals facing chemical threats

CBRNePortal

By Georges Saad

Source: http://www.cbrneportal.com/preparedness-lebanese-hospitals-facing-chemical-threats/

As it was well known in Lebanon, both the medical staff working in health facilities and the first responders working at emergency medical services or fire brigade were not able to deal with any CBRN incident. In addition, they were not capable of handling and managing any relative event due to the lack of knowledge, training, equipment and incentives.

During the different Lebanese wars, the health care providers were able to deal with mass casualty incidents resulting from shelling and car bomb explosions. Their gained experience from such situations gave them the unfortunate advantage to be leaders in this field. However, it kept them as **beginners** in the management of CBRNe incidents.

On 21 August 2013, during the Syrian Civil war, a Chemical Nerve agent (The Sarin nerve gas) attack took place in eastern Ghouta, near Damascus. The large number of casualties there (estimated around 1300 people), as well as the open and uncontrollable borders between Lebanon and Syria caused panic and confusion among all Lebanese citizens. Consequently, Lebanese people in charge worked on preparing themselves by all means to face any potential "terrorist chemical attack" by nerve agents, such as, Sarin, Tabun, Soman, Mustard, and VX. The Lebanese Ministry of Heath, financially supported by the World Health Organization and in cooperation with the Lebanese Syndicate of Hospitals, took immediate actions. They worked on increasing the preparedness and response capabilities of healthcare providers in many governmental and private Lebanese hospitals, especially the ones situated near to the Syrian borders.

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▶ **Read the full article at source's URL**

Georges Saad *is a Senior Consultant in Emergency Preparedness and Disaster Management; he is actually working within 11 countries in the Middle East and Africa. He received his International Master Degree in Business Administration- Health management in 2007 from University of Dauphine-Paris. He is currently the Director of the Lebanese-European Academy of Emergency Medicine-LEAEM, a Continuing Formation partnership program in emergency Medicine, Life Support and Disaster Management, started in 2009 between Saint George Hospital University Medical Center and University of Balamand-Faculty of Medicine, Incentive Med-Germany and the American Heart Association-USA.*

Holy War, Dirty War: ISIS and the CBRN Threat

CBRNePortal

By Frank G. Rando

Source: http://www.cbrneportal.com/holy-war-dirty-war-isis-and-the-cbrn-threat/

Over the recent months, we have witnessed the barbaric acts of violence and terrorism committed by the dangerously radical, militant Islamic organization, ISIS. While, this extremist organization has committed vile acts reminiscent of ancient times, such as beheadings and crucifixions, as well as terrorist bombings, armed assaults and the use of conventional weaponry against resistant counterinsurgency efforts and non-combatants, ISIS has resorted to the use of chemical weapons, such as the recent use of chlorine gas in Iraq.

With the growing threat of ISIS acquiring and deploying CBRN weapons, and the proliferation of radicalization and jihadism expressed by non-traditional actors from around the world, terrorism and asymmetric warfare utilizing toxic, etiologic and radiological-nuclear agents by ISIS and related actors on a wider scale is not only possible, but probable.

The ubiquitous availability of toxic industrial chemicals and materials (TICs/TIMs) and radionuclides in commerce and industry is especially problematic, as these sources are not well secured despite upgraded mandates and some improvements in security countermeasures. Low-tech dispersal methods of these agents is not difficult to achieve, and even crude dissemination of biotoxins, microbial agents, and TICs/TIMs, may be

accomplished by contaminating foods, cosmetics, pharmaceuticals or other commodities. These methods could result in mass casualties, logistical-supply chain disruptions, gross economic adversity, even collapse, profound psychosocial impacts, civil disorder and environmental health and safety concerns.

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▶ **Read the full article at source's URL**

Frank G. Rando *possesses over 30 years of real world experience as a public safety professional, clinician, educator, emergency and crisis manager, author and consultant in the areas of tactical, disaster and operational medicine, weapons and tactics, law enforcement /criminal investigations, counterterrorism, hazardous materials management and emergency response, toxicology, environmental safety and health,and health care and public health emergency management.*

Coming Soon to Iraq—Thousands of Chemical Warfare Suits

Source: https://medium.com/war-is-boring/coming-soon-to-iraq-thousands-of-chemical-warfare-suits-34ab8ea47c35

November 24 – **The United States is sending thousands of gas masks and chemical suits to Iraq—as it equips Iraqi army and Kurdish troops before an upcoming counter-offensive against Islamic State.**

Islamic State has chemical weapons, but how much is both a big fear and also a bit of a mystery. There have been several engagements involving Islamic State fighters in both Iraq and Syria that included chemical weapons use.

The result is that American allies tasked with going head-to-head against the jihadist group risk inhaling poison gas.

The chemical protection gear is a small part of a $1.6-billion request the Pentagon sent to Congress on Nov. 20. The money will go towards equipping three Iraqi army divisions, three Kurdish brigades and a force of Anbari tribal fighters to roll back Islamic State.

The money pays for tens of thousands of M4 rifles, M240 machine guns and nearly 2,000 Carl Gustaf anti-tank weapons. That's in addition to hundreds of mortars, shotguns and radios. And more than 2,000 trucks.

For the chemical-biological protective gear, the U.S. plans to equip the three Iraqi divisions with 45,000 M50 gas masks and hooded, sealed body-suits known as JLISTs (photo). The Iraqi divisions will also receive 216 chemical detectors—used to test nerve, blood and blister agents. Another 15,000 masks and JLISTs, and 72 chemical detectors, will go to the Kurdish brigades.

The chemical threat is real. Although Islamic State has only used such weapons on a small scale.

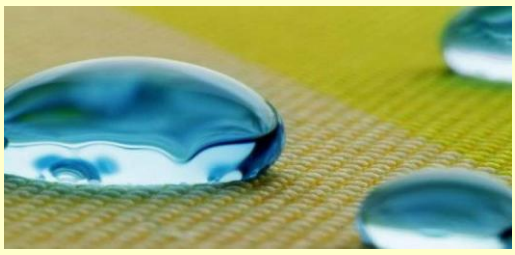
On Sept. 15, Iraqi police held a position outside the town of Duluiyah when Islamic State fighters unleashed a cloud of bleach-smelling chlorine gas towards the Iraqi positions. Eleven police officers suffered injuries. "It was a strange explosion. We saw a yellow smoke in the sky," one Iraqi cop told *The Washington Post*.

The Iraqi police retreated, coughing as they went.
Less clear is an attack on Kurdish troops near Kobane on July 12. Bodies of three Kurdish fighters killed in the village of Avdiko with white spots possibly caused by a chemical agent. On Oct. 21, more Kurdish troops fighting for Kobane began vomiting and suffering from outbreaks of red blisters—a sign of a potential exposure to chlorine gas.
To be sure, chlorine is a much less deadly weapon that nerve agents like sarin—which the Syrian regime used on civilians in the Damascus suburb of Ghouta in August 2013. But it can still be demoralizing and debilitating. A cloud can stop an attack, or force an enemy to flee if they're not wearing protection.
The good news is that in Iraq, at least, Islamic State hasn't used chlorine much—and it's a relatively weak weapon. But this also makes the attacks that have happened hard to verify.
It's somewhat of a different story in Syria. In September, the Organization for the Prohibition of Chemical Weapons announced it possessed evidence that militants—although it did not name who—used chlorine gas "systematically and repeatedly" against villages in northern Syria in 2014.
The other question is whether Islamic State has made much use of captured chemical weapons. The militants overrun the Al Muthanna chemical weapons complex near Fallujah this summer—a relic of Saddam Hussein's chemical weapons program.
But mustard gas artillery shells are likely the only weapon stored at the site that Islamic State could conceivably redeploy on the battlefield—and even that comes with horrendous risks to the militants tasked with pulling rusted, leaking chemical shells out of the crypt and firing them.
By contrast, chlorine is relatively easy and cheap to make. The jihadists can simply mix bleach and vinegar in a lab. They just have to produce enough to use effectively in the open—relying on the wind to carry the gas towards their enemies.
But that's not so effective if the troops waiting on the other end are covered in protective suits and gas masks.

UCLA engineers create 'superomniphobic' texture capable of repelling all liquids

Source: http://newsroom.ucla.edu/releases/ucla-engineers-create-superomniphobic-texture-capable-of-repelling-all-liquids

A pair of researchers from the UCLA Henry Samueli School of Engineering and Applied Science has created the first surface texture that can repel all liquids, no matter what



material the surface is made of. Because its design relies only on the physical attributes of the texture, the texture could have industrial or biomedical applications. For example, the surface could slow corrosion and extend the life of parts in chemical and power plants, solar cells or cookware.
Water will bead up on a nonstick cooking pan because it is coated with a hydrophobic material that repels water thanks to its chemical composition. If the hydrophobic material also is rough at the microscopic scale, it can trap air at its surface, causing the water to bead up and roll around effortlessly. Scientists have named such surfaces "superhydrophobic" to distinguish their unusual zeal to repel water. As an example in nature, water droplets will bead and roll down on some leaves.
"At the microscopic scale, the leaves' surfaces are 'hairy' and points of contact with water are reduced," said Chang-Jin "CJ" Kim, a UCLA professor of mechanical and aerospace engineering, and the study's principal investigator. "This reduction in points of contact means the water is held up by its own surface tension. Manmade superhydrophobic surfaces have been designed to take advantage of this phenomenon by forming

microscale roughness or patterns on a hydrophobic material."

While a nonstick cooking pan is hydrophobic, it is not "oleophobic," meaning that it does not repel oil-based liquids. Cooking oil spreads out rather than beading up because it has a lower surface tension than water, making it more difficult to repel. Since the material is not oleophobic, roughening it won't make its surface oleophobic, let alone "superoleophobic."

However, in recent years scientists have created certain microscopic textures capable of making surface hydrophobic materials' surfaces not only oleophobic but also superoleophobic.

But a true "omniphobic" surface — one that can repel *any* liquid, even those with the lowest surface tensions — has remained elusive.

Liquids with extremely low surface tension will "wet" not only the cooking pan but also even the best-performing superoleophobic surfaces today, collapsing into their microscopic texture. These liquids include fluorinated solvents, some of which are used for industrial applications like cooling electronic devices. Although the term "superomniphobic" began to be used by some, no surface was shown to repel the fluorinated solvents.

Working with Tingyi "Leo" Liu, a postdoctoral scholar in Kim's lab and the paper's lead author, Kim demonstrated for the first time true omniphobicity. The engineers formed a surface covered with thousands of microscale flathead nails, each about 20 micrometers in head diameter — each much smaller than the width of a typical human hair — resembling the appearance of existing superoleophobic textures.

The effect had never previously been observed, either on manmade or natural surfaces. It relies solely on the physical attributes of the texture, rather than any chemical properties of the material the surface is made of. Kim said it would actually be appropriate to call it a "mechanical" surface.

The research, which was part of Liu's doctoral dissertation at UCLA, is published in the journal Science.

The key to the team's innovative design is additional nanoscale details around the nail heads. Underneath the flat head, a nanoscale thin and short "curtain" surrounds the top and droops down vertically. This overhang creates a reverse meniscus when the liquid is on the surface and suspended between the nails. These special nails, spaced about 100 micrometers apart, are reminiscent of a serif letter "T" in cross section. On this engineered surface, even completely wetting liquids roll around like a ball and slide right off when the surface tilted.

"In a manned spaceship, you can see how a liquid will hold together as a sphere and that's because it's completely surrounded by air, that's the same idea here," Liu said. "On our textured surface, liquid sits on a cushion that is 95 percent air, and its own surface tension holds it up so it can roll over the surface without collapsing."

The surface super-repelled all available liquids, including water, oils and many solvents, qualifying to be superomniphobic. It even super-repelled a fluorinated solvent called perfluorohexane, the liquid with the lowest known surface tension.

The team made the same microscale pattern on surfaces of glass, a metal and a polymer. In each case, the engineered surface super-repelled all liquids in a series of tests.

The researchers said it could be capable of lasting a long time in an outdoor environment, such as on buildings or vehicles, because its repelling properties would not degrade from ultraviolet light exposure and extreme temperatures. And it could improve biomedical devices because its repelling properties would not degrade because of fouling by biofluids.

Kim also has a UCLA faculty appointment in bioengineering and is a member of the California NanoSystems Institute. The researchers have filed a patent on the work.

▶ **Watch some interesting videos at:** http://phys.org/news/2014-11-superomniphobic-texture-capable-repelling-liquids.html

EDITOR'S COMMENT: This might be also applicable to a new generation of personal protective equipment.

Maritime security: Applications and perspectives to combat chemical, radiological and explosive threats

By Fabrizio Pirelli[1,2*], Orlando Cenciarelli[2,3], Valentina Gabbarini[2], Andrea Malizia[2,3], Giuseppe Famũ[1], Alessandro Sassolini[2], Fabrizio D'Amico[2,3], Daniele Di Giovanni[2,3], Mariachiara Carestia[2,3], Leonardo Palombi[2,4], Carlo Bellecci[2,3] and Pasquale Gaudio[2,3]

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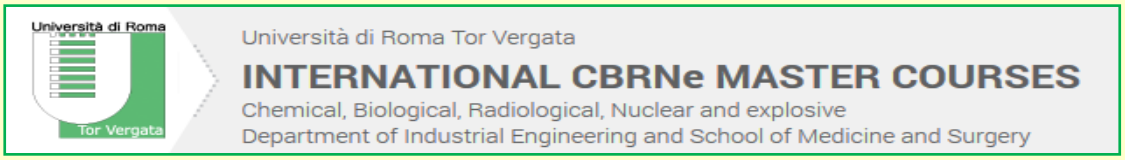

ABSTRACT

In a globalised world, the potential for crisis in the exchange of goods through searoutes continues to increase due to its low costs and technological progress. Theworldwide terrorist threat has increasingly identified transports as a main target, showing several gaps in the field of security to which international conventions and organisations have tried to find solutions. The development of regulations that has followed the awareness of risks in the maritime sector has determined the creation of a complex organisation attending to prevention procedures and emergency measures. The control of maritime security is based on risk analysis and deterrence measures. This modus operandi, which involves public and private actors with different skills, has allowed the achievement of important results. In this work, we analyse maritime security by discussing the method used for risk assessment of passenger and cargo ships in relation to chemical, radiological and explosive threats, and available technologies that can be used to avoid illicit acts on board ships.

▶ **Read the full paper at:**
http://www.mastercbrn.com/uploads/various/20141126468426116_Pirelli_paper.pdf

Syrian minister claims terror groups used chlorine as chemical weapon

Source: http://www.foxnews.com/world/2014/12/01/syrian-vice-foreign-minister-claims-terror-groups-have-used-chlorine-as/

December 01 – Syria's vice foreign minister denied Monday that his government ever used chemical weapons or chlorine during the country's brutal civil war and warned that terror groups are using such weapons.

Faysal Mekdad was speaking at a meeting of the Organization for the Prohibition of Chemical Weapons as the group comes close to fully eliminating Damascus' deadly stockpile of nerve agents and poison gas -- helping international efforts to prevent terrorists using such weapons.

Mekdad said that terror groups "have used chlorine gas in several of the regions of Syria and Iraq."

It's not the first time such claims have been made. In October, Iraqi officials said militants from the Islamic State group used chlorine gas during fighting with security forces and Shiite militiamen north of Baghdad. The statements in Iraq came two days after Kurdish officials and doctors said they believed IS militants had released some kind of toxic gas in an eastern district of Kobani.

President Bashar Assad's government also is widely believed to have unleashed chemical weapons during the civil war, despite its repeated denials.
Chlorine gas is readily available and used in industry around the world, but can also be used as a weapon.
Angela Kane, the United Nations' disarmament chief, also acknowledged the new risks posed by terrorists.
"There is a very distinct threat that has arisen and actually also is being investigated by the OPCW with a fact-finding mission," she said, adding that various international bodies and the U.N. are coordinating efforts to fight terrorism.
In a preliminary report issued in September, the fact-finding mission concluded that a toxic chemical, almost certainly chlorine, was used "systematically and repeatedly" as a weapon in attacks on villages in northern Syria earlier this year, but didn't apportion blame.
The OPCW, a Hague-based body, won the 2013 Nobel Peace Prize.

Who Really Used Chemical Weapons in Syria?

By Reese Erlich
Source: http://whowhatwhy.com/2014/12/01/really-used-chemical-weapons-syria/

The following article is adapted from journalist Reese Erlich's new book, "Inside Syria: the Backstory of Their Civil War and What the World Can Expect".

The videos shocked the world. Hundreds of bodies lay on the floor of makeshift morgues in and around the town of Al Ghouta on the southeastern outskirts of Damascus.
Early in the morning of August 21, 2013, Sarin gas killed hundreds of men, women, and children. Victims suffered horrible deaths, going into spasms and gasping for air. The videos, produced by the rebels, blamed the Syrian army.
The Obama administration strongly condemned the Assad regime and over the next few weeks prepared to bomb Syria in retaliation. The rebels hoped the American bombing raids would destroy Assad's air force and lead to an opposition victory.
The Assad regime argued that the rebels, not the government, had fired the chemical weapons in order to provoke a US assault on Damascus. UN weapons inspectors eventually issued two reports on the use of chemical weapons. Investigative reporters cast doubts on some of the Obama administration's claims. The controversy deepened over time.
So the question remains: Who used chemical weapons and why? First, the official US government version.

The US Government Account:
On August 30, the White House issued a "government assessment" about the Al Ghouta attack. It stated that the Sarin gas killed 1,429 people, including 426 children. The White House stated that the Syrian military had used chemical weapons previously. The assessment said, "We assess that the opposition has not used chemical weapons. We assess that the regime's frustration with its inability to secure large portions of Damascus may have contributed to its decision to use chemical weapons on August 21."
The US position seemed to gather strength when Human Rights Watch and the *New York Times* indicated they had independently analyzed information that calculated the trajectory of the rockets that landed in the Al Ghouta area.
Rick Gladstone and C.J. Chivers of the *Times* wrote that rockets were fired from a military complex solidly under government control, some nine kilometers from the Al Ghouta sites. Chivers wrote that the rockets were fired from Mount Qasioun, which he described as "Damascus's most prominent military position. . . . It is also a complex inseparably linked to the Assad family's rule." The article held the top forces of the regime responsible for the attack and discounted the possibility that a rogue officer or a rebel mole carried it out.

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Within weeks, the U.S. version of events began to fall apart. First was the matter of civilian deaths.

The White House figure of 1,429, a strangely precise number for estimating mass deaths, was nearly three times the size of the highest estimates of other reliable sources. Doctors Without Borders, which had medical personnel on the ground in Al Ghouta, estimated 355 deaths. British intelligence indicated 350, and the pro-opposition Syrian Observatory for Human Rights counted 502. Only the Syrian National Coalition, the opposition group backed by Western powers, agreed with the U.S. estimate. But when pressed by the Associated Press for a list of names, it could come up with only 395.

Ake Sellstrom, head of the UN chemical-weapons inspection team, said the rebels significantly exaggerated the number of dead and injured treated in Al Ghouta hospitals. "We saw the capability of those hospitals, and it is impossible that they could have turned over the amount of people that they claim they did." The discrepancy was explained when *The Wall Street Journal* revealed that U.S. intelligence had scanned the rebel videos with face recognition software to count the number of dead. They made no on-scene investigation.

Second, serious questions arose about the White House claim that the Sarin rockets were fired from the heart of Assad-controlled Damascus. The *New York Times* and Human Rights Watch analyses assumed that the rockets were fired from over nine kilometers away.

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But a report published by missile experts showed otherwise. Richard Lloyd is a former UN weapons inspector and currently works at Tesla Labs in Arlington, Virginia. Theodore A. Postol is a professor of science, technology, and national security policy at the Massachusetts Institute of Technology in Boston.

They analyzed the data presented by the UN inspectors concerning the Sarin-laden rockets. They concluded that the rockets would have a maximum range of two kilometers. When asked about this issue at a press conference, Sellstrom concurred that the two kilometer range would be a "fair guess." He later indicated the rockets could have been fired as close as one kilometer.

Lloyd and Postol superimposed the two kilometer rocket range onto the White House maps. Their report said, "These munitions could not possibly have been fired at east Ghouta from the 'heart,' or from the eastern edge, of the Syrian government-controlled area shown in the intelligence map published by the White House on Aug. 30, 2013."

The report noted that these "improvised artillery rockets" could have been constructed by the army or the rebels. "The indigenous chemical munition could be manufactured by anyone who has access to a machine shop with modest capabilities, that is, the claim is incorrect that only the Syrian government could manufacture the munition." The *New York Times* wrote about the report and noted the much shorter range but never retracted its erroneous reports that the rockets must have been fired from the Mount Qasioun military complex.

Poking holes in the U.S. government's case doesn't automatically mean the rebels were responsible, however. Were the rebels militarily capable and politically willing to carry out a massive war crime against their own supporters?

The Syrian Version

As a liquid, Sarin is quite volatile and can't be stored for very long because it can corrode storage containers and warheads. So Sarin precursor chemicals are stored separately and then mixed prior to use. They can be mixed in a lab by trained technicians. Mixing in the battlefield can be very dangerous to both the technician and anyone nearby. The Syrian army has admitted having Sarin precursors in large quantities. Some extremist rebel groups may have had some as well.

I spent some time in Damascus interviewing government officials and experts about the chemical-weapons issue. The Syrians presented a version of events sharply at odds with the U.S. government narrative.

On March 19, 2013, rebels used Sarin against a pro-government neighborhood in the village of Khan Al Asal near Aleppo, according to Dr. Bassam Barakat, a medical doctor and pro-government political consultant. He told me that blood samples and other physical evidence were sent to

Russia for analysis. Officials there wrote a 100-page report indicating rebel use of Sarin and delivered it to the United Nations, but neither party ever made it public. According to Barakat, the Russians confirmed that the Sarin had originally come from the chemical stockpiles of Libyan dictator Muammar Qaddafi, who had been supplied by the old Soviet Union. Extremists in Libya shipped the Sarin chemical precursors to Turkey, where they were then smuggled across the border into Syria, according to Barakat. Assad officials were so confident that they could prove the rebels had used the poison chemicals, they allowed UN inspectors into Syria to investigate, but only after months of delay.

The final UN chemical-weapons report confirmed a number of points in the Syrian government version. Rebels were shelling Khan Al Asal prior to the chemical attack. At about 7:00 a.m., a munition hit the area some 300 meters from a government checkpoint. The UN report indicated, "The air stood still and witnesses described a yellowish-green mist in the air and a pungent and strong sulfur-like smell. . . . The witnesses reported seeing people scratching their faces and bodies. They also observed people lying in the streets, some unconscious, some having convulsions and foaming from the mouth."

The UN inspectors concluded that Khan Al Asal had been attacked with Sarin. The UN inspection team was unable to visit the town due to security concerns but was able to interview eyewitnesses and take medical samples of residents who had come to Damascus. A Syrian government report indicated that twenty people died from the Sarin attack and 124 were injured.

Interpreting the Facts

Those are the facts. Now the interpretation. It's been my experience that if something doesn't make sense politically, it doesn't make sense militarily. In this case, why would the Syrian army attack its own village? If it was seeking to discredit the rebels, why kill and injure so many of its own soldiers and civilians? On the other hand, the rebels—particularly extremists of al-Nusra and the Islamic State—would gain a lot from the use of chemical weapons. They would both kill the enemy, which included pro-Assad civilians, and discredit the Assad regime by blaming it for the attack.

One high UN official admitted that the Syrian government was not responsible for Khan Al Asal. Carla del Ponte told a Swiss TV interviewer, referring to the Asal incident, "This was use on the part of the opposition, the rebels, not by the government authorities." Del Ponte was a member of the UN Independent Commission of Inquiry on Syria and a former war-crimes prosecutor for the International Criminal Tribunal for the former Yugoslavia. After her initial statement, she and other members of the commission of inquiry stopped commenting.

Then, in late May, Turkish newspapers reported that suspected members of al-Nusra were arrested carrying two kilograms of Sarin with plans to attack the US Air Force base at Adana, Turkey. By the time the case came to trial, however, the Turkish government did not prosecute the men for possessing Sarin. There's no public record on why prosecutors didn't pursue the chemical-weapons issue.

In another incident in late May, Iraqi authorities arrested five alleged members of the Islamic State for building two labs to manufacture Sarin and mustard gas. At a press conference, the police displayed lab equipment and weapons. At the time the Islamic State was part of al-Nusra and was also carrying out its own activities inside Syria.

Al-Qaeda Rebels Had Chemical Weapons Expertise

So it appears that al-Qaeda-affiliated rebels had the expertise and capability to carry out small-scale chemical attacks. In Khan Al Asal they may well have deployed Sarin against the Syrian army and its supporters.

The Syrians charge there was another, virtually unknown chemical-weapons attack in May 2013. Dr. Bassam Barakat described a Sarin attack on an army checkpoint near the Scientific Studies and Research Center in Damascus, an area near Hamish Hospital. Barakat said a rebel mortar shell packed with Sarin hit dozens of Syrian soldiers. Twenty died and one hundred were injured, according to Barakat.

Syrian Minister of Justice Najm al-Ahmad confirmed the attack. "The soldiers died of suffocation," he

told me. He and Barakat argued that the Syrian army wouldn't use chemical gas against its own soldiers, and therefore the rebels had to be responsible. The incident was briefly reported on Syrian TV at the time but not mentioned further. I asked both men why such a horrific attack was not more widely publicized by the Syrian government. After all, an attack of such magnitude against government soldiers would point suspicion directly at the rebels. As far as I can tell, the incident was never reported to the United Nations and certainly wasn't included in the inspector's reports.

The United Nations reported a total of seven alleged chemical weapons incidents. Inspectors were unable to collect enough data in some cases. Incidents included attacks on both rebel and pro-government areas. So what does this mixed record of likely responsibility mean for the massive attack on Al Ghouta?

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The Al Ghouta victims lived in rebel-controlled areas in towns to the southeast of Damascus. Virtually all the victims were treated in rebel-controlled medical facilities, not government hospitals. The UN inspectors were able to examine the Al Ghouta area in a timely manner. They collected contaminated soil, took medical samples from victims, and located at least some of the munitions used.

The United Nations concluded that without doubt victims had been exposed to Sarin. The gas was delivered by guided rockets and artillery-fired rockets. The guided rockets, a modified version of an old Soviet Grad, were launched independently. The other munitions, which have tail fins, are fired from artillery but have no independent guidance system.

UN inspectors found five munitions carrying Sarin that hit the Al Ghouta area. Each of the two Grads were capable of carrying thirteen gallons of Sarin, and three artillery-launched rockets could carry eleven to sixteen gallons each. If those figures are correct, and the munitions were filled to capacity, whomever fired the rockets had to either transport the Sarin from a sophisticated lab or mix and load fifty-seven to seventy gallons of liquid Sarin in battlefield conditions, which is no small task.

London-based chemical-weapons expert Dan Kaszeta told me that such a batch of Sarin would require a huge amount of "precursor chemicals and produce a significant waste stream." An organized army with proper facilities and trained technicians seemed to be the likely culprit. On the other hand, if UN inspector Sellstrom, as well as professors from MIT and Tesla Labs, are correct on the rocket trajectory, the rockets were fired from areas very near to or under rebel control.

Assad Stupid Enough to Attack?

And the political question remains: Why would Assad be stupid enough to launch a major chemical attack just days after UN inspectors entered Damascus? He may be evil, but he's not stupid. Justice Minister Ahmad told me, "When the Syrian army was making progress in Al Ghouta, the terrorists wanted the world to look at another issue, so they used chemicals again."

Joshua Landis, director of the Center of Middle Eastern Studies at the University of Oklahoma, offered a possible answer as to why the Syrian army used weapons of mass destruction. He told me that the regime was fighting a desperate battle in the suburbs against rebels who had considerable popular support among Sunni residents. Assad didn't have the troops to retake all the towns, so the army used Sarin. "It's like sending the U.S. Marines into Japan in 1945. But the United States used atomic weapons."

He noted that "Syria doesn't operate its military efforts around weapons inspectors. As long as the United States wouldn't invade, he [Assad] could get away with anything."

Investigative reporter Gareth Porter offered another explanation. He argued that much less Sarin was used than commonly thought. The rebels could have diluted Sarin with water. So they would only have had to manufacture as little as fifteen gallons of Sarin. Some victims showed symptoms inconsistent with Sarin poisoning, possibly caused by tear gas or smoke grenades. Under Porter's theory, extremist rebels didn't have to transport dozens of gallons of Sarin from Turkey to Al Ghouta.

"The new information suggests a much less lethal attack with munitions that were less effective and perhaps even using much less Sarin than was initially assumed," he wrote.

So what conclusions can we draw? Both sides quite possibly

used Sarin. Both sides lied and manipulated evidence. At a minimum, the Obama administration exaggerated its case to justify a military attack on Syria. At worst, the White House fabricated intelligence. Bottom line: no one has yet presented convincing evidence of who perpetrated the horrific Al Ghouta attack.

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30 Years After The Bhopal Disaster, India Has Not Learned The Lessons Of The World's Worst Industrial Tragedy

Source: http://www.ibtimes.com/30-years-after-bhopal-disaster-india-has-not-learned-lessons-worlds-worst-industrial-1731816

The now decaying building of the Union Carbide facility in Bhopal, central India from where a deadly gas leaked on Dec. 3, 1984, that killed thousands and affected more than half a million people. Amit Deshmukh

Harish Singh Yadav vividly remembers that chilly December night in Bhopal, 30 years ago. Events of that night changed his life forever, the 58-year-old said.

"We were sleeping, when suddenly my daughter woke us up. She said her eyes were burning," said Yadav, a father of two. "Soon, all of us in the family had the same sensation, as if someone was burning chilies. We all began coughing. Then, when I opened the window, I saw people running for their lives."

On Dec. 3, 1984, almost 40 tons of deadly methyl isocyanate (MIC) gas, leaked from a Union Carbide India Ltd. insecticide-manufacturing plant situated in the middle of Bhopal, a city in central India, and the capital of Madhya Pradesh state. The plant manufactured Carbaryl, an insecticide that was sold under the trade name "Sevin."

Within four hours that night, over half a million people would be exposed to the leak, and several thousand would not see sunrise. While, officially, the government put the immediate death toll at just under 4,000 people, unofficial estimates vary from anywhere between 8,000 to 10,000 to much higher numbers. No one knows for sure how many perished that night and in the following month and years. Scores were never identified or accounted for. It was, in any case, the deadliest industrial accident in history.

Yadav said that he, like hundreds of others in the city, has had to live with the aftereffects of the leak, which left him with chronic breathing problems and reduced vision.

"I have had to spend almost a million rupees of my own on

treatment, and that is what has kept me alive," he said. That sum translates to $16,000, an enormous expenditure in India -- more than 10 times the nation's gross domestic product per capita.

"Whoever escaped the gas alive that day is now like a living dead body," said Yadav, who, in an ironic twist, now guards the decaying and eerily silent plant, spread over 60 acres.

The facility was shut down following the leak, never to be revived.

Thirty years on, the average Indian, indeed the average city resident who was not around at the time of the disaster and was fortunate enough to be not touched by it, has moved on, with precious little learned in terms of disaster management.

The accident itself has not led to any significant improvements in occupational safety standards in the country. Several experts who spoke with International Business Times said that while the Indian government set up various committees to assess the damage and recommend safeguards, the efforts amounted to little real change. Accidents are commonplace in the country's mines and factories. And across Indian industry, which is flooded with cheap immigrant labor from the country's villages, workplace hazards and workers' rights continue to remain unaddressed. The problem is compounded by a lax regulatory environment and endemic corruption, which analysts said stack the odds against people like those suffering from the Bhopal disaster.

'Negligence Led To The Disaster'

The Bhopal gas tragedy, as it came to be known, was a result of negligence followed by an attempted cover-up, say locals.

T. R. Chouhan, an engineer and a plant operator at the time who has written a book on the subject, said that the events leading up to the tragedy began almost as soon as Union Carbide Corporation (UCC), now a wholly owned subsidiary of the Michigan-based Dow Chemical Company, decided to set up the unit about 12 years earlier. A faulty industrial design was primarily to blame, he said, adding that rising maintenance costs and mounting losses led the company to cut back on safety measures that could have averted the leak.

"The actual cause of the accident was … an unproven design," he said. "Secondly, they built this plant at a very low cost, so they used double standards in the construction material."

The plant's setting in Bhopal, close to habitation, had been opposed by Shakir Ali Khan,

a Madhya Pradesh legislator, in the early 1970s, according to Abdul Jabbar Khan, a prominent activist who runs the Bhopal Gas Peedit Mahila Udyog Sangathan, a nonprofit that helps affected women. "He raised an alarm, but no one listened to him since he was a Communist and was seen as opposing an American multinational company setting up

shop in India," Khan said.

Chouhan said the safety equipment could only control smaller leaks and could not neutralize a leak of the magnitude that occurred that night. He claims that initially the operating and maintenance staff was trained well, but over

time there was a deterioration in the quality and numbers of such staff.

When the leak happened, the warning siren could only be heard inside the factory and not by the community, he said. "So, they got to know about the leak when the gas itself hit them. Moreover, the hospitals were not informed [about the chemicals], so there was no line of treatment or antidote," Chouhan claims.

Swaraj Puri, then the chief of police in Bhopal, said that he had never before heard of methyl isocyanate until a police forensics expert informed him of its deadly nature.

"MIC gas was never known to people in Bhopal before it was leaked. There was no antidote developed and even doctors could not read the patient's condition," said S. A. Pillai, director of the Bhopal-based Institute of Industrial Management for Safety, Health and Environment.

However, this claim is refuted by N.P. Mishra, a Bhopal-based doctor who was then the dean of the Hamidia Hospital, the city's largest, and head of the team of doctors that responded to the medical emergency that night.

"One hundred percent, we had an idea," he said, when asked if doctors knew of the leak's nature. "Antidote for every poison is not available. But we knew how to treat patients of inhalation of toxic gases. The treatment is the same for every gas, not much different," Mishra said. He said that most of the deaths that occurred that night were a result of pulmonary edema: "People drowned in their own secretions."

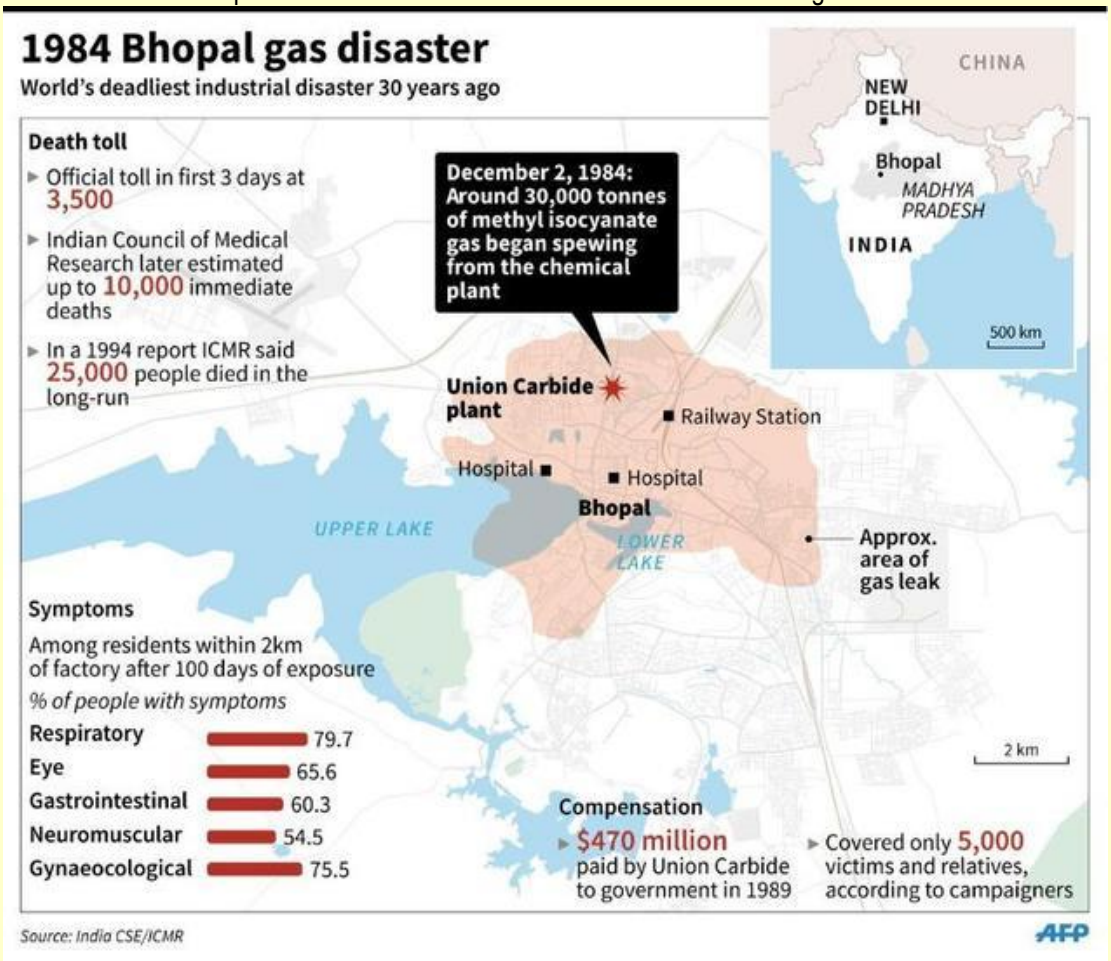
The massive leak that night was not the first fatal accident at the plant. In 1982, at least one plant worker had died after being exposed to phosgene gas, an intermediate chemical used in making Sevin.

Kumkum Saxena Modwel, who was then a doctor working at the plant, remembers taking the worker to the hospital where he later died.

to those who were working in the plant," he said.

A scientific panel appointed by the Indian government reportedly concluded that the tank that leaked had become vulnerable more than a month before the disaster.

A UCC spokesperson, in response to a query, emailed the following statement:



"There were lots of chemical exposures," she said. "We were very worried that with holding all these toxic chemicals, a big disaster can happen," she said.

Following this incident, Chauhan claims, several employees including him had expressed concerns with senior government officials, but nothing came of it. He said that after the 1982 accident, UCC made a safety survey and highlighted several problems in their report. A similar survey, he said, was done in September 1984 in West Virginia in the U.S. "That too threw up several severe problems, including contamination of the MIC storage tank. Both the reports were marked confidential. Those reports were not provided

"During the past 30 years, much has been written and broadcast about the tragedy and it continues to evoke strong emotions even three decades later. While Union Carbide continues to have the utmost respect and sympathy for the victims, we find that many of the issues being discussed today have already been resolved and responsibilities assigned for those that still remain."

An inquiry by the company claimed that the accident was the result of sabotage.

"The evidence showed that an employee at the Bhopal plant had deliberately introduced water into a methyl isocyanate storage tank. The result was the cloud of

poisonous gas," the company's report claims. "Also in 1988, an independent study of the incident by the prestigious international engineering consulting firm of Arthur D. Little supported the analysis by the Union Carbide team," the report further said.

Investigation And Conviction

Soon after the gas leak, the criminal probe was taken over by India's federal investigating agency, the Central Bureau of Investigation (CBI), which was mired in controversy as well.

In 2010, after a lengthy trial, an Indian court convicted eight people accused in the tragedy, including industrialist Keshub Mahindra. Mahindra, who was the non-executive chairman of Union Carbide India, and seven others were handed two-year sentences, but soon released on bail. Mahindra's office said that he would not comment on the matter.

B.R. Lall, the agency's officer in charge of the probe between 1994 and 1995, said that he had been told to "go soft" on Union Carbide chief Warren Anderson. "Communication received from the Ministry of Foreign Affairs asking us not to pursue extradition...he (Anderson) was the main culprit as far as we were concerned, " NDTV, a local news network, quoted Lall as saying.

Four days after the tragedy, Anderson arrived in Bhopal, and was arrested by Puri, the city police chief. The arrest was made on the orders of then Chief Minister of Madhya Pradesh, Arjun Singh. Within hours, Anderson was released and left the country, never to return. Puri, who has reportedly been accused of helping Anderson flee, declined to comment on the incident, as it is still a matter of investigation by an inquiry commission.

"But I will say this, I wish Anderson or someone from his family was in Bhopal on the night the gas leaked. They would have realized how people suffered," Puri said.

On Sept. 29, Anderson died, never having faced trial in India.

'No Lessons Learned'

Pillai, the industrial safety expert, said that few lessons on the subject appear to have been learned in India in the last three decades.

"There are four issues in learning - one is the infrastructure of the government, second is rules and regulations, third is enforcing of the rules and regulations, fourth is the total awareness of the subject," he said. "If these four issues are taken care of, this type of disaster will not be repeated. Are we on that track or not? If you ask me, I will say no."

According to Puri, contingency plans were put in place by the police following the disaster. "Now, we have fixed protocols, we have the involvement of the community in community-based disaster management, we have a state disaster management authority, people are getting trained and oriented," he said. But, he concedes, it would still be hard for India to cope with a disaster of the magnitude of the one in Bhopal.

"The realization that it can happen is missing. We think it is going to happen to somebody else."

In 2005, India established the National Disaster Management Authority to respond to such events, but its effectiveness has been far from satisfactory. And, in the recent past, the agency has been made largely redundant.

"Wherever there has been a disaster, the army has had to be called in. So, probably (the) army is the only organization which is ready to combat disaster," said Manoj Pandey, who heads the Bhopal Memorial Hospital & Research Centre (BMHRC), set up in 2001 to serve gas victims using the sale proceeds of UCC's stake in its Indian operation. "We do require rapid response teams. Not just industrial disasters, there could be man-made disasters, biological and chemical warfare could be there. So, definitely, we require rapid response teams."

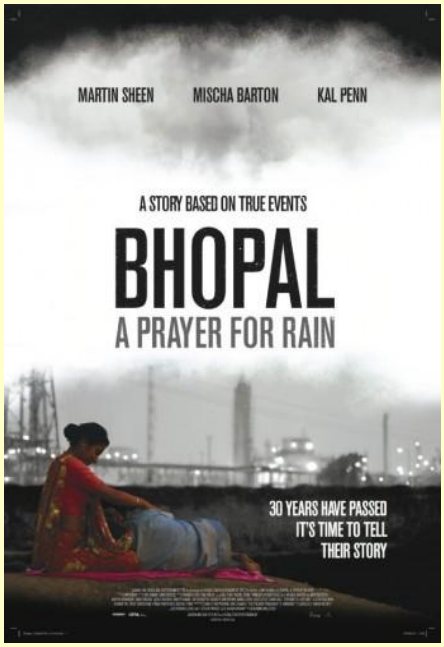
According to Pillai, one of the major impediments is that the industrial safety law, which was enacted when India was still under British government, is not stringent enough.

"People thought of amending it after the Bhopal disaster, why not before?" he asks, adding that industries in India simply do not follow safety protocols unless their customers compel them to. And, even then, they might only adhere to regulations until an official inspection, he said.

Pillai said that while India may not have learned much from its own disaster, other countries have. "All developed countries, including the U.S. have learned from Bhopal. I visited the U.K. and Japan and I

have seen that they are very afraid of the Union Carbide disaster," he said.
The issue of liability is yet another point of contention in India, according to Pillai.
"Both the process and the product should be covered under the liability clause," he said. "But unfortunately, what happens in our country is that the management bargains, the insurance compromises, and ultimately liability is compromised. This should be stopped."

Long-Term Health Effects
The incriminations, investigations and convictions mean little to Madan Lal, a 70-year-old unemployed resident of J. P. Nagar, a poor residential area just across from the boundary wall of the UCC plant.



"I was a balloon seller. Since I got exposed to the gas, I cannot breathe properly. I lost my only means of livelihood that night," said Lal, who claims he lives on the generosity of his neighbors.

The movie (2014)

Lal's story is by no means unique. Almost all gas victims complain of chronic ailments, including lung, eye and renal problems. A vast majority of those who were exposed to the toxic gas that night continue to suffer long-term side effects. Apart from the nearly 600,000 people directly affected by the disaster, BMHRC also caters to another million dependents, providing them free medical care, according to Pandey.
Privately, however, hospital staff say the facility is understaffed as doctors are leaving for greener pastures. Mishra, who treated disaster victims at Hamidia, said that eight of the 13 departments in the hospital are without doctors and blames the previous Congress Party-led government for the decay.

"I had told them, hire good doctors on contract and pay them good money, but no one listened."
Several victims who have taken to activism claim that the effects of exposure to the toxic gas have been passed on to later generations. Some of them run a nonprofit, Chingari Trust, that provides special education and medical help to more than 700 children who suffer from mental health issues, which they say is directly linked to the gas leak. However, Pandey said there are no data to support this theory.
"Honestly, we don't know, because there is no empirical evidence as of today to suggest that some of the changes might have passed on," said Pandey. "So, I'll say there is an absence of evidence but there is no evidence of absence," he adds.
Mishra refutes activists' claims that there are any seriously ill survivors alive today.
"One who can live for thirty years, can he be serious? All those who were seriously ill have since died," Mishra said. "One-time exposure can cause damage only once. That damage has limited their breathing capacity. One-time exposure will not produce repeat diseases," he said.

'Inadequate Compensation'
In 1989, the Indian Supreme Court approved a compensation of $470 million from UCC, which translated to 25,000 rupees ($400) for each survivor, while the family of each person who diedreceived 62,000 rupees. In 2010, the Indian government approved an enhanced relief package for seriously affected victims.
In 2001, UCC was acquired by Dow Chemical. On Nov. 19, IBTimes UK reported that Dow's shareholders were to "table two resolutions calling for the company's management to accept responsibility" for the Bhopal disaster and to "fully compensate victims and to pay for a full-scale clean-up of the still-contaminated area."
"The second resolution will call for Dow Chemicals to acknowledge that, rather than becoming a shareholder in UCC (which Dow's management claims), the companies became a single entity, thus combining assets and liabilities," the report added.

Meanwhile, the activists refuse to relent. "Our main fight is not for money," said Abdul Jabbar Khan.
"We want that those who suffered should get proper medical aid and the following generations should be looked after well," he said. "I cannot bear to see people in pain…I feel like being in a long, dark tunnel. I just want to see some light at the end of it," Khan said, almost in tears.

A CBRNE Booklet for the members of the Public

Source:https://www.academia.edu/9608963/Responding_to_emergencies_involving_chemical_biological_radiological_and_nuclear_CBRN_hazards_Information_for_members_of_the_public?auto=download&campaign=upload_email

EDITOR'S COMMENT: This is a very useful booklet targeting populace – the most important player in all state response plans! It is a product of PRACTICE Eu-funded project and is written by Dr. M. Brooke Rogers (King's College London) and Dr. Richard Amlot (Public Health England) – both have excellent knowledge of CBRN issues and how people react in extreme emergencies.

Japan starts destruction of WWII chemical weapons in China

Source: http://news.asiaone.com/news/asia/japan-starts-destruction-wwii-chemical-weapons-china#sthash.lpnivZU9.dpuf

A Japanese-built facility in China on Monday began destroying the largest cache of World War II chemical weapons abandoned in the country, Tokyo officials said, in a rare case of cooperation between the two countries.
The facility has been built in Harbaling in the northeast, where some 300,000 to 400,000 chemical weapons are believed to have been left behind, a government official at Japan's Cabinet Office told AFP.

Both Japanese and Chinese staff work at the facility, the official said, adding: "As our responsiblity, we will sincerely proceed with the disposal by paying great attention to the safety of local people and the environment."
Relations between Tokyo and Beijing are at their worst for years over a territorial dispute in the East China Sea, and the


File photo: Reuters

continuing legacy of Japan's brutal 20th-century occupation.

"Abandoning these weapons was one of the severe crimes Japanese militarist invaders committed during their invasion of China," China's official news agency Xinhua on Sunday cited an unnamed Chinese official as saying.

In 1999 Tokyo and Beijing agreed to destroy the devices, with Japan providing all necessary funds, technology, experts and other resources. Originally the process was meant to be completed by 2007, a deadline later pushed back to 2012. It has since been delayed further.

The Japanese government's Abandoned Chemical Weapons Office says on its website that a total of 47,000 chemical munitions have previously been "excavated, recovered and stored".

Beijing, which regularly calls on Tokyo to show sincerity in confronting the past, urged Japan to work faster on the issue.

"The progress is still lagging far behind the plan set by China and Japan," foreign ministry spokeswoman Hua Chunying told reporters.

"China asks Japan to increase their input both in terms of personnel and materials and accelerate

the destruction of chemical weapons left by Japan in China."

Japan used more than 7,300 tonnes of toxic gases to make 7.5 million weapons between 1931 and 1945, the Beijing Times said Monday, citing Japanese scholar Yoshiaki Yoshimi.

Preparing first responders for CBRN incidents

Source: http://www.nato.int/cps/en/natolive/news_115712.htm?selectedLocale=en

Chemical, biological, radiological and nuclear (CBRN) weapons are among the most dangerous weapons in the world. Several terrorist groups have actively sought weapons of mass destruction as they can cause a higher mortality than conventional weapons. It is important to ensure that first responders are prepared for such eventualities and that decision makers get timely scientific and operational CBRN information to protect populations.

In order to effectively manage the consequences of CBRN incidents, **a training course for first responders took place at the Joint CBRN Defence Centre of Excellence in Vyškov, Czech Republic on 12 November 2014. Thirty military and civilian participants from consequence-management structures in Azerbaijan, Moldova, Ukraine and NATO countries attended the course entitled "Consequence Management after CBRN Incident".**

The main aim of the course was to ensure that first responders such as police officers, fire fighters and paramedics have a common knowledge base and a basic level of preparedness when responding to CBRN incidents. Blending theory with practice, the course focused on helping countries improve their civil emergency plans and looking at how NATO, the European Union and other international organisations organise their consequence-management systems. The 2011 Fukushima nuclear power plant incident, for instance, was closely examined, and experts who helped deal with the incident also participated in the course.

Dealing with the recovery

"A lot of people will be affected and a lot of subjects will be dealing with the recovery," said Captain Gorazd Stergar, CBRN defence course instructor at the JCBRN Defence COE. **"***And for this we need to be ready. This course provided opportunities on how and where to find possible solutions; each CBRN incident is unique,"* he added.

Consequence management is a national responsibility and each country is responsible for handling emergencies that occur within its own territory. However, responding to CBRN incidents involves many organisations and agencies as no single civil or military agency possesses the capacity and expertise to handle the many complex issues alone that may arise in response to CBRN incidents.

Promoting security

The co-director of this project is Colonel Mariana Grama, Ministry of Defence of the Republic of Moldova, whose country is facing security issues in this area. *"There are many vulnerable CBRN facilities that are lacking physical protection and presenting a high risk for our national security, public health and environment,"* said Colonel Grama. *"There is also an increase of CBRN agents imported in the country or transited through our territory and we are dealing with instability in bordering countries, in particular with Ukraine,"* she continued.

In the future, Colonel Grama hopes that she will be able to integrate what has been learnt into their national crisis-management planning. *"It will be easier and more efficient to improve interoperability between response teams at national and international levels and to review and enhance operational CBRN plans and actions in the country with the integration of international standards and procedures, especially EU and NATO ones,"* explained Colonel Grama.

With regard to greater coordination, Ukrainian Security Service officer Andrii Vasylyshyn, who attended the course, stated: *"Today's ongoing globalisation processes are changing the nature of warfare together with the increasing threat from global, networked, decentralised and outsourced terrorist groups who are prepared to use CBRN materials no longer as a means to achieve political objectives but as an end in itself."* He added, "*there is a growing need to protect society from potential future scenarios in which CBRN materials might be deployed by unconventional means of delivery. This will require cooperation between governments, counter-terrorism officials and counter-proliferation agencies."*

Sharing information on CBRN threats and risks

In addition to this training course, the JCBRN Defence Centre also inaugurated on 12 November NATO's first CBRN reachback capability. *"It provides timely scientific and operational CBRN expertise, assessments and advice to NATO commanders and their staff across the full spectrum of operations,"* said Jamie Shea, NATO Deputy Assistant Secretary General for Emerging Security Challenges.

The operations room located at the JCBRN Defence Centre will allow NATO commanders to protect deployed forces and provide experts with CBRN advice to help protect the civilian populations of member

countries. In short, it will enhance NATO's CBRN preparedness and first response capability.

"A comprehensive information-gathering system and informed assessment are essential aspects of intelligence and CBRN defence," said Colonel Jiri Gajdos, JCBRN Defence COE Director. This is crucial for a reliable assessment of activities, as experienced during the CBRN misuse by terrorists groups in Northern Africa and the Middle East, or the consequences of industrial incidents such as those in Chernobyl or Fukushima.

The operations room is already able to respond to national and NATO requests for information on a 24/7 basis and can easily shift to operations mode, should a crisis emerge. Its set-up is inclusive of both military and civilian consequence-management authorities.

The requirement for CBRN reachback is one of the lessons learned from NATO operations and has been identified as a critical capability for future operations in a potential CBRN environment.

The course is funded under the NATO Science for Peace and Security (SPS) Programme and sponsored by NATO's Defence against Terrorism Programme of Work (DAT PoW), which aims to mitigate critical capability shortfalls of the Alliance.

FACTS chemical accident database

Source: http://www.factsonline.nl/

FACTS is the acronym for "Failure and ACcidents Technical information System". FACTS is a accident database which contains information on more than 25,200 (industrial) accidents (incidents) involving hazardous materials or dangerous goods that have happened all over the world during the past 90 years.

The main objective of the FACTS chemical accident database is to learn from accidents or incidents and to prevent them in the future.

Not only analyzed and documented accidents involving severe damage or danger, such as BLEVES, major spills, huge explosions and derailments, are included, but also near-misses. The quality of the information on recorded accidents is also related to their seriousness and impact. For the most serious accidents detailed information is known; 2,00,000 pages of background information is stored, most of it electronically and remains available for further research purposes.

FACTS contains more than 25,200 accidents and can be used as an in-house reference system. The accidents are coded in abstracts making the existing data suitable for risk analysis, risk management, damage prevention and statistics. The abstracts are very accessible, so that even the most complex accidents are easy to comprehend.

The FACTS chemical accident database was a product of TNO Industrial and External Safety.

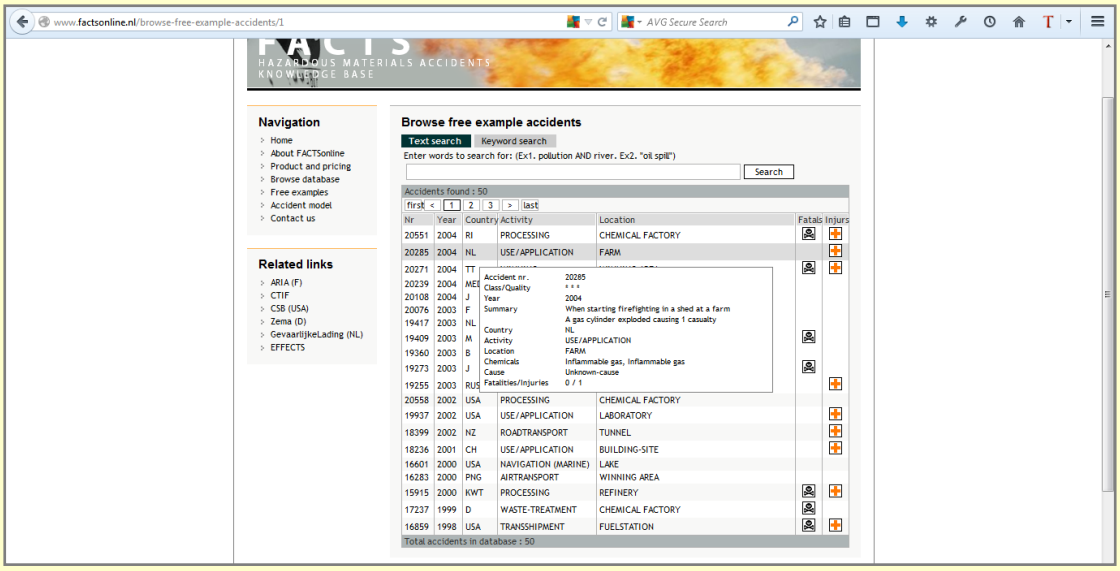
The exploitation of the database is no longer be done by TNO. The maintenance and exploitation of the database are continued by the Unified Industrial & Harbour Fire Department in Rotterdam-Rozenburg.

The database contains more than 24,100 descriptions of accidents involving hazardous materials

- Accident prevention by analyzing former accidents
- Learning from previous accidents with hazardous materials in order to improve the safety of chemical processes and emergency response
- Research on safety methods, accident mechanisms, equipment, reaction of chemicals, emergency response and cost reduction
- Investigating the risks that are involved with the handling of hazardous
- Collecting the necessary information to obtain permits from government authorities

Users

- Safety and environmental managers in the chemical, petrochemical and energy sectors
- Safety and environmental consultants
- Engineering companies
- Companies storing, transporting and transferring goods
- Insurance companies
- Authorities and emergency response organizations



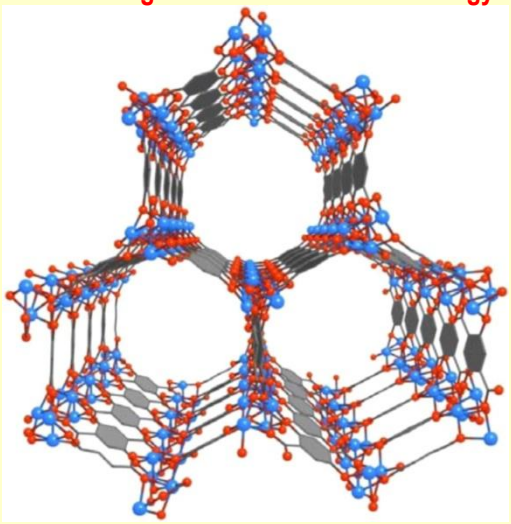
- Fire brigades and safety training centres
- Universities and colleges of advanced technology (chemical engineering)
- Research institutes

New gas mask filtration materials show promise

Source: http://www.homelandsecuritynewswire.com/dr20141217-new-gas-mask-filtration-materials-show-promise

PAST, PRESENT, FUTURE
A silicone and butyl rubber facepiece coupled with contoured filters and a visor make the M50 gas mask (center), which was recently fielded by the U.S. Navy, Marine Corps, and Air Force, less bulky and more functional than the older M40 (left), which is still used by the U.S. Army. Future masks (concept model, right) may feature a streamlined design, in which mask, helmet, and filter are integrated into a low-profile unit.

Scientists are examining the possibility of metal-organic framework compounds (MOFs – photo below) — porous crystalline materials which are made up metal ions and bridged with organics — as a possible evolution in gas mask filtration technology.



As *Chemical & Engineering News* reports, chemical engineers have experimented with the materials, and how they can function as filtration materials better than the standard charcoal that has previously been used.

"We have been using activated carbon to remove toxic gases for about 100 years," said Gregory Peterson, the leader of a gas filtration research group at the Edgewood Chemical Biological Center (ECBC), on the earlier carbon-based technology.

Despite the general success of older filtration technology, carbon cannot protect soldiers from all conceivable conditions. Peterson notes that one of the many of the shortcomings of carbon-based filtration is the relatively weak physical absorption which slowly degrades the filter.

With MOF technology, however, the extremely porous materials allow for filtration via a much more extreme surface area.

"If pores are too small or blocked, toxic gas molecules cannot reach absorption sites," said Krista Walton, a chemical engineer at the Georgia Institute of Technology. "If they are too large, there may be insufficient interaction between the pore walls and the gas molecules for optimal trapping. You need to find the sweet spot."

A number of research groups have conducted studies and reached similar results in examining how MOFs can traps poisons such as carbon monoxide, nitrogen oxide, sulfur dioxide, and other compounds. These studies, of which Peterson recently headed an overall review, are helping to guide scientists toward which MOFs might be the most effective.

Additionally, some of these new materials can also neutralize the compound chemically, and not just by trapping it with pores. Finding the right compound to neutralize, however, is of utmost importance, or a distinctly negative reaction would result.

"With nerve agents, cleaving the right bond is critical," said Omar Farha, a chemist at Northwestern University. "If you cleave the wrong bond, the product can be as nasty as the real thing."

Seeing the success of some MOFs in the laboratory, however, is only half of the solution. Filtration materials must be submitted to intensive tests before they can be approved for use by the U.S. Army, Navy, Marine Corps, or Air Force.

"I've seen many technologies that work well in the lab but don't survive in the harsh field environment," said William Fritch, an ECBC product manager.

Thought MOFs may still be a way from real-world application, the impact that they might have on respiration technologies could be significant.

Australia's CBRNE Defense

Source: http://www.cbrneportal.com/australias-cbrne-defense/

The Australian Government's Defense Science and Technology Organisation (DSTO) provides science and technology support to improve the Australian Defense Force (ADF) chemical, biological, radiological and nuclear (CBRN) defense capability through the protection of personnel from the strategic, tactical and physiological impacts

of exposure to toxic chemicals and materials and CBRN weapons.
The science and technology program supports Defense capability to anticipate, train and equip for such eventualities, so that operations can continue in CBRN environments. A new, purpose-built laboratory is being built in Melbourne that will enable DSTO to better meet the growing needs of Defense for scientific support, particularly the research into defense against chemical, biological and radiological threats. The new facility expected to be completed in 2016.

▶ **Read the rest of the article at source's URL.**

Turning deadly chemical warfare agents into harmless soil

Source: http://www.homelandsecuritynewswire.com/dr20141218-turning-deadly-chemical-warfare-agents-into-harmless-soil

December 18 – Destroying chemical warfare agents in bulk is a challenge for the military and international community. Current methods of eradication, such as incineration or hydrolysis, create toxic waste which requires further processing. The logistics required to transport large stockpiles from storage to a disposal site can be risky and expensive.
Additionally, different types of chemicals require different methods to make them safe, so each agent requires a specific neutralization procedure – one size doesn't fit all. To address these challenges, DARPA has announced the Agnostic Compact Demilitarization of Chemical Agents (ACDC) program and issued a Broad Agency Announcement solicitation.
DARPA says that the program aims to develop technologies for a transportable, prototype disposal system that converts any chemical warfare agent into safe organic compounds, such as harmless soil, using minimal consumables in the process and creating no hazardous waste. The system would enable safe destruction of chemical stockpiles on site without need for transportation.
"Chemical warfare agents are made of deadly combinations of chemicals that in their original, basic constituent form were at one time a harmless part of the environment," said Tyler McQuade, DARPA program manager. "ACDC aims to develop technologies that reverse the process and return the chemical compounds to their safe, natural state in the environment, without creating hazardous waste in the process."
Looking beyond current incineration methods that can create acid rain as a byproduct, and hydrolytic methods that require large amounts of water, ACDC seeks new methods that would allow indigenous materials near a chemical weapons storage site anywhere in the world to be used as scavenger material to neutralize agents. Soil is plentiful in many places around the world and is envisioned as a main consumable for a new neutralization process.
"Simply put, we want a new process that would take dirt, plant matter, or whatever is plentiful at the storage location, mix it in with any chemical agent and get safe dirt or plant matter out the back side that can be put back in the environment right at that location, significantly reducing the cost of current methods," McQuade said.
The ACDC program seeks expertise in areas such as soil science, environmental science/engineering, chemistry (analytical, inorganic, organic, physical), chemometrics, process engineering, and control system engineering.

Barriers to public health data-sharing; life-saving solutions proposed

Source: http://www.medicalnewstoday.com/releases/286043.php?tw

Barriers to the sharing of public health data hamper decision-making efforts on local, national and global levels, and stymie attempts to contain emerging global health threats, an international team led by the University of Pittsburgh Graduate School of Public Health has announced.

The analysis, published in the journal *BMC Public Health* and funded by the Bill & Melinda Gates Foundation and the National Institutes of Health (NIH), classifies and examines the barriers in order to open a focused international dialogue on solutions.

"Data on disease surveillance, intervention coverage, vital statistics and mortality represent some of the most widely collected but also some of the most underused data," said lead author Willem G. van Panhuis, M.D., Ph.D., assistant professor of epidemiology at Pitt Public Health. "Innovative methods for collection of new data are developed all the time, but a framework to share all these data for the global good is seriously lacking. Investments in routine data systems will better position health officials to address ongoing challenges as well as new public health threats, such as the current Ebola epidemic in West Africa."

Dr. van Panhuis and his team - which included experts in ethics and law, as well as public health and epidemiology - identified more than 1,400 scientific publications related to public health data-sharing, ultimately winnowing them down to the 65 most relevant articles. From those, they determined 20 real or perceived barriers to data-sharing in public health and classified them into **six categories: technical, motivational, economic, political, legal and ethical.**

"These barriers and categories describe a landscape of challenges that must be addressed comprehensively, not piecemeal," said senior author Donald S. Burke, M.D., Pitt Public Health dean and UPMC-Jonas Salk Chair of Global Health. "We must work together as a global community to develop solutions and reap the benefits of data-sharing, which include saving lives through more efficient and effective public health programs."

The team found that most technical, motivational and economic barriers are deeply embedded in much larger challenges of health information system capacity, particularly in low- and middle-income countries. Solutions lie in sufficiently funding such systems through international cooperation and shared development of data and infrastructure used across agencies and institutes.

The political, legal and ethical barriers will require a dialogue across international agencies that should include the World Health Organization, World Intellectual Property Organization and World Trade Organization, as well as the countries, development and funding agencies, and experts in ethics and law. The team proposes the creation of a treaty for data-sharing in public health across the world, as well as a commission to monitor, mediate and facilitate data-sharing.

"Identifying and classifying these barriers was the first step toward harnessing the potential of data for a new era in population health," said Dr. van Panhuis. "As our knowledge of these barriers increases, so will the opportunities for solutions."

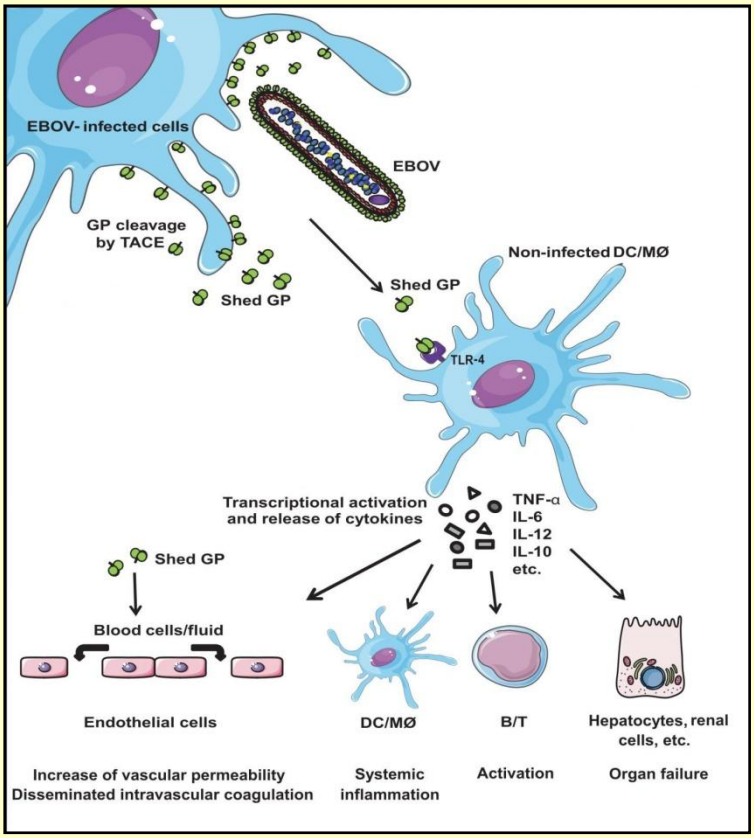
Ebola virus protein linked with severe inflammation, blood vessel leakage

Source: http://www.medicalnewstoday.com/articles/285688.php?tw

The Ebola virus (EBOV) consists of seven genes. In their study, the investigators - including Viktor Volchkov of the Claude Bernard University of Lyon, France - focus on one of these genes, called **glycoprotein (GP).**

The team explains that GP expresses two proteins: shed **GP** and non-structural secreted glycoprotein (**sGP**). Shed GP is described as longer protein that

covers the viral wall and protrudes from its surface, while sGP is a shorter protein that is secreted from the virus.



According to the researchers, both of these proteins are found at very high levels in the blood of humans and animals infected with EBOV. The team set out to determine what role these proteins play during infection.

Shed GP linked to overactive immune response

To reach their findings, Volchkov and colleagues cultured shed GP and sGP in tissue before introducing them to human cells and monitoring their effects.

From this, they discovered that **shed GP - but not sGP - can attach to macrophages and dendritic cells, which are types of immune cells.** The researchers say that both of these cell types are targeted by EBOV during infection.

When the shed GP attaches to the immune cells, the cells begin secreting large amounts of pro-inflammatory and anti-inflammatory cytokines. Both shed GP and cytokines are able to travel in the bloodstream. This entire process may lead to an overactive immune response and cause fever, severe inflammation and septic shock in Ebola patients, the team says.

What is more, they found that **the effect shed GP has on the immune cells is dependent on a molecule called TLR-4. When the researchers blocked TLR-4 with certain antibodies before the shed GP attached to immune cells, they found that the cells had a weaker reaction and secreted very few cytokines.**

Further analysis revealed that shed GP affects the function of endothelial cells, which line the inside of the blood vessels. Through binding to immune cells and secreting cytokines, and through a direct mechanism, shed GP is able to increase the permeability of endothelial cells. This increased permeability may lead to the blood vessel leakage found in Ebola patients.

Commenting on their findings, the researchers say: "Overall, our data contribute to a better understanding of the way EBOV might provoke the excessive cytokine storm that appears to be detrimental to survival of infection and provide new insights with which to develop therapeutic strategies to combat this newly defined role for shed GP in high viral pathogenicity.

In this regard, it is intriguing to **speculate that treatment with anti-TLR4 antibodies could be used to reduce the inflammatory reaction caused by shed GP** [...]. Similarly, it is conceivable that neutralizing antibodies targeting shed GP could also help to alleviate the systemic shock-like syndrome seen with EBOV infection."

The researchers note, however, that further studies looking at the association between shed GP and EBOV are warranted.

Ebola-Associated Waste Management

Source: http://www.cdc.gov/vhf/ebola/hcp/medical-waste-management.html

This document is intended to provide hospitals and healthcare providers with key information about the safe handling, transport, and disposal of waste generated from the care of persons diagnosed with or suspected of having Ebola virus disease (EVD).

Polio Workers Killed, Injured in Pakistan

Source: http://www.terrorismwatch.org/2014/11/polio-workers-killed-injured-in-pakistan.html

Gunmen shot dead four polio workers, including three women, in an attack Wednesday in the southwestern Pakistani city of Quetta, police officials said.

The attack represents the latest setback to efforts to curb the crippling disease. Pakistan is one of only three countries, along with Nigeria and Afghanistan, where the disease is endemic.

A man mourns over the covered body of his brother who was among four workers of a polio drive campaign shot by gunmen in Quetta, Pakistan. *Reuters*

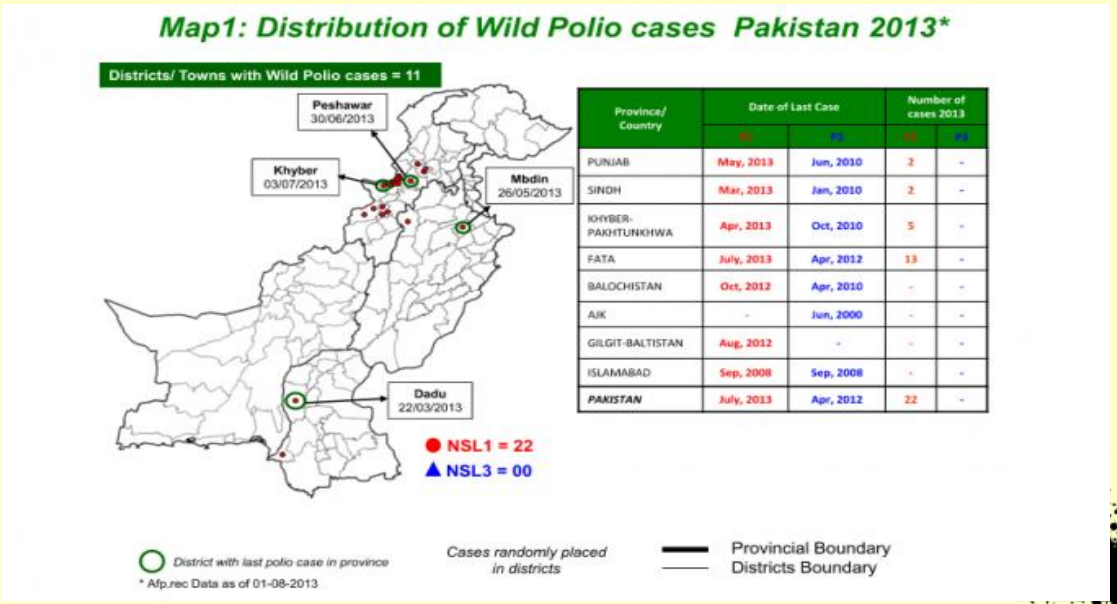
At least three other workers were also injured in the attack, which took place during a vaccination drive on the eastern outskirts of Quetta. Imran Qureshi, a senior Quetta police official, said gunmen on motorcycles opened fire on the polio workers as they were waiting to start the campaign.

"Two workers were killed instantly, while the remaining died on the way to the hospital," Mr. Qureshi said.

The attack was the second on polio workers in Pakistan within 24 hours. On Tuesday, Pakistani Taliban militants claimed responsibility for a gun attack in northwestern Khyber Pakhtunkhwa province that left a polio worker fighting for his life.

Pakistani Prime Minister Nawaz Sharif condemned the attacks. State broadcaster Radio Pakistan quoted him as saying those who targeted polio workers were "enemies of Pakistan."

At least 256 polio cases in Pakistan have been reported this year, making it the highest number in 14



Province/ Country	Date of Last Case		Number of cases 2013	
	P1	P3	P1	P3
PUNJAB	May, 2013	Jun, 2010	2	-
SINDH	Mar, 2013	Jan, 2010	2	-
KHYBER-PAKHTUNKHWA	Apr, 2013	Oct, 2010	5	-
FATA	July, 2013	Apr, 2012	13	-
BALOCHISTAN	Oct, 2012	Apr, 2010	-	-
AJK	-	Jun, 2000	-	-
GILGIT-BALTISTAN	Aug, 2012	-	-	-
ISLAMABAD	Sep, 2008	Sep, 2008	-	-
PAKISTAN	July, 2013	Apr, 2012	22	-

years. At least 13 of those cases were in Baluchistan, Pakistani health officials say.
Provincial officials in Quetta said the rise in the number of cases had prompted the current campaign as a special effort to target the disease in 11 districts listed as high risk. But Wednesday's attack means the campaign has now been suspended until further notice, officials said.
While there was no immediate claim of responsibility for Wednesday's attack, Taliban militants from the Jamaatul Ahrar group took responsibility for Tuesday's shooting. It was the first time that a militant group had taken direct responsibility for targeting a polio team.
The Pakistani Taliban have banned polio campaigns in regions controlled by them, accusing the polio workers for spying for Western countries. But until Tuesday's attack, they have also denied carrying out attacks on the teams themselves.
Security officials say that at least 11 people have been killed in such attacks in 2014.

5 Lessons in Crisis Communications from the Ebola Response

By Gerald Baron
Source: http://www.emergencymgmt.com/emergency-blogs/crisis-comm/Ebola-communications-lessons.html

Agency communication around the ongoing Ebola scare provides some very important lessons in risk and crisis communications. I'd be very interested in hearing from any of you who have been on the front lines of public communication in this situation. Sharing lessons learned is one of the most important ways we can improve.

Here are a few of my observations:

1. **The media are working harder than ever to generate fear and outrage.**
2. **Early communication demonstrated a lack of preparation.**
3. **Later communication demonstrated risks of political involvement.**
4. **Social media demonstrated its value in both operational response and public communication.**
5. **Outdated communication policies continue to hamper effective communication.**

1. Media fear and outrage

Is there any doubt that the American public exhibited unwarranted fear in the face of the threat? Certainly, seeing what was happening in West Africa was cause for legitimate concern. While I wouldn't say the reaction was one of panic, it did seem that we were one or two bad news stories away from having the fear take control. There seemed to be little responsibility demonstrated by the media. This post by Politico (which admitted to participating in the obsession) provides plenty of examples. Headlines like *You Are Not Nearly Scared Enough About Ebola* and *The New York Times* reporting the highly unlikely scenario of airborne transmission provide just a couple of examples.
What about outrage? The blame game was played big time from the beginning. Trust and credibility in those working hard — risking their lives and health in some cases — were consistently undermined. And when the media tired of pointing out lapses in preparation for fighting the virus, they focused on the inconsistent communication.

This is likely nothing new to you. But I marvel at the practice of so many in communication. Just today in reviewing some crisis comms training material I saw again the headline: How to make the media your partner in an emergency. I'm sorry, but their agenda is different. Sure, there are many examples of where they are incredibly important and helpful. But working effectively with the media begins with an understanding that their No. 1 responsibility is to gather eyes. It's not to tell the truth, it's not to help provide perspective, and it is certainly not to carry your message. It is to gather eyes. Knowing that, you can work more effectively with them and even more, communicate directly and around them.

2. Early communication showed a lack of preparation

Yes, there were some missteps in early communication. There were some conflicting messages and while the CDC emerged early on, appropriately, as the voice to trust, even there there were some missteps.

What this says is that there may not have been the level of preparation at the federal level, with the CDC and from the CDC to state and regional health agencies about Ebola, and how to communicate with the public. I have utmost respect for the CDC's crisis communication believing it is probably the best in class in this regard. But I suspect discussions internally including with the administration, are taking a hard look at their preparation and what to do next time.

3. Later communication showed risks of political involvement

I saw a lot of parallels between Ebola and the 2010 Gulf oil spill when it came to the federal administration's involvement. I noted in conversation with others that I was not the only one. The first response is to let the experts handle it. But then the heat, fear and blame game from the media cause a change in political judgment. This could be dangerous to the president, so the reaction is to step in, take charge, try to control the message and communicate that everything is going to be OK because No. 1 is in charge. Contrast this to the strategy that says: "The CDC has the experts we need to deal effectively with this. We're providing the CDC with the resources it needs, it will communicate about this." His actions further stripped the CDC of credibility, opened the way for enterprising politicians like Govs. Andrew Cuomo and Chris Christie to demonstrate that it wasn't just the president in charge, but we are too, and we can one-up him in protecting the public.

The result was a confusing mess. A "czar" who was missing in action from day one, or "self-quarantined" according to one wiseacre. The voice of the CDC removed from the scene, states and cities left to their own devices in trying to calm fears — in general a bit of a mess.

We need our elected leaders to step up and communicate openly with the public. But they need to do it in a way that builds trust and confidence in the people who need to do the job. If their only goal is to inoculate themselves against blame, the predictable result is further erosion of trust just when it is most needed.

4. Social media demonstrated its value in operational response and public communication

I had the opportunity to talk to one person on the front lines of the Ebola information challenge and was encouraged to see the way social media was incorporated into the operation of the emergency response team. *The Economist* had an article talking about how using the big data available from cellphone use, officials could more effectively plot progress of the disease. Much more will come from using citizen content in the future.

The CDC is again leading the way in using social media to communicate directly with the public. But many local, state and regional organizations were and are using social media to answer questions, quell rumors and provide much needed information. I have heard of some great examples of rumors about new victims gaining traction and contributing to near panic in some neighborhoods that were relatively quickly squashed by official use of social media. Again,

I'd be very interested in hearing from any of you about specific examples of rumor management — rumors arising from social media as well as media misreporting.

5. Outdated communication policies continue to hamper effective communication

As a general observation it seems to me that many agencies are still operating under the old rule of "never pick a fight with someone who buys ink by the barrel." I did not see agencies challenging media miscommunication, hyper-ventilating or promulgating rumors. I recall the time during California wildfires when reporters were questioning then Gov. Schwarzenegger on his use, or lack of use, of firefighting aircraft. He did all but call them girlie-men. He challenged their assumptions, their question and the story they had pre-determined to be right. There seems to be continuing reluctance to address media practices and stories. It doesn't have to be personal, it doesn't have to be aggressive. I recently participated in a webinar with Patrice Cloutier and he asked the intriguing question: **Do rumors offer an opportunity for organizations? Yes, I replied. Because if it is valuable to you to be seen as the credible voice in a crisis, the voice the public can trust, then rumors provide the opportunity to demonstrate your credibility and trustworthiness. But only if they are identified, corrected and directly communicated quickly.**

Developing a global workforce to tackle emerging pandemic threats

Source: http://www.homelandsecuritynewswire.com/dr20141127-developing-a-global-workforce-to-tackle-emerging-pandemic-threats

When a new pandemic threat like this year's Ebola outbreak emerges, the importance of preventing and limiting disease spread becomes apparent. Well-trained global health professionals play a key role in preventing and responding to emerging zoonotic disease.

A University of Minnesota release reports that under a new 5-year award of up to $50 million, the University of Minnesota and Tufts University will be part of an international partnership of universities to strengthen global workforce development against emerging pandemic threats. Called One Health Workforce (OHW), the work is part of a new United States Agency for International Development (USAID) Emerging Pandemic Threats 2 program, focusing on disease surveillance, training and outbreak response.

The global workforce development program will focus on the One Health Central and Eastern Africa Network and South East Asia One Health University Network. Their networks are supported by a partnership with the University of Minnesota and Tufts University in Massachusetts.

Primary leads of the partners are William Bazeyo of Makerere University in Uganda, Noor Hassim of Universiti Kebangsaan Malaysia, Saul Tzipori, D.Sc., Ph.D., DVM, of the Cummings School of Veterinary Medicine at Tufts University, and David Chapman, Ph.D., of the University of Minnesota.

The interdisciplinary Tufts University team, including faculty from the Cummings School of Veterinary Medicine and Tufts School of Medicine, will be led by Tzipori as well as Felicia Nutter, D.V.M, Ph.D, and Hellen Amuguni, D.V.M, Ph.D., both from the Cummings school. They will bring expertise in global infectious disease of humans and animals, environmental health, training in higher health education and research methodologies, and internet technology.

Faculty from the University of Minnesota's programs in medicine, nursing, public health, education, and development, environmental health and veterinary medicine will collaborate in the work, under the leadership of Katey Pelican, D.V.M., Ph.D.; John Deen, D.V.M., Ph.D.; and David Chapman, Ph.D.

The combined expertise from both universities will reflect "one health" — the intertwined health of animals, humans, and the environment.

"These global partnerships will create a new generation of skilled health workers needed to battle infectious disease threats like Ebola in the world's most vulnerable communities," said Katey Pelican,

D.V.M., Ph.D., of the University of Minnesota. "We're helping our colleagues be ready to respond with sustainable models that maintain change long into the future."

The release notes that in central and eastern Africa, fourteen public health and veterinary medicine institutions from the Democratic Republic of Congo, Ethiopia, Kenya, Tanzania, Rwanda, and Uganda form the One Health Central and Eastern Africa Network. The South East Asia One Health University Network includes fourteen faculty members from 10 universities in Indonesia, Malaysia, Thailand, and Vietnam.

These university networks, alongside the University of Minnesota and Tufts University, will in turn partner with in-country government ministries to define the one health workforce and determine the competencies, knowledge, and skills required in practice, and in undergraduate and graduate education. From there, curricula, training modules, field experiences, and other teaching and learning opportunities will be established to ensure that future graduates are prepared to address disease detection, response, prevention, and control challenges. These capacity building activities will be anchored in local institutions including universities to support long-term sustainability.

"The team at the Cummings School of Veterinary Medicine at Tufts University is thrilled to continue to be a partner in this program which began in 2009 and is now more important than ever," said Saul Tzipori, chair of infectious disease and global health at the school.

"Working with colleagues across Tufts, we have a long history of combating serious global infectious diseases affecting humans and animals. The OHW team expects to continue this very important work in Africa and in Southeast Asia well into the future."

The One Health Workforce program builds on the partnership of University of Minnesota and Tufts University expertise, and global university networks established during the RESPOND project, administered by DAI, an international development company, which recently concluded after five years of work. The RESPOND program successfully built capacity to respond to emerging pandemic threats.

"Together we will create a positive impact on the community and, indeed, on the profession. Now is an especially critical time as we face off against emerging potential epidemics, and we will need to work together to quickly get policy makers on our side, to be able to excel at creating the needed one health workforce," said William Bazeyo, dean of the Makerere University School of Public Health in Kampala, Uganda and One Health Central and Eastern Africa Network lead.

Civil War and Ebola

By Tanisha M. Fazal

Source: http://www.isn.ethz.ch/Digital-Library/Articles/Detail/?ots591=4888caa0-b3db-1461-98b9-e20e7b9c13d4&lng=en&id=185424

As the Ebola crisis may (or may not) be reaching a containment phase, it is critical to consider what conditions may have enabled its outbreak. Epidemiologists are hard at work identifying mutations and transmissions. What they may miss, however, is a troubling connection between civil war and Ebola.

Of the 32 sub-Saharan African states to have experienced internal armed conflict since 1976, nearly a third have also experienced Ebola outbreaks. **If we were to look at a map of where in sub-Saharan Africa Ebola has struck since it was first identified in 1976, the virus might appear to be tracking ongoing and recent civil wars in the Democratic Republic of Congo (1976), Gabon (1996), Uganda (2000), Gabon again (2001), Congo (2002) to today's outbreak in West Africa.** Civil war enables the spread of disease – especially viruses as stubborn as Ebola – by destroying physical and personal infrastructure.

The destruction of infrastructure after civil war

For example, prior to the start of over a decade of civil war in Liberia, there were 293 clinics in country. By the end of the civil war over 80 percent of these clinics had been looted or damaged. According to one report, Liberia had 237 physicians in country in 1989, 89 by 1998, and fewer than 20 in 2003. With assistance, this number had climbed significantly by 2013, but was still well short of the public health infrastructure that would be needed to identify and contain an Ebola outbreak. Sierra Leone's medical infrastructure was similarly devastated by civil war. A 2008 survey of Sierra Leonean hospitals found that most had either no or interrupted oxygen and electricity and half had no running water. Only one hospital had more than one native surgeon.

Other infrastructure, such as roads, also suffered during the war. According to USAID, the destruction of Liberia's transportation infrastructure during the civil war was so severe that Liberia went from being a net exporter of rice to importing nearly all of its rice, because transportation routes from the capital to rural areas were severed . Stop signs and traffic lights were destroyed in the war. Sierra Leone also saw a significant drop in usable roads as a result of its civil war.

The destruction of interpersonal trust is as important in understanding the spread of disease as the ravaging of public infrastructure. Trust in government typically falls after civil war. One study found that Ugandan social capital decreased markedly after the civil war ended, while ethnic cleavages increased. Similar results have been found inNepal and theBalkans (on the other hand, another study found that Sierra Leoneans who had been victimized during the civil war were more politically active than those who had not been victimized). Interpersonal trust is much more difficult to measure than physical infrastructure, and research on this topic in post-conflict environments is evolving. It may be, for example, that ethnic and/or territorial civil wars are more likely to leave a legacy of mistrust than other types of civil wars. But even if civil war can produce surprising levels of postwar political participation, it should also produce high levels of wariness amongst the population – particularly when it comes to strangers.

Distrust of health care workers in ongoing and post-conflict zones is evident in the challenges faced by polio immunization campaigns in Pakistan and Nigeria, where aid workers have been gunned down by militants in recent years. Aid and health care workers are frequently targeted in conflict and post-conflict zones, including Afghanistan, South Sudan, and the Central African Republic. These incidents further degrade already faltering health care systems.

Poor infrastructure and the spread of Ebola

With outbreaks like the ongoing Ebola crisis in West Africa, these background conditions quickly come to the foreground. A lack of good roads prevents health care workers from entering affected regions. To be sure, poor transportation infrastructure could hinder or help an outbreak; patients will have a harder time getting medical assistance, but the difficulty of getting to certain areas might also facilitate containment. Rather than celebrating bad roads that condemn entire villages, however, a better solution would be to have both good roads and good medical resources available. Moreover, even though poor roads hinder access to rural areas, what has been most dangerous about this outbreak is the presence of Ebola in large West African cities.

A lack of hospitals, clinics, and medical personnel prevents the afflicted from receiving the care they require. Compounding these problems are cultural beliefs that do not include the germ theory of disease. Add to the mix local norms of hugging, touching dead bodies at funerals, and faith healing, and you have multiple new networks of transmission.

The lack of social trust after civil war further aggravates attempts to contain and treat the disease. Aid workers and health facilities have been threatened and attacked on multiple occasions during this Ebola outbreak. These incidents include attacks on an Ebola facility and the homes of Ebola victims in Liberia, threats against Red Cross workers in Sierra Leone, and the murder of eight health workers in Guinea. This additional danger to health care workers already taking on the risky job of caring for Ebola patients in countries with minimal public health infrastructure has almost certainly depressed the

number of medical volunteers to address this outbreak.

Health care workers in personal protective equipment that resembles spacesuits are likely to be extremely frightening, especially in cultures where the germ theory of disease is not widely accepted and thus there is no obvious explanation for the use of this equipment. To hand over a loved one, or even bodily fluids, under these conditions is as understandably terrifying as it may be medically necessary. In retrospect, recent attacks on health care workers are perhaps unsurprising. Individuals who do not believe in the germ theory of disease will almost surely hold some other theory of transmission. In post-conflict societies, this theory might be one that blames former enemies. Unknown aid workers – strangers – coming to your door to offer care could therefore be very suspect.

It is difficult to know whether and to what extent additional resources for health care could have mitigated the effects of this outbreak. Scientists still do not know enough about the origins of Ebola to have prevented its recurrence. Moreover, it presents similarly to Lassa fever, another hemorrhagic virus, and is also mutating very quickly. But what we do know is that health aid accounted for a mere three to six percent (on average) of post-conflict aid to Liberia and Sierra Leone through 2010. Increasing this percentage may be a first step to preventing, or at least mitigating, future outbreaks.

Ebola and future civil wars?

The Ebola outbreak has captured international attention, especially so when the virus travelled to North America and Western Europe. But it is by no means the only infectious disease that can spread rapidly and fatally, particularly during and after civil war. HIV/AIDS, malaria, and tuberculosis are already prevalent in Africa and also require constant monitoring. Previous research has suggested that improving a country's health infrastructure post-conflict can increase government legitimacy and economic development . Investment in such infrastructure may also be critical to preventing global pandemics. Thus, wealthy governments should be extremely interested in making such investments; it is in their national interest to do so.

Just as the destruction of public and personal infrastructure in civil war enabled the spread of Ebola, the current outbreak has ravaged the already-precarious health infrastructure of affected countries. Another danger to guard against today is the possibility of renewed civil war. Projections for economic development as well as confidence in government in Sierra Leone, Liberia, and Guinea are dangerously low, and the Director-General of the World Health Organization has suggested that these outbreaks could lead to state failure or collapse. In addition to providing emergency relief, then, the international community must commit, along with the governments of Sierra Leone, Liberia, and Guinea, to rebuilding a public health infrastructure that can contain the disease both medically and politically. Failure to do so could lead to as many indirect as direct future victims of Ebola.

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Biological Emergency Management: The Case of Ebola 2014 and the Air Transportation Involvement

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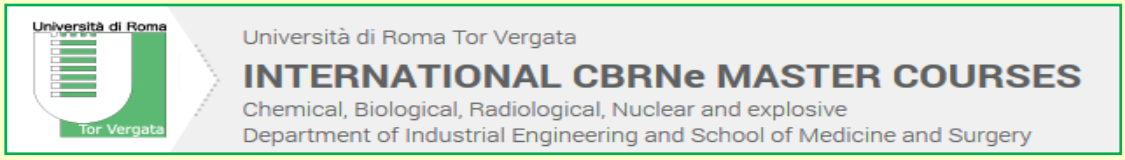


Abstract
The putative spread after the outbreak of the haemorrhagic fever epidemic caused by Ebola virus in West Africa, in the early months of 2014, puts the spotlight on the management of biological risks involving air transportation. Ebola virus is a highly pathogenic agent, causing a haemorrhagic fever defined Ebola HF, characterized by a high fatality. This virus is generally considered to be self-limiting in terms of diffusion; its lethality is in fact so high as to prevent the exit from rural areas where outbreaks generally occur. However, when the virus comes from rural areas and reaches urban places, it is important to assess the risk of spreading even in areas far from the outbreak of origin. Therefore, the development or strengthening of strategies and plans to take action with timely and effective response in order to reduce the consequences of public health emergencies is paramount. During Ebola virus outbreak in West Africa in 2014, World Health Organization focused attention on many airports, stops of main flights coming from Africa; the aviation, due to its nature, has the potential to help boost the global spread of transmissible diseases, since air travel allow to reach the most remote locations in hours. The management of biological emergencies during ordinary operations of airlines and airports represents a real constraint in the event of contrast epidemic situations or endemic outbreaks. An effective response plan should include a careful assessment of the risks and the establishment of procedures to carry on board of aircrafts or on the ground. To ensure that this complex system works correctly, a broad and effective cooperation between the different actors involved is required. On the international level, several documents and recommendations relating to the management of contagious diseases in aeronautical environment have been produced by authoritative agencies. In this paper, after an overview on the international response to public health emergencies in the aviation environment, the attention is focused on emergency response to the Ebola virus crisis in 2014, including an evaluation of the potential dispersion of the pathogen.

▶ **Read the full paper at:**
http://www.mastercbrn.com/uploads/various/20141111728908350_biological_emergency_management_the_case_of_ebola_and_the_air_transportation_involvement_1948_5948.1000152.pdf

What is going on with Ebola transmission issue?

Source: http://www.ebolaready.com/

Until recently both the U.S. Centers for Disease Control and the Public Health Agency of Canada directly warned about possible **AIRBORNE** transmission of the Ebola virus.

Beginning in August 2014 such references began disappearing from publicly available agency information resources.

EXAMPLE 1: Sometime between August 2-4, 2014 the U.S. Centers for Disease Control CHANGED THE LANGUAGE of their guidance document entitled, *Infection Prevention and Control Recommendations for Hospitalized Patients with Known or Suspected Ebola Hemorrhagic Fever in U.S. Hospitals*, to remove any reference to AIRBORNE transmission. Thankfully the WayBack Machine archived the old version.

OLD VERSION (Link)

> Though these recommendations focus on the hospital setting, the recommendations for personal protective equipment (PPE) and environmental infection control measures are applicable to any healthcare setting.
>
> In this guidance healthcare personnel (HCP) refers all persons, paid and unpaid, working in healthcare settings who have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air.

NEW VERSION (Link)

> Though these recommendations focus on the hospital setting, the recommendations for personal protective equipment (PPE) and environmental infection control measures are applicable to any healthcare setting.
>
> In this guidance healthcare personnel (HCP) refers all persons, paid and unpaid, working in healthcare settings who have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or aerosols generated during certain medical procedures.

EXAMPLE 2: Sometime between Oct 1-2, the Public Health Agency of Canada actually CHANGED THE LANGUAGE of their *Pathogen Safety Data Sheet on Ebola* to to remove references to AIRBORNE transmission, including the removal of citations to key scientific literature. Thankfully the WayBack Machine archived the old version.

OLD VERSION (Link)

> **MODE OF TRANSMISSION:** In an outbreak, it is hypothesized that the first patient becomes infected as a result of contact with an infected animal (15). Person-to-person transmission occurs via close personal contact with an infected individual or their body fluids during the late stages of infection or after death (1, 2, 15, 27). Nosocomial infections can occur through contact with infected body fluids due to the reuse of unsterilized syringes, needles, or other medical equipment contaminated with these fluids (1, 2). Humans may be infected by handling sick or dead non-human primates and are also at risk when handling the bodies of deceased humans in preparation for funerals, suggesting possible transmission through aerosol droplets (2, 6, 28). In the laboratory, infection through small-particle aerosols has been demonstrated in primates, and airborne spread among humans is strongly suspected, although it has not yet been conclusively demonstrated (1, 6, 13). The importance of this route of transmission is not clear. Poor hygienic conditions can aid the spread of the virus (6).

NEW VERSION (Link)

> **MODE OF TRANSMISSION:** In an outbreak, it is hypothesized that the first patient becomes infected as a result of contact with an infected animal [22]. Person-to-person transmission occurs via close personal contact with an infected individual or their body fluids during the late stages of infection or after death [1] [2] [22] [42]. Nosocomial infections can occur through contact with infected body fluids for example due to the reuse of unsterilized syringes, needles, or other medical equipment contaminated with these fluids [1] [2]. Humans may be infected by handling sick or dead non-human primates and are also at risk when handling the bodies of deceased humans in preparation for funerals [2] [10] [43].
>
> In laboratory settings, non-human primates exposed to aerosolized ebolavirus from pigs have become infected, however, airborne transmission has not been demonstrated between non-human primates [1] [10] [15] [44] [45]. Viral shedding has been observed in nasopharyngeal secretions and rectal swabs of pigs following experimental inoculation [29] [30].

Italy will investigate 11 Deaths linked to flu vaccine

Source: http://www.news.com.au/lifestyle/italy-will-investigate-11-deaths-linked-to-flu-vaccine/story-fneszs56-1227140313129

December 01 – **The number of people who have died in Italy after being administered a flu vaccine made by Swiss pharmaceutical company Novartis has risen to 13.**

The Italian Medical Agency (AIFA) has warned against panic and stressed there is not proof yet that it was the vaccine that led to the deaths.

It said it banned two batches of the product — called FLUAD — as a precautionary measure, pending further studies.

AIFA said the European Medical Agency would start examining the problem on Monday, and would report back on Thursday.

Italian authorities issued a partial ban on FLUAD on Thursday after being alerted that three people had died and a fourth had been taken seriously ill within 48 hours of being administered the product.

More cases came to light in the following days.

UPDATED: Novartis' Fluad off the hook in Italy following 19 deaths

December 1, 2014

After last week partially banning Novartis' Fluad, Italian officials now say tests on the flu vaccine show the product is safe.

The number of fatalities occurring shortly after Fluad vaccination in Italy grew from three to 19 within a few days after the country issued the ban, suspending batches 142701 and 143301. But "the results of the tests confirm the safety of the anti-flu vaccine," the Italian Medicines Agency said in a statement seen by *Reuters*. Tests on the batches in question came back "completely negative."

As Novartis spokeswoman Liz Power told *FierceVaccines,* all Fluad batches have passed "extensive" analytical and safety testing and fulfill all required quality standards.

Liberia: Ebola Doctor Alarmed Over Male Survivors Infecting Partners

Source: http://allafrica.com/stories/201411271023.html

Dr. Atai Omurutu, head doctor at the Island Clinic Ebola treatment unit, has raised an alarm over the disturbing incidents of male Ebola survivors infecting their partners and putting entire families at risk.

Dr. Omurutu said wives of male survivors are being admitted to the facility because they have contracted the disease from their partners.

She appealed to the Ministry of Health for condoms to be given to male survivors in order to stop this mode of transmission of the Ebola virus.

She disclosed this new wave of infection to President Ellen Johnson Sirleaf when the President toured the Island Clinic ETU and the Alpha OAU ETU in Tweh Farm and Virginia, respectively.

Dr. Omurutu, a Ugandan doctor, stated that once a person survives Ebola, they still have the virus in their semen for up to three months, therefore it is extremely important that male survivors abstain from sex during that period or use a condom to avoid infecting their partner.

Dr. Omurutu, who is expected to return to Uganda next week, hoped that Liberia will have an Ebola-free Christmas, which President Sirleaf has envisaged. The Ugandan doctor said Island Clinic has played a very big role in the reduction of Ebola transmission because of its location in the middle of hotspots such as West Point, New Kru Town, St. Paul's Bridge and Brewerville.

In continuation of her visits to various Ebola Treatment Units (ETUs), President Sirleaf expressed delight that all the ETUs around Monrovia are experiencing a drastic decline in patient intake. However, she continues to warn Liberians to follow the advice and measures specified by healthcare workers in order to break the transmission of the disease, as there are still hotspots.

The President yesterday visited the 96-bed Alpha OAU Ebola Center in Virginia and the 100-bed Island Clinic Ebola Center near St. Paul's Bridge, Bushrod Island to assess conditions there and to thank healthcare workers, partners, and volunteers for their services to the country especially in the fight against the Ebola virus disease.

At the Alpha OAU Ebola Center in Virginia, near Hotel Africa, the head of the ETU, Dr. Jonathan Hart, informed the President that the ETU commenced operations two weeks ago. With a total of 80 staff, the Alpha ETU currently hosts 20 suspected patients most of whom have been there for a week.

Responding to the Liberian leader's question about constraints, Dr. Hart, who previously worked at ELWA-2, appealed for more clothing, including blankets, beddings, pampers, etc. and supplements like biscuits, juices, etc. "We need to make sure our patients are rehydrated constantly and adequately or else they will die from dehydration and not Ebola," he said. He also appealed for transportation for the staff as the ETU has only one vehicle that serves all purposes.

Speaking to the staff, President Sirleaf thanked the healthcare workers for serving their country during this difficult time and working with this kind of disease. She thanked them for their commitment and dedication.

At the Island Clinic Ebola Treatment Unit, the head of the clinical team, Dr. David Kaggwa provided President Sirleaf with the statistics since the ETU opened in late September. They have seen 1,015 patients to date while 582 were confirmed with the disease. A total of 301 deaths occurred at the ETU and the survival rate there is between 50 and 55 percent.

Dr. Kaggwa reiterated that there is a decline in the cases of Ebola being treated at the unit. He noted, "We are operating below 50 patients because shortly we will be discharging 28 patients - 22 Ebola survivors and six were tested negative twice. This means we will be operating below 30 patients."

President Sirleaf later interacted with 28 patients that were about to be discharged from the Center.

During the President's interaction with health workers at the ETU, a number of concerns raised including outstanding hazard allowances, contractors still to receive pay for two months, workers with expired contracts still hoping to be transferred to other facilities, transportation for workers, among others.

The Red Cross workers, for their part, appealed to President Sirleaf to visit their office at the old Ministry of Health where they would like to discuss issues with her privately. She readily accepted their invitation.

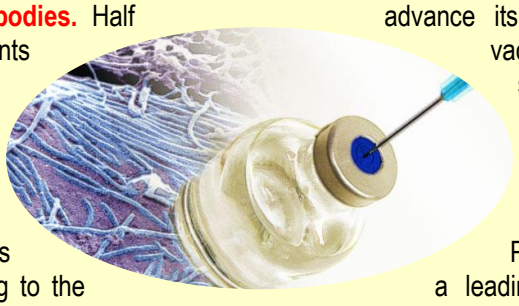
In response, the Liberian leader appealed to the health workers to have patience and promised to raise their concerns with the Ministry of Health in order to resolve the issues. With regards to outstanding arrears owed the healthcare workers, she assured them that they will receive their salaries that they diligently worked for. "Once you sign a contract, you'll have to get paid no doubt about that," she assured.

Subjects produce immune response, develop antibodies in Ebola vaccine test

Source: http://www.homelandsecuritynewswire.com/dr20141201-subjects-produce-immune-response-develop-antibodies-in-ebola-vaccine-test

December 01 – **All twenty research subjects recruited by the University of Maryland School of Medicine in partnership with the National**

Institute of Health (NIH) to test an experimental Ebola vaccine developed by the National Institute of Allergy and Infectious Diseases (NIAID) in collaboration with drug maker, GlaxoSmithKline, have produced an immune response and developed anti-Ebola antibodies. Half of the research participants were initially injected with ten billion particles of a chimpanzee cold virus modified to resemble Ebola, while the other half received a dose with ten times as many particles. According to the *Baltimore Sun*, the variation helps researchers learn how much vaccine a patient needs to create immunity and how long the immunity lasts.



This particular vaccine contains proteins that convinces the immune system into treating the chimpanzee virus as Ebola. The research subjects' immune response are now being compared with that of monkeys who were issued the vaccine and then exposed to Ebola. "Based on these positive results from the first human trial of this candidate vaccine, we are continuing our accelerated plan for larger trials to determine if the vaccine is efficacious in preventing Ebola infection," said Anthony Fauci, director of NIAID.

The concern over Ebola, which has now killed at least 5,680 people in Guinea, Sierra Leone, and Liberia, has provided Ebola researchers new opportunities to further their work. Within the past year, Baltimore-based Profectus BioSciences has received $32 million from the Pentagon, the U.S. Department of Health and Human Services, other U.S. agencies to advance its development of Ebola vaccines. The company had struggled for years to raise money to pay for human trials, but now expects to begin trials next year.

Professor Andrew Easton, a leading virologist at Britain's Warwick University, cautions that though the University of Maryland vaccine trial provided some optimism on the road to developing an Ebola vaccine, researchers still have plenty of unanswered questions. "We know from some of the preliminary work that went on in animal studies previously that the antibodies that are generated in response to the vaccine don't last as long as we would like — there was a clear reduction over a fairly long period of time, about 10 months," he said. "So it's possible that that might be a problem in humans, but the reality is we won't know until it's actually been tested in humans." Easton adds that if the vaccine fails to provide long-term protection from the Ebola virus, then perhaps it could be used to protect people from Ebola at the time outbreaks occur.

Ebola outbreak: Darwin volunteer writes from Sierra Leone treatment centre, 'I just cry in my goggles'

By Dan Baschiera

Source: http://www.abc.net.au/news/2014-11-26/darwin-ebola-volunteer-dan-baschiera-writes-from-sierra-leone/5919516

*Australian **Dan Baschiera** is volunteering at an Ebola treatment hospital in Sierra Leone where he is doing what he can to stop the deadly disease. Mr Baschiera, a former Charles Darwin University lecturer in social work and humanitarian studies, has seen first hand the bravery of people risking their lives to battle an "invisible, unpredictable and highly contagious enemy".*

In October he sent a letter to the ABC from Sierra Leone, Where does one begin to describe the Ebola frontline?

Here is his second letter:

One week to go so my days in "Mama Salone" are coming to an end.

Probably the most humanitarian of my missions so far - the learning curve has been amazing - but the body bagging terrible.

I am now very tired physically and emotionally, it is time to leave before I make a mistake. I know I face stigmatisation on my return.

Dan Baschiera

It is without question a horrific death, the grimace on the face of the corpses as we body bag describe a pain beyond description.
For some reason the rigor mortis starts to set in within minutes; the medics have to straighten the body immediately otherwise it is hell trying to body bag the contortion of pain.
The body is highly contagious - we try to minimise our contact with it as we sterilise a lost life into a white plastic bag. The smaller the body bag the harder it is to fight back the tears and sometimes I just cry in my goggles.
An unprecedented psycho-social humanitarian disaster, a man standing in our discharge tent sobbing - his family lost, wives and mothers inconsolable as they scream in anguish, families are unable to comfort their dying kin. Whole villages in the forests are now found empty by the Red Cross burial teams returning the corpses home.
The fear on patients' faces is indescribable. They know they might not have long to live and look up and try to appeal to you as you clean the vomit from their bed.
I have met and worked with a whole bunch of incredibly talented people. The bravery and humanitarian concern of all my colleagues in trying to save lives is humbling.

Darwin humanitarian Dan Baschiera (left) plans to return to the region next year with his wife. (Supplied: Dan Baschiera)

We are all under stress, some bury it in work, others in their own way, interestingly the digital age does help us all as we can connect with our loved ones - as I write this one of our doctors is "having a Skype" with his mum.
The wet season now finally seems to be petering out, but the Ebola cases increase. The sound of the ambulance sirens is a constant.
Day in, day out we work, donning the space suits and melting with sweat; the tears help to defog the goggles, the heat unbearable after an hour. You have to be controlled as you undress in the decontamination room - a mistake could be fatal.
Where is the true leadership in this world, I ask. I hear a lot of political talk but see very little walk. We desperately need medical boots on the ground. We have to fight this horror, not bury our heads in the sand.
Ebola is testing our humanity. Thankfully some countries and humanitarian NGOs are rising to the challenge, but no doubt others in the world will wait for a "convenient vaccine".
Who knows how long Sierra Leone can withstand the assault of this epidemic?

The smaller the body bag the harder it is to fight back the tears and sometimes I just cry in my goggles.

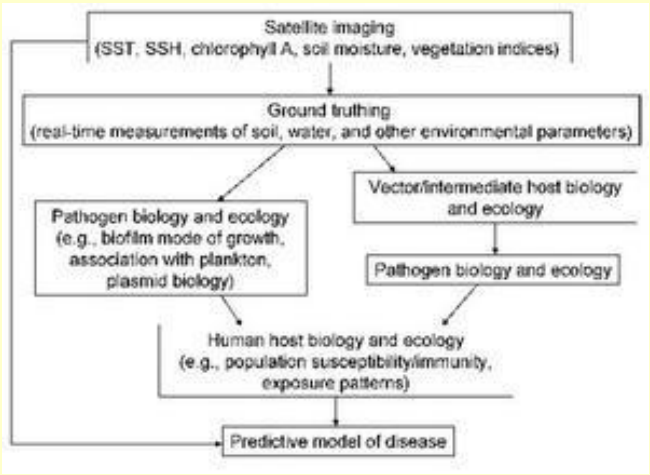
Dan Baschiera

On the other hand, Ebola is doing unpredictable things: it plateaus in some places, and continues upwards in others; some people it kills, others recover - some of them from the brink.
A lot of it seems to be in sync with the viral load people are exposed to. I think the combination of good hydration, good food (mixed with "Plumpy nut" [a peanut-based paste for treatment of severe acute malnutrition]) and a sterile environment where we minimise patient risk of increasing viral load by rolling into their faeces and vomit, has given us a better cure/discharge to body bag rate.
But anything is possible with this virus.
There is an interesting case of a discharged patient being reinfected when returned to his home where exposure to further viral load probably collapsed an already weakened immune system.
Sierra Leone continues in the grip of poverty: increased begging for food, for jobs, a hundred or so mobbing the front gates when casual daily work is available (we were able to employ a whole village to help carry stones for our massive drainage system), the motor bikes are now ridden slowly (saving fuel).
I am now very tired physically and emotionally, it is time to leave before I make a mistake. I know I face stigmatisation on my return, but my garden should benefit from my 21 days in quarantine.
Next year my wife and I plan to return. I don't think Ebola will conveniently (read politically) go away.

Satellites help assess risk of epidemics

Source: http://www.homelandsecuritynewswire.com/dr20141203-satellites-help-assess-risk-of-epidemics

Changes in the environment, global trade, and travel are all factors in the ever-increasing numbers and movement of pests. Identifying and predicting the distribution of existing local species as well as the spread of new exotic ones are essential in assessing the risk of potential epidemics.



Flowchart showing satellite's contribution to predicting pathogen spread // Source: cdc.gov

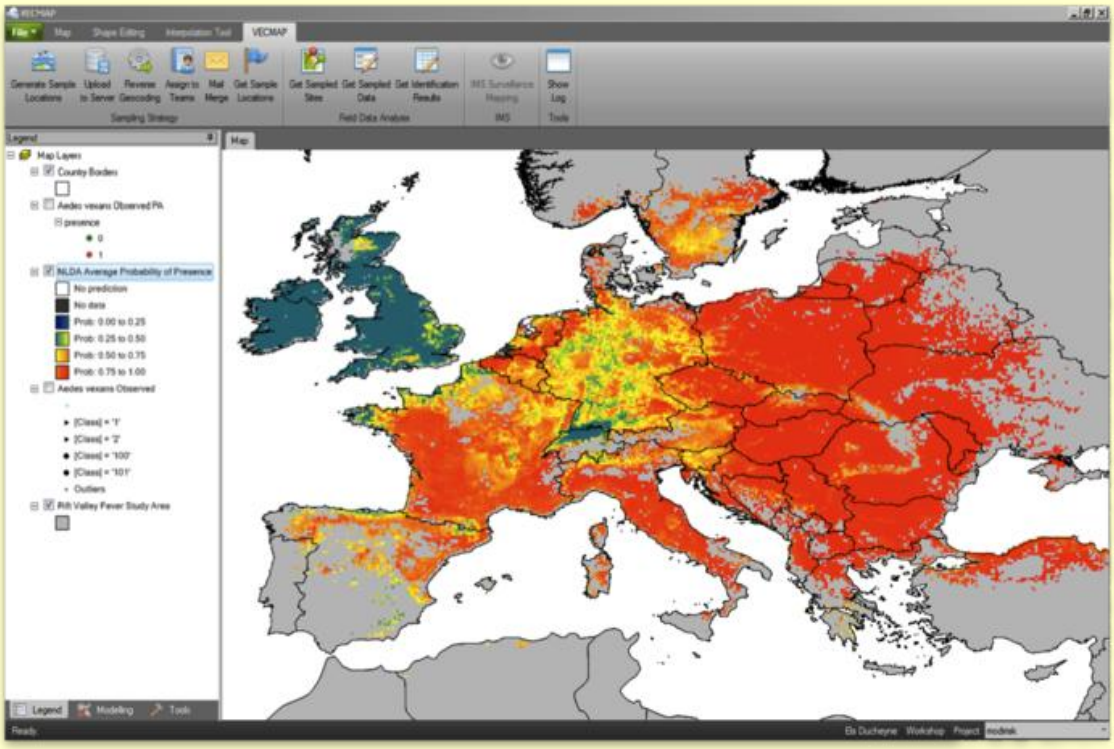
An ESA release reports that a consortium led by Avia-GIS in Belgium and supported by the European Space Agency (ESA) has developed Vecmap — an all-encompassing software and services package including a smartphone app for field studies with a time and location information system, all linked to an online database.

The database pools satellite information with results from field research. Satnav adds location information, helps researchers find their way to testing sites, and helps field teams locate traps for return and analysis in the lab.
Traps are left in target areas chosen from satellite observations. The information helps researchers choose the most representative testing sites, saving time and cost of fieldwork — traditionally the most expensive part of gathering data. The results collected online ultimately enable researchers to map high-risk areas using a wide range of satellite images.

The new approach greatly reduces the complexity of tracking species compared to traditional methods.
Currently, public health authorities use field sampling and statistical analysis to predict those areas most at risk, but a lack of integration between the various services results in a highly complex system requiring specialized knowledge.
Vecmap provides all the data and services for vector mapping and acts as a single entry point for all information needed to predict and prevent infection, making it easy for researchers to collaborate on risk-mapping.

The release notes that twelve institutions in nine European countries tested Vecmap for producing area-wide risk maps during the course of ESA's ARTES project, confirming its viability and the operational benefits for users. Potential users range from governmental health organizations working with researchers to industry.

In parallel, other applications are being developed to support landscape mapping in the Caribbean.



"The support given to us by ESA's ARTES Integrated Applications Promotion Program was a critical step to enable us to embark upon the commercialization of Vecmap," said Guy Hendrickx, CEO of Avia-GIS.

World's response to Ebola slow, inconsistent, inadequate: Médecins sans Frontières

Source: http://www.homelandsecuritynewswire.com/dr20141203-worlds-response-to-ebola-slow-inconsistent-inadequate-m-decins-sans-fronti-res

The NGO Médecins sans Frontières (MSF) has harshly criticized the international community for its slow and inconsistent response to the Ebola crisis in West Africa.

MSF says the world's response risks creating "a double failure" because ill-equipped locals in Sierra Leone, Liberia, and Guinea have been left to run hospitals and treatment centers.

MSF international president, Dr. Joanne Liu, said it was "extremely disappointing that states with biological-disaster response capacities have chosen not to deploy them." She said people "are still dying horrible deaths in an outbreak that has already killed thousands" and urged the world not to be complacent. "We can't let our guard down and allow this to become a 'double failure': a response that is slow to begin with, and then is ill-adapted in the end."

Three months ago MSF issued a call for countries to get involved in the Ebola response. Liu criticized the concentration of international efforts on the construction of

Ebola treatment centers without also providing staff and training, transport and laboratories.

Liu said that in rural areas of Liberia, where hopes had been raised that the Ebola infection rate had plateaued, there were still "active chains of transmission" and no transport facilities to test the patients. In Sierra Leone, the national Ebola response team was struggling, with callers to the emergency 117 helpline being told to isolate themselves at home.

"How is it that the international community has left the response to Ebola — now a transnational threat — up to doctors, nurses and charity workers?" said Liu.

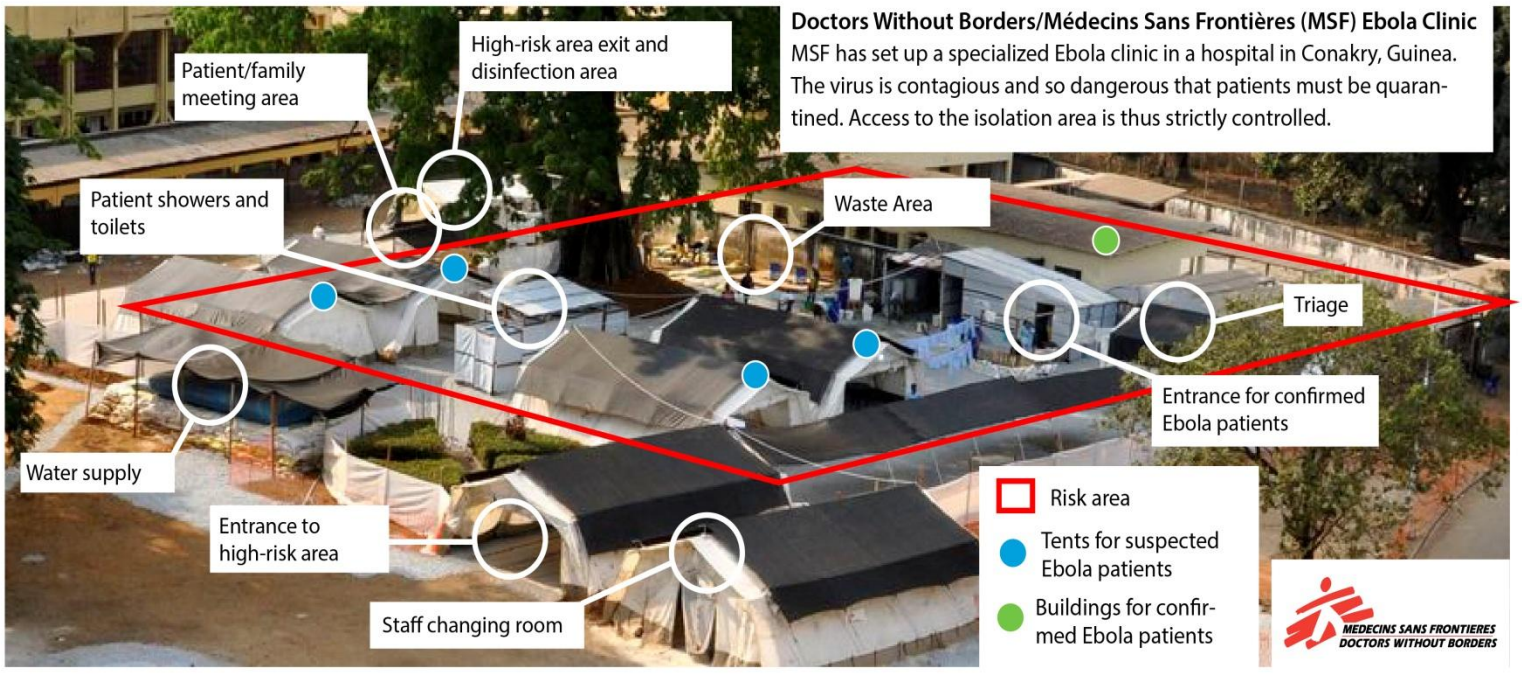
The *Guardian* reports that MSF's gloomy briefing paper on the three West African countries hardest hit by Ebola comes only a day after the World Health Organization (WHO) said it was optimistic about the region despite rising numbers of reported cases.

Bruce Aylward, assistant director general in charge of emergencies at the WHO, said that "there has been a real slowdown in the spread of new cases" in Sierra Leone, where the disease is on the rise, and that "across west Africa we are no longer seeing exponential growth and in some areas a steady decline."

MSF, though, said the situation was "far from under control" in Sierra Leone, that the "situation is alarming" in Guinea and, while progress was being made in Liberia, there was no room for complacency. "The outbreak is far from over, as a single case can start a localized epidemic," it said, reporting infection chains starting in remote rural areas with no access to treatment centers or testing facilities.

MSF noted that case numbers had dropped in the Liberian capital, Monrovia, where there was now surplus bed capacity, but added that many international agencies "seem unable to adapt to the rapidly changing situation" with outbreaks in Bong, Margibi, Gbarpolu, Grand Cape Mount, and River Cess counties. In some areas, such as River Cess, patients must travel for up to twelve hours by road to reach a functioning laboratory and a community care center, MSF said.

In Guinea, where, the MSF says, the outbreak started but was "long overlooked by international efforts," the response was "painfully slow" (see also Adam Nossiter, "Ebola Now Preoccupies Once-Skeptical Leader in Guinea," *New York Times, 30 November 2014*) MSF said that Guinea's Ebola taskforce was improving but that the caseload in November, month on month, was up 25 perent. It added: "New areas are reporting infections and 17 of Guinea's 33 prefectures have reported cases in the past three weeks.



"Like in Sierra Leone and Liberia, the absence of implementing partners willing and able to manage case management centers and a lack of trained staff have been a bottleneck and the source of large delays."
Infection is increasing "alarmingly" in Sierra Leone, said the MSF report, and local healthcare workers were carrying the burden. The latest number of confirmed cases in the country is 5,978.
The *Guardian* notes that the U.K.'s contribution in Sierra Leone has yet to have an impact two months after its aid program was announced. The United Kingdom and China have sent teams to build Ebola centers in
locations including Port Loko, Freetown, and Makeni, the worst-affected of the country's fourteen districts.
The MSF said the United Kingdom pledged to build and provide resources for an additional 700 beds had yet to be fulfilled. "As of 27 November, only 11 of these beds were operational, and only 28 patients had been treated. While the remaining centers are under construction and scheduled to open soon, they will not be running at full capacity until well into the new year," it said.
The U.K. government announced plans to build six hospitals, but only one has opened, in Kerrytown, an hour's drive from Freetown. About 50 percent of the available beds were government-run or run by the armed forces, with another 40 percent run by MSF, the NGO said.
"In the absence of adequate facilities to isolate, diagnose and manage Ebola cases, Sierra Leonean healthcare workers are struggling," MSF said. "[We are] deeply concerned about contamination of uninfected patients and healthcare workers where staff are not necessarily trained to manage Ebola patients and where infection control measures cannot be assured."
Referring to Liberia, the NGO said that "MSF teams are still finding that misconceptions about Ebola are widespread and stigma is intense, leading some to avoid seeking treatment or report cases." The organizations says it found that people who had been in contact with the sick were fleeing into the bush so as not to be traced, fearful of what would happen if they were.

Irish company at advanced stage of testing a treatment for Ebola

Source: http://www.medicalnewstoday.com/releases/286178.php?tw

November 28 – **Hemanua Limited, an Irish start-up company, in collaboration with the Irish Blood Transfusion Service, today announced that they are in advanced testing of Hemanua's ProBlood CP product for treatment of Ebola Virus Disease.**

The ProBlood CP has the capability to enable the harvesting and the transfusion of convalescent plasma (CP) without electricity and driven only by gravity thereby providing a real advantage in remote and less developed regions such as West Africa.
The ProBlood CP has additional advantages as it produces totally cell free plasma.
Dr William Murphy, Medical and Scientific Director, Irish Blood Transfusion Service said, "The use of convalescent plasma from people who have recently recovered from Ebola virus infection has considerable promise as an effective treatment for patients with acute life-threatening infection."
He added, "Clinical trials of plasma therapy are now planned by several agencies in the epidemic-affected region to assess this approach. Phase 1 test results on the ProBlood CP were very encouraging and the device provides a very real opportunity for clinicians in the field to provide convalescent plasma to the Ebola patients in their care easily and rapidly, and without the need for expensive and complex plasmapheresis equipment."
Laboratory testing of Hemanua's technology has been coordinated by Aine Fitzpatrick and Harry Croxon, medical scientists with the Irish Blood Transfusion Service.
Harry Croxon observed that, "Operationally, the ProBlood CP

device tested in our Blood Components laboratory is good to go, by meeting the

requirements to separate a donation of whole blood simply and efficiently into a unit of therapeutic plasma and donor blood cells within a timeframe of 60- 90 minutes. **Results of preliminary laboratory tests indicate that the plasma should be found to be of similar therapeutic value to the plasma produced by conventional means**."

Dr Monique Gueguen, of Médecins sans Frontières in Paris said, "The use of plasmapheresis machines in remote locations can be problematic and a gravity-driven solution could prove of real interest, if full testing completes successfully. Preparation of units of red cell concentrates and plasma without a stable electricity supply and without sophisticated equipment could bring modern transfusion therapy in lesser developed blood centres and remote hospitals."

Dan Maher, CEO, Hemanua Limited said, "ProBlood CP is based on the company's patented filter configuration of hollow microfibres capable of extracting plasma while concentrating the red blood cells for re-transfusion to the donor." He stressed "the ability to re-transfuse immediately to the donor their own red cells is a critical advantage facilitating more frequent donations and keeping the donor healthy."

Hemanua Limited was founded in early 2014 by Dan Maher, Michael Flaherty and Frank O'Regan and is based at NovaUCD, the Centre for New Ventures and Entrepreneurs at University College Dublin and has a development laboratory at the Pharmaceutical and Molecular Biotechnology Research Centre in Waterford Institute of Technology.

Hemanua is focused on designing and manufacturing a wide range of gravity-driven blood separation technologies.

Nebraska Biocontainment Unit perspective on disposal of Ebola medical waste

By John J. Lowe, PhD, Shawn G. Gibbs, PhD, Shelly S. Schwedhelm, RN, MSN, John Nguyen, BS and Philip W. Smith, MD

Am J Infection Control; Volume 42, Issue 12, pp. 1256–1257, December 2014
Source: http://www.ajicjournal.org/article/S0196-6553%2814%2901219-X/abstract

Clinical practices surrounding the current Ebola epidemic have been center stage in discourse concerning research and practice of care. As the medical community becomes more sophisticated in understanding the many facets of treating and containing this virus, the Nebraska Biocontainment Unit has identified Ebola medical waste disposal as a key area of concern for U.S. hospitals. The requirements for processing Ebola medical waste stand to impact most U.S. hospitals currently preparing readiness plans to receive and treat patients with suspected or confirmed Ebola virus disease (EVD).

NEBRASKA BIOCONTAINMENT UNIT APPROACH

The Nebraska Biocontainment Unit is equipped with a passthrough autoclave allowing sterilization of all EVD solid waste being passed out of the units. Briefly, all EVD solid waste generated in the patient room and all doffed PPE is placed inside a clear autoclave bag within the room or designated doffing area. Likewise, patient linens are discarded as solid waste within the patient care room. Our experience caring for a single patient generated a total of 464.4 cu ft of solid wasteweighing 1,011 lbs, which wasmostly PPE. Additionally, linens (eg, HCW scrubs, towels) used as part of the exit procedure for Nebraska Biocontainment Patient Care Unit staff were placed inside green linen bags in the designated scrub doffing area, generating

4-8 bags a day. Bags were goose necked when 75% full, secured with autoclave tape, bleach wiped and transported within the unit to the pass-through autoclave by HCWs in full contact precaution PPE. After autoclave sterilization, solid EVD medical waste was retrieved from the external or clean side of the pass-through autoclave and placed in a biohazard bag lining a primary watertight receptacle and rigid outer packaging and disposed of as category B medical waste. Autoclaved HCW linens were placed into a hospital soiled linen receptacle for special processing. Liquid waste generated by EVD patients was placed into the toilet along with hospital grade disinfectant at the appropriate manufacturer recommended ratio and held for 2.5 times the recommended contact time before flushing. This treatment of the liquid waste surpassed the CDC's guidelines, which states that the liquid waste can be flushed untreated down the toilet.This liquid waste approach was positively received by numerous stakeholders within the surrounding community and alleviated concerns of local plumbing and public works organizations. Hospitals considering the addition of solidifying agents to the liquid waste to enable disposal as a solid waste must first check the material compatibility of the solidifying agent with the autoclaving process prior to autoclaving. If the solidifying agent cannot be autoclaved, the solidified liquid then must be disposed of as category A waste. Our experience indicates that EVD patients may generate up to 9 L of liquid waste a day, which would then contribute to the solid waste burden.

Nebraska Bio-containment Unit

Here Are The 35 U.S. Hospitals Approved To Treat Ebola

Source: http://time.com/3614047/ebola-hospitals-cdc/

The Centers for Disease Control (CDC) has designated 35 hospitals across the U.S. as Ebola treatment centers: facilities that will take in Ebola patients from wherever they first present and provide the more intensive care in isolation wards that the cases require.

The hospitals were evaluated by the CDC's Rapid Ebola Preparedness team, and staff were trained in infection control, use of personal protective equipment and removal of waste from patient rooms. The CDC reviewed 50 hospitals in 15 states.

About 80% of people entering the U.S. from the affected West African countries live within 200 miles of one of the centers, according to the agency. Every person returning from these regions is required to take their temperature daily for 21 days, the incubation period

for the virus. More than 3,000 travelers have been monitored by the CDC and state health departments since the program was implemented in November.

More Ebola treatment centers may be added in coming weeks, but for now, here is a list of the approved facilities:

- Kaiser Oakland Medical Center; Oakland, California
- Kaiser South Sacramento Medical Center; Sacramento, California
- University of California Davis Medical Center; Sacramento, California
- University of California San Francisco Medical Center; San Francisco, California
- Emory University Hospital; Atlanta, Georgia
- Ann & Robert H. Lurie Children's Hospital of Chicago; Chicago, Illinois
- Northwestern Memorial Hospital; Chicago, Illinois
- Rush University Medical Center; Chicago, Illinois
- University of Chicago Medical Center; Chicago, Illinois
- Johns Hopkins Hospital; Baltimore, Maryland
- University of Maryland Medical Center; Baltimore, Maryland
- National Institutes of Health Clinical Center; Bethesda, Maryland
- Allina Health's Unity Hospital; Fridley, Minnesota
- Children's Hospitals and Clinics of Minnesota; St. Paul, Minnesota
- Mayo Clinic Hospital; Minneapolis, Minnesota
- University of Minnesota Medical Center, West Bank Campus, Minneapolis;Rochester, Minnesota
- Nebraska Medicine; Omaha, Nebraska
- North Shore System LIJ/Glen Cove Hospital; Glen Cove, New York
- Montefiore Health System; New York City, New York
- New York-Presbyterian/Allen Hospital; New York City, New York
- NYC Health and Hospitals Corporation/HHC Bellevue Hospital Center; New York City, New York
- Robert Wood Johnson University Hospital; New Brunswick, New Jersey
- The Mount Sinai Hospital; New York City, New York
- Children's Hospital of Philadelphia; Philadelphia, Pennsylvania
- Hospital of the University of Pennsylvania; Philadelphia, Pennsylvania
- University of Texas Medical Branch at Galveston; Galveston, Texas
- Methodist Hospital System in collaboration with Parkland Hospital System and the University of Texas Southwestern Medical Center; Richardson, Texas

- University of Virginia Medical Center; Charlottesville, Virginia
- Virginia Commonwealth University Medical Center; Richmond, Virginia
- Children's Hospital of Wisconsin, Milwaukee; Milwaukee, Wisconsin
- Froedtert & the Medical College of Wisconsin—Froedtert Hospital, Milwaukee; Milwaukee, Wisconsin
- UW Health—University of Wisconsin Hospital, Madison, and the American Family Children's Hospital, Madison; Madison, Wisconsin
- MedStar Washington Hospital Center; Washington, DC
- Children's National Medical Center; Washington DC
- George Washington University Hospital; Washington DC

This Is How Much the U.S. Has Accomplished in Ebola Preparedness in Only Two Months

Source: http://www.nationaljournal.com/health-care/this-is-how-much-the-u-s-has-accomplished-in-ebola-preparedness-in-only-two-months-20141202

A U.S. military equipment hangar at the airport outside of Monrovia, Liberia.(John Moore/Getty Images)

December 02 – There are no reported Ebola cases in the United States right now. But should one emerge, the country is more than prepared to handle it.

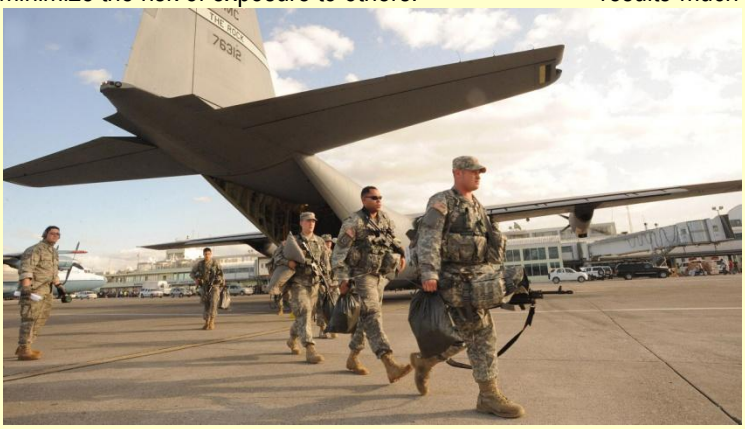
The White House released on Tuesday a comprehensive review of how the domestic and international response to the deadly virus both has changed in the past two months, when a patient was diagnosed with Ebola on American soil for the first time in history. The level of preparedness, described in more than 5,700 words, is massive, and something that countries such as Liberia, New Guinea, and Sierra Leone, which are at the center of the Ebola outbreak, can only dream of. The update came ahead of President Obama's speech at the National Institutes of Health in Bethesda, Md., on Tuesday night, where he urged Congress to grant his request for $6.2 billion in emergency funds for global Ebola response efforts before members leave for the holidays.

"It's a good Christmas present to the American people and to the world," Obama said, later adding: "This can't get caught up in normal politics."

Here are the highlights of the administration's update:

There's a greater U.S. presence on the ground in West Africa. The number of military personnel has risen from several hundred in the summer to 3,000 this month. U.S. workers have the capacity to train 200 health care

workers per week in Monrovia, the capital of Liberia. And the number of U.S.-supported burial teams has risen from 12 in September to 65 in December. The teams are called to dispose of bodies of deceased Ebola patients, who are most contagious after death, to minimize the risk of exposure to others.



And the U.S. personnel have constructed new medical facilities there. The U.S. military opened three treatment units this month. Seven more are expected to be up and running in a few weeks.

More U.S. hospitals are ready for Ebola patients. Before Ebola arrived in the United States, federal health officials didn't know how to judge whether a hospital was prepared to treat the disease. The U.S. had just eight hospital beds in three facilities with the "biocontainment capability" necessary to treat highly infectious diseases such as Ebola. Now, 53 beds at 35 designated treatment centers are available, from coast to coast.

Obama's "Ebola SWAT Team" exists. In mid-October, the president directed the Centers for Disease Control and Prevention to build a team that could travel to U.S. hospitals with Ebola cases within 24 hours of a diagnosis. The group has since visited 52 facilities in 15 states and Washington, D.C., to advise health workers on treatment, containment, and protocol for personal protective gear.

More laboratories can now test for the virus. Before the outbreak in West Africa, Ebola could be confirmed only at CDC headquarters in Atlanta. By August, 13 labs in 13 states had the capacity to test for Ebola. Now, 42 labs in 36 states can do so, with authorization from the Food and Drug Administration, which has approved six different diagnostic tests. And doctors can get results much faster. An Ebola specimen tested at Mt. Sinai Hospital in New York City in August took 24 hours to complete. Now, it takes just four to six hours. One of the FDA-approved tests produces results in less than an hour.

An Ebola vaccine has made it through the first set of clinical trials. The vaccine, developed by the National Institute of Allergy and Infectious Diseases and British pharmaceutical company GlaxoSmithKline, has shown promise in preliminary trials. Four others are in development, and health officials expect to begin clinical trials in West Africa in the coming weeks.

The feds check with people who recently returned to the U.S. from Ebola-affect countries every day. Those people, who, since October, are allowed to enter the U.S. only through five specific airports, are required to report their temperature readings twice a day to state public health officials for 21 days, the accepted incubation period for Ebola. The White House reports that more than 80 percent of travelers returning from West Africa live within 200 miles of a treatment center.

Federal health officials have talked to thousands of health workers about Ebola. Employees at the CDC and the Health and Human Services Department have held more than 100 conference calls and 30 webinars about infection control and protective gear. They have regularly called 20,000 physicians and dentists and 10,000 nurses.

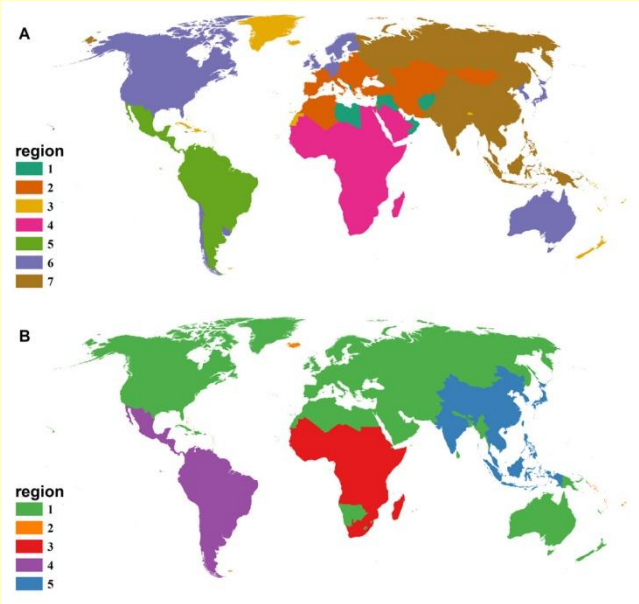
Ebola Toy…

Source: http://www.giantmicrobes.com

EDITOR'S COMMENT: And this is supposed to be educational? And part of the buying price will go to Ebola victims? Sorry I have become a bit suspicious on good intentions and global markting…

World can be separated into seven regions for vectored human diseases

Source: http://www.homelandsecuritynewswire.com/dr20141204-world-can-be-separated-into-seven-regions-for-vectored-human-diseases



Researchers at North Carolina State University have for the first time mapped human disease-causing pathogens, dividing the world into a number of regions where similar diseases occur.

Maps reflect vectored human diseases (top) and non-vectored human diseases. Click for larger image. Image courtesy of Michael Just.

The findings show that the world can be separated into seven regions for vectored human diseases — diseases which are spread by pests, like mosquito-borne malaria — and five regions for non-vectored diseases, like cholera.

Interestingly, not all of the regions are contiguous. An NC State release reports that the British Isles and many of its former colonies, such as the United States and Australia, have similar diseases and are classified in the same vectored and non-vectored regions. Britain's former colonies in Africa and Asia, however, contain different diseases and therefore are located in differing regions, suggesting that colonization is just one of a variety of factors, like climate and socio-political status, affecting the prevalence of disease in a specific area.

"This is about more than just the movement of people — climate, history, and geography all seem to be important factors in how diseases survive and thrive across the globe," said Michael Just, an NC State Ph.D. student in plant and microbial biology and lead author of a paper describing the research. "Understanding that not all pathogens are everywhere could have consequences for public health and the global society as a whole."

The researchers examined the world's 229 countries for the presence or absence of 301 diseases — 93 vectored and 208 non-vectored. It found two more vectored-disease regions than non-vectored disease regions, which is likely due to the fact that the vectors — the pests that carry disease — sometimes have limited mobility. Think of a warm-weather pest that can't handle the cold, like the mosquito.

"Researchers have mapped humans, animals and plants and their movement and evolution across the globe, but the things that live on or with us — pests and pathogens, for example — have been largely ignored," Just said. "This study is a good first step in examining the relationship between people and their pathogens, which could have important human health implications."

▶ **Read the full paper at:** http://www.esajournals.org/doi/full/10.1890/ES14-00201.1

Role of big data in the early detection of Ebola and other emerging infectious diseases

By Gabriel J Milinovich, Ricardo J Soares Magalhães and Wenbiao Hu

School of Public Health and Social Work, Queensland University of Technology, Australia; School of Veterinary Science, University of Queensland, Australia

Source: http://www.thelancet.com/journals/langlo/article/PIIS2214-109X%2814%2970356-0/fulltext?version=printerFriendly

The lack of adequate disease surveillance systems in Ebola-affected areas has both reduced the ability to respond locally and has increased global risk. There is a need to improve disease surveillance in vulnerable regions, and digital surveillance could present a viable approach.

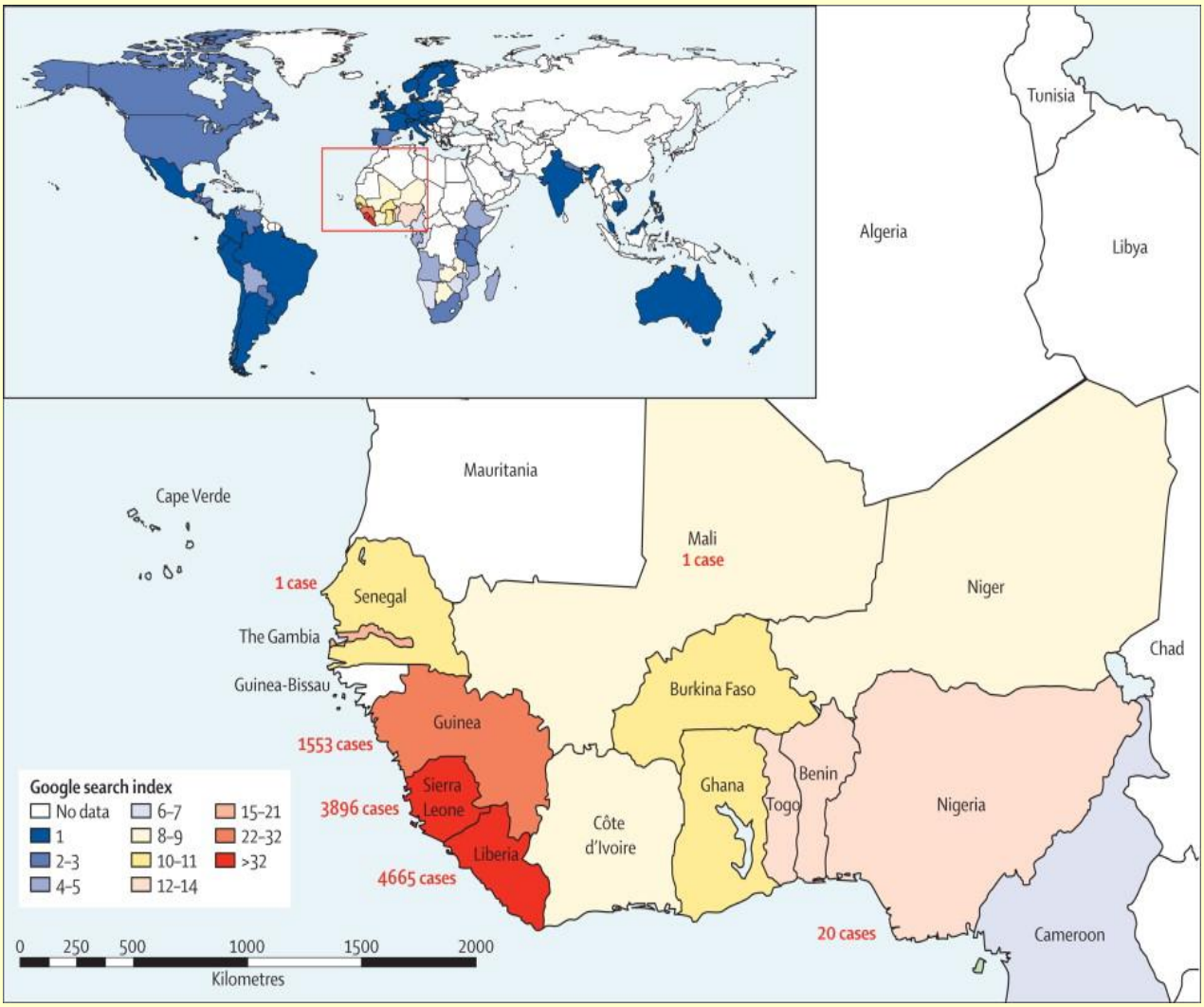
Digital surveillance seeks to gain knowledge of public health issues through the analysis of data in the digital domain (such as internet search metrics, Twitter posts, or online news stories), the distribution of these data, and patterns of access. It has already shown some promise.1 In 2002, the Global Public Health Intelligence Network, a news-feed aggregator developed by the Public Health Agency of Canada, provided the first alert of SARS (more than 2 months before publication by WHO) and prompted the confirmation of an emerging disease event by the Chinese Government.2 A more recently developed system, HealthMap,3 is currently applying a similar data-aggregation approach to monitor the evolving Ebola outbreak; HealthMap identified news stories reporting a strange fever in Guinea on March 14, 2014—9 days before the release of official case information for the ongoing Ebola outbreak.

Currently, the most comprehensively investigated digital surveillance approach is based on monitoring of internet search metrics.4 These systems work on the premise that people who contract a disease are likely to seek information on their condition on the internet and an estimate of disease in the community can be produced by monitoring the frequency of specific searches. Overall, results for this approach have been promising; the scope of research has, however, been limited to a small number of diseases, particularly influenza, and has mainly focused on industrialised countries.

We used Google Trends to assess the volume and location of Google searches for "ebola" between Jan 1, 2014, and Oct 27, 2014. Search volume data were downloaded from Google Trends on Oct 28, 2014. Internet search volume increased markedly from affected regions over the course of the epidemic, and most Google searches during 2014 for

"ebola" originated from the regions most affected (Liberia, Guinea, and Sierra Leone; figure). Furthermore, search frequency in these countries was highly correlated with epidemic curves (appendix). Pairwise correlations, by Spearman's Rho, between weekly national case numbers5 and Google Trends search frequencies for the term "ebola" were 0·54 for Guinea, 0·70 for Liberia, 0·68 for Sierra Leone (all p<0·001; one-tailed).

Relative internet search interest for "ebola" during 2014
The region with the highest search volume (Liberia) is indexed to 100 and other regional values are scaled accordingly. Total case numbers (as of Oct 25, 2014) are indicated beside the affected countries.5



There is clearly some noise in these data and this is not unexpected considering analyses only used a single search term and given the significant public and media interest in the outbreak. Also, whether digital surveillance systems might have facilitated earlier detection or reduced the effect of the ongoing Ebola epidemic remains moot. Overall, however, these results are promising and, generally, support the development of internet-based surveillance systems for developing countries.

Shifting patterns of health-seeking behaviour, the digitisation of society, and increased technology uptake present an opportunity to address emerging infectious disease events. Internet use in developing countries is high and continues to grow; as such, sufficient infrastructure exists on which to develop digital infectious disease surveillance and early warning systems in many of these regions.

There will be challenges to developing digital surveillance systems for regions that are not currently covered sufficiently by traditional surveillance systems. The potential impact for

these regions, however, extends beyond the local scale. These systems will have global relevance and could contribute to improved global health security.

Ebola Free-for-All Could Trigger Bad Science and Wasted Efforts

Source: http://www.scientificamerican.com/article/ebola-free-for-all-could-trigger-bad-science-and-wasted-efforts/

Dr. John M. Dye, Jr., U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) Viral Immunology branch chief, works in a laboratory at the USAMRIID headquarters in Frederick, Maryland. Dr. Dye is leading a team that is conducting a study with nonhuman primates involving the experimental drug ZMapp, an experimental treatment for Ebola patients.

When it comes to treatments for Ebola, there has been a nearly four-decade-long drought. Nothing in the medical arsenal attacks the virus directly. For the most part, patients receive only supportive care, offered at a minimum level if too few health-care workers struggle to keep too many patients alive.

The current extraordinary outbreak in West Africa provides, really for the first time, a chance to change that. This, the largest outbreak on record, presents an opportunity to test some therapies in the hopes that those caring for future Ebola patients will never again despair at the fact that the best they can offer is a bed, fluids, nutrition and human kindness.

But that drought could give way to a free-for-all if the world is not careful, some experts worry. Driven by the enormity of this epidemic and the prospect of months more to come, there is a sharp desire in some quarters to try almost anything that might help.

It is not a position all endorse. “I think we have to go forward based on scientific evidence, not on belief,” says Martin Friede, the World Health Organization’s team leader for work on experimental Ebola drugs. “There are situations where doing nothing is actually better than doing something that is not justified.”

Drug shortages

The drugs people really want to test are not currently available in sufficient quantities to run clinical trials in West Africa. And that status will not change anytime soon.

The monoclonal antibody cocktail ZMapp gained nearly mythical status last summer when Kent Brantly, an American missionary doctor infected with Ebola in Liberia, became the first person to receive the treatment. Media reports suggest Brantly, gravely ill when his first transfusion started, improved rapidly, getting up to shower the next day. There were fewer than a dozen treatment courses (three transfusions equal one course) in existence when Brantly was treated; within a couple of weeks, they were gone.

The three antibodies in the cocktail—developed by researchers at the Public Health Agency of Canada’s National Microbiology Laboratory and the U.S. National Institute of Allergy and Infectious Diseases—are generated in genetically modified tobacco plants by Kentucky BioProcessing for license holder Mapp Biopharmaceutical. Kentucky Bio can produce enough antibodies for between 17 and 25 treatment courses per batch; it takes 12 weeks to grow the plants and a couple more to process the material.

Efforts are afoot to try to substantially ramp up ZMapp output. The Biomedical Advanced Research and Development Authority (BARDA), tasked with

meeting America's vaccine, drug and diagnostic needs during public health emergencies, is considering bringing on board another producer, a move that could potentially increase ZMapp output four- or fivefold, says director Robin Robinson. In addition, researchers are conducting studies in nonhuman primates to determine whether the number or volume of the infusions in a treatment course could be reduced, allowing supplies to be stretched.

The other leading therapeutic is the small interfering RNA drug TKM-Ebola, made by Tekmira Pharmaceuticals. The Vancouver-based company had in hand a modest number of doses when the outbreak took off; it had commenced phase 1 human trials on the drug.

That work—designed to determine if TKM-Ebola is safe and what a dose should entail—is actually on a partial clinical hold because the U.S. Food and Drug Administration raised concerns about some of the safety data. Still, the drug can be released under "emergency use" rules, and it has been given to a small number of confirmed or suspected Ebola patients who have received care in the U.S. or Europe. Tekmira says clinical trials in West Africa are planned for the first half of next year.

Dangerous enthusiasm

But the lack of Ebola-specific treatments has not deterred the search for magic bullets—or ammunition of any sort. To the contrary: The drug vacuum, coupled with the severity of this outbreak, has inspired a curious phenomenon. Everybody and his uncle, it seems, has an idea of something that might work to cure people infected with the deadly virus.

A tsunami of treatment proposals has flooded the in-boxes of staff at the WHO and research funding agencies. Silver nanoparticles. Cholesterol-controlling statins. A breast cancer drug. Intravenous ozone. Vulture gastric fluids. An influenza antiviral. Interferon. Almost anything you can think of is being advocated as a potential Ebola curative, often with few or no data to support the case.

Some of the suggestions are easy to strike from the list, says Friede. For example, there will be no WHO-led push to see if exposing infected blood to ultraviolet light will cure the disease. Likewise, vultures can rest easy.

But the vast majority of the proposals are not in the readily dismissed class. Many are being proposed by scientists who hypothesize if a certain drug treats such and such a symptom in the course of one disease, it may well do the same for Ebola patients.

"The problem then is that there are hundreds of these.... People say, 'This is an antiviral. Ebola is a virus. Therefore we should try this.' Now, that's a bit of a jump," Friede says, noting relatively few scientists understand the Ebola disease course thoroughly.

The scientific quest for an at-hand answer to a horrible outbreak could actually waste time and resources and potentially endanger lives. Some people have argued that there is no time to test if licensed drugs that might work against Ebola are protective and safe in animal studies; they advocate using them in patients because of the disease's high death toll. The WHO is powerless to stop that kind of study, Friede admits. If a researcher can get financial support for a trial and secure regulatory agency approval in an Ebola-affected country and persuade staff in an Ebola treatment unit to go along with the idea, this kind of study could happen.

And will, it seems, despite the WHO's reservations. Italian doctors announced last week they will test the antiarrhythmia drug amiodarone at a treatment center in Sierra Leone. The drug has some action against Ebola virus in the test tube, but the fear is that the concentrations required for it to have an effect might be unsafe in people. Friede has reached out to the principal investigator to convey those concerns.

The situation underscores how poorly served science is when researchers do not write up negative study findings, or journals choose not to publish them. Many of the compounds being proposed have been tested against Ebola in vitro or in animal models already, but there may be no evidence of the work in the literature. Repeating the research—or worse, taking one of these failed compounds directly to the field to test in people—would be wasteful and potentially unwise.

In this respect, the small size of the Ebola research community is an advantage for those who want to forestall that possibility. Ebola research must be done in

laboratories with the highest degree of biosafety and biosecurity, BSL-4, and there are not many of them around. The WHO's Scientific and Technical Advisory Committee on Ebola Experimental Interventions is working with those labs to draw up a list of compounds that have been studied. They plan to publish a registry on the global health agency's website, listing compound, testing method and results. The hope is this will prevent duplication of work that is unlikely to bear fruit.

Next steps

So what will be tested? In the first round, starting in December, three therapies will be studied; two are drugs and the other is transfused blood from Ebola survivors. These studies will start in Ebola treatment units operated by Médecins Sans Frontières (MSF, known as Doctors Without Borders in English) in Guéckédou and Conakry, Guinea, and in a third site yet to be named.

The drugs are antivirals, though not specifically designed to target Ebola. Favipiravir, an influenza drug also known as T-705, is licensed in Japan for use against novel influenza strains. In test tubes and in mice, the drug shows some inhibitory activity against Ebola virus—although the rodents are not the most reliable of animal gauges. There has been some testing in nonhuman primates, but those results have not yet been published. Still, with this degree of evidence and the fact of an available drug, the WHO committee felt favipiravir should be tried.

The other is an antiviral called brincidofovir, which is in development for treatment of cytomegalovirus and adenovirus infections. It works against Ebola in vitro but cannot be tested in nonhuman primates; they lack an enzyme needed to metabolize the drug, Friede says.

The MSF trials will not be placebo controlled; the group shares the views of a number of experts that randomly assigning some people to forgo a treatment that might improve their survival chances is not acceptable under the current circumstances. "MSF does feel that at this stage it will be ethically and operationally very challenging to have an RCT"—randomized controlled trial—"in one of our settings," says Annick Antierens, who is heading the organization's work on experimental Ebola drugs.

Those who oppose placebo-controlled trials for Ebola patients hope instead that comparing outcomes from treated patients to those who were previously cared for in the same facility will show if a drug being tested increases survival rates. But that may be challenging. If care has improved because patient numbers have dropped, survival rates could rise on their own. A drug that does nothing might look like a winner.

That may not be merely a theoretic possibility. The mortality rate seems to be dropping in some locations. Centers that reported losing 70 percent of their patients are now seeing half survive. "Nobody can actually currently explain why, because it does not appear to be due to better care being available," Friede says, noting that for trials without control arms, "this creates a real challenge."

Survivors' blood

The trial at Conakry, the Guinean capital, will test whether the blood of survivors can help Ebola patients overcome their illness. In theory, it should: the acquisition of antibodies through blood transfusion works for some other diseases. And this technique has been used previously, during a 1995 Ebola outbreak at Kikwit, in what is now the Democratic Republic of Congo. Eight patients received blood from Ebola survivors; seven lived.

But Ebola experts have long disputed that the transfusions contributed to the patients' survival. The transfusions were given late into the disease course; patients who do not succumb early tend to survive. And convalescent serum does not save primates from Ebola. "The data is just foggy," says Luciana Borio, who leads the FDA's Ebola response.

Still, it is something the WHO and others have pushed, a therapy they believe is worth testing. There was hope the project could have gotten off the ground weeks ago. But even something as seemingly simple as blood transfusions is complex in countries where health-care systems are in disarray. "Yes, it's frustrating. You want to move quicker. But this is just the reality of the situation that we're facing," says David Wood, the WHO's

lead on the convalescent blood project.
There is huge stigma attached to Ebola, and it is not clear how willing survivors will be to step forward to donate blood. "We are planning that there will be a trickle rather than a flood to start with," Wood says.
There are other challenges. Few Ebola treatment units can provide the consistent care to do clinical trials. And case counts wax and wane. This month's hot spot may have few patients next month when a trial begins. Says Friede, "This outbreak is like quicksand. It's continually moving."
Simple things researchers take for granted—access to a tablet or laptop for entering data while assessing a patient—are anything but easy in Ebola treatment units. Only items that can be decontaminated can be taken out of the hot zones in these centers. That rules out tablets, smartphones, even pieces of paper. Some health-care workers have reported devising systems in which someone on the inside holds a piece of paper containing patient data up to a window or aperture while someone on the outside takes a photo, thereby capturing the data.
As well, these units cannot run the gamut of blood tests researchers would normally need to assess a drug or therapy in clinical trial in the U.S. or Europe. Given these complexities, it is little wonder that the WHO's Scientific and Technical Advisory Committee is urging use of a standardized minimum data set, to ease the demands on treatment centers while still generating evidence that could be compared from one location to the next.

Nosocomial Transmission of Crimean-Congo Hemorrhagic Fever (CCHF) from a US Soldier

By Amesh A. Adalja, MD, FACP, FACEP
Source: www.upmc-cbn.org | www.UPMCHealthSecurity.org

December 05 – Hemorrhagic fever viruses are generally not as contagious as many other pathogens--such as those that spread primarily by a respiratory route--but they pose considerable infection control challenges because of the amount and type of blood and bodily fluids they induce patients to emit. Crimean-Congo Hemorrhagic Fever (CCHF) virus, a tickborne pathogen endemic in many parts of the world, is one such virus. The case of a US soldier who was fatally infected with CCHF illustrates several important points about caring for hemorrhagic fever patients that are directly applicable to Ebola and other similar viruses.

Infection in Afghanistan

A US soldier working in Kandahar City, Afghanistan, in 2009 presented for care after having experienced fever and gastrointestinal symptoms for several days. The patient was diagnosed with gastroenteritis, prescribed an antibiotic, and released. His condition had worsened by the next day, and he was admitted to the hospital. Testing for CCHF was performed upon admission and returned positive on the 7th day of illness. The patient's clinical condition had deteriorated to the point that he had developed multi-organ dysfunction requiring multiple heroic interventions, including mechanical ventilation, hemodialysis, and liver dialysis. The antiviral ribavirin was administered. Despite these measures, the patient succumbed to CCHF. Of note, until the patient was confirmed to have CCHF, only standard infection control measures were in force.

Contact Tracing

Since CCHF can be spread through direct contact with blood and bodily fluids, contact tracing was commenced. Three tiers of exposure were identified encompassing 90 individuals, 18 of whom were offered oral ribavirin as postexposure prophylaxis (PEP). Of the contacts, 2 were of special concern: an ICU nurse and a respiratory therapist who had had higher-risk exposure to the patient including manual bag-valve ventilation. Both of these individuals were subsequently found to have seroconverted to CCHF when a serosurvey was later performed. Both individuals seroconverted while receiving

ribavirin PEP. They were both noted to have mild symptoms during treatment that were attributed to the ribavirin at the time but which in fact may actually have been CCHF blunted by the ribavirin.

Vigilance Needed

Hemorrhagic fever viruses--whether Ebola, Lassa, Marburg, or CCHF--are unforgiving of lapses in infection control. The fact that these viruses are primarily transmitted from person to person by contact with blood and bodily fluids hampers their ability to spark large-scale epidemics, but it does not greatly reduce the risk of infection to healthcare workers who are not wearing appropriate PPE. Such risk is magnified when dealing with patients who are critically ill and receiving invasive procedures in which blood and bodily fluid exposure is the norm. Like the 2 American nurses who were infected with Ebola while caring for a critically ill patient, these 2 CCHF-infected healthcare workers exemplify how essential infection control protocols are and how difficult it may be for all hospitals to implement them without fail.

Reference

Conger NG, Paolino KM, Osborn EC, et al. Health care response to CCHF in US soldier and investigation of nosocomial transmission to health care providers, Germany, 2009. *Emerg Infect Dis* 2015.

▶ **Read the full paper at:** http://wwwnc.cdc.gov/eid/article/21/1/14-1413_article

The Choice

By Nancy Gibbs

Source: http://time.com/time-person-of-the-year-ebola-fighters-choice/

Not the glittering weapon fights the fight, says the proverb, *but rather the hero's heart.*

Maybe this is true in any battle; it is surely true of a war that is waged with bleach and a prayer.

For decades, Ebola haunted rural African villages like some mythic monster that every few years rose to demand a human sacrifice and then returned to its cave. It reached the West only in nightmare form, a Hollywood horror that makes eyes bleed and organs dissolve and doctors despair because they have no cure.

But 2014 is the year an outbreak turned into an epidemic, powered by the very progress that has paved roads and raised cities and lifted millions out of poverty. This time it reached crowded slums in Liberia, Guinea and Sierra Leone; it traveled to Nigeria and Mali, to Spain, Germany and the U.S. It struck doctors and nurses in unprecedented numbers, wiping out a public-health infrastructure that was weak in the first place. One August day in Liberia, six pregnant women lost their babies when hospitals couldn't admit them for complications. Anyone willing to treat Ebola victims ran the risk of becoming one.

Which brings us to the hero's heart. There was little to stop the disease from spreading further. Governments weren't equipped to respond; the World Health Organization was in denial and snarled in red tape. First responders were accused of crying wolf, even as the danger grew. But the people in the field, the special forces of Doctors Without Borders/Médecins Sans Frontières (MSF), the Christian medical-relief workers of Samaritan's Purse and many others from all over the world fought side by side with local doctors and nurses, ambulance drivers and burial teams.

Ask what drove them and some talk about God; some about country; some about the instinct to run into the fire, not away. "If someone from America comes to help my people, and someone from Uganda," says Iris Martor, a Liberian nurse, "then why can't I?" Foday Gallah, an ambulance driver who survived infection, calls his immunity a holy gift. "I want to give my blood so a lot of people can be saved," he says. "I am going to fight Ebola with all of my might."

MSF nurse's assistant Salome Karwah stayed at the bedsides of patients, bathing and feeding them, even after losing both her parents—who ran a medical clinic—in a single week and surviving Ebola herself. "It looked like God gave me a second chance to help others," she says. Tiny children watched their families die, and no one could so much as hug them, because hugs could kill. "You see people facing death without their loved ones, only with people in space suits," says MSF president Dr. Joanne Liu. "You should not die alone with space-suit men."

Those who contracted the disease encountered pain like they had never known. "It hurts like they are busting your head with an ax," Karwah says. One doctor overheard his funeral being planned. Asked if surviving Ebola changed him, Dr. Kent Brantly turns the question around. "I still have the same flaws that I did before," he says. "But whenever we go through a devastating experience like what I've been through, it is an incredible opportunity for redemption of something. We can say, How can I be better now because of what I've been through? To not do that is kind of a shame."

So that is the next challenge: What will we do with what we've learned? This was a test of the world's ability to respond to potential pandemics, and it did not go well. It exposed corruption in African governments along with complacency in Western capitals and jealousy among competing bureaucrats. It triggered mistrust from Monrovia to Manhattan. Each week brought new puzzles. How do you secure a country, beyond taking passengers' temperatures at the airport? Who has the power to order citizens to stay home, to post a guard outside their door? What will it take to develop treatments for diseases largely confined to poor nations, even as this Ebola outbreak had taken far more lives by mid-October than all the earlier ones combined?

The death in Dallas of Thomas Eric Duncan, the first Ebola patient diagnosed on U.S. soil, and the infection of two nurses who treated him, shook our faith in the ability of U.S. hospitals to handle this kind of disease. From there the road to full freak-out was a short one. An Ohio middle school closed because an employee had flown on the same plane as one of Duncan's nurses. Not the same flight, just the same plane. A Texas college rejected applicants from Nigeria, since that country had some "confirmed Ebola cases." A Maine schoolteacher had to take a three-week leave because she went to a teachers' conference in Dallas. Fear, too, was global. When a nurse in Spain contracted Ebola from a priest, Spanish authorities killed her dog as a precaution, while #VamosAMorirTodos (We're all going to die) trended on Twitter. Guests at a hotel in Macedonia were trapped in their rooms for days after a British guest got sick and died. Turned out to have nothing to do with Ebola.

The problem with irrational responses is that they can cloud

the need for rational ones. Just when the world needed more medical volunteers, the price of serving soared. When nurse Kaci Hickox, returning from a stint with MSF in Sierra Leone with no symptoms and a negative blood test, was quarantined in a tent in Newark, N.J., by a combustible governor, it forced a reckoning. "It is crazy we are spending so much time having this debate about how to safely monitor people coming back from Ebola-endemic countries," says Hickox, "when the one thing we can do to protect the population is to stop the outbreak in West Africa."

Ebola is a war, and a warning. The global health system is nowhere close to strong enough to keep us safe from infectious disease, and "us" means everyone, not just those in faraway places where this is one threat among many that claim lives every day. The rest of the world can sleep at night because a group of men and women are willing to stand and fight. For tireless acts of courage and mercy, for buying the world time to boost its defenses, for risking, for persisting, for sacrificing and saving, the Ebola fighters are TIME's 2014 Person of the Year.

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When the next shoe drops — Ebola crisis communication lessons from October

Source: http://www.cidrap.umn.edu/news-perspective/2014/12/commentary-when-next-shoe-drops-ebola-crisis-communication-lessons-october

***Editor's note:** Today's commentary was submitted to CIDRAP by the authors, who are internationally renowned experts on risk communication and crisis communication. Peter M. Sandman, PhD, originated the "Risk = Hazard + Outrage" formula for risk communication. In addition to his work on risk controversies, he speaks, writes, and consults widely on communication aspects of pandemic preparedness and other public health threats. Jody Lanard, MD, a psychiatrist by training, is also a risk communication speaker, writer, and consultant. She specializes in public health crisis communication, especially in developing countries. Much of their risk communication writing is available without charge on the Peter M. Sandman Risk Communication Website (www.psandman.com/). Commentaries submitted to CIDRAP do not necessarily represent the center's scientific position.*

In contrast to the Ebola crisis in West Africa, which started in late 2013 and will last well into 2015 or longer, the US "Ebola crisis" was encapsulated in a single month, October 2014. But there may well be US Ebola cases to come, brought here by travelers or returning volunteers. And other emerging infectious diseases will surely reach the United States in the months and years ahead.

So now is a propitious time to harvest some crisis communication lessons from the brief US Ebola "crisis."

We're putting "crisis" in quotation marks because there was never an Ebola public health crisis in the United States, nor was there a significant threat of one. But there was a crisis of confidence, a period of several weeks during which many

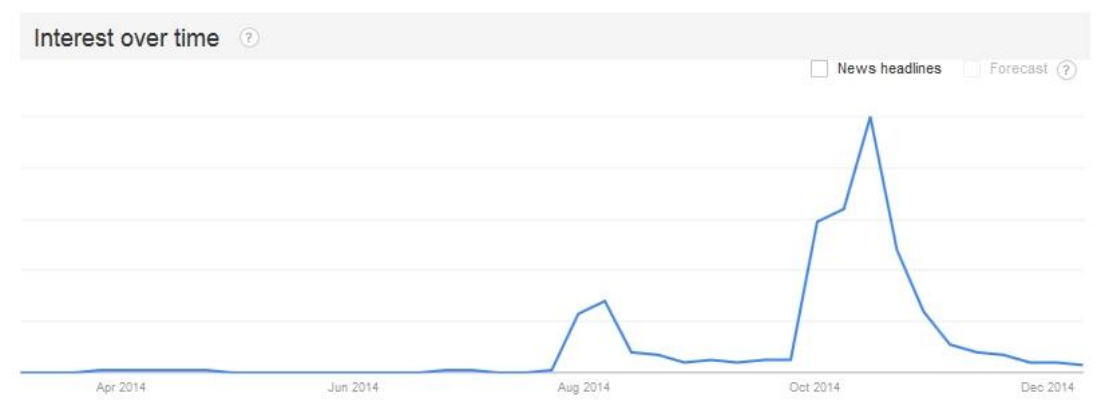
Americans came to see the official response to domestic Ebola as insufficiently cautious, competent, and candid—and therefore felt compelled to implement or demand additional responses of their own devising.

To some extent this brief overreaction was inevitable, simply because a terrifyingly lethal infectious disease had made its way from fiction to reality, from small outbreaks to a major epidemic, and from Africa to America.

New risks typically provoke such a temporary overreaction, which we have labeled an "adjustment reaction." The strength of the US Ebola adjustment reaction, however, was exacerbated by a number of official crisis communication errors.

Four of the main errors are delineated below.

Google Trends data showing increased Ebola interest in August and a larger peak in October.



Early US response

But first, consider phase one of Ebola in the United States, from early August through late September 2014. During this phase, starting with the repatriation of Kent Brantly, MD, and ending with the diagnosis of Thomas Eric Duncan, the public generally accepted what public health professionals were telling them about Ebola. As a result, public health professionals generally found the public's reaction acceptable, and accusations that the public was overreacting, hysterical, or irrational were infrequent.

After the announcement that two infected American healthcare workers (Brantly, followed by Nancy Writebol) were to be repatriated in early August, there was immediate intense interest, and a vivid but small outcry against bringing Ebola-infected persons into the country.

But the general public lost interest fairly quickly, believing the repeated assurances that the two patients would not spread Ebola to others in the United States. Most laypeople got the impression then that public health officials and experts were trustworthy, competent, and justified in their drumbeat of confident statements that "We know how to stop Ebola."

During this phase, US hospitals had numerous rule-out-Ebola false alarms and even more numerous drills. The celebratory proclamations of hospital officials contributed to the public's confidence. The headlines were virtually identical: "California hospitals say they are ready for Ebola, if it shows up"; "Colo. hospitals say they're prepared for Ebola."

But during this same period, some healthcare workers and state public health officials started (quietly) voicing concerns about the Ebola infection control measures recommended by the U.S. Centers for Disease Control and Prevention (CDC), and about hospital readiness to manage Ebola cases.

On Aug 5, the day Writebol arrived at Emory University, the CDC held a Clinician Outreach and Communication Activity (COCA) call. Throughout the call, CDC officials were emphatic that familiar infection control equipment and procedures would be sufficient to manage Ebola patients. Many of the clinicians who called in asked tough questions about whether those familiar precautions would be enough. At the end of the call, there were still more than 90 questions in the queue.

By the end of August, several state health officials had contacted us about the CDC's

Ebola infection control risk communication. Their message: "Our healthcare workers are not buying what the CDC is selling—and we aren't either."

And on Sep 24, while Eric Duncan was incubating Ebola in Dallas, nurses in Las Vegas held a "die-in" to warn that the nation was not ready for an Ebola outbreak.

US public interest in Ebola naturally escalated after Sep 30, when Duncan was diagnosed as having Ebola at Texas Health Presbyterian Hospital Dallas. But it wasn't the mere fact that the country now had its first domestic case that provoked the ensuing strong public reaction. The CDC had done a good job of warning that there would probably be a domestic case sooner or later. Rather, the reaction was fueled by a sequence of seemingly improbable mistakes: the fact that the Presby emergency room had sent Duncan home on Sep 26, after missing that he was a recently arrived visitor from Liberia; the fact that two nurses who treated Duncan somehow caught the disease from him, despite having worn the recommended personal protective equipment (PPE) and followed the recommended protocols; the fact that one of the nurses was permitted to fly to Ohio and back with a low-grade fever.

Mistakes happen in crisis situations. The CDC and the US healthcare system were facing Ebola together for the first time; they were climbing a steep learning curve. But they had led the public to expect something much smoother, much more flawless. When CDC Director Tom Frieden, MD, MPH, said in an Oct 2 CNN op-ed that he was "confident we will stop Ebola in its tracks here in the United States," he may have meant "…with some inevitable screw-ups and policy changes along the way." But he certainly didn't say so. He set a standard that response efforts could not meet.

The US Ebola experience highlights four main crisis communication errors.

1. Don't over-reassure

Over-reassurance backfires in two ways. Some people smell a rat immediately; their response to over-reassurance is to feel "handled" rather than leveled with, and therefore to become all the more alarmed. Others let themselves believe the over-reassurance until something happens that proves it wrong; then they feel betrayed and all the more alarmed.

To avoid these reactions, crisis communication experts advise officials to err on the alarming side. Official alarmism has its own problems, especially post-hoc accusations of hype; the CDC has experienced some of that with regard to its effort in September to model a West Africa Ebola worst-case scenario, which yielded numbers of up to 1.4 million cases in the region by Jan 20, 2015.

But it's not damned if you do (warn people about risks and even about worst-case scenarios) and damned if you don't. It's darned if you do and damned if you don't. Over-reassurance erodes public trust far more than alarmism. Paradoxically, over-reassurance also exacerbates public alarm more than alarmism.

The most vivid examples of Ebola over-reassurance by US officials came before the October 2014 crisis of confidence, especially in Frieden's words. At a Sep 30 news conference after Duncan was diagnosed in Dallas, Frieden famously said: "Ebola is a virus that is easy to kill by washing your hands. It's easy to stop by using gloves and barrier precautions…. And that's why at the hospital in Texas, they're taking all of the precautions they need to take to protect healthcare workers who are caring for this individual."

At that news conference Frieden talked about stopping Ebola "in its tracks" three separate times. The CDC is a fervent believer that communicators should repeat their key messages as much as possible. The CDC's unique jargon for this contention is SOCO: Single Overriding Communication Objective. Stopping Ebola in its tracks was clearly a linchpin of Frieden's Sep 30 SOCO.

Many observers have noted these and other examples of official Ebola over-reassurance. But most haven't drawn the connections between official over-reassurance and public overreaction. We think those connections are crucial.

Official over-reassurance exacerbates public overreaction. Arguably it even justifies public overreaction. If officials seem to think everything is under control when it obviously isn't, individuals sensibly try to figure out what additional controls might be useful—and then demand them

(eg, travel restrictions and quarantines) or take them themselves (occasionally even to the extent of homemade PPE).

Once people realize that officials are understating the seriousness of the problem, they also try to figure out whether officials are more worried than they're letting on, or whether they're simply wrong. That is, to what extent is official over-reassurance a candor problem, and to what extent is it a competence problem? Both are common.

But it's clear that CDC Director Frieden believed what he said. CDC policies matched Frieden's claims—vis-a-vis the ability of US hospitals to manage Ebola patients, what PPE they would need, what sort of monitoring (if any) should be imposed on healthcare workers who treated Ebola patients, etc.

The CDC's pre-Dallas policies were promptly changed once they proved inadequate. But Frieden hadn't warned that errors and policy reversals were to be expected as officials climbed the Ebola learning curve. Instead, he reiterated often his contention that Ebola was well-understood and would succumb to tried-and-true public health measures.

(By contrast, after some initial overconfident over-reassurances during the 2001 anthrax attacks, Frieden's predecessor Jeff Koplan, MD, MPH, warned that public health officials would learn things in the coming weeks that they would then wish they had known when they started.)

So the CDC's errors and reversals looked incompetent, and the impression of CDC incompetence left the public devising its own Ebola response strategies.

2. Acknowledge uncertainty

As the preceding comparison of Frieden and Koplan demonstrates, Ebola over-reassurance was aggravated by Ebola overconfidence.

In an Oct 20 *Houston Chronicle* op-ed on the CDC's Ebola communication performance,former CDC health marketing director Jay Bernhardt, PhD, MPH, wrote: "A major challenge of risk and crisis communication is finding the right balance between controlling public fear with confident pronouncements and sharing the reality that the experts can't know everything and are making difficult judgments quickly, some of which will turn out to be wrong."

We think Bernhardt's frame—that officials must "balance" the need to sound confident against the need to acknowledge uncertainty—is mistaken. The goal of (over)confident pronouncements is indeed to control public fear, as Bernhardt suggests. But confident statements that turn out wrong exacerbate public fear. Effective crisis communicators acknowledge uncertainty; the best ones go out of their way to proclaim uncertainty. They do it in a confident tone, showing they can cope with the uncertainty and helping the public cope with it too.

Instead of proclaiming Ebola uncertainty, the US public health establishment proclaimed Ebola absolutism. The media were inundated with overconfident assertions about what "the science" proves about Ebola. Nearly all these assertions converted accurate generalizations about how Ebola usually or almost always behaves into what sounded like ironclad laws about how it always behaves. It (always) has an incubation period of 2 to 21 days; it is (always) transmitted through direct contact with bodily fluids; etc.

When experts start talking about "the science" instead of just "science," it's often a tipoff that they're about to attack as unscientific some opinion with which they disagree. In late October, the most frequently attacked opinion was that asymptomatic healthcare volunteers just back from treating Ebola patients in West Africa should be quarantined.

We don't have room here to review the scientific evidence for and against Ebola quarantines. (Interested readers might want to look at Ebola in the U.S. (so far): the public health establishment and the quarantine debate.) But the strongest scientific anti-quarantine argument is that asymptomatic people rarely if ever transmit Ebola. The strongest pro-quarantine scientific arguments are that people with Ebola sometimes hide or misinterpret their symptoms (as Nigerian doctor Ada Igonoh did after treating Patrick Sawyer in Lagos) and that Ebola is often characterized by sudden onset of symptoms (as both the CDC and World Health Organization case descriptions specify).

The case of Craig Spencer, MD, in late October demonstrates all three points. Despite being out and about in New York City the

day before he was diagnosed with Ebola, Spencer infected nobody—yet another example of asymptomatic non-transmission. On the other hand, Spencer later said he "felt sluggish" the day before he went out on the town. It's not clear if he decided his sluggishness wasn't a symptom or if he reported it to someone at Doctors without Borders who decided it wasn't a symptom. The morning after his outing, Spencer had simultaneous abrupt onset of a low fever (100.3ºF) and diarrhea. He called in his symptoms and was transported to Bellevue Hospital, where he was isolated and tested positive for Ebola the same day. (See the New York City news conference transcripts for Oct 23 and Oct 24.)

If Spencer's sluggishness was an Ebola symptom, he missed it. If it wasn't an Ebola symptom, his symptoms came on suddenly and it was lucky he happened to be home then, with easy access to a private bathroom.

Bottom line: There is science on both sides of the quarantine debate—and no excuse for either side to be uncivil or absolutist. And of course any debate over "how safe is safe enough" is fundamentally about values, not science.

To varying degrees, science is always provisional. Ebola science is highly provisional. As statisticians remind us, distributions have tails as well as a hump; the hump is what usually happens and the tails are the outliers. With regard to Ebola, we know a great deal about what usually happens, at least in Africa. We know very little about the outliers—there are too little data to distinguish unusual occurrences from impossible ones.

Here's a thought experiment for public health professionals: Imagine an incontrovertible exception to one of your Ebola absolutes—someone gets the disease after an incubation period of longer than 21 days; someone transmits it while his or her own symptoms are still mild; someone catches it via a cough or a sneeze.

Would you be shocked? Would you judge that our scientific understanding of Ebola has been rocked to its foundations? Or would you acknowledge the exception as simply an outlier, too unusual to be a sound basis for policymaking but not incompatible with anything fundamental about Ebola science as we know it? Would you, in fact, belatedly tell the public something like "We're not surprised that…."?

By their absolutism, officials and experts are setting up the public to be shocked by such exceptions—and to see them as further evidence that those in authority are lacking in competence, caution, and/or candor. That's a recipe for mistrust and overreaction. If experts and officials want the public to trust "the science," they must trust the public with a less absolutist depiction of what science tells us about Ebola.

3. Don't overdiagnose or overplan for panic

Everyone has seen the news stories about US individuals and organizations that took unreasonable Ebola precautions in October—the woman at the airport in her homemade PPE, the school system that thought Zambia might be in West Africa, etc. We don't dispute that some people and some local officials took obviously excessive Ebola precautions.

Most didn't. The typical American (even in Dallas and New York City) was interested in Ebola, a little anxious, and maybe a little titillated. But very few stocked up on supplies in anticipation of a US epidemic, and very few changed their daily routine. When asked by pollsters, most Americans said they supported Ebola policies (such as quarantine) that most experts consider an overreaction. But comparatively few Americans "overreacted" in their actual behavior.

When public health professionals claimed that the country was in a panic, they were treating the outliers as if they were typical. (Reporters unsurprisingly did the same thing, reporting as representative the most far-out tweets they could find.) There's a certain crazy symmetry in the fact that the public health establishment ignored the possibility of outliers on the Ebola transmission spectrum while overstating the prevalence of outliers on the Ebola public response spectrum.

Even these atypical public overreactions weren't examples of panic. Panic is doing something seriously harmful to self or others that you *know* is seriously harmful to self or others, but your level of emotional arousal is so strong you just can't help yourself. Getting off a bus because someone a few

seats away looks ill and West African is unnecessary and even cruel, but it's not panic. Panic is if you don't wait for the bus to stop before you get off.

Social scientists who study emergency management have known for decades that panic is comparatively rare. Articles and book chapters about "the myth of panic" have been appearing since the 1950s. (For a readable online example, see this 2002 article by Lee Clarke, PhD.) However panicky they may feel, most people behave sensibly in emergencies. But official "panic panic"—misdiagnosing an overcautious and possibly mistrustful public as panicking or about to panic— is widespread.

A number of reporters contacted us in October for comment about the public's Ebola panic. In each case we asked the reporter whether he or she knew anyone personally who had panicked. The answer was always no. But reporters had read about a small number of quasi-panicky reactions. And they'd seen quotes from public health experts noting and mocking the public's panic. So it must be real, right? No, actually, wrong.

For the longest and best of our published responses to the Ebola panic question, see How rational are our fears of Ebola?

4. Tolerate early overreactions; don't ridicule the public's emotions

So if they weren't panicking, what were Americans—some Americans—doing in October? They were having an adjustment reaction, a temporary overreaction to a new scary situation, exacerbated by leaders who kept sounding over-reassuring and overconfident, while looking under-competent and untrustworthy.

What's the proper public health response to people's adjustment reaction? Certainly not to ridicule it!

Ashish Jha, MD, MPH, of the Harvard School of Public Health crystallized the ridicule response on Oct 24, when he told Sarah Kliff of Vox: "I'm a believer in an abundance of caution but I'm not a believer of an abundance of idiocy." Kliff's article, focused largely on the case that Ebola quarantines are foolish, was entitled "The New York Ebola patient is a hero. Stop criticizing his bowling trip." The "abundance of idiocy" quote was widely requoted and retweeted. Other expressions of contempt for the public's Ebola fears included labels like "hysteria," "panic" (of course), and even "insane."

Instead of trying to squelch the adjustment reaction contemptuously, seasoned crisis communicators try to guide it empathically—to help people figure out which aspects of a scary situation are most serious and which precautions are most sensible. For Ebola, this would have meant seizing the teachable moment presented by the US public's brief preoccupation with Ebola to mobilize greater concern about the epidemic in West Africa and its possible spread to other developing countries.

Public health professionals did try to deflect Americans from focusing on Ebola in their backyards to focusing on Ebola in West Africa. Or on flu. Or on auto accidents. On anything, in fact, instead of Ebola in their backyards. In short, the effort to harness and redirect the public's Ebola fears was hobbled by contempt rather than empathy for the public's Ebola fears.

The tougher question is whether public policy should take note of public fears. President Obama was neither the first nor the last to intone (on Oct 25) that the US response to Ebola must "be guided by facts, not fear." In other words, we should do what public health professionals think best, not what the public thinks best. Fair enough—though arguably the US public and a few governors were ahead of the CDC in deciding that returning volunteers needed to be monitored carefully, not trusted to monitor themselves.

But public health professionals seemed systematically confused about the relevance of Ebola fears to Ebola policy. Many were apparently comfortable making over-reassuring and overconfident statements to assuage people's fears (rarely noticing that these practices backfire). But taking precautions to assuage people's fears—airport thermal screening, for example—struck the very same experts as unacceptably unscientific. If fear is itself a threat to health, as David Ropeik among others has argued, then isn't there a scientific, public health basis for policies that calm people's excessive fears?

In the debate over Ebola quarantine policy, the dominant

position of public health professionals has been even more confused. Leave aside whether a quarantine might protect against an Ebola sufferer whose symptoms have been missed or appear suddenly. Focus instead on how quarantining a volunteer just back from West Africa might affect the fears of that volunteer's neighbors, 80% of whom support Ebola quarantines.

We agree fervently that trying to assuage neighbors' fears (and to reduce stigma) isn't a good enough reason to restrict the freedom of returning volunteers, perhaps deterring prospective volunteers in the process. But most public health critics of Ebola quarantines haven't even acknowledged that calming excessive public fears is a useful byproduct of Ebola quarantines. Instead, they have accused the pro-quarantine side of fearmongering.

It is inconceivable to us—and contrary to much risk communication theory and research—that people who are demanding that returning volunteers be quarantined would become more alarmed if their demands were met, but would be reassured if they were told their demands are idiotic.

Consider also the remarkable contradiction between what experts and officials told America's healthcare workers and what they told the rest of us.

The appropriate message given to healthcare workers: "Prepare. Imagine an Ebola sufferer walking into your waiting room. Practice donning and doffing your PPE without contaminating yourself, and then practice some more. Ask all patients with fevers if they've been to West Africa recently. Even though the odds of your ever treating an Ebola sufferer are low, you still need to get ready."

Nurses and doctors were rightly instructed to go "Oh, my God" and get through their adjustment reactions now, precisely so they will be ready in case they are needed.

The inappropriate message given to everybody else: "Don't prepare. Don't imagine sitting in the waiting room when an Ebola sufferer walks in and sits down next to you. Don't worry about your daughter the nurse or your neighbor the doctor who has been told to get ready to take care of an Ebola patient. Don't try to figure out what you might do or what your local government might do to reduce Ebola risk in your community. Don't try to figure out where that risk might come from. Focus on how low the odds are of your ever meeting an Ebola sufferer, and then think about something else, la-la-la-la."

The public was instructed to stop having this ridiculous adjustment reaction, to stop trying to be ready in case they are needed.

Treat the public like grownups

Aiming to convince the public that there was no cause for Ebola alarm, officials and experts used overconfident over-reassurance and absolutist invocations of "the science." And then they had the gall to ridicule the public as hysterical and panic-stricken. We hope that before the next unfamiliar and frightening infectious disease arrives, officials and experts will practice treating the public like grownups.

Deconstructing Ebola to find its weakness and defeat it

Source: http://www.medicalnewstoday.com/releases/286480.php?tw

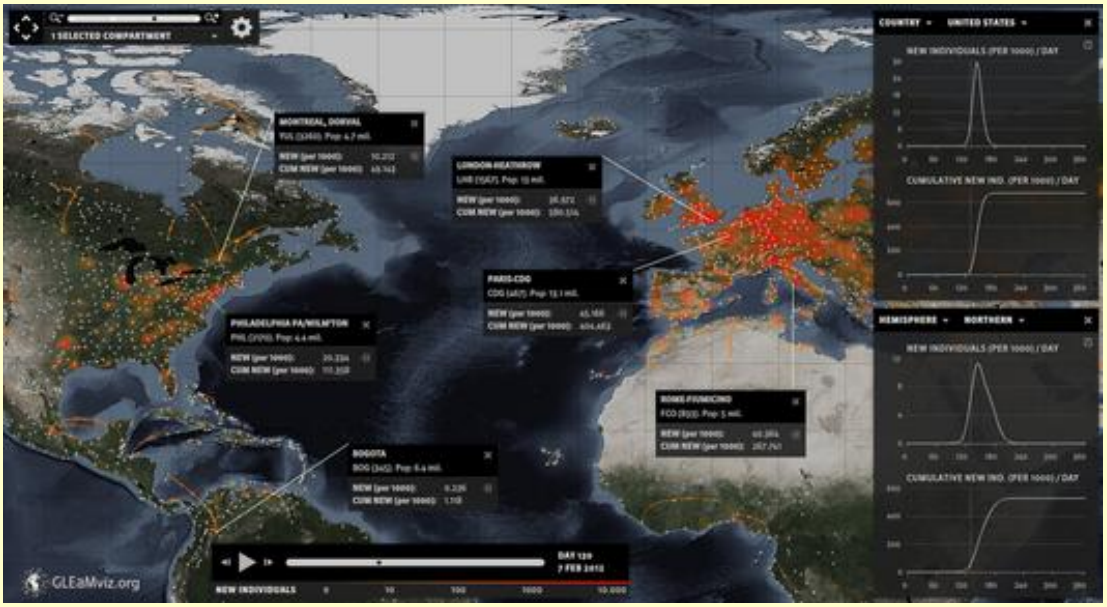
The Ebola epidemic in West Africa has pushed the decades-long search for a treatment to a frenetic pace. Somewhere in the virus' deceptively simple structure is a key to taming it. To find that key, scientists are undertaking multiple strategies, some of which are being fast-tracked for human testing, according to an article in *Chemical & Engineering News (C&EN)*, the weekly newsmagazine of the American Chemical Society.

Senior editors Lisa M. Jarvis and Bethany Halford of *C&EN* note that the Ebola virus is endowed with a mere seven genes that code for eight proteins. Although few in number, the proteins each have many functions, which **allow the virus to commandeer nearly 70 proteins from a person it infects.** To fight this highly efficient virus, scientists are taking several approaches. They're designing antibodies to prevent the virus from attaching to host cells, and working on small molecules to attack the virus at various stages of its life cycle. They're also starting clinical trials on antiviral drugs that are already approved to treat other kinds of infections.

If developed quickly enough, an effective treatment could curb the current outbreak. It could also potentially spare the world from future epidemics. But as some scientists point out, drugs and vaccines take years to tailor into safe and effective therapies, so it's essential the efforts continue long after this crisis passes.

EPIWORK: Ebola forecasting uses model developed by EU project

Source: http://www.medicalnewstoday.com/releases/286334.php?tw



Forecasters predicting the spread of Ebola are using one of the most sophisticated modeling systems in the world - the result of an EU research project.

An EU-designed forecasting model has shown that Ebola will have infected between 14,000 and 22,000 people (number of reported cases) in West Africa by the end of November 2014. The Global Epidemic and Mobility Model (GLEaM) is one of the most detailed and inclusive in the world. It was developed by the EU's EPIWORK research project, which ended in 2013.

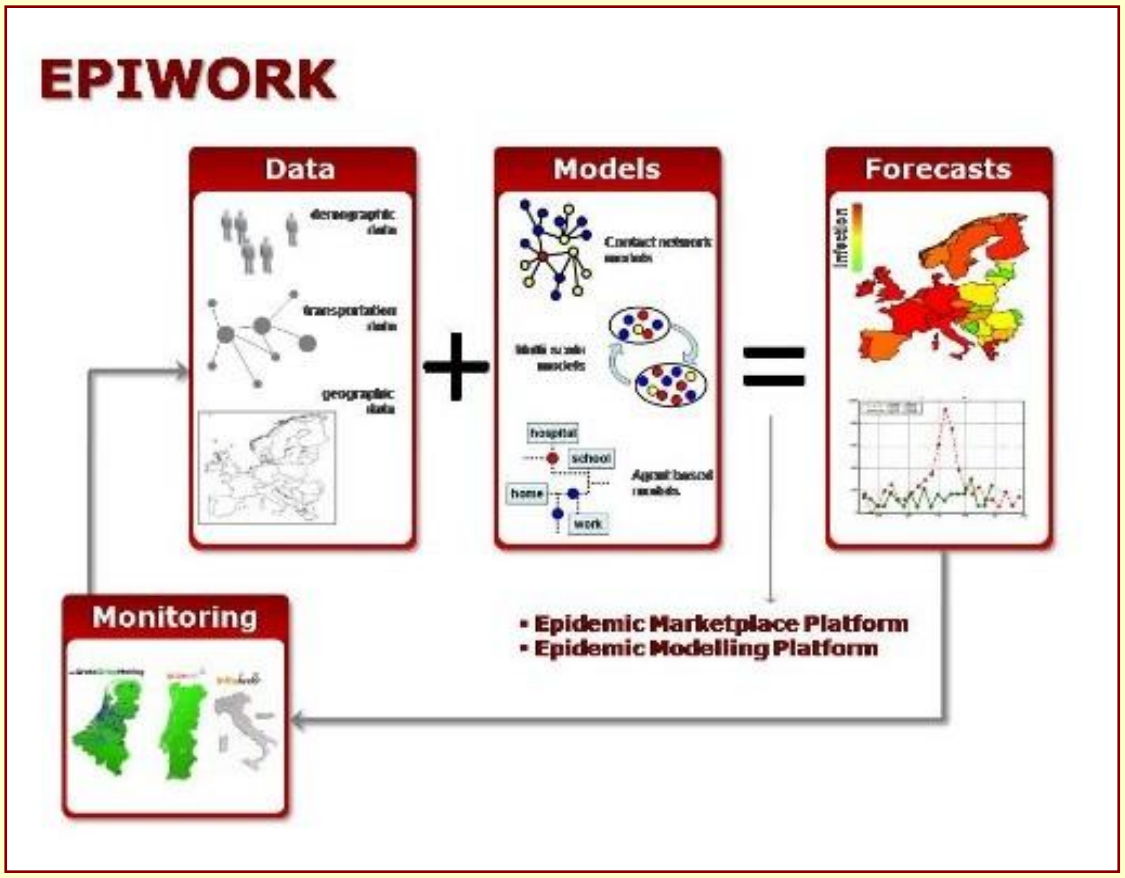
GLEaM produces realistic simulations of the global spread of infectious diseases by combining real-world data on populations and human mobility with elaborate stochastic models of disease transmission. GLEaM draws on flows of data never before included in health-related forecasting, such as daily airline passenger traffic, censuses, hospital admissions and medical services, funeral attendances, and even information submitted from mobile phones.

This product of EU research excellence is now available for laboratories around the world to help predict the spread of global diseases such as Ebola.

The use of GLEaM in EBOLA

Professor Vespignani, EPIWORK project leader at the time, is now head of the Laboratory for the Modeling of Biological Socio-Technical Systems (MOBS LAB) at Northeastern University in Boston, US. 'We began using the model for Ebola in July this year, when the disease started to show

exponential growth in West Africa. We are also looking at the possibility of Ebola spreading worldwide. In the case of Ebola, so far the predictions of reported cases have been accurate within the probability range the model



calculates,' he said.

The model was developed during the EPIWORK project, which involved collecting epidemiological data during the 2009 outbreak of H1N1 influenza, commonly known as 'swine flu', and making it available to the research community across the EU.

Daniela Paolotti, an epidemiologist at Italy's ISI (Institute for Scientific Interchange) Foundation, the institution which coordinated EPIWORK, added: 'The focus for GLEaM in 2009 was the H1N1 influenza pandemic, but it was always meant to be extended to other infectious diseases. The idea was to build a framework that could be used for new emerging diseases and as a result it has been able to be adapted to Ebola, too.'

These simulations help policymakers to visualize how the outbreak might spread, and therefore to prioritize public health measures to contain it.

Participatory science via website and app

During EPIWORK project, researchers also developed ' Influenzanet ', a system to monitor the activity of influenza-like-illness (ILI). This system has a 'citizen science' focus, obtaining its data directly from the population completing an online application form, which contains various medical, geographic and behavioral questions.

Now Influenzanet has around 20,000 participating volunteers in local communities across 10 EU countries. It provides additional information for epidemiologists and public health scientists, who beforehand could only rely on the traditional system of primary care doctors forming sentinel networks to report the presence of disease. This creates a supplementary fast and flexible monitoring system, which does not replace the doctors' sentinel network, but allows for direct comparison of Influenza-Like Illness (ILI) between countries.

In many countries involved in Influenzanet, the web data is published weekly on government

surveillance websites as an annex to the official data. During the project, the EPIWORK partners developed close contact with national health institutes which they can alert if the data being gatKhered through Influenzanet warrants urgent attention.
Influenzanet has also produced a reporting app for mobile devices, available through some of the national partners (e.g., https://www.influweb.it/app/), iTunes, Facebook and Twitter. 'In countries like Italy, where access to the Internet is mostly through smartphone, participation has increased a lot thanks to the mobile app,' observed Daniela Paolotti.
EPIWORK ran from 1 February 2009 to 31 July 2013 and involved 12 teams in eight countries. It received 4.85 million euros from the 7th Framework Programme.

▶ **Read more on GLEaM** at: http://www.gleamviz.org/

Aspects of certain Ebola guidelines questioned by experts

Source: http://www.medicalnewstoday.com/releases/286366.php?tw

December 03 – Various guidelines for caring for patients infected with Ebola virus are being issued from different national and state public health authorities, professional societies, and individual hospitals. Experts are questioning aspects of some of the guidelines that go beyond current CDC recommendations, especially those that call for suspending certain routine lab tests.
The authors of a *Transfusion* commentary note that most individuals with suspected Ebola virus disease will have a fever due to another cause, and forgoing such testing may compromise patients' health more than any reduction in the risks to laboratory personnel.
The authors also state that it is imperative for all laboratory directors to work with institutional infection control and safety personnel to evaluate their hospital policies on potentially infectious patients in order to provide a safe environment for their patients and employees.
"We are anxious for a balanced, thoughtful discussion of the best way to prepare for the potential of increasing numbers of Ebola suspects across a spectrum of healthcare institutions in the developed world, and believe that the key is recognition of risk and application of well characterized infection prevention and control recommendations," said co-author Dr. Louis Katz. "Suspending aspects of care or automatically transferring patients to other facilities may not be an effective response to the prevention of healthcare-associated transmission if more cases are repatriated than we have seen to date."

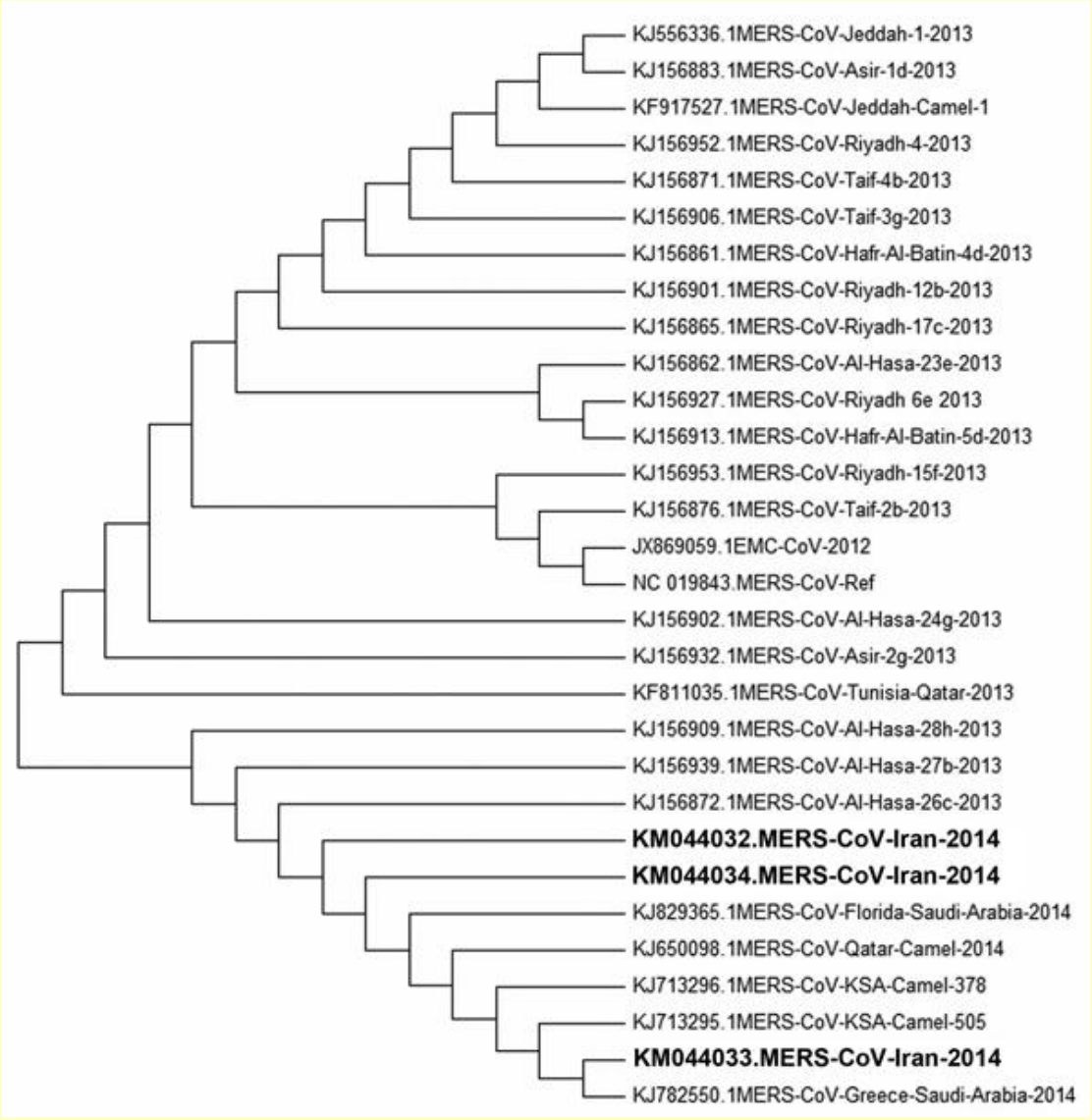
Cluster of Middle East Respiratory Syndrome Coronavirus Infections in Iran, 2014

By Jila Yavarian, Farshid Rezaei, Azadeh Shadab, Mahmood Soroush, Mohammad Mehdi Gooya, and Talat Mokhtari Azad
Tehran University of Medical Sciences School of Public Health, Tehran, Iran (J. Yavarian, A. Shadab, T. Mokhtari Azad); Iranian Center for Communicable Disease Control, Tehran (F. Rezaei, M. Soroush, M.M. Gooya)
Source: http://wwwnc.cdc.gov/eid/article/21/2/14-1405_article

Middle East respiratory syndrome coronavirus (MERS-CoV) was initially reported in September 2012 in Saudi Arabia (1); the first human infected died of respiratory and renal failure (2,3). As of July 23, 2014, a total of 837 human cases and 291 deaths had been reported (4); all cases were directly or indirectly linked to travel to or residence in the Middle East.
During January 2013–August 2014, a total of 1,800 patients in Iran who had respiratory illness were tested for MERS-CoV. Patients tested during 2013 had been pilgrims to Mecca, Saudi Arabia, during the Hajj; patients tested during 2014 were pilgrims or had been hospitalized for respiratory infections with unknown causes. We report a cluster of 5 cases that occurred in the same hospital in Kerman Province, Iran, during May–July 2014.

The Cases

Patient 1 was a 52-year-old woman with a history of hypertension who became ill on May 1, 2014, and was admitted to hospital A on May 11 with high fever (temperature >38°C), cough, dyspnea, diarrhea, and anorexia. Her condition deteriorated, and she was transferred to an intensive care unit (ICU). Her condition remained poor, and on May 29, 18 days after her symptoms began, she died of progressive respiratory failure. Patient 1 had not traveled to Saudi Arabia, but she had had close contact with a woman who had influenza-like illness and who had traveled to Saudi Arabia 2 weeks before her symptoms began. This contact of patient 1 is suspected of being the index case-patient, but when throat swab and sputum samples were collected from her, she had no symptoms, and PCR results were negative.



Phylogenic sequence analysis of 3 Middle East respiratory syndrome coronavirus (MERS-CoV) isolates from patients in Kerman Province, Iran (boldface), 2014, compared with sequences from GenBank (accession numbers shown).

A serum sample was not tested because serologic testing for MERS-CoV was not available.

Patient 2 was the 50-year-old sister of patient 1 and also had a history of hypertension. She became ill on May 11, 2014, with fever (temperature >38°C), cough, hemoptysis,

nausea, vomiting, and anorexia. She was admitted to hospital A on May 17; her condition improved, and she was discharged on May 30, 19 days after onset of symptoms.
Patient 3 was a 35-year-old female nurse assistant at hospital A who had no underlying medical conditions. Her symptoms of sore throat and productive cough were detected on May 26 as part of the investigation of the first 2 cases; co-infection with influenza A(H1N1)pdm09 was detected. Patient 3 had

Table

Patient and clinical data on 5 Middle East respiratory syndrome coronavirus infections in Kerman Province, Iran, 2014*

Patient no.	Patient age, y/sex	Date of illness onset	Hospitalization dates	Date infection confirmed	Date of death	GenBank accession no. for isolate
1	52/F	May 1	May 11–29	May 24	May 29	KM044032
2	50/F	May 11	May 17–30	May 24	NA	KM044034
3	35/F	May 26	NA	May 31	NA	NA
4	44/M	Jun 6	Jun 17–21	Jun 19	NA	KM044033
5	67/F	Jun 25	Jun 25–Jul 5	Jul 5	Jul 4	NA

*NA, not applicable.

contact with patient 1 during her hospitalization in ICU. Patient 3 was advised to stay home and follow infection control precautions until respiratory samples tested negative.
Patient 4 was a 44-year-old male physician at hospital A with a history of chronic heart disease who had contact with patient 1 during her hospitalization in ICU. Mild respiratory symptoms developed in patient 4 on June 6; his condition deteriorated, and he was admitted to a hospital in Tehran, Iran, on June 17 with fever (temperature >38°C), sore throat, cough, dyspnea, chills, anorexia, and myalgia. Patient 4's symptoms were initially severe, but his condition improved, and he was discharged on June 21.
Patient 5 was a 67-year-old woman who was admitted to hospital A on June 6 because of exacerbation of chronic obstructive pulmonary disease. She was discharged from the hospital on June 14 and was in stable condition until severe acute respiratory infection (SARI) developed. She was readmitted to hospital A with fever (temperature >38°C), cough, and dyspnea on June 25. During her first hospitalization, the patient had close contact with another patient who had SARI but had tested negative for MERS-CoV. A respiratory sample from patient 5 was obtained on June 30, and she died on July 5.
All 5 patients were residents of Kerman Province and had no history of travel or contact with animals in the 14 days before becoming ill. Throat swab specimens and sputum samples were collected and analyzed by using real-time reverse transcription PCR (RT-PCR) performed on the basis of a previously reported method by targeting the upstream E region and open reading frame 1b of the virus (5). Conventional RT-PCR was conducted for the N region (6). The PCR products of the N region were sequenced in both directions.
The samples from patients 1, 2, and 4 yielded N gene sequences positive for MERS-CoV. Phylogenetic analysis showed differences between these sequences and a consensus sequence retrieved from GenBank (accession no. JX869059; Figure). All 3 sequences from these cases had polymorphisms at positions 28880 (T→C), 28941 (G→C), and 29097 (T→G). The mutation at position 28941 was nonsynonymous with an aspartic acid to histidine change. For the isolate from patient 4, another nonsynonymous mutation was observed at position 29329 (C to T), which resulted a change of tyrosine to isoleucine. In all 3 sequences, nucleotide C was detected at position 29147, as was the case with the first identified isolate of MERS-CoV. For some sequences in GenBank, this position contains T.

Conclusions

We identified a cluster of MERS-CoV infections in Iran (Table), showing apparent person-to-person transmission but with unclear transmission routes for some patients. In this cluster, patient 1 was in close contact with a person suspected of being the index case-patient, but we were unable to verify the infection status of this patient. Patient 2 seems to have acquired the infection from patient 1. The source of infection for patients 3 and 4 was

patient 1 or 2, but the source for patient 5's infection remains unknown. However, subclinical cases of MERS-CoV infection have been reported to the World Health Organization (7); exposure to a person with subclinical infection could explain an active infection that has an unknown route of transmission.
Throat swab specimens and sputum samples were collected from all close contacts of the 5 patients in this cluster, including family members, other patients in the hospital, and health care workers. All samples were negative for MERS-CoV. Patient 1 had a pregnant daughter who was a frequent visitor during her hospitalization but who tested negative for MERS-CoV by real-time RT-PCR.
Before patient 1 was hospitalized, none of her contacts showed signs of MERS-CoV infection, but after her hospitalization (during her second week of her illness), her sister became ill and subsequently tested positive for the virus. This finding suggests that, as with severe acute respiratory syndrome, MERS-CoV is not readily transmitted during the early phases of the disease (3), in contrast to the other human coronaviruses, which are transmitted early in the infection (2). Early recognition of confirmed MERS-CoV infections and investigation of the contacts of these patients are critical for effective epidemic control. Because Saudi Arabia has reported the highest number of MERS-CoV infections, one approach for limiting the transmission of this virus may be to screen travelers from Iran who report SARI to detect MERS-CoV. However, screening of pilgrims from Iran who traveled to Mecca during the 2013 Hajj did not detect MERS-CoV infections (National Influenza Center Iran, unpub. data).
Our investigation has limitations. First, some persons who may have had MERS-CoV infection were not tested, such as the probable index case-patient with whom patient 1 had contact, the patient with SARI with whom patient 5 had contact, and the contacts of these persons. Second, we performed N gene PCRs on samples from all 5 case-patients, but results were negative for patients 3 and 5, which suggests that these samples should be tested with more specific primers.
In summary, we identified 5 cases of MERS-CoV in the same province in Iran; for several of these cases, virus transmission routes were not clearly defined. Future research should focus on clarifying routes of transmission for this virus, including the possibility of transmission from persons with subclinical infection.

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

Dr Yavarian *is an assistant professor in the Virology Department, School of Health, Tehran University of Medical Sciences. Her primary research interests are human respiratory viruses.*

Israel Gives Ebola Detection Equipment to Palestinian Authority and Hamas

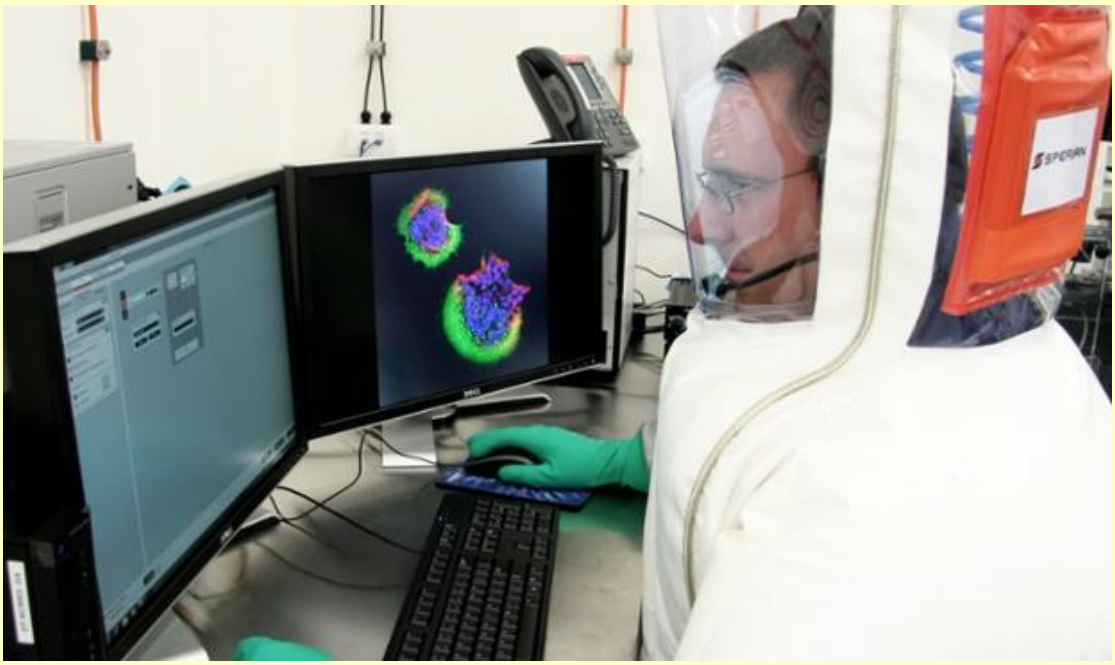
Source: http://www.algemeiner.com/2014/11/10/israel-gives-ebola-detection-equipment-to-palestinian-authority-and-hamas/

Despite a string of Palestinian terror attacks on Israelis in recent days, which have resulted in dozens of injuries and two deaths, the Israeli government on Sunday transferred Ebola screening equipment to the Palestinian Authority and Hamas.
The equipment was transferred after a Palestinian request and will be used to diagnose the Ebola virus among people entering the West Bank from Jordan and the Gaza Strip through the Rafah Crossing, *Yedioth Ahronoth* reported.
The equipment includes a special thermometer, laboratory kits, and protective suits. Beyond the Rafah Crossing, Hamas is solely responsible for handling the equipment in Gaza. Israel is also supplying the Allenby border crossing with Jordan with the detection devices.
The Israeli civilian committee is also holding regular meetings in Israel with the Palestinian Minister of Civil

Affairs and representatives from Gaza's Health Ministry regarding the prevention of the spread of Ebola in the West Bank, Gaza, and Israel should an infected person be discovered.

Scientists reveal the 12 'megashocks' that threaten Australia's biosecurity

Source: http://www.theguardian.com/science/2014/nov/25/australia-faces-threat-12-megashocks-biosecurity-report



A bioterrorist attack or swine flu-like pandemic.
Incursion of a new wheat disease or fruit fly crippling crops.
An outbreak of foot and mouth or bluetongue disease, devastating farmers.
These "megashocks" could pose a real threat to Australian biosecurity, the CSIRO says.
In a report into Australia's biosecurity system, released on Tuesday, the scientific body outlines 12 potential megashocks it thinks could hit Australia in the next 20 or 30 years.
The CSIRO wants to spark debate about Australia's preparedness for future threats, saying it can't rely on past success in remaining pest- and disease-free.
The report details five trends that will put pressure on Australia's biosecurity system, such as a growing global demand for food and its impact on production, bigger urban populations, and increased movement of goods and people around the world.
Should it become complacent, Australia risks megashocks similar to the SARS epidemic or the 2001 UK foot-and-mouth outbreak, it says.
The CSIRO's Gary Fitt says they do not want to present a "doom-and-gloom" view of Australia's biosecurity.
But Dr Fitt believes any of these shocks could happen, and the economic impact would run into the tens of billions of dollars.
A foot-and-mouth outbreak could cost $50 billion over 10 years, while the loss of pollinating European honey bees to disease would cost farmers $4 billion to $6 billion annually in lost production.
"If you look at Australian agriculture, it's worth $55 billion to $60 billion annually," he told AAP.
"It's a significant asset that we're trying to protect, without thinking of human health or the environment."

The 12 megashocks Australia may face

- Nationwide incursion of new exotic wheat stem rust
- Decline in pollination as disease hits European honey bees
- Nationwide incursion of new exotic fruit fly
- Outbreak of foot and mouth disease

- Bluetongue disease outbreak across Australia's sheep-producing regions
- Spread of highly virulent rust
- Government walks away from environmental biosecurity
- Invasion of black-striped mussel impacting marine and aquaculture industries
- Outbreak of infectious salmon anaemia affected aquaculture production
- Nationwide zoonotic disease epidemic (diseases transmitted between animals and humans)
- Bioterrorist attack
- Rapid spike in antibiotic resistance

How long can Ebola live? No one really knows

Source: http://www.sciencedaily.com/releases/2014/12/141210121444.htm

The Ebola virus travels from person to person through direct contact with infected body fluids. **But how long can the virus survive on glass surfaces or countertops? How long can it live in wastewater when liquid wastes from a patient end up in the sewage system?** In an article published Dec. 9 in the journal *Environmental Science & Technology Letters*, Kyle Bibby of the University of Pittsburgh reviews the latest research to find answers to these questions.

He and his co-investigators didn't find many answers.

"The World Health Organization has been saying you can put (human waste) in pit latrines or ordinary sanitary sewers and that the virus then dies," says Bibby, assistant professor of civil and environmental engineering in Pitt's Swanson School of Engineering. "But the literature lacks evidence that it does. They may be right, but the evidence isn't there."

Bibby and colleagues from Pitt and Drexel University explain that knowing how long the deadly pathogen survives on surfaces, in water, or in liquid droplets is critical to developing effective disinfection practices to prevent the spread of the disease. Currently, the World Health Organization guidelines recommend to hospitals and health clinics that liquid wastes from patients be flushed down the toilet or disposed of in a latrine. However, Ebola research labs that use patients' liquid waste are supposed to disinfect the waste before it enters the sewage system. Bibby's team set out to determine what research can and can't tell us about these practices.

The researchers scoured scientific papers for data on how long the virus can live in the environment. They found a dearth of published studies on the matter. **That means no one knows for sure whether the virus can survive on a surface and cause infection or how long it remains active in water, wastewater, or sludge.** The team concluded that Ebola's persistence outside the body needs more careful investigation.

To that end, Bibby recently won a $110,000 National Science Foundation grant to explore the issue. His team will identify surrogate viruses that are physiologically similar to Ebola and study their survival rates in water and wastewater. The findings of this study will inform water treatment and waste-handling procedures in a timely manner while research on the Ebola virus is still being conducted.

How You Can Help Find a Cure for Ebola

Source: http://www.ideaconnection.com/blog/2014/12/how-you-can-help-find-a-cure-for-ebola/

The Ebola outbreak may be fading from the headlines, but it is still a huge problem that is claiming thousands of lives. To help speed up the development of a definitive cure for the devastating disease, the Scripps Research Institute is enlisting members of the crowd to use their computer downtime to carry out critical research.

Erica Ollmann Saphire, a Professor at Scripps, said: "We have the information in my lab that will tell us how to fight it [the virus]. **But we need computational power to calculate which drugs will best fit in the targets that we find."**

Anybody with a PC or mobile device that runs on the Android platform can help perform the research. No scientific knowledge is necessary. Members of the public can download a free app that takes advantage of idle computer time. It is available at IBM's World Community Grid that has a host of data-driven initiatives.

The crowdsourced efforts will help scientists at Scripps with their screening process for chemical compounds. They are looking to stop the virus from infecting new cells by targeting its molecular machinery.

The Crowd Can Deliver Rapid Results

According to Professor Saphire, this crowd-based initiative has the potential to slash hundreds of years off research time, delivering results in a matter of weeks. With such a rapidly spreading virus, time and speed are of the essence.

The project is called "Outsmart Ebola Together" and can be found here.

Belgian Expert: WHO Messed Up Ebola Response

Source: http://i-hls.com/2014/12/belgian-expert-messed-ebola-response/

A Belgian scientist who helped discover Ebola in 1976 (photo right – yellow circle) has accused the World Health Organization (WHO)

of mismanaging the current outbreak response.

Peter Piot, an award-winning microbiologist, told *Al Jazeera* that "we wasted too much precious time. It took three months for the WHO to find out there was an Ebola outbreak. That I understand. Guinea had a poor laboratory infrastructure." This, according to a report in *emergencymgmt*, which quotes an interview Piot recently gave *Al Jazeera*.

"I have much more of a problem with the fact that it took five months for WHO, for the international health regulations committee, for that's what it is, to declare this a state of emergency.

"It took a thousand dead Africans and two Americans who were repatriated to the US because they were infected. There's no excuse for that. It took too long."

Tarik Jasarevic, a spokesman for WHO, told Al

Jazeera by email that "declaring a public health emergency of international concern is not a measure of WHO's operational response."

Jasarevic said that WHO measures its operational response on a scale from one to three.

"As soon as WHO received notification from Guinea in late March that the first cases of Ebola virus disease had been identified, we immediately increased our operational response to Level 2," said Jasarevic. "And we mobilized experts to Guinea, then to Liberia and Sierra Leone through our Global Outbreak Alert and Response Network."

Having waited too long to act, Piot said the international community has overreacted in unhelpful ways.

"An epidemic of mass hysteria that we saw particularly in North America … was really out of proportion with the issue."
He gave an example of the governors of New York and New Jersey who made it mandatory for healthcare workers from West Africa to be put under quarantine.

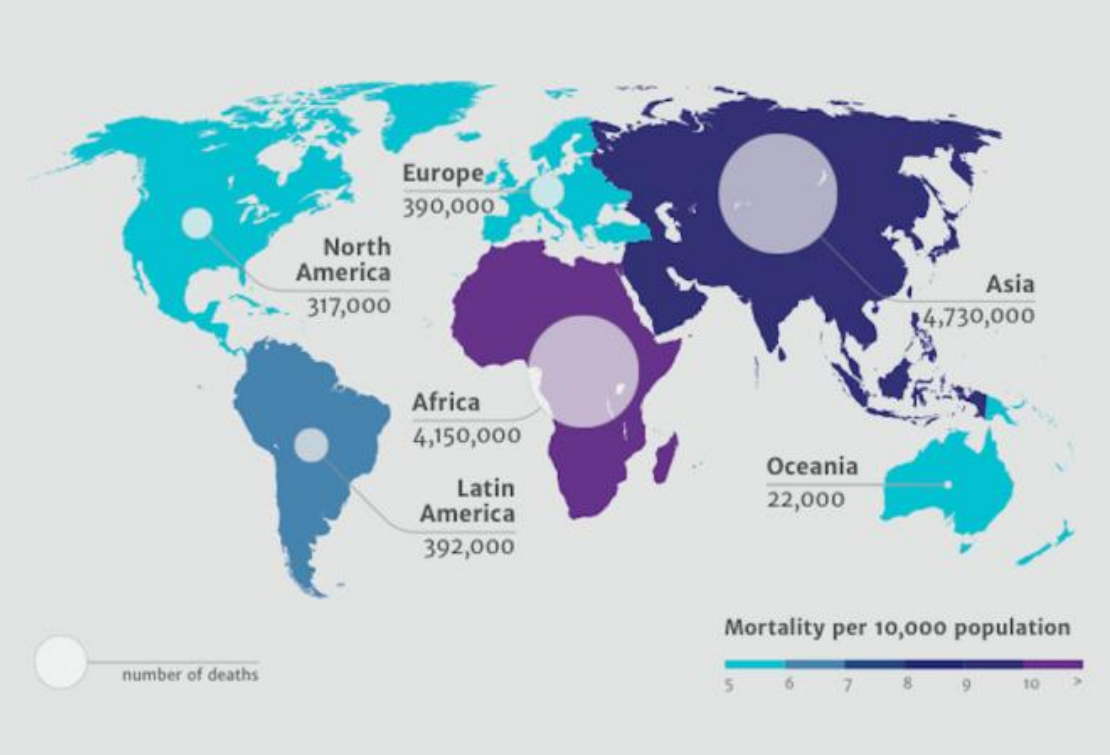
"It's not cost-effective and also it's a major deterrent and disincentive for supporting the countries in West Africa," said Piot.
He said any potential solutions needed to address both the lack of robust healthcare systems and the local population's cultural habits and belief systems.

The Coming Cost of Superbugs: 10 Million Deaths Per Year

Source: http://www.wired.com/2014/12/oneill-rpt-amr/

If you weren't taking antibiotic resistance seriously before, now would be a good time to start.
A project commissioned by the British government has released estimates of the near-future global toll of antibiotic resistance that are jaw-dropping in their seriousness and scale: 10 millions deaths per year, more than cancer, and at least $100 *trillion* in sacrificed gross national product.

as serious a threat to society as terrorism. To chair the effort, Cameron recruited Jim O'Neill, previously the head of economic research for Goldman Sachs (and the person credited with coining the acronym BRICs — Brazil, Russia, India, China — as part of forecasting that global economic power would shift south and east). The Review is envisioned as a two-year project that will publish periodically, ending in July 2016 with recommendations for actions to blunt the threat that antibiotic resistance poses



Deaths attributable to antibiotic resistance, annually, by 2050.

The project, called the Review on Antimicrobial Resistance, was commissioned by UK Prime Minister David Cameron last summer, a follow-on to the dire report issued in 2013 by the UK's Chief Medical Officer, which ranked resistance

worldwide. (The project is supported by the nonprofit Wellcome Trust.)
Their first paper, released late last week, is based on work by two consulting teams, from RAND and KPMG, examining just the effect of resistance in six pathogens: three commonly resistant bacterial

infections, *Klebsiella pneumoniae, E. coli* and MRSA; and three globally important diseases: HIV, TB and malaria. It doesn't examine the effect of resistance in other pathogens; and it doesn't attempt to estimate either healthcare costs or secondary social costs (more on that below). So it is a conservative effort, several different ways.

And yet, its baseline estimates of the size of the global problem are breathtaking. Among them:

Antibiotic resistance currently accounts for an estimated 50,000 deaths in the US and Europe, which have surveillance to support those numbers. (The CDC puts the number for the US at 23,000.) But the project estimates that the actual *current* death toll is 700,000 worldwide.

If antibiotic resistance were allowed to grow unchecked — that is, if there were no successful efforts to curb it or no new drugs to combat it (the latter is very plausible) — the number of deaths per year would balloon to 10 million by 2050. For comparison, that is more than the 8.2 million per year who currently die of cancer and 1.5 million who die of diabetes, combined.

Those deaths would cost the world up to 3.5 percent of its total gross domestic product, or up to $100 trillion by 2050.

Moreover, the toll of deaths — and the cost of them — would fall unevenly across the world, with the global south and Asia suffering to a greater extent and losing greater amounts of income. In one example, they estimate that 25 percent of all deaths in Nigeria could be caused by resistance if trends continue unchecked.

Notably, the project doesn't attempt to estimate what they call the secondary costs of resistance: that is, the cost of having to forego routine medical procedures such as cancer care, joint and organ transplants and surgeries, because without antibiotics, the danger of infection would be too great. (They estimate that C-sections alone contribute 2 percent to annual GDP.) It also doesn't try to estimate what the healthcare costs would be of caring for those additional resistance illnesses and deaths.

The tone of the report is deathly serious, with a tinge of frustration that I am sure will be familiar to anyone who pays attention to resistance as a public health issue. (It certainly resonates with me.) It says:

For doctors and for those who have experienced first-hand the anxiety of an infection that is drug-resistant, as a patient or when caring for a loved one, there is little need to prove the importance of tackling (antimicrobial resistance).

However for the majority of people, including in leading policy and business circles around the globe, the threat of drug resistance might seem a distant and abstract risk, if it is known at all…

This is a looming global crisis, yet one which the world can avert if we take action soon.

Sierra Leone's Ebola Epidemic Is Spiraling Out of Control

Why has Liberia -- once the epicenter of the outbreak -- been able to stop a rampaging killer disease, while the country next door can't even count its dead?

By Laurie Garrett

Source: http://foreignpolicy.com/2014/12/10/sierra-leones-ebola-epidemic-is-spiraling-out-of-control/?utm_content=bufferaaff3&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

It was a terribly disturbing sight. At first glance, Connaught Hospital in central Freetown looked unremarkable; the Sierra Leone facility featured a walk-in and ambulance entrance that led to typical hospital hallways and a central patients' garden. But the entry was flanked by tented structures — on the left, a table at which sat three men, sweating in full protection suits, goggles, gloves, and masks. On the right was what appeared to be a wood-fenced pen with a sun-shading tarp over it, suitable for livestock. Patients and visitors were required to approach the suited men on the left for triage: If they had a fever or nausea they were sent to the pen.

And inside the tent-roofed pen lay five men,

waiting in the blazing heat for someone to die or be released from the hospital's 18-bed Ebola isolation ward so they could take their place. These men lying in the street without toilet facilities, food, or water could not get into hospital beds until they were vacated. Inside the hospital grounds, a special door flap was all that signaled the location of the "Red Zone," where suspected Ebola patients lay on actual beds. Meanwhile, routine medical care continued in the rest of Connaught, as families and patients strolled by. And as I watched a cluster of routine-care patients walk past the outside pen, through the main entry, and on into the garden, a patient poked his head out of the Red Zone door flaps, calling out to a staff nurse, who shushed him and said he should stay inside because he was contagious and could endanger other hospital visitors.

If a patient in that Red Zone tests laboratory-positive for Ebola, then that patient (and other lucky ones in that Red Zone) would be transferred from Connaught to a full-scale Ebola treatment center about two hours' drive away, in Kerry Town. The less fortunate die in the isolation ward, or out on the street inside the pen, waiting for space to free up. Turnaround time on lab work averages three to four days in Sierra Leone — versus a mere four to five hours in neighboring Liberia — so most patients die here, without ever learning whether or not it is the Ebola virus that is driving their fever, diarrhea, vomiting, and hemorrhaging.

"We had no choice but to build this, to keep out swarms of people," explained Stacey Mearns, her blue hospital scrubs streaked with sweat in the sweltering tropical climate. The 31-year-old Brit is a volunteer physician from the London-based King's Health Partners. "The tent is always full, as is the isolation ward. All across the district we just don't have enough hospital beds. And we have a long list of people waiting to come in from all over the community," she told me. "There's not a single treatment bed open in *all* of Freetown. And every day that we're behind in building more treatment facilities is another day of transmission."

Nationwide, Sierra Leone has only 400 Ebola treatment beds, of which 175 are located in and near the capital city of Freetown.

Nationwide, Sierra Leone has only 400 Ebola treatment beds, of which 175 are located in and near the capital city of Freetown. The World Health Organization (WHO) reckons the country needs 4,800 Ebola beds.

Mearns, who has served on the front lines of the Ebola fight in Freetown since September, cast sad eyes at the delirious men lolling in the "holding center" — the pen structure out on the street — and said that only 13 percent of suspected Ebola cases ever survive their stays at Connaught long enough to make it to the distant Kerry Town

treatment center. She sighed. "I feel we're yet to get a handle on things. It's just steadily getting worse and worse."

Even as world health authorities laud neighboring Liberia for bringing its Ebola transmission rate down from the catastrophic levels seen in September, Sierra Leone's situation is spiraling out of control. The officially reported numbers of the sick and dead are not to be believed, experts say; the pace of construction of treatment centers lags far behind patients' needs; most burials and funeral practices remain unsafe; the military has taken control of the national response; and international partners are struggling to work within the government's control mechanism. The soaring Sierra Leone epidemic was cited by the U.N. Ebola Emergency Response Mission (UNMEER) as the primary reason it did not meet its Dec. 1 target of having 70 percent of Ebola patients in treatment and 70 percent of the dead safely buried. But instead, on Nov. 21 UNMEER reported that only 13 percent of Sierra Leone's Ebola patients are isolated from the general population to prevent spread of the disease — an astonishingly low figure compared to the more than 90 percent isolation rates reported in Liberia and Guinea. Elhadj As Sy, secretary-general of the International Federation of Red Cross and Red Crescent Societies, predicted in late October that it would be at least four months before "control" could be achieved in Sierra Leone.

Traveling between Liberia and Sierra Leone to examine the respective countries' Ebola battles offered stark evidence of the importance of sound local governance in epidemics. Liberia has, with great apparent success, fought back the Ebola virus and lifted its national state of emergency. In contrast, Sierra Leone's fight with the virus is a classic cautionary tale of what happens when contagion meets governmental incompetence or — worse — corruption.

The capital of corruption

In order to get to Freetown you have to catch a speedboat or a ferry from the airport, which is located on a finger of land across the wide Sierra Leone River from the city. As seen from the water, Freetown is beautiful, its steep, verdant fingers of land, covered with shanties and houses, reminiscent of Rio de Janeiro. Hulking rust-bucket ships sit abandoned in Tagrin Bay and dot the mouth of the river as it empties into the Atlantic Ocean. The roads that branch off from Africa's third-largest harbor and wind through Freetown's mountains bear names that betray the country's British colonial past: Aberdeen Road, Macaulay Street, White Man's Bay Road, Newcastle Street. And congestion is the norm, as massive road construction projects and drainage-infrastructure improvements are underway, elements of President Ernest Bai Koroma's "Agenda for Change and Prosperity." Since his 2007 election, the former businessman has pushed an aggressive development strategy that features roadway expansion in support of the country's diamond, iron, and other extraction industries. It is an economic strategy that pushed a nation torn asunder by civil war (1991-2002) to become one of Africa's economic miracles. In 2013, Sierra Leone's economy grew by an astonishing 20 percent.

But miracles were never meant for all, or even most, of Sierra Leone's 6.2 million people — more than half of whom, in 2013, lived on less than $1.25 per day, according to the International Monetary Fund (IMF). Sierra Leone consistently rates among repressive economies in the world, falling near the world's rock-bottom worst on the Index of Economic Freedom, at 148th. The $8.3 billion economy ranks as one of the world's most corrupt and most poorly regulated by all 21 of the world's leading assessors. For example, in 2014 Transparency International ranked Sierra Leone 119 out of 175 nations (with 175 being the worst) for corruption. More than 90 percent of Sierra Leoneans surveyed by the organization in 2013 said that they had to bribe police and/or judicial officials for all aspects of daily life, from avoiding unwarranted traffic tickets to evading false arrest; most also paid bribes to other government officials.

The most telling indication of the depth of this corruption is that Sierra Leone has the fourth-largest gap between its wealthiest and poorest citizens in the entire world, after Lesotho, South Africa, and Botswana. The wealth gap is visible at every turn in the winding roads of Freetown, as mansions behind high security walls loom over tin-roofed shanties lacking running water.

That disparity fuels a tension which feeds rumors about everything, putting corruption at the top of every citizen's list of explanations for the country's myriad failings — now including the Ebola epidemic.

"The root of all problems here is money-siphoning," said a local journalist, who asked that I not identify him for fear of retribution. In Sierra Leone, such admissions are tied to a fear that thugs will beat people who voice concerns, or harm their families. The way people talked about these fears in Freetown struck me as reminiscent of the height of the mafia shakedowns in 1950s Brooklyn. One top global health official, insisting I not even identify his agency, said, "This place gives Nigeria a run for the money on corruption. Some $18 billion in foreign aid has poured in here since Koroma took office — where is it?"

The answer seems to be connected to the fancy mansions that line tony hillsides of Freetown, complete with swimming pools and shiny new BMWs.

All over the world, foreign aid and humanitarian assistance programs are subject to theft, typically executed by the government officials who are supposed to receive and process the cash. For example, a country's farm program officer might take in $100 million in aid intended for purchasing seed and fertilizer for local farmers, and submit $100 million in receipts to the foreign aid donor. But that official may have purchased $90 million worth of farm supplies and pocketed $10 million right off the top. The frequency with which such "skimming" occurs and the size of the typical graft vary dramatically from country to country, and are measured by a variety of banking and finance institutions. Sierra Leone consistently ranks as one of the world's most permissive environments for classic graft. No foreign aid or investment has been immune to "skimming," including programs that are literally matters of life and death for the general population.

In December 2011, the U.S. Agency for International Development (USAID) audited spending for food and agricultural development in Sierra Leone, discovering $794,664 in "cost overruns" in a $13.2 million program implemented jointly by the government of Sierra Leone and the Christian charity World Vision. The audit concluded that "[p]rogram performance data could not be verified, and impact could not be measured," and that "[t]he partner incurred unreasonable expenses and exceeded line-item budgets."

The following year, the GAVI Alliance (formerly known as the Global Alliance of Vaccinators and Immunizers) put a $6 million campaign on hold due to misuse of funds. In a November 2012 letter to the Sierra Leone minister of health, GAVI stated that the Geneva-based organization had "serious concerns of misuse of GAVI funds" totaling $1,099,640.

In March 2013, 29 Sierra Leonean government officials — including the country's chief medical officer, Kisito Sheku Daoh — were charged by Sierra Leone's Anti-Corruption Commission with defrauding GAVI. Investigators maintained that GAVI was billed for meetings and training sessions that never took place, and that government officials owned mansions and luxury vehicles that were "not consistent with official salaries," according to the *New York Times*.

None of the high-level government officials were convicted in Sierra Leone courts of any wrongdoing, although the Anti-Corruption Commission demonstrated that there was evidence of malfeasance.

None of the high-level government officials were convicted in Sierra Leone courts of any wrongdoing, although the Anti-Corruption Commission demonstrated that there was evidence of malfeasance. At least a half million dollars in GAVI funding was never accounted for. In April 2013, GAVI stated: "Funding for HSS in Sierra Leone was suspended in November 2012 after initial findings from the GAVI review, which covered the disbursement period 2008 to 2010 and funds which were spent between 2008 and 2011, raised

concerns over possible misuse of funds."

In May, just a little over a year after the GAVI debacle, the Global Fund to Fight AIDS, Tuberculosis, and Malaria's office of the investigator general (OIG) "found evidence of fake invoices and fictitious vendors in the procurement of office equipment for the Sierra Leone Ministry of Health and Sanitation, a Principal Recipient of Global Fund grants. In an assessment of the ministry made in 2011 by the Local Fund Agent, losses of USD 167,947 were highlighted in the purchase of non-health products. In its investigation, the OIG identified a further USD 70,510 of compromised expenditure." In plain English, the inspector general concluded that $238,457 was unaccounted for, and had likely been used to buy such things as personal cars and houses unrelated to the intended mission of vaccinating Liberian children.

Samuel Sam-Sumana, currently the vice president of Sierra Leone, was allegedly involved in a November 2011 bribery scandal dubbed "Timbergate," in which the politician was accused of accepting kickbacks in return for giving the nod to illegal logging operations. The Anti-Corruption Commission indicted two individuals who paid the kickbacks, but did not charge Sam-Sumana due to lack of direct evidence that the now-vice president accepted bribes.

Sources in Freetown told me a failure to pay bribes was the reason shipments of Ebola medical supplies never get out of customs — and in one case even sat inside a ship's hull for more than two months.

Given the political atmosphere in Sierra Leone, replete as it is with real and rumored corruption claims and alleged criminal cover-ups to protect government officials and their cronies, it is perhaps inevitable that the buzz and chatter on the streets of Freetown would freely mix comments about failures to slow the Ebola epidemic with talk of graft. All of the local media, both broadcast and print, tap dance around the corruption issue, and every substantive conversation I had with either foreign Ebola fighters or local Sierra Leoneans eventually led to exasperated chatter about lost funds, unpaid staff, delays due to bribe demands, or incompetent government officials who retained positions granted them in exchange for deals made by other officials. It is not possible to confirm or refute every rumor, or confront all of the accused; some claims must be false. But the sheer scale of the allegations, the casual way in which they slip into every conversation and are greeted as "normal," is staggering, even over the course of a short visit amid an epidemic.

For example, over the American Thanksgiving week, unpaid Ebola burial teams nationwide went on strike, saying they had not received a single paycheck since September. One team was sacked by the National Ebola Response Center (NERC) for staging a protest by publicly dumping the bodies of 15 Ebola victims, including two babies, into a street in the town of Kenema, near the Liberian border. Other health care workers, including doctors and nurses, have staged strikes and walkouts in recent days over salary nonpayment, and NERC spokesperson Sidi Yahya Tunis admitted to the BBC that, "Somebody somewhere has to investigate where these monies have been going, who have been paid these monies…. Action will definitely be taken against those who delayed their pay."

The money boat

Despite concerns that money is unaccounted for, Ebola funds are pouring into Sierra Leone — as they must. The country is in desperate need of outside aid to stop the virus, and the entire world needs to see the epidemic brought to a complete halt.

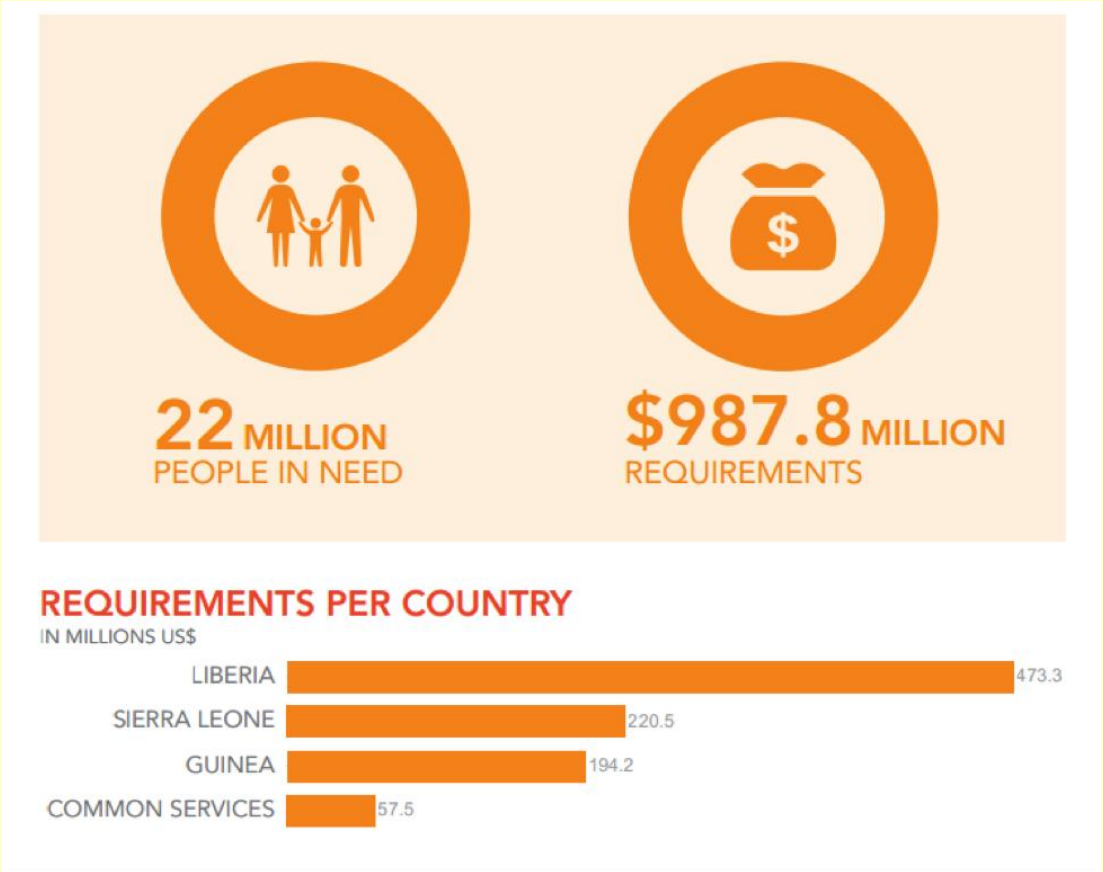
In September, the United Nations estimated that stopping Ebola in West Africa would require $987.8 million in donor support, $220.5 million of that for Sierra Leone. A week later, on Oct. 1, the British NGO Save the Children released an alarming document attesting to a skyrocketing epidemic in Sierra Leone that claimed, "An estimated 765 new cases were reported last week — a rate of five every hour — while there are only 327 beds in the country…. Ebola is spreading across Sierra Leone at a terrifying rate, with the number of new cases being recorded doubling every few weeks. At the current rate, 10 people every hour will be infected with Ebola in the country before the end of October."

Because of the country's former colonial ties to the United Kingdom, British Prime Minister David Cameron has made Sierra

Leone's epidemic his nation's special concern, and asked the European Union to pony up 1 billion euros ($1.2 billion) for the Ebola-hit country. Cameron committed his own government to providing $322 million towards that $1.2 billion goal.

At the end of October, the British Navy and Royal Marines sailed the *RFA Argus* into Freetown, bearing medical supplies and 750 unarmed soldiers and sailors meant to assist the country in its Ebola battle. Justine Greening, the U.K.'s international development secretary, pledged, "Britain is determined to stand with the people of Sierra Leone as they battle Ebola." Former Sierra Leone Minister of Defense Alfred Palo Conteh greeted the British ship on Oct. 30 in his then-new role as head of the NERC. Conteh, a former army major, looked the British gift horse in the mouth and told reporters, "We are in a crisis situation which is going to get worse. What is happening now should have been done three months ago."

The U.N.'s Financial Tracking Service (FTS) endeavors to keep a scorecard on donor pledges and actual expenditures on the Ebola effort, but clear discrepancies and unknowns are already emerging for Sierra Leone, and it is almost impossible to sort out cash versus in-kind donations and pooled funds "to the region" from targeted Sierra Leone-specific programs. One of the most valuable "donations" to the region has been Cuba's commitment of 165 medical workers, spread over the West African countries, but the FTS places no monetary estimate on that effort. Specifically for Sierra Leone, a total of $255.4 million in cash or services has been committed by outside donors, and another $134 million is pledged. Of the "committed" cash and services, it appears that roughly half has actually been delivered to Sierra Leone for disbursal. This falls well short of Cameron's call for $1.2 billion.



Nevertheless, a great deal of money and outside expertise has poured into Sierra Leone since September, yet the country's epidemic remains out of control. By mid-October the virus had reached every district of the nation, and by the end of that month, some six weeks after the world started promising cash and expertise to Sierra Leone, the

contrasting rates of success between Liberia and Sierra Leone were raising tough questions, both from the outside and from domestic media and political opposition leaders.

Too slow to act

When the Ebola epidemic first leaked across the Guinea border into Sierra Leone in early May, government leaders were slow to recognize the threat the virus represented to the whole nation. President Koroma left the problem to his health officials, even as it continued to spread along the border region throughout the month of May. Then the virus spread across Sierra Leone's eastern districts, eventually reaching Kenema, where U.S. military and university researchers had long maintained a Lassa Fever treatment and laboratory center. Lassa is a rat-carried virus that produces a deadly hemorrhagic fever disease in people that resembles some of the symptoms of Ebola, and Kenema's hospital had in place security and infection-control procedures approaching the scale required to protect health workers from catching Ebola from their patients.

The Ebola outbreak in Kenema drew swift worldwide attention due to the international presence there, and raised red flags in President Koroma's office in Freetown. As the death toll climbed in eastern Sierra Leone, one district, Kailahun, declared a state of emergency on June 9. As June wore on and the epidemic spread in geography and volume across eastern Sierra Leone, officials from Doctors Without Borders (or MSF, as the group is known by its French initials) declared that the outbreak was "totally out of control," drawing fire from President Koroma's press official Theo Nicol, who said that if the epidemic wasn't controllable it was likely MSF's fault.

Frustrated by inaction at the top government levels, the business and mining community in early July called for drastic steps to stop Ebola. But the Koroma government's response remained sluggish until the first cases of Ebola reached Freetown in mid-July. By then, the eastern outbreaks had grown dire and violence against health care workers erupted in Kenema. Political opposition and religious leaders decried the Koroma government's inaction, calling for a national all-out effort to stop the plague. On July 18, the government created the first of what would be a succession of national plans and offices to tackle Ebola, this one dubbed the Emergency Operations Center, or EOC. A sense of genuine urgency finally imbued the national response when the nation's top Ebola doctor, 39-year-old Sheik Umar Khan, died of the disease, having acquired the infection while treating patients in a remote eastern clinic. At the end of July, President Koroma declared a national state of emergency.

Executive action

Since then, Koroma has shuffled the leadership of the Ebola response at least three times, changed the national strategy, and sowed considerable confusion regarding how Sierra Leone plans to stop its horrible epidemic.

Most recently, on Nov. 4, Koroma quietly changed the entire Ebola response for the third time, pushing civilian Ministry of Health officials aside and putting the Sierra Leone armed forces in the lead. Claiming frustration over the chaotic responses executed in August through October, he created the NERC and put former Minister of Defense Alfred Palo Conteh in charge. And on Nov. 5, the president activated Section 29 of the Sierra Leone Constitution, giving himself state-of-emergency powers that included the authority to place any individual in jail without a court order or formal indictment.

The first of Koroma's shake-ups came in late August, when the president sacked Minister of Health Miatta Kargbo, saying that her handling of the Ebola crisis was incompetent. Kargbo, who had previously served as a political advisor to the president but had no experience in health or training in medicine, was already despised by Sierra Leone's medical community for her handling of a 2013 doctors' strike in which she bitterly condemned physicians, even portraying those requesting unpaid salaries as greedy. Kargbo had become a lightning rod for attacks on the Koroma government's response to Ebola when, on June 17, she delivered a speech to Parliament in which she blamed Ebola victims for their own infections. Speaking of a nurse who died of Ebola, Kargbo told legislators the woman had brought the illness upon herself because she had a boyfriend and, "They stayed in the same house and throughout the process when

he was infected, they were sleeping together in the same room as boyfriend and girlfriend; most definitely, most definitely."
Koroma eventually fired her for incompetence, saying that it was "in order to create a conducive environment for more efficient and effective handling of the Ebola outbreak in the country." (Kargbo's firing came just days after the U.S. government declared the Ebola crisis in Freetown sufficiently dire to mandate evacuation of family members of embassy and consulate personnel.).
On Aug. 29, Koroma appointed medical college professor Abu Bakarr Fofanah as the new minister of health and sanitation, and political operative Madina Rahman was designated his deputy. While Fofanah's appointment was hailed by the medical community, Rahman swiftly became another lightning rod for criticism after she publicly denounced unpaid gravediggers in two districts for going on strike. At roughly the same time, Stephen Gaojia was named head of the Emergency Operations Center that took over the national Ebola response. Under his leadership, in mid-September the entire nation was placed on a three-day lockdown, a move that proved wildly controversial.

During the house-to-house searches, hidden bodies and 130 Ebola sufferers were discovered, but in rural areas the national quarantine spawned food shortages and hunger.

During the house-to-house searches, hidden bodies and 130 Ebola sufferers were discovered, but in rural areas the national quarantine spawned food shortages and hunger. Though Gaojia declared the national lockdown a success on Sept. 22, by Oct. 11 the EOC's efforts were declared "a failure."
At the end of October, the EOC was dismantled, the NERC was created, and five days later the military was put in charge, with Palo Conteh at the helm. Under Conteh's leadership the NERC convenes twice a day and the pressure to provide the former army major with impressive presentations finds officials from the government and outside organizations, such as the U.K. military and Save the Children, scrambling to prepare snappy PowerPoints and rehearsing their short talks, according to three participants with whom I spoke.
Conteh is a controversial character, in part because of his rumored relationship with ex-Minister of Health Kargbo. According to veiled press accounts, in May, while still minister of defense, Conteh ordered his entourage into a high-speed chase of Kargbo's vehicle, which was taking the minister of health home from an Ebola funeral. Kargbo's car was rammed, several people were injured, and two members of Conteh's security detail died in the horrible accident. Some media hinted that Conteh was in love with Kargbo, who allegedly dumped him for another suitor.
In July, Freetown's popular radio host David Tam-Baryoh asked questions on his popular independent weekly program "Monologue" about Conteh's behavior, drawing the defense minister's rage. Tam-Baryoh's show was later suspended by the Sierra Leonean Independent Media Commission for 60 days because:
"David Tam-Baryoh threatened the security of the state, by the inciteful [sic] comments he made against the Minister of Defence.... He was calling on the Army to take immediate action, because, two of their colleagues had died in a road accident.... He blamed the Minister and by extension the government for the accident...."
In early November, shortly after Conteh took charge of the NERC, the daring radio host took to the air again to recite a list of unmet Ebola control measures. Asking where the funds had disappeared to and why the government had not met its own targets for construction of treatment facilities and other activities, Tam-Baryoh and his opposition party guests called for accountability. Midway through his broadcast, six armed police stormed the studio and Tam-Baryoh was arrested live, on the air, and accused of making "disparaging and inflammatory statements" about the government "that in no way would aid the collective efforts we are making as a nation in the fight against the Ebola virus." The broadcaster was further accused

of rousing Kono ethnic hatred against the central government.

According to a fellow journalist I spoke with in Freetown, Tam-Baryoh's arrest was ordered by Conteh, in part as revenge for the reporter's prior comments about the deadly car accident. Conteh appealed to President Koroma, who signed a decree ordering the reporter jailed without indictment or trial. Tam-Baryoh was reportedly subjected to severe beatings and jailed in a 324-bed prison that contained more than 1,200 inmates. Two weeks later, the journalist was released on bail after his case was raised by politicians in the British Parliament, which passed a resolution calling for his freedom. Legal experts in the country warn that no reporters are immune to such actions, including the foreign press.

Members of political opposition parties now charge that Koroma is using the Ebola epidemic state of emergency to "create a police state in Sierra Leone." A month after Tam-Baryoh's arrest, the Kono district did indeed explode, but not politically: Ebola emerged with with such ferocity that between Nov. 30 and Dec. 10, the World Health Organization announced, 87 bodies were buried and 119 cases were officially reported in an outbreak so extreme that one government official said, "we are only seeing the ears of the hippo."

By early December, the center of gravity of the entire Ebola epidemic of West Africa had shifted to Sierra Leone, with the country not only having the vast majority of new cases and deaths reported daily, but by Dec. 8 eclipsing Liberia for the dubious distinction of witnessing the largest officially reported cumulative case burden. As the Koroma government struggles to stop the virus's spread, especially in Freetown and its neighboring districts, pressure is building from domestic and international health communities for a more strategic and accountable effort. Publicly, the WHO, the U.S. Centers for Disease Control, and U.K. agencies have resisted issuing direct criticisms of Sierra Leone's response or the quality of the nation's governance.

On Dec. 1, the WHO issued statements and convened a press conference to put a positive face on the epic battle against Ebola, highlighting the achievements made in Liberia and downplaying defeats in Sierra Leone. MSF was not pleased. In its Dec. 1 counter-report, MSF insisted that, "The fight against Ebola in Sierra Leone is being outpaced by the increasing number of infections. Despite efforts by the national authorities and support from international actors, the situation is far from under control. Every district in Sierra Leone is affected by the epidemic, and the number of infections has increased alarmingly."

Supplies are inadequate, MSF wrote, international assistance minimal, and the Sierra Leone government is in dire need of assistance. "In the absence of adequate facilities to isolate, diagnose and manage Ebola cases, Sierra Leonean healthcare workers are struggling with the needs and are forced to face the epidemic with whatever support they can get."

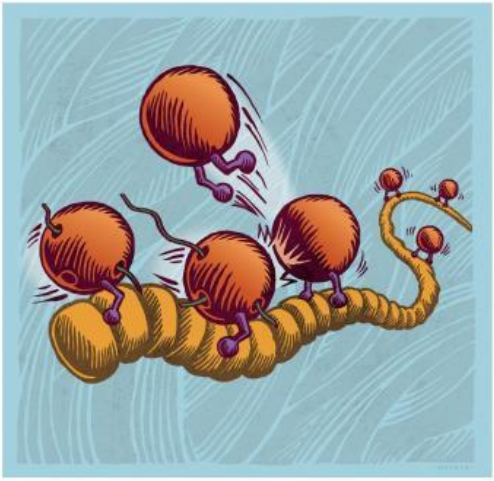
Though Sierra Leone is, indeed, in desperate need of far more international assistance, especially for treatment and isolation of Ebola-infected individuals, the epidemic will only come under control when the nation itself — the NERC, the government, and the people — confronts the virus squarely, without any hint of corruption, and with willingness to change behaviors that spread the disease.

__Laurie Garrett__ is senior fellow for global health at the Council on Foreign Relations and a Pulitzer Prize winning science writer.

Study indicates target for future drugs for Ebola, measles, RSV

Source: http://www.medicalnewstoday.com/releases/286920.php?tw

University of Utah researchers ran biochemical analysis and computer simulations of a livestock virus to discover a likely and exotic mechanism to explain the replication of related viruses such as Ebola, measles and rabies. The mechanism may be a possible target for new treatments within a decade.



This illustration depicts an exotic mechanism by which a family of viruses named NNS RNA viruses may replicate to make copies of themselves, according to a University of Utah study. The family includes a livestock virus named VSV as well as viruses responsible for Ebola, measles, rabies and a common respiratory virus, RSV. The mechanism may serve as a target for new drugs against Ebola in five to 10 years. The yellowish strand is a viral genetic blueprint made of RNA and covered by bead-like proteins. The orange, ball-shaped objects are enzymes called polymerases, which normally read and copy the RNA to make new virus particles. That process can begin only when some polymerases attach to the correct end of the RNA and start reading it, which the two polymerases on the left are doing. The other polymerases (the four on the right side) are attached to the protein-covered RNA but slide along it until they collide with the polymerases that already are reading the RNA. Those collisions kick sliding polymerases loose (top center) so they can float to the proper end of the RNA and start reading it. Researchers hope future drugs can be developed to target this sliding mechanism as a new treatment for Ebola. Credit: Dave Meikle, University of Utah.

"This is fundamental science. It creates new targets for potential antiviral drugs in the next five to 10 years, but unfortunately would not have an impact on the current Ebola epidemic" in West Africa, says Saveez Saffarian, senior author of a new study published by the Public Library of Science journal *PLOS Computational Biology*.

Saffarian, a virologist and assistant professor of physics and astronomy, and his colleagues studied a horse, cattle and pig virus named VSV - vesicular stomatitis virus - which is a member of family called NNS RNA viruses. That family also includes closely related viruses responsible for Ebola, measles, rabies and the common, childhood respiratory syncytial virus, or RSV. The genetic blueprint in these viruses is an RNA strand that is covered by protein like beads on a necklace.

By conducting 20,000 computer simulations of the VSV starting to replicate in different possible ways, the study found a "fundamental mechanism" used by VSV and related viruses like Ebola to make copies of themselves or replicate, Saffarian says.

The mechanism: Once the virus infects a cell, enzymes called polymerases literally slide along the protein "bead"-covered viral RNA strand until they reach the correct end of the strand. Then the polymerases can read and "transcribe" the RNA code to synthesize messenger RNA, or mRNA. Once one polymerase starts doing that, it collides with other sliding polymerases, kicking them loose within the cell until they, too, attach to the correct end of the RNA and start making copies. That lets the virus replicate and take over the infected host cell.

"The proposed sliding mechanism is a fundamental new mechanism specific to the NNS RNA viruses that can be a target for antiviral drugs in the future," Saffarian says - something he hopes pharmaceutical scientists will pursue.

The sliding contrasts with replication in many other viruses, in which the polymerases easily detach from the virus inside an infected cell and then find the right end of the RNA so replication begins.

The mechanism was discovered by computer simulations, so "we are working now on demonstrating evidence of the sliding mechanism in VSV," Saffarian says.

He believes the discovery is "as fundamental as understanding the workings of HIV protease" - an enzyme essential for replication of the AIDS virus and that became a target of protease inhibitors, which first made it possible for AIDS patients to live with AIDS as a chronic rather than deadly disease.

Saffarian conducted the study with first author and physics doctoral student Xiaolin Tang, and with research scientist Mourad

Bendjennat. The National Science Foundation funded the study.

Why Antivirals Could Be Better than Vaccines

Many viruses have their genome or genetic blueprint hidden within an envelope of fat or lipid. The only parts of the virus that are exposed are some envelope proteins, and about 10 percent of those proteins are used by the virus to play a direct role in entering and infecting a target cell. Antibodies in vaccines target the proteins to attack and block viral infection.

But viruses quickly mutate different exposed proteins, making vaccines less than ideal - as demonstrated by the discovery that this year's influenza vaccine doesn't closely match the viruses circulating this flu season.

Some viruses, known as RNA viruses, have genetic blueprints made of RNA instead of DNA. Creating vaccines is particularly difficult for many RNA viruses - which include HIV, influenza and the group with VSV and Ebola - because RNA viruses are adept at mutating and changing their envelope proteins to evade vaccines, Saffarian says, adding that the Ebola virus now in Africa "is mutating extremely fast."

So while promising vaccines candidates against Ebola now are being developed, Saffarian says, "Vaccines are not the most potent way to fight these RNA viruses."

"The only way to create stable antiviral therapies against RNA viruses is to target multiple sites within the replication machinery," he adds.

The Mystery of Ebola Replication

Some RNA viruses are known as "nonsegmented negative sense" or NNS RNA viruses, including Ebola, rabies, measles, the VSV livestock virus and RSV.

"The replication machinery of the Ebola virus is not fully understood because it has not been possible to reconstitute replication of Ebola in the lab," Saffarian says. "It's biochemically difficult. But the fundamental mechanism of replication has been shown to be almost identical to a well-studied animal virus, VSV," which infects and causes bleeding mouth and udder ulcers in cattle, horses and pigs.

When an NNS RNA virus infects a cell, its RNA genetic blueprint enters the cell along with a set of polymerases, which are enzymes essential for a virus to replicate. Polymerases normally "read" the RNA genetic blueprint to synthesize mRNA, which then leads to formation of viral proteins and viral replication: more viral particles.

But in the NNS RNA viruses, the RNA strand is covered by bead-like proteins, preventing polymerases from reading the RNA and starting the replication process. Yet the viral polymerases somehow evolved to read, transcribe and replicate the RNA genome hidden beneath the protein beads.

What the Study Found

Researchers previously thought viral polymerases worked similar to the polymerases inside our cells, which move freely inside the cell and find the proper end of DNA to begin replication.

But in an initial phase of the study conducted with real VSV, the livestock virus, Bendjennat showed the polymerases attached to the bead-covered RNA of the livestock virus VSV were so tightly bound they could not float off into the cell to find the correct end of the RNA to start reading it.

"Our team was puzzled by, how do these polymerases find where they are supposed to start working if they are stuck to the beads on the RNA so tightly most can't even come off?" Saffarian says.

So Tang used computer simulation to test 20,000 different conditions that could possibly occur as the livestock virus RNA was read and transcribed into mRNA in the first steps of viral replication. The simulations were based on current knowledge of how much work polymerases do during the first hour after VSV infects a cell, and that each virus carries about 50 identical polymerase molecules to use for reading and copying the virus' RNA into mRNA.

Tang looked for the mechanism - a set of conditions - that best fit the speed of a real VSV infection.

Tang "found that no matter what she tried, these viral polymerases have to be able to slide on their bead-covered RNA genomes rather fast in order to get any meaningful work done" toward replication, Saffarian says. "They can't dissociate [separate from the RNA], but they can slide. That

helps the polymerases find where they have to start work at the end of the RNA."
The study also indicates that as a polymerase reads and transcribes the beaded RNA strand, it collides with sliding polymerases and kicks them into solution inside the cell, which allows them to eventually bind to the correct end of the RNA, where they also starts transcribing it to mRNA for replication.

Simple steps can safeguard against Ebola transmission through organ donation

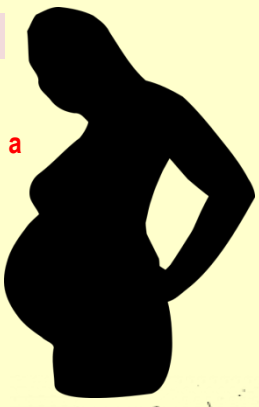
Source: http://www.medicalnewstoday.com/releases/286930.php?tw

While serious infections can be transmitted from donated organs, the risk of passing Ebola virus disease from an organ donor to a recipient is extremely small. In a new editorial published in the *American Journal of Transplantation*, experts explain how simple assessments of donors can help ensure that the organ supply is safe, while having little impact on the donor pool.
Despite screening all organ donors for infection, on rare occasions an organ donor will transmit an unexpected infection to a recipient. Because cases of Ebola virus disease have occurred in the United States recently, clinicians want to make sure that appropriate steps are taken to reduce the already low risk that Ebola virus could be unknowingly transmitted from donor to recipient. Experts note that simple screening questions, many of which are already asked, can be used to assess if donors have risk for harboring Ebola virus disease. Also, investing in new laboratory-based testing is likely not practical or effective. "Thousands of people die in the United States each year waiting for an organ transplant, and we think it is very important not to overreact to the very low risk that a potential donor might have the Ebola virus, and, as a consequence, unnecessarily discard potentially life-saving organs," said lead author Daniel Kaul, MD, who is the director of the transplant infectious disease division at the University of Michigan in Ann Arbor and the chair of the United Network for Organ Sharing's Disease Transmission Advisory Committee.
Dr. Kaul and his colleagues suggest that individuals who travelled in the past three weeks to the countries in Africa where Ebola virus is active, as well as health care workers and others in the United States who were recently exposed to someone infected with Ebola virus, should not donate organs. While it is difficult to know how long a person should be kept from donating after exposure to the Ebola virus, they feel that a 21-day exclusion period is reasonable. "We think that after the 21-day period, doctors taking care of the patients involved could consider using those organs after talking with the potential recipients if that organ might be the recipient's best chance to survive," said Dr. Kaul.

Nursing care for pregnant women who contract Ebola

Source: http://www.medicalnewstoday.com/releases/287075.php?tw

A pregnant woman in Africa who has contracted Ebola is likely to suffer with a spontaneous abortion, pregnancy-related hemorrhage, or the death of her newborn.
Although the risk of caring for a pregnant woman with Ebola in the United States may be rare, the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) has published a practice brief in its *Journal of Obstetric, Gynecologic, & Neonatal Nursing* to guide nursing care for pregnant women and newborns.
"Nurses play a vital role in caring for patients with Ebola," said Dr. Debra Bingham, who is Vice President at AWHONN. "AWHONN's practice brief will help nurses identify women with symptoms of infectious diseases in order to minimize the risk of spreading Ebola infections among women and newborns."



Endless Ebola Epidemic? That's The 'Risk We Face Now,' CDC Says

Source: http://www.gpb.org/news/2014/12/15/endless-ebola-epidemic-thats-the-risk-we-face-now-cdc-says

Speed! That's key to ending the Ebola epidemic, says the director of the U.S. Centers for Disease Control and Prevention.

Dr. Thomas Frieden is visiting West Africa this week to figure out how to reduce the time it takes to find new Ebola cases and isolate them.

Otherwise, Ebola could become a permanent disease in West Africa.

"That's exactly the risk we face now. That Ebola will simmer along, become endemic and be a problem for Africa and the world, for years to come," Frieden tells NPR. "That is what I fear most."

Frieden plans to spend several days in each country where the virus is still out of control Guinea, Liberia and Sierra Leone.

The biggest challenge right now is in Sierra Leone, he says, where the epidemic shows no signs of slowing down. New cases continue to rise exponentially. Last week, the country reported nearly 400 cases, or more than three times the number of cases reported by Guinea and Liberia combined.

Since February, there have been nearly 18,000 reported Ebola cases globally, the World Health Organization says, with more than 6,000 deaths.

But Frieden is still confident that the three countries can eventually reach zero new cases and end the epidemic.

Why?

Because the world has stopped every Ebola outbreak before, Frieden says. "Even in this epidemic, we are stopping individual outbreaks. The challenge is doing it at a scale and with a speed that we've never done before."

When Frieden visited West Africa last time, in August and September, the disease was "raging out of control in Monrovia," he says.

Since then, the epidemic has slowed down in Liberia. "But we haven't been able to get it under control," he says.

"As the weeks have gone by, we have been able to intervene faster [in Liberia]," Frieden says. "We've found that we can stop outbreaks in weeks instead of months."

So a hot spot in one town or county ends up having only a handful of cases instead of hundreds, he says.

Now the CDC and international aid groups need to figure out how to do that in Sierra Leone.

But even then, the response may not be fast enough. All it takes is one sick person to travel to a vulnerable town and ignite a new hot spot. That's been happening in Guinea for months.

"It's not like a forest fire, so much," Frieden says, "as a country full of bush fires in different places."

ISIS launch SCORPION BOMBS to spread panic in Iraq

Source: http://www.mirror.co.uk/news/world-news/isis-launch-scorpion-bombs-spread-4817241

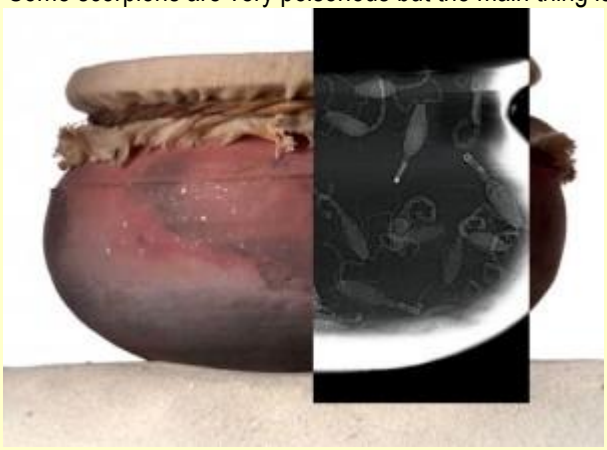
Islamic State militants are launching bombs containing live scorpions as the latest terror weapon in Iraq.

Canisters of the creatures are being blasted into towns and villages, according to a British military expert who has just returned from the country.

Hamish de Bretton-Gordon, ex-head of chemical and biological weapons for the Army and NATO, said: “It’s madness. IS have improvised devices to

launch them.
"They promote the fact that they are doing it and it creates panic.
“Scorpions are robust – even if they are launched a couple of miles, when the canister breaks

thousands are flung out and start crawling all around.
"Some scorpions are very poisonous but the main thing is creating fear."



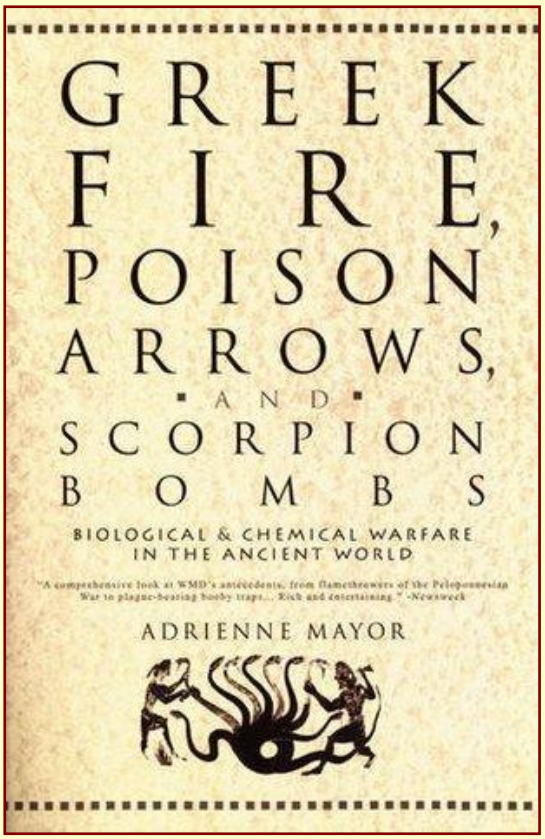
He said the 2ft bombs were not causing mass casualties but had a massive “psychological impact”.
Mr de Bretton-Gordon – of Avon Protection Systems – returned from Baghdad last week, where he was advising security forces.
Senior Iraqi officials reported the beasts were being used to target civilian areas in the north of the country.
The weapon harks back to the scorpions stuffed into pots and launched by Iraqis thousands of years ago – in 198 AD.
They were defending themselves against the Roman invasion.

Here’s How to Make a Scorpion Bomb

Source: http://www.smithsonianmag.com/smart-news/heres-how-to-make-a-scorpion-bomb-154013653/?no-ist

Want to keep your enemies at bay? How about throwing a jar of scorpions at them? Well, that’s exactly what some ancient people did, *National Geographic* writes:
In the second century, the inhabitants of the fortress city of Hatra—in what is now Iraq—managed to hold off an attacking Roman army by hurling pots full of deadly scorpions onto the legionnaires.
National Geographic even made a real scorpion bomb, then photographed and x-rayed it.

An expert in ancient pottery created an authentic replica of a terracotta pot like those found at the desert fortress of Hatra near modern Mosul, Iraq, where scorpion bombs had successfully repulsed Roman besiegers in AD 198. After some searching, six deadly Iraqi Death Stalker scorpions were obtained from an exotic pet shop. But now, in the National Geographic studio, photographer Cary Wolinsky and his scorpion wranglers found themselves facing the same threat of "blowback" that the defenders of Hatra had somehow overcome. How does one go about stuffing deadly scorpions into a jar without getting stung? In antiquity, there were several techniques for handling scorpions "safely"—none of them all that safe. The National Geographic team hit on a method unavailable to the desert dwellers of Hatra: the wranglers placed the scorpions in a refrigerator to slow them down before each photo shoot.



Making a scorpion bomb was chronicled in the book *Greek Fire, Poison Arrows & Scorpion Bombs.* The author, Adrienne Mayor, says that the scorpion bomb recipe went over quite well:

Countless parents told me that their twelve-year-old boys (and some girls) loved the recipe for making scorpion bombs, the live "grenades" that had saved the ancient desert city of Hatra from the besieging Roman army of Emperor Septimius Severus in AD 198-99. Visions of homemade spin-offs troubled my conscience, imagining kids gleefully lobbing baby-food jars filled with hapless spiders, wasps, fire ants, etc at school bullies. It turned out that grown-ups were just as devilishly attracted to the notion of re-creating ancient biochemical weapons. I had to remind History Channel TV producers, for instance, to don gas masks when they replicated toxic fumes devised by the ancient Spartans.

So how do you do it? Well, here's what Mayor says:

In antiquity the common technique was to verrrrrry carefully spit on the business end of the scorpion. But that requires nerves of steel and perfect aim. Resorting to a method unavailable to the ancient desert-dwellers in Iraq, they placed the scorpions in a refrigerator to induce torpor before each photo session. The resulting photograph and X-ray of the replica scorpion bomb of Hatra was a smashing success and one of my favorite souvenirs of this book.

JUPITR program takes shape on Korean Peninsula

Source:http://www.army.mil/article/121633/JUPITR_program_takes_shape_on_Korean_Peninsula/

The Joint United States Forces Korea Portal and Integrated Threat Recognition advanced technology demonstration is underway and already making a difference to the Korean Peninsula.

The Joint United States Forces Korea Portal and Integrated Threat Recognition, known as JUPITR, a program led by the Joint Program Executive Office for Chemical and Biological Defense, or JPEO-CBD, and supported by the U.S. Army Edgewood Chemical Biological Center, or ECBC, will provide unique biological detection capabilities to address the demand for stronger biosurveillance capabilities on the Korean Peninsula.

JUPITR supports the Homeland Security Presidential Directive-21, which states that biological threats could take many forms, including naturally occurring disease outbreaks. This policy led to the National Strategy for Countering Biological Threats

in 2009, which recognized that an outbreak of disease could impact national security just as much as an overt attack on U.S. forces. In 2012 the first ever National Strategy for Biosurveillance was established with the goal, "to achieve a well-integrated national biosurveillance enterprise that saves lives by providing essential information for better decision making at all levels."

The JUPITR program introduces new instrumentation that increases speed and ease of biosurveillance equipment for the United States Forces Korea, or USFK. The instrumentation also comes at lower cost, less training and burden to the Soldier with higher performance results. JUPITR's presence on the Korean Peninsula aligns with the Joint Force's strategy to rebalance military efforts toward the Asia-Pacific region.

"Our long standing commitment to the security of South Korea and the DOD's 'Pivot to the Pacific' made the choice of basing the JUPITR ATD within the Republic of Korea a straight forward selection," said Peter Emanuel, JUPITR ATD team lead and ECBC Biosciences division chief.

As a part of the program, researchers from ECBC and JPEO-CBD will be traveling to the Republic of Korea on short-term rotations. The first rotation started in summer 2013 and will continue for the next two years. In these rotations, the ECBC/JPEO-CBD representatives help the USFK build advanced laboratory capabilities in-house, and personally train and demonstrate the JUPITR instrumentation.

Specifically, the ECBC/JPEO-CBD representatives are helping to certify the 106th Food Safety Laboratory in South Korea with a BioSafety Level 2 (BSL 2) laboratory standard in Youngsan Army Garrison. This certification will allow this lab to safely receive and analyze real-world contaminated samples. The traveling group started their work by demonstrating the power of the BioFire Film Array, the IQUUM Liat and the 3M Focus, all of which are new biosurveillance analysis instruments.

This level of interaction with the end-users in Korea ensures that ECBC and JPEO can gain rapid feedback, make quick adjustments and ensure that the biosurveillance equipment functions properly in the South Korean environment. ECBC/JPEO-CBD representatives are also able to train one-on-one and build important relationships with the USFK.

"This in-person JUPITR method is innovative," said James Wright, a biologist in ECBC's BioScience's division and among one of the first researchers to travel to Korea. "It allows us to acquire the results quickly, get direct feedback from the Soldiers and efficiently see our results first

hand. It's very exciting and a great developmental assignment for us to participate in as laboratory scientists."

So far, the groups have worked directly with the 121st Medical Group, the 106th Veterinary Support and the 51st Air Force Medical Group in Korea. ECBC and JPEO representatives provided USFK with new capabilities to enhance the efficiency and functionality of their labs.

For example, new equipment such as the BioFire Film Array, can run Dry Filter Unit samples in five to six hours compared to the current system which would run samples in a couple days.

Julie Renner, a toxicologist from ECBC has already completed two rotations in Korea. When Renner saw how JUPITR's instruments could obtain results faster than it took USFK to prepare a sample for the current equipment, she realized the true impact of JUPITR.

"The imminent need for these new instruments and capabilities they offer became apparent," Renner said. "Also, in meeting with and creating a relationship between the 106th and the 501st CBRNE (chemical, biological, radiological, nuclear and explosives) Tech Escort, we were able to bridge a huge and long-overdue gap that is necessary for future exercises across the peninsula and for real-world bio-threat readiness."

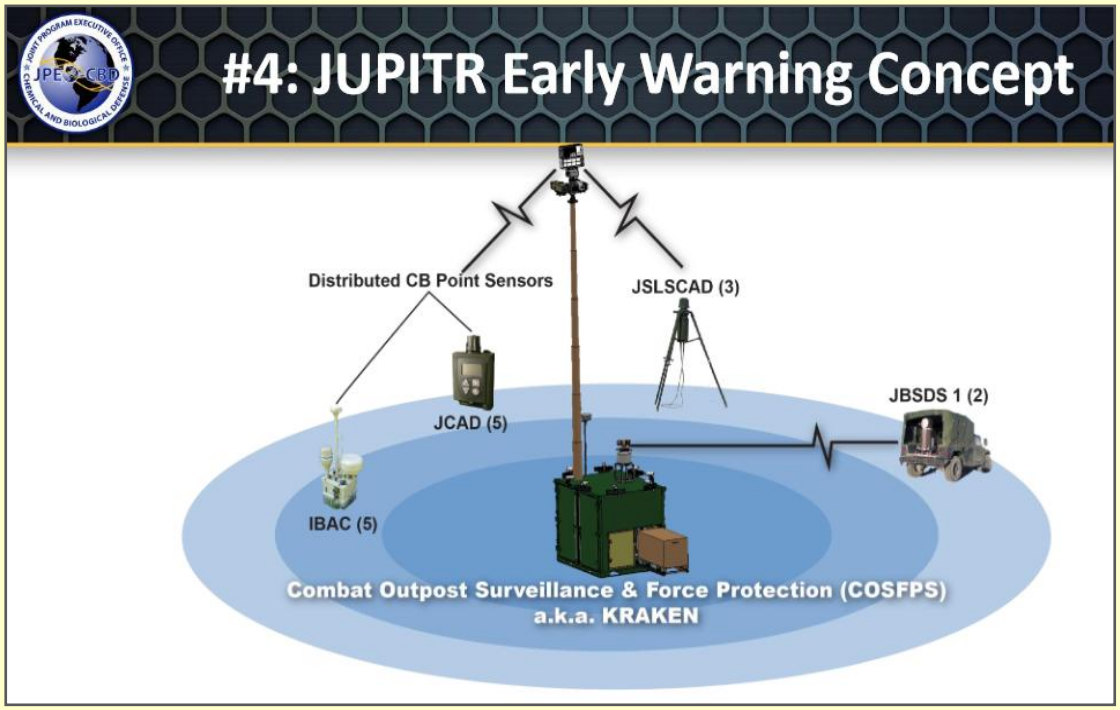
The projects that ECBC and JPEO representatives led while in Korea, range across many disciplines from instrumentation training to classroom training. Marcus Thermos, a member of the ECBC training team was able to teach a course about basic Chemical and Biological defense to USFK personnel during his time in Korea.

"I taught a course for 18 Soldiers. While they were familiar with the Army, they didn't know too much about the chemical and biological defense program and the work we were doing, so I had the opportunity to give them a crash course that they found very rewarding," Thermos said.

JUPITR combines advanced communications with cutting-edge detection capabilities to design a program that will bring rapid and efficient biosurveillance. The program is comprised of four legs that work simultaneously to achieve JUPITR's goal.

The first leg is an information portal that is similar to a health surveillance web management tool. This portal will house a library of identified biological substances in a cloud library that authorized personnel can access.

The second leg sends ECBC researchers to Korea to work alongside USFK representatives to improve their laboratory



capabilities. This allows the USFK to conduct analysis at their own facilities rather than shipping samples back to the U.S.
The third leg, called the "Shoot-Off," tests a number of biological detectors, and sends the best one to Korea. The last leg, called Integrated Base Defense is a large multifunctional, all seeing sensor that can rapidly design a defensive perimeter. Together, these legs form a dynamic, multifaceted program that will advance the biological detection capabilities of the Korean Peninsula.
Supporting organizations for JUPITR include the Department of Homeland Security, Office of the Assistant Secretary of Defense for Health Affairs, Health Affairs and Defense Threat Reduction Agency.

Read a very interesting interview on the same topic at:
http://www.cbrneportal.com/interview-with-dr-peter-emanuel-the-joint-united-states-forces-korea-portal-and-integrated-threat-recognition/

Identification of 53 compounds that block Ebola virus-like particle entry via a repurposing screen of approved drugs

By Jennifer Kouznetsova[1], Wei Sun[1], Carles Martínez-Romero[2,3], Gregory Tawa[1], Paul Shinn[1], Catherine Z Chen[1], Aaron Schimmer[4], Philip Sanderson[1], John C McKew[1], Wei Zheng[1] and Adolfo García-Sastre[2,3,5]

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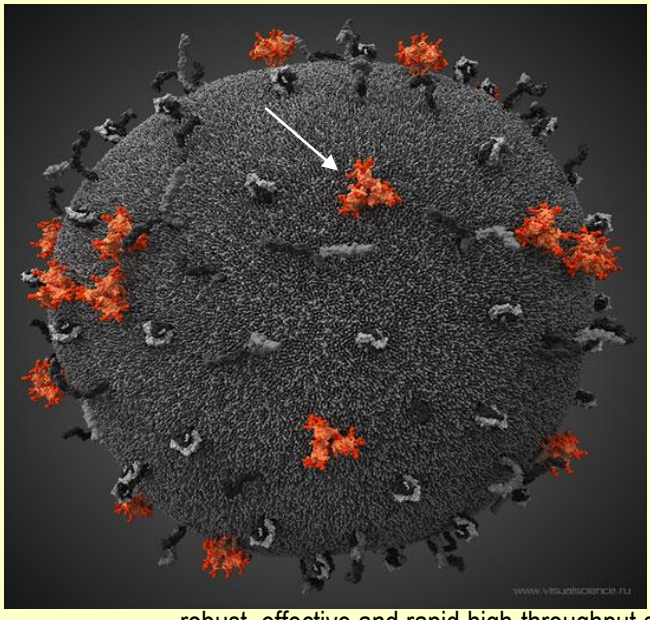
Source: http://www.nature.com/emi/journal/v3/n12/full/emi201488a.html

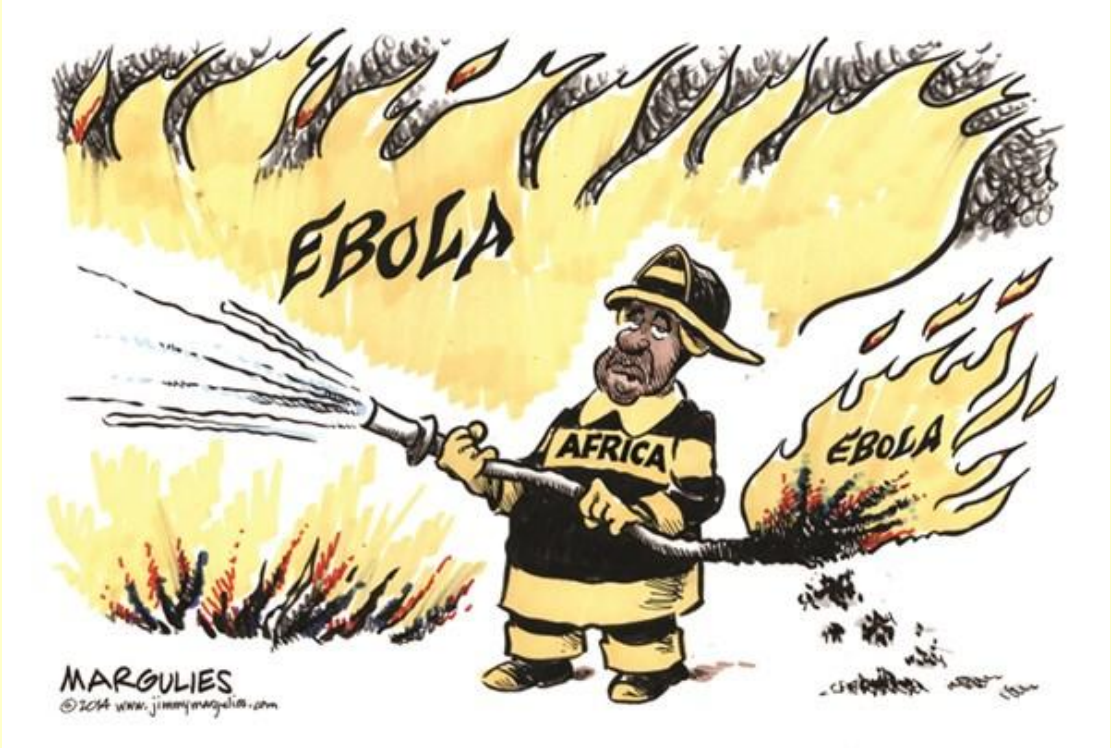
ABSTRACT

In light of the current outbreak of Ebola virus disease, there is an urgent need to develop effective therapeutics to treat Ebola infection, and drug repurposing screening is a potentially rapid approach for identifying such therapeutics. We developed a biosafety level 2 (BSL-2) 1536-well plate assay to screen for entry inhibitors of **Ebola virus-like particles** (VLPs – orange stractures in photo) containing the glycoprotein (GP) and the matrix VP40 protein fused to a beta-lactamase reporter protein and applied this assay for a rapid drug repurposing screen of Food and Drug Administration (FDA)-approved drugs. We report here the identification of 53 drugs with activity of blocking Ebola VLP entry into cells. These 53 active compounds can be divided into categories including microtubule inhibitors, estrogen receptor modulators, antihistamines, antipsychotics, pump/channel antagonists, and anticancer/antibiotics. Several of these compounds, including microtubule inhibitors and estrogen receptor modulators, had previously been reported to be active in BSL-4 infectious Ebola virus replication assays and in animal model studies. Our assay represents a robust, effective and rapid high-throughput screen for the identification of lead compounds in drug development for the treatment of Ebola virus infection.



We found that 11 of these 16 compounds are active in our Ebola VLP (virus-like particle) entry assay: Nocodazole, Toremifene, Tamoxifen, Raloxifene, Cepharanthine, Clomiphene, Dronedarone, Amodiaquine, Imipramine, Chloroquine, and Nilotinib.

▶ Read the full paper at source's URL.



EDITOR'S COMMENT

Let us ALL hope that 2015 would be a victory year against Ebola!
It is amazing how much progress has been already done at scientific level.
But still the big question remains: Why now and not before?
Why we always need a shocking event to activate our scientific and humanitarian potential? Why we almost never act pre-emptive to prevent deadly things to happen?
Running water, sanitary infrastructure and proper food cost less than expensive medications and vaccines…