

“Defending the Homeland from Bioterrorism: Are We Prepared?”

**Testimony of
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Subcommittee on Emergency Preparedness, Response, & Recovery
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I would like to thank Chairman Thompson, Ranking Member Rogers, Subcommittee Chairman Payne, Ranking Member King, and members of the committee for the opportunity to testify today on behalf of local health departments and public health emergency responders across the country.

My name is Dr. Umair Shah, and I am the Executive Director for Harris County Public Health (HCPH) and the Local Health Authority for Harris County, Texas. Harris County is the third most populous county in the United States with 4.7 million people and is home to the nation’s 4th largest city, Houston. I am a Past President and former Board Member of NACCHO, the National Association of County and City Health Officials. NACCHO is the voice of the nearly 3,000 local health departments (LHDs) across the country. I am also a Past President and current Board Member of TACCHO, the Texas Association of City and County Health Officials, which represents approximately 45 LHDs across Texas.

As background, Harris County is the most culturally diverse and one of the fastest growing metropolitan areas in the U.S. and home to the world’s largest medical complex, the Texas Medical Center, one of the nation’s busiest ports, the Port of Houston, and two of the nation’s busiest international airports. Our metropolitan area comprises the largest concentration of petrochemical manufacturing in the world. HCPH is the county public health agency responsible for protecting the public's health in the event of widespread public health emergencies within Harris County under the direction of County Judge Lina Hidalgo, who by state law, is the county’s director of emergency management and leads the Harris County Office of Homeland Security & Emergency Management (HCOHSEM). In close coordination with HCOHSEM, HCPH’s Office of Public Health Preparedness and Response (OPHPR) ensures an effective, coordinated public health response to a variety of emergencies including terrorist attacks, disease outbreaks, weather-related disasters, to name a few.

In fact, our community has seen its share of emergencies over the years, including but not limited to Tropical Storm Alison (2001), Hurricane Katrina sheltering (2005), Hurricane Ike (2008) and more recently Hurricane Harvey (2017). Coupling these natural disasters with others such as the department’s 18 month nH1N1 influenza pandemic response (2008), West Nile virus (WNV) response (2012), Ebola readiness & “response” activities (2014-2015), human rabies death and rabies in a Harris County dog (2008 and 2015), Zika virus (2016-2017), measles “resurgence” (2019), and three large-scale chemical fires in 2019 as well, our community is undoubtedly an impacted community. However, one

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thing one must remember about Harris County – and really this goes for all of Texas – is that it is also an incredibly strong and resilient community.

In my testimony today, I will focus on three main points:

1. We all agree that emergencies occur repeatedly, unexpectedly, and we must ensure that our communities are prepared for what lurks behind the next corner. BioWatch and the next generation of biodetection are important tools in the toolbox for decision-making but are not the only tools. Yet these tools must be effective which means they must be science-based and must evolve as the science and threats equally evolve.
2. Public health at all levels of government is vital – indeed we say that public health truly matters! Public health must be invested in and capacity built because it is absolutely critical to protecting our communities even when it is largely invisible or forgotten (the so-called “Invisibility Crisis”). Public health is equally a crucial sector that must be well-equipped and trained to prevent, protect against, mitigate, respond to, and recover from all incidents whether small or catastrophic.
3. There is a science and an art to public health and we must have access and availability to as much information as possible especially during a biological attack to make appropriate, difficult, nuanced decisions on behalf of our community so sharing of that information is critical. We must continue to involve all federal, state, local, and even global partners in not just response activities but also the planning phase.

Protecting Our Communities

HCPH is part of the Houston/Galveston Metro Area BioWatch Advisory Committee (BAC) and this BAC makes up one of the more than 30 BioWatch jurisdictions across the country. The National Academy of Medicine (formerly the Institute of Medicine) and the National Research Council convened a workshop in 2014 entitled, “*Strategies for Cost-effective and Flexible Biodetection Systems that Ensure Timely and Accurate Information for Public Health Officials*” that explored many of the issues around BioWatch and biodetection systems and needs. I participated in this workshop that was held five years ago – unfortunately many of those same themes that were inherent then are still of concern today. Many of the issues and problems with any biodetection system or the next generation replacement systems will always need to be addressed in order to ensure the most robust and accurate system and must be seen as a “tool” within a well-established public health emergency preparedness system. In 2003, our local community had the first BioWatch hit in the nation when low levels of *Francisella Tularensis* (FT) were detected for three days. The detection caught natural occurring instances of the bacterium and yet no terrorism was discovered. Instead it caused a cascade of events and highlighted gaps that public health helped identify that I will describe within my testimony.

The CDC Foundation states, “Public health is the science of protecting and improving the health of people and their communities. Overall, public health is concerned with protecting the health of entire populations. These populations can be as small as a local neighborhood, or as big as an entire country or

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region of the world.” Public health emergency preparedness is truly national health security. Local health departments play an essential role in ensuring that people and their communities are prepared for, protected from, and are resilient to, threats to health that result from a host of disasters and emergencies. Given that the impact of all disasters is felt locally first and foremost, local health departments have and will continue to play a critical part of every community’s first response to disasters in an emergency and in the long-term recovery efforts. Local health departments regularly host trainings and exercises to prepare their own staff and healthcare partners for public health emergencies, to build consistent and ongoing communication between partners, clearly define response roles, and anticipate challenges before an emergency occurs. And when disasters strike, local health departments are the “boots on the ground” responding to and helping communities recover.

Much of the discussion around BioWatch is focused on the science of biodetection. **I agree there is a “science” to public health decision-making, but I also strongly maintain there is also an “art” to public health decision-making.** Public health decision-making is still based on the experiences of the individuals and the agencies that are part of the process and performed in the contextual framework of a summation of available information. It is what we as clinicians and public health practitioners do all the time, which is really taking the situational contexts, the individual nuances, and making that part of our decision-making process. BioWatch and the next iteration, BioDetection 21 (BD21), should be considered simply as tools – one of many tools that are available to public health decision-makers and needs to be kept in the context of that paradigm. The sum of all those tools is really how we go about making sound public health decisions.

As mentioned earlier, our community had the nation’s first BioWatch Actionable Result (BAR) for tularemia in 2003. Our community has seen multiple subsequent tularemia detections where HCPH has been notified by our Houston Health Department partners who operate our region’s Centers for Disease Control & Prevention (CDC) BioWatch Laboratory of a BAR. This has required considering those detection data, along with information from disease surveillance and contextual intelligence. Disease surveillance includes examining zoonotic patterns reported by local veterinary clinics and the state zoonosis surveillance system as well as data on human disease patterns that may have been reported by area hospitals or other health departments to our epidemiologists, or *disease detectives*. Contextual information includes details about environmental patterns and unusual security threats or security patterns.

While this decision-making process is occurring, response partners begin mobilizing its crisis risk communication resources and makes sure that its operational support functions are ready. Local public health officials also take a number of other factors into consideration including community concerns as well as political and economic ramifications for actions such as canceling large-scale community events when making decisions on how to respond to a BAR. Fiscal constraints in particular have a real impact on the value proposition of biodetection today. For example, investment in the technologies that enable programs such as BioWatch may compete with more broad-based public health investments and capacity-building. This could mean decreased investments in other technologies such as syndromic surveillance and automated disease reporting systems, not to mention decreased staffing for surveillance and response as well as other important preparedness-related activities. These diminished response capabilities in turn make the decision on how to respond to a BAR even more art than science.

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It should be pointed out that a laboratory positive is not the same as a public health positive, and the issue of false-positives is likely to be a bigger issue with new autonomous detection systems with more cycles, more tests, and more results on an almost continual basis. A biodetector that has the capability to signal automatically a BAR or act as if it has somehow “confirmed” that very result without any human input or additional context (so-called red light/green light) may be appealing from a technology perspective, but from the public health perspective such a feature would take away the ability to engage in nuanced decision-making. It is important to remember that the integrity of public health is critically important. How does the public view decision-makers if we do launch or do not launch a response based on incorrect or incomplete information? What are the ramifications to a community if decision-makers cancel events or move forward with them based on inaccurate sensor data systems alone? Our understanding of what a BAR means locally has even changed over time. Let me provide a clinical example to drive home this point.

As a clinician, if I had a female patient who walked through the clinic door and I said to her, “Ma’am, we have unfortunately found a spot on your mammogram, and without any additional testing, I am going to send you immediately for a total mastectomy (i.e., removal of the entire breast), based on that abnormal spot,” immediately, my days as a physician would be numbered. That is the challenge here. What we are really trying to do is take that spot on a mammogram, figure out what other diagnostic and contextual information we need to put to the puzzle, and then figure out what to do with that information. In the IOM Workshop I referenced, one of my colleagues, Dr. David Persse said, *“Two of the strengths that public health agencies bring to the table are their versatility and their ability to make decisions even when sufficient information is not available.”* Dr. Persse is an emergency medicine physician and the City of Houston’s Public Health Authority, who serves as our local BioWatch Advisory Committee (BAC) chair.

Ultimately the decision of how to respond to the release of a biological weapon must be a shared one but it must involve local decision-makers front and center. Our communities, our residents, expect local governance and local decision-making, which implies both a need for transparency and a need for local public health officials to help in managing the data from a networked system. Local Health Authorities (LHAs) are responsible for the lives of the people entrusted to them within their jurisdictions. Local (and state) officials must be given more input and information from federal partners during the planning phase as well as the response phase as future programs are deployed. Any new technology must make public health more effective and not make it more difficult for these officials to make necessary decisions when time is of the essence.

Cooperation and Information Sharing will All Partners

From the beginning of BioWatch and the inception of a national response system after the 9/11 terrorist attacks, a priority has been placed on the need to form partnerships and acknowledge the role of local responders and to share information with all partners. This has been an important and accepted tenet within the program. Anything less than this is unacceptable, and we must continue this cooperation and information sharing.

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In 2012, President Obama released the National Strategy for Biosurveillance. He said at that time that this strategy “...calls for a coordinated approach that brings together Federal, State, local, and tribal governments; the private sector; nongovernmental organizations; and international partners. There exists a strong foundation of capacity arrayed in a tiered architecture of Federal, State, local, tribal, territorial, and private capabilities. We can strengthen the approach with focused attention on a few core functions and an increased integration of effort across the Nation. In these fiscally challenging times, we seek to leverage distributed capabilities and to add value to independent, individual efforts to protect the health and safety of the Nation through an effective national biosurveillance enterprise. (https://obamawhitehouse.archives.gov/sites/default/files/National_Strategy_for_Biosurveillance_July_2012.pdf)

I have spoken in front of Congress previously about the invisibility crisis of public health. I refer to this in the age of social media as the so-called “hashtag Invisibility Crisis” (*#InvisibilityCrisis*). Why? Well, despite the significant impact to a community’s overall health and well-being, public health is largely invisible, under-appreciated, and as a result underfunded. This is further exacerbated when public health agencies are confused for healthcare. Most people operate in their daily lives without noticing that public health is there working to prevent diseases and address other concerns. Though the news may cover a measles outbreak, few tell the countless stories of public health responders who work to ensure the most vulnerable are vaccinated. Just this year as our department confirmed a few cases of measles in our community, each identified case meant that our epidemiologists had to contact 100 persons for each case to ensure the protection of our community. The prevention of countless outbreaks seldom makes the headline. Public health is there day and night ensuring the health, well-being, and safety of the community. I say often that public health is like the “offensive line” of a football team – rarely recognized for the success of the football team but absolutely critical nonetheless.

Whether intentional or not, one of the most important areas where public health is largely invisible to the public and other partners is in emergency preparedness and response. Everyone sees and knows the other first responders, such as police, fire, EMS, and even the National Guard, but many are unaware of public health’s role in emergency response. All public health staff are trained and are a part of the National Incident Management System (NIMS) developed by the Federal Emergency Management Association (FEMA) to respond and prepare for large and small-scale disasters across the country. Local public health would respond and distribute antibiotics, vaccines, chemical antidotes, antitoxins, and other critical medical supplies from the Strategic National Stockpile (SNS) as the final interface between government and its community members.

This “Invisibility Crisis” problem has unfortunately led to funding cuts for public health and public health preparedness at every level of government at a time where our services are needed more than ever as we face incredible challenges in our public health sector for ensure the health, security and well-being of our communities from a variety of emergencies. These funding cuts impact preparedness and our ability to respond to a public health disaster. We know another hurricane, wildfire, mass-shooting, disease outbreak, or even another terrorist attack may happen, yet preparedness and resiliency for our communities is still just not at adequate levels to protect us. We need a national response strategy that does not react to the latest disaster but one that is pro-active to build and maintain that necessary capacity on an ongoing basis. All emergency events, including infectious disease emergencies, are

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ultimately local. An effective response that prevents illness and saves lives demands immediate attention. Local health departments, local healthcare providers, local emergency responders and local government all work together to make this an every-day reality and are in the best position to exact immediate action for small and large scale events. They must be trusted partners for our federal and state agencies and decision-makers.

Local public health departments deal with infectious diseases daily – our staff of epidemiologists and other key personnel are on-call, 24 hours a day, 7 days a week, diligently monitoring disease patterns and looking for irregularities. In fact, the only way to recognize the unusual is to understand the normal. On a daily basis, public health staff members work with healthcare providers to conduct disease surveillance activities. We communicate disease patterns and specific actions that are critical for disease investigation and disease control to the community. From an epidemiologist’s point of view, you take away the name of the disease, and the response is the same – early detection of cases, contact investigation and control measures are all essential. They save lives. At our department, we have built capacity keeping the “One Health” approach in mind as we know that the intersection of the environment impacts all those who live in that environment, whether humans, animals, or even insects. This is vital as many of the agents of bioterrorism and nearly 75% of the newly emerging infectious disease agents are zoonotic (animal-related) in nature.

(http://www.onehealthinitiative.com/publications/One%20Health_ASMPoster.pdf)

I applaud Congress and President Trump for passing and signing the Pandemic and All-Hazards Preparedness and Advancing Innovation Act (PAHPAI) earlier this year. PAHPAI reauthorizes the Public Health Emergency Preparedness (PHEP) grant program and the Hospital Preparedness Program (HPP) to keep our emergency preparedness infrastructure strong; strengthens the National Health Security Strategy, including global health security; and authorizes the Public Health Emergency Medical Countermeasure Enterprise, with a role for input from stakeholders, including local health departments. These measures must not just be milestones in time but lead to foundations of ongoing capacity-building that should be maintained and strengthened over time.

Cooperative Partnerships

As recently as 2017, national biodefense policy continued to emphasize cooperation between federal, state, local, and territorial partners. Section 1086 of the National Defense Authorization Act for Fiscal Year 2017 (<https://www.congress.gov/114/plaws/publ328/PLAW-114publ328.pdf>) directs the Department of Defense (DOD), the Department of Health and Human Services (HHS), the Department of Homeland Security (DHS), and the Department of Agriculture (DOA) to develop a strategy for the United States response to biological threats. The *National Biodefense Strategy* (<https://www.whitehouse.gov/wp-content/uploads/2018/09/National-Biodefense-Strategy.pdf>) was released on September 18, 2018. The strategy lays out a clear pathway and set of objectives to counter threats effectively from naturally occurring, accidental, and deliberate biological events. It is broader than a federal government strategy. It is a call to action for state, local, territorial, and tribal (SLTT) entities, other governments, practitioners, physicians, scientists, educators, and industry.

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Moving the responsibility of biodetection and the authority previously within the U.S. Department of Homeland Security (DHS) Office of Health Affairs to the Countering Weapons of Mass Destruction Office is potentially concerning as it is a significant change from the U.S. history of biodetection in the aftermath of the 9/11 attacks. The Director of the HCPH Office of Public Health Preparedness and Response (OPHPR), Mr. Michael W. “Mac” McClendon – who is with me here today and I might add along with the rest of our dedicated HCPH staff members has served admirably to protect our community from a variety of threats over the years – serves on a DHS Countering Weapons of Mass Destruction (CWMD) BioDetection 21 (BD21) workgroup.

Earlier this year, locals were briefed on BD21 in Indianapolis at a closed workshop. I cannot say too much about this meeting except that we hope the concerns of locals have been heard and that appropriate steps to address these concerns including the importance of true partnership and the sharing of information bidirectionally is not forgotten. We know that problems with BD 21 continue to appear in the press. (<https://www.latimes.com/politics/story/2019-08-08/bipartisan-lawmakers-seek-probe-of-controversial-bio-weapons-defense-system>). The technology is not proven or vetted as of yet and has not been fully shared with local public health partners. It is hard for us to say more from a local level since we do not have additional information to base any such comments on. As per what we have read though, it appears there are concerns that an environmentally-based detection system could still have trouble with small pathogen releases in real-time, underground or indoor releases, and may not detect previously unknown organisms such as naturally occurring mutant viral strains of genetically engineered bacteria. Ongoing epidemiologic and zoonotic surveillance systems which rely on collective diagnoses, monitoring of the health and agriculture sectors looking for aberrant disease patterns, will always be needed for natural pathogens but have a role in detecting a terroristic attack as well.

Conclusion

Thank you for allowing me to testify today on this very important topic. I want to restate three main points:

1. We all agree that emergencies occur repeatedly, unexpectedly, and we must ensure that our communities are prepared for what lurks behind the next corner. BioWatch and the next generation of biodetection are important tools in the toolbox for decision-making but are not the only tools. Yet these tools must be effective which means they must be science-based and must equally evolve as the science and threats evolve. We must continue to involve all federal, state, local, and even global partners. Even the DHS Countering Weapons of Mass Destruction Office acknowledges that the current BioWatch Program “involves a large network of stakeholders from public health, emergency management, law enforcement, laboratory, scientific, and environmental health organizations around the country who collaborate to detect and prepare a coordinated response to a bioterrorism attack.” (<https://www.dhs.gov/biowatch-program>)
2. Public health at all levels of government is vital – indeed we say that public health truly matters! Public health must be invested in and capacity built because it is absolutely critical to protecting our communities even when it is largely invisible or forgotten (the so-called “Invisibility Crisis”). Public health is equally a crucial sector that must be well-equipped and

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- trained to prevent, protect against, mitigate, respond to, and recover from all incidents whether small or catastrophic. Public health emergency preparedness is national health security. Local health departments and local health authorities should be notified and allowed to verify independently a suspected sample and use medical and veterinary surveillance and local intelligence of the community to help make the call on the threat.
3. There is a science and an art to public health and we must have access and availability to as much information as possible especially during a biological attack to make appropriate, difficult, nuanced decisions on behalf of our community so sharing of that information is critical. Beyond a certain point, during a biological catastrophe, everything will depend on sound public health decision-making. Leaders will then have to do the best they can with the resources they have at their disposal to ensure the very health, safety, and security of the communities for whom they are responsible. (<https://biodefensecommission.org/wp-content/uploads/2019/07/Holding-the-Line-on-Biodefense.pdf>)

On behalf of Harris County Public Health, and the nearly 3,000 local health departments across the country, I appreciate again the opportunity to testify today. We join you in strengthening a public health system that protects our economic vitality and national security. Thank you for all you do in building safe, healthy, and protected communities where we live, learn, work, worship, and play, across this great nation of ours.

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