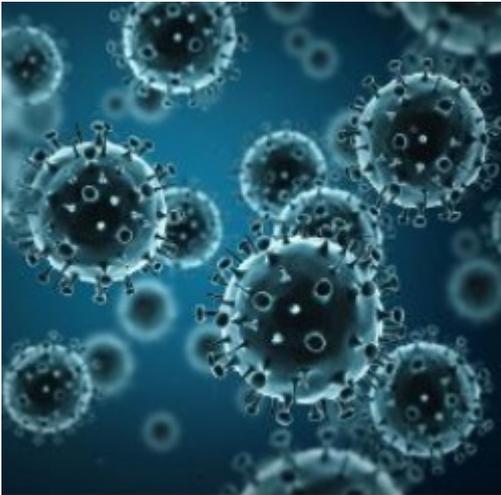


Biological Threats Against Americans: Where Are We Now?



By Yesmar Oyarzun — July 5, 2018



The Pandemic and All Hazards Preparedness Act (PAHPA) exists “to improve the Nation’s public health and medical preparedness and response capabilities for emergencies, whether deliberate, accidental, or natural” and I have been attending hearings on the bipartisan effort to re-authorize an appropriation toward responding to biological attacks, pandemics, and emerging infectious disease outbreaks.

When it comes to biological agents, lots of hyperbole takes place, so here’s a review of what these hearings got right and wrong about biological threats.

The Next Plague: Flu?

Throughout the proceedings there has been a large focus on the flu. When asked to name the most imminent threat to public health, the witnesses that responded with particular biological agents both named influenza, or the flu.

As discussed in our free book [The \[1\] Next Plague and How Science Will Stop It \[1\]](#), the flu is the most likely candidate for a global pandemic. The flu virus is not only easily spread, but also rapidly and constantly mutating.

To combat a potential flu crisis Dr. Anthony Fauci, head of the National Institutes of Allergy and Infectious Diseases (NIAID), suggests we continue efforts on developing a universal flu vaccine.

There is currently one in phase 2 trials, but even if it survives phase 3, it will be hard to guess a government timeline for approval. If data and venture capitalists align, we could be 5 years out from a ready vaccine. Getting universal vaccine *coverage* on the other hand...good luck with that.

Antibiotic Resistance

One of the more well-known changes in disease has been bacterial resistance to antibiotics, which witnesses from the National Institutes of Allergy and Infectious Disease (NIAID), Food and Drug Administration (FDA), Centers for Disease Control and Prevention (CDC), and the Office of the Assistant Secretary for Preparedness and Response (ASPR), as well as congressional



Antibiotics Protesting Overuse

committees discussed at length. Some of the measures these

agencies are using or encouraging their partners to use include:

1. “Antibiotic stewardship” in hospitals

This involves getting hospitals to track antibiotic prescriptions, usually by prescriber, to get doctors to prescribe less unnecessary antibiotics. According to Dr. Schuchat of the CDC, this approach has worked, but we know that education ? behavior change.

We’re also particularly interested in how other healthcare settings, like urgent cares, are prescribing antibiotics. This was something that was not brought up in the hearings. And we shouldn’t just be tracking doctors. Prescribers of all sorts should be wary of their antibiotic prescribing habits.

2. Improving detection of bacterial infections and identifying resistant strains

This is the first step to in preventing the spread of bacterial infections.

3. Immunotherapy

Immunotherapy against bacterial infections has been discussed as a “non-traditional” method for curing bacterial infections, but it’s been around for a long time. It may even stem back to before antibiotics. While it’s not a “novel” approach to fighting bacterial disease, it is more of a novel idea to use it to combat antibiotic resistant bacteria.

However traditional or non-traditional immunotherapy is, it’s not gaining significant traction, and that’s probably fine. Diversifying our methods could help with a stronger overall defense against antibiotic resistance. That said, other curative and preventive measures show much more promise for fighting against bacterial agents.

4.

Bacteriophages

Bacteriophages are viruses that are used to fight off bacteria. In hearings, this was discussed more seriously as a potential solution to the resistance problem. [While this is a promising therapeutic technique](#) [2], it is also not new and predates antibiotics by at least 10 years. In other places, the use of bacteriophages gained much more traction than in the United States because of our adoption of antibiotics instead. It'll be interesting to continue monitoring developments in this area.

5. Development of new antibiotics

Of course this is one way to combat antibiotic resistance, but to do it, antibiotic creation must be more attractive for drug developers. According to ASPR, partnerships with drugmakers have led to and may continue to lead to development of new lines of defense against bacterial disease.

6. Vaccines

Duh! Although most vaccines are against viral vectors, some like the BCG vaccine, are for bacterial illnesses like tuberculosis. Vaccines can help prevent the spread of bacterial diseases, lowering the chances for antibiotic exposure and subsequent development of resistant strains.

The Worst Bioterrorist

Obviously, a huge topic covered in the hearings was bioterrorism. Bioterrorism is a scary word, but should it be a major concern?

Well, we should always be prepared and that was a point covered in these meetings. For biological terroristic threats, the main goals were science- and technology-based. While people often worry about Category A pathogens like anthrax and smallpox, Senator Walden from Oregon reminded us that the most widespread biological attack in the United States was from Salmonella. This attack by the Rajneeshees infected well over 600 people in Oregon through food contamination.

To respond to biological attacks, government agencies want to continue working on creating vaccines, improving detection systems, and producing drugs that work against pathogens of concern.

While we must remain prepared for a biological attack, the reality is that preparedness must look beyond intentional threats. As Dr. Fauci of the NIAID stated, "The worst bioterrorist may be nature itself." That means we need to focus more on the rapid and unpredictable mutation of "natural" pathogens.



Other Vaccines on the Horizon?

The hearings also covered what progress we've made on some other vaccines as part of the US's all hazards response.

Beside the potential flu vaccine, two vaccines discussed were for Zika and Ebola. On the one hand, concern about these two disease make sense because they are viruses and therefore subject to rapid mutation like the flu virus. On the other hand, there are plenty of infectious diseases that did not get the same media attention as Zika and Ebola. Some diseases, like malaria for instance, are more likely to cross US borders and already affect more people globally.

Diseases that cause birth defects and are yet to be fully understood like Zika and hemorrhagic fevers like Ebola are scary and need attention. But in terms of absolute threat to global and US public health, other factors deserve attention as well. For example, diseases we've dealt with in the past, like TB, can make a comeback if we don't respond appropriately to changes in disease.

COPYRIGHT © 1978-2016 BY THE AMERICAN COUNCIL ON SCIENCE AND HEALTH

Source URL: <https://www.acsh.org/news/2018/07/05/biological-threats-against-americans-where-are-we-now-13157>

Links

[1] <https://www.acsh.org/news/2018/05/07/next-plague-and-how-science-will-stop-it-12929>

[2] <https://www.acsh.org/news/2018/06/28/phages-may-be-answer-antibiotic-apocalypse-13128>