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6 ways countries can prepare for the next infectious disease pandemic

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Image: REUTERS/Kenny Katombe

When Johns Hopkins researchers ran a simulation of the next disease outbreak, the results were darkly informative.

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All pandemics start as a small outbreak somewhere. When the next potential pandemic begins, will we detect it early? Will we recognize its pandemic potential? Will we have the means to prevent a limited outbreak from becoming a pandemic? The answer to these questions is theoretically yes, but practically probably not - at least, not now.

How will political leaders across the globe deal with the complex policy issues that come with an evolving severe pandemic?

My colleagues and I at the Johns Hopkins Center for Health Security recently explored these challenging questions in [Clade X](#), a day-long tabletop exercise. It was designed to simulate a series of US National Security Council meetings responding to an evolving pandemic.

The participants consisted of eight former senior US government officials and a current member of Congress, with our staff playing the roles of experts and facilitators. It was conducted in Washington, DC, in front of a live audience of 150 government officials, academics and policy experts. It was streamed live on the internet, the first time to our knowledge that such an exercise has been made open to the public as it happened.

How Clade X worked

The scenario started with limited outbreaks in Frankfurt and Caracas of a novel respiratory virus with pandemic potential, and for which there were no effective vaccines or drugs. The scenario was built on an epidemiological model that was informed by data from the [SARS epidemic](#) in 2003 and [H1N1 influenza pandemic](#) in 2009. The fictional Clade X virus had the lethality of SARS and was about as contagious as flu, but spread more slowly.

How should the US respond to this outbreak overseas? Should it ban travel from those cities? Should it send aid? What aid is available to send? What would other countries do? How would geopolitics affect such a decision? These were the first issues the players had to consider. Many of these questions were based on events that happened in the 2014 West African [Ebola epidemic](#). Throughout the course of the exercise, the participants were faced with difficult issues that were all drawn from actual recent events.

As the disease spread, slowly at first but growing exponentially, it became clear that the virus was not naturally occurring and that an extremist group had intentionally released it. How would this change the response? Could international transport of a dangerous pathogen on airlines be detected or prevented? How would the international community find the perpetrators? At the same time, the first US cases occurred in a small college town. Should the college be quarantined? How would a quarantine be enforced? Does mass quarantine even work?

Death rates began to rise ...

With the pandemic picking up speed inexorably, healthcare workers became infected, hospitals were overwhelmed, and death rates began to rise. It affected commerce and the global economy. It also affected international policy. With hospitals failing in hard-hit countries and very limited capacity to transport those who become critically ill, should the US pre-emptively pull back its troops and diplomats from affected countries?

Eventually, as a vaccine was being developed, the participants had to decide how to use limited supplies of the vaccine. Should priority be given to essential personnel or those most likely to die from the disease? If the decision is to give preference to essential personnel, who is "essential"? Where do you draw the line? And how do you communicate this to those not given priority?

A tragic outcome

Over six hours, the participants - all very experienced and knowledgeable policy-makers - wrestled with these questions and others. There were no easy answers. In the end, the outcome was tragic: the most catastrophic pandemic in history with hundreds of millions of deaths, economic collapse and societal upheaval.

The catastrophic outcome was not a result of bad choices by the players. Rather, it reflects the fact that we as a global community have not made the necessary long-term investments in the capabilities needed to respond to such an outbreak. There are potential solutions to this low-probability-but-high-consequence threat, but they require substantial, sustained political will.

6 ways to change the future

At the end of the exercise we proposed [six long-term policy goals](#), that if enacted could prevent, or at least mitigate, the outcome of a pandemic similar in scale to Clade X:

1. Develop the capability to produce new vaccines, drugs and rapid diagnostics for novel pathogens within months, not years.
2. Pioneer a strong and sustainable global health security system. Build a deployable clinical capability for international infectious disease emergencies.
3. Invest more in a robust, highly capable national public health system that can manage the challenges of pandemic response.
4. Develop a national plan to harness effectively all US healthcare assets in a catastrophic pandemic.
5. Implement an international strategy for addressing research that increases pandemic risks.
6. Ensure the national security community is well prepared to prevent, detect and respond to infectious-disease emergencies.