



The Nation's Health Podcast transcript

S26, EP4 The next outbreak is coming. America may be less prepared than you think

COLIN CARLSON: The fear that so many of us have is that we will get to the next public health emergency in the U.S. and choose not to use any of the preparation. We'll just choose to fly blind.

SOPHIA MEADOR: *From the American Public Health Association, I'm Sophia Meador, and this is The Nation's Health Podcast.*

It's already shaping up to be a busy summer for infectious disease experts. Public health professionals are tracking a range of concerns, from recent hantavirus cases to an ongoing Ebola outbreak in the Democratic Republic of Congo, all while global travel ramps up, including visitors heading to the U.S. for the FIFA World Cup.

Taken together, these factors are raising urgent questions about what today's outbreaks could signal for tomorrow and what might spark the next global pandemic.

On today's episode, we're talking with two public health experts about where the next pandemic could emerge and how prepared the U.S. is to respond.

Joining us now is Jay Butler, dean of the College of Health at the University of Alaska-Anchorage. Dean Butler, when you look beyond current headlines, what regions of the world are at greatest risk for infectious disease threats that could spark the next pandemic?

JAY BUTLER: Well, first of all, thank you for the opportunity to speak with you today. And what a great question to sort of frame all of our discussion going forward here.

So, when I think about the factors that drive disease emergence and outbreaks — that's the framework that I think we have to look at in terms of how do we prepare and respond, and I really like the "one health" approach, because it acknowledges the three factors that drive disease emergence and spread: people, animals and the environment.

Kind of like in real estate, it comes down to location, location, location and who's in the neighborhood. So that includes then the density of the population that supports person-to-

person spread and their proximity to animals, as well as arthropod vectors. And then the environmental conditions, which are not static due to seasonal changes or even due to more difficult-to-predict factors, like climate change or extreme weather events that can drive disease emergence, both new pathogens as well as ones that were previously unrecognized.

Now, looking at all these variables, many public health academicians, much more sophisticated than I am in their analytic abilities, have looked at that, and almost all of the models then begin to point to areas like Southeast Asia or parts of Africa, where you have large populations, oftentimes densely packed into megacities. And you also have frequent interactions with animal reservoirs, as well as the potential for exposure to arthropod vectors.

When you're talking about that one health framework, one component of that is environmental health. I noticed some of the regions that you spoke about are warmer climates.

So, I'm curious, how do you think climate change and extreme weather will change the way viruses spread or mutate?

Yeah, that's something we think about a lot, really, all over the world. I'm speaking to you today from Anchorage, Alaska. So, we're 61 degrees of latitude. We don't have some of those other factors as much in terms of the dense population, but the Arctic is the area of the world that has been most directly and drastically impacted by climate change. Now, that will change as time goes on, because as the Arctic thaws and particularly the land-based ice shelf in Greenland begins to melt, we'll begin to see ocean levels rise and more flooding in low-level areas all around the world.

The warming of the environment oftentimes will change the ranges of animals that may serve as reservoirs, as well as the range of arthropod vectors that carry human pathogens. This can also cause problems in areas that are very remote. Type of risk is going to differ in different parts of the world.

I think we also have to talk about the social determinants of health and what role conflicts and poverty play in the risk for infectious diseases. The outbreak of malaria that occurred in Florida a couple of years ago, the people who are at highest risk were people experiencing homelessness, and it kind of makes sense because they were outdoors oftentimes without access to basic housing, no window screens when you're sleeping outside, and so they had much higher risk of exposure to malaria-carrying mosquitoes.

Conflicts, of course, compromise every part of infrastructure...access to clean water, pure foods, also can compromise the infrastructure for health care as well as public health. And we see that right now happening in eastern Democratic Republic of Congo, facilitating the current outbreak of Ebola.

Sure, and talking more about social determinants of health and people that are at greater risk. Looking back at COVID-19 and how the pandemic unfolded across the U.S., we know certain populations were disproportionately affected, and while public health measures touched everyone's life, the burden of the pandemic fell more heavily on some groups than others.

So, as public health officials prepare for future outbreaks, what lessons did COVID-19 teach us about who is most vulnerable during a large-scale infectious disease event and which populations tend to be hit the hardest and what factors put them at greater risk?

Yeah, what a great question. I think that's a part of the lookbacks at COVID-19 that really deserve emphasis. First of all, the special populations at risk — some of the earliest calls that we received when I was at the CDC about outbreaks of COVID-19 were from homeless shelters and from prisons and jails, obviously situations where people are in close contact with one another and they may have limited agency or resources to be able to take advantage of the various recommendations that were available to us at that point in the pandemic.

So the second area that really became apparent as the pandemic progressed was that not everybody could shelter in place. It was very easy for some of us — although I was going into the office every day, I had a very small bubble of people that I was exposed to, and many people were able to just be with their families and work from home.

But the people that we bought our food from, people who provided many services, oftentimes in lower-paying jobs, had less ability to be able to do those services remotely. And being able to get the types of resources that were needed prior to the availability of vaccines into their hands could be a challenge.

And even when that was possible and that employers were able to get masks and hand hygiene products to the employees, oftentimes that employee was then going home to a household that might have six, seven, eight people, and it might be much more difficult to control the number of people that they were exposed to, that may actually have been infected with SARS-CoV-2.

Another workforce that also had to stay in person during the COVID-19 pandemic was the health care workforce, and following the height of the COVID-19 pandemic, we saw a significant number of health care and public health care workers leave the workforce, placing added strain on an already-stretched system.

So now those challenges are being compounded by cuts to the public health infrastructure, including layoffs across health agencies, as well as tighter immigration policies that could further reduce the healthcare workforce.

Given those pressures, how concerned are you about the nation's ability to respond to the next major infectious disease outbreak? And what do workforce shortages pose for preparedness and response efforts moving forward?

If I could use the analogy — it's kind of like deferred maintenance on a building. That's a common budget-cutting measure in government, and at first maybe you can address the failing roof with some well-placed buckets, but as time passes, the structure itself becomes compromised, and then when an earthquake or tornado strikes, the failure could be catastrophic.

Likewise, as we lose the public health workforce, including infrastructure for laboratory support of that workforce, the impact may not be felt when it's sunny and 70. But when the next outbreak or pandemic hits, the impact will be much greater due to that neglect, and in the current environment in the U.S., I think the intentional damage is something that we're all going to regret down the road.

And if another pandemic were to happen right now, it would come at a time when trust in public health and federal agencies is at an all-time low. In fact, a KFF poll from January found less than half of the public is confident in the government's health agencies to make health decisions based on science.

So, how concerned are you about distrust in public health beyond just federal agencies? And how could that undermine prevention and response efforts to the next infectious disease outbreak?

Well, as a public health professional, I want people to have access to good information, and I don't want to take anything away from our public health officials who are continuing to do the best job they can under very trying circumstances.

But I never felt we would come to a day where I would have to advise people, in all honesty, take what you read on a .Gov website with a grain of salt, encouraging people to look at Health Canada or some of the European health agency recommendations because there's

an inject of politics, it seems like, into much of what's being promoted in the U.S. right now, and that the science has been compromised by political ideology.

And this highlights another social determinant of health that we haven't really discussed yet — and that's the role that misinformation, even disinformation, play in compromising our ability to respond and which also compromises trust in public health officials...and often that's done for political means.

I mean, fear, anger are powerful motivators to political ends, but oftentimes are the enemy of a healthy lifestyle.

And personally, Dean Butler, how confident are you in this current administration to make good health recommendations in the next pandemic, given their responses to hantavirus and Ebola?

I think the challenge is going to be people won't know who to believe.

During COVID, certainly, some of the messages from the CDC were silenced. Other messages came in, and that led to much more confusion among members of the public.

I really worry about how the messaging would roll out if we continue to see...say spread of Ebola, or even more concerning, if we saw some type of respiratory-spread pathogens, such as influenza, move into a pandemic-type situation.

Finally, let's talk about how funding cuts will have an effect on this all.

So, the Trump administration has dismantled USAID, who played a crucial role in global disease control and response efforts. They also terminated the Centers for Research in Emerging Infectious Diseases, along with other departments, and the U.S. withdrew from the World Health Organization.

So, how do you think the absence of the U.S. will increase the risk and severity of the next pandemic?

Well, let's start with an example that's playing out right now — not a pandemic, certainly — but with the Ebola outbreak that's occurring right now.

Looking at earlier Ebola outbreaks, one of the critical players was USAID because they have staff boots on the ground that know the local environment. They also can assist with the logistics so that the public health responders, both domestic and international, can arrive and really respond with their expertise and not spend most of the time trying to figure out how to keep from getting shot or how to move things to where they need them to be, and as well as moving people to where they need to be.

And I think sort of looking at the bigger question about WHO, we have to remember preparedness as a team sport.

In the past, the U.S. has been a star player, maybe even a player-coach, and I take the analogy a little too far. We've been a leadership role in global health, but we've abdicated that role, and I'm thankful that only Argentina has followed the U.S. in withdrawing from the WHO.

I want to be clear, I don't think any of us are going to say that WHO is a perfect organization. But I do believe that Americans are better off and safer because the vast majority of nations have continued to participate in the multinational collaboration that is facilitated by WHO.

And as the U.S. becomes increasingly isolated from other countries on a range of public health and policy issues. How concerned are you about America's ability to respond collaboratively to the next global pandemic? Do you think the U.S. risks being more on its own during a future international health crisis?

I think even identifying emerging health threats outside of the U.S. is going to be difficult because without that relationship, getting information, sharing of information, may occur much more slowly.

It's an old saw that, I think, in public health we learn from our law enforcement colleagues: During an emergency or an attack, that's a terrible time to start exchanging business cards.

I think as we have withdrawn from multinational agreements, that has really compromised our ability to have that relationship. Health diplomacy really comes down to knowing who the players are and developing that degree of trust. We spend a lot of time discussing trust in the relationship with the public, but trust between governments is also critical to global health and responding to emerging infectious threats that can cross borders, oftentimes very easily.

Dean Butler outlined how misinformation, declining trust in public health, and the U.S. withdrawal from global health initiatives could worsen the impact of the next pandemic.

But another growing concern is what research cuts could mean for the public health workforce and for the nation's ability to prepare for future outbreaks.

Our next guest has seen these challenges up close. Dr. Colin Carlson is an associate professor at the Yale School of Public Health and the co-founder and executive director of Verena.

Dr. Carlson, it's great to have you with us. Your work with Verena has been at the forefront of pandemic forecasting. To start, can you walk us through what pandemic forecasting looks like in practice?

So, for the last few decades, everyone has wanted to find a way to predict and prevent the next pandemic and we all go around saying this to each other, but nobody actually ever sat down and decided what it meant to predict and I think that the test has to be that you can get it wrong. You have to be able to make a prediction that is specific enough and testable enough that you find out you were right, or you find out that you still have things to learn.

So we set out to figure out what those fundamental problems are that so we can make specific predictions about. We came up with really four: We want to know which viruses could cause the next pandemic, we want to know which animals host those viruses right now, we want to know where and when spillover will happen, and we want to know why it's going to happen.

And if we know those four things, then we can basically figure out how the next pandemic is going to start and how to prevent it.

And how could that kind of model help public health professionals respond to pandemics?

There's all sorts of ways, right? So the response side is very hard. Response is costly. We're talking about often trillions of dollars of economic damages on the response side, just from direct impacts to the economy.

Pandemic response itself can cost billions of dollars. So really, what we want to do is two things: we want to prevent the pandemics that we can, and we want first responders to be on the ground as early as possible. So that maybe we can contain some outbreaks before they become pandemics.

That means that we can use these models to look for surveillance gaps where outbreaks are going undetected, right? Think about this Bundibugyo outbreak — we have taken weeks to find it before there were hundreds of cases. Imagine if we could have gotten in there two weeks earlier.

We also want to be able to figure out where viruses come from a lot faster. We still don't really know where a lot of Ebola viruses come from. We don't know which animals host them, and that means that we don't actually really know where those outbreaks can happen.

If you go to the Wikipedia page for Bundibugyo, you'll see that part of the definition of that species is that it's a virus from Uganda. But we don't know that it's not in other African countries, because we don't know where it's circulating 99% of the time.

So being able to target surveillance of wildlife, being able to target surveillance at those high-risk interfaces, like wildlife markets or farms — all of that means that we can get in there a little bit earlier and try to prevent as much as we can and save money and save lives.

And Dr. Carlson, can you share what the current status is of Verena?

Yeah, so we've been shut down for about six months. It is...it is still tough to talk about, honestly. We are the victim of something that has sort of affected all of science in the U.S.

We never actually even got terminated, they just didn't pay us and then they just kept not paying us...and now 10 months in, we've run out of funds. That is a huge bummer.

Being able to run an NSF (National Science Foundation) center that did pandemic prevention work coming off the heels of COVID was really important. We had this brief window where people understood the importance of the work and we could get a lot done. But now we are, you know we're losing all of the people who are employed on the project...we're losing trainees to industry, all of the data that we've collected is going to get lost, all of the samples are stuck in freezers.

It's just...it's a dead end and it's right in the middle of the project.

And you were federally funded, is that correct?

Yeah, so Verena was an NSF center.

How do you see research cuts potentially disrupting the public health pipeline?

I think it's just a mess at every level and it's so much deeper than just research. I don't think we're fully communicating it to the public yet. Everyone thinks, oh, it's cancer research being stopped in clinical trials or it's USAID isn't able to give out medication — and those things are true and those things are killing people and they're undermining the mission of public health.

There's also just a much more systemic thing happening, where at every level the education and training pipeline is being undermined by this. You know we are losing students at every level, from, MPH students up to postdocs to other fields to industry.

We're not able to focus on training as much. We don't have the resources to support trainees and it just means that at every level people are missing opportunities. There's going to be fewer people who are trained and they're going to have fewer experiences.

And one thing that we know is that experience matters a lot in public health. You can't... you can't learn it all from books. You got to be able to make split-second decisions and you got to be familiar with the history and all of that is part of a training pipeline that has been being built for 100 years.

And so it's just... it's heartbreaking to see students who want to pursue a career in public health and just don't even know how to do the work anymore. My heart goes out to people who are trying to find a way to keep sort of climbing the ladder as it's being pulled up.

And so...I just...I think we're going to have this lost generation in public health and it's just terrifying to think about.

And it sounds like, based off what you said, this is all putting us further behind in pandemic prevention as we're really losing the next generation of researchers.

100%. One thing that has taken a lot of center stage in the last few years is the idea of workforce. We talk about workforce as a basic public health capacity and often when we're talking about workforce, we're talking about other countries; we're saying, 'OK, are there enough clinicians, are there enough nurses, do we have veterinarians trained in One Health approaches?' Right, all of those are sort of part of the workforce conversation.

But workforce is also a fragile thing here and I don't think we've ever banked on the idea that America might not have a public health workforce for five or 10 or 15 years. If we have a pandemic, which we probably will in that time, we're just going to be completely suffocated. We'll feel it at every level.

Everyone has eyes on the federal government right now and we need leadership at federal levels. But also a lot of the people that we train go to state and local offices, right, and like a lot of the MPH students I work with end up in those positions where in the next pandemic they're going to be the people making sure people can get shots in arms and they're just not going to have that opportunity to be trained and there's not funding for those positions, and it's just, it's really scary to think about.

I also just think that a central theme in all of our work is that the pandemics are just going to keep coming and they're probably going to get closer and closer together. I think this, this old way of thinking of there are the pandemics and there's the time in between, right. There's peacetime and wartime. I don't think the rest of the century is going to look like that. I think it's 75 years of wartime, right.

We're going to have concurrent epidemics. It's going to look like hantavirus on a boat, going headfirst into what could become the largest Ebola outbreak in history — and all of that is going to take a level of workforce that we're just hemorrhaging.

And I think it's really hard to believe that after the height of COVID-19 that we're not better prepared for the next global pandemic. And from your perspective, are we worse off now than we were pre-COVID-19?

You know, I try to be an optimist and I think there are some things that we have to anchor ourselves to.

So, for example, the technological progress we've made on vaccine development, huge. We'll always have made it. Same thing goes for monoclonal antibodies, for therapeutics. I think we have scale-up of home diagnostics looks completely different than a decade ago.

So, all of those things will help in the next pandemic, but there are a lot of ways in which that won't necessarily matter if things look the way they do now. I think a very practical level on which we can think about this is if the federal government is not interested in responding to a pandemic, they're not going to let anyone bring vaccines to market, drugs to market, diagnostic tests to your CVS.

Right, all of those advances aren't going to mean anything if the FDA [Food and Drug Administration] is captured or if the CDC is captured. And I think these captured institutions have the potential to really just block any substantive response. And I mean, we've seen this in the first couple years of COVID. There was this sort of belief that the best thing to do was nothing and to leave public health to the individual level and as we all know, that doesn't work.

Public health is a collective endeavor, you can't individualize it in a meaningful way and so I think you know the question of whether we're prepared is a tricky one because we could be prepared tomorrow if we just chose to be. But I think the fear that so many of us have is that we will get to the next public health emergency in the U.S. and choose not to use any of the preparation. We'll just choose to fly blind.

Thanks to our guests for their time and expertise.

For more on infectious disease outbreaks, visit [who.int](https://www.who.int)