

Patrick Ryan:

*I'm Patrick Ryan and this is a special report focusing on the 2019 Novel coronavirus outbreak. I'll be discussing the outbreak and response efforts with two public health experts. Dr. Julie Gerberding is Executive Vice President and Chief Patient Officer at Merck. She's also the former director of the US CDC and led the United States' SARS response in 2003.*

*Phyllis Arthur is Vice President of Infectious Diseases and Diagnostics Policy for BIO, the world's largest trade association for biotech companies aiming to advance biotech innovation by promoting sound public policy and fostering local and global collaboration.*

*Phyllis, what are you watching for as we learn more about the coronavirus outbreak?*

Phyllis Arthur:

What I'm looking for actually is to see what happens now that we have an internationally declared emergency. So, WHO declared that this week and I think everybody was certainly working to do all the work they do to better understand the virus. And of course, companies are working with governments to start to create products to treat, diagnose, and hopefully prevent the disease. So, we'll see whether that declaration, it leads to other declarations by other countries and more partnerships and funding for industry to really help with the response.

Patrick Ryan:

*And [Dr. Gerberding], I'd love your perspective. You led the US CDC through the response to SARS. How do you see that comparing to this situation?*

Dr. Julie Gerberding:

As I'm looking at this from the outside in, I'm really interested in nailing down the parameters of transmission. And by that, I mean, [asking questions like] what is the incubation period? What is the period of infectivity? Are we sure that asymptomatic people can efficiently transmit or not? And then ultimately what does the epi curve look like? How do we see this shape of the outbreak moving over time and place?

Patrick Ryan:

*That's so interesting. So, from your experience, what does good preparedness look like?*

Dr. Julie Gerberding:

Well, I think of preparedness as a process, not as an outcome. And I think when you look back over the last 20 years or so in the US we have seen significant advances in certain elements of our preparedness. But each time we get one of these new outbreaks, we get tested in new and different ways. I think the

big challenge with this outbreak is how are we going to manage the international travel and how are we going to manage the supply chain in the movement of goods and resources. We're already seeing shortages of critical medical supplies in many hospitals around the world. Things like masks. I'm sure there'll be a run on other protective equipment as well, and we really haven't planned ahead for that kind of reality.

Phyllis Arthur:

I completely agree. I think the other thing is, this is one of the preparedness issues I think we're struggling with is how quickly can the government find out from industry all the different things in the armamentarium that can be brought to bear on a surprise novel virus.

And so, I think it's really important for the government to build systems that allow them to quickly reach out to industry, have a clear way that companies can say, *I'd like to test this molecule and see if it's effective against this virus. I'd like to, you know, I have a platform technology to bring to bear.* It's often very hard and very clunky as a process to engage the entire private sector in response. And you need to have those bridges all built and those systems in place before you're in the middle of the emergency.

Patrick Ryan:

*I'd love your perspective, [Dr. Gerberding]. You've talked about in the past your time at CDC, how to engage the private sector. Even mentioning that you had certain desks for certain companies. I'd love for you to take us behind the curtain at CDC right now.*

Dr. Julie Gerberding:

When you're planning for something as big as the global outbreak, you really have to recognize up front that it's not just a whole of government response, it's a whole of everyone response. And you need to have room to communicate directly with health systems, with people in the private sector, particularly those who are responsible for healthcare supply chains. But beyond that, the people who just keep ordinary people fed and housed and keep the lights on and the security systems operational. So, having desks and an operations center that can link into that kind of expertise, including the private sector is really critical in certain kinds of situations like this one where transportation is so important. I wouldn't be surprised if the transportation desks were occupied for this response. In situations involving medical goods, we need to have the medical suppliers linked in. They don't necessarily sit physically in an operation center, but they are certainly connected and contributing to the regularized situation reports.

Patrick Ryan:

*Great. So, we've talked about preparedness. Let's talk about the reaction to this particular situation too. I think it's been recognized that the reaction has come at pace this time. You've mentioned the genome being released really put us in a good position to react quickly. I love both of your perspectives on that.*

Dr. Julie Gerberding:

Well, let me just start by saying, yes. Compared to the situation with SARS in 2002, 2003, we do have earlier information about the virus and we know more about the patterns of transmission than we did then. Having said that, we haven't fully taken advantage of the incredible advances in science that have occurred since then. Probably one of our biggest opportunities is CEPI, the organization that's now funded through multilateral organizations and governments to build vaccines in advance of events and to complete their progression through at least clinical development. So they're in the freezer should one of these very difficult epidemics like Ebola or SARS or the new Coronavirus emerge. CEPI is also funding platforms that we'll get to some of the things Phyllis was talking about earlier in that we have a platform so that when the new coronavirus appears, we can sub in the antigens that are specific to the new agent in a backbone of molecules that we believe would be immunogenic. So, these are steps that have been started. They just aren't quite far enough along to be of a tremendous amount of use to us right now.

Phyllis Arthur:

I think though CEPI is a great indicator of how fast we can move when you have a system built. So several companies have actually, very quickly, worked with CEPI to start at least preclinical and early clinical work and I think it's only because that structure was built and some of those platform research things were done and I think SARS and MERS were actually learnings for a lot of companies.

So a lot of companies, at least, started to work on something there and then they could very quickly pivot to the new coronavirus and see if their systems work. I do think it's indicative of the fact though that it would be good to finish one of three of these things, but it's important to know that things, like CEPI, that are plugged into the community or companies know they can go there. They've learned a lot about the platforms and the other coronaviruses beforehand can allow us to go faster, at least in getting started. But the development process, no matter how much you try to compress it is still longer than you think.

Dr. Julie Gerberding:

I would just add one really important lesson that I wish we didn't have to keep learning. And that is that when we have an

outbreak, for example, SARS or MERS or Zika, that we finished the job. And that is that we keep working on the countermeasures until we have them done and we don't abandon them midway because the problem has disappeared. So we had partial work on SARS, we had partial work on MERS, we have partial work on Zika, but we didn't cross the finish line. And so that really handicaps us when we start something new that could have benefited from that progress.

Phyllis Arthur:

We should think of this as capability building, capacity building and the going all the way through the process. We have to finish that because every one of those processes and every one of those outbreaks is a learning for the next one. And we go faster and we're better. And that's actually the cornerstone of preparedness and response.

Patrick Ryan:

*Let's talk about the science. How does a company like Merck approach a situation like this, from a scientific perspective?*

Dr. Julie Gerberding:

I think the first thing all of us do is take a look at our existing assets.

[Asking questions like] well, what kind of antivirals do we have on the shelf? What compounds do we have in the storage room that might be useful in a situation like this?

So, what we do is look at what are we capable of and then is there anything we can do to repurpose either that compound or that capability into something useful in the emergency situation. Right now, at Merck, people are assembling and thinking about how they can screen our antiviral compounds for the new coronavirus.

Patrick Ryan:

*Let's talk about communication with the public, the importance of trust when you're communicating on such issues of policy and public health. I'd love to start with you on that, Phyllis.*

Phyllis Arthur:

So I think it's really important, as Dr. Gerberding actually embodies, to actually tell people this is what we know thus far and no further. I think that you saw that with Dr. Gerberding with Dr. Schuchat during H1N1 that it's important to really tell people the right information, that it's factually based. And I think it's important for industry to do the same, to be able to clearly communicate. This is how we're going to approach this, and that people understand how they're going to approach the clinical trials and work closely with the agencies so that people don't get the wrong impression of what's possible in what time.

Dr. Julie Gerberding:

I would just follow that with we tell people what we know today in a candid and truthful way, but we also have to tell them what we wished we knew and are working to find out and then promise to continuously update as new information becomes available.

Trust is everything and in the United States the trust that's most important is that the community level on the frontline in government, and government spokespeople can do so much, but ultimately people want to hear information from their own doctor or their own local health department and that means the cascade of our public health system has to be seamless and we have to really involve everyone in the process. That's one of the things that's I'm sure going on at CDC right now is that linkage with our state and local health officials and helping make sure that the information is flowing by directionally up and down the system.

Another thing I would say overall is that you have to really let people know that you care. This is a really tough and scary thing and sometimes the scientists are falsely reassured by the facts and figures, but people who trying to figure out what to do can be genuinely frightened and you really need to validate their concerns. Not try to talk them out of it, but just tell them the things that they can do to help protect themselves.

Phyllis Arthur:

And I think actually, as I watched the media, the interaction between media and the health officials has been really good. The media coverage I think has been very clear. They haven't been alarmist; they've been very factual, and they've also made sure that people understand it's also flu season.

So, what's the difference between flu like symptoms and potential coronavirus like symptoms? You don't want people running to the ER saying, I have coronavirus when in actuality, unfortunately, they might have flu type B. So, I think it's also important to make sure to tell people in a very concrete way through their trusted sources of information what it is, and it isn't so that they can make better, more concrete decisions about their health.

Dr. Julie Gerberding:

I guess the other thing that has worried me a little bit is that we over promise, we need to be careful that as excited as we are, as a sector, as we are excited about what we can do with our biotechnology and our scientific breakthroughs, we have to be realistic about the timing of these new tools becoming available because the epidemic is spreading right now and nothing that we have right now is really going to be helpful. That's why we

have to rely on the more common sense, personal hygiene and social distancing measures and really pay attention to the travel advisories.

Patrick Ryan:

*[To Dr. Gerberding] And you've even mentioned that Americans should bear in mind even getting a flu shot.*

Dr. Julie Gerberding:

Well, I think a flu shot is always a good idea, you know. On a global basis, one of the challenges that could emerge is just extreme inability to access medical services. If we do have a growing outbreak, hospitals and clinics can get overrun. So, if people can protect themselves against the common things that we know are circulating, that really reduces the burden on the health system and helps keep the doors open for the people who really need serious medical care. If there was ever a year to make sure you've gotten your flu shot, this would be a year to make sure you've gotten your flu shot.

Patrick Ryan:

Well, Dr. Gerberding, Phyllis Arthur, thanks so much for joining us.