

COURTESY MARRAZZO

Marrazzo is director of the National Institute of Allergy and Infectious Diseases.

AMERICA'S INFECTIOUS DISEASE DOCTOR

JEANNE MARRAZZO SPOKE AT THE UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE DIPLOMA DAY CEREMONY ON MAY 19, 2024.

In August 2023, Jeanne Marrazzo, an MD, MPH, was named director of the National Institute of Allergy and Infectious Diseases (NIAID), a role previously held by Anthony Fauci, an MD. At NIAID, Marrazzo oversees a $6.3 billion budget that supports research to advance understanding, diagnosis and treatment of infectious, immunologic and allergic diseases. She previously held the C. Glenn Cobbs Chair and served as director of infectious diseases at the University of Alabama at Birmingham. As a researcher, Marrazzo's specialties are the vaginal microbiome, sexually transmitted infections and HIV pre-exposure prophylaxis.

Marrazzo was the keynote speaker at the School of Medicine's Diploma Day in May. She took time then to share her thoughts on some of the most pressing issues facing science, on infectious disease threats, on lessons learned, as well as plenty of reasons for optimism in biomedicine. *—Interview by Erica Lloyd*

What are you excited about moving forward as NIAID director?

It's an incredible time. I would say in the next five years we have an unparalleled opportunity to change the trajectory of some diseases that have been incredibly stubborn. The three that I think about a lot are tuberculosis, HIV and malaria.

For malaria, we have a couple of vaccines that have modest efficacy, but we are also now developing monoclonal antibodies that can be given very early in life, like at 10 months when kids lose their maternal antibodies. That's a devastatingly vulnerable time for infants, for babies, for little kids.

If you could partner those monoclonal antibodies with a vaccine, we may be able to show at scale that a combination prevention and treatment program really works and start to reduce the number of deaths from malaria worldwide. Way too many kids, in particular, still die of malaria and cerebral malaria.

Regarding TB: We've been sort of at a standstill for a long time, but in the last five years we've started having promising developments in some drugs that are long-acting that can be used for both treatment and prevention. And the Gates Foundation recently embarked on a very large study of a TB vaccine that is a new biological model that has significant promise. Some ability to control TB would be amazing. It's still the No. 1 killer of people living with HIV.

And the third one is HIV. We've done great in so many parts of the world getting treatment to people, and when people are adequately treated, they're no longer able to transmit the virus to others. We've also done very well getting PrEP, pre-exposure prophylaxis, to people, but not well enough. There are still way too many perinatal transmissions worldwide.

And even in the United States, in the South, where I was most recently, and in challenged urban areas, we're still seeing an incidence that is completely unacceptable.

We're moving into an era where we now have better tools for prevention. We have long-acting injectables. We're studying long-acting pills. And if you pair that with some of the advances in the vaccine and monoclonal antibody field, those may be closer to seven, eight, 10 years away. It comes together as a very encouraging picture for global prevention.

You've spoken of the importance of meeting people where they are. Can you talk about how that translates to the pandemic?

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First of all, because you had a spectrum of opinions from physicians—there are plenty of people who were pushing therapies that we know from good evidence-based trials are completely ineffective and, in fact, sometimes harmful.

But why were people doing that? Would it have made a difference to hear information from a peer? From somebody who was more representative of their communities? I don't know. But all those questions are really important to talk about and engage with.

Are there any disease threats that keep you up at night? Like bird flu, or a new variant of COVID or measles?

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Marrazzo with Pitt Med's recently retired vice dean, Ann Thompson.

All of it. There's a baseline of infectious diseases that could come back and bite us at any time. Measles is a good example. Polio is a good example. These are things that we thought we had under control and, obviously, we're not quite there.

You can't forget the coronavirus has continued to evolve, and even SARS-CoV-2 continues to evolve. There's always a possibility that there will be enough immune evasion in that virus or another coronavirus that will cause a similar scenario.

Everybody's really laser-focused on the avian influenza situation. We don't really understand how cows became infected. At this moment, there's no evidence of a very worrisome genetic mutation, but this virus is so crafty and has established worldwide domination in the avian population very quickly.

So to see it spill over into cows and also into peridomestic animals like cats, that is worrisome. No. 1, it increases the possibility for further pressure—for the virus to evolve, to adapt. No. 2, it increases opportunities for us humans to interact with these species.

And it increases the likelihood that you can involve another species, like pigs. Pigs are sort of the holy grail for influenza genetic reassortment. All of this is making many people in the public health world hypervigilant.

We're all working very hard to ramp up our antiviral discoveries, as well as vaccines and monoclonal antibodies. We have a stockpile that's substantial, but we need to make sure we have plan B and C and D.

We ignore, in particular, the massive die-offs we're seeing of marine mammals at our peril, because that's not normal.

The well is not as deep as the need in terms of funding for science generally. Physician-scientists and PhDs may feel like they're fighting for their research lives. Where do we go from here?

[When I was in training,] we expected to be in training for a long time, but not forever. And we also didn't expect to be in debt in the same way, like hundreds of thousands of dollars. We're asking people to live a model that is almost no longer tenable.

We have to look very hard at the disincentives. We've relied for a long time on the incentives, right? Because we think it's fantastic. It's fun. Science is great: We're making a difference. But there are some disincentives to getting into this work.

What should new grads going into medicine be optimistic about?

In addition to what I've mentioned, I think that evolving technology is probably going to make life better, easier and more interesting. So when I say that, I mean the technology for interventions for developing cancer drugs (which are completely amazing right now), for imaging, for developing vaccines. Those technical tools are just going to keep getting better and better because the pace of discovery is really quick right now.

The other thing is, I hope that some of the drudgery that has characterized the last 20 years of shifting to the electronic medical record is likely to be relieved by AI. For every five minutes you spend with a patient, you spend [about] 20 on documentation.

The recent pig-to-human kidney xenotransplantation is pretty amazing. They basically took all the porcine retroviruses out of that pig using CRISPR. The ability to carefully curate what you're doing as you transplant an organ—it's a game changer.

What would your advice be to new doctors generally in this polarized environment where medical authorities aren't necessarily trusted anymore? And then there are, of course, populations who didn't really trust them all along.

If you're doing what you love, and you feel like you're making a difference and having an impact on people's lives, you really can't go wrong. You could be in research. You could be in clinical practice. You could be working for a pharmaceutical company. You could be doing global health and working with a nonprofit. You could go into policy. If you're bringing your best self to whatever is happening at that moment, and that's translating to an enhancement of someone's life—

There are so many interactions I've had, particularly with patients, that have refueled me and mean so much more than some of the more traditional honors that I've gotten. I don't think about the awards. I think about my patients, and I think about my trainees, my students. That's what really keeps me motivated. ■

This interview has been edited for length. See more of the conversation with Jeanne Marrazzo at pi.tt/marrazzo.