TOWARD A HEALTHIER TOMORROW: THE FUTURE OF BIOMEDICAL RESEARCH AND INNOVATION

Esther Krofah 00:00

Yes, all right. Well, thank you all very, very much for being with us for this closing plenary discussion. We're thrilled to have all of you here. I don't think any of you need introduction. So as you speak, we'll have your name come up. We're going to have a conversation around the future of US biomedical innovation and research. Obviously, it has been a highly evolving and changing year across HHS, and we've heard from many leaders across HHS today. We have seen an impact across the federal workforce, certainly cuts to science and to grants, and there are uncertainties from a regulatory perspective. We look at other countries and how they're leveraging this time and this moment, perhaps, to accelerate their own investments in life sciences, and as we think about the US, and we released a report alongside this conference, that we are at a tipping point, right, we can choose, we're at our fork in the road. We can choose which direction we go and where we can choose to double down and make these investments. We outline really three key principles in the report, that the US should be a leader in breakthroughs, scientific breakthroughs that enables better health for the US population, drives growth in the economy, and protects national security. And to do that, there's six main recommendations that we have outlined. Many of them deal with data. I know we'll get into that conversation today, but as we think about where we are relative to other countries, the US has really been this beacon of hope for the rest of the world. The innovations that have come from the US have saved human lives. If Mike were here, he'll say that medical research and public health have contributed to 50 percent of economic growth, and when we look at the last 100 years, we've seen tremendous impact on life expectancy as a result of the innovations, largely that have been borne out of the US biomedical research ecosystem. And so this panel really—talk about their thoughts, their feelings about where we are relative to the rest of the world, where we go from here. How concerned are you about the leadership of the US relative to the world, and what leadership do we need going forward to really articulate our vision and our plan. I want to start the conversation actually by having Elias talk to us about the elements that make for a thriving biomedical research ecosystem. You have been a former NIH director, you have led a company, you've been in the private sector, you've been an investor, you've seen all parts of the biomedical innovation ecosystem. What are the components that

we need to thrive? And are you concerned by what I shared about other countries, perhaps leapfrogging over the US?

Elias Zerhouni 03:13

You know, Esther, it's a great question, because I think people need to step back a little bit and understand the system. The system was created in 1945 by Vannevar Bush in a paper called "Science, the Endless Frontier," and it's really based on six, and maybe, seven pillars. He understood that what happened during the war was the collaboration between government, industry, universities was a magic solution to a lot of the problems and the challenges of the war. He wanted to continue that, so he convinced Roosevelt to say, well, we need to come up with a system that would maintain the innovation that we had in science and technology during the war. And his system is based on a few components. Number one was federal funding of basic research, because companies cannot afford the cost of basic research, and then universities even less so. And he realized that to put all this world together, the universities and the companies, the industry and the government and all of them together, was like herding cats. And if you read the story about how he had to convince people, it's amazing, but he said, you know, to herd cats, you need to bring fish. The fish is the federal government funding. It really is. And then the second component of the system, besides federal funding, was universities. That's where the basic science will be done. But universities had two roles, discover new knowledge and train the next generation of science and technology leaders and doers, right? So that was the function of industry, of universities. Below that, the third pillar is industry. So in our biomedical research world, it's biopharma, right? And the idea was, you'd create the knowledge, it will be transformed into companies, and the taxes will go back to fund the government. That is the fundamental nature of the system. So you had funding, you had universities, you had knowledge and manpower with immigration, and then you had the companies, and then you had philanthropy as well, that came in a bit later, and then obviously venture capital. And the seventh pillar is regulatory, a good FDA, right. Today, we're experiencing a—what I would call a perfect storm. Every element of that bio ecosystem is under attack. The thing that's interesting, it's under attack for different reasons. So in each each of the proponents of the change, I have a rationale that you can understand. Okay, well, we want to reduce federal funding to correct the deficit. That's the OMB view. That's why they want a 40 percent reduction of NIH. Then the universities, it's more ideological. It's really, we need to get the universities to go from the far left back to the center and even the right. So ideological. Then you have the biopharma, oh, it's pricing. It's too expensive. The American people feel gouged, so we need to attack that. And then you say, oh, immigration. Well, why do we have immigration? I mean, can't we have our own kids to do that? You know, the problem is, we're 4 percent of the world population, and we have 25 percent the economy. We don't have the manpower nor the educational system. So what I'm telling you is that you should look at the systemic view of what's happening and how to correct it, realizing that there's not a conductor. There's no coordination between what I'm seeing happening, and therefore you need to really respond in the appropriate way. And we have, there's hope. Congress has refused to lower the NIH budget in their resolution, both on the left and the appropriations in the Senate. And so that's the view I'd like people to frame. The issue is not to look at one element at a time, because each of the elements we're dealing with has a different reason and a different proponent within the ecosystem, the government, the administration.

Esther Krofah 07:14

Well, given that it's a perfect storm, what are the implications of that?

Elias Zerhouni 07:17

Of the perfect storm?

Esther Krofah 07:20

Yeah. Why? What are the implications that all of those six elements and seven if—

Elias Zerhouni 07:25

Right. I think right now we're experiencing the winds of the hurricane, right? I don't think it's destroyed the system yet, but I think if the center of the hurricane happens, it will be a disaster. I mean, let's not mince words. I mean, what is being done here is destroying 75 years of progress that has made us supreme in biomedical research and in science and technology. We're challenged not because of ourselves alone, but challenged from the outside, too, China and others. So it's a double-edged sword. We are being attacked at the same time, we're reducing our own capabilities.

Esther Krofah 08:03

Rob, obviously, you just formerly led FDA. You've interacted with so many different companies, biotechs, product sponsors. You've talked about even broader issues, your concern around life expectancy in the US compared to peer countries, that, yes, we are driving this engine of innovation, but are we realizing the benefits of that? Are you as concerned, or do you share the views that Elias just mentioned, that this is the perfect storm.

Robert Califf 08:34

Completely. First of all, let me just say Elias is in my top 10 people I like to argue with, but I can't argue with him on that part of what he says—

Esther Krofah 08:44

Congratulations on being part of the top 10.

Robert Califf 08:47

I completely agree with his depiction of the problem. And I don't know, I'm a sports person, I always like to be the number one team. I don't know why you would declare that you don't want to be number one team at the same time the opponents are revving up their effort to build their capabilities. It just does—it makes no sense to me at all. But there's another element. We have to be able to walk and chew gum at the same time. You can't blame our life expectancy on the biomedical research, technology development area. The other countries that are beating us in terms of the health of their populations, they're depending on us for the technology. They're just using it better. And so we've got to also, at the same time, be able to say we're the only high-income country that doesn't have health care as a right, and that doesn't have a primary care system. We're the worst of all countries in primary care, even faculty members at our most distinguished institutions can't get appointments in primary care now. So I'm totally on board with that part of it, but I think if we want to have the public behind us, we've actually got to pay attention to what they need, and mostly what they need is to have their blood pressure and lipids controlled and to have help and not overdosing on drugs. That's also being dismantled right now as we speak. And dare I say, I was just in Ireland, their police don't even have guns, and the number one cause of death in our children is guns, and we're not doing anything about it. So I'm totally on board on that front. But if you want to talk about life expectancy, I don't think that's the primary issue. Now you can tie the two together by saying that the future economy, well-being of everyone is going to be dependent on this merger of biotechnology, technology, and health care—to have no plan, seems totally insane to me. So I hope that there'll be an effort to, you know, put Humpty Dumpty back together again.

Esther Krofah 10:54

Julie, you led the CDC. You currently lead the Foundation for NIH. I want to ask you about data, but before I do, I want you to respond to this conversation that we've been having as well, which is, what is your perspective on really what Rob said, are we ceding our number one role to other countries?

Julie Gerberding 11:16

So you know, we have been the envy of the world. We have all the pieces necessary to innovate, to create better skilled workers, to increase our national prosperity, our national security, and contribute that to the rest of the world. And as Elias said, we are systematically attacking every piece of that. So there's a huge threat to our pipeline of innovation. I'm also very worried about the other pipeline that matters here, and that's the pipeline of talent. And I think embedded in all of this is, you know, the people who are inventing today will not actually result in biomedical innovation and success for another decade. So what's happening right now—and we see universities reducing the number of graduate students, or you see that what used to be a magnet for the best and brightest people internationally coming to our universities. And just look at who's leading the health tech companies or many of the biotechnology companies that are thriving right now, they're people who were not born in the United States. So we are creating damage to our pipeline of talent, and the impact of that is being experienced by young people right now who are floundering around, trying to figure out what to do in their graduate program or their post doc program,

but it's also affecting those who are looking at their career opportunities in much earlier stages of their career. And I think that pipeline attack is something that we'll pay a price for for a long time, unless we really get assertive right now about correcting it. I'm involved with a university that in the school of medicine, has a 30 percent reduction in the number of graduate students this fall compared to last year. And you know, there are people who run important laboratories at prestigious universities who've told me that what used to be a routine occurrence of having international students apply for positions in the lab, sometimes more than 100, 125 a month, has now resulted in two or three. So we have really a hurricane of a different nature here that is swirling around us, and unless we really get assertive about figuring out how to protect that pipeline of talent, we'll pay a price for a long time.

Esther Krofah 13:48

One of the premise of the report is around questioning status quo. I think all of us can agree on the stage that we should not go back to the past. We should think forward toward the future and perhaps break down silos that you always wanted to break down, but you did not have the opportunity. Two of the sections of the report talk about data. One is focused on creating much more of access to federal data. Right? We have incredibly rich data at FDA and NIH and at CDC and CMS, but they are stuck within rules, lack of ability for us to access or learn from that in efficient ways. And you now, Julie, are looking at an initiative for us to perhaps move toward a vision of a federated national health infrastructure. Tell us more about that?

Julie Gerberding 14:45

You know, I started at CDC a long time ago, and when I became the CDC director, there was a big initiative at the Department of Health and Human Services to create a national federated data infrastructure and interoperability, and we all worked on setting standards and creating the hubs and spokes necessary to make that happen. It's proven to be pretty hard to do. And you know, fast forward, 25 years later, we're still, you know, not there. But what is happening right now, and at HHS, is that there is a plan to really take advantage of the data sources that we have, not just electronic health information, but whole ecosystem of health input from the patient perspective, the pharmacy perspective and so forth, and really try to bring that together in new and creative ways. It's actually something that Rob and Monica started, you know, before the change in administration, but a piece of that is something that the Foundation for NIH is working on, and that's a program called Data COUNTS, which is an effort to try to, in an anonymized fashion, consistent with all cybersecurity standards, etc., create use cases where, rather than having each health system have to report some things to FDA, to report some things to CMS, CDC, etc., why not have a system where you use the data more than once. In other words, the program's called Data COUNTS because that means count once, used numerous times. So there would be only one process of submitting data to the federal government for the required purposes, but also creating the opportunity to—for example, if you're investigating a new drug for a rare disease, one of your challenges is trying to find patients who might benefit from that drug. Well, wouldn't it be great if you could look into the federated data resource and say, Wow, there are 400 patients who might possibly benefit from these treatments. I don't know who they are, because I don't see their names, but I know what health system they came from. Can reach back to that health system and say, you have three people who have this rare

genetic disease, maybe you could contact them and see if they'd be interested in participating in a clinical trial. So we're really looking at ways to expedite that data integration and interoperability in a way that protects the patient's right to decide how their data are used, and at the same time, increases the efficiency of data transfer so that it doesn't have to cost so much at the health system perspective to parse all these data out through all different kinds of systems, and ultimately, that we will have our dream of access to real-world evidence that will help us make better health decisions. Early days. Only a handful of health systems are participating right now, but we expect this is going to grow over time, and hopefully it will be a giant step forward in our ability to use data for assessing health, but also improving health.

Esther Krofah 18:00

And Sharmila, I want to come to you. Thank you for waiting so patiently. You serve as the dean of the Alice Walton School of Medicine in Bentonville, Arkansas. So welcome to the Washington, DC area. Well, tell us a little bit about the vision for this school, the vision that Alice Walton has for the school. Workforce is a critical component about how we move forward in the future. You're very focused on how we can address the needs in rural populations and creating a different workforce there. How can that help us solve this question that we're grappling with around shaping a renewed future for the country.

Sharmila Makhija 18:41

Yes, well, thank you. Great to join everyone here. You know, Alice really was focused, and she shares this—with her own health illnesses, she realized that she could afford to go anywhere in the world and get care, but she was really saddened by the fact that those in Arkansas that needed it the most couldn't get access to even primary care, much less specialized care. So that was the impetus for looking and working with the community leaders to see what are the needs, the health-care needs of at least that part of Arkansas that spread out to the rest of Arkansas, and it was very clear that all of the community came together and said, We need to increase the pathway programs and pipeline of the workforce. And so that was the start of—she actually started the Whole Health Institute first, and then the medical school. The Whole Health Institute is our sister organization that's looking at payer modeling, policies, because we know we can't just produce more doctors. We have to be able to change the system. The vision of the school is to really look at the needs of our particular community, which is rural. We're in the heartland region. You know, that's 20 states that are very predominantly rural, and many counties don't even have one doctor, much less a specialist. And so there's not only not enough doctors, there's the access to care for patients. So we really focused on recruiting those students from a rural background. When we look at the percentages of medical students with the rural background, it's less than 5 percent nationally, and we are at 15 percent with our first class that started in July, and we feel that if you're coming from that community, you're more likely to go back and serve in that community. And when you look at the rural needs of a community in a rural area, you know, their age-adjusted death rate is 20 percent higher than the national average. And when you go deeper into looking at those illnesses, they are chronic illnesses, but they're—the majority of those are associated with lifestyle factors, social needs, and so that is where we built into the curriculum a whole-health approach. And it's nothing new. The VA has done this, but we haven't been able to put it into a medical school curriculum very intentionally for the four years, and that's what we've done. We've put it in as the premise of teaching students how to take care of the whole person. And it seems very obvious,

but we don't do that. We talk about how to take care of a disease, but not what a patient needs, which could range from emotional to social to even economic needs. So we're at least building that in with the hopes that the students will understand how to ask those questions as we build out the rest of the health-care system, because we also know they can't—it's a luxury to have that knowledge, but if you can't work in an environment that you can actually do something about it, then it's not going to be of any use. So we're also working on that piece as well, and I'm happy to go into that at some point.

Esther Krofah 22:07

So you're building locally, and you're deploying locally as well—

Sharmila Makhija 22:10

That's right.

Esther Krofah 22:11

And you're trying to close these health gaps. Is that a model for how we rebuild?

Sharmila Makhija 22:16

You know, we think so, and we are also trying to be very mindful. Yes, we have the luxury of having the support of Alice, but we want to be able to replicate this. So we're very—we're looking at the modeling in a very fiscally responsible way of even how you deliver medical education, working with existing partners. We don't feel that we need to rebuild things that are already there, we want to partner. And that's a big part of our focus is the collaboration and partners. You know, someone who would be considered a competitor like University of Arkansas is not—they're our partners. They have beautiful laboratories there. We co-recruit faculty to work there, but that—in our health system that we're partnering with is Mercy Health system that has 57-plus hospitals in the heartland region. They have the manpower. We're working with them. They're very focused on value-based care. Our values are aligned, and that's how we think we can amplify it and create the model that will be appropriate for a rural community, but really anywhere. That's our goal, that's our hope.

Esther Krofah 23:26

Elias and Rob, I want to come to you. We talked about the concerns, and Elias, you articulated them so well across each of those different components. When you want to design something new, how do we bring it back together? How do we address those—perhaps, rather than just one at a time, it operates as an ecosystem. So we need all of them to work at the same time. You need basic science investments to work

to create a pipeline for biotech discovery and translation in order to have product sponsorship, etc. Where would we go to rebuild, or maybe reimagine how all of these ecosystems should work together going forward?

Elias Zerhouni 24:06

I don't know that we need to redesign the system, and the system has worked for 75 years. I mean, it's not a new system. I mean, we should really do what Rob is talking about, fixing health care, which nobody is trying to. The president says he has a concept, but didn't talk about what this detail, and no one wanted to touch that. So I think, in terms of the—my view is that we have an uncoordinated attack on the system. And when you talk to folks who are quite, you know, influential in the administration, they all say, oh, no, we don't want to destroy that system. We want still to be number one. We—so, I think there is an education issue. I think in the case of the NIH budget, replacing that funding pillar, we talked to, you know, we created some campaign, there's United for Science, that was directed by AAAS, and then United for Cures, which is patient organizations. Guess what? The patient organizations were more powerful than the elite and the experts, of which I'm part of, and Rob is part of—all of us here, we are not listened to, you know, we have a period of, you know, evidence-free zone. Nobody wants to listen to evidence. They want to hear stories that really have an impact on people directly. So I think if you really want to be effective, you have to highlight that and then highlight the irrationality of the sum of the quote, unquote, rational actions that everybody's taking. I mean, I'm not against reducing drug pricing. I'm not against, you know, reducing deficits. I mean fraud and abuse. Sure, absolutely we need to do this, but the sum total of what's happening requires a very surgical response to each component of it, because there's not a single center, because when you talk to them in the administration, do you realize what you're doing? No, we don't want to do that. So I think there's hope, and I think we need to be hope—optimistic, otherwise, you know, why are we here, right?

Esther Krofah 26:06

Rob, do you agree with that, that we fundamentally have the right system in place, and we need to shore it up?

Robert Califf 26:14

Well, I mean, the way I would think about it, we have the elements. They're the right elements, they're pretty much defined, but the sum is so much less. The whole is so much less than the sum of the parts right now. The biggest deficit—it sounds like Elias and I agree. I don't know what's going on today. The big step is really in translating all this fancy science into fundamental, basic health-care delivery that has an impact on how long people live, and we need to fix that. But your report is notable—that it calls for a lot of centralized thinking and coordination, which seems to me to be a core issue that people, for whatever reason, have come to the conclusion that in the US, we don't do that. But let's look at our competitors that are beating our socks off in Singapore. Their biggest health problem is that the average teenager is expected to live to age 100. That's their biggest health problem. They're highly coordinated. There are

things about Singapore that are imperfect. On the other side, China is totally amassed to beat us, and they're making progress at a rate because they are centrally coordinated. You know, Scandinavia is looking phenomenal, and they have the data, they have national data systems with patient identifiers so that they can put all the information together and decide where to put the resources to help people the most. And for some reason, we're—seem to be opposed to that. But you know, it's like you're—I don't know, I'm a basketball person, so, I mean, just imagine that you had no coach, no central plan, and you just told centers, forwards, and guards to go out there and run around and try to score a basket. It just wouldn't work. That seems to me to be what we're doing. But the most important core thing, I think, is to fix the basic fundamental of delivering primary care. And since I've already mentioned guns, I might as well go to the other one. When people ask me what the biggest health problem is in the US right now, it's wealth disparity. It's getting worse by the moment, when you have individuals worth $300 billion and half of Americans couldn't raise 5,000 bucks if they had a medical emergency. Maybe you don't care about that half of America, I don't know, but doesn't make sense to me that the rules ought to reward that sort of amassing of wealth with all the privileges that go with it. I used to love Uwe Reinhardt's lectures, he was on our board of trustees at Duke, about how you could live forever if you were wealthy enough, you just keep replacing body parts and keep going. But if we don't fix that problem, I think, you know, we'll have great biotechnology, but it will be available to the privileged 20 percent and not to the other 80 percent of Americans. I just think that's so fundamental, you can't overcome that with technology. You have to overcome it with policies that make sure that people do a good day's work, get paid enough to be able to take care of themselves.

Esther Krofah 29:26

You know, that contributes to the mistrust that we've been talking about throughout from various perspectives.

Robert Califf 29:34

Yeah, let me just add on that one, because it comes up every day for me now. I mean, why would anyone trust our health system? You can't even get an appointment, and when you do, you get bankrupted. If you get sick, if you're an average person, it's not a trustworthy system.

Esther Krofah 29:48

Well, we started yesterday's conference with results from a Gallup poll that demonstrated that Americans cannot afford their health care, and the costs increasingly are going up. The out-of-pocket costs for them—I'm talking about out of pocket across everything, not just medicines and drugs, and they're forgoing care as a result. So what you're talking about is—I can't access, supposedly, what this amazing innovation engine has generated. Therefore I don't trust that ecosystem. I don't trust those institutions, and I certainly don't trust those elite universities who are supposed to fix all of this for us, but they're somehow failing. Do you think that's contributing to this erosion that we're seeing across all of the different institutions that we have held in high regard for so long? Anyone can take that.

Elias Zerhouni 30:39

Well, I think it's the fundamental problem. I mean, when people ask me, oh, people have lost trust in science, they've lost trust in institutions, they've lost trust in Congress. There is a fundamental definition of trust, which is the ability to predict someone's behavior or result, or if you give me your word, you're going to deliver, right. And what we have seen is, when I came to this country, I thought that the biomedical system, research system was number one and health care was number one. Fast forward 50 years, there's such a disconnect between what you promise and what happens, you know? So people are completely like, "Wait a minute. I think I'm being cheated, right?" And yesterday, I saw the latest statistics was $5.4 trillion in 2025, 7, 8 percent increase in spending. We're spending twice as much as any other country, and yet we get these results. I mean, I'm not so worried about life expectancy, because there are some factors. I'm worried about what Rob was talking about, the impact on people, and I think it's the issue that we have. There's been a institutional capture of the health-care system where 40 percent of the expenditures in health care are not going to health care. They're going to middlemen, intermediaries, PBMs, something, you name it, and all of it is being tweaked here and there every year under the cover of health-care policy. But frankly, it's not fixable, in my view, and it creates increasing distrust. So that is the source of it, it's a disconnect between what is being said and what is being delivered in this country. Not just health care, by the way. Education is the same. High tuition fees, the same. People are not just looking at health care. That's why they're so angry.

Sharmila Makhija 32:27

Yeah, I was going to add, you know, we call it out front and center in the school and have it as part of the curriculum. And it seems, again, very obvious, but we've seen it deteriorate post-pandemic, right? It really got accelerated with the trust factor. When we talk about building that trust and rapport with the patient. I mean, when I went and was in medicine, we didn't really talk about that but we saw it emulated by our mentors and how they practice. And it's an art, and we've lost that ability, and in the school, we talk about it in our health system science track of how you work with each other. How do you trust each other to take care of a patient together, and how do you communicate and develop that trust with the patient? So I think it's a very important piece that we have to call out and start building back again.

Esther Krofah 32:57

Sharmila?

Robert Califf 33:17

I think we got to also acknowledge the role of social media and some very—as you know, I'm very fixated on this now, and there's sort of two factors here for me. Right now, established fact-based, evidence-based interventions that improve people's health are under attack from 24/7 social media, and all of us use

it. I'm not opposed to social media. I love it. I worked at Alphabet for six years. It can be great, but the response of our established institutions is a press release and a journal article, which is no competition for what people are getting 24/7, even a doctor in the clinic. And by the way, at least, last I looked at the polling, people still have a high degree of trust in the individual person they're dealing with, a doctor, a nurse, a pharmacist, and that is important. But the second factor is, yeah, I'm really worried that the tech-opoly now, whatever you want to call it, there's—I saw this happening when I was in Silicon Valley, a view that because our established brokers of knowledge have gotten old and hierarchical, and it's very well known that the world's knowledge is going to be on everybody's cell phone with large language models. There's a view that maybe all this biomedical science stuff can be supplanted by just iterative technology in a virtual world. That sounds crazy when you first say it, but this is a force that's happening. So at the same time, we've got all these problems that you describe now, coming in underneath is a whole set of things that are pushing people away from trust in our institution and the things that work and we need to respond to it, not by putting our heads in the sand, but by actually engaging, not just by one-on-one activities in the clinic, but actually—my favorite question is, who knows who MrBeast is?

Esther Krofah 35:18

I do.

Robert Califf 35:19

All right, so a small number of people. He has 440 million followers on YouTube right now. So if he says anything about health, they're going to be a few million people who change what they're doing. And as long as we're engaging by putting out press releases and journal articles or even the New York Times, the Washington Post, they're just seen by a small proportion of people.

Esther Krofah 35:44

I have a question around aligning incentives, and it was interesting, the question, or the comment that you made, Rob, around the wealth gap across the country, we do have a concentration of wealth in philanthropy. I know your benefit—you're benefiting from a benefactor, Sharmila, from that perspective. But we see Open AI, and we see a number—the Chan Zuckerberg Initiative, so many others, who are investing in medical research as the arm of philanthropy. We are in a world now, and this is part of the mistrust and distrust component, where they're not trusting government to come. In fact, much of the public wants less of government. When we think about aligning these incentives, is philanthropy part of the equation of keeping some of these institutions moving or running or filling some of the gap? I'm not talking about in the context of NIH funding. I'm just talking about some of these gaps in solutions that we have. How do we think about these large medical foundations playing a role? I don't know, Julie, if you want to—

Julie Gerberding 36:50

Yeah, so we—I'm having responsibility for serving a large nonprofit organization that does medical research. We really are now framing our secret sauce as private, public, patient, philanthropic partnerships, because we recognize that all of those elements are increasingly relevant to our success. And when we have those kinds of partnerships, and we do have several of them, now, it's miraculous. You know, you can create that alignment. You can create the wise crowd. And I'd like to think we can even get a whole that's greater than the sum of the parts from time to time. It's a lot of work to herd lions, but I think our philanthropy ecosystem, if you will, is becoming increasingly sophisticated, and we're about to experience this enormous wealth transfer as the boomers age and pass their wealth on to their younger children, who have different priorities for how they want to spend their philanthropic dollars, and they're much more interested, not necessarily in the museum or the symphony, but they're interested in social justice or health equity or issues that really speak to addressing some of the problems that we're experiencing here. So we have a real opportunity to take advantage of that community's philanthropic spirit, but also their citizenship in a way, and to really help them help us put their money to work in ways that really solve some pretty complex problems. I think the other point we made a little bit earlier was how important it is to have end-to-end engagement with patient communities who have actual lived experience, but also haven't always had a voice at the table. I worked in pharma. I know we tried really. I was the chief patient officer at Merck. Tried really hard to build a constituency where having patients participate in the design of clinical trials or the reporting of clinical trials, built part of our culture, and we're doing that at FNIH, but there's nothing more powerful in helping people understand the value of a medical intervention or a new approach to therapy than hearing it from the perspective of the n-of-1, the person who's living with it, or whose child has died from it. And, you know, we get up and go to work in the morning most days because that's on our mind, but it also bringing that together with these large-scale philanthropy efforts. And then, of course, our life science company partners, our health tech partners, and our academic partners, all of that is really an amazing connectivity, a convergence, that can achieve really magic results. It's hard work, and you know this from working at NIH and we're, you know, our whole effort is there to try to support the mission of the NIH, to improve health. It takes time. It's not fast, but we're learning, and we really hope that this can be an increasingly relevant part of that ecosystem that we were talking about, especially since we probably won't see massive increases in government investing in health innovation, and we're going to have to figure out other funding models.

Esther Krofah 40:24

Yes, Elias.

Elias Zerhouni 40:25

Just a quick you know, of all the things that are being attacked or challenged, philanthropy is one of them, because now we're talking about taxing endowments and taxing philanthropy. And there's a point at which, you know, some people are saying, "Oh, this should be tax like income." You know, then the incentive of creating philanthropies goes away, like in Europe, you know, there's not a lot of fortunes that are going into foundations to be—yet at the same time, we have a $7 trillion transfer of wealth that is

going to occur next few years, and then we have individuals who have wealth that is greater than the GDP of many countries. And you know, the question then becomes, this is a growing force in the ecosystem, and we need to really figure out a way to transfer it to the good of—because people are not going to take it to heaven, right? They're going to leave it here. And so we need to really be smart about doing it. The alliance, you know, Philanthropy Alliance is very good, but I think we need to do more and not in the traditional way. Because I think a lot of philanthropists I talk to, they want to have an impact. They want to own something that they do with their wealth. So it's not the passive type of philanthropy anymore. It's going to be a very proactive type of activity, provided that those who want to use the taxation to reduce deficit don't destroy the golden goose.

Esther Krofah 42:01

Well, as we come to our closing few minutes here, I want to end with really two things. One is, what is your bold idea if you could redesign this system to achieve those three aims that I talked about earlier, we're a leader, we're improving the public health in a significant way, we're driving economic growth, and we're protecting our national security. We did not have the constraints that we have today, because we're able to reimagine and do things in a bold, purposeful way. What's that bold idea from your perspectives? Any of you could start. In the report, we talk about ideas like empowering every patient to be able to control and use and benefit from their own health data, creating a patient data wallet. I mean, these are ideas that we've had for so many years we've never executed on it. You go to other countries, for example, I had a great example in a discussion yesterday where someone from Denmark said, "Yes, I have a patient ID, and I can contribute my data towards research. And by the way, it's on an app, I can press it and I can share my data immediately." We don't have that capability in the US. So as we think about this new vision, what would it be for you? What's that bold idea?

Elias Zerhouni 43:16

I'll start by giving you something that you won't expect, and that is that my idea is the fact that we have a system that can work. It is working and it will work. The problem is the disconnect between that and delivery, so research development, but the delivery, delivery system is broken. Now, yesterday, I was at an event where Dr. Oz was speaking before me, and he pointed out a few things. He said, "Oh, you know what? What is the software that we use at CMS?" Does anybody here remember COBOL? Okay, it was high school, right? He said, "I have COBOL." He said that to the audience. He said, I can't even deliver the data that you want because it's not compatible. Then I asked the question, you know, when I was NIH Director, there were pushes from Congress to do implementation research, which was to say, oh, it's enough to do discoveries. It's enough to do, you know, new drugs and just tell us about how best to deliver health care, right? That's called implementation research. We did a survey, and it was clearly going to be $20, $25 billion a year, which was the budget of the NIH, so I obviously said, you know, it's not our mission. It should be CMS. And so I talked to Senator Harkin, at the time, inspector and there was a bill that they prepared to say 1 percent of the insurance premiums and Medicare/Medicaid should be dedicated to implementation research. Now, guess how much we spend on research at CMS, the Center for Medicare & Medicaid Innovation, you know, and Dr. Oz said yesterday that he spent $1.75 trillion dollars, twice as much as the Department of Defense, right? What is the budget of research,

implementation research for CMS? Anyone say, guess over $10 billion? Say, raise your hand. Below $10 billion, raise your hand. It's $1 billion. So 1 percent of the trillion is $17 billion and then the rest is the insurance. You could have a $40 billion investment in understanding delivery, and we don't have it for reasons that relate to the capture of the income stream. So my recommendation will be to advocate, which I think Dr. Oz would love, to have a 1 percent R&D implementation budget in the health-care system, in addition to all the things that we can talk about.

Julie Gerberding 45:47

So I had the opportunity to interview Tom Frieden, who has this new book out, former CDC director. And in the most astonishing thing in the book to me was this little paragraph, the fact that we spend $4 trillion a year on health care, less than 50 percent of Americans have their blood pressure controlled, except Kaiser patients, where it's over 90 percent. Why is that? It's because the incentives are aligned, right, and that Kaiser has a stake in keeping the people in their health plan as healthy as possible for as long as possible. So I'm not here to advertise Kaiser, although at one time I was a Kaiser doctor, I just think that the big idea is that we need to align the incentives so that we're actually incentivizing health and and not, you know, the other things that are so very, very expensive, right?

Esther Krofah 46:46

Yeah. Sharmila, for you, what's your—

Sharmila Makhija 46:48

You know, my world has changed over from the health-care delivery, which I'm still part of, to the education, and I, I'm very hopeful that we use this opportunity of this disruption to look at how we educate the next generation and the pipeline and the workforce. And I think you know, one of the things that we're also working on is STEM University, a medical high school that many places have started to do, but we want to show the impact and the value to those high school kids, college kids of why you go into health care, and seeing how we are trying to change the end piece of the health-care delivery to get them motivated and engaged, and we're already seeing that impact. So I'm very hopeful that that will address some of these other issues, but that workforce piece and education is something that we're really committed to.

Esther Krofah 47:43

Rob.

Robert Califf 47:44

I can't argue with what people have already said. The thing that I would emphasize, in addition, is really focusing this effort on that primordial and primary prevention and as it relates to primary care. I mean, it's great. I think we're really good at sick care. And, you know, I think everybody acknowledges that. I'm amazed when I walk in the hospitals today. I used to run intensive care units. I can hardly recognize it now. There are all these people who are alive who never would have been alive 25 years ago, when I was in my prime. And that's great. We're completely ignoring what's causing all of this, which is related to very simple things like controlling blood pressure. That is not rocket science.

Robert Califf 48:29

We have generic drugs that do it. They're very inexpensive, but who cares? And we have 30 million people using combustible tobacco in this country. Where are the smoking cessation clinics? You can't find them, they're in trailer parks behind the cancer centers that look like Four Seasons. So I think if we and we don't have to stop doing high-tech here. So I do want to also put in a plug for, I mean, the Milken report, I think it's great. The emphasis on data is essential because we can, on the sick care part, we could deliver just as good a result there at about 65 percent of the money that we're spending, but we're not generating the evidence to support the policies to stop doing high-tech things that don't work and focus on the things that really do. So fix the primary care thing and then focus on evidence and the sick part we already do well by reducing the exorbitant amount of money that we're spending that's not producing results.

Julie Gerberding 48:29

It's cheap too.

Esther Krofah 49:33

Yeah, I was recently in Singapore for our Milken Institute Asia Summit conference and had a number of conversations with stakeholders. One of my takeaways is that the rest of the world is not waiting for the US to, for lack of better words, get its act together. The rest of world is continuing to move forward on innovation and collaboration. Collaborate. You know, building locally and deploying locally and having collaborations locally. I can imagine in one to two to three years, they would have made leaps and bounds progress beyond where they are today. So as we close the panel, what is your call to action? How urgent should we be about the state of affairs now, and how quickly can we mobilize ourselves as an ecosystem, but not forgetting about the rest of the country. This should not be about elite institutions and having elite conversations in Washington, DC. It's really about listening and learning and adapting to where the public is. What is your call to action for all of us, as we think about securing the US leadership that it's had and benefited from, but not just the US, the entire world has benefited from the innovations that we have developed. Final thoughts?

Julie Gerberding 50:50

I want to say one thing, and that is, please be an informed voter and influence your friends and family to be informed voters also, because we need policy change and we need policy support to be able to change the trajectory that we're on right now.

Robert Califf 51:08

Yeah, I think we have to. I think we need leaders with courage right now who are willing to stand up and argue not for the way it used to be. I think you made that point very well, but I have to say, not in the direction we're currently going of tearing down all the things that have made us great. We got to find a different path, and to do that, leaders have to be, have to be strong and stand up. I mean, I've been on a tour of a lot of our best institutions, there is just a sense of—the young people are still excited there could be a future, but they're very uncertain about where this is going. And I was just over in Ireland. I mean, I love the golf, I have to admit. So that was great, but it felt like the US was 25 years ago. Their life expectancy is now 84, ours is 78, and they were all full of, here are our ideas. All these great things are going to happen, and just a really bright sense of the future. I'm not getting that here, so the leaders are going to have to help change the course, because we still have the most creativity of any country by far, and we need to make that work.

Sharmila Makhija 52:25

I would say, get rid of the egos and collaborate, collaborate, collaborate. Partner. Work together, amplify and enhance everybody's strengths to work together to get things better.

Elias Zerhouni 52:35

Well, when it comes to biomedical research, I think the—we need to engage, and we need to engage decision makers about understanding what is happening and to tell them what's the way out. In other words, you know, we can't just repeat funding, funding, funding. There are things that we do that can be improved. The second thing is manpower, talent, brains. You know, you lose that, you lose the war. And so that's the other issue that we need to talk about, because a high, high quality, highly qualified immigration is very important, and the next generation of Americans who go to science very important. I think those two things need to be engaged. We need to really do it in multiple ways and turn with engaging the people who can make this decision, but stress the fact that it is American competitiveness that is at stake, and our ability to lead and be the prime mover because in science and technology, the prime mover advantage is something we don't talk about. But I can tell you, there's a huge advantage to discover something first. AI and the AI algorithms that we defined have made America's companies premier in that field, but it started here. So that's the kind of things that we need to tell policy makers, you lose the prime mover advantage, you've lost the game.

Esther Krofah 54:00

Thank you so much. One of the things that we call for in the report, and would be my call to action, is that we need a national life sciences strategy for this country. We have to mobilize, we have to coordinate, we have to work together. Thank you so much Rob, Julie, Sharmila, Elias, for your leadership. Thank you for being part of this discussion. Thank you all.

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