

Futureproof: Eric Topol on revolutionizing pandemic preparedness

Lauren Fish (00:07):

This is Science Changing Life, and I'm your host Lauren Fish. As part of our pandemic preparedness miniseries, we're joined by Dr. Eric Topol, cardiologist, expert science communicator, and executive vice president here at Scripps Research and founder of the Scripps Research Translational Institute. Dr. Topol has been at the forefront of efforts to understand and improve global health responses, and today he'll be sharing his insights on how we can better prepare for future pandemics, lessons learned from COVID-19 and the critical role of science and technology in protecting public health. So I do want to chat too about switching gears from ai, more about pandemic preparedness. Scripps Research, I know is doing a lot of work in this area from universal vaccines to antiviral development to your group, doing a lot of the genomic surveillance of this. As we're thinking about the last four years and where we've been, how can we better prepare ourselves for an upcoming pandemic?

Eric Topol (<u>01:02</u>):

It is those things that you've mentioned back early in the Covid pandemic, Dennis Burton and I wrote a piece of nature about if we were smart, we would have stockpiled vaccines against the leading pathogens that we know are out there that are universal vaccines against them. Because as we've seen now with Mpox and H5N1, if we don't have this ready to go, it takes time. And some of these pathogens have very serious consequences. So that would be in some ways, a high priority that we haven't done. Now, short of that, developing data systems that take all of the layers of data, and we've written about this, the fact that you'd have your sensors

(<u>01:51</u>):

In your phone, it would have your local instantaneous risk of that condition or multiple condition with the wastewater, the genomic variance, the circulating levels, your contact information that gives you exposures. What's coming, what's your best treatment, what's your best vaccination preventive strategy, detecting whether your mask is fit right, and if it's high quality and the air quality where you're sitting at any moment in time, both with respect to carbon dioxide, quality itself, filtration, ventilation instantly, all for the individual level. Now that's for a respiratory of course, pathogen, which many of them are. But that sort of thing of having all that data on your phone for the people who are willing and interested to have this risk assessment and to get notified when you're now with someone with whatever you've been exposed, been exposed or likely, whatever. But we could, if we had just taken temperature of people every day, we would've been able to know where a new outbreak was starting. And if you want to get into preparedness, I mean, there's so many ways just lowing heart rate as we've done with an app where people are wearing a wristband and you can see a signal where there's a cluster in a neighborhood or a town or wherever where there's something going on. Now, is it flu? Is it covid, is it whatever? But our preparedness, we have all these ways to know something's off the track early. We're just not using them. And as you mentioned, yes, having better antivirals medications that are

great and effective nasal vaccines is one thing I'm really big on. I don't know why we don't already have those for covid and people don't like shots. If they could just have at home a spray, they could take every few months. Wouldn't that be great? And the universal vaccines that are not sensitive to variants, because every one of these pathogens evolves so quickly. Again, we haven't made these a priority.

Lauren Fish (04:08):

That's so amazing how you're talking about integrating these massive amounts of data, right? From environment to your personal self to your own heart rate, things like that. It just seems so futuristic. But as you mentioned, we have the capabilities of doing this now. It's just a matter of actually implementing it in these communities and actually deploying it.

Eric Topol (<u>04:29</u>):

Yeah, I mean, we have the way to do this. The will, the willingness to devote resources is just not there. Again, I am confident someday what was just outlined, we will have, but it's going to take time. It's just a missed opportunity right now. And it shows with the millions of lives that were lost and also those that were saved by vaccines and medications. We haven't learned a lesson how serious this it, and I don't know what it'll take. We have so much, so much counterforce to the progress, and that's one of the reasons in this country, we haven't had the resources allocated because we don't even have a Congress that has agreement that this should be a very high priority. So we have very minimal funding to do things that we've just been talking about.

Lauren Fish (05:21):

Right, exactly. Where it's impending whatever threat. Covid was an example of that. We were waiting for some big event like that to happen, and it was a shame we weren't better prepared at the time. And now it's just insane to think that we have had the time to prepare. We've seen how things operate when a disease is breaking out, but the fact that we haven't been able to actually do anything at this point or allocate funding and resources just seems absolutely crazy.

Eric Topol (<u>05:48</u>):

And we're still in the midst of major covid circulating, and we will be for years to come unless we do a much more tactics to override that. There's denialism, there's unwillingness to use the mitigation measures. We know there's a only very low rate of vaccination, even though their immunity wanes as in a matter of months. So it's just crazy that we aren't more intelligent in responding just to the current Covid story, no less the ones that are going to, it's not going to take another a hundred years before you have another major,

Lauren Fish (<u>06:27</u>):

Major,

Eric Topol (<u>06:27</u>):

Major pandemic. And with the climate change and all the other forces that are out there, we could be looking at something in the relative near term. And it's just sad that we don't get smarter about it.

Lauren Fish (06:41):

Yeah. Is there anything actionable to people listening that either, I know funding and resources is a big one, and then gaining regaining trust in science is another one. But is there anything actionable that people could do to help this issue other than just reading up and

Eric Topol (06:59):

Well being up on it, but if we all put pressure on our governmental representatives, maybe we see some movement,

(<u>07:09</u>):

But there hasn't been that, and I should say the toll of long covid is profound with millions of people. We've done a lot of work on that here, and that's what's often missed is, oh, well, the death rates are lower now, the hospitalization rates. Well, what about the fact that there's millions of people suffering and more that are getting infected now? So it's just sad that we don't use that pressure that we have supposedly we're being represented, and it doesn't show with respect to the commitment for the current problems with covid no less the ones we're going to face in the future.

Lauren Fish (07:48):

Right, absolutely. And these wearable technologies too, that or these biosensors, even being able to track things like heart rate or step count, where in the days leading up to you actually knowing you're sick, it could actually predict this information.

Eric Topol (<u>08:02</u>):

We published on that multiple papers that the triad of more sleep, higher heart rate and less steps is a precursor to covid or flu. And it doesn't take, oftentimes those metrics might not even be notable to a person, but when you flash the data in front of them and say, well, this could be an infection, and indeed it often was. So we're not using simple things like that.

Lauren Fish (08:33):

Crazy. Well, hopefully in the future, hopefully it is changing towards that because it just seems like a huge missed opportunity.

Eric Topol (<u>08:40</u>):

Yeah, no, it really is. The digital part never gets the respect that it deserves. So inexpensive, passive easy, and we've never gotten CD, C, the state of California, other attempts, shots on goal, and they've all come up blank to get that at scale.

Lauren Fish (09:02):

But why, for digital specifically, is it just that implementing it is too difficult or seems too cumbersome, or is

Eric Topol (<u>09:08</u>): It No, no. I think everybody's been fixated on

Lauren Fish (<u>09:11</u>): Other things. Eric Topol (09:12):

Wastewater and genomics and the digital part just been a field of neglect. And anytime I've raised it with so many groups and it's kind of laughed off, and there are over a hundred million people that have capability for risk data capture, whether it's Fitbit or these other smart watches, Garmin, whatever.

(<u>09:40</u>):

They're out out there, they're wearing, and if they're collecting dust in a drawer, put 'em on. But the point is that most Americans have, and if we covered, they took our work in Germany and they used that and they had an instantaneous map of where hotspots were in Germany of Covid, and we're not doing it here.

Lauren Fish (<u>10:01</u>):

Yeah. It's like this is a real case study of it working.

Eric Topol (<u>10:05</u>):

Yeah.

Lauren Fish (<u>10:05</u>):

Well, hopefully in the future we'll have learned.

Eric Topol (<u>10:08</u>): Got to be patient. I guess

Lauren Fish (10:09):

That brings us to the end of this insightful conversation with Dr. Topol and Pandemic Preparedness. We hope you gained a deeper understanding of the challenges and opportunities in safeguarding global public health. A big thank you to Dr. Topol for sharing his expertise and vision for a more resilient future. Be sure to subscribe for more episodes where we continue to explore the latest and greatest in science and medicine. Thanks for listening today and catch you next time on science Changing Life, where listeners come curious and leave informed.