

CONVERSATIONS WITH MIKE MILKEN



Vas Narasimhan

CEO, Novartis

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Mike Milken: Vas, thank you for joining us today.

Vas Narasimhan: Great to be here. Mike.

You led Novartis's response to H1N1 in 2009. You described it as a trial by fire. What do you mean by that, and what did you learn then that is applicable to the coronavirus today?

When you think back to 2009, we had a situation not dissimilar to today in terms of the urgency at the time. We were pressed, as one of the largest partners with the U.S. government and European governments, to rapidly develop and scale a vaccine so that it would be ready for the fall, for this H1N1 strain.

We knew the virus was impacting children and pregnant women, so there was a big desire to move very quickly. When you think about the effort required to take a genetic sequence, get that into a vaccine strain, move it into our production, run – in the end we ran six clinical trials – and scale up to be ready to produce hundreds

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This interview has been lightly edited for clarity and readability.

of millions of doses of vaccine for the world. We were ultimately, I think, successful in developing the vaccine very quickly. Also the virus' profile was not as bad as we had worried about. Still, nonetheless, I think some estimates suggested it ultimately killed many hundreds of thousands of people in spite of an effective vaccine.

Now when I look back and think about what can we learn from that, you've got to take a longer term view in these situations. You have to mitigate the near-term crisis, as we're doing right now, but then really prepare for what are your longer term technical solutions – whether those are drugs, vaccines, diagnostics – and really get those elements in place. In H1N1, it was a very coordinated response across the various U S government agencies, European governments, the China CDC, the WHO to enable us to get to where we needed to be.

My last point would just be the things that we *didn't* learn from that pandemic and even earlier pandemics. We did increase the surge capacity in the system. And then what typically happens is over time that erodes – that capacity erodes down. People sort of forget that these pandemics have happened. I'm hopeful this time we'll learn some of those lessons so that we're really ready for the next one.

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As we redirected the various centers in the Milken Institute, one of our goals was to look at work that had been done in immunology that had resulted in these new therapies to energize the immune system and deal with the cytokine storm. The other thing we tried to do is identify all compounds that had already gone into humans, so we weren't starting at square one. How do you ramp up to produce hundreds of millions of doses? What is the technology that Novartis has created, since we might be heavily dependent on your ability to make things to get to the world?

Our effort right now to respond is in part looking at repurposing many of our immunology drugs as you rightfully point out to target cytokine-release syndrome and the acute respiratory distress syndrome. We're looking at hydroxychloroquine just because we're one of the largest producers.

Alongside that, we're also working on trying to tackle the protease and looking at, can we find a drug [for] the key protease involved in the replication of the COVID-19 virus? In addition, we're looking at some of our novel technologies and what we call the “glue degraders” to see if we can also degrade various elements of the proteins that are critical, we think, for the virus's ability to replicate and then ultimately kill host cells.

So we're taking a couple of different directions from the R&D standpoint. It's a multi-hundred-million-dollar effort on our side to really tackle this in the best way we can.

From a production standpoint, we are either the largest or second largest producer of medicines in the world. Last year we produced 72 billion doses of medicine. I think as long as we're using small molecule technologies, I feel very confident that we can scale up to meet the need.

We have already committed to donate 130 million doses of hydroxychloroquine and could produce hundreds of millions of doses more if needed – if ultimately the data and evidence support its use.

We will announce shortly that we are going to sponsor our own FDA-endorsed protocol phase 3 study on hydroxychloroquine to try to do a properly randomized, placebo-controlled study in early hospitalized patients based on what we've seen in some

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countries, and do it in a way that's highly rigorous. It's going to be hard to run this study, but we're hopeful we can do it and provide very high-quality evidence and then make the IP completely free to the world. I mean, we're not going to try to protect it, but the idea would be to try to definitively answer the question and just make that investment.

You're in Switzerland, China, India, the U.S. How are you dealing with your employees' safety, and has it been different based on what country you're located in?

You know, Mike, this has been an area we've had to keep evolving our thinking as we go, because this is a complex situation. If anything, I've learned from a leadership standpoint that this is a situation where you have to accept that there's a lot of unknowns and better to navigate step-by-step than overspending your time trying to forecast unknown scenarios.

We operate in a 152 countries, I believe. We're really present everywhere around the world. We started out trying to take a more, let's call it, consistent approach to all of our sites. But then, with all the different travel restrictions and all the different local policies, we've moved to a more tailored approach where we try to follow both local regulations but also what makes sense for our people locally.

That's also led to some important things we've needed to do to support our people. For instance, in India we've had to really ensure that our associates have broadband connections that are strong enough to enable them to do their very important work.

We've had to keep evolving our policies, particularly in Latin America, Africa and Asia where the situation is really rapidly shifting. In the U.S. and Europe we could follow the government guidance; in these other countries in some cases we've had to go ahead of the government just to ensure our employees are safe.

I think the most critical thing I've realized through it though is you have to be very transparent. Maintain your credibility with your people. Keep trying to take a people-first, associate-first mindset, and then when the people sense that, they're willing to really go the extra mile to deliver for patients.

You've mentioned two areas I'd like to follow up on, Vas. One is Africa – particularly, Sub-Saharan Africa.

We are very committed as a company to building our effort there. We've also launched a company-wide effort to maximize access to our medicines, even independent of profit levels, across the entire region. We measure ourselves really by trying to get the latest innovations to those patients, along with continuing our work in malaria and leprosy.

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People don't realize Novartis has now treated over 900 million people with our Coartem medicine over the years for malaria. It's an area I'm very passionate about. I am very concerned about the fragility of these healthcare systems. On my mind is, as we develop this next wave of innovations to tackle COVID-19 – whether it's repurposed medicines, whether it's new innovations – how are we always thinking, how can we scale and enable rapid access in those countries at the same time that we provide access in the U.S. and in Europe.

Even in past pandemics, it's generally been a situation where the U.S., Europe, and wealthier economies were in effect given the innovations first. And I think that's not going to be a defensible approach when we do have these innovations. So, it's something on our mind. We're thinking about it as part of the Gates initiative, thinking about it on our own as a company – but we have to be ready to scale these initiatives for those regions.

Let's turn to India. You have a number of members of your own family from India, live in India. Obviously this country is going to have eventually the largest population in the world. Social distancing might be much more difficult in India than it is in Europe or the

United States. We're well aware of that. You have a large number of employees in India. What is your strategy as you see that this challenge in India unfold?

I think in India it's a really complex story. One that's really a story of different countries within a country, with the rising middle class and the more well-off segments of the economy, you can have a world in India, particularly in urban centers, where I think there is a segment of the population that can manage with the social distancing, physical distancing. But certainly as you go down the economic pyramid and you get more to the bottom of the pyramid – and we're seeing that already in the slums of Mumbai, in Delhi, and in other parts of the country – you're going to have situations where the density of the populations are going to lead to likely very large outbreaks.

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The big challenge in India is we're just not going to know enough because of the diagnostic capacity being so limited. I think the approach we're taking is to protect our people as best we can; keep them at home; give them the technology they need; keep a very close eye on the situation in the regions that we work; understand that any numbers that we see are likely a significant underestimate of the actual disease burden. And we're going to have to see how the situation evolves.

There have been positive case studies in India. Kerala, as a state, has done a very good job at contact tracing and being very aggressive in how it manages the outbreak. But I think the reality is that it's likely going to continue to rapidly spread, and we'll have to be conservative in how we approach thinking about getting people back to work in India.

We think of the bioscience, and particularly the large pharmaceutical companies like Novartis, as potentially the defense companies of the 21st century. How do you position your own company for the future?

When I think about Novartis's future, it's all about our core purpose of re-imagining medicine. Can we keep developing cutting-edge science and technology that tackles the major human unmet needs across therapeutic areas, whether those are major diseases like cardiovascular disease, cancer, pulmonary disease, all the way down to the rare diseases and our work in cell therapy and gene therapy? We want to be a company that covers the full range of that human illness spectrum. That's what we really aim to do. That means you have to keep investing in the cutting-edge technologies that we have and continue to honor, of course.

I think a situation like this is going to bring into focus the biodefense question once more, which has been a question in past decades. Fundamentally, our ability to withstand pandemics is likely going to center around our ability to think of this more as a defense topic than a health topic.

I believe companies like ours could build elements of our strategy around biodefense capability. As a case study in that, when we work on a protease inhibitor for a coronavirus, our thinking is how do we create a protease inhibitor that could work on future coronaviruses, not just the current coronavirus, so that we create a longer-term pandemic preparedness. How can we think about this as well from a biodefense perspective and not just a kind of traditional public health perspective? I think this will definitely make companies like ours have to consider do we need a biodefense elements to our portfolio? We'll have to see. Right now it's opportunistic for us to, of course, focus on antivirals. We have enough to do normally with our 10 therapeutic areas and our broad portfolio of medicines. But I think this biodefense question will be one that will come up more and more.

Vas, thank you for joining us today. The world in many ways is dependent on Novartis's ability to continue to innovate and, as you say, follow the science. And we look forward to many more successes and solutions under your leadership.

Thank you, Mike. Thanks for the opportunity to speak. Great speaking, and wish you and the Milken Institute all the best.
