



## CONVERSATIONS WITH MIKE MILKEN



**Kiran Mazumdar-Shaw**

Executive Chairperson, Biocon

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**Mike Milken:** Thank you for joining me today.

Kiran Mazumdar-Shaw: It's a pleasure.

India has gone under a dramatic change in the last decade or so. The country that in many ways is the backbone in technology for so many companies in the world is your home. Before we talk about your response to the COVID-19 crisis, I'd like to talk about your life's journey and how you got here. You're the EY World Entrepreneur of the Year in 2020, a fantastic honor. So, let's go back and talk about the path you thought you might be on as a young girl.

I did my bachelor's degree in biology, chemistry, and botany, and then I decided to pursue a very unusual master's program. It was my late father, who himself was a brewmaster, who decided that maybe one of his children's should actually be influenced with his own profession. He made me take up this program

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near Melbourne, in Australia, and I actually did very well in that program. I planned to pursue a professional career in brewing.

I came back to India full of aspirations to have a brewery put in my charge. That was not to be, because I was told that this is not a job for a woman. And you can understand how I felt after pursuing such an unconventional kind of a program to be told that I wasn't wanted. So it was a very despondent state I was in, and it was almost kind of a rebellious streak in me that kind of made me accept an offer from an Irish biotech entrepreneur, who said, hey, would you like to partner with me in starting a biotech company in India? And I said, listen, I have no clue about how to run a business, I have no money to invest

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***“My father told me money is not something that you buy favors with. It's something you use to make a difference with. I believe in that. We want to make a difference. We want to help change this world for the better.”***

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in that business, and I've just been told that a woman is not welcome in the business world in India – so I don't know whether it's a good idea.

But he persuaded me. He gave me a lot of confidence, and he said, go for it. And so I did, and that's how I started my entrepreneur career in 1978. I was 25 years old at that time. I was a young woman, and it wasn't exactly a welcoming environment for a woman who was trying to start up a

company in biotech, which nobody understood. So it was tough in the beginning. Of course I wasn't taken seriously. I was considered high-risk by everyone. The banks didn't want to lend to me. People didn't want to work for me. And even businesses were very wary about doing business with me.

**You have received the Order of Australia, Australia's highest civil honor. How has the world changed for women and their opportunities?**

When I was building Biocon, it wasn't a place for a woman in the business world. Today, I think things are very different for women in India, at least in urban India. And the reason I say that is because we have the leading banks in India being headed by women. We have a large number of women-led startups in India. The tech space has a lot of women. I'm on the board of a company called Infosys, and Infosys has a very high level of women techies working in that company. We have close to 35% of women working in the, software sector in India. So things have come a long way. In fact, the head of the software industry body is a very bright woman. And the head of Intel in India is a very bright woman.

Almost 40% of my scientists are women. Women are far more confident than they used to be. And there are far more opportunities for women in urban India, but I wouldn't say the same is true of rural India, where they still struggle, where women still have a tough

time get getting into the economic mainstream. So, I think that's where we are really focusing on making sure that women have equal opportunities.

And the good thing is that the present government has really done a lot to empower women in many ways, starting with making sure that women have toilets to go to. Just to give them the dignity, I think is a big improvement that women are seeing in rural India. The women have now been given bank accounts so that they can be economically independent, and so on and so forth. So I think hopefully in the next 10 years you will see a big improvement for the status of women in India.

**As the cities have grown throughout India, Bangalore, where you live, has about 10 million people. It's the center of technology for so many companies. At the beginning Bangalore was one of the key examples of a city where the virus had not spread – just maybe a couple hundred cases. As you see the number of cases in India increase dramatically, when we talk about social distancing, I don't have to tell you, for large parts of India it's impossible to have social distancing. Give us the view from a pretty modern city like Bangalore, and then from other parts of your country.**

India has about 1.8 million cases to date, and we have just over 38,000 deaths in the country. If you look at Bangalore in that context, Bangalore has over 50,000 cases to date, and we have about 2,500 deaths so far. Now, if you think about it, the percentage mortality is much lower than the world average, and for a country the size of India, that's pretty good news. We used to call it the Bangalore model for COVID management up until the end of May. But the truth is that up until the end of May, India was in a lockdown. And during the lockdown, states like Bangalore and the state that I'm in, Karnataka, were doing very well because they were using technology to trace and track every single outbreak.

And that contact tracing was amazing. For every one positive case, they could contact trace between 45 to 50 people. Therefore we kept the disease under check. But the moment the unlocking happened, I think people were under the impression that the virus has been chased away and we can now go back to normal life. And that was a big mistake. So I think that's how we saw the surge in infections, and now I think the government is scrambling to try to get back to the

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containment and quarantine methodologies that they had adopted during the lockdown time, which is now very difficult to pull back. Having said that, we are now trying to triage patients into sort of mild, moderate, and severe so that we don't overwhelm our

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hospitals. At the moment, the hospitals are just about coping, so we just hope that our mortality rates don't increase.

But the good news is we are also getting better and better treatments. I think the number of people who are on ventilators is reducing, and we just hope that we get things back under control. Now it is forecast that India is going to start peaking at different times in different parts of the country because we are like a mini-Europe. We have different states with different ethnicities and with different kind of densities of populations, The most fascinating part of India is that slums seem to have developed herd immunity because the serosurveillance that they did in some

of the most congested slums in Mumbai and other parts of the country had in excess of 50% to 60% positive antibodies, which means that these very congested areas have actually developed herd immunity, which is a good thing.

Rural India, I'm told, has actually practiced its own containment and isolation. They're not allowing people to come into their villages from outside because they're scared of the virus infecting them. So in their own way, they've actually practiced their own form of lockdown. That's why I think the death levels at the moment are quite low. It's quite fascinating to see behavior all around the country. The cities that are worst affected are Bangalore, Chennai, Mumbai, Delhi, and all the big cities. They are the ones who are worst affected, but they're peaking one by one. So it's being forecasted that by the end of November all the big cities would have peaked. At least, that's the expectation.

**When you talked about the rural villages, there's another side of this COVID-19 crisis. And that is the economic side. India has a very large informal society. And so that informal society, if they're not working or they're not out doing odd jobs, they're not bringing in any money. What's the government response and your company's response?**

Let me start by saying that this has been a human tragedy of huge magnitude because we have an exodus of migrant labor. These people come from villages to work in cities, and the moment the pandemic broke out in all the cities, I think the government had not anticipated that these large droves of migrant labor would want to go back to their

villages. The government kept sort of insisting that they stay back in the cities, but they hadn't provided enough support to them to stay back. So they all decided to venture back, and it was like the exodus that happened during the independence time – these huge caravans of people migrating back to their villages.

We started distributing food kits. The government in the meantime realized that they had to swing in. So they decided to basically give them a small handout for a period of time, a minimum income. Then they started a lot of economic activities in the rural hinterland where they could then be employed. That's what they've tried to do: to create some of these rural infrastructure projects where they are going to hire these people and give them employment.

Today it's all about livelihood. The first part of the pandemic was about saving lives; now it's about saving livelihoods. That's what's happening across the country. Things are slowly limping back to normalcy. We are finding a lot of the labor now coming back to their jobs as the economy opens up but, it's taken a huge toll.

**India's had not only workers move to cities in India, but it's had large numbers of workers move to other countries. How has that played out during this coronavirus?**

India did a very good thing. They actually sent flights to bring a lot of these people back to India, and sort of rehabilitated them and made sure that they had something to come back to in terms of at least having a roof over their heads. I'm on the board of Infosys, and Infosys also sent a few flights to the U.S. so that they could come back. So I think everyone's

tried to do whatever they can to get people back to India in case they were stranded and had no means to live in those countries. So I think a lot has been done in that sense.

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**We've had the honor of being in the Giving Pledge together. How have you led your philanthropic activities over the last five to six months?**

We reached out to a lot of the poor communities around the country. We looked at providing them with small amounts of money basically to just survive every month. So we have given that to at least 10,000 families in the poorer slums and migrant labor communities in the country. We've helped a lot of the construction workers because

there has been a lot of construction workers who have lost their livelihoods. We've made sure that the contractors have actually created camps for these construction workers, made sure that they've been fed. We've done a lot of that as well.

Food, of course, has been distributed, and we've given them a lot of amenities for their children. In addition to that, we've also distributed a lot of free medicines. We've actually done a lot of testing for the government. We have a COVID-19 testing laboratory in our facility and we do a lot of RT-PCR and antibody tests and antigen tests in our labs. We are supporting all the government hospitals with these tests for the patients. We are actually considered to be the number one private lab that has given them free testing for all the patients

So that's another part of our contribution to the COVID management crisis. We've also bought a lot of PPES and masks and what have you to distribute to a lot of the hospitals, the COVID care centers. So we've done all of that.

### Have you discovered anything as you've looked in this area that has applications that might be able to control COVID-19?

We actually have a very exciting monoclonal antibody which we had developed for autoimmune indications like psoriasis and rheumatoid arthritis, which we are now repurposing for COVID-19 because of its very unique mechanism of action. This is, an IgG1 anti-CD6-targeting antibody. The beauty of CD6 is that it is actually over-expressed on affected T cells, and these affected T-cells trigger a hyper-immune

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response which causes cytokine release, which is why you get these autoimmune responses in some of the diseases I mentioned. And if you remember in the early stages, it was being treated like ARDS or pneumonia, and they were just sort of giving it its normal treatment. They found lots of people were dying, and they couldn't figure out why.

They found that it wasn't just a pneumonia-like situation, but it was actually because of a cytokine storm

that was causing this intense inflammation and hyper immune activity in the body that was reducing the oxygen intake into the lungs, causing this organ failure because of the huge load of cytokines, and causing almost a sepsis-like condition in the body. Patients were dying. If you remember a lot of antibodies were being tried to see if they could intercept the cytokine storm. IL-6s have been tried, and then when I looked at what was

happening with many of these antibodies, these were antibodies targeting single cytokines. That's why it was not as effective as it should be.

In our case, we don't regulate the entire cytokine cascade, and so we felt that this had a better chance of actually arresting the cytokine storm than taking one cytokine at a time. We did a proof-of-concept study in India with our drug and we got some very compelling results: All the patients who took our drug recovered very well, and in the small control arm that did not take our drug we had quite a few deaths.

We got an emergency-use approval from the regulator in India. We just received it a couple of weeks ago, and in these two weeks we've actually treated over a thousand patients in India, and most of them have recovered. I think they are very, very encouraged by this data. We have also licensed this drug to a San Diego-based company, Equillium, and they now want to actually start the COVID trials in the U.S. We are hoping that we can do something to save lives with this drug.

Many of the immunology drugs, as you know, that energize your immune system had to control a cytokine storm because you could energize it at too high a level. And so we've been looking at that opportunity.

When I think of education, I think of India. Those individuals born into the lowest socioeconomic in many ways, their only path was education. And I know when we have kids talking about competition in the United States, many of our own scholars have told us that competition is a hundred times more in India as it is in the United States. So, the concern over schools, the operation of schools, the educational system – how do you see that challenge being met?

For every parent, I think they live to educate their children so that they can have a better life. And it's amazing to see how these kids, when they're given an opportunity to educate themselves, how well many of them do. Many of them who are really bright get on to coming to the universities in the U.S. and

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when you hear stories of Satya Nadella and Sundar Pichai, they come from very modest families back in India. They've done so well because they're just so bright and intelligent,

and their parents educated them by sacrificing many things in their homes. So I think these are wonderful stories.

Now, India basically has just come out with a national education policy. We have a huge problem where you have schools, but you don't have teachers, and you have children who want to educate themselves. There's a mismatch between the number of schools and the number of teachers. I think technology is beginning to address a lot of these deficits. Even though all of us have grown up in a pre-computer age, so to speak, and therefore we believe you cannot deliver good education on a tablet or on a smart phone. But it's amazing to see how these young people learn using new technology. So I think today they want a hybrid model of how do you basically democratize education; give them quality education, at least on a digital platform; and then help the teachers to give them the real-life experience of being in an academic setup, which is really more to do

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with making friends and understanding how to interact with society more than anything else.

So I think this new education policy is also now inviting a lot of the foreign universities to basically set up satellite colleges in India, because that is the dream of every Indian – to go and study overseas. You'll be very interested to know that we set up something called the Biocon Academy. And this is in

partnership with the Keck Graduate Institute at Claremont, California. There were a lot of biotech students who kept complaining to me that they were being turned away by industry because they said you're not “industry-ready.” So we decided to set up a finishing school. And I did this in partnership with KGI, and we have an amazing program that we've been running for the last five years. We've graduated over a thousand students for the biotech industry in India. I can tell you that they are all well-placed doing great jobs in the biotech sector.

I've had the honor of being able to teach school in India, and in many of these schools I've visited, they are delivering what we would think of in the United States as a private school education for \$1,000 U.S. a year – an unheard of capability. When I taught math, I wanted to know what level the children were at. I taught children as young as five, and I've also taught in college in India. Many of the children in India are far more advanced than the children in the United States in mathematics. And as I spoke to them, their complaint was when they took those academic tests that would be required – SAT, ACT – the tests were covering things that they had done in 10th grade or when they were a freshmen, and they had to go back and review material that they had done two or three years earlier. They wanted to take the English part of the test in their senior year in high

school, but they said it would have been easier if they were a freshman or sophomore taking those math tests.

Of 11 countries in Asia, the number one thing that people in the middle class in India told us – their number one family activity – was studying with their children. I think the percentage was 27% of every middle-class family wanted their child to get a PhD. Well in the United States, just graduate degrees, not PhDs, about 7% of the population. So the aspirational nature in India of education was four times the United States.

And as you noted here, if we looked at all the companies in the last generation created in Silicon Valley, 15% to 20% of their CEOs were born in India. And as the issue of immigration to the United States in the 2014, 15, 16 period was so vivid in this discussion, the largest percentage of people that came to the United States as immigrants were either from India or China at that time. And so the U.S. has benefited greatly from the diaspora from India. And all I can think back is to the competitive exams to get into the schools, particularly the technical schools.

It's fiercely competitive because as you rightly said, it's a kind of a filtering process. You have to get used to the fact that you're going to compete to get into the best schools in India with at least 100,000 people. That's the kind of competition for it. There's such a disproportionate mismatch that you finally get the best of students who finally make it to all these premier institutes. There is the IIT – the Indian Institute of Technology – where all these guys in Silicon Valley come from, because every one of them competed with such a huge number of students. So I think you have to get the best when you finally graduate from these schools.

India is such a diverse country – with diverse languages and cultures. And as we drove the backroads of India, we saw cattle, of course, on the roads, but we also saw elephants and that brand new highway that you can take from Varanasi, or from seeing the Taj Mahal, to Delhi. It's so amazing to me. How do you bridge those hundred centuries?

Well, when you live in a country like India, you're immersed in this kind of an environment, which is all the time in contradiction and in harmony with each other, if you know what I mean. That's why I'm very committed to compassionate capitalism, which is what I like to call my business. When people ask me, what drives you? I think it's about providing affordable access in my business to patients around the world, right? My products are there to help patients who need it anywhere in the world. And therefore, I believe that if I can actually produce these products in a way that provides affordable access to either the countries, which finally give it to the patients, I think I will be very driven by that sense of purpose.

It's about a billion patients, not just a billion dollars. The billions will come later, but it's about serving those billion patients first, which to me is my sense of purpose. Both you

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and I have taken the Giving Pledge. My father told me money is not something that you buy favors with. It's something you use to make a difference with. I believe in that. We want to make a difference. We want to help change this world for the better. And so when you want to do all of that, then I think you have a very different understanding of what life is all about.

India reminds you every day what it means to be poor, what it means to be rich, what it means to be ill, what it means to be healthy. It reminds you all the time. I can't get away for even a minute in my own country without seeing somebody who is really deprived. And you learn to

accept all this together, and I think that's the melange that India is. It is about life. It teaches you many things about life, because it always is constantly evoking your conscience.

**Americans and Europeans discovered with the coronavirus outbreak, that many of the products and ingredients they needed were being manufactured in India. Where do you see the future of your country?**

COVID has brought a lot of spotlight on how India should look at the future. We are the largest producers of vaccines in the world. We're the largest producers of generic medicines in the world. And if you actually look at you're just combining these aspects of the biopharmaceutical world, we only account for 3% of the value chain of the pharmaceutical industry worldwide. I said to our government and I said to our industry, there's something wrong in what we are doing. We've got to start creating value. And we've got to start leveraging our science, our technology, and really move up the innovation part.

So I think that's what India is now focusing on. For instance, vaccines. I think the whole world now realizes they neglected zoonotic viruses and the research and innovation around zoonotic viruses for too long. Now, India is home to zoonotic viruses. You have dengue, chikungunya, now coronavirus, you have SARS, H1N1 – you name it, it's all there. But we have done nothing to research these viruses. We've done nothing to develop new technologies or even look at new adjuvants or new formulations or new

delivery systems. We can do all of that. So why not be a part of the global innovation value chain? That's the real way forward.

On top of all this, you've got IT: data analytics, data science, all of this has to be a convergence of technologies. India has it. India has the largest number of medical professionals graduating every year from college. India has the largest number of engineers graduating from college every year. So on and so forth. Why are we not leveraging this talent and innovating instead of just providing services or just doing contract manufacturing? That's the question. That's the part I look forward to – India the innovator, and not just India the maker.

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**I wanted to ask you about this quote, which was one of my favorite things I've heard you say. “I managed to do things with a lot of common sense, a lot of determination, and a lot of foolish courage.” Tell me a little bit about that.**

When I think about my journey, the fact that I decided to start a business when I knew nothing about it, I think that was foolish courage because I just sort of convinced myself that I could do it. I had not gone through any formal business education. So I just had to use common sense to figure out things. And I think that was very important. I think all of us, I'm sure you yourself, use a lot of common sense in making judgment calls. I don't think I ever used a consultant to tell me how to take a decision. I've never really sort of bothered about being too analytical and do a deep dive in assessment of a certain decision I have to take. I just make a judgment call that's based on common sense. I'm very determined because I had to prove that I could do it. I had to prove to myself that I can succeed. I had to prove to the others who didn't believe in me. So, I think that's the combination I've used as what drives me if you know what I mean.

**You're an inspiration to me and so many others in the world. I want to wish your family all the best health, and we look forward to what you have created here and maybe have found a solution for some of the problems with COVID-19. Wonderful to be with you today.**

Thank you, Mike. This was just wonderful.