

## CONVERSATIONS WITH MIKE MILKEN



**Albert Bourla**

Chairman and CEO, Pfizer



**Alex Gorsky**

Chairman and CEO, Johnson & Johnson

*December 16, 2020*

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**Mike Milken:** We are fortunate enough to have the leaders of two of the most important companies in the world, Pfizer and Johnson & Johnson, join us today, who have been active particularly in the last year working on COVID-19. Their expertise has changed the world for so many people by dealing with life-threatening diseases, and not only extending life, but improving the quality of life. They've met many, many years ago. So Albert, when did you first learn about Alex?

**Albert Bourla:** Well, I did learn about Alex when I admired him because he was always a role model for me. He was the CEO of a very successful corporation for many years. And when I became a CEO we got to know each other and somehow Alex became my mentor. I know it's a little bit unconventional because we are competing as a heads of two different companies, but I was fascinated with his leadership style and he was very willing to help me navigate the early days of a CEO. Then we realized that in real life we had met also before, because Alex used to serve in the U.S. military, and he was serving

in a U.S. base in Greece the years that I was studying to be a veterinarian a very few miles away from his base. Indeed it is a small world.

**So Alex, what memories do you have defending the Eastern front there in Greece?**

**Alex Gorsky:** Well, Michael, thank you so much for having me and really just kudos to you, the Institute for your decades-long commitment to science, to research and development, because were it not for your efforts, we likely wouldn't be having the conversation that we're going to be having today. And taking it a step further to be educating and informing people of really the meat of these important topics. And it is interesting how our lives go, and how the world goes. As Albert mentioned, who would have thought that nearly 35 years ago that Albert and I would have been living probably within an hour of each other, not even knowing it, in the northern parts of Greece.

And to think that here we would be decades later taking on another enemy, the virus in this case, but here too, working together being part of a mission that's way bigger than either one of us, I've known Albert for some

time in the industry; it's great to see leaders like him, particularly who have come from the science part of the field, particularly at a time when the technology and the new capabilities are creating new opportunities that we couldn't even have imagined probably 10 years ago. That kind of leadership, I think, is so important. It's been great partnering and collaborating with him every step of the way.

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*"I wrote down on a small piece of paper, three bullets. The first one was we have 90,000 people working right now; I need to do something to protect them. The second that came to mind was the hospitals would be overloaded. And the third was, what role can we play as a company to find a solution, a medical solution, to this pandemic?"*

- **Albert Bourla**

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**So Albert, take us back to this year and your work on the vaccine for COVID-19.**

**Albert Bourla:** I was very concerned when it became a problem in China in December and January because we have very large operations in China. We have thousands of Pfizer colleagues working there and took it very seriously, took a lot of measures. I was thinking this is going beyond what we all thought, what should be our priorities?

And this is where I wrote down on a small piece of paper, three bullets. The first one was we have 90,000 people working right now; I need to do something to protect them. It was

not clear at the time what governments would do, what employers would do, and it was not clear in my mind what we should do. All I was thinking was I need to do something.

The second that came to mind was the hospitals would be overloaded. Everybody's saying that this pandemic will create a huge burden to the hospitals. We are one of the biggest providers of injectibles to hospitals in the world. We are providing one point something billion units every year in the world, and that was thinking, how am I going to maintain our sites open so that they can continue supplying.

And the third was, what role can we play as a company to find a solution, a medical solution, to this pandemic? Pretty soon we came to a conclusion that both in antiviral

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***“We've got to have robust, resilient, strong, global public health care systems. If this has taught us anything, it's that if we don't have well-established well-coordinated global public health care systems, we are all exposed.”***

**- Alex Gorsky**

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and in vaccines there's something that we could do. We had at our disposal basically experience with all different technologies that could be applied to develop a COVID-19 vaccine. And, it was our scientists who told me, we want to do the mRNA technology. And I asked them, are you sure that would be the first vaccine that will be done, with a technology like that. And they said, yes, it has the best odds to deliver.

So this is how it started. For us, we had already an agreement with BioNTech to work on this technology, and we are working with them on their flu vaccine. We spoke with them and then we said, let's work together on a COVID vaccine. We started with working, because both of us, we were thinking, this is not business as usual. This is not about return on investment. That world is needing a solution. That was the whole story, and the rest is history. It's nine months of endless days and nights with many setbacks and many successes. I used to joke saying that if you're lucky you can enjoy good news for one half, two hours, maybe, because of the frequency that the bad news will come. We knew that the stars needed to be aligned to be able to achieve such an achievement. And I'm still thankful to God that the stars remain aligned all the way to the end.

### **And what about manufacturing?**

**Albert Bourla:** Oh, it was part of this nine months work. The traditional way to know if we had the product and then we tried to manufacturer, it wouldn't work in this case. So we started manufacturing efforts as if we had a successful vaccines from day one. We started ordering equipment, building equipment, liberating our manufacturing lines, sending production to other places, trying to perfect the manufacturing process, which we were far from being able to scale it up. But actually, we were at the stage that we're

trying to manufacture for our clinical trials. The first truck of finished goods left our Belgian manufacturing site, then crossed the Chunnel and drove to the U.K., which was the first country that approved the product, hours after the approval. And this is where we started the first vaccination.

**What is your capability of manufacturing today? How many doses could you manufacture in the balance of December, January, February, March?**

**Albert Bourla:** In December, we will make approximately 50 million doses after quality controls and everything. We expect that we will be able to ramp up after 1.3 billion doses – this is a two-dose vaccine, which means that the 1.3 billion doses will provide the protection to 650 million people.

**Alex Gorsky:** We're just all so pleased to see the outcome that Pfizer has been able to achieve. I think this is tremendous news for the world to see these kind of results. And while clearly all of us were very hopeful that we were going to see robust efficacy and safety from some of these new technologies, clearly the early results that we've seen, I think, surpassed all of our expectations. It gives us hope for many of these new platforms that will have to be proven by the trials, but I think it's a great signal that under Albert's leadership what Pfizer has been able to achieve.

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- Albert Bourla

And Albert's still a relatively new CEO, and to take that kind of risk, to have that kind of vision to bank on the science, that's never easy in a big organization. I think it's a testament to Albert's leadership, but also to the commitment of the industry, where we've seen many examples of people stepping out of the normal paradigm of business to say, 'what do we need to do to really make a difference at this unique time in history?'

We had had experiences with SARS and Zika that didn't go in near the direction that we've seen here. So there were some skeptics, some others that were quite concerned. But I think one area where there wasn't really much debate was our need to get involved from very early on. And the early interest within Janssen and Johnson & Johnson was more around our antiviral portfolio and could some of those be applied to fight this virus. We also have a very broad monoclonal antibody area and there was some interest in those. A team of scientists actually took some of the very early genomic sequencing information, they applied it with our vector technology and we began assembling a small team. Within literally a matter of weeks, we were seeing encouraging data coming out of

some of our pre-clinicals and some of our animal models that quickly put us on a path to say we feel that we could potentially be in a position to really make a difference.

I cannot think of anything that's occurred in the last 50 years where we saw more collaboration than in an effort here to stop COVID-19 and find solutions for it. Collaborations among pharma, government agencies, academic institutions that came together here. Do you see this changing the future? Or do you see this as a one-time experience, Albert, to try to put in place something in a short period of time that would solve this problem.

**Albert Bourla:** I believe that collaboration between the pharmaceutical companies had started way back, and the necessity was that science is very diverse. Now we have for everybody biological target, zillion types of approaches that could be taken. They are cultivated in academia, they're cultivated in multiple biotech companies and in multiple

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biopharmaceutical companies. So we already started doing collaborations because that's the only way that you can advance the medical science right now. But you are right: what happened during COVID is unprecedented. And that demonstrates a greater example of what can be accomplished when you do something like that.

I'm very proud for what we have been able to achieve altogether. We will see many more companies in the next few weeks and months demonstrating similar successes in their projects against COVID because one vaccine or two vaccines and one or two therapeutics will not be enough for the entire world. The world needs options. It needs different scientific platforms and manufacturing volumes. And that's why I hope that the cutting-edge technology that J&J is using right now will also prove to have equally better results. The world is needing it. But I think in the future, we'll see much more of that. We will see collaborations and we will see a healthy competition, which is also a very big driver of success that will drive scientific miracles. Because if we were able to do it in COVID, why not Alzheimer's? Why not in cancer? Why not in the other devastating diseases?

When we started funding medical research out of our foundations, we discovered a lot of people didn't want to share, and we told them, well, we couldn't really share our money unless they were willing to share with others, their data, their ideas. Ultimately, everyone agreed at some level to share. So, when I see arch-competitors Regeneron and Roche teaming up for manufacturing capability and others, this collaboration has taken on a whole new sense during COVID.

**Alex Gorsky:** I think history has shown us to have major leaps forward almost after every crisis, whether it's a war, a natural disaster or frankly a big challenge such as going to the moon, that these kinds of inflection points force us to go in new directions to collaborate and to accelerate technological breakthroughs. Clearly, it's been impressive to see the collaboration across industry. I'm sure there's not more than a few weeks that go by where Paul Stoffels, our head of research and development, isn't talking to Miguel Edelstein, who's heading R&D for Pfizer; where they're on a joint phone call on Saturday morning with heads of R&D and Francis Collins and Tony Fauci and other leaders around the world, again, collaborating, sharing information, data insights.

The collaboration that I've seen with the government, certainly at a national level, where, whether it's the FDA, the CDC, the NIH, Operation Warp Speed, others, where people are really trying to make sure that we're marshaling all of our efforts, reaching out, trying to do their best to facilitate acceleration of these things. But again, ensuring at the same time that we have a robust and rigorous process in place.

I think that there will be opportunities for us to collaborate in new ways, hopefully based upon the lessons that we've learned through this. Science just happens so quickly today. If you're not constantly looking externally trying to build a partnership with academic centers, with the venture community, with others that you've played a role in helping to create, there's just no way that you can keep pace with the cutting edge of science and pushing into a new direction. I'm encouraged by the kind of partnering and collaboration that I'm seeing.

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*"In a pandemic, it's important to understand that there are no borders; you are as protected as your neighbor. It is extremely important that you try to have a global mindset when it comes to this pandemic. I think we are going to be much better prepared next time, because I think we'll learn a lot of lessons."*

- *Albert Bourla*

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**So Alex, when we spoke on April 5th of this year, you spoke about maybe the possibility of getting the vaccine approved in the first quarter of 2021. Where do you stand on that eight months later?**

**Alex Gorsky:** We're in the midst of our Phase Three trial as we speak and the teams are working very hard, as I'm sure Albert's, as well as the Moderna team have done, to reach as diverse of a patient population as we can. Unfortunately, this disease has taken an extremely heavy toll on underserved populations, such as African-Americans, Hispanics. We're making sure that we're reaching the elderly population and others. And we remain confident that as we proceed into the first quarter of next year, we will have a clear indication around the profile of our product and around the early results of the trial and be

in a position to talking with regulators. It's difficult to say exactly, but things are progressing well and we continue to remain confident in the kind of timeline that you just mentioned, assuming that everything stays on its current track. That's one aspect of it.

Now the other is the manufacturing component, and can we produce enough in a period of time where you can make a difference? More than a decade ago, there was a technology called Persys that utilized a different kind of protein and biology in the production of vaccines that allowed us, without diving too deep into it, we could get a yield of literally tens of millions of doses of a vaccine in a relatively short period of time. And for us, this was a game changer because this meant that, assuming that our platform

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worked, that we could very quickly be able to scale it. And so that's what we've been working on, we're partnering with numerous companies around the world, and now we're in a position where we feel confident that in the first half of 2021 we should be able to provide hundreds of millions of doses. And by the end of next year, we should be in a position to have close to a billion doses, assuming that our clinical trials prove out. We're manufacturing at risk as we speak to make that possible. And then by the way, this won't just be a 2021 issue. I'm quite certain that the next several years we'll be dealing with this in a pretty significant way.

**So Albert, I want to move to the next area with you and Alex, and that is distribution and what role the companies will play in distributing the vaccine.**

**Albert Bourla:** To distribute to all the countries of the world within the next six months, hundreds of millions of doses makes it a very big logistical challenge, very big. It's something that we don't do every day. This you can only do it in crisis, like a pandemic. We had, in addition, to deal with the fact that our product needed to maintain in minus 70 degrees Celsius before it's going to be used in people. So from day one we started using technologies, also how to be able to simplify this logistical challenge. Our engineers developed a box, but it is an ISO thermic box that can carry, it's the size of a suitcase, can carry from one to 5,000 doses and is equipped with a GPS and the thermometer, and you can transfer to the box with normal transportation. And in case something happens and the temperature goes below the acceptable levels, we know that we can withdraw the box. You don't expect that to happen. Fabulous, major innovation, I think this box by itself we hope will simplify it tremendously, the whole effort. And as I said yesterday, a



big truck left our facilities in Belgium to go to U.K.; they were transporting in a normal truck, not in everybody's special vehicle.

We are working particularly with the U.S. Army and General [Gustave] Perna, who is responsible for the logistics of the army. He's very, very knowledgeable about logistics. I believe that immediately, we should be able to have a very smooth, logistical flow of hundreds of millions of doses all over the world.

**It was 1955 when I got my polio vaccination, and there was a concern by some people not to take the vaccination because it might give you polio. What are the issues you see in getting wide acceptance of vaccines during this year?**

**Alex Gorsky:** It's going to require transparency. It's going to require the building of trust. And it's going to require broad collaboration between industry, between governments, academia, thought leaders and frankly, all of society. I can understand some of the skepticism and cynicism, but Albert and I worked together and we felt it was really important for the industry to make a statement that we would absolutely not compromise the standards, the protocols. We would work very closely with regulators to ensure that we were doing everything we can to provide the level of transparency and all the appropriate methodologies to produce a safe and effective vaccine.

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We felt it was important to have all of the pharmaceutical companies that are participating, whether for therapeutics or for vaccines, to join in. There's been a huge commitment around providing details regarding our study that more than 30 years in the industry, at least from my perspective, I've never seen that kind of transparency. And many times it can be quite challenging because information and data is being released, frankly, before we know about it, ensuring that we have the objectivity and the independence of third parties, such as advisory committees, independent safety monitoring boards, who can very objectively and independently ascertain what the data is actually saying. We think that's important for people around the world to know. We've followed all the appropriate protocols that have been established through decades, if not centuries, of research.



We are investigating this with patients who are afflicted by this disease as well, and that we're going to do everything we can to reach diverse populations – young, old, black, Hispanic, other ethnicities. We know Pfizer Moderna has taken an mRNA approach; we're utilizing a vector approach. Some of these vaccines may end up having different characteristics in particular strengths in one patient population versus another. There

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could be nuances of difference between onset and durability, and that we think the more options where we've demonstrated safety and efficacy that healthcare systems, the physicians can have to use with patients, all of these things will not only give greater confidence and greater trust, but will also offer again, just more options to be considered and ultimately lead to the best overall outcome.

One of the issues we've been looking at is the distribution, reaching seven billion people. We've never done that in the world's history. I am very encouraged though, here too, by the partnering and collaboration that I've seen certainly here in the United

States with General Perna and his team, but also the pharmacies, the distributors, the public-private partnerships, the level of work being done at the states as well as with the federal government.

If you would have asked me only eight weeks ago if we would be where we are today, I think I would have been more skeptical. But I think we're making very good progress, and we're seeing it globally as well. We're seeing good collaboration among the developed countries, but also with GAVI (The Vaccine Alliance), CEPI [Coalition for Epidemic Preparedness Innovations], with the Bill and Melinda Gates Foundation and others to make sure we're also reaching those populations. Because it's not until we have a global solution that I think all of us are really going to be able to feel safe and return to life in a new kind of normal.

**I'd like to talk about the future. Are we now better prepared for future pandemics? Albert, maybe you address it first, and then you Alex. Are we better prepared, and what do we need to do on a permanent basis, not this crisis basis? Albert?**

**Albert Bourla:** This experience tells us that we were not in fact well-prepared and there was not great collaboration between the countries. We didn't get our act together right in the beginning. And in a pandemic, it's important to understand that there are no borders; you are as protected as your neighbor. And, it is extremely important that you try to have a global mindset when it comes to this pandemic. I think we are going to be much better prepared next time, because I think we'll learn a lot of lessons. Those lessons are at different levels, different categories. Clearly I think one of the very powerful lessons is the power of science and how that can play a role. I hope that not only the U.S. government, where biopharmaceutical industry, for example, is the crown jewel of technology biotechnology, but all the governments of the world will create legislation that will encourage innovation to flourish so we will be even better prepared technologically the next time.

I think another message, frankly is the power of the public sector. The diagnostic tests came to resolve some issues only when the private sector took it seriously and started the producing. Therapeutics came from the private sector. The vaccines are coming from the private sector. I think it's extremely important also for the world to understand that it is a very healthy to maintain a vibrant private sector that can step up and help the entire society. I think WHO [World Health Organization] needs to be reformed, but we should never get out of the WHO. I think we should get back and try to make a better; but we need WHO. So I think all of these are lessons that will make us much better prepared in the future.

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**Thank you, Alex. Sputnik, 1957 went up and NASA was formed. DARPA [Defense Advanced Research Projects Agency] was formed. Today, it's 63 years later, and DARPA still is playing an important role. Are there things that have been put in place that we should make sure they stay put in place to get us better prepared for the next time?**

**Alex Gorsky:** Yeah, absolutely. Michael. And look, I agree with Albert's comments and I think he was spot on. The only other additions that I might make are first of all, we've got to have robust, resilient, strong, global public health care systems. We don't have security as society if we don't have public healthcare security. And unfortunately, for too many decades it's always been the 13th-highest priority among everybody's Top 10. And it's tough because there are budgetary issues. It requires investment. It can require stockpiling. It really requires planning for the future. But if this has taught us anything, is

that if we don't have well-established well-coordinated global public health care systems, we are all exposed.

And it's certainly my hope that going forward, we've got to learn from this and how can we better integrate, collaborate, bring forward our systems to ensure that that's in place for the long term. I think second is there's been a maniacal focus on efficiency on an effectiveness of our health care systems around the world, and I understand that certainly costs are important. We need to make sure they're value added. But we also for the long-term need to not only focus on efficiency, but we need to focus on resiliency, sustainability, and how do we ensure that these systems are built for these kinds of times?

There's not just one silver bullet that's going to work in any case. And how do we as a society think about investing in that for the future? How do we think about ensuring that we have an environment that's conducive to that kind of innovation? And finally, how do we ensure that we promote a system, a partnership of collaboration, as we were talking about earlier to make all that possible?

**Well, Alex, I want to thank you and Albert. We also want to thank your teams and all the employees for their commitment to solving this pandemic, and also hopefully laying the groundwork that we will be prepared for all future pandemics. Thank you for joining us today.**

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