An interview with Yaneer Bar-Yam on Omicron, BA.2 and the ongoing dangers of the coronavirus pandemic: Part 1

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Professor Yaneer Bar-Yam is an American scientist born in Boston, Massachusetts, who received his Bachelor of Science and PhD in physics from the Massachusetts Institute of Technology. He is the founding president of New England Complex Systems Institute. His research has focused on formalizing complex systems science and applying it to social challenges.

He is one of the founders of the World Health Network, a global coalition of scientists and researchers and community groups that have come together to protect individuals and societies from harm caused by the COVID-19 pandemic. We spoke at length with Professor Bar-Yam in April 2021, at a time when Delta was emerging as a threat to the globe. In the following interview, we continue the discussion on the pandemic and the impact of Omicron during the present global emergency. The interview was conducted on February 21, 2022.

Benjamin Mateus: Professor Bar-Yam, thank you again for accepting the interview. It is good to see you again.

You have been working diligently through your organization, the World Health Network, to bring awareness to the dangers posed by the SARS-CoV-2 virus and the pandemic. It's been more than two years since the World Health Organization (WHO) declared the outbreak that erupted in Wuhan, China, a public health emergency of international concern.

Until even their most recent meeting at the World Health Assembly, Director-General Tedros Adhanom Ghebreyesus has said the pandemic remains a public health emergency.

We are fast approaching one-half billion reported COVID cases and six million reported deaths. Excess deaths, however, are higher by three to four times. And despite the continued spread of the virus, countries are waving the white flag or declaring the pandemic over as Prime Minister of the UK, Boris Johnson, officially decreed despite significant opposition from many scientists.

Having followed the pandemic very closely, can you elaborate on these developments?

Yaneer Bar-Yam: Hi Benjamin. Thank you for having me.

I think that the first step is to really try to anchor ourselves in the incredible amount of suffering that is going on around the world as a result of this pandemic. The different pieces of it remain, the sickness itself, where even "mild" cases are "not mild" according to the person who is experiencing the symptoms.

The term "mild" is a medical definition, which means that you don't have to be in the hospital, but that surely doesn't mean that it's an easy disease to tolerate. Of course, there are some cases that are not difficult and even some cases that are asymptomatic. But there are many cases that are quite difficult for those infected.

And then of course there are hospitalizations and deaths. But the large, ignored problem is Long COVID, and the suffering from the change in life that results if people are disabled, they're unable to do normal daily tasks, people have brain fog. And even the experience of symptoms is not the whole story because there's organ damage that people may not recognize. For instance, four percent of people who have COVID are, within the year from their infection, at risk for severe cardiovascular events—strokes, pulmonary embolisms, heart attacks and other life-changing events. And that's just within a year.

BM: That's four percent above the background risk, correct?

YB: Yes, four percent … just for cardiovascular events, not including all the rest of the stuff that I talked about. And the point is that this happens also for "mild" cases, people that are not hospitalized, so medically mild cases have about three percent of these above baseline events.

Now, when we talk about the possibility that it's really people with prior conditions that might be having these events, it turns out the opposite is true. People with prior conditions actually have less above baseline [because they are already at higher risk for these events]. In other words, the baseline is of the events that they are at risk for without COVID. If you subtract their baseline, healthy people have more of these events.

So, this is quite a claim that this is something we can live with and tolerate this level of harm to people. It is simply astounding. And it's surely not consistent with what people want. Even though governments are declaring we have to learn to live with COVID, it is clearly not what the people want.

At least most of the people, there are some people who do, but the polls, for example, in the US now that mask mandates are being repealed, the polls say that people want to keep the mandates. There is a vocal, small minority that is advocating against, but the vast majority of people seem to be unhappy with what's going on. And I think that's the key to the future, but the piece that's not, that is surely not included in the public policy declarations is the dynamics of this disease.

Even if we were to come to the conclusion that the current situation is somehow tenable, which is not reasonable according to our standards of human life before the pandemic, the dynamics of variant introduction are surely not consistent with it.

We already have a stealth variant, BA.2, which is the second variety of Omicron, which is tremendously different from the first variety of Omicron. What's been happening is people have been studying BA.1 by using a specific feature of it, which is the S dropout. Using standard PCR tests, one can identify the presence of the BA.1 variant. But BA.2 doesn't have that feature. If you just do PCR testing it looks like Delta.

It has only been recently that there have been additional studies of BA.2.

First, it's growing 40 percent faster than Omicron, which was already transmitting incredibly rapidly. Second, data from studies suggest that infection with BA.2 will cause substantially more severe disease.

BM: If I may ask, the study you are referencing is the one recently done at the University of Tokyo in Japan? They were comparing BA.2 to BA.1.

YB: Yes, they compared BA.2 to BA.1. What they did was to look at five different properties.

The first thing that they did, which you know is very clear and simple, is they just looked at the extent of genetic difference. People think that because Omicron BA.1 and BA.2 are both called Omicron then they must be similar genetically. And in fact, I recently read an article where they say the genotype is very similar, which is very wrong. Their genotypes are actually very different.

One of the confusions is that if you look at the distance of BA.1 and BA.2 from the original variant they're different. But if you look at the difference from each other, because genetic space is a very large space and you can go in different directions, it's like going north and south by the same distance. If you measure the distance from where you started it's the same, but your distance from each other is twice as much as your distance from where you started.

What happens with BA.1 and BA.2, and I can show you a picture of this … is that in fact, they're really dramatically different.

Here we have the figure that is in their paper [see figure 1] in the Japanese study that reported on the difference between BA.1 and BA.2. Now you look at the solid area, the bar shows you the difference in the spike protein and all the way out to here, the end of the open space shows you the full genome differences, the number of amino acid differences.

If you look at it and compare Alpha-Beta-Gamma-Delta [variants] to BA.1 and BA.2, you see that this difference is much larger than the difference between the other variants. But when you look at the difference between BA.1 and BA.2 …

BM: They are essentially two different variants altogether. They may have started with the same parent, but they have certainly traveled a long way apart.

YB: And if you look over here, I've made this triangle to show pictorially how it works. I've taken these distances and mark them here with BA.1 in one direction and BA.2 in another. And the distance between them is almost, not quite as much as the difference between BA.2 and the original variant, but it's twice as large as the difference between any of the first four variants and the original.

In the lower right-hand corner, the arrows delineate the distance from the original variant and the previous variants of concern before Omicron and you see how much smaller they are than these arrows [pointing to the figure in the upper right-hand corner], which is the difference between BA.1 and BA.2.

The question then becomes what are the properties that distinguish BA.1 and BA.2. And in this study, which was done by a research group in Japan, they extensively analyzed multiple properties of BA.1 and BA.2 in order to compare them.

Among the things that they did is they looked at the transmission around the world. And what they found is that BA.2 transmits 40 percent faster than BA.1. Now, BA.1 is probably … It's a little bit hard to visualize because the cycle time is different … but let's say it's compared to the original variant. The R [Reproductive number] would be about 10 now. Again, I'm not correcting for the transmission time difference, so it may be a little bit different, because the cycle is shorter for BA.1, but if we use that scale for a moment, BA.2's R number would be 14. That's a huge difference in the transmission rate. And the result of that is that BA.2 is now growing to dominate cases globally.

The second thing is that they showed that it's more vaccine evading than BA.1. If you recall, BA.1 was more vaccine evading than Delta. But BA.2 is more evading than BA.1 by a significant amount.

The third thing is that infection by BA.2 is resistant to previous infection by BA.1.

BM: Can you explain that further?

YB: If you were previously infected by BA.1, the level of protection to BA.2 is not the same as BA.1. BA.2 will bypass immunity after infection by BA.1 and lead to [higher risk] of another infection.

BM: Can we think of BA.2 as a completely new coronavirus—SARS-CoV-3? What would need to happen to make it a different virus?

YB: People have argued that you should consider Omicron as different.

Serologically, it's quite different from the original variant. It has a somewhat different mechanism for invading cells. The biology is noticeably different. But there's no doubt that it originated genetically from the original variant.

So, to declare it as a completely different virus, I don't know if that helps. But BA.2 is different enough from BA.1 that it should be given its own designation—its own Greek letter —according to the current numbering scheme. But that's politically not very comfortable, because people are declaring this to be over and having a new Greek letter would raise questions that require us to reevaluate what's going on.

And it really should be reevaluated because the last thing that they did is that they found that it's substantially more severe in their animal models and severe in many different dimensions.

Here is the image of lung tissue after the animals were infected with the sub-variants taken at one, three, and five days after infection. The two panels (See figure 2) are dramatically different. Let's just compare. You can see that BA.1 has much less injury to the lungs. BA.2 from this study shows it is much more severe.

The scientists looked at a lot of different measures from the underlying biology to the specifics of the lung damage measures, hemorrhage, and damage to different parts of the lung. BA.2 is much worse than BA.1 in this study.

Now, obviously this is something that we still need to see in people, but if you realize that this is what's happening in hamsters, you should stop assuming that it's okay and you should go back and look at what's going on now.

Even before BA.2, the claims about BA.1 being mild are overstated. This is mostly a marketing ploy and not based on evidence. BA.1 is still quite severe even if it is not quite as severe as Delta, which one can argue the point because many more people are being infected. Measuring severity relative to each other … Let's say 10 people get infected by Delta and you look at what would happen to the same 10 people if they got infected by Omicron, it's about the same severity. There's almost no difference.

BM: If I recall correctly, there are two studies—one from the Imperial College and the other from South Africa—and they both essentially came to the same conclusion that the intrinsic virulence of BA.1 to Delta was about 75 percent.

YB: The point is the reason why people keep saying that it's milder is that Omicron (BA.1) infected a lot of people that would not have been infected by Delta, such as people that have either previously been vaccinated or with prior infection. And these people that would have avoided infection with Delta are now being infected by Omicron and those cases tend to be milder.

If you take the cases that would have happened by Delta and compare them with previously unvaccinated and infected individuals, it's about the same severity. But when you add Omicron infections in people with prior immunity, then it's not an actual comparison of the severity of the disease. There is a mathematical statement called Simpson's paradox … where we are averaging over different stuff.

[*Simpson's paradox is a phenomenon in probability and statistics where a trend that appears in several groups of data disappears or reverses when the groups are combined. In this case, the intrinsic virulence of Omicron is misstated because it infects people who would not have been infected by Delta because of prior immunity, so averaging those cases*

with the people who would be infected by both Delta and Omicron is making an apples and oranges comparison.]

One way to imagine it is, let's say you have a river, and it overflows its bank. And because of the overflow, the plain just above the bank floods over. If you now measure the average height of the flood using the flooded plain and river, then the overall result is that the flooding appears very shallow. But of course, it isn't shallow; it isn't a small river. In fact, it is massive deluge, and that's a better way to think about Omicron versus Delta.

Again, it's affecting more people and the number of deaths in the United States is extraordinarily high even though people are claiming that we're facing a milder disease.

BM: In January, the COVID-19 Scenario Modeling Hub, based out of Penn State, which provides the White House with updated estimates, said that from mid-December to mid-March, they expected 190,000 people would die during the Omicron wave. They were quite accurate. Meaning that the White House knew in December that another 200,000 people would be dead in three months, and they didn't do anything.

YB: That's a fifth of all the deaths all together.

BM: Yes, 20 percent of all the deaths over two years of the pandemic in the United States.

YB: Let's be clear … First, COVID-19 continues to be a severe disease. People are continuing to get infected, which leads to severe cases and deaths. Many are ending up with Long COVID in large numbers, which is already affecting the labor pool, not to mention the fact that it affects key employees and companies. There is a severe impact on the brain in many cases that leads to brain fog. There are people having strokes, heart attacks, and an assortment of all other secondary diseases caused by their infection. There are all kinds of things that are happening. So that's number one.

Second, there's this other narrative about the suggestion that this only affects unvaccinated people. Or it's only vulnerable people. The absence of compassion is astounding. But another issue with simply ignoring the fact that people who are vulnerable are dying from this disease, is that the vulnerable people today may have been healthy young people at the beginning of the pandemic who became infected earlier. Now they have Long COVID and are vulnerable *and* can get infected, reinfected with Omicron. People infected with Delta are now being infected with Omicron.

What we know now, the second version of Omicron, BA.2, will infect people who were previously infected with BA.1. And the next variant, we don't know what that will be, but because we have all this massive amount of virus around the world, we already see the genetic divergence is occurring much more rapidly than when previous variants were spreading.

To assume that we won't get another variant that will be either more severe or even the same severity doesn't make sense. We will, essentially, surely get such a variant. You'd have to win a lottery to not have that happen.

The natural expectation today is not that we're going to end up with a baseline number of a few hundred thousand cases a year, which we would have, even if we kept going the way we are, but there are going to be new variants that are going to cause things to be much worse.

There is a fundamental loss in the value of life.

Also, there is a fundamental narrative that is being amplified by the press that we can't do anything about this. And because we can't do anything about this, we're going to have to live with it. And because we're going to have to live with it, we're going to have to accept all this death and disability.

And the suggestion that this is a viable future trajectory even though there's an accumulation of harm and we haven't yet even talked about—whether it's to the heart, the brain, the lungs, or the kidneys and other organs—this is going to have very long-term effects on people. This will undermine life and health. And though life is the most important thing, ultimately, it will affect economic activity, which is what many people are trying to protect. So, the narrative by the media, by the government, which is clearly driven by business considerations rather than health considerations, is undermining even what *they're* trying to protect. This has been true since the beginning [of the pandemic] and all the evidence continues to line up with that.

To be continued