StraightTalk
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2020 – Optimism Wins Again

What a year. Everyone alive and over the age of twelve knows what 2020 will be remembered for. The novel coronavirus, COVID-19, was a global game changer for all of humanity, and when viewed through the lens of history decades from now, will dominate any other news story from this year. However, I believe that 2020 will also come to be known as a pivotal year in the life sciences sector, and this year has proven, once again, that optimism is the only viewpoint that actually squares with the facts.

True - there is no shortage of negative news around this novel Coronavirus – from bungled policy responses at the Federal, state, and local levels, to the horrific scenes in hospitals and nursing homes across the world, to the deprivation of almost all of our normal human interactions for the majority of the year. But (as is always the case) bad news is short-term focused, easy to report on, and immediately touted by the media, while good news often takes longer to develop, is hard to compress into digestible sound bites, and is frequently overlooked by that same media.

Simply put, in an era of incredibly polarized politics, modern science was able to break down barriers between governments, countries, and industries to produce the biggest piece of good news in many, many years. Yes, the announcement of a few viable vaccine candidates was covered by most major news sources, and was roundly cheered by the stock market – but the story behind the race for a vaccine is much, much bigger than any nightly news sound bite.

Unlike older, slower ways of developing vaccines, which involve stimulating the body's immune system by injecting inactivated or weakened viruses, several companies created platforms that work like the operating system on a computer, allowing researchers to quickly insert new genetic code from a virus – somewhat like adding an app to your phone's operating system – to create a new kind of vaccine. And, amazingly, this genetic discovery process happened over a period of just a few days.

This science behind this radical new vaccine development is quite complex, but the basics of it can be understood by those of us that don't work in laboratories. This new method employs a synthetic form of a genetic molecule, called messenger RNA, or mRNA for shorthand. When injected, mRNA causes human cells to make a harmless viral protein called a spike, which stimulates the immune system to make antibodies and immune cells that can recognize that spike quickly, and counterattack when needed. In plain English, rather than introduce a weakened virus into our bodies to create an immune response over time, this new type of vaccine teaches our cells how to make a protein to quickly respond if we are ever exposed to that virus. This methodology is proving to be stunningly effective at warding off this insidious virus, and clearly represents the future of medicine.

Back in 1957, the Soviet Union launched the Sputnik satellite, which fostered a space race that defined the next decade. Similarly, the year 2020 will be known as the year medicine changed for the better with the proven efficacy of the mRNA vaccinations. And I'm betting that the decade that follows this year will see a scientific race to use this new methodology in combating many other viruses and diseases.

Never before in history has a company sequenced the genetic code of a virus, and just 63 days later gone to live trials in humans. Dr. Fauci, for all of his immunologic brilliance, predicted it would take a minimum of 18 months to develop a viable vaccine, which based on history was an optimistic projection. The fastest prior vaccine development on record was for the mumps, which took over four years. However, the global scientific community collaborated on a scale

never before witnessed to greatly speed up the process of developing a COVID-19 vaccine. Unprecedented amounts of scientific sharing, government funding, private charity money, and corporate forfeiture of profits have combined to do something truly amazing for all of humanity. The CDC reports that there are currently 12 vaccines in large scale efficacy tests, 6 of which are approved for emergency use, and I expect by the time we ring in the new year, a couple of them will have been approved for distribution to the public.

We will need billions of doses in total, and India is actually positioned to scale production the fastest. The Bill & Melinda Gates Foundation has donated hundreds of millions of dollars towards this global production project, as have other foundations. Remember that roughly 8 out of 10 pharmaceuticals in your medicine cabinet are already made in China – and much of the world's stock of this vaccine will be made abroad. We, of course, have significant domestic manufacturing ability, and will work hard to meet our own country's demand in the coming months. Getting to global immunity will take much of 2021, and the world will also need to agree upon a protocol for a "vaccine certificate" so we can know who has been vaccinated – but these are all solvable problems.

Moncef Slaoui, the retired vaccine developer and drug company executive who was tapped to lead Operation Warp Speed, predicted this past summer that mRNA vaccines would be very effective. He and many other leading immunology experts have been ready to develop this new kind of vaccine for more than a decade, but each outbreak that presented the opportunity for mapping the genetics of the virus to create the vaccine ended too quickly. The previous coronavirus (MERS), the H1N1 and Avian flu viruses, and Zika virus all flamed out before the project could get to the testing phase. Only this year did the virus persist long enough for the process to move forward and become a true game-changer for modern medicine. And although the reality is that there will most certainly be viruses that are far more deadly in the future, 2020's fire drill will have left us all much more prepared when that day comes.

The old adage that history doesn't repeat itself but often rhymes is always evident when examining events or trends, and the very human behavior that accompanies them. Part of what has made the Coronavirus outbreak so dangerous is that we became so good at preventing pandemics, that we were caught emotionally unprepared for this one. According to the CDC, death from infectious disease in the United States declined 94% in the previous century. *Read that sentence again – a 94% decline in dying from infectious disease!* Words like cholera, typhoid, scarlet fever, smallpox, dengue fever, polio, and measles have been relegated to Google searches – they are no longer part of our daily experience. Modern medicine eradicated these diseases, but at the same time left us emotionally unprepared for a new pandemic. As the historian Dan Carlin writes in his book, *The End is Always Near*, "Nothing separates us from human beings in earlier eras than how much less disease affects us. If we moderns lived for just one year with the sort of death rates our pre-industrial age ancestors perpetually lived with, we'd all be in societal shock."

In a year like 2020 it is helpful to remember that nothing too good or too bad stays that way forever. Great times have a tendency to plant the seeds of complacency, leading to tougher times ahead, while bad times plant the seeds of recovery through problem solving and opportunity. While it is fair to say that governments struggled with their response to the virus, many businesses quickly pivoted – stores installed Plexiglas dividers to ensure spacing, restaurants created previously unused outdoor dining space, businesses invested in remote work software and systems, etc. Making those changes kept employees and customers safe and loyal, and is an optimistic indicator for the coming months and years when the virus is no longer the dominant story in daily life.

In the colder and darker months of winter, it will be easy to focus on all of the negatives around COVID-19. However, the stock market's stunning recovery and rise to new highs this year is predictive of much brighter days ahead, and when the history books are written, the bigger story will be how businesses and medicine adapted to the virus in 2020. Indeed, optimism wins again…

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