


## Waiting for the real solution. The medicine.

*The scientific community has reached an unprecedented achievement, a vaccine in eight months. But behind the development comes manufacturing and distribution of unresolved complexity. Meanwhile the virus that plagues the world does not give up and follows its natural course, which is mutations. The experience gained from AIDS research has been vital to achieve this milestone in history, but a loophole remains that with HIV was shown to be more critical than the vaccine itself, the treatment of the disease.*



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I am from the generation of healthcare students who lived through the dark dates of a new and deadly disease: AIDS. Luckily for me, I didn't have it, nor did anyone around me die or become ill with HIV, the virus that causes the disease, but it radically marked my academic studies, at least the scientific one. I started my career in the early 80's just when the first cases of AIDS were being reported in the world. I remember that in the third year of the race, all students knew a question that was going to fall on the final exam in microbiology: the new way to determine AIDS, the "ELISA analytical biochemistry assay", so popular now because it is the serological test. determining whether or not we have passed COVID-19. This discovery marked the study of various pathologies and the scientific world recognized its Swedish discoverers with a Nobel Prize.

***"The evolution of the treatment has made it become two simple daily pills, but above all the research has ensured that no one has to die of AIDS."***

At that time the President of the United States, Ronald Reagan, announced that in two years we would have a vaccine. Today, forty years later, the vaccine is neither there nor expected due to how mutant HIV is. But thanks to this fight against the virus, our scientists have been capable of three things that we have not given due importance to:

The first, a treatment against the disease was discovered, which at first was a cocktail of medicines that I call "the bottle of M&M's" and that patients had to take every morning. The evolution of the treatment has turned this bottle into two simple daily pills, but above all the medicine has ensured that no one has to die of AIDS.

The second, research on vaccines has taken a leap not only quantitative but qualitative. Twenty years ago a Hungarian scientist, Dr. Katalin Karikó, whom the world probably recognizes more than deservedly as

the next winner of the Nobel Prize in Medicine, discovered what the vaccines of the future will be, those based on modified mRNA (such as Pfizer or Moderna for COVID-19).

***"A far greater capacity to fight viruses has been achieved, which has made nano biotechnology unparalleled in development."***

And the third has achieved a much greater capacity to fight viruses that, without the obligation to fight HIV, we would not have developed, and that has made nano biotechnology have had an unparalleled development. Biotechnology based on another of the most important discoveries of recent years and also deserving of another Nobel Prize for its discoverers: *monoclonal antibodies*. And it seems that we have forgotten that this is where the real solution to the current pandemic that is ravaging the world is.

***"Medicine is where the real solution to the current pandemic that is ravaging the world is."***

The previous great pandemic experienced by humanity occurred at the end of the First World War, and unfortunately for the Spanish, since then we have lived with the disgrace that the disease bears our last name, the *Spanish flu*. Actually the first known case occurred in a military base in Kansas (USA), and it arrived in Europe through a French port, but already at that time, as now, some considered that telling the truth when The rest of the world was not what it needed.

***"Something similar to what Darwin defined as natural selection: the strongest survive at the expense of the weakest."***

That pandemic killed more people than the World War that was already ending, and that there is no verifiable mortality data from the disease in the Middle or Far East. This pandemic was resolved by having achieved *group immunity*, which unfortunately is something similar to what Darwin defined as *natural selection*: the weakest die at the cost of the strongest surviving. The problem with figuring out what percentage is necessary to obtain group immunity is that you only get to know with time. Due to this and although with this virus it is estimated that group immunity is obtained with 70% of those immunized (either by the vaccine, or by having passed the disease), we really have no idea and only time will tell.

The fact that viruses mutate is well known, and that the more they mutate, they generally become more dangerous as well, and not because they are necessarily more lethal, but simply because they are more difficult to combat. And to endorse my words, I only have to refer to HIV.

***"In military terms the vaccine is the sniper who shoots his target for miles."***

I like to define the vaccine in military terms, because after all the fight against pathogens is a war. On one side we are humans and on the other some invisible beings, generally very harmful. In military terms, the vaccine is the sniper who shoots his target for miles: any small movement of the target (mutation of the virus) or change in wind or humidity conditions (characteristic of the patient) causes the sniper to miss the shot. On the contrary, I like to define treatment as the pigeon hunter using the pellet gun. It does not matter how much it moves (if the mutations are not brutal), as long as the dove is within a limited radius.

The disease is not going to be eradicated, nor is our economy going to definitely improve with the vaccine alone. I have already said that the capacity to manufacture vaccine doses in the world today is 5,000 million for all types of vaccines, which by the way must continue to manufacture, and we are 7,000 million people. How much should we increase a limited manufacturing capacity if we need two doses per person and we must immunize the world population?

***"Scientists found out about AstraZeneca's results from the business press and that seemed strange to me."***

Generally, the scientist who talks a lot tends to present poor results. Those who follow me in the media will have heard me say that the first vaccine would be Pfizer's, and I am not really the Delphic Oracle, but when a scientist is dedicated to publishing more in the *Financial Times* than in *The Lancet*, no good. The Scientists found out about AstraZeneca's results from the business press, and that was strange to me. At the same time, Pfizer worked in silence and published where it should be done and I refer to the results, Pfizer has a vaccine that is already inoculated around the world while AstraZeneca has just submitted its requests for emergency use.

Science and economics are not the same, the first only deals with contrasted realities, the second lives on expectations that by dint of saying them many times end up becoming realities, because after all we humans are like sheep, although sometimes a little more intelligent.

Therefore, science and economics coexist quite badly. The same goes for treatment. I trusted Eli Lilly and he failed, or at least his treatment is not effective enough, but this is common. But write down some more names and some more dates: Merck and spring 2021, and Amgen a little later. When this happens the financial markets will fly, but this time the optimism will be justified.

***"In the meantime, we will fight for vaccines that will not arrive, and we will do so because of a detail "without importance": there is not enough manufacturing capacity."***

Meanwhile the virus will run its course and mutate. Let us hope and hope that it will be little, and that both the manufactured doses of the vaccines are effective and that the new mutations of the virus do not develop new strains that can infect even those already immunized.



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