To my valued patients

Okay, has everybody survived another day…. great. Let's get started.

<u>3 strains of SARS-CoV-2</u>

The following is my synopsis of the Proceedings of the National Academy of Sciences of the USA. The genetic material (genomes) of the SARS-CoV-2 virus has been analyzed around the world and there appear to be three strains. The scientists cleverly named them A, B and C.

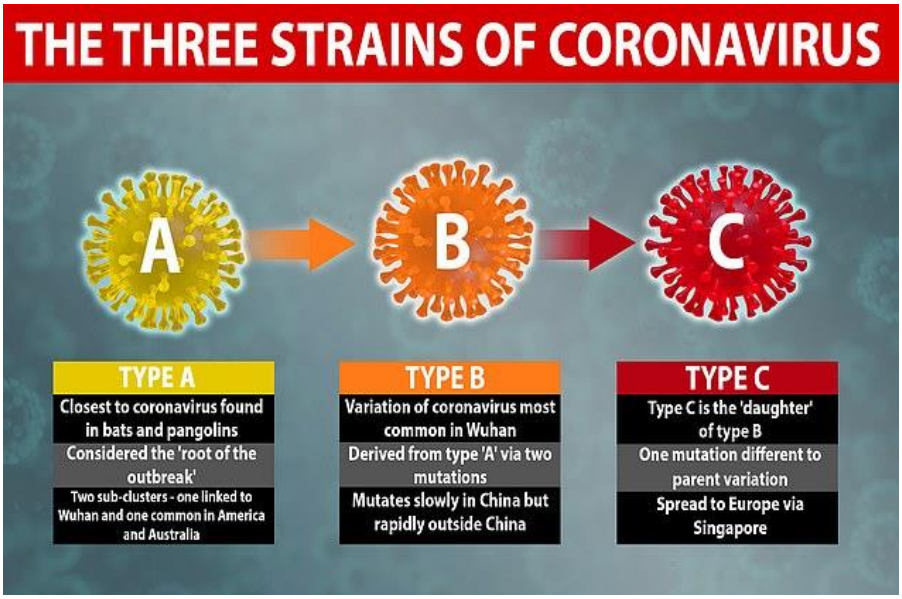
Type A is the ancestral type that is found in bats and pangolins. There are two sub clusters of subtype A - one linked to Wuhan and one common in America and Australia. The Wuhan cluster was found in Americans living in Wuhan. My guess is that Americans and Chinese living in that area then traveled to the America and Australia.

Type A then mutated into type B via two mutations and circulated around China. Type B is the most common type in Wuhan itself.

Type C is the offspring of type B with one more mutation and spread through Europe via Singapore.

The thing to remember is that viruses mutate to survive. Type B has a strong affinity for Wuhan and derived from the Type A in Wuhan to type B. Type B does not travel well but is quite comfortable in the immune systems of people living in Wuhan. It did not really need to mutate to adapt and go wild.

Outside Wuhan, Type B needed to mutate to survive to overcome resistance. Hence the reason it mutated to type C. Type C left the Chinese mainland, went to Singapore, Hong Kong and South Korea and then entered Europe.



Hat tip to my wife for emailing me the initial source for this news item.

Drawing the wrong conclusions

If you don't understand the data, you can draw the wrong conclusions. Yesterday, this headline appeared in the Business Insider.

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80% of NYC's coronavirus patients who are put on ventilators ultimately die, and some doctors are trying to stop using them

This is a stunning short-sighted conclusion based on not understanding the data.

It reminded me of the story about usage of metal helmets during WWI. Before WWI, soldiers wore cloth hats that looked something like this US Civil War hat:

At the beginning of the war, British soldiers were given brown cloth caps. However, generals and others quickly saw that cloth hats were inadequate in the face of shrapnel and machine gun fire. The British military then authorized the usage of the Brodie Helmet made of metal in hopes of protecting their soldiers.

The war office was amazed to discover that there were more soldiers with head injuries than ever before. The initial conclusion was that the metal helmet was a failure. As a result, they almost decided to scrap the metal helmet.

Knowing that anyone hit with shrapnel wearing a cloth hat was dead, the war office then looked at fatalities as well as injuries. Without helmets there were way more fatalities, but with the helmet they had more injuries, some only modest and easily survivable. The helmet, initially thought as a liability, was in actuality a great advantage. This was a classic example of almost drawing the wrong conclusion from the data.

The same is true of the NYC coronavirus data where those on ventilators had an 80% death rate. The incorrect conclusion is that the ventilators are killing the patients. There are several reasons the preliminary conclusion is wrong. First, this data on the number of deaths of those on ventilators includes many of the first cases identified when there were no medications such as:

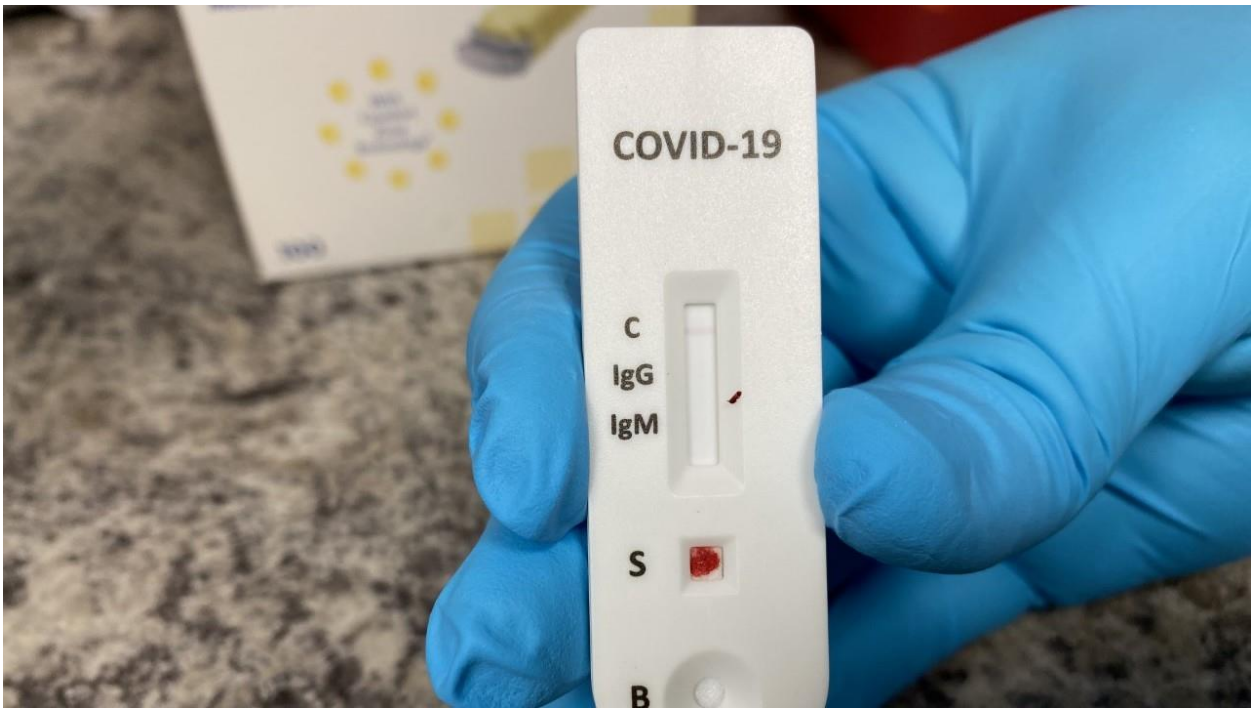
- anti-virals (such as remdesivir)
- monoclonal antibody anti-IL6 drugs (such as sarilumab)
- possibly hydroxychloroquine (with or without azithromycin)
- plasma antibody infusions.

Therefore, the death rate was initially high. Second, the people on ventilators are the sickest of the sick and without them there would be close to 100% mortality.

Drawing the conclusion to stop using ventilators is to fall into the British cloth hat fallacy. The reasons ventilator patients die is not from the ventilator, which can be lifesaving, but from the lethality of the disease for that particular patient's immune system.

Be careful out there, it the wild west of antibody testing

Everyone is clamoring for an antibody test. I think that is the number one call I get and the number one email question I receive. My answer…be very careful if you are doing an antibody test today. There are many tests out there that do not have FDA approval; in fact, most antibody tests don't have FDA approval. Already countries in Europe have had to deal with antibody tests that simply don't work. Evidently PeopleG2, ToxTest (via WHPM, Inc.) and several other companies are selling packages of 25 antibody tests for between $625 and $650 dollars or roughly $25 per test. These two companies use finger pricks and promote results in 15 minutes. I don't know the accuracy of their tests and cannot tell you to use them or avoid them. To date neither have FDA approval. So just be careful. There are other companies making similar products, some in Asia and some more local. If you plan to use any of the antibody tests, it is best to determine if the test has been approved by the FDA.



It is important to note that if a person has antibodies to the coronavirus, that person can still be contagious and potentially infect others.

History and disease

Thucydides (c.460-400BC) is one of the world's greatest historians. He wrote about the Peloponnesian war fought between Athens and Sparta and their various allies between 431 and 404 BC. One of the most remarkable passages of Greek literature is his description of the plague that struck Athens in 430 BC. Thucydides caught the disease and survived! The disease is said to have claimed 100,000 lives in a much smaller population, so it was especially deadly. Thucydides was particularly descriptive in discussing the horror of the disease. He described the symptoms in some detail – the burning feeling of sufferers, stomach aches and vomiting, the desire to be totally naked without any linen resting on the body itself, the insomnia and the restlessness.

After seven or eight days, if people survived that long, the disease descended to the bowels and other parts of the body – genitals, fingers and toes. Some people even went blind.

Amazingly, for possibly the first time in history, Thucydides noted how the plague spread more quickly in crowded populations, such as in the most crowded areas of Athens (similar to NY today), and in places with inadequate housing and sanitation.

> *"Words indeed fail one when one tries to give a general picture of this disease; and as for the sufferings of individuals, they seemed almost beyond the capacity of human nature to endure."*
>
> *"The most terrible thing was the despair into which people fell when they realized that they had caught the plague; for they would immediately adopt an attitude of utter hopelessness, and by giving in in this way, would lose their powers of resistance."*

The disease caused fissures and fractures in Athenian life and politics. It killed the great Athenian general and statesman Pericles as well as his family. It altered the Peloponnesian War, all of Greece and therefore world history. It was at least partly responsible for the defeat of Athens. It would eventually help destroy Athenian democracy. This amazing writer noted the plague tested the moral health of individuals and societies.

We are nowhere near as vulnerable as ancient Greece. The disease we face is nowhere near as severe. Yes, we are tested, psychologically, financially and morally. But we are nowhere near the calamity that had befallen that great civilization which fought war and plague, simultaneously. We are blessed with an amazing healthcare system and technology. No matter how loudly some scream about this calamity, we are blessed in our abilities to fight this onslaught and in the relative mildness of the disease itself.

So, if you are down and depressed about your home isolation, remember the plague that destroyed the world's first democracy and the despair they felt. We have a great deal to be thankful for.

Art and disease

As you might expect given the previous discussion, here is “Plague of an Ancient City” by Michiel Sweerts c.1652-1654, which is believed to depict the Athenian Plague. This painting is in the Los Angeles County Museum of Art. It is thought that this Flemish painter lived through an outbreak of plague while residing in Rome in the 1640s. Therefore, the painting represents both his 17th century concerns and the original historical themes and is an attempt to capture the accuracy of life events at a specific moment in time.

Thank you to everyone for your comments and for reading these newsletters.

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