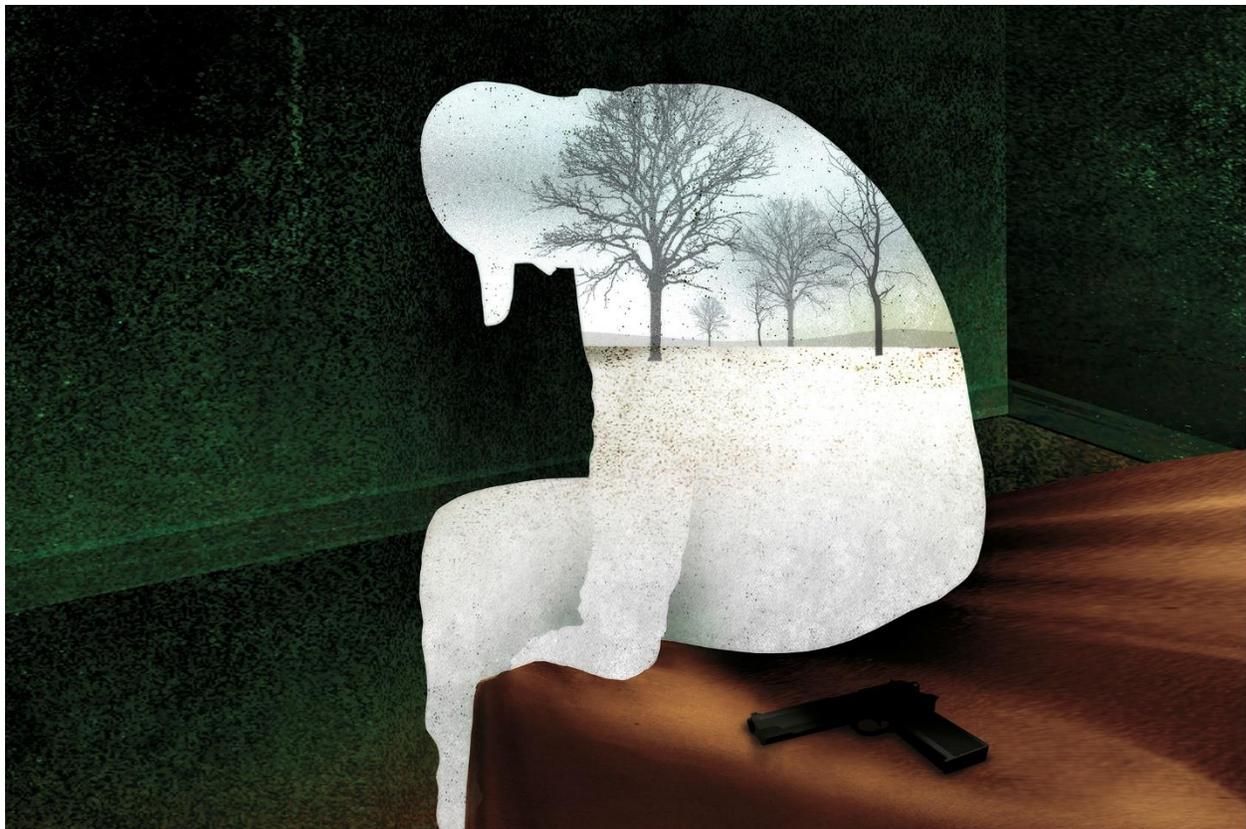


To my valued patients and colleagues

A year's worth of suicide

In Walnut Creek, California, near San Francisco, there has been a huge increase in deaths from suicide during the lockdown. The trauma center stated that they responded to a “years’ worth of suicide attempts” in just the last four weeks. Doctors have been questioning the safety of continued quarantine.

Because of trauma from losing loved ones, unemployment, disrupted sleep patterns and a never-ending cycle of terrible news, calls to national mental health hotlines are up 1000% (that is not a typo, one thousand percent). Making things even worse is the fact that depressed people may be physically isolated from their social network due to stay-at-home orders.



A special note to my fellow physicians. On average, one physician dies of suicide every day. The suicide rate for physicians is 28-40 per 100,000 which is double the suicide rate in the general population. Doctors are afraid of seeking professional help because of the fear of being stigmatized. Doctors have easier access to lethal methods, making completion of suicide occur at a much higher rate. The reasons for the high suicide rate among physicians are complex and include difficulty dealing with patient deaths and the associated feelings of failure, helplessness, and hopelessness. The coronavirus epidemic is particularly challenging in this regard. The challenges posed by the coronavirus epidemic are not limited

to doctors but affect all healthcare workers. If you feel like you maybe at risk, I implore you, seek help, it is not a sign of weakness.

Gross

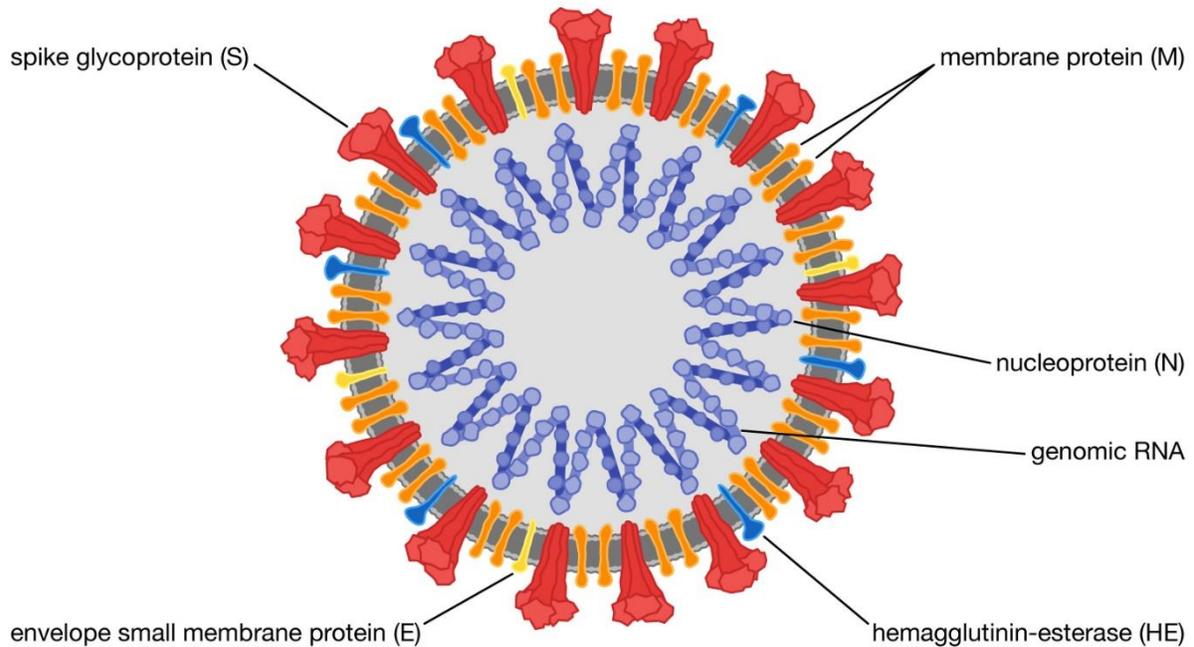
Did you know that monitoring sewage for coronavirus genetic material could give public health experts up to a week of warning before corona cases peak in an area? Scientists have found coronavirus RNA in stool. In Connecticut, the level of the virus's genetic material found in sewage peaked a week before the number of cases were seen clinically. Hospitalizations related to COVID-19 hit their highest point three days after peak RNA levels found in sewage. For all you budding stool virologists, this could be your big breakthrough.



Its mutating, its mutating hide the children, bring grandmother off the street

If you read or listen to the news at all, you will hear sources talking about a new strain of coronavirus. STOP, this does not mean we are all going to die. It may work like that in the movies, but so far, not in real life. As of now, none of the new strains have been shown to be more dangerous than others and these changes are quite common. Not all mutations are meaningful and cause a change in a virus.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)

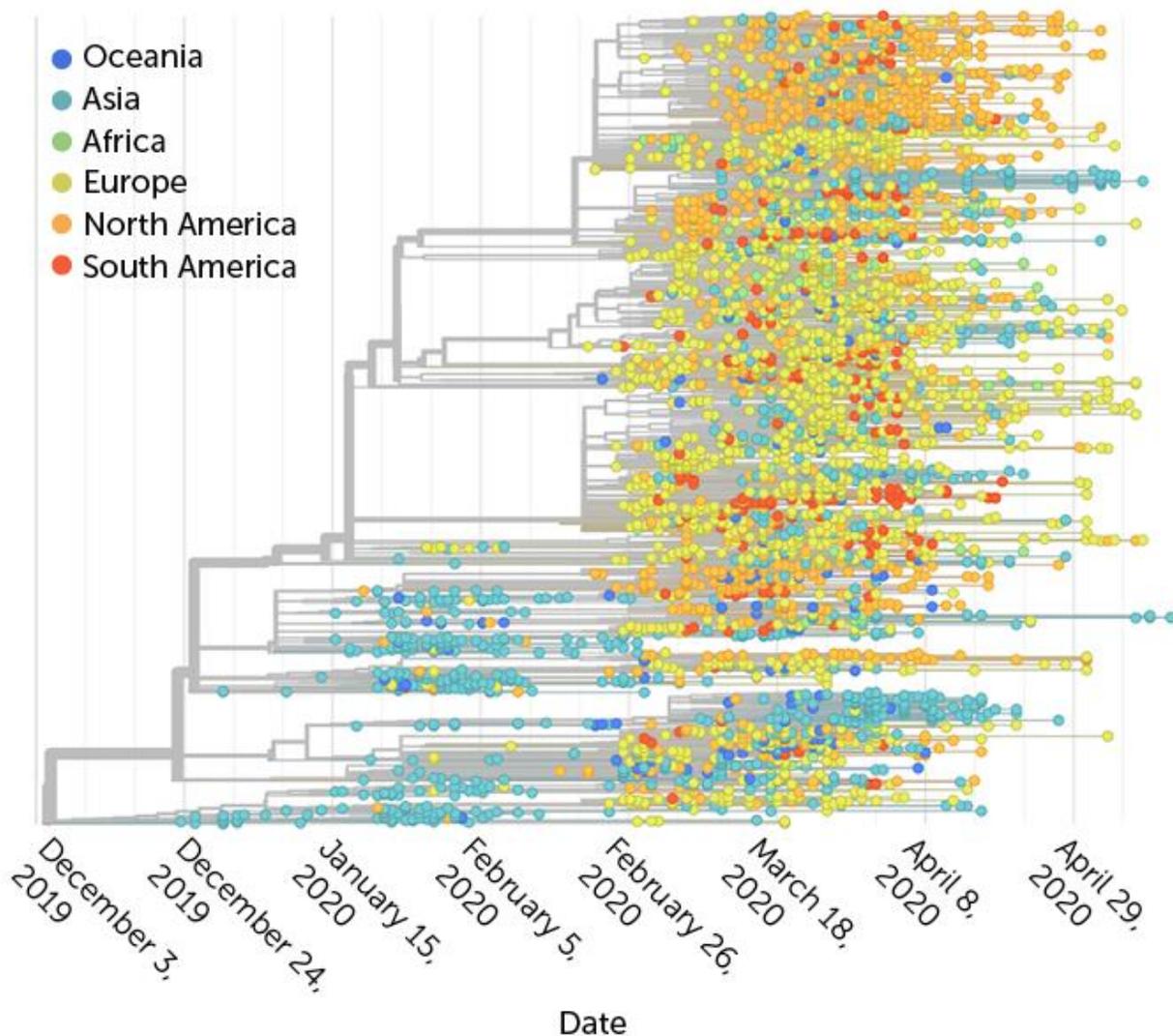


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Viruses are protein shells with DNA or RNA within the shell. SARS-CoV-2 is an RNA virus. Nucleotides, the genetic material of the virus, codes for amino acids. Amino acids are the building blocks of the viral protein. Sometimes the nucleotides mutate or change without any change in the virus's infectivity. Other times, the nucleotides mutate and cause the virus to be dysfunctional, leading to the disappearance of that particular strain. Rarely, they result in more virulence.

From an epidemiological perspective, these virus mutations make it easier to track the virus because different populations frequently get different versions allowing us to track how the virus flowed from one city to another.

If you wish to be blown away with complexity here is a genetic map of the virus so far:



If you care to memorize this graph, great, I will nominate you for the Einstein award. Seriously, though, the bottom line is that viruses are always changing. When a virus enters a host cell it rapidly makes many copies of itself and does not check for errors well. On the other hand, our coronavirus does have a spell checker, meaning errors can still occur but not as quickly. There was a preliminary study published May 5 which found a mutation in the SARS-CoV-2 spike protein. The mutation was more common in the US and Europe, but its significance is not known.

So, when you hear the word strain or mutation, do not assume the worst. It could just be part of the normal viral lifestyle.

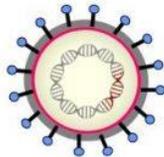
DNA vaccine

Researchers at Harvard and other collaborating institutions recently published a paper describing a DNA vaccine trial in rhesus macaques. A DNA vaccine works by introducing DNA molecules into the body with the intention of stimulating an immune response to markers of a virus.

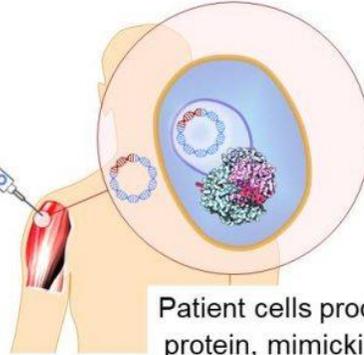
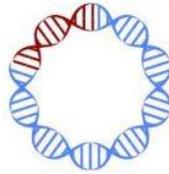


Plasmid is a short circular piece of DNA commonly used to shuttle genes into cells in the lab.

Transfer viral protein gene into a plasmid



Deliver plasmid into patient skin or muscle cells



Patient cells produce viral protein, mimicking a viral infection and inducing a strong immune response

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The team studied six different DNA vaccines against the spike protein of SARS-CoV-2. They found that one of the six vaccines, which encoded the full-length spike protein, had the most protective effect. It should be noted the vaccinated monkeys did develop mild symptoms of infection but also developed neutralizing antibodies. A similar response is seen in humans who have recovered from infection with the new coronavirus. These monkeys had a lower than normal viral load than unvaccinated monkeys following SARS-CoV-2 infection. So more good news on the vaccine front.

Low childhood vaccine rates

There is a big problem on the horizon. Vaccinations rates for children under the age 2 were exceptionally low in Michigan and may be similar around the country. Fewer than half of infants 5 months or younger have received their preventative vaccines. This could set us up for a measles outbreak in the months ahead. Measles is extremely contagious and requires herd immunity and a vaccination rate of 93-95% of the population to stay in control. If you have not vaccinated your young one or if your child has missed any vaccinations, now may be a good time to head over to the pediatrician.



Are you familiar with Sibelius?

Sibelius is a name you do not hear very often in the US. I simply do not understand why. Go to Finland and you will not stop hearing about him. Born in 1865, he composed prolifically until the mid-1920's and then stopped composing major works for the next 30 years. Beginning in 1907, Sibelius imbibed excessive amounts of wine and spent exorbitant amounts on champagne and lobster, so much so that his health was damaged, and he had to retire to a sanatorium to recover. Sibelius also underwent a serious operation for throat cancer in 1907. Early in 1908, he had to spend more time in the hospital. In May 1908, he traveled to Berlin to have a tumor in his throat removed. The impact of his serious illnesses has been said to inspire several works. He lived into his 90s, dying of a brain hemorrhage at age 91.

Below you will find Sibelius's Symphony No. 2. It is one of my favorites. Then again, I have only been giving examples of my favorites in this newsletter.

<https://www.youtube.com/watch?v=SAOf46CXaaw>

Some interesting Sibelius facts:

- He wrote his first work at age 10.
- He was born Johan Julius Christian Sibelius but went by Jean Sibelius. It is said that his uncle, a ship owner who died of yellow fever in 1860, left behind a large stock of business cards. His uncle Johan had adopted the name Jean and had them printed on the cards. Our Sibelius decided to use these business cards and voila.
- He auditioned as a soloist for the Vienna Philharmonic and was not accepted.