Letter 30: Safe Harbor for Our Family

May 7, 2021

Dear Daughters,

Today Caitlin got her second COVID-19 vaccination shot, the last of the family to reach this safe harbor. I cannot begin to communicate the relief I feel that we are all protected.

The Pfizer and Moderna vaccines (we all took one or the other) protect us beautifully against the common forms of the virus (95% effective!) but also against the British B.1.1.7 variant (90% effective) which is spreading rapidly in the United States and will soon be the most common here. They even provide reasonable protection against the far more dangerous Eeek-containing South African B.1.351 variant (75% effective). I could not have hoped for better a year ago when we first began to look at the possibility of one of us dying of this awful virus.

It's still wise for our family to avoid crowds, indoor restaurants, theater and the like, because 95% is not the same thing as 100%. One in 20 fully vaccinated people will still become COVID-19 infected (5,800 fully vaccinated Americans have), and you don't want to be one of them.

Vaccination

At first glance, vaccinations across the United States are going very well. The federal government is making a massive effort to get people to "take the shot," and many have done so. As of today, 150 million Americans have received at least one dose of coronavirus vaccine. That's 56% of everyone 16 and older, and 46% of the total population. 31% of American adults are fully vaccinated. The White House target is to get the first dose into 70% of American adults by July, which seems an achievable goal.

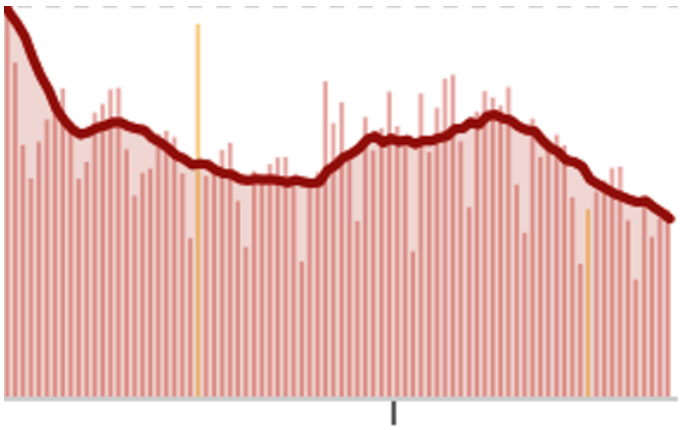
Herd Immunity

The point, of course, is herd immunity. As more people become immune from infection by vaccination, a virus particle from an infected person has fewer potential targets it can successfully invade. The number of people an infected person is likely to infect is measured by scientists as a term called r_0. An r_0 value of 1.0 says that an infected person will most likely infect 1 other person. With vaccination, r_0 falls. As more people become vaccinated and r_0 falls further and further below 1.0, the probability that an infected person will infect someone else becomes less and less. As r_0 approached zero, there is very little chance of transmission, even to a vulnerable individual. At $r_0 = 0$, the entire "herd" is immune, not just the vaccinated.

According to Dr. Fauci, something like 85% of a population must be fully vaccinated to approach herd immunity, so we in the United States are as yet a long way from totally safe. But every step along the way helps. The 56% of American adults who have already had a shot provide a lot of protection to all of us, by greatly reducing r_0. The more Americans become vaccinated, the greater the protection for each of us.

Partial but Real Protection

Is it working? Are we in fact more protected? Yes!



The graph shows new cases of COVID-19 in the United States from mid-February to now. You can see that despite the widespread relaxation of mitigation measures in the United States this spring, the daily number of new cases of COVID-19 is slowly and steadily falling.

This same pattern of decreasing infection is seen in other countries with high rates of vaccination, like Israel and Great Britain. Elsewhere in the world, however, in countries where far fewer are being vaccinated, infections are not falling but rising.

India

The clearest way to see the impact of COVID-19 vaccination is to look at a country doing little of it – India. India is, with China, one of the two largest countries on earth. With a population of 1.36 billion, it is four times bigger than the United States (we have 0.33 billion people).

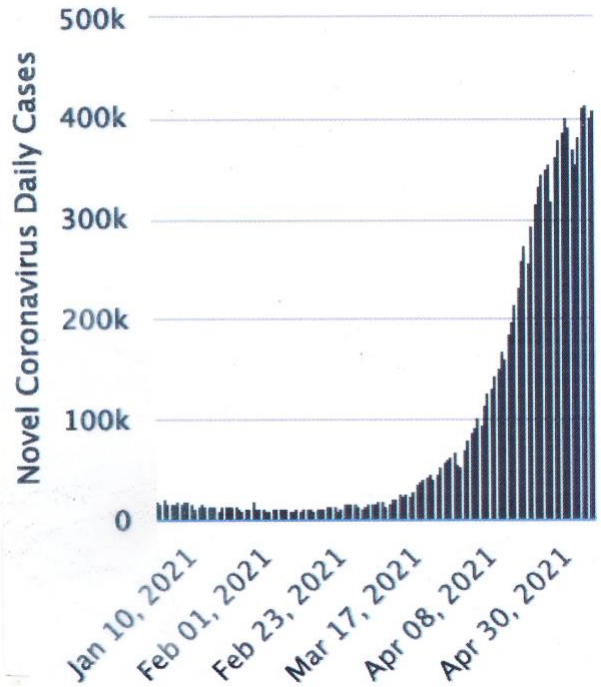
Despite being so much larger, daily COVID-19 infections in India were lower than in the United States two months ago, fewer than 10,000 per day for the entire country. This was the result of a stringent and very effective country-wide lock-down last year.

This spring, with the coronavirus problem seemingly finally in the rear-view mirror, the country relaxed mitigation and opened up for business. There was very little vaccination of the population, even though much of the world's vaccine is manufactured in India. There did not seem to be a need.

Then a new COVID-19 variant arose.

Called B.1.617, the new variant contains two mutations that makes the virus much more transmissible, L452R and P618R. It also contains a nasty immune-escape mutation E484Q that allows it to evade antibodies (a close cousin of E484K, which we know from the South African and NYC variants).

With very little mitigation to impede its spread, the pandemic reignited in India in mid-March:



A tiny 0.5% of the country's population was vaccinated against COVID-19 then. With almost no vaccination to provide a wall of protection, the virus spread like wildfire. In six weeks, daily new cases increased from under ten thousand a day to over four hundred thousand a day!

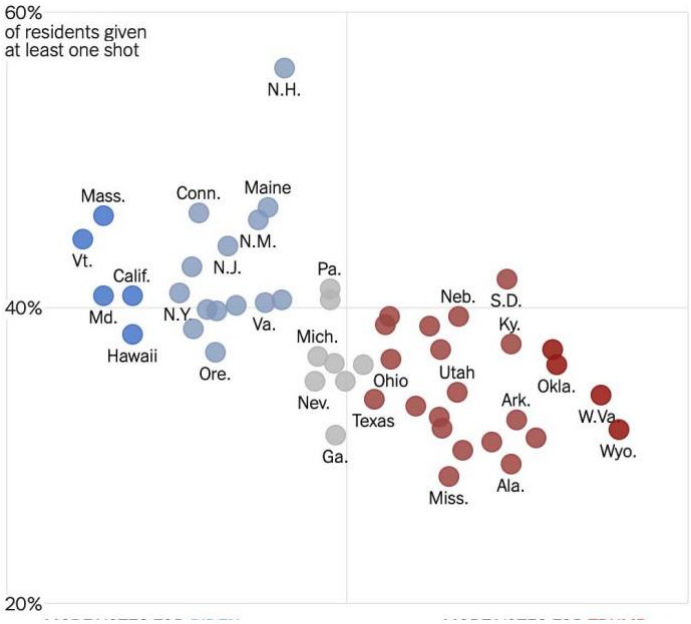
As I write this, COVID-19 infection in India is still on the rise. There were 414,188 new cases reported in India today, and 3.915 deaths – that's 4 new cases a second, and 2 deaths a minute! Hospitals are full to overflowing, and ventilators and oxygen are in short supply.

Wide-spread vaccination in India has finally begun, with 2.3% adults fully vaccinated as of today. Compare that to America's 31% fully-vaccinated adults. The protective wall provided to the United States by our mass vaccination works. While far short of herd immunity, the protection it provides is real, and important. India shows what can happen without it.

But Progress In the United States Is Spotty

So all is well in the united States? Not exactly. Different parts of the country are responding to the COVID-19 threat in different ways, and to different degrees. You have seen this in the rush of states like Texas to lift face-mask mandates, while others like New York insist on them.

In a very regrettable development, many states are falling behind in COVID-19 vaccinations:



Over the coming months the number of people "getting the shot" can be expected to grow as federal programs to encourage vaccination continue to take effect.

So by fall we may approach herd immunity in some regions -- but not others. Look on a map, and you will see that the less-vaccinated states cluster in the South and West. In time, they will come to have the bulk of this country's new COVID-19 cases. Until COVID-19 levels fall in these states, the country as a whole cannot achieve herd immunity. It seems this pandemic is going to be with us for years to come.

Hope To See You Soon

Kentucky Derby last week. Your mother and I researched the horses carefully and each picked three, betting $5 (3 pts for first place, 2 pts for second, 1 pt for third; most pts wins). Aunt Linda came over to watch with us on the big-screen TV, and quickly put in her 5 bucks, picking three names she thought sounded cute. Guess who won?

Your mother and I look forward very much to seeing each of you in the coming months. We will drive the Tesla down to Atlanta in July for a week-long visit with Sue. Little Jed is now walking, and I am looking forward to teaching her how to speak "duck." In July Nikki will visit St Louis for two weeks, and in September both Nikki and Caitlin will join us for a week in Maine, where we can take turns playing "dog ball" outdoors with Paddington.

Things are not exactly back to normal, but getting there.

Dad