Post #776: COVID-19 vaccine: 2: The US is screwing it up …

3: The major drug companies might be able to save us, despite ourselves.

4: But the stupidity of The American People may yet snatch defeat from the jaws of victory.

Background

Source: US Centers for Disease Control.

See Post #773 for the lead-in here, 1: The Russians have it right, in their decision to distribute a vaccine that is safe (but of unknown effectiveness) sooner rather than later. See Post #741 for some discussion of the seasonal flu vaccine, including high prevalence of asymptomatic flu cases.

The only other things you really need to know for this post are:

1. There are many different ways to make a vaccine. Anything that will consistently provoke the immune system to manufacture antibodies capable of attaching to the virus/bacterium in question can potentially work as a vaccine.
2. Vaccines vary widely in terms of their effectiveness. For example, in the best years, the seasonal flu vaccine is reckoned to be 60% effective in protecting you from flu.

I was going to write up a more technical posting on the immune system and vaccines, but I don’t think anybody really needs to read that from me. It’s enough to say that the immune system is not always pinpoint precise. People may already have partial immunity to
COVID-19 solely because proteins on the surface of other diseases (flu, colds) or antibodies provoked by other vaccines (MMR) might sometimes latch onto COVID-19 surface proteins and so flag the virus for destruction by the immune system. (This same lack of precision leads to many types of “autoimmune” responses, where (e.g.) antibodies targeting strep bacteria in the throat end up attacking the body’s own cells, leading to (e.g.) rheumatic heart disease.)

2: The US is screwing it up

This section is pretty short. Many of the major world powers are developing their own vaccines. Off the top of my head: China, Russia, Great Britain, France. No doubt there are others.

Oh, and the USA. Too. But we’re more-or-less irrelevant. For two reasons.

Isolationism. When the rest of the world got together to pledge a group effort at vaccine production, and pledged to provide vaccine to the third world — the US pointedly refused to participate.

Offhand, I can’t recall the US ever, in my adult lifetime, refusing to help provide vaccines to poor nations. Why? Because we’re nice guys? No. Because we make money doing it? No.

We did that because it’s insane not to, given the cost/benefit ratio for the vaccines in question. E.g. polio vaccine costs about a dollar a dose. At that price, the idea that the wealthiest country on earth wouldn’t do its bit to (e.g.) try to eradicate polio just made no sense.

Trust me, I was not the only person who was shocked and appalled by the US refusal to participate internationally. You can read several quotes here.

So, while the rest of the civilized world agreed to play nice, we took our ball and went
home. And so made whatever we choose to do irrelevant to the rest of the world. Which, unfortunately, seems to be a recurring theme these days.

Crony capitalism. I’ll just lay out the facts. See if you reach the same conclusion that I do. Compare the British and American vaccine efforts.

Britain. Britain’s vaccine is being developed by researchers from the Jenner Institute. This is a private-public consortium with a decade(s)-long history of producing successful vaccines. They were chosen primarily because they had already worked out a way to produce a coronavirus vaccine, from their work on MERS. Back in April, they partnered with AstraZeneca for vaccine production (Post #668), and proceeded directly to large-scale human trials (thus largely saving the time needed for Phase I (safety) trials). AstraZeneca is a global pharmaceutical manufacturer with a long-standing track record of successful drug development and production. As of last year, they had 61,000 employees and $24B in annual revenue. AstraZeneca has agreed to provide the vaccine world-wide on a not-for-profit basis. The first doses of that vaccine were scheduled to be delivered in Britain in September 2020.

America. I’ll keep it short. Our flagship vaccine is being developed and produced by Moderna. This is the only vaccine that can be said to be purely an American effort. Moderna has been in the vaccine development business for nine years. They have never successfully developed a vaccine, and they’ve never made a profit. The method they are adopting has never successfully been used by anyone, anywhere to develop a vaccine for human use.

They have about 800 employees, and plausibly were “not financially viable” prior to reaching an agreement with the US to fund a COVID-19 vaccine there. Moderna’s CEO has publicly stated that they have to make a profit from this vaccine. They are already counting vaccine revenues in their financial projections. And they’re going to try to sell their vaccine at roughly two to three times the price of other vaccines being developed. Given the number of entities making vaccines, that’s going to be a pretty tough sell, I think. Except, of course, for selling it to the Federal government.
Need more? They claimed to have the patent on the method they’re using, but in fact, they are infringing on another patent, (or read this story) in order to make this vaccine. Or so a court just decided about a month ago. At this point, it’s not clear that they can legally sell their vaccine anyway. If they ever develop it.

Who picked this loser? A Moderna board member did. The Trump administration hired one of Moderna’s directors to head up the Warp Speed vaccine development program. And, surprise surprise, from among all the candidates available, the US Government chose to dump an appreciable fraction of a billion dollars on … wait for it … Moderna.

Make up your own mind. As for myself, I’m not holding my breath waiting for this particular vaccine. Instead, I think it’s just another factor that makes the US irrelevant in this process. Many other global powers will develop successful vaccines, and use them to help put a stop to this globally. But not us.

3: The major drug companies might be able to save us, despite ourselves.

The one thing the US is doing right is that we’re buying up a portfolio of potential vaccines from all the major drug companies. You can see the start of that process written up in Post #698.

I am a particular fan of Johnson and Johnson (having served as a consultant to them for many years), but pick your major big-dollar international drug giant, and chances are, they are in the process of making a COVID-19 vaccine. It’s a pretty fair bet that some of those are going to work. Might even work well. You can see an exhaustive listing at the NY Times vaccine tracking page.

You can read any number of writeups of the US vaccine portfolio, but look for one dated recently, as the deals continue to evolve. Here’s one from 8/10/2020. Here’s one from 8/14/2020. That’s close enough for this next part.
This next exercise is called: Count the Doses. Realize that we’re only buying vaccine for US use. (As noted above, we’re not part of any international consortium to supply vaccine to shit-hole lesser-developed countries.) But also realize that some vaccines take two doses. But further realize (below) that 30% of the population says they won’t get the vaccine. And, of course, by the time the vaccine is here, it’s likely that a good solid (guesstimate) 15% of the US population will already have the antibodies for it, because they’ve already had COVID-19.

Put all that in a blender and guess how many vaccine doses the US needs? I think we need maybe 400 million doses, at the outside. (Calculated as ~ 350M people x 85% not already immune x 70% opt for it x 2 for two doses in the regimen).

Now add up all the doses the US has contracted to buy or option, from the last reference above. I count 2.5 billion vaccine doses. The federal government has bought or optioned 2.5 billion doses of various COVID-19 vaccines. So far.

That’s an interestingly large gap, I think. The Federal government has bought or optioned six times the number of vaccine doses that it will plausibly actually need. Or roughly enough to cover the US population seven times over. The European Union is doing something like this — buying into each others’ vaccines. Great Britain, like the US, is going it alone, and has bought 190M doses, for a population of 66M, or roughly three-times coverage of its population.

The somewhat distressing reason for the overkill in vaccine purchases is that some of them, possibly most of them, won’t work. And so, the variety and number that you purchase depends on the depth of your pockets, and your estimate as to how many will fail.

It’s a fair bet that some big drug company is going to develop a viable vaccine. But it is a bet. Nobody knows which ones will work, and which won’t. So the US has bought itself a nice, diversified portfolio of vaccines. And, with any luck at all, the big drug companies will be able to save us.
4: But the stupidity of The American People may yet snatch defeat from the jaws of victory. Suppose I told you that I have a medical treatment available. And you said that you didn’t want it. Without knowing any of the following:

- What it is.
- Who makes it.
- How effective it is.
- What risks are involved if you take it.
- What risks are involved if you don’t take it.
- How much it costs.

At this point, we’ve had several surveys showing that about a third of Americans are saying exactly that, with respect to a COVID-19 vaccine. That’s something I find kind of astonishing. But it is what it is. (And it’s not unique to the US — about a third of people in Great Britain also said they wouldn’t get vaccinated.)

What’s particularly weird about it is that almost half of US adults get the seasonal flu shot. Flu rarely kills adults other than the oldest old, and the flu vaccine is, at best, only about 60% effective. So, presumably, those people are going to get the COVID-19 vaccine.

What’s weird is that if we change that scenario from seasonal flu to coronavirus pandemic, we only pick up another 20% or so of the US adult population. Just ponder that a bit. Swap in a vastly deadlier disease, with no known season, that may well still be circulating years from now, and a vaccine that might (or might not) be far more effective than the seasonal flu vaccine. Oh, and did I mention that it’s your patriotic duty to get vaccinated, because we need herd immunity to be able to get the economy running again?

All that, and we only pick up another 20%? I don’t get it. But I don’t get people who say “no” before they have the faintest idea what the terms of the deal are. Maybe they’ve bought into somebody’s disinformation campaign. Maybe this, too, has been politicized,
along with masks. I don’t know. I try not to hang out with the crazies.

But that 30% non-vaccinate rate, by itself, pretty much spikes any chances for “herd immunity”.

Herd immunity is one of those terms that everybody uses, but few people define precisely. You can think of it as having enough people immune to a disease that an epidemic/pandemic eventually dies out, for lack of disease carriers. You can also think of it as protecting unvaccinated members of the population, in a probabilistic sense, because so many non-carriers (vaccinated individuals) stand between them and any infected member of the population.

As an economist, I have to say that herd immunity is a free-rider problem. That is, if enough people take the trouble to get vaccinated, you don’t have to. You can be a “free rider”, and reap almost all the benefit of a vaccination program without taking part in it. This is what allows the “anti-vaxxers” to get away with not vaccinating their kids. If everybody else does, then their kids won’t die of (say) pertussis, or measles, or any of the rest of what used to be the common causes of childhood mortality, because they’ve been sheltered by the responsible behavior of the rest of the parents in their community. If not for that — for this free-rider issue — if failing to get their kids vaccinated meant that an appreciable fraction of their kids would die — I bet we’d see a whole lot fewer anti-vaxxers. In other words, the free-rider problem caused by herd immunity is a key driving force behind the anti-vaxxer movement. They get to take their bold and brave stand, while hiding behind the majority of community residents who get vaccinated. Abraham and Isaac, this is not. It’s more like hurling insults at someone while standing behind your bodyguards.

At any rate, most estimates seem to guess that we need to have 70% of the population immune to COVID-19 before we’ll achieve herd immunity. If 30% really, truly refuse to be vaccinated, then we’d have to have a near-perfect vaccine to achieve that.

It only needs to be near-perfect because some appreciable fraction of the population will achieve immunity by getting infected. At this point, about 1.5% of the US population is known to have had and survived coronavirus (5.2M out of about 350M). Guesses as to the size of the population that had it, but wasn’t officially diagnosed, range “up to” 10 times that amount. And so, if (say) 15% of the population has antibodies already, then the 30% un-vaccinated population is really only about 26% that are non-complaint and potential disease carriers. So the vaccine could be slightly less than perfect, and we’d still be able to achieve an overall rate of 70% immunity.
So, how good are these vaccines going to be? Nobody knows. But if it’s only as good as the seasonal flu vaccine (pictured above), it’s going to be a long time before we achieve herd immunity. The old-fashioned way. While culling the herd in the process.