Our Finite World
Exploring how oil limits affect the economy

We can't expect COVID-19 to go away; we should plan accordingly

Posted on April 11, 2021 by Gail Tverberg

Can the world achieve "herd immunity" with respect to COVID-19? Anthony Fauci has said that 80% of the population needs to be vaccinated in order to reach herd immunity. My view is that using vaccines is unlikely to achieve this result, something I discussed in my August 2020 post, *We Need to Change Our COVID-19 Strategy*. Now, the news arm of the prestigious journal *Nature* has published a similar view: *Five reasons why COVID herd immunity is probably impossible*.

In this post, I explain why, in my view, COVID-19 seems likely to become endemic, like the flu. The vaccines won't be enough to make it go away completely. I will also look at the issue of how we should respond to the cases of COVID-19 that we will almost certainly experience in the future.

To a significant extent, what we can and should do in the future is an energy issue. If we plan to transition to a green energy future, or if we simply plan to reduce usage of fossil fuels in future years, we probably need to scale back our plans for vaccines. In fact, any treatment that would be given in today's emergency rooms is likely to become less and less possible as energy supplies deplete.

We will need to focus more on what our bodies can do for us, and what we can do to assist them in this effort. We also need to think about what simple changes to our environment (such as windows that open) can do for the prevention of both COVID-19 and the many other communicable diseases that we can expect to encounter in the future. The big issue will be changing expectations.

[1] Why herd immunity is unlikely

[1.1] Viruses don't pay any attention to the geography of humans. As long as there are active cases anywhere, they will tend to spread to other countries.

Over the past year, we have seen how ineffective cutting off travel between countries is in stopping the path of the virus. Even New Zealand, far out in the Pacific Ocean, has been battling this issue. The country has found that occasional cases slip through, even with a required two-week stay in managed isolation after arrival.

Furthermore, there are hidden costs with staying this removed from the rest of the world; New Zealand's only oil refinery has been losing money, given its low use of oil. This refinery has laid off about a quarter of its staff and is considering the option of quitting refining in 2022. New Zealand would then need to import a full range of refined products if it wants to continue having industry. Perhaps being too cut off from the rest of the world is a problem, rather than a solution.

[1.2] The cost of vaccines is high, especially for poor countries.

We can get a rough idea of the cost involved by looking at a news article about Israel's dispute with Pfizer regarding its vaccine purchases. We can also see what goes wrong politically.

Israel recently made news for failing to pay Pfizer for the last 2.5 million vaccine doses that it purchased from the company. Pfizer retaliated by cutting off future vaccine shipments to Israel. The article linked above doesn't tell us exactly how much Israel paid for Pfizer's vaccine, but a calculation based on information in the article seems to indicate that future doses from a mixture of vendors would cost about $35 per dose, on average. We also know that US Medicare is paying $40 per dose for administering each dose of the vaccine. Putting these two amounts together, we can estimate that the purchase and administration of a single dose of COVID-19 vaccine costs about $75. Thus, a two-dose series costs about $150, with the high-tech vaccines Israel is now using (Pfizer, Moderna, and AstraZeneca).

We also know that Israel was planning to administer two doses per person, every six months, based on an early review of how well immunity was holding up for the vaccines. If it is really necessary to repeat the two-dose regimen every six months, then the annual per-person cost of the vaccine would be approximately 2 times $150, or $300 per person. Benjamin Netanyahu favors buying all of these doses, quite possibly because it might make him popular with voters. Netanyahu's opposition does not, which seems to be why payment has not been forthcoming.

A cost of $300 per person would amount to 0.7% of Israel's 2019 GDP, which is theoretically feasible. But for poorer countries, the relative cost would be much higher. For South Africa, it would amount to 5% of 2019 GDP. For Yemen, it would come to 40% of 2019 GDP. (These are my calculations, using World Bank GDP in current US$.) For countries with severe financial problems, any payment for vaccines would almost certainly be a problem.

There are less expensive vaccines being made, but their percentages of efficacy in fighting the virus that causes COVID-19 seem to be lower. Thus, it would be even more difficult to greatly reduce the number of cases down to the point where the disease would simply disappear for lack of an adequate number of victims to infect, using these vaccines.

[1.3] The fact that the disease can infect animals further adds to the problem of getting rid of the disease completely.

The disease supposedly jumped from an animal to humans to begin with. We know that the virus that causes COVID-19 can infect animals of many types, including ferrets and cats. While the disease jumping from animals to humans is supposedly unusual, we know that the disease spreads easily among humans with inadequate immunity. Having a reservoir of disease among animals raises the likelihood of this happening again. Having a reservoir of vulnerable people (not immune and in poor health) also increases such a risk.

[1.4] Microbes of all types mutate frequently. We are fighting a losing battle to stay even with them. This is especially a problem for narrowly targeted vaccines.

We know that whenever we try to reduce the population of microbes, scientists can find solutions that work for a while, but eventually we start losing the battle. Scientists can develop antibiotics against bacteria, but eventually some bacteria will evolve in a way that allows them to resist the effects of the antibiotic. In fact, antibiotic resistance is becoming a greater and greater problem. Similarly, scientists can develop weed killers, but weeds soon develop resistance to whatever we develop. The situation seems to be similar with vaccines, unfortunately.

In this case, scientists have developed vaccines that target the RNA of the spike protein of the virus that causes COVID-19. In some sense, this approach is very precise, leading to a high proportion of COVID-19 cases being stopped. The drawback is that it is very easy for small mutations in the spike protein to make the vaccine not work well. We end up needing to obtain booster shots of slightly revised versions of the vaccine quite often, perhaps

every six months. If booster shots are not given, the vaccine is likely to become less effective against the new mutations that arise.

One danger is that manufacturers cannot keep up with all of changes needed to match the new mutations. Another is that the cost of trying to keep up with this whole process will become prohibitive. The medical care system may be forced to give the vaccine process up, leaving citizens worse off than they might have been if we hadn't "flattened the curve" and kept the virus around for an extended period of time, allowing all of these mutations.

[1.5] There are very real reasons for people's reluctance to accept the vaccine, when it is offered to them. Because of this, it is difficult to get very close to 100% acceptance (or even 80% acceptance) of the vaccines.

There seem to be any number of reasons why people are reluctant to get the new vaccine. Some are afraid of the pain involved with the shot. Others are afraid that they will be somewhat ill afterward, causing them to miss work. If employees are paid on an hourly basis and they barely have enough income as it is, this, by itself, could be a reason for avoiding the shot. Financial incentives might help with these issues.

Others who are reluctant have followed the situation more closely. They realize that important steps in the normal vaccine approval process have been skipped, making it difficult to identify adverse effects that occur fairly infrequently. Even worse, it becomes impossible to discover problems that take many months or years to become evident. Over 100 doctors and scientists from 25 countries have signed a letter saying that offering vaccines that are as radically different from what has been used in the past, without more testing, is unethical.

One concern is the likelihood of blood clots in the immediate period after the vaccine is received. Blood clots have also been observed with the AstraZeneca and Johnson & Johnson vaccines, and may be a concern with other vaccines, as well. There seem to be several related conditions, including sudden blindness, heart attacks, and sudden deaths of elderly people in nursing homes. These issues seem to be fairly rare, but people worry about them without adequate data on their frequency. If the issue is blood clots, it would seem as if simple adjustments such as taking low-dose aspirin for the time period of risk might be a partial solution.

We know that in some cases, vaccines can inadvertently make later exposure to somewhat different versions of the virus *worse*, rather than stopping these infections. The virus that causes the illness SARS is very similar to the virus that causes COVID-19. When an attempt was made at a vaccine for SARS in 2012, a study on mice showed that exposure at a later date to a slightly different virus led to blood clots forming in the lungs. We already know that blood clots can be an issue for COVID-19 vaccines. Will COVID-19 vaccine recipients who are later exposed to mutations have an adverse reaction such as blood clots in the lungs? We don't know. There have been no animal studies with respect to the vaccines for COVID-19.

Another risk of COVID-19 vaccinations would seem to be auto-immune problems, especially in people who are already predisposed to such issues. Not much research has been done yet to clarify this issue.

A related issue is allergic reactions to vaccines, including anaphylaxis. The possibility of allergic reactions is one reason vaccine recipients are asked to stay for 15 minutes after receiving their immunizations. Even with precautions, some deaths are occurring because severe allergic reactions can take up to 150 minutes to become apparent. It is impractical to keep vaccine recipients this long.

The very long-term effects of both the COVID-19 illness and vaccines to prevent the COVID-19 illness are unknown. The Alzheimer's Association recommends studies to see whether people who contract COVID-19 have a long-term increase in dementia-type illnesses. In theory, the vaccines could also lead to similar issues because of

prion-like structures that are formed, both with the vaccine and the disease. Without long-term studies, we don't know whether either of these concerns is valid. If dementia is an issue, will repeated vaccinations raise the long-term risk of dementia? We don't know. If the disease itself and vaccines can both lead to dementia, is there an optimal strategy?

Without a better understanding of what the risks are, it is hard to convince young people, especially, to take the vaccine. Their chances of a severe outcome from the disease are low to begin with. What is the point of taking a vaccine that may raise their risk of serious injury or death? The vaccine may be appropriate for people aged 80 and over, but is the risk really necessary for young people? Without better data, it is hard to know for certain.

[2] Why a change away from dependence on vaccines is needed

The Nature article referred to earlier says in its concluding paragraph, "It's time for realistic expectations. . . we need to think of how we can live with the virus."

Also, as I mentioned in the introduction, we are reaching energy limits. Even if in theory we could vaccinate everyone on the planet twice a year for COVID-19, we do not have the resources to do this. In some ways, the problem looks like a cost problem (poor countries especially cannot afford to buy high-priced vaccines), but it is just as much a resource problem. We cannot devote enough resources to this project without taking them away from other necessary projects. The vaccines are very much a product of today's fossil fuel economy. We can't expect to make vaccines with intermittent electricity.

Because of limited resources, we may encounter something similar to the "empty shelf" problem in the grocery stores. We may find that only limited doses of vaccine are available because too many doses were accidentally ruined in production. Or, not enough of the right reagents were available. Or, more doses are needed in the country where the vaccine is manufactured, leaving less for use elsewhere. Or, there is a war in a country integral to vaccine supply lines, interfering with production.

In fact, obtaining promised supplies of vaccines is already a problem. Trying to scale up production at the same time that resources in general are squeezed is likely to make this type of problem increase.

[3] Learning to live with COVID-19 and diminishing resources per capita

If we can't really fix the COVID-19 problem with endless vaccines for everyone, we need to look at other options.

[3.1] Strengthening our own immune systems

Our bodies come with built-in immune systems. It is the action of the immune system that tends to lead to a low incidence of and low severity of COVID-19 in some people, compared to others. Some of the things that seem to be helpful include the following:

- Being young
- Getting plenty of sleep at night
- Not being overweight. Proper exercise and diet are helpful in this regard.
- Maintaining a healthy microbiome. Our bodies need good microbes to help fight the "bad" microbes. Antibiotics, excessive antibacterial cleaners and a lack of exposure to "good" bacteria could be problems. Staying away from everyone and wearing masks, indefinitely, is not necessarily helpful.
- Getting adequate vitamin D through sun exposure, eating of foods that are high in vitamin D and/or supplementation. Dark skinned people living away from the equator are especially at risk for inadequate vitamin D.

- Getting adequate vitamin C from fruits and vegetables and perhaps supplementation.

Researchers need to be actively looking into optimal strategies to advise citizens. Schools might start teaching about these issues in health classes.

[3.2] Changing our customs and infrastructure to try to reduce the problem of communicable diseases in general, not just for COVID-19.

Customs for greetings among people vary greatly around the world. Some people use hugs and handshakes, others greet with bows. We may need to adopt more distant physical greetings, simply to help reduce the transmission of disease. Of course, hugging at home is still fine.

In the last 100 years, the emphasis increasingly has been on building tighter, more energy-efficient buildings. This is good from a point of saving energy, but it doesn't work in a world with many communicable diseases. We need to move toward much more ventilation, often based on open windows. Because of energy constraints, we likely cannot expect to keep heating and cooling our buildings as much in the future. We will need to dress more for outdoor temperatures, indoors.

Some leaders have suggested rapid electric rail is the way of the future, but rail transport also needs to be well ventilated. It is also likely that we will be dealing with more intermittency of electricity supply in the future. We need to plan as if we are dealing with an electricity constrained future, as much as an oil and vaccine constrained future.

[3.3] Finding low energy ways to deal with the likely COVID-19 cases that do occur.

The approach in the "rich world" to date in looking for ways to deal with COVID-19 has been to look for new, high technology drugs and vaccines that might have a two-fold benefit (a) help sick people and (b) help the pharmaceutical industry. What we really need are technologies that are low cost and can be used at home. Repurposed old drugs, such as steroids, are ideal, especially if they can be made locally without dependence on international supply lines.

If COVID-19 doesn't really disappear, we can expect recurring instances of having inadequate medical facilities to treat all of the patients in a given area. Countries need to plan strategies for dealing with this likely long-term problem. Should there be an upper age limit on patients using these facilities, for example, especially when demand is high? Or can the richest citizens have the ability to buy services, when others cannot? Should there be a lottery for beds? Ordering everyone to remain at home is sort of a temporary solution, but it is very damaging to the economy as a whole.

[3.4] Finding leadership that can think in a direction other than "more technology will save us." Unfortunately, this is pretty much impossible.

Back in 1979, Jimmy Carter tried to change the direction of the US economy when he gave his famous Sweater Speech. In this speech, he told people that they needed to adjust their thermostats and drive their vehicles less because there was an energy crisis. We all know that Jimmy Carter was not reelected after this speech. Instead, Ronald Reagan was elected. He cut taxes and raised debt levels, temporarily delaying our need to deal with our energy problem.

When Anthony Fauci took on the COVID-19 issue, he led us in the direction of spending more money on vaccines and pharmaceuticals. His own financial interests and his work interests were in the direction of helping the vaccine and pharmaceutical interests. He certainly didn't stop to think, "This is not a battle that we can win. There

are too many instances of transmission of the virus by people who have no symptoms. Our track record at wiping out diseases with vaccines has been pretty dismal in the past. Stopping COVID-19 in one part of the world won't stop the long-term problem."

I expect that President Biden will continue on his current path until the economy "runs off the cliff." I wrote in my recent post, *Headed for a Collapsing Debt Bubble*, that the economy was reaching a point where a major discontinuity would occur. Interest rates are about as low as they can go, and debt levels are reaching an upper bound.

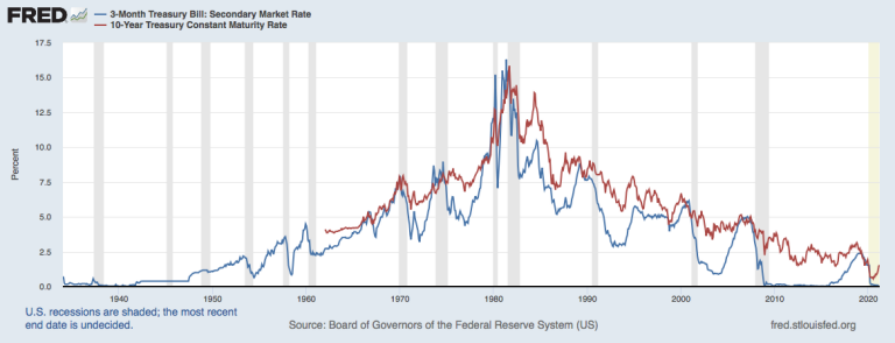

Figure 1. Ten-year and three-month US Treasury interest rates as of March 1, 2021.

Ronald Reagan's administration started to decrease interest rates shortly after he took office in 1981. This drop in interest rates has hidden rapidly rising debt and energy problems for many years. We are now running out of room on both energy and debt. When the world's debt bubble collapses, our ability to fight COVID-19 with vaccines will likely go downhill quickly. We will then need to find new strategies. Unfortunately, considering new strategies in advance is almost impossible.

[4] Conclusion

While it is possible to see what change in direction seems to be needed with respect to COVID-19 and infectious diseases in general, it is not something that those in leadership positions will be able to implement. Instead, we will likely "go off the cliff" at full speed. Changing expectations in advance is almost impossible.

At most, a few interested people can try to explain to their fellow citizens what is happening. Perhaps, in our own little spheres of influence, we can make some small changes in the right direction, starting with strengthening our own immune systems.

About Gail Tverberg

My name is Gail Tverberg. I am an actuary interested in finite world issues - oil depletion, natural gas depletion, water shortages, and climate change. Oil limits look very different from what most expect, with high prices leading to recession, and low prices leading to financial problems for oil producers and for oil exporting countries. We are really dealing with a physics

problem that affects many parts of the economy at once, including wages and the financial system. I try to look at the overall problem.
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3,514 Responses to *We can't expect COVID-19 to go away; we should plan accordingly*

Durwood Dugger *says:*
May 1, 2021 at 11:15 am

As I commented earlier – "Herd Immunity" is already here in the US. Here – even as more and more people – especially Republicans increase unrestricted social activities without precautions – of masks, social distancing. And of course their continued generation of anti-vaxing conspiracy theories.

The nCV-19 "Herd Immunity" process is on schedule (if not slightly ahead – because of vaccinations) to be similar to past well documented viral flu pandemics of the past century – even though there were no vaccines for those past pandemics. Basically, two years of wide spread global infections followed by two years of asymptotic declining infections. Leaving remaining concentrations of lingering infections in remote areas where the initial pandemic had not spread as effectively early on and vaccinations were not available.

The basis for these "herd immunity" statements are well demonstrated – if not documented – in the stats of several recent polls of US social activities. Essentially, more and more people are interacting with less and less social precautions – while US daily infection rates continue to decline to a residual level that may take another couple of years to disappear if only half the country (divided by politics and a lack of basic science education) gets vaccinated. Discussion and links to these respective poles in this CNN article: (https://www.cnn.com/2021/05/01/politics/pandemic-return-to-activities-analysis/index.html)

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Robert Firth *says:*
May 1, 2021 at 12:34 pm

Herd immunity, as originally defined and then applied for over a century, had nothing to do with vaccines. It occurs when enough of the population have developed immunity in the way evolution intended: through our own immune systems.

Then the WHO and the CDC changed the definition to imply it could be achieved only through vaccines. Unsurprisingly, many "experts" in both those bodies were in the pay of Big Pharma. In other words, they are lying.

This is now being proven in the field. Cases of infection are dropping in US states that have fewer vaccinated, but have opened up and abolished social distancing. They are dropping far more slowly, if at all, in states with more vaccinated, but also strict lockdown.

It is also being proved in the laboratory: vaccinated people can still spread the virus, while naturally immune people cannot.

Naturam expellas furca; tamen usque recurret.

And why do you, or anyone else, expect us to believe CNN?

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hillcountry *says:*
May 1, 2021 at 12:54 pm

well said Robert, short and sweet !!!