

## **It is easy to overdo COVID-19 quarantines**

Posted on [March 11, 2020](#) by [Gail Tverberg](#)

We have learned historically that if we can isolate sick people, we can often keep a communicable disease from spreading. Unfortunately, the situation with the new coronavirus causing COVID-19 is different: We can't reliably determine which people are spreading the disease. Furthermore, the disease seems to transmit in many different ways simultaneously.

Politicians and health organizations like to show that they are "doing something." Because of the strange nature of COVID-19, however, *doing something* is mostly a time-shifting exercise: With quarantines and other containment efforts, there will be fewer cases now, but this will be mostly or entirely offset by more cases later. Whether time-shifting reduces deaths and eases hospital care depends upon whether medical advances are sufficiently great during the time gained to improve outcomes.

We tend to lose sight of the fact that an economy cannot simply be shut down for a period and then start up again at close to its former level of production. China seems to have seriously overdone its use of quarantines. It seems likely that its economy can never fully recover. The permanent loss of a significant part of China's productive output seems likely to send the world economy into a tailspin, regardless of what other economies do.

Before undertaking containment efforts of any kind, decision-makers need to look carefully at several issues:

- Laying off workers, even for a short time, severely adversely affects the economy.
- The expected length of delay in cases made possible by quarantines is likely to be very short, sometimes lasting not much longer than the quarantines themselves.
- We seem to need a very rapid improvement in our ability to treat COVID-19 cases for containment efforts to make sense, if we cannot stamp out the disease completely.

Because of these issues, it is very easy to overdo quarantines and other containment efforts.

In the sections below, I explain some parts of this problem.

### **[1] The aim of coronavirus quarantines is mostly to slow down the spread of the virus, not to stop its spread.**

As a practical matter, it is virtually impossible to stop the spread of the new coronavirus.

In order to completely stop its spread, we would need to separate each person from every other person, as well as from possible animal carriers, for something like a month. In this way, people who are carriers for the disease or actually have the disease would hopefully have time to get over their illnesses. Perhaps airborne viruses would dissipate and viruses on solid surfaces would have time to deteriorate.

This clearly could not work. People would need to be separated from their children and pets. All businesses, including food sales, would have to stop. Electricity would likely stop, especially in areas where storms bring down power lines. No fuel would be available for vehicles of any kind. If a home catches fire, the fire would need to burn until a lack of material to burn stops it. If a baby needs to be delivered, there would be no midwife or hospital services available. If a person happened to have an appendicitis, it would simply need to resolve itself at

home, however that worked out.

Bigger groups could in theory be quarantined together, but then the length of time for the quarantine would need to be greatly lengthened, to account for the possibility that one person might catch the disease from someone else in the group. The bigger the group, the longer the chain might continue. A group might be a single family sharing a home; it could also be a group of people in an apartment building that shares a common ventilation system.

**[2] An economy is in many ways like a human being or other animal. Its operation cannot be stopped for a month or more, without bringing the economy to an end.**

I sometimes write about the economy being a self-organizing networked system that is powered by energy. In physics terms, the name for such a system is a [dissipative structure](#). Human beings are dissipative structures, as are hurricanes and stars, such as the sun.

Human beings cannot stop eating and breathing for a month. They cannot have sleep apnea for an hour at a time, and function afterward.

Economies cannot stop functioning for a month and afterward resume operations at their previous level. Too many people will have lost their jobs; too many businesses will have failed in the meantime. If the closures continue for two or three months, the problem becomes very serious. We are probably kidding ourselves if we think that China can come back to the same level that it was at before the new coronavirus hit.

In a way, keeping an economy operating is as important as preventing deaths from COVID-19. Without food, water and wage-producing jobs (which allow people to buy necessary goods and services), the deaths from the loss of the economy would be far greater than the direct deaths from the coronavirus.

**[3] A reasonable guess is that nearly all of us will face multiple exposures to the new coronavirus.**

Many people are hoping that this wave of the coronavirus will be stopped by warmer weather, perhaps in May or June. We don't know whether this will happen or not. If the coronavirus does stop, there is a good chance the same virus, or a close variation of it, will be back again this fall. It is likely to come back in waves later, for at least one more year. In fact, if no vaccine is found, it is possible that it could come back, in various variations, indefinitely. There are many things we simply don't know with certainty at this time.

Epidemiologists talk about the spread of a virus being stopped at the community immunity level. [Harvard epidemiologist Marc Lipsitch](#) originally estimated that 40% to 70% of the world's population would come down with COVID-19 within the first year. He has revised this and now states that it is plausible that 20% to 60% of the world's population will catch the disease in that timeframe. He also indicates that if the virus cannot be contained, the only way to get it under control is for 50% of the world's population to become immune to it.

The big issue with containing the coronavirus is that we cannot really tell who has it and who does not. The tests available for COVID-19 are expensive, so giving the test to everyone, frequently, makes no sense. The tests tend to give a many false negatives, so even when they are given, they don't necessarily detect people with the disease. There are also many people who seem to spread the disease without symptoms. Without testing everyone, these people will never be found.

We hear limited statements such as "[The United States surgeon general said Sunday](#) that he thinks the coronavirus outbreak is being contained in certain areas of the country as cases of the virus rise across the United States." Unfortunately, containment of the virus in a few parts of the world does not solve the general problem. There are lots and lots of uncontained cases around the world. These uncontained cases will continue

to spread, regardless of the steps taken elsewhere.

Furthermore, even when we think the virus is contained, there are likely to be missed cases, especially among people who seem to be well, but who really are carriers. Getting rid of the virus is likely to be a major challenge.

**[4] There is an advantage to delaying citizens from catching COVID-19. The delay allows doctors to learn which existing medications can be used to help treat the symptoms of the disease.**

There seem to be multiple drugs and multiple therapies that work to some limited extent.

For example, plasma containing antibodies from a person who has already had the illness can be injected into a person with the disease, helping to fight the disease. It is not clear, however, whether such a treatment will protect against future attacks of the virus since the patient is being cured without his own immune system producing adequate antibodies.

Some HIV drugs are being examined to see whether they work well enough for it to make sense to ramp up production of them. The [antiviral drug remdesivir](#) by Gilead Sciences also seems to have promise. For these drugs to be useful in fighting COVID-19, production would need to be ramped up greatly.

In theory, there is also a possibility that a vaccine can be brought to market that will get rid of the virus. Our past experience with vaccine-making has not been very good, however. Out of 200+ virus-caused diseases that affect humans, only about 20 have vaccines. These vaccines generally need to be updated frequently, because viruses tend to mutate over time.

With some viruses, such as Dengue Fever, people don't ever build up adequate immunity to the many disease variations that exist. Instead a person who catches Dengue Fever a second time is likely to be sicker than the first time. Finding a vaccine for such diseases seems to be almost impossible.

Even if we can actually succeed in making a vaccine that works, the expectation seems to be that this will take at least 12 to 18 months. By this time, the world may have experienced multiple waves of COVID-19.

**[5] There are multiple questions regarding how well European countries, Japan and the United States will really be able to treat coronavirus.**

There are several issues involved:

- (a) Even if medicines are identified, can they be ramped up adequately in the short time available?
- (b) China's exports have dropped significantly. Required medical goods that we normally import from China may not be available. The missing items could be as simple as rubbing alcohol, masks and other protective wear. The missing items could also be antibiotics, antidepressants, and blood pressure medications that are needed for both COVID-19 patients and other patients.
- (c) Based on my calculations, the number of hospital beds and ICU beds needed will likely exceed those available (without kicking out other patients) by at least a factor of 10, if the size of the epidemic grows. There will also be a need for more medical staff. Medical staff may be fewer, rather than more, because many of them will be out sick with the virus. Because of these issues, the amount of hospital-based care that can actually be provided to COVID-19 patients is likely to be fairly limited.
- (d) One reason for time-shifting of illnesses has been to try to better match illnesses with medical care available. The main benefit I can see is the fact that many health care workers will have contracted the illness in the first wave of the disease, so will be more available to give care in later waves of the disease. Apart from this difference, the system will be badly overwhelmed, regardless of when COVID-19 cases occur.

**[6] A major issue, both with COVID-19 illnesses and with quarantines arising out of fear of illness, is *wage loss*.**

If schools and day care centers are closed because of COVID-19 fears, many of the parents will have to take off time from work to care for the children. These parent will likely lose wages.

Wage loss will also be a problem if quarantines are required for people returning from an area that might be affected. For example, [immigrant workers in China](#) wanting to return to work in major cities after the New Year's holiday have been quarantined for 14 days after they return.

Clearly, expenses (such as rent, food and auto payments) will continue, both for the mother of the child who is at home because a child's school is closed and for the migrant worker who wants to return to a job in the city. Their lack of wages will mean that these people will make fewer discretionary purchases, such as visiting restaurants and making trips to visit relatives. In fact, migrant workers, when faced with a 14 day quarantine, may decide to stay in the countryside. If they don't earn very much in the best of times, and they are required to go 14 days without pay after they return, there may not be much incentive to return to work.

If I am correct that the illness COVID-19 will strike in several waves, these same people participating in quarantines will have another "opportunity" for wage loss when they actually contract the disease, during one of these later rounds. Unless there is a real reduction in the number of people who ultimately get COVID-19 because of quarantines, a person would expect that the total wage loss would be *greater* with quarantines than without, because the wage loss occurs twice instead of once.

Furthermore, businesses will suffer financially when their workers are out. With fewer working employees, businesses will likely be able to produce fewer finished goods and services than in the past. At the same time, their fixed expenses (such as mortgage payments, insurance payments, and the cost of heating buildings) will continue. This mismatch is likely to lead to lower profits at two different times: (a) when workers are out because of quarantines and (b) when they are out because they are ill.

**[7] We likely can expect a great deal more COVID-19 around the world, including in China and in Italy, in the next two years.**

The number of reported COVID-19 cases to date is tiny, compared to the number that is expected based on estimates by epidemiologists. China reports about 81,000 COVID-19 cases to date, while its population is roughly 1.4 billion. If epidemiologists tell us to expect 20% to 60% of a country's population to be affected by the end of the first year of the epidemic, this would correspond to a range of 280 million to 840 million cases. The difference between reported cases and expected cases is huge. Reported cases to date are less than 0.01% of the population.

We know that China's reported number of cases is an optimistically low number, but we don't know how low. Many, many more cases are expected in the year ahead if workers go back to work. In fact, there have been recent reports of a COVID-19 [outbreak in Shenzhen and Guangzhou](#), near Hong Kong. Such an outbreak would adversely affect China's manufactured exports.

Italy has a similar situation. It is currently reported to have somewhat more than 10,000 cases. Its total population is about 60 million. Thus, its number of cases amounts to about 0.02% of the population. If Epidemiologist Lipsitch is correct regarding the percentage of the population that is ultimately likely to be affected, the number of cases in Italy, too, can be expected to be much higher within the next year. Twenty percent of a population of 60 million would amount to 12 million cases; 60% of the population would amount to 36 million cases.

**[8] When decisions about quarantines are made, the expected wage loss when workers lose**

## **their jobs needs to be considered as well.**

Let's calculate the amount of wage loss from actually having COVID-19. If workers generally work for 50 weeks a year and are out sick for an average of 2 weeks because of COVID-19, the average worker would lose 4% ( $=2/50$ ) of his annual wages. If workers are out sick for an average of three weeks, this would increase the loss to 6% ( $3/50$ ) of the worker's annual wages.

Of course, not all workers will be affected by the new coronavirus. If we are expecting 20% to 60% of the workers to be out sick during the first year that the epidemic cycles through the economy, the expected overall wage loss for the population as a whole would amount to 0.8% ( $=20\%$  times 4%) to 3.6% ( $=60\%$  times 6%) of total wages.

Let's now calculate the wage loss from a quarantine. A week of wage loss during a quarantine of the entire population, while nearly everyone is well, would lead to a wage loss equal to 2% of the population's total wages. Two weeks of wage loss during quarantine would lead to wage loss equal to 4% of the population's total wages.

Is it possible to reduce overall wage loss and deaths by using quarantines? This approach works for diseases which can actually be stopped through isolating sick members, but I don't think it works well at all for COVID-19. Mostly, it provides a time-shifting feature. There are fewer illnesses earlier, but to a very significant extent, this is offset by more illnesses later. This time-shifting feature might be helpful if there really is a substantial improvement in prevention or treatment that is quickly available. For example, if a vaccine that really works can be found quickly, such a vaccine might help prevent some of the illnesses and deaths in 2021 and following years.

If there really isn't an improvement in preventing the disease, then we get back to the situation where the virus needs to be stopped based on community immunity. According to Lipsitch, to stop the virus based on community immunity, at least 50% of the population would need to become immune. This implies that somewhat *more* than 50% of the population would need to catch the new coronavirus, because some people would catch the new virus and die, either of COVID-19 or of another disease.

Let's suppose that 55% would need to catch COVID-19 to allow the population immunity to rise to 50%. The virus would likely need to keep cycling around until at least this percentage of the population has caught the disease. This is not much of a decrease from the upper limit of 60% during the first year. This suggests that moving illnesses to a later year may not help much at all with respect to the expected number of illnesses and deaths. Hospitals will be practically equally overwhelmed regardless, unless we can somehow change the typical seasonality of viruses and move some of the winter illnesses to summertime.

If there is no improvement in COVID-19 prevention/treatment during the time-shift of cases created by the quarantine, any quarantine wage loss can be thought of as being simply in addition to wage loss from having the virus itself. Thus, a country that opts for a two week quarantine of all workers (costing 4% of workers' wages) may be more than doubling the direct wage loss from COVID-19 (equivalent to 0.8% to 3.6% of workers' wages).

## **[9] China's shutdown in response to COVID-19 doesn't seem to make much rational sense.**

It is hard to understand exactly how much China has shut down, but the shutdown has gone on for about six weeks. At this point, it is not clear that China can ever come back to the level it was at previously. Clearly, the combination of wage loss for individuals and profit loss for companies is very high. The long shutdown is likely to lead to widespread debt defaults. With less wages, there is likely to be less demand for goods such as cars and cell phones during 2020.

China was having difficulty before the new coronavirus was discovered to be a problem. Its energy production has slowed greatly, starting about 2012-2013, making it necessary for China to start shifting from a goods-

producing nation to a country that is more of a services-producer (Figure 1).

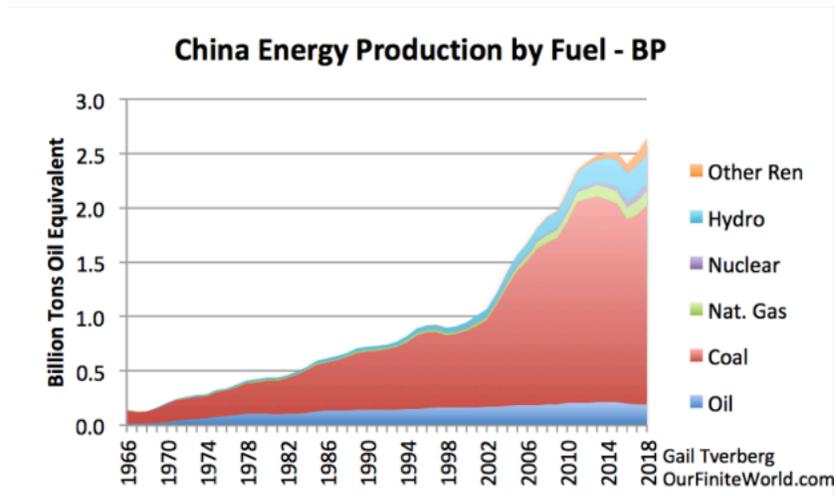


Figure 1. China energy production by fuel, based on 2019 BP *Statistical Review of World Energy* data. "Other Ren" stands for "Renewables other than hydroelectric." This category includes wind, solar, and other miscellaneous types, such as sawdust burned for electricity.

For example, China's workers now put together iPhones using parts made in other countries, rather than making iPhones from start to finish. This part of the production chain requires relatively little fuel, so it is in some sense more like a service than the manufacturing of parts for the phone.

The rest of the world has been depending upon China to be a major supplier within its supply lines. Perhaps many of these supply lines will be broken indefinitely. Instead of China helping pull the world economy along faster, we may be faced with a situation in which China's reduced output leads to worldwide economic contraction rather than economic growth.

Without medicines from China, our ability to fight COVID-19 may get worse over time, rather than better. In such a case, it would be better to get the illness now, rather than later.

**[10] We need to be examining proposed solutions closely, in the light of the particulars of the new coronavirus, rather than simply assuming that fighting COVID-19 to the death is appropriate.**

The instructions we hear today seem to suggest using disinfectants everywhere, to try to prevent COVID-19. This is yet another way to try to push off infections caused by the coronavirus into the future. We know, however, that there are good microbes as well as bad ones. The ecosystem requires a balance of microbes. Dumping disinfectants everywhere has its downside, as well as the possibility of an upside of killing the current round of coronaviruses. In fact, to the extent that the virus is airborne, the disinfectants may not really be very helpful in wiping out COVID-19.

It is very easy to believe that if some diseases can be subdued by quarantines, the same approach will work everywhere. This really isn't true. We need to be examining the current situation closely, based on whatever information is available, before decisions are made regarding how to deal with the COVID-19 outbreak. Perhaps any quarantines used need to be small and targeted.

We also need to be looking for [new approaches for fighting COVID-19](#). One approach that is not being used significantly to date is trying to strengthen people's own immune systems. Such an approach might help people's own immune system to fight off the disease, thereby lowering death rates. Nutrition experts

recommend supplementing diets with Vitamins A, C, E, antioxidants and selenium. Other experts say zinc, Vitamin D and elderberry may be helpful. Staying away from cold temperatures also seems to be important. Drinking plenty of water after coming down with the disease may be beneficial as well. If we can help people's own bodies fight the disease, the burden on the medical system will be lower.

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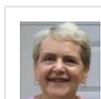
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**About Gail Tverberg**

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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## 2,627 Responses to *It is easy to overdo COVID-19 quarantines*



**Gail Tverberg** says:

March 22, 2020 at 2:25 pm

Someone claims to have found what might be close to a cure for coronavirus. From the WSJ:

[These Drugs Are Helping Our Coronavirus Patients](#)

By Jeff Colyer and Daniel Hinthorn. Dr. Hinthorn is with the University of Kansas Medical Center.

*On March 9 a team of researchers in China published results showing hydroxychloroquine was effective against the 2019 coronavirus in a test tube. The authors suggested a five-day, 12-pill treatment for Covid-19: two 200-milligram tablets twice a day on the first day followed by one tablet twice a day for four more days.*

*A more recent French study used the drug in combination with azithromycin. Most Americans know azithromycin as the brand name Zithromax Z-Pak, prescribed for upper respiratory infections. The Z-Pak alone doesn't appear to help fight Covid-19, and the findings of combination treatment are preliminary.*

*But researchers in France treated a small number of patients with both hydroxychloroquine and a Z-Pak, and 100% of them were cured by day six of treatment. Compare that with 57.1% of patients treated with hydroxychloroquine alone, and 12.5% of patients who received neither. What's more, most patients cleared the virus in three to six days rather than the 20 days observed in China.*

*[We tried this combination approach too.] Our experience suggests that hydroxychloroquine, with or*