Why I'm Optimistic That We'll Soon Stop the Coronavirus

By Whitney Tilson

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OVERVIEW

The coronavirus is a very serious national and international public health crisis. We should all be gravely concerned because it is *not* just a slightly different version of the seasonal flu. It appears to spread much more quickly and be much more deadly.

So the strong measures we've taken so far as a nation to try to stop its spread are appropriate (though we have to be careful not to overreact).

As individuals, we must not dismiss the warnings of public health experts. Wash your hands frequently and self-quarantine immediately if you have any symptoms – and even if you don't, still practice the maximum possible social distancing because as many as half of those infected are asymptomatic.

MY OUT-OF-CONSENSUS VIEW

Many people think our efforts to contain the coronavirus will fail, and that it will continue to spread rapidly for many months, infecting tens of millions of Americans and killing hundreds of thousands or even millions.

I disagree.

I'm cautiously optimistic that the measures we've ramped up over the past couple of weeks are having their desired effect, sharply reducing the coronavirus' replication rate.

If I'm right, the growth in the number of newly infected Americans is already slowing dramatically – and will soon plateau and then decline, which is exactly what happened in China's Hubei province, as I discuss below.

This would translate into a range of 10,000 to 20,000 U.S. deaths this year. Every one them is heartbreaking, of course, but to put this in perspective, it would be a small fraction of the 37,000 from traffic fatalities or nearly 150,000 from lung cancer.

As it becomes clear that we've controlled the spread of the virus and know exactly where the outbreaks are – which could happen as soon as a couple of weeks from now – we can start bringing our economy back to life.

A HUGE ANALYTICAL MISTAKE

There are many reasons why I think those predicting doomsday are wrong. The first is that they're making a huge analytical mistake by focusing on the wrong data.

The number of Americans testing positive for the coronavirus is growing exponentially right now, roughly doubling every two days for the last two weeks, as you can see in this chart (the trends are similar across much of Europe):

Total Cases - U.S.
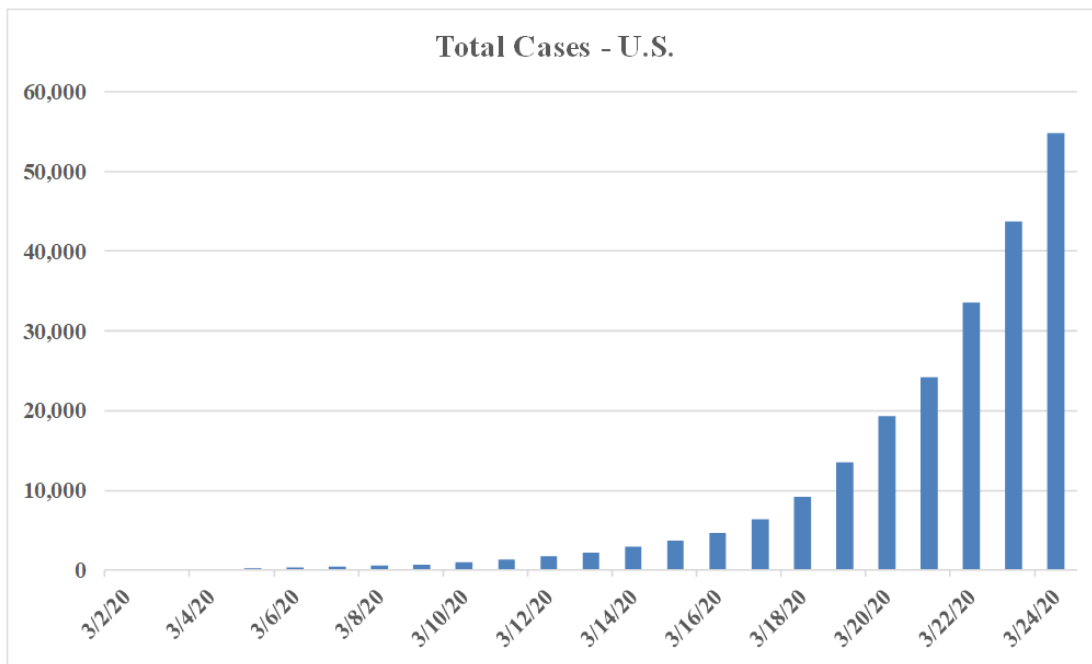
If this rate of growth continues, the number of cases will grow by more than 30 times in the next 10 days, resulting in 1.4 million infected Americans. And if it continues for 10 more days after that, we'll have 45 million cases. With a 1% mortality rate, that would result in the death of nearly a *half million* of our fellow citizens!

In the face of this grim math, it's no wonder our political leaders are shutting down our economy, irrespective of the cost. What choice do we have? After all, that's what simple math tells us, right?

Not so fast...

There's a huge error in this analysis. You see, the chart above (and the accompanying 24/7 media coverage) shows the number of *positive coronavirus test results*, not the number we really care about: ***how many people are actually infected***.

To understand the difference, let's imagine that an infected person arrives undetected in a particular city and starts an outbreak of the coronavirus. And, hypothetically, let's assume that it spreads steadily, such that 1,000 people are infected at the end of the month. This is called "linear growth," and here's what it looks like on a chart:

Actual infections (hypothetical)
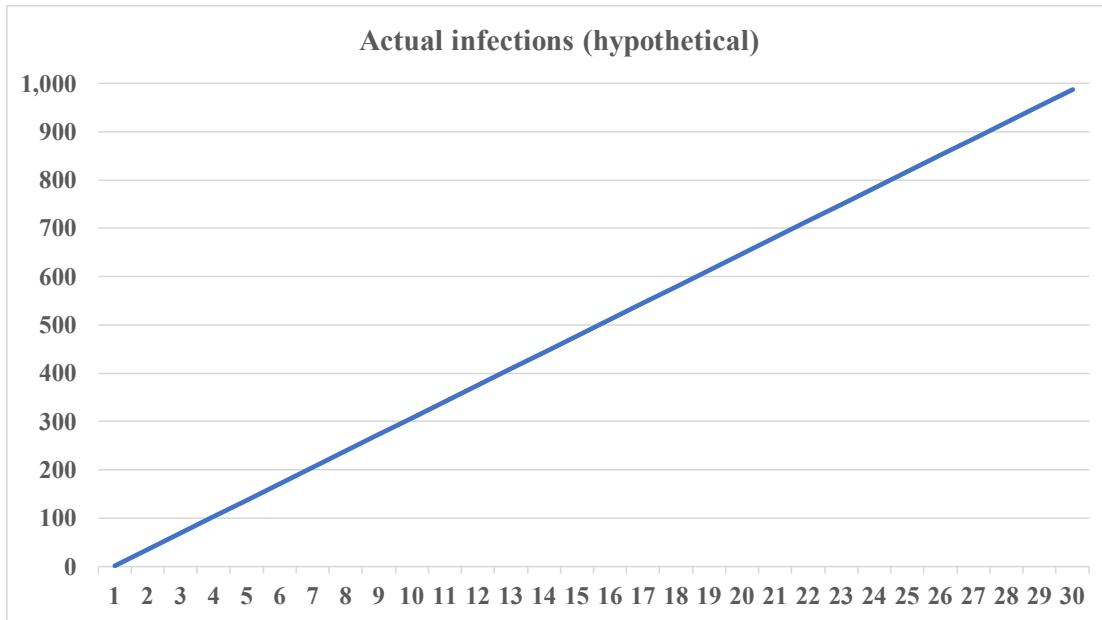
Now, let's imagine that nobody knew about the virus until the end of the third week, at which point testing ramps up quickly, such that by the end of the month every infected person has been detected. This is what that chart would look like, showing "exponential growth":

Reported infections (hypothetical)
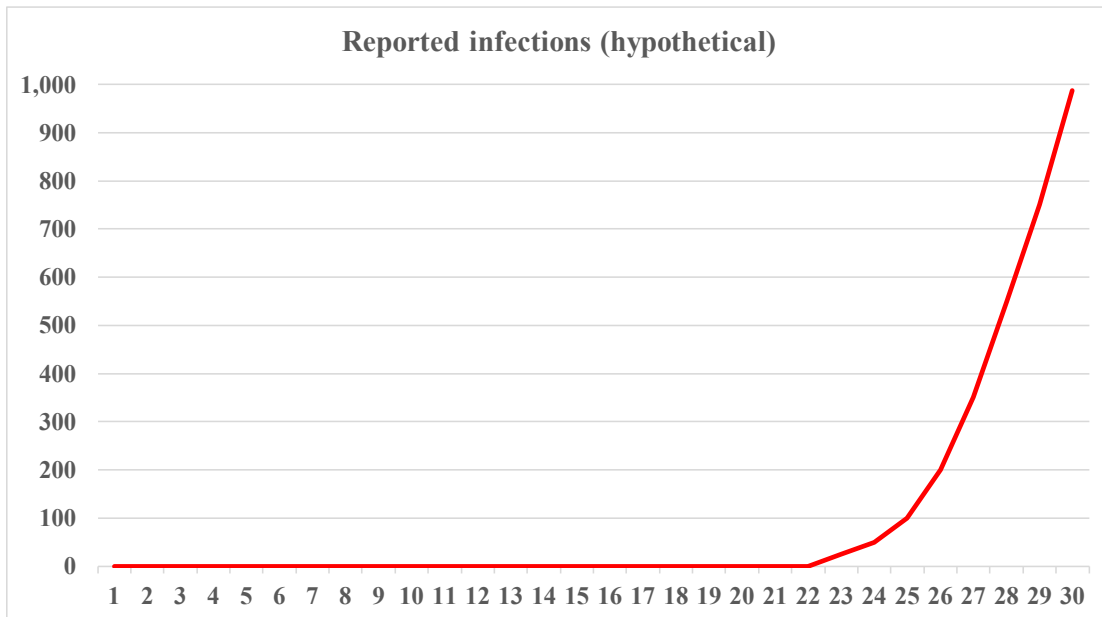
Both charts cover the same time period, and the same number of people are infected... but the second one is much scarier, isn't it?

Looking at the only data they can see – the second chart – most folks would no doubt project the recent, exponential growth indefinitely into the future, causing widespread – but largely unwarranted – panic.

Now, in reality, the various, limited case studies we have on the coronavirus indicate that the rate it actually spreads is somewhere in between these two hypothetical examples I've given.

Exactly where is nearly impossible to know, however, with such a new virus, because its replication rate appears to be highly dependent on many factors like the temperature and humidity, population density, age and health of the population, smoking rate, and, perhaps most importantly, the degree of social distancing.

Widespread testing – some of it random – is the only way to know the critical information necessary to win this fight: the number of infected people, where they are, and how rapidly the virus is spreading.

Unfortunately, however, we failed to take the coronavirus seriously for far too long and thus failed to ramp up our testing, as South Korea and other nations did.

As a result, we're blind, thrashing about, and unable to mount an effective defense against this terrible scourge. (See below for my thoughts on what we need to do right away to rectify this.)

But what we do know with certainty is that focusing on *reported* new cases can be completely misleading.

THE DIFFERENCE BETWEEN REPORTED AND ACTUAL NEW CASES: HUBEI PROVINCE CASE STUDY

Consider what happened in China's Hubei province – its capital is Wuhan, where the coronavirus originated. Someone named Tomas Pueyo posted this fascinating chart:
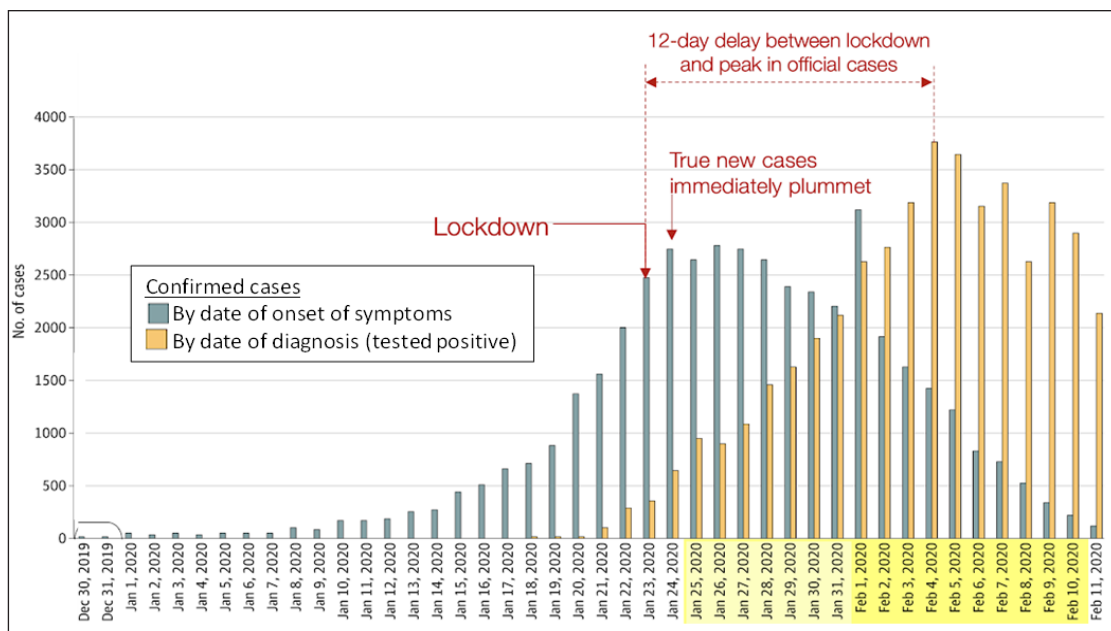
It's a very busy chart, but you only need to focus on the two sets of bars: the gray ones show the number of confirmed coronavirus cases by day, based on the date the person first had symptoms, while the orange ones show the date they received the positive test result.

So, for each person who tested positive, there were two dates: when they said they first started feeling sick (the gray bars) and when they tested positive (orange bars).

On average, there was a 12-day difference between these two dates, which reflects two things: first, most people don't rush to get tested the day they first start having symptoms like a mild sore throat, cough, and fever. Most probably figure it's just a regular cold, so they don't seek treatment – much less get tested – until they're really feeling lousy a week or two later. Then, compounding the delay, there were testing delays in China, just like we're seeing here.

Now look at what happened: the number of infected people – the gray bars – rose rapidly, about 10 times, from 250 to 2,500 – in only nine days from January 14 to January 23. That's when the Chinese government did an about-face and implemented an extreme lockdown of the entire province.

And it worked – immediately! As you can see, the number of newly infected people only rose slightly the next day to about 2,750, was flat for another three days, and then steadily dropped for the next two weeks to almost zero.

But nobody could see this. Instead, people could only see the number of *reported* new cases – the orange bars. Looking at them, one would no doubt be convinced (wrongly!) that the lockdown wasn't working because this number was skyrocketing.

Whereas the *actual* number of new cases peaked almost immediately after the lockdown, the peak in the *reported* number of new cases didn't occur for another *12* days!

In summary, as soon as China locked down Hubei province, the growth of *actual* new cases plateaued and started to fall within days, dropping to almost zero within two weeks.

Yet *reported* new cases soared for another two weeks as testing caught up with what was really happening.

I'm cautiously optimistic that this is what's happening right now in the three outbreaks in the U.S., which were among the first areas hit by the coronavirus: Seattle, the greater New York City metropolitan area, and a few parts of California.

I can't prove it, though. It's an educated guess, nothing more.

The reality is, until there is more widespread testing (discussed below), we're all flying blind. Nobody knows how many people are actually infected here in the U.S. right now, where they are, and how rapidly that number is growing.

Because we can't answer these questions, those who are making the most extreme predictions are getting the most attention – and nobody can prove them wrong.

MORE TESTS EQUAL MORE POSITIVE TEST RESULTS

But one thing I know for sure is that the rising number of Americans testing positive for the coronavirus tells us only one thing right now: that there are more people getting tested – which is *good news*! This chart shows the enormous growth in tests over the last two and a half weeks:

Total Tests
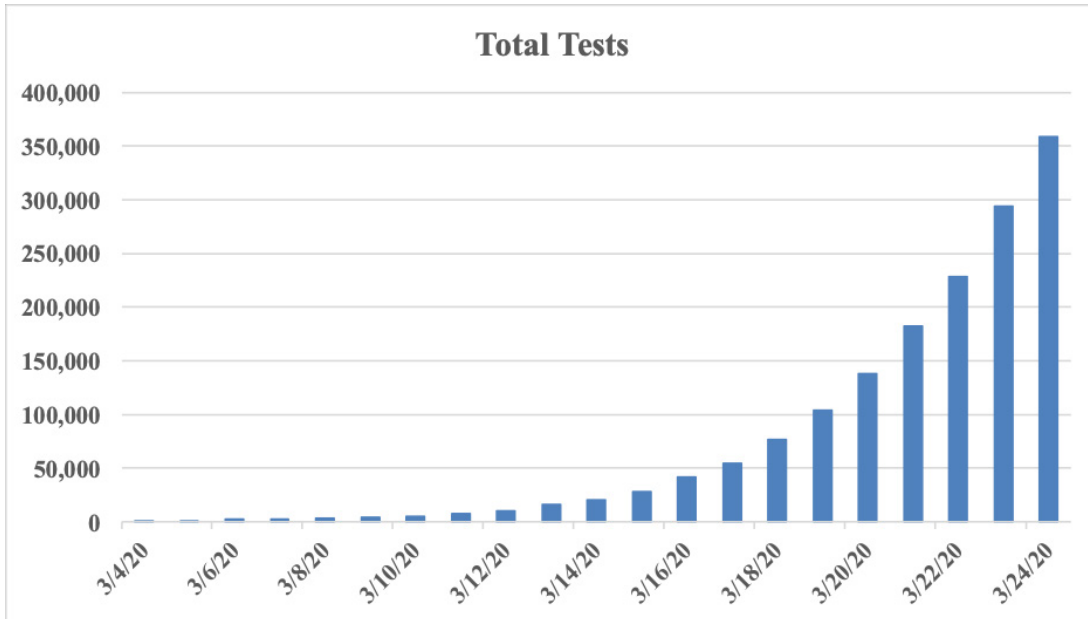
A reasonably consistent 10% to 19% of tests have been coming back positive over the past couple of weeks so, not surprisingly, the growth in the number of people testing positive is rising in lockstep with the growth in the number of tests, as you can see in this chart:

Total Tests and Positive Tests
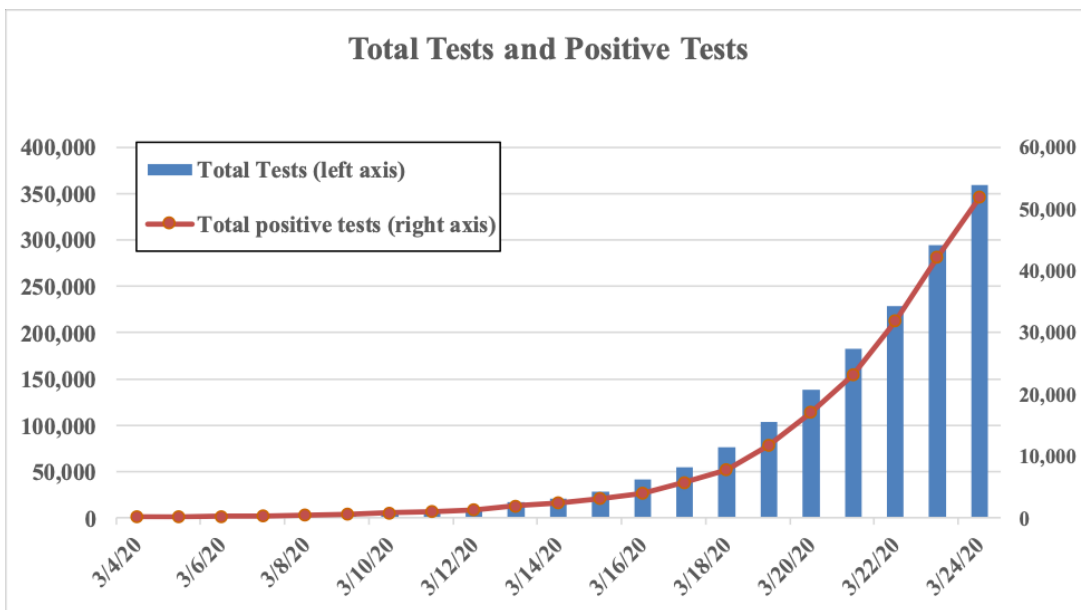
In summary, it's critically important to understand that when you see headlines like "Coronavirus cases hit a new high in the U.S. (or California, or Seattle)!", this doesn't necessarily mean that the number of newly infected people is going up.

In fact, the precise opposite might be true – as was the case in Hubei province. It's possible that all of the steps we've taken have dramatically slowed the spread of the virus, and the number of newly infected people is actually going *down*. But in the short-run, we wouldn't know it because the *reported* number of new cases is certain to keep rising as our testing ramps up.

When people don't understand what's really happening, it leads them to make terrifying doomsday forecasts.

WHY I'M OPTIMISTIC

There are many reasons why my best, educated guess (I have chosen those words carefully, because it's far from a certainty) is that we're going to stop the coronavirus sooner than most people think.

Let's start by looking at five case studies...

Case Study No. 1: Hubei Province

I've already discussed what happened in Hubei province, but here are some additional details...

The Chinese initially didn't recognize the problem when the coronavirus first jumped from animals to humans in December in the Huanan Seafood Wholesale Market in Wuhan. Then, making matters worse, the government tried to cover it up, so it spread like wildfire initially.

By the time the government realized its mistake and locked down the province on January 23, 25 people had already died and new cases were growing exponentially. But, as I showed earlier, it worked: new infections stopped rising almost immediately and, within two weeks, dropped to almost zero... where they have remained.

In total, only 81,000 Chinese have been infected so far – one of every *17,387* citizens – and fewer than 3,300 people have died, nearly all of them elderly. (Further below, I address the question of whether we can believe the numbers China is reporting... but the short answer is yes.)

Case Study No. 2: China's Asian Neighbors

The second case study is China's Asian neighbors. Travelers from Wuhan carried the coronavirus to Taiwan, South Korea, Japan, Hong Kong, and Singapore, but each of these countries recognized the risk and took strong countermeasures – focusing on testing to identify who's infected and then taking targeted steps to quarantine and treat those people.

All of these countries effectively stopped the coronavirus in its tracks – and, importantly, did so without shutting down completely and quarantining all of their citizens. (Some of them have had small increases in recent days, but this is due almost entirely to "imported" cases.)

Case Study No. 3: The Diamond Princess Cruise Ship

The fourth [case study](#) is the Diamond Princess cruise ship. One passenger with the coronavirus boarded the ship on January 20, a day after symptoms first appeared.

Over the next month, there were near-perfect conditions for the virus to spread among the 3,711 passengers and crew: most of the passengers were elderly (a third over age 70 and another quarter in their 60s), and everyone was eating together, living in close quarters, and interacting socially.

Despite this, when nearly everyone on the ship was tested a month later, only 634 (17%) were infected. In other words, 83% did *not* catch the virus!

More importantly, only eight people have died so far, equal to only 1.1% of those infected, and 0.2% of those on the ship.

Case Study No. 4: Germany

During times of stress and fear, the human mind naturally focuses on worst-case outcomes – even if they aren't highly likely. I think this is what people are doing when they look at the hardest-hit country in the world, Italy (discussed below), and assume that we are doomed to follow it into the abyss.

But we have much more in common with Germany in terms of our lifestyle, social and family structure, adherence to rules, and both the quantity and quality of our critical care medical system (see data below) – all of which contribute to halting the spread of the coronavirus, as we've seen in the Asian countries discussed above.

So let's look at Germany's data. The country has also seen a surge in both cases and deaths this month, as you can see in this chart:
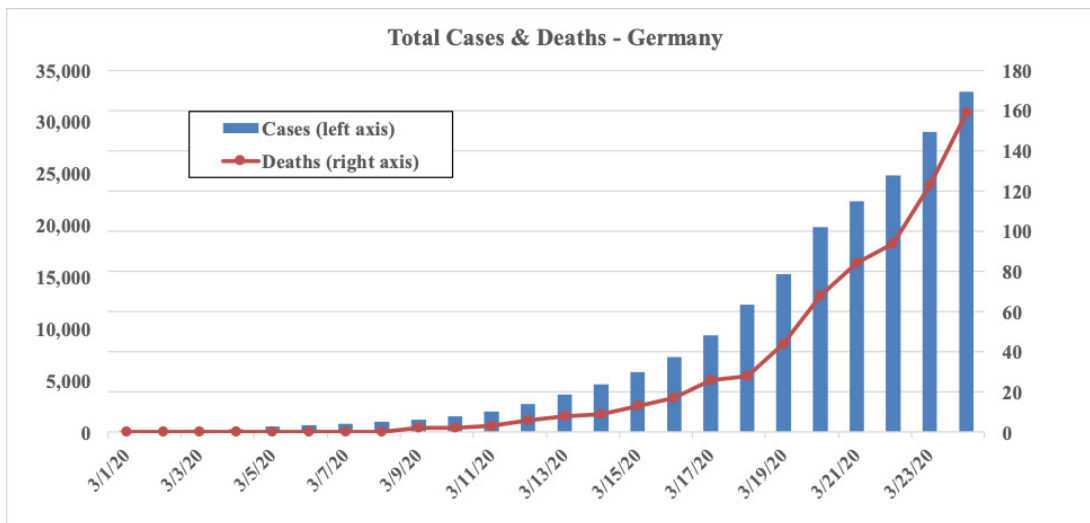
However, the absolute number of deaths, 123, is extremely low… reflecting a 0.4% mortality rate, by far the lowest among the dozen countries that have been hit the hardest by the virus (below I discuss mortality rates and why Germany's is so low).

And if we look at the number of reported new cases and deaths each day, after two weeks of rapid growth, they may be plateauing:

Cases & Deaths By Day - Germany
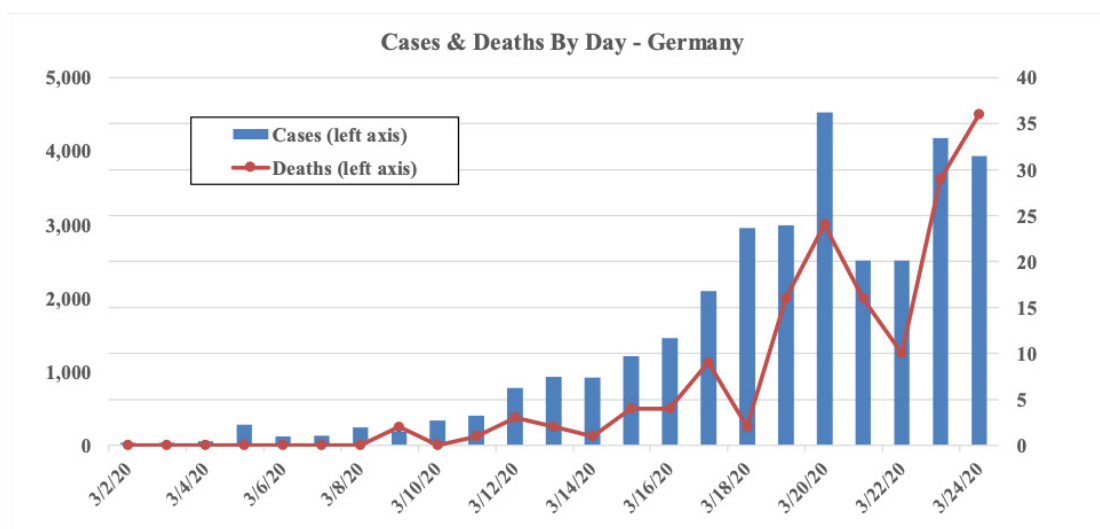
Case Study No. 5: Vo, Italy

Finally, let's look at the little village of Vo, Italy. Amidst the calamity in that country, it's a tiny bright spot with important lessons for us all.

It's in the hardest-hit northern part of the country, and had Italy's first confirmed coronavirus-related death, a 78-year-old man, on February 23. Its response was to test *every one* of the town's 3,300 residents, *even those with no symptoms*. This was critical because most of the 89 residents (2.7%) who tested positive "were completely asymptomatic."

Rather then sending them to the hospital, where they could spread the disease, they were home-quarantined, told not to go outside or interact with anyone.

Within a mere *two weeks*, the virus had been virtually eradicated. When every villager was retested, the infection rate had dropped to only 0.41%.

With all of these hopeful case studies, why are we worried?

## THE CALAMITY IN THE REST OF ITALY – AND WHY WE'RE UNLIKELY TO SUFFER THE SAME FATE

Well, sadly, the rest of Italy didn't learn from Vo. Other parts of the country didn't take the coronavirus seriously, waited too long to act, and are now paying a *big* price. Italy's hospitals overwhelmed, the nation has had to do a nationwide lockdown, and more than 6,000 people have died – nearly double any other country.

Those who think we're going to follow in Italy's footsteps point to this chart, which shows the number of new cases by day for the U.S. and Italy, with the U.S. 10 days behind:
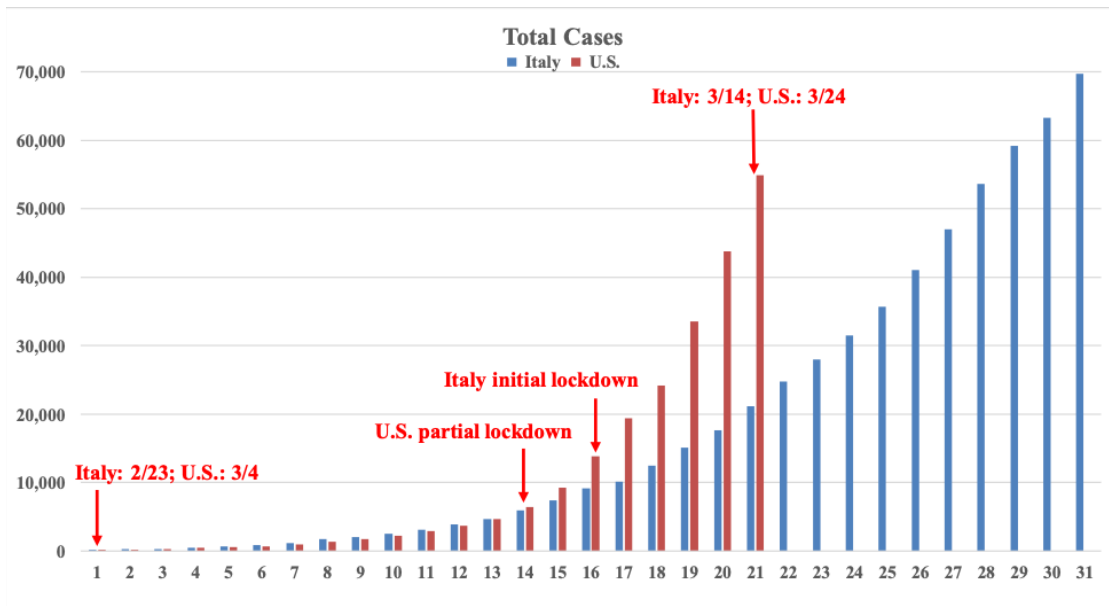
Scary, isn't it? We're now well above Italy's trajectory!

But keep in mind that the U.S. is a much larger country – our population, at 331 million, is 5.5 times larger than Italy's 60 million. If we adjust for cases per million people, the chart looks different – we're still on a similar trajectory, but are *16* days behind, not 10:
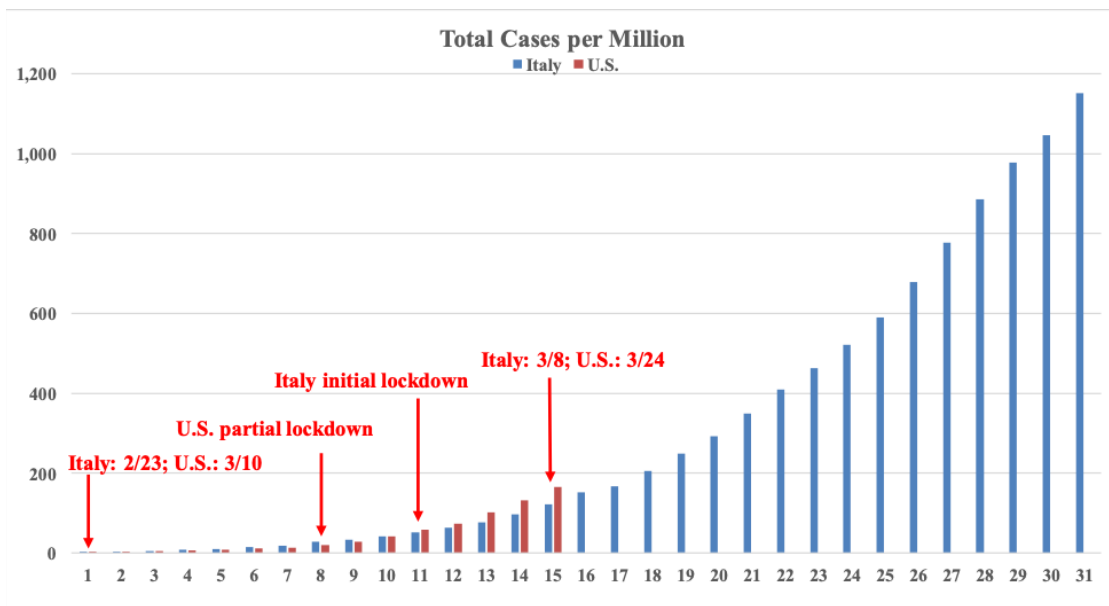
Those extra six days may not sound like much, but when the number of people infected by the virus, left unchecked, *doubles every few days*, it's huge.

Here's my back-of-the-envelope math...

Italy declared a national lockdown on March 9. Similarly, starting a couple of weeks ago here, we started taking strong measures: closing schools, cancelling all large-group events like professional and college sports, Broadway shows, and concerts; shuttering most businesses in cities with outbreaks; and initiating social distancing.

Unlike Italy, however, we haven't had a national lockdown so it's hard to choose a date for comparison, but I'm going to pick last Tuesday, March 17. That was day that, anecdotally, I felt that Americans really started to take this seriously.

So, we acted eight days after Italy – but our number of cases per capita is *16* days behind Italy, so that gives us an eight-day advantage.

If we assume the virus was doubling every four days, as Italy's was at the time of its lockdown, that means we might have avoided two doubles. In other words, if the actions we're taking prove to be effective, our peak infection rate could be only *one-fourth* that of Italy's.

And there are other reasons to believe we'll fare better than Italy, even without fully adopting the country's draconian measures.

Outside of the Asian countries right next to China, Italy was uniquely vulnerable to the spread of the virus because there are strong ties between small manufacturers in Italy and China, which is a big reason why more than 320,000 Chinese citizens live in Italy and why there was extensive travel between the two countries.

Compounding this risk, it's hard to overstate how badly Italy initially botched its initial response to the crisis, failing to take even the most basic steps to slow the spread of the virus until it was much too late.

For example, it allowed its famed Venice Carnival to take place for two weeks from February 8-23 before cancelling only the last two days. I didn't fully understand how dangerous this was until an American friend wrote me:

> I think Carnival in Venice may have accelerated the spread of COVID-19 in Italy.
>
> When I heard last month that officials hadn't canceled it until only the last two days (after COVID-19 had been detected there), I immediately thought, "Wow, the number of cases could explode from this."
>
> I went to Carnival when I was studying abroad in Milan back in 2006. It was an amazing event – a huge festival where people wearing festive masks dance and party in the streets all day and night. The streets are packed wall-to-wall the entire time. I remember being surprised how many random strangers kissed other random strangers – like *dozens* of random strangers.

And an Italian friend added:

> Others think that the virus could have been spread at a Champion League soccer game in Milan on February 19 (see this article: [Atalanta v Valencia Champions League match 'was a coronavirus biological bomb', says the mayor of Bergamo... after it went ahead in front of 44,000 fans three days before Italy's first recorded death](#)).
>
> I think, apart from our inexperience, our government was shallow, incompetent and unable to take the problem seriously from the start.

Here are some other reasons why I think we're likely to fare better than Italy:

- Italy's population density is nearly six times ours
- 23% of Italians are over age 65 versus only 16% of Americans

- 21% of Italians smoke versus 14% of Americans
- Travel and tourism as a percentage of its GDP, a rough proxy for how many foreigners are moving in and out of a country relative to its size, is much higher for Italy than the U.S. (13% vs. 8%)
- If you've ever been to Italy – I go every summer for at least a week – you'll see how they all hug and kiss each other far more than Americans
- Families, across generations, are far more likely to live together (one Italian friend told me that those who were quarantined went home – and infected their relatives!)
- In the hard-hit northern part of Italy, hospitals were overwhelmed with coronavirus patients, such that many didn't receive the treatment they needed and died unnecessarily; in contrast, our healthcare system is coping far better (at least for now), largely because we have far more critical care beds per capita (discussed further below)

All of these factors indicate that the coronavirus won't spread nearly as quickly or broadly in the U.S., so I think there's a good chance that our more targeted lockdown will work.

And when people do get infected, our mortality rate will likely be much lower – so far, it's one-eighth that of Italy's (as I show below).

If I'm right that we have far fewer infected people per capita *and* a far lower mortality rate, our deaths, relative to our population, might only be a tiny fraction of Italy's.

By the way, there's a glimmer of good news from Italy: in the last three days, the number of new cases and deaths may have plateaued, as you can see in this chart:


Cases & Deaths by Day - Italy
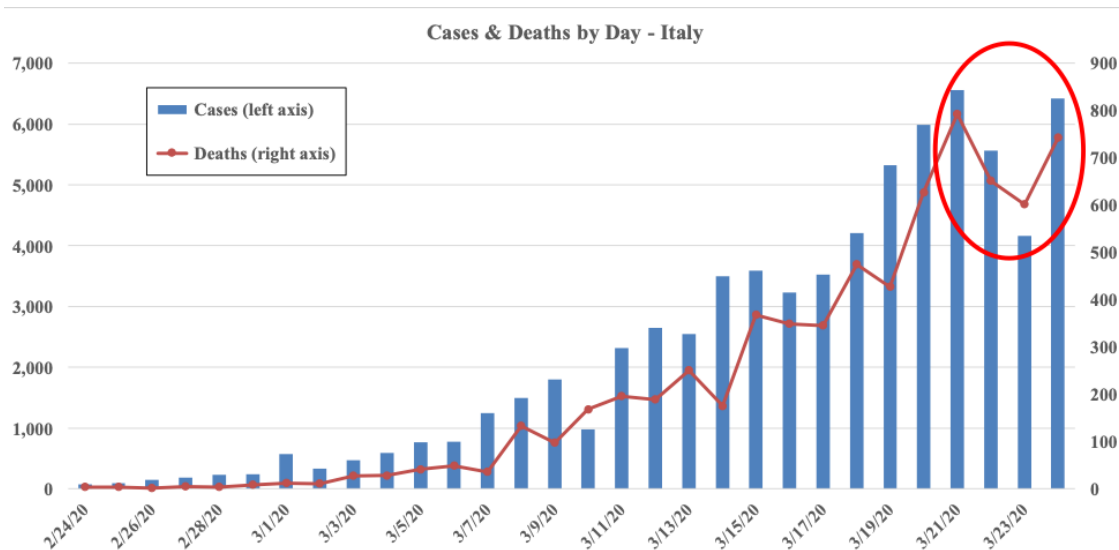
MORTALITY RATES

So far, we've mostly been looking at the number of cases (i.e., people who test positive for the coronavirus), but the number of people who *die* is much more important. Folks don't worry too much about getting sick – but are rightly terrified by a premature and awful death.

That's why we don't shut down our economy every fall as flu season approaches, even though tens of millions of Americans are going to get the flu and it will kill 12,000 to 64,000 of them, because the mortality rate is so low (about one-tenth of 1%).

It's the much higher mortality rate, combined with its ability to spread so rapidly, that makes the coronavirus much more frightening.

So let's compare the U.S. and the 11 other countries with the most cases, starting with their respective mortality rates:
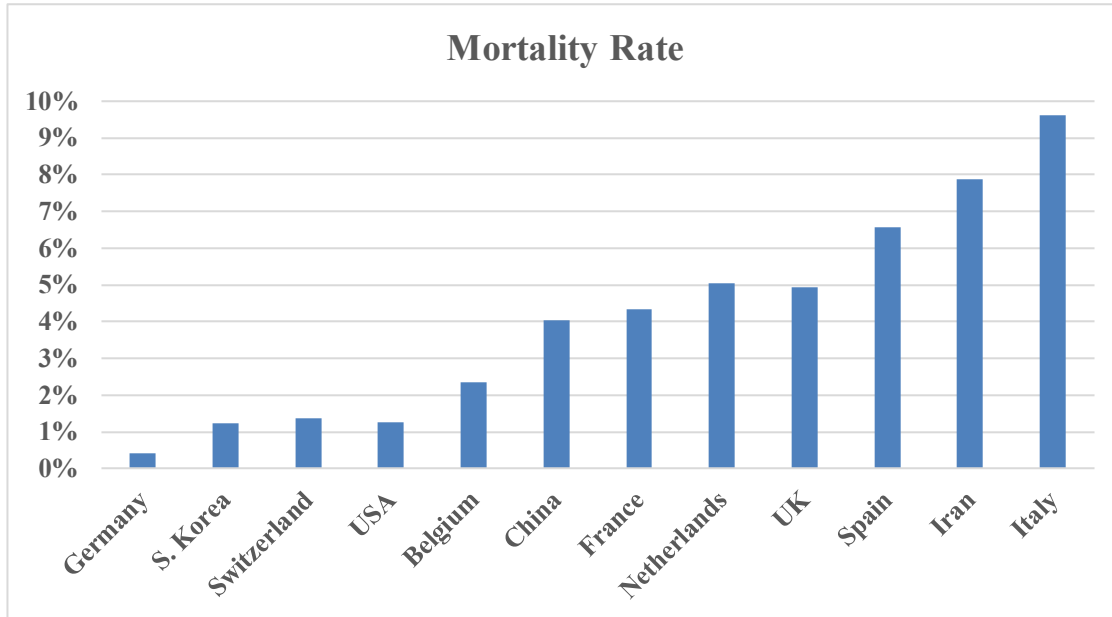
As you can see, the U.S. is among the lowest, meaning the coronavirus – at least so far – isn't proving to be as lethal here as in most other countries.

This article in the *Wall Street Journal* captures some of the reasons why Germany's mortality rate is so low: [Covid-19 Deaths in Germany Far Below Rates in Other Countries](). Excerpt:

> Germany, which has the world's fifth-highest number of Covid-19 cases, has so far experienced far fewer deaths from the disease than other countries—mainly, experts say, because the outbreak started among younger people who tend to experience milder symptoms and rarely die...
>
> Another reason for Germany's low death level could be the large number of tests conducted in the country since the outbreak. The German doctors' association estimates that well over 200,000 coronavirus tests have been run in the past weeks.
>
> This could mean that the number of infected people who recover without ever being tested is much lower in Germany than in other countries that test mainly patients with severe symptoms. Some German hospitals have been testing any patient showing flu-like symptoms for weeks, while physicians who have available testing kits can conduct a probe on anyone who wishes to be tested.

I want to highlight some very good news here: that other countries' mortality rates may, in fact, be much lower than reported because their testing simply hasn't been as widespread as Germany's

Now, let's look at the total number of deaths over time in each of these 12 countries, starting the day they first reported their 25th death:
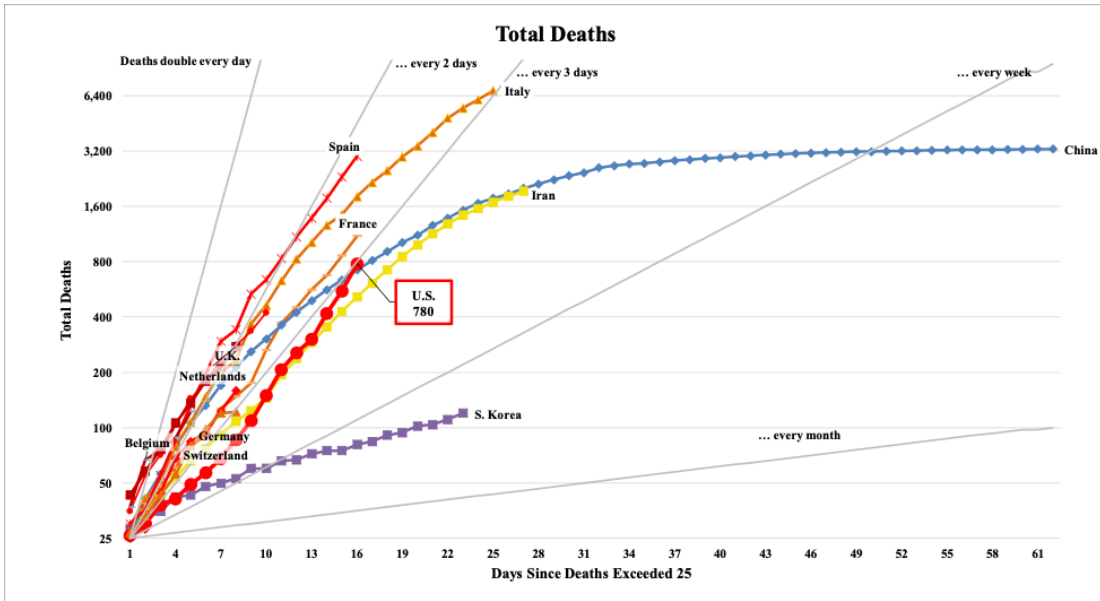
Total Deaths

We can see that the U.S. is on a better (i.e., slower) trajectory than all but two other countries.

Finally, let's look at every country based on its total number of deaths per capita over time (from the day of the first reported death):

Deaths Per 10 Million Population
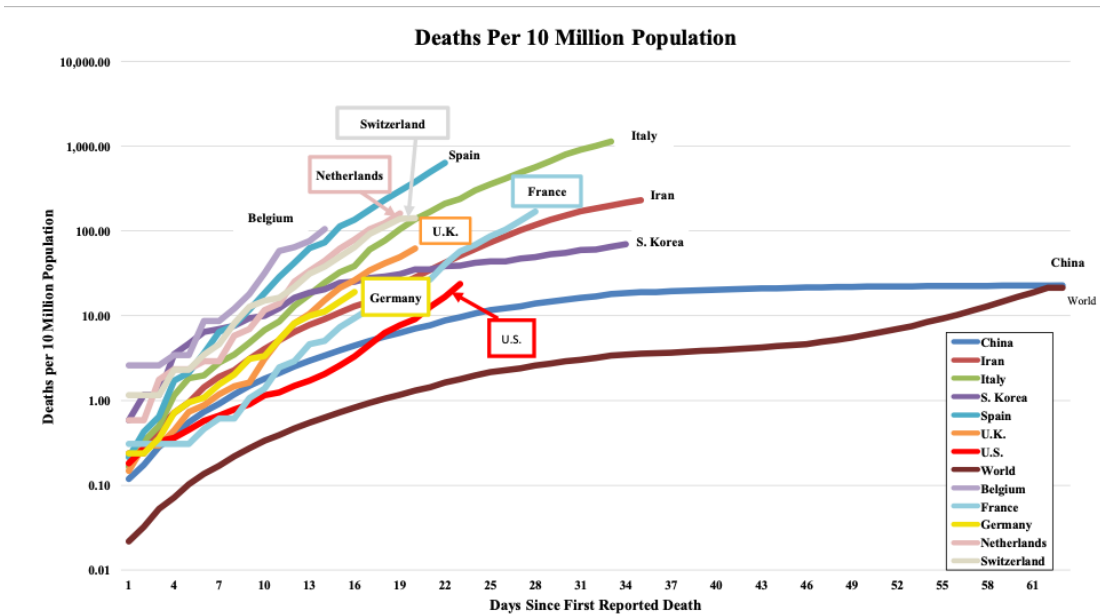
Again, we're on a much lower trajectory than all but one other country.

In summary, any way you measure it, when it comes to deaths and mortality rate, we're doing better than almost any other country that's been hard-hit by the coronavirus.

Our challenge, of course, is to bend the curve to the right by reducing the number of infections and further lowering our mortality rate.
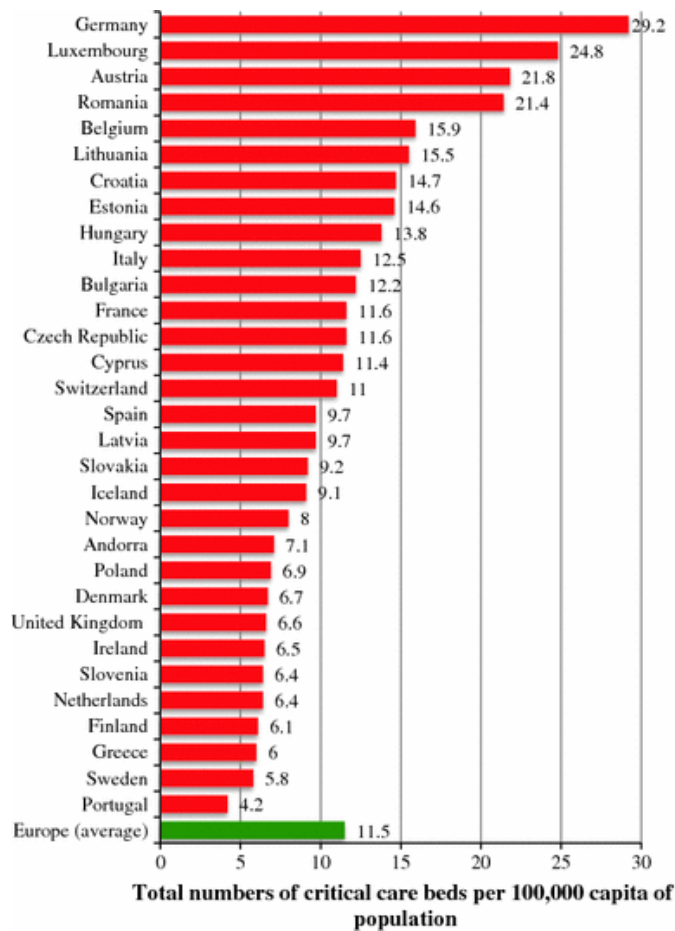
OUR CRITICAL CARE BEDS

There's lot of talk about how inferior our health care system is relative to most countries in Europe, but the mortality rates so far tell a completely different story. Why might that be?

Well, when it comes to providing decent, basic, low-cost health care to every citizen, we (shamefully) rank far down the list of developed countries.

But when it comes to providing the absolute *best* care, with the latest drugs and equipment – albeit only to those lucky enough to have good insurance or deep pockets – we're second to none. That's why pretty much every ultra-wealthy person on earth comes here for complicated cases.

When it comes to saving someone's life who's seriously ill from the coronavirus, it's not the average level of care or the cost that matter: it's the availability of "critical care beds" (and, of course, the associated specialized doctors and other stuff). And here, we compare very favorably...

This 2012 paper in *Intensive Care Medicine* looked at critical care beds per capita in Europe. This chart gives the answer:

Total numbers of critical care beds per 100,000 capita of population

Note that Germany leads the way with 29.2 critical care beds per 100,000 population versus Italy at only 12.5, 57% lower.

And the U.S.? The same study puts the U.S. at the top of the world, with 20.0-31.7 critical care beds per 100,000.

This more recent study from 2015 shows even better data: for adults age 20 years and older, critical care beds here range from 32 to 39 critical care beds per 100,000, depending on location. And for those 65 years and older, who are most vulnerable to the coronavirus, there are 171 to 210 critical care beds per 100,000, *15 to 20 times* the number in Italy.

This is no doubt an important reason why our mortality rate is so much lower – and means our hospitals are far less likely to become overwhelmed, which is what happened in Italy, leading to many deaths.

WEATHER

Another reason the coronavirus might stop spreading so quickly is that it may prove to be very seasonal, like its cousin the flu. While the evidence is far from conclusive, there are two studies that indicate that it may be sensitive to ultraviolet light and heat, so that it will "burn off" as humidity increases and temperatures rise. If so, this would be *huge*, giving the hardest hit countries some much-needed room during the upcoming warmer months to restart their economies, test their entire populations, etc.

According to a study by the University of Maryland School of Medicine…

> All cities experiencing significant outbreaks of COVID-19 have very similar winter climates with an average temperature of 41 to 52 degrees Fahrenheit, an average humidity level of 47 to 79 percent with a narrow east-west distribution along the same 30-50 N" latitude.

The study includes this map showing "average temperature data from March 2019 to April 2019 to predict the at risk zone for community transmission of COVID-19. The zone at risk for significant community spread in the near-term include land areas within the green bands, outlined in dark black":
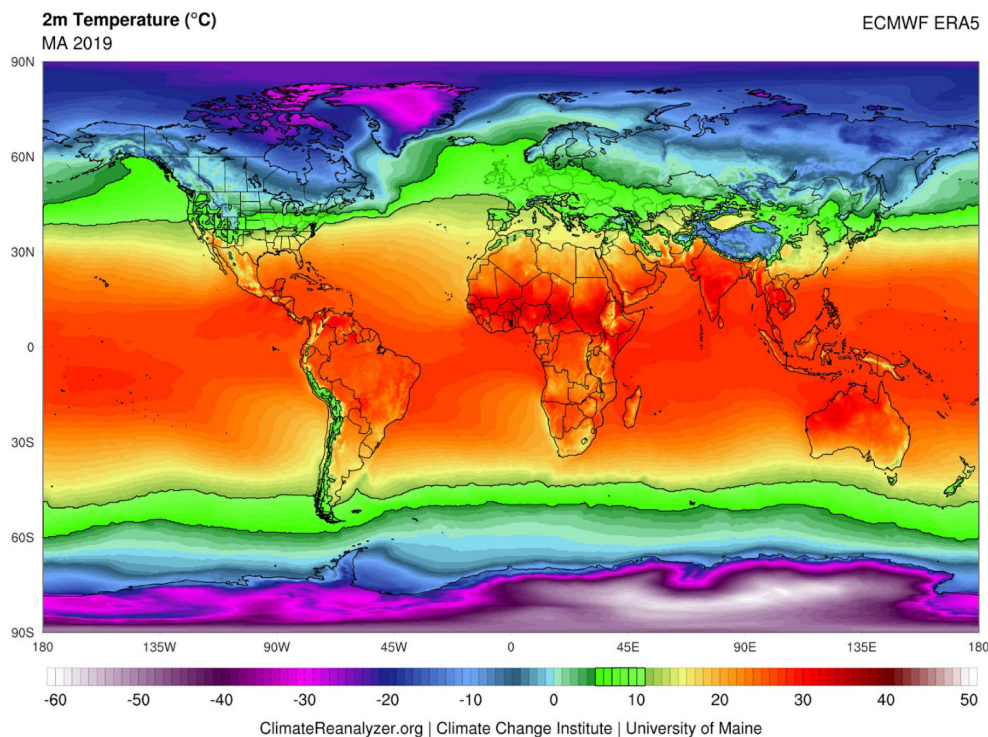
This map would certainly help explain why eight of the 10 most populous countries in the world have been mostly spared (at least so far), including Russia, India, Brazil, and Mexico.

And here's an article about a study of 100 cities in China: New study says 'high temperature and high relative humidity significantly reduce' spread of COVID-19. Excerpt:

> According to the researchers' findings, "High temperature and high relative humidity significantly reduce the transmission of COVID-19." An increase of just one degree Celsius and 1% relative humidity increase substantially lower the virus's transmission, according to the data analyzed by the researchers.
>
> The study is the latest in a limited but growing body of research, not all of which has been peer-reviewed, that examines the effect of weather on the spread of the SARS-Cov-2 virus, which causes the COVID-19 illness...
>
> UV light has been proven to kill other strains from the coronavirus family, like SARS and MERS, but there isn't research yet showing the same is true for SARS-CoV-2...
>
> Projected temperature increases over the next few months are expected to align favorably for U.S. residents if the findings of the published paper prove true. With much of the U.S. forecast to see higher-than-normal temperatures in March and April, according to AccuWeather meteorologists, there is a chance that the virus could eventually "burn itself out,"

This chart from the article shows how the R value – the transmission rate – of the coronavirus will be much lower in most of the world by July:
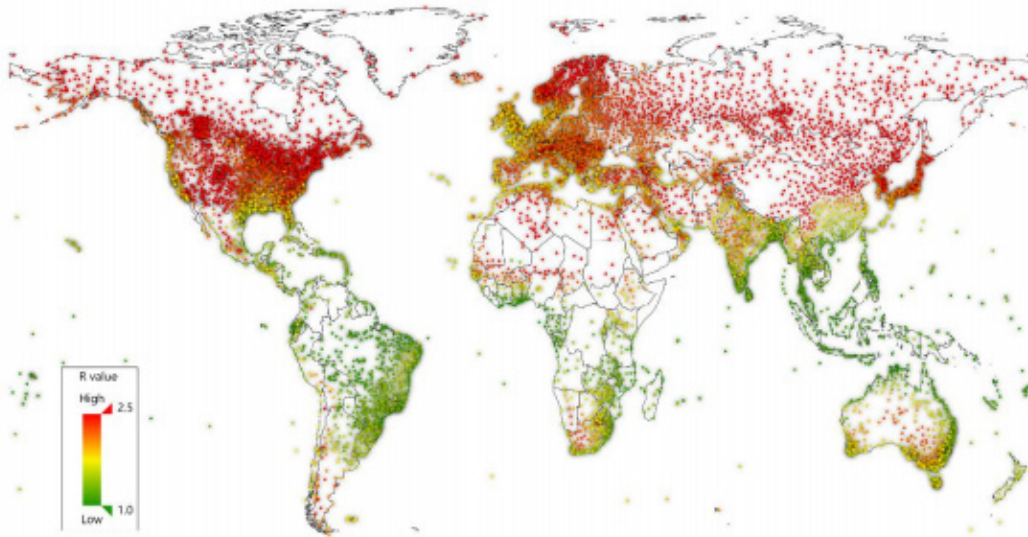
(a) *R* values in March
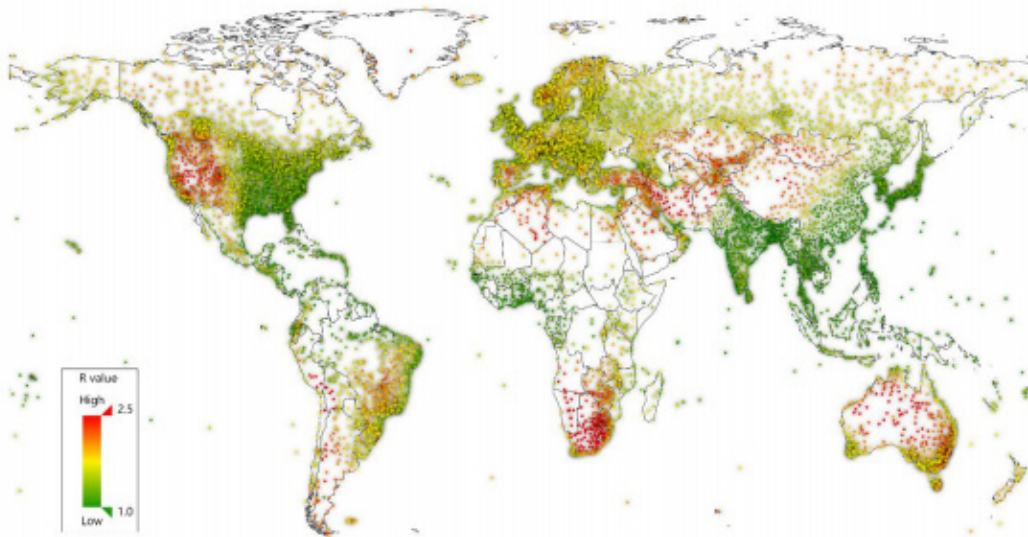
(b) *R* values in July

Figure 4: Worldwide risks of COVID-19 outbreak in March and July 2020

TREATMENTS

Lastly, almost every day there is promising news regarding new tests, treatments, and vaccines that every scientist and medical-related company is frantically working on.

For example, the U.S. Food and Drug Administration ("FDA") just gave emergency authorization to Cepheid, a Silicon Valley molecular diagnostics company that's a unit of Danaher (DHR), to release a bedside test for the coronavirus that can deliver results in less than an hour. Cepheid will start shipping it next week.

And preliminary results published in the International Journal of Antimicrobial Agents from a small study were very promising. In it, six infected patients received both hydroxychloroquine (an anti-malarial drug) and azithromycin (an antibiotic), 14 were given hydroxychloroquine only, while 16 patients weren't given either drug. Only six days later, all six patients who received both drugs and half of those who received hydroxychloroquine only no longer had the virus versus only three of the 16 others (19%).

Finally, a drug made by Gilead Sciences (GILD), remdesivir, which was studied to treat Ebola (but didn't work very well), is being studied in several large-scale clinical trials around the world. Early results from trials in China could be announced by the end of next month.

COULD THE CORONAVIRUS CRISIS JUST BE A BAD FLU SEASON?

This theory is such a wildcard that I hesitate to include it here because I think it's quite unlikely and don't want to get anyone's hopes up, but I would be remiss not to mention it...

Some folks believe that, while the coronavirus has a much higher replication rate than the seasonal flu, it has a *much lower* mortality rate. They argue that the virus has already spread widely, infecting tens of millions of people – but we just don't know it yet because most showed few or no symptoms and just got better, without seeing a doctor or going to a hospital.

Because we've only done a small number of tests – nearly all of them of highly symptomatic patients – this has led everyone to calculate a high mortality rate, when in fact it may be no worse than the seasonal flu. It would be as if a pollster, trying to predict the winner of an election, asked people who they were voting for – but only surveyed attendees of one candidate's rally!

Additionally, the mortality rate may be overstated because the test used to identify cases doesn't catch people who were infected and recovered.

Here is an article in today's Wall Street Journal in which two Stanford professors of medicine make the case for this theory: Is the Coronavirus as Deadly as They Say? Excerpt:

> If it's true that the novel coronavirus would kill millions without shelter-in-place orders and quarantines, then the extraordinary measures being carried out in cities and states around the country are surely justified. But there's little evidence to confirm that premise—and projections of the death toll could plausibly be orders of magnitude too high.

> Fear of Covid-19 is based on its high estimated case fatality rate—2% to 4% of people with confirmed Covid-19 have died, according to the World Health Organization and others. So if 100 million Americans ultimately get the disease, two million to four million could die. We believe that estimate is deeply flawed. The true fatality rate is the portion of those infected who die, not the deaths from identified positive cases.
>
> The latter rate is misleading because of selection bias in testing. The degree of bias is uncertain because available data are limited. But it could make the difference between an epidemic that kills 20,000 and one that kills two million. If the number of actual infections is much larger than the number of cases—orders of magnitude larger—then the true fatality rate is much lower as well. That's not only plausible but likely based on what we know so far.

If this theory proves to be correct, it would be *amazing* news, as it means that the mortality rates could be much, much lower than anyone thinks.

If, say, one person dies among 50 people who test positive, that's an alarming 2% mortality rate.

But what if there were another 950 people – some who had already recovered plus others who are currently infected, but didn't get tested because it wasn't available or they didn't feel sick enough to go to the doctor. In this case, the mortality rate would be only 0.1% – equal to the seasonal flu.

And what if the virus spread so aggressively (as we know it can) that it infected 10,000 people? Then the mortality rate would be 0.01%, *90% lower* than the flu.

If the true mortality rate for the coronavirus is close to – or certainly lower than – the seasonal flu, this would be a *game changer*! People could stop worrying and we could quickly return to something resembling normalcy. We would take care to protect the elderly, ill, and immunocompromised and focus on areas of outbreaks – just as we do with the regular flu – but most people in most areas could go back to work and businesses could reopen.

There is precedent for this with the swine flu (H1N1) pandemic in 2009-2010. President Obama's acting director of health and human services declared H1N1 a public health emergency on April 26, 2009, when only 20 cases of H1N1– and no deaths– around the country had been confirmed. Six weeks later it was declared a pandemic by the World Health Organization, and six month later, after more than 1,000 deaths, President Obama himself declared H1N1 a national emergency.

In total, between April 12, 2009, and April 10, 2010, the CDC estimates that H1N1 led to 273,304 hospitalizations and 12,469 deaths in the U.S. (and far more overseas).

That sounds terrifying until you realize that *60.8 million* Americans were infected with H1N1, meaning its mortality rate was a microscopic 0.02%, *80% lower* than the regular seasonal flu. It's now just considered one of many strains of the normal, seasonal flu.

In summary, could the coronavirus end up being just like the swine flu? I wish it were true, but I doubt it…

However, there's an easy way to find out – and it would only take a matter of days: do the widespread, random testing I call for below. The Stanford professors agree, writing:

> Given the enormous consequences of decisions around Covid-19 response, getting clear data to guide decisions now is critical. We don't know the true infection rate in the U.S. Antibody testing of representative samples to measure disease prevalence (including the recovered) is crucial. Nearly every day a new lab gets approval for antibody testing, so population testing using this technology is now feasible.

CONCLUSION

To repeat what I said at the beginning, I'm cautiously optimistic that the measures we've ramped up over the past couple of weeks are having their desired effect, sharply reducing the coronavirus' replication rate.

If I'm right, the growth in the number of newly infected Americans is already slowing dramatically – and will soon plateau and then decline, which is exactly what happened in China's Hubei province.

As it becomes clear that we've controlled the spread of the virus and know exactly where the outbreaks are – *which could happen as soon as a couple of weeks from now* – we can start bringing our economy back to life.

In the meantime, however, the fear and turmoil will likely continue because the number of *reported* new coronavirus cases will keep rising for another two weeks, just as it did in China.

So fasten your seatbelt, it's going to continue to be a wild ride!

THE ONE THING WE NEED TO DO RIGHT NOW: SOME *RANDOM* TESTING

As we try to combat one of the greatest threats our nation has ever faced, we're unable to make good decisions about what actions to take – and where – because we don't have even the foggiest notion of how many people are actually infected right now, where they are, and how rapidly the virus is spreading.

Without at least some idea of the answers to these three questions, we're blind, thrashing about, unable to mount an effective defense against this terrible scourge.

What if we just have a few outbreaks in a handful of major cities? If so, we could take the strongest measures in these areas, but much of the rest of the country could quickly get back to work.

On the other hand, if the virus has spread to every corner of the country, then a complete national shutdown – at least for a couple of weeks – is likely necessary.

But since we don't know where the virus is and how quickly it's spreading, those who are making the most extreme predictions are getting the most attention – and nobody can prove them wrong, so our response has been to err on the side of caution.

While this may be the right approach from a public health perspective, it's imposing a terrible – and perhaps unnecessary – cost, crippling most businesses and throwing untold millions out of work.

We can't possibly sustain this for much longer, so we need answers *fast*.

Widespread testing is ultimately the solution. As former FDA Commissioner Scott Gottlieb recently [tweeted](#): "In order to contain the epidemic, we need broad screening… so we can identify positive cases in the community and contain the spread." This is the lesson from every place that's successfully contained the virus.

Ideally, of course, we'd have a quick, cheap, easy test that every American could take – and that would be required of anyone seeking to enter our country. I have no doubt that this is where we will end up, but it will take time.

In the meantime, after a disgraceful lack of action, we're finally ramping up testing in a big way. As recently as 10 days ago, we were doing barely 7,000 tests every day, nationwide, but that had risen to 66,000 earlier this week and is rising fast, as you can see in this chart:

Tests Per Day
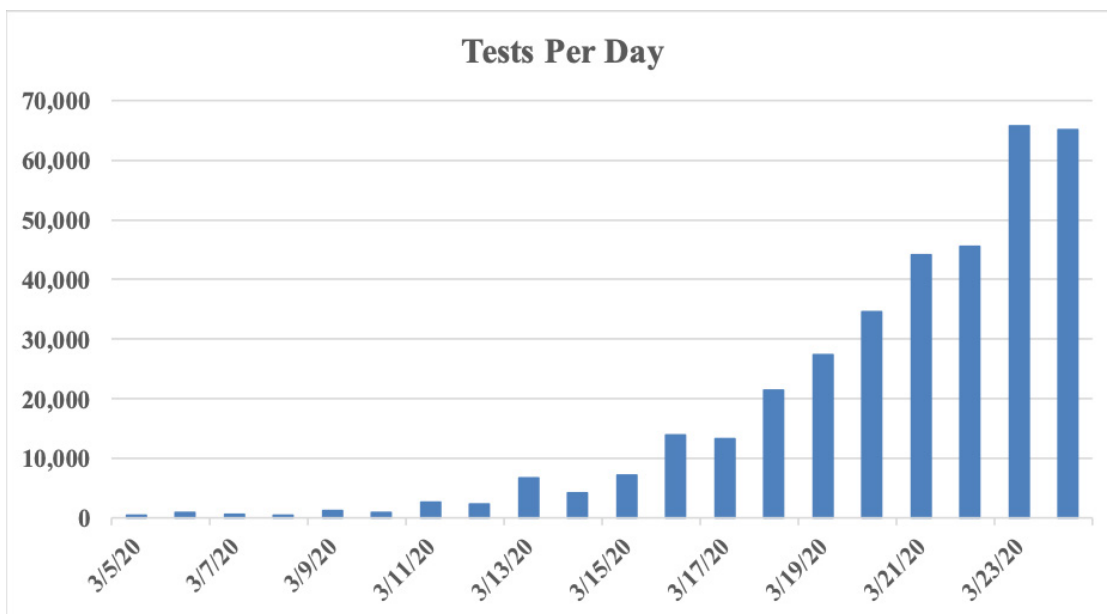
But there are two problems with our testing right now. First, 66,000 tests a day is a drop in the ocean. Even if this expands rapidly, it'll be weeks, if not months, before we've tested enough people. We need answers within *days*.

The second problem is that, from a statistical perspective, we're testing the wrong people: those with symptoms or who were exposed. In doing so, we're not getting much useful information to answer the three key questions: how many people are actually infected right now, where they are, and how rapidly the virus is spreading.

What we need to do, in addition, is some *random* testing, just as we do when we poll political races.

We have developed sophisticated methods by which we can survey just a few thousand people and almost precisely predict how the entire population will vote. The key, however, is to survey *random* people. Imagine the results if pollsters surveyed only people at, say, one candidate's rally – but that's what we're doing right now with our coronavirus testing!

I'm not saying we should stop testing those who need it – I'm just saying that a small fraction of the tests should be random, so we'll get the information we so desperately need. Earlier this

week, for example, New York [tested] 16,888 people. Imagine how much more we would know right now if we did 1,000 tests every day on a random group of New Yorkers.

We need to start doing this all over the country, right away. There's no time to waste!

CAN WE BELIEVE CHINA'S NUMBERS?

Whether we can believe China's numbers is a hugely important question. Many are doubting them, and I share their general mistrust of the Chinese government.

It's no doubt spinning the coronavirus data. Six days ago, the Chinese government reported 13 new cases nationwide, then they "jumped" to 34, 39, 41, 46, and 39 the last five days.

Do I believe these numbers? No. They're probably 10 times higher.

My point is that *it doesn't matter*, as long as they're not 1,000 times higher – and I'm 99.9% certain they're not. I don't believe it's possible that the coronavirus is, in reality, still spreading out of control, but the government is hiding this fact, for two reasons:

First, as authoritarian as China is, there's no way the country could hide this even if it wanted. It already tried and failed – and every person in China and around the world is now super-attuned to this.

Secondly, like most authoritarian regimes, the Chinese government initially tried to hide bad news (as, tragically, we did as well), but couldn't bury such a serious crisis. And once the masses discovered it, they threatened to revolt, forcing the government to completely reverse course.

The government now recognizes that this virus could topple it, so it's now taking any and all measures to contain it. And the only way to successfully do so is to have radical transparency: massive testing, widespread dissemination of the data, etc.

I asked my best source in China whether the government could be engineering enormous cover-up, and he replied:

> No, I don't believe this could be true, especially in Wuhan or in any of the major cities.
>
> There is so much focus on testing, exposure monitoring/tracking, and prevention now, with a particular emphasis on imported cases from other parts of the world. The procedures at the international airports for incoming passengers are quite incredible, lasting 6-8 hours or more. Anyone who shows any symptoms is quarantined.

A friend in Singapore added:

> I have close friends in Wuhan, with whom I have calls weekly just to touch base.
>
> The situation has improved significantly. Zero new infections is a stretch; slowing down is maybe more appropriate.
>
> China's media is similar to your Fox News – leave it to your better judgement :)

So rather than dismissing the Chinese and dismissing their numbers, we should be learning from them!