

Messari's Coronavirus / Covid-19 Tracker

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Last update: 10:00am ET March 25

NOTE: THIS IS A VIEW ONLY DOC; DM @twobitidiot for updates / suggestions.

I've been monitoring the coronavirus since Feb 1. Here are some resources I've relied upon since I started covering. I am not a doctor/expert, but have been ahead of many of them on this.

Expert Twitter feed (updated daily): [List of top nCoV follows](#)

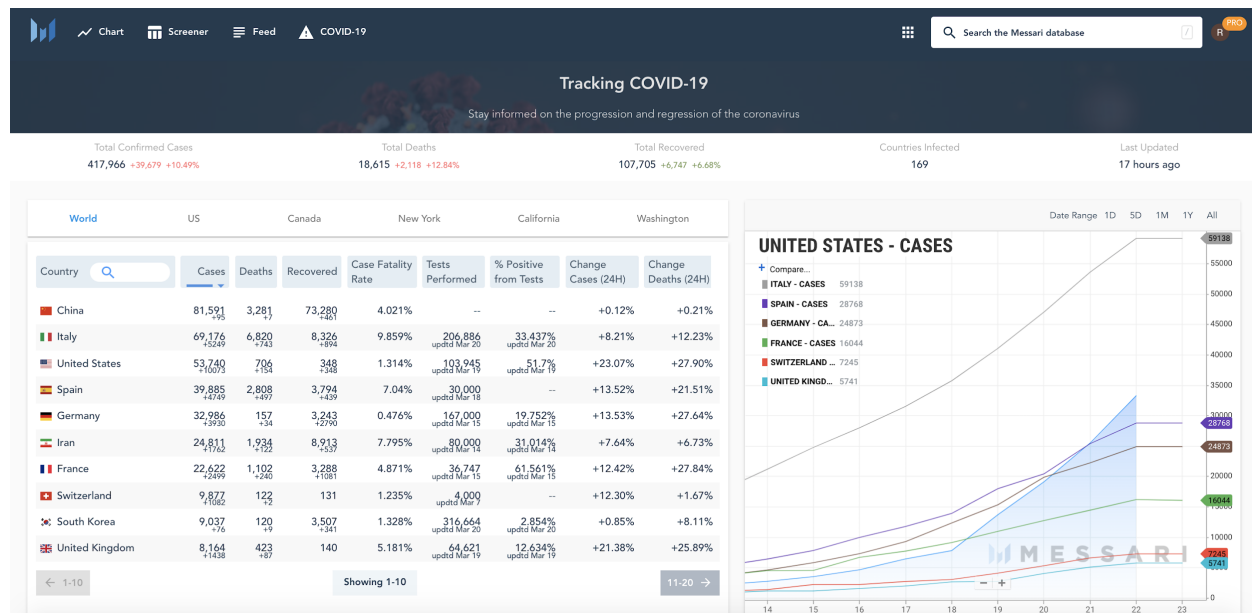
News: [New York Times](#) (paywall) | [Washington Post](#) (paywall) | [Germ Info](#) (Drudge for nCoV)

Data: [Johns Hopkins Dash](#) + [Github](#) | [WaPo US Map](#) | [College Closings](#) | [US State Testing](#)

SEND TO YOUR FRIENDS & FAMILY: <https://staythefuckhome.com/>

Messari's Dashboard

+ Sortable stats (county, state, country level), charts, newsfeed, and daily livestream



My top posts on the topic - ([Daily Brief](#) is free):

Feb 11 - [What Now](#) (Variables that impact the virus)

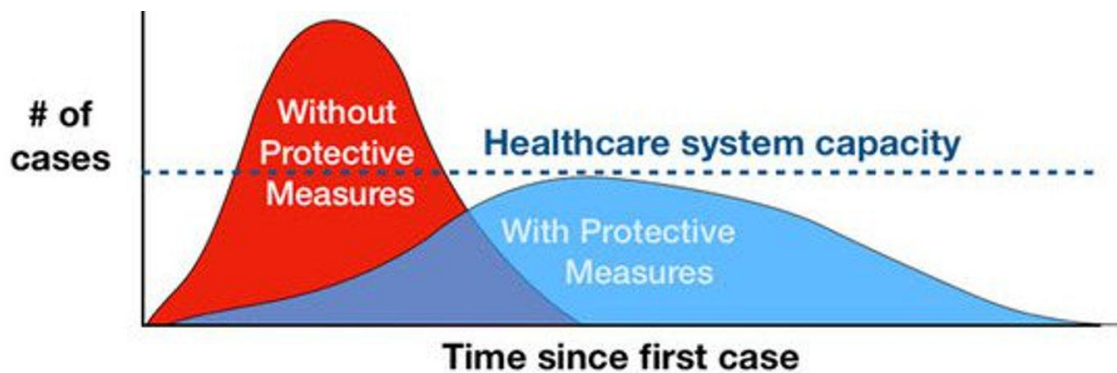
Feb 14 - [CoronaVirus Podcast](#) (with Balaji Srinivasan)

Feb 25 - [The End of the Beginning](#) (Picked up by ZeroHedge)

Mar 9 - [R.I.P. Moon Times](#) (Top post)

Most important recent updates:

Compared to the flu, coronavirus: more contagious; deadlier; harder to contain; takes up more critical medical resources; longer and asymptomatic infectious period; no effective vaccine / treatment; can infect entire populations in close quarters (hospitals, Diamond Princess). If containment fails, it will overwhelm global healthcare systems.



Adapted from CDC / The Economist

Helpful graphic, but see also: [Why Flattening the Curve is a Deadly Delusion](#).

Must reads: [The Hammer and the Dance](#) - surge response followed by containment.

Key variables:

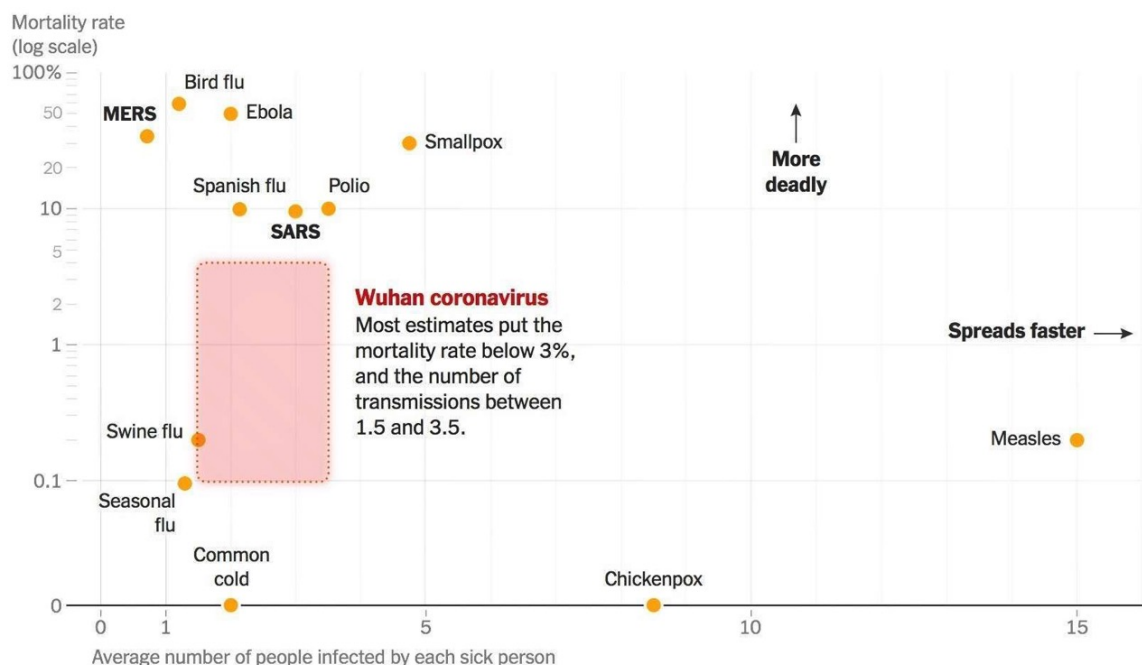
- + The [virulence \(\$R_0\$ \) 2.0-4.0+](#) vs. 1.3 for seasonal flu. Exponentially more contagious
- + Case Fatality Rate (CFR) [likely 1.0%+](#) an order of magnitude deadlier than flu
- + Spreads [asymptotically](#) for up to 2-4 week [contagious period](#)
- + 10-20% of infections result in serious symptoms that [require medical intervention](#)

Historical background (what is the true range of outcomes & proper context here:

[COVID-19](#) (through 3/25): 445,000+ cases / 19,000+ deaths; U.S. / Europe epicenters

[SARS](#): 8,098 cases / 774 deaths | [Spanish Flu](#): 50 million deaths (~3% of population)

[Swine Flu](#): 20% infected globally, 0.02% mortality (500k deaths globally, 3x typical flu)



US Best Guess Epidemiology

Best Guess Epidemiology

- $R_0 = 2.5$; Doubling time 7-10 days
 - Community attack rate = 30-40%
 - Cases requiring hospitalization = 5%
 - Cases requiring ICU care = 1-2%
 - Cases requiring ventilatory support = 1%
 - CFR = 0.5%
- Community epi wave 2 months
US: 96 million cases
US: 4.8 million admissions
US: 1.9 million ICU
US: 1 PPV
US: 480,000 deaths
- **PREPARE FOR DISEASE BURDEN ROUGHLY 10X SEVERE FLU SEASON**

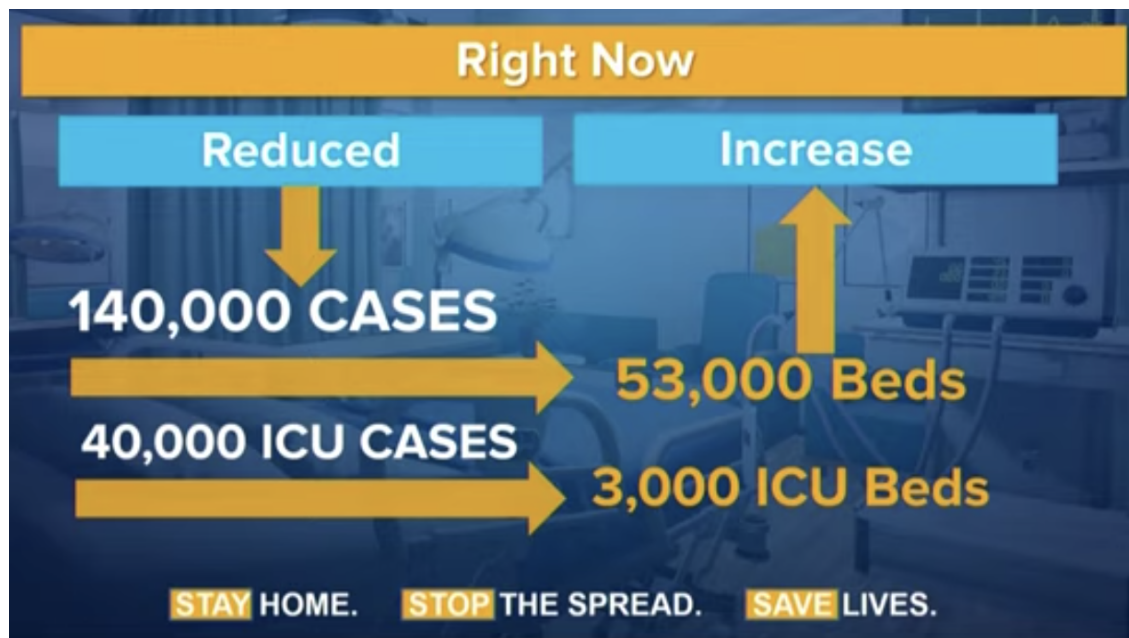


**CFR will be higher if hospitalization and critical case capacity threshold is breached.*

NYC Epicenter Update:

Governor Cuomo [3/25 Briefing](#):

- + Shows the state expects 40k ICU cases to just 3k ICU beds.
- + M*A*S*H hospitals in Javits, schools, hotels are possible to address bed shortages
- + But best guess impact is that NY faces 30k deaths for those without access to ventilators



Potential Economic Impact - UPDATING

3/23 projections of [U.S. economic impact](#):

- + St. Louis Fed: 50% U.S. GDP contraction in Q2 with 30% unemployment (**no stimulus**)
- + Morgan Stanley: 30% U.S. GDP contraction in Q2 with 12.8% unemployment
- + Goldman Sachs: 24% U.S. GDP contraction in Q2
- + JPMorgan: 14% U.S. GDP contraction in Q2. China GDP contracted 40% in Q1
- + Bank of America: 25% U.S. GDP contraction in Q2

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Sections

The Washington Post

selkirk

CORONAVIRUS

Senate, White House reach deal on \$2 trillion stimulus package

Largest bailout in history expected to face a vote this afternoon

The deal would send checks to many Americans, create a loan program for small businesses and establish a lending fund for industries, cities and states.

By Erica Werner, Mike DeBonis and Paul Kane · 44 minutes ago

EXCLUSIVE

Deal carves out billions intended for Boeing, officials say. Critics say money should go to workers.

Lawmakers have inserted a provision in the package aimed at providing billions to the aerospace giant.

By Aaron Gregg, Jeff Stein and Josh Dawsey

▶ Why stimulus is crucial 3:05

(Video: Monica Akhtar/The Post; photo: John McDonnell/The Post)

Watch live at 3 p.m. ET: Q&A and special report on covid-19

Join anchor Libby Casey and reporters Yasmeen Abutaleb and James Hohmann for the latest reporting, in-depth analysis and live Q&A.

LIVE UPDATES

Access to these updates is free

Prince Charles tests positive; Spain's death count surpasses China's

- 12:54 PM **'Zoo-bombing' disrupts online classes at USC with 'racist and vile language'**
- 12:22 PM **Cuomo says pending Senate stimulus bill would be 'terrible' for New York**
- 12:09 PM **New Jersey may keep businesses closed past Easter, despite Trump's wishes**
- 12:07 PM **Stimulus deal includes \$400 million for elections — far less than what Democrats sought**

The Guardian:

Coronavirus
Wednesday
25 March 2020

Coronavirus US live / New York governor warns parks could be closed if social distancing is ignored

8m ago At his briefing on the G7 video conference this morning, US secretary of state Mike Pompeo also stressed that...

14m ago The US secretary of state, Mike Pompeo, has been giving a briefing on the virtual G7 foreign ministers meeting t...

29m ago Summary of the day so far. Here's what the blog has covered so far today: Congress reached a \$2tn stimulus de...



Senate
Leaders reach deal with White House on \$2tn package

Schumer
Trump family will not profit from \$2tn package

Royals
Family practises physical distancing as Charles self-isolates

Global updates / Death toll in Spain passes China, as global numbers approach 20,000

Donald Trump / Are coronavirus briefings the new 2020 campaign rallies?

'What am I supposed to do?' / Covid-19 sparks mass unemployment across US

US healthcare / Retired workers urged to return as US coronavirus cases set to spike

Drudge:



BIGGEST BAILOUT IN HISTORY!
TREASURY NEGATIVE INTEREST
NYC COULD CLOSE STREETS
MORGUES NEAR CAPACITY
DRUDGE REPORT

First US child to die from virus diagnosed after death, 'didn't meet test criteria'...
Bailout prevents Trump and family from personally benefiting...
Lawmakers to vote on 4th, 5th spending bill to fix 'mistakes'...
Third of world on lockdown...
One patient could infect up to 59,000 others?
Pink eye could be early symptom...
Countries Starting to Hoard Food, Threatening Global Trade...
Rand Paul: Why I didn't quarantine after getting tested...
Those who intentionally spread could be charged as terrorists!
How govt can track social media posts to enforce quarantines...
Americans rush to make online wills...
At least 6 AMAZON warehouses infected...
Half of NYC cases found in adults under 45...
As Panic Spreads, Living Underground Doesn't Seem So Strange...
Fired Americans Send Unemployment Websites Crashing Down...
Billionaires want people back to work, but employees not so sure...
On road through pandemic, truckers fear for lives...
Postal Service Bankrupt By Summer...
Will California look like Italy soon?
GARCETTI: Water, power will be shut off for businesses that don't close...
GUSH: Fed Taps BLACKROCK to Purchase Bonds for Government...
DAWN OF DIGITAL DOLLAR?
SICK MAP...

News Feed / Rough Timeline - UPDATING

3/17 -

3/16 -

<https://www.dailymail.co.uk/news/article-8118415/Donald-Trump-tells-America-lockdown-15-days-stop-coronavirus.html>

3/15 - Dramatic Fed action; Fauci pushing for 14 day mass shutdown “prepare to hunker down” [MTP on Coronavirus](#) (45 min), UK gov’t [plans for crisis to last a year](#), infect 80% of population, and lead to 15% hospitalization rate. CDC [recommends nationwide suspension](#) of gatherings of 50 or more. NY, CT, NJ follow suit.

3/14 - TBU | Trump administration messaging has [eroded public trust](#), Spain [declares state of emergency](#) as case growth spikes to 5700+ (second in Europe behind Italy).

3/13 - Containment is [now or never](#). US relief plan [expected to pass with bipartisan support](#) will cover sick leave, tax breaks. Brazil Ambassador who visited Trump [confirmed with virus](#). White House Presser: [National Emergency](#). Private sector engaged. “[Doesn’t take responsibility](#)” for testing issues. But admin’s infectious disease lead doctor says [they “failed.”](#) Restaurant traffic down 30%+ in a week ([OpenTable stats](#)).

3/13 - [America is shutting down](#). [Norway is shutting down](#). Most of [Europe has closed schools](#). [Broadway shuts down](#). Italy [really, really shut down](#). US [starting to see supply issues in food chain](#): supply chain optimizations are operating leverage, and we don’t truly understand the potential “credit risk.”

3/12 - What can we learn from [Italy vs. South Korea](#), Medical [supply chain issues](#) could lead to deaths, too. The virus [will bankrupt more than it kills](#).

3/11 - Twitter does [mandatory work from home](#); WHO declares [global pandemic](#), Most [Americans will be exposed](#), [Germans too](#), Brits [focus on "herd immunity"](#) a high-risk strategy.

3/10 - President [Xi visits Wuhan](#).

3/9 - People ‘shed’ high levels of coronavirus, but [most not infectious after recovery begins](#),

3/3/ - [Fed cuts interest rates by 50bps](#). [Previous two emergency 50bp cuts: Lehman, 9/11.](#)

Ray Dalio shares his [thoughts on the coronavirus](#):

The most important assets that you need to take good care of are you and your family. As with investing, I hope that you will imagine the worst-case scenario and protect yourself against it.

2/25: [Thread](#): “Not if, but when” coronavirus breaks out in the U.S. Nancy Messonnier, director of the Centers for Disease Control and Prevention's National Center for Immunization and Respiratory Diseases: “[Disruption to everyday life may be severe.](#)” Schools could be closed, mass public gatherings suspended and businesses forced to have employees work remotely.

2/25: US response is a discombobulated mess. The Trump administration is probably not to be trusted (I'm a political moderate, but this tweet is horrifying in its implications.) They are [worried about the economy](#) and not testing nearly enough.

2/25: [The Sun](#) (POTENTIAL TABLOID FODDER): “reasonable worst case” involves “up to 80 per cent of the population being infected”. The document by the National Security Communications Team warns: “The current planning assumption is that 2-3 per cent of symptomatic cases will result in a fatality.” Around 500k Brits (mostly elderly or those with pre-existing illnesses) would be killed under this scenario, according to health sources.

2/24: I agree with [this thread](#)'s predictions: “Infections are spreading in the US as I type this. The US has only tested 414 people - we'd have no clue if there are active clusters or not. The primary risk of #covid19 for most people is empty shelves, others panicking, supply chain breakdown, and possibility of not being able to go to work for extended period of time. China's containment measures _appear_ very effective. Western states will not be able to enact such extreme measures as China, and therefore will not be able to contain as well. We don't have the social infrastructure or top down control.

2/24: Likely [China GDP growth is negative](#) in Q1/Q2 and possibly for the year: “Zhang Anyuan, economist at CFC Financial, a broker controlled by CITIC Securities, raises the possibility that Q1 growth will be 0% (or worse). “let's consider the medium term... Speaking frankly, the basic forces, incentives, foundations that have driven growth in the reform period, have, over recent years been put on the shelf, have been altered. Things we agreed on, conclusions we'd formed, they've all become problems again. And new constraints have not been built up. After the epidemic, if we don't reform, the economy will slip to an even lower level of growth.”

2/23: [new study](#) shows this could be aerosolized: “While a sneeze or a cough by someone infected with a “respiratory disease” can only infect others within a few meters, the virus-laden gaseous plume from an infected person having diarrhea can infect others up to 200 meters.”

2/23: [South Korea scene](#) “The streets of South Korea’s fourth-largest city were abandoned on Thursday, with residents holed up indoors after dozens of people caught the new coronavirus in what authorities described as a “super-spreading event” at a church. “It’s like someone dropped a bomb in the middle of the city. It looks like a zombie apocalypse.”

Great deal of unrest [in Iran](#) as well: “Coronavirus cases increase in #Iran. 3 in Qom, 1 in Arak, 5 suspected transferred to Tehran. Lack of transparency about how & when virus entered & spreading & why public wasn’t informed earlier is infuriating Iranians afresh.” Canada said tonight a 30-year-old has arrived from Iran with coronavirus.

Is there a plan B for U.S. primaries, so we don’t run into an issue with turnout?
<https://twitter.com/jtenenbaum/status/1230549651515834375?s=20>

2/20: What coronavirus does [to the body](#).

2/20: A superspreader [infected 36 people](#) in a Central Beijing hospital, which may set back the city’s restart plans indefinitely. “According to a table which compares the “infection density” of cities or areas — the number of confirmed cases per square kilometer — Xicheng district ranks second, with an infection density just lower than the epicenter Wuhan.”

2/20: China bans three WSJ reporters over an op-ed headline. [WSJ response](#): “President Xi Jinping says China deserves to be treated as a great power, but on Wednesday his country expelled three Wall Street Journal reporters over a headline. Yes, a headline. Or at least that was the official justification. The truth is that Beijing’s rulers are punishing our reporters so they can change the subject from the Chinese public’s anger about the government’s management of the coronavirus scourge.”

2/20: Bloomberg and Atlantic columnist [tweets](#): “Think the Wuhan virus outbreak is slowing? Doesn’t feel that way on the ground. My Beijing apt complex just instituted new rules barring nonresidents. We need special passes to get in & out. Only 3 passes/apt. Sorry family of 4. You’re out of luck.”

2/20: Japan will likely [slide into a recession](#). “already staggered by a devastating typhoon and a wallet-shutting tax increase. Now, the coronavirus that has brought business in neighboring China to a virtual standstill” after shrinking at an annualized rate of 6.3% in Q4.

2/20: The enormous pressure on the Chinese government continues to build. “Many of China’s businesses, particularly small ones, appear to be in trouble. One-third of small firms in the country are on the brink of running out of cash over the next four weeks, according to a survey of 1,000 business owners by Peking University and Tsinghua University. Another third will run out of cash in the next two months.”

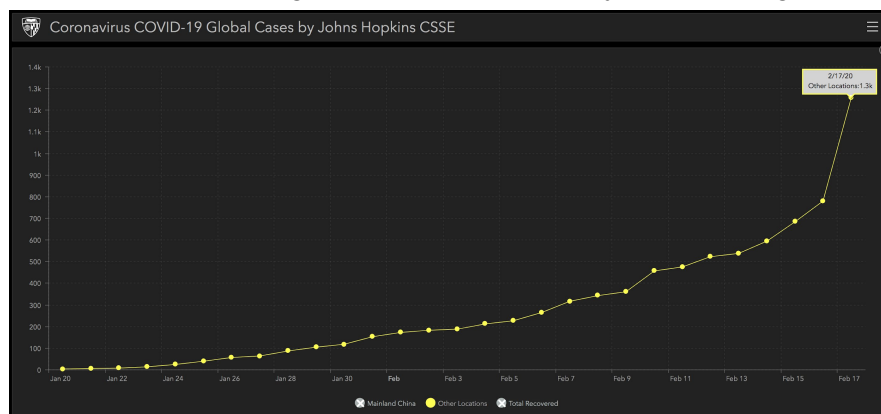
2019 Global Preparedness Monitoring Board (GPMB) [Report](#): co-chaired by the former WHO Head and head of the international Red Cross: “very real threat” of a pandemic sweeping the planet, killing up to 80 million people. “A deadly pathogen, spread airborne around the world, could wipe out almost 5 percent of the global economy. And we’re not ready.”

I wrote on [2/11](#) about the 10-11 major variables in play: How contagious is the virus? (R_0 likely 2-4...more infectious than the flu); How deadly is the virus? (Unclear, but likely less than 3% - seems to be closer to 1%); Is mortality rate tied to ethnic or environmental factors (hits East Asians, smokers harder?); How long does it take to show symptoms? (Could be 14+ days, which is the most concerning from a diagnostics perspective); How much have infected people traveled? (A lot.) How effective will the response be? (China has slowed but not reversed the spread.) What is the ICU / critical case rate? (This could overwhelm ICUs?) Will we have collateral damage from supply chain shutdowns? (almost certainly); How long will it take to develop a vaccine? (still a year away — at minimum.) And are the Chinese lying about their numbers (likely understating impact significantly). (Daily updates [available in our newsletter](#).)

Top News/Tweets

[2/20 Time](#): “According to analysis by research firm Capital Economics, COVID-19 will cost the world economy over \$280 billion in the first quarter of this year, meaning that global GDP will not grow from one quarter to the next for the first time since 2009.”

2/17: I wrote last Monday that the coronavirus stat I was watching most closely was the date at which RoW cases passed 1000. 2/17 or earlier -> containment efforts likely failing; 2/19 or later -> containment has a shot of working; Not the start to the day I was hoping for:



2/17 [GOOD NEWS](#) from Singapore, though. Among the 5 #COVID19 patients discharged today is case 48, the first patient from the Grace Assembly of God cluster to leave hospital. There are 53 patients still in hospital.

2/17 [BUY TIME](#): “Outside Hubei and with proper care, 99.9% of the 30-60 year old have been recovering (although it takes 3+ weeks for most). Now the million-dollar question is: what can your city do to prevent it from turning into Wuhan 2.0?”

2/17 **Economic impact so far is huge, and seems to be underestimated.** Significant impact on the [oil markets](#), which could have ripple effects. “Demand is now expected to contract by 435 kb/d in 1Q20, the first quarterly decrease in more than a decade. For 2020 as a whole, we have reduced global growth forecast by 365 kb/d to 825 kb/d, the lowest since 2011. Growth in 2019 has been trimmed by 80 kb/d to 885 kb/d on lower-than-expected consumption in the OECD.”

2/17 **Chinese economy seems like it's on the brink already.** China Evergrande [slashes prices of new flats by a quarter](#) as coronavirus leaves developers struggling with plunging house sales. American Chamber of Commerce in Shanghai members struggling to kick-start production despite the end of the official Lunar New Year holiday extension....roads, ports and cargo depots clogged up due to staff shortages. [Survey of 109 companies](#) in the Shanghai region found 2/3 of factories were up and running again, but 78% did not have enough workers to kick-start full production. Companies in the region had to apply for permission to reopen: 58% were permitted to open all production lines. “The biggest problem is lack of workers as they are subjected to travel restrictions and quarantines.” 40% factories would not have enough masks if workers return...Foxconn plants that usually employ 16,000 and 20,000 workers in Zhengzhou and Shenzhen, only 10% were expected back to work last week...Only 40 per cent of Shanghai's trucking network is available, down to 10% from Shanghai to other cities, with drivers rejecting trips to inland provinces. [Tens of millions of small businesses across China face an uncertain future](#) as the extended slowdown after the Lunar New Year weighs heavily. With the outbreak wreaking havoc on economic activities, [firms are faced with tough decision](#) whether to reduce staff levels and wages to be able to survive.

2/17 “[An additional 99 people have tested positive](#) for coronavirus on a cruise ship off the Japan coast, Japanese media said Monday, bringing the total number of positive cases on Diamond Princess to 454.” That means 12% of all passengers are now confirmed cases despite the onboard quarantine.

2/17 11 Chinese cities [now have more confirmed cases](#) than Wuhan did when it was put into lockdown on 1/23. (Three weeks ago Wuhan was at 444 cases.) Beijing, Shanghai right behind.

2/17 Chinese say [blood plasma treatment](#) from recovered patients has helped 10 seriously-ill patients improve since February 8. “In terms of inflammation, blood oxygen levels and virus counts in their body within 12 to 24 hours after plasma infusion.” Absent a vaccine, plasma may

be the most effective way to treat the infection and can significantly reduce the death toll. (The same was true for SARS in 2003.)

2/17 "As sign situation still far from normal... [official Beijing Daily](#) now reports all people returning to #China capital Beijing should quarantine themselves for 14 days to stop #coronavirus spread. Those who refuse will be punished, newspaper says."

2/17 [WSJ](#): Hundreds of Americans who had been passengers on a coronavirus-stricken cruise ship in Japan landed in the U.S. on Monday, including 14 people who tested positive for the virus and were allowed to join the evacuation at the last minute.

2/17 "[Japan's health minister urges public to avoid crowds](#) and "non-essential gatherings" and warned the country was "entering a new phase" in the outbreak of #coronavirus. Avoiding crowds in Tokyo? Good luck with that one. #COVID19"

[WaPo 2/14](#): "The economic casualties from China's coronavirus epidemic are mounting as Asian and European auto plants run short of parts, free-spending Chinese tourists stay home and American companies brace for unpredictable turbulence. That's just the start of a financial hangover that is expected to linger for months even if the flulike illness is soon brought under control, economists and supply chain experts say. The epidemic's aftereffects will probably cause the global economy to shrink this quarter for the first time since the 2009 financial crisis." Also expected to have first quarterly drop in more than 10 years.

NYT 2/14: Japan confirms its first death from [COVID-19](#).

CDC Director: "[This virus is probably with us beyond this season](#), beyond this year, and I think eventually the virus will find a foothold and we will get community-based transmission."

2/13: China's Dawu County in Hubei province announces "[wartime](#)" lockdown due to coronavirus, bans people from leaving their home. Novel coronavirus can [be spread by people who aren't exhibiting symptoms](#), the director of the US Centers for Disease Control and Prevention confirms. South Korean hospital [successfully treats](#) coronavirus patient with HIV drugs. [Texas reports 1st case](#) of coronavirus, 15th in the U.S. Professor Neil Ferguson states on the COVID-19 Outbreak "[We're at the early stages of a global pandemic](#)" (BBC News)

2/12: In the past 24 hours, Singapore [posted its second consecutive day of 15%+ daily case growth](#) (15% critical); the Diamond Princess cruise petri dish now has a [6% infection rate](#); [wartime measures are now being imposed](#) in another district of the Hubei province; Chinese travel bans [keep getting extended by weeks](#) in western economies; Chinese Communist Party officials are being scapegoated and replaced at the same time [Xi is pushing to limit the country's economic damage](#); and last, but not least, the [hoped for reduction in case growth proved ephemeral](#)...things looked better for a couple of days because of limits on testing capacity, [not on actual growth](#).

NYT covers the overnight [spike in reported cases](#): “On Thursday, health officials in China reported more than 14,000 new cases in Hubei Province alone. A change in diagnostic criteria may be the reason.” This seems like a triple whammy of not great news: 1) confirms that previously “slowing” case growth may be likely due to the fact that the system is overwhelmed and there are major constraints on testing capabilities, 2) even those that are getting tested are showing massive rates of false negatives, 3) reported deaths from Hubei jumped 20%+.

This [We Study Billionaires podcast with a macro trader](#) captured my sentiment fairly well. Worth a listen. Cogent summary of the Covid-19 situation and potential economic impact.

Number I’m watching right now: RoW case growth via John Hopkins dashboard. When will we cross 1000 confirmed cases? If before 2/17, transmission is accelerating and $R_0 > 2$. If after 2/18, then loose confidence that global containment efforts are working.

I’m paying the closest attention to what Scott Gottlieb writes. His [latest tweet is concerning](#): “Deeply concerning: Singapore has 3 new cases of #COVID-19, bringing to 50 the country’s total case count. 8 are in intensive care. Singapore, with an excellent public health system, is going to provide far more information on viral epidemiology than China.” Good detailed graphic on [Singapore growth](#).

[BBC 2/11](#): “Xi Jinping warned senior CCP officials that the measures taken to contain the new coronavirus were well beyond reasonable limits and had threatened the Chinese economy. There is growing concern that China’s economy, which has slowed during the Sino-U.S. Trade war, could be further dragged down.” warns CCP officials not to over-react to the Covid-19 epidemic to avoid hurting the economy.” (this is the biggest concern to me -> are they cutting corners on containment already?)

Cruise ship keeps getting worse. [40 new cases](#). “39 new positive cases came from 53 additional tested” ==> that’s ~3/4th of those tested! Moreover, a Japanese Ministry of Health *quarantine officer* was among those diagnosed... that he had not been wearing a full hazmat suit“.

The virus may be racist. A [look back at SARS](#) and its disproportionate impact on East Asians.

NYT: [How bad could it get?](#) | [The Urgent Questions Scientists Are Asking](#)

[New study](#) (pre-print = not yet peer reviewed) is largest to date from China CDC of first 4021 confirmed cases w/ COVID-19 from 30 provinces: $R_0 \sim 3.77$ (95% CI 3.51-4.05) | Case fatality rates (CFR) ~3.06%: Male 4.45%, Female 1.25%. (Could be a clear indication of smoker susceptibility as there are major differences in smoking rates.)

[New pre-print study](#): 1324 Chinese COVID-19 patients show incubation times out to 24 days, only 43.8% of new patients have fevers, after hospitalization 87.9% develop fevers, surveillance of cases is missing for many.

[New pre-print study](#): # of infected individuals during early epidemic double every 2.4 days; R0 between 4.7 & 6.6; exponential growth rate, 0.29/day (doubling time 2.4 days) consistent w/ rapidly growing outbreak in late Jan.

North Korea ['executes trade official'](#) for visiting a public bath while he was in quarantine over #coronavirus fears after returning from #China'

PSA: Don't be a racist: the UK ["superspreader" was white](#).

[WHO Chief](#): "impact could be worse than a terrorist attack"

Jon Stokes (The Prepared) dropped his [daily update](#) for 2/11.

It's in the U.S. This is not good: [CDC discharged a patient after false negative test in San Diego](#). US response in this [five minute clip](#) from HHS (2/11)

It seems as if the case fatality rate is likely closer to 1% (Swine Flu) vs. 10% (SARS/Spanish Flu). [This analysis from The Prepared](#) was the best at clearly laying out all of the variables.

The most important concerning update to me: I cannot understand why the Chinese would keep the CDC and WHO from sending in teams to assist with the outbreak for a full month. [NYT](#)

[Guardian 2/11](#): "Prof Gabriel Leung, the chair of public health medicine at Hong Kong University, said the overriding question was to figure out the size and shape of the iceberg. Most experts thought that each person infected would go on to transmit the virus to about 2.5 other people. That gave an "attack rate" of 60-80%." My note: This would work out to deaths for ~0.5% of the world population or 25-50 million people. Staggering.

[WaPo 2/11](#): At some point, you have to worry that China will begin to cut corners to re-open its economy. The Lunar holiday helped delay some of the hard decisions. "Beijing on Tuesday urged countries that have enacted travel restrictions aimed at curbing the outbreak to restore normal ties for the sake of the global economy. The appeal from China's Ministry of Foreign Affairs underscored the economic dangers posed by the unprecedented shutdown of much of the world's second-largest economy, as well as the ruling Communist Party's concerns about the outbreak's capacity to fuel domestic instability."

The challenges of [communicating risks surrounding an evolving epidemic](#), from a 14 communications vet (former WHO senior pandemic influenza comms advisor).

Scott Gottlieb (fmr FDA commissioner): "[THREAD](#): On #Coronavirus, China and U.S. Drug Shortages: Some shortages or near shortages may be inevitable in U.S. as a result of crisis in China. U.S. regulators can take steps now to mitigate impact on Americans by identifying vulnerabilities and getting alternate supply online...U.S. knows which critical products China (and Wuhan) supply. List includes starting materials for certain antibiotics. China may also hold onto supply in setting of their public health crisis, satisfying in country needs before they ship outside China."

[Scott Gottlieb interview on CNBC](#) (4:33) 2/10 am ET + [OP-ED](#)

- + Re detection: Wuhan can do 3000-4000 tests per day; CDC can test 50,000 cases in the U.S. so we have a much higher capacity for testing early on.
- + We're seeing more community transmission, but this is not yet pandemic (2+ continents).
- + Most frequent transmission is touch, but aerosol is also possible.
- + This could be worse than the flu, 5-10% nCoV cases get severe pneumonia
- + More importantly, this is much more contagious. Flu has an R0 of 1.3, this is R0 of at least 2-3, but as high as 4. (Needs to cut transmission rate by 60-70% to contain.)
- + Next couple of weeks we'll know what this will look like in the U.S., Singapore is the country to watch re sustained community transmission
- + "For every person who traveled into the U.S. infected with coronavirus, and who was successfully diagnosed and quarantined, maybe three more arrived undetected."

Also [from Scott](#) on 2/5: "It's time to start testing patients with unexplained pneumonia, even if they haven't traveled to China...It's clear that China waited several weeks to tell the world about the outbreak. Meanwhile, roughly 250,000 Chinese nationals traveled to the U.S...So far the 11 known U.S. cases are recent travelers to Wuhan and their household contacts. But it's highly probable that dozens of other cases have gone undetected. The first sign of an outbreak will be a cluster of patients in one community stricken with unexplained pneumonia. The priority should be identifying this community transmission early, so that public-health authorities can intervene and prevent spread throughout the U.S."

Former US Foreign Disaster Assistance chief under Obama [THREAD](#): "US hospitals nowhere near ready for conditions like we're seeing in China. Neither are those in the developing world. We shouldn't take too much comfort in the low numbers we're still seeing outside of China. US hospitals are running full-tilt with flu season already, and beginning to face supply shortfalls due to nCoV-driven surge in PPE demand. Major supplier of N95 facemasks has told hospitals that ability to fulfill orders will be questionable for next 4 months."

Director General of the World Health Organization, [THREAD](#) "As I told media yesterday, #2019nCov spread outside #China appears to be slow now, but could accelerate. Containment remains our objective, but all countries must use the window of opportunity created by the containment strategy to prepare for the virus's possible arrival."

[Imperial College Study](#) THREAD “CFR for cases detected in Hubei 18%; cases detected outside mainland China, CFR range 1.2-5.6%; overall CFR in all infections (asx, sx) of approximately 1%.”

AP 2/10: [UK can forcibly quarantine virus cases](#). UK cases has doubled to 8. “The U.K. Department of Health and Social Care said people with the virus can now be forcibly quarantined and will not be free to leave. It named two British specialist hospitals in London as isolation facilities for those affected: Guy’s and St. Thomas’ and The Royal Free. It also designated the Chinese city of Wuhan and the surrounding Hubei province where the virus first emerged as a “infected area.””

WaPo 2/10: [Quarantined cruise ship infection rate doubles. New stats on severity rates](#). 65 new cases with “135 known to have been infected. Pressure is mounting to test everyone on the ship.” “It generally takes three days from the time of infection for symptoms to manifest, and 15 percent of the infected contract severe pneumonia.” Around a third of all cases outside of mainland China are on the ship.

Bloomberg 2/10: [Wuhan may have 500k infections before peak](#). “But most of those people won’t know it...Recent trends in reported cases in Wuhan broadly support the preliminary mathematical modeling the London School of Hygiene & Tropical Medicine is using to predict the epidemic’s transmission dynamics....Kucharski, whose research focuses on the dynamics of infectious diseases, and colleagues have based their modeling on a range of assumptions about the 2019-nCoV virus. These include an incubation period of 5.2 days, a delay from the onset of symptoms to confirmation of infection of 6.1 days, and about 10 million people being at risk of infection in Wuhan.”

NYT 2/10: Hong Kong [two residents from different floors in an apartment building were infected](#). The building was evacuated after the discovery of a leaky bathroom pipe. Compared to a 2003 incident “when 329 residents of a housing estate in Hong Kong became infected with SARS, which had spread through defective piping. Forty-two of the infected residents died.” Much of the country was supposed to have reopened by now, but its empty streets, quiet factories and legions of inactive workers suggest that weeks or months could pass before this vital motor of global growth is humming again.

Powerful NYT op-ed from someone living in an [unofficial quarantine in Shanghai](#). “I’m scared of being scared. I don’t want to face how bad things can get, how quickly our cozy little home stay could fall apart should the infrastructure cease to run smoothly. A pampered sitting duck is still a sitting duck, and I no longer have any illusions about everything turning out fine.”

Speculative Theories

Note: Given the lack of transparency from the Chinese and discrepancies in “rest of world” data, it seems likely there is a significant amount of disinformation coming out of Wuhan and China regarding key virus stats and response methods. As such, I have included speculative theories herein, which seem sensible and could be proven or disproven over time. I’ll highlight whether something is a HOAX if debunking evidence is published.

Theory: The reported Chinese numbers are gamed to fit a quadratic model. **Probably False**

- + [Reddit](#): “If I’m right, this near perfect “Chinese Propaganda” quadratic model will provide the world press and the WHO with the following numbers over the next few days:

05/02/2020 23435 cases 489 fatalities

06/02/2020 26885 cases 561 fatalities

07/02/2020 30576 cases 639 fatalities

08/02/2020 34506 cases 721 fatalities

09/02/2020 38675 cases 808 fatalities

10/02/2020 43084 cases 900 fatalities

11/02/2020 47733 cases 997 fatalities

These predicted values are very close to the actual values that were subsequently reported. “This isn’t how viruses work with an $R_0 > 2$.” Could suggest testing limitations.

Disputed on [The Prepared](#).

“The first thing worth noting is that a quadratic is actually not the expected form of the case counts in an epidemic. There’s no epidemiological model which will project perfect conformity with a quadratic; real models largely follow exponential and logistic functions. So, fabricating case numbers to have them fit a perfect quadratic would both look highly suspicious, and also not simulate what anyone would expect. But also, we took the same data (plus the extra days of data since Wednesday), and plotted it in the same manner, and the data are far from being a perfect quadratic. This is particularly clear when you consider the new daily case numbers, which for a quadratic would follow a perfect linear trend. They don’t. The R-squared value of the fit for this data segment is only .88, and the divergences are large and clearly visible. The divergence from linearity becomes particularly pronounced in the days since the original post.”

“We’re not saying the data is reliable, just that it’s not faked.”

- + Dovey Wan [THREAD](#) notes 1% infection rate of evacuees to western countries: “IF 1% infection rate, Wuhan population is ~10mm: 100k infections. IF 10% are serious infection needs full hospitalization, it aligned with public health governor once stated in news release “Hubei province prepares 100k beds capacity and Wuhan plans 10k.”
- + Pretty [scary video](#), which I include here because it’s comprehensive and has 500k views. A lot of OP’s points are ones that make intuitive sense to me.

Medical Studies

[JAMA Study](#) “In this single-center case series involving 138 patients with NCIP, 26% of patients required admission to the intensive care unit and 4.3% died. Presumed human-to-human hospital-associated transmission of 2019-nCoV was suspected in 41% of patients.”

Economic Consequences

WSJ 2/11: [This risk doesn't feel like it's priced in.](#) “Investors and analysts are racing to figure out how far the coronavirus outbreak will spread and what its eventual impact will be. Unfortunately, many are making assumptions that actual disease experts caution against. Some of Wall Street’s reassuring statements about the epidemic could be wildly off, and so, too, their expectations of the economic disruption the virus could cause.”

BBG 2/10: [List of air travel suspensions to China is staggering.](#) Many have suspended flights for 6-8 weeks already or significantly reduced capacity.

BBG 2/9: Major manufacturing giant Foxconn has [closed facilities / working at reduced capacity.](#) Major supply chain component for Apple iPhones among other hardware.

Geopolitical Consequences:

2/9 Chen Qiushi, a citizen journalist [may have been silenced.](#) “who had been doing critical reporting from Wuhan, the central Chinese city at the epicenter of the outbreak, went missing on Thursday evening, just as hundreds of thousands of people in China began demanding freedom of speech online

2/10 [Vox](#) Whatever the motivation for this secrecy and delay — China’s rigid bureaucratic structures, its culture of obedience and compliance, an unwillingness by government officials to share bad news, a desire to protect economic interests — the outcome is the same: The world had less time to prepare and react to the new coronavirus, which has likely worsened the outbreak and increased the risk of a global pandemic, global health experts said. “[This] delay in announcing the first cases of coronavirus for several weeks meant that during that time, millions of people traveled outside of Wuhan, so it was precious time lost,” Gostin said. According to the Financial Times, some 5 million people left Wuhan in the weeks before the city was quarantined on January 22, “thus helping to transport the virus all over the country and overseas.”

2/10 [Epsilon Theory](#) “From a narrative perspective, China is fighting this war against nCov2019 exactly like the US fought its war against North Vietnam. It’s what the Best and the Brightest always do ... they convince themselves that the people can’t handle the truth, particularly if the truth ain’t such good news. They convince themselves that they can buy enough time to win the real-world war by designing and employing a carefully constructed “communication strategy” to win the narrative-world war. That strategy proved to be a social and political disaster for the United States, as the cartoon tail (gotta get more NV casualties for Cronkite to report) ended up wagging the policy dog (send out more counterproductive search-and-destroy missions). I think

exactly the same thing is happening in China. And I think the social and political repercussions will be exactly as disastrous.”

[NPR](#) breaks down the social unrest in China right now following the disappearance of a citizen journalist. "Those restrictions were put to the test on Friday after the death of Dr. Li Wenliang, one of the eight whistleblowers reprimanded by police for warning others about a mysterious pneumonialike disease in December. Less than 90 minutes after his death on Friday morning, the hashtag "I want freedom of speech" was trending on Weibo, a popular Chinese blogging site, with nearly 2 million posts. The posts were gone by sunrise."

How to prepare for the worst?

If you're ready to go full prepper, I recommend, The Prepared [resources and guide](#).

“Your most important goals:

1. Be able to shelter in your home for at least two weeks (the longer, the better) without leaving for supplies or outside help. If we have a significant amount of transmission here in the US, you'll probably want the option of avoiding other people and public places. Or, if things get really dire, it may be recommended or required that you stay in your home for a period of time.
2. Be able to protect yourself against picking up the virus. There are steps you can take now, and more serious steps you may want ready in case things get much worse.
3. Listen to legitimate sources so you can make decisions based on accurate, rational news. This epidemic already has enough actual cause for concern — there's no need to make things worse with fake news!”

Other Notes:

Key concerns:

- + Long incubation and asymptomatic transmission, one to two weeks
- + Young, healthy people are dying as well (still mostly older or immunocompromised)
- + Higher rate of infection than the flu
- + Unclear mortality rate that could be as high as 5-10%

“It would be reasonable to expect this kind of mass shut down at around 500-1000 cases. Looking at the Wuhan outbreak curve this would be in around 1-2 weeks for Beijing and Shanghai (200 cases now) and 2-4 weeks for the likes of Singapore (20 cases now)”

<https://www.linkedin.com/pulse/underestimating-coronavirus-impact-precautionary-emad-mostaque/>

Not the Flu!!

- ▶ Super high serious complication rate (20%)
- ▶ Much more deadly than flu (10x to ?)
- ▶ Very high R0 – way over 2, maybe as high as 4
- ▶ Spreads asymptotically – that's really bad
- ▶ Spreads via droplets and aerosols – (!@\$#!)
- ▶ Long incubation period – means those with it are walking about
- ▶ No natural immunity on the herd – no fire breaks
- ▶ No vaccine available – so no prior vaccines to work from

<https://www.youtube.com/channel/UCD2-QVBQi48RRQTD4JhXu8w>