

Lecture 23:

6.2. Trade and Development; Foreign Aid; Foreign Intervention

Brad DeLong

Department of Economics & Blum Center, U.C. Berkeley; & WCEG

last revised: Su 2020-04-12

for presentation: Th 2020-04-23

Original course by Melissa Dell (Harvard Econ 1342), revised by Brad DeLong

<<https://github.com;braddelong/public-files/blob/master/econ-135-lecture-23.pptx>>

<https://www.icloud.com/keynote/0_hQOtKpPzq3oGpMEhZTACKJQ>

Final Paper

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Econ 135 Final Paper

Due: Mo May 18, 11:59 PM PDT

3000 words

Prompt: We have looked at a lot of the history and the process of economic growth this semester, and covered a huge amount—the only thing I am kicking myself at not having covered is the plagues-and-medicine-and-public-health topic. Now I want you to look forward. Drawing on your knowledge of the history of economic growth, outline three scenarios about how global economic growth might proceed from now up to the year 2100 that you think are (a) plausible and (b) interesting. Explain why you think they are plausible. And also, in your text, ask yourself and answer what I call Bob Rubin's question: "Consider somebody living in that particular scenario's future: what would they wish then that we humans had done differently today?"

<<https://bcourses.berkeley.edu/courses/1487685/assignments/8093768>>

Points 30

Submitting a text entry box or a file upload

Due	For	Available from	Until
May 18	Everyone	-	-

Discussion

Trade and Development; Foreign Aid; Foreign Interventions:

- What strikes you as important here?

Trade and Development; Foreign Aid; Foreign Intervention

**Th Apr 23: 6.2. Trade and
Development; Foreign Aid; Foreign
Intervention:**

- Slides: <<https://github.com/braddelong/public-files/blob/master/econ-135-lecture-23.pptx>>

Trade & Development

We have had 500 years of globalization:

- Many of the poorest places in the world are those that are not integrated into regional, national, and international trade
- Trade allows specialization, which typically improves *static* economic efficiency
 - *Dynamic* efficiency is another kettle of fish
- Globalization creates winners and losers
- Initial circumstances determine the impacts of economic integration on institutions and growth
- Initial circumstances determine who wins versus loses from globalization
- Trade integration solidifies an economy's niche in the global economy
- Governments have incentives to try to extract as large a share of the surplus from globalization as possible

10:30 minutes of audio for this segment; 33:00 minutes of audio for this lecture as a whole

A Very Short History of Early Globalization

It really starts in the 1500s with the caravel:

- The West Indies—we have covered the shock of the *conquistadores* and their cannon, smallpox, and steel breastplates
- The East Indies:
 - Cutting out the middleman
 - Making the products of India, China, and southeast Asia much cheaper
- This wave of globalization had big winners and big losers:
 - In wealth, the winners gained much more than the losers gained
 - In human utility, the losers lost much more than the winners gained
 - Possible role of globalization in triggering the Industrial Revolution, and then MEG...



First Modern Globalization

1815-1914:

- Railroads, steamship, and telegraphs made possible:
 - Mass transport of goods
 - Mass transport of information
 - Mass transport of people—a greater share of the world's population changed continents between 1845-1914 than at any time before or since, by far
- Connection to world markets not perceived as an unmixed good: Melissa Dell's anecdote from Peru:
 - The steamship made it feasible for Peruvian wool producers to sell to Britain.
 - Peasants knew an increase in wool prices would lead to land grabs. Attempted to stop the construction of a railroad from wool producing areas to the coast.
 - Many of the gains from trade seem to have been absorbed by quelling persistent peasant unrest (Jacobsen, 1993)
- United Fruit Company & co. (Dube, Kaplan, and Naidu (2011)):
 - Eisenhower was easily grifted by corporations. So were other presidents:
 - The authorization of the overthrow of the Arbenz regime in Guatemala
 - U.S. and Belgian operations to neutralize the Lumumba government in the Congo after it refused to allow copper-rich Katanga to secede
 - Salvador Allende's acceleration of the nationalization of Chile's copper industry



Profit!

Coup authorization leaked out into the financial markets:

- 22 “events”
- Some people profited very handsomely
- Focus on a four day return starting at the event date.
- Control for four Fama-French factors
 - excess return on the NYSE (market)
 - SMB (small)
 - HML (value)
 - MOM (momentum)
- Results: over 4 days after the decision date, a 10% excess return on equity positions...

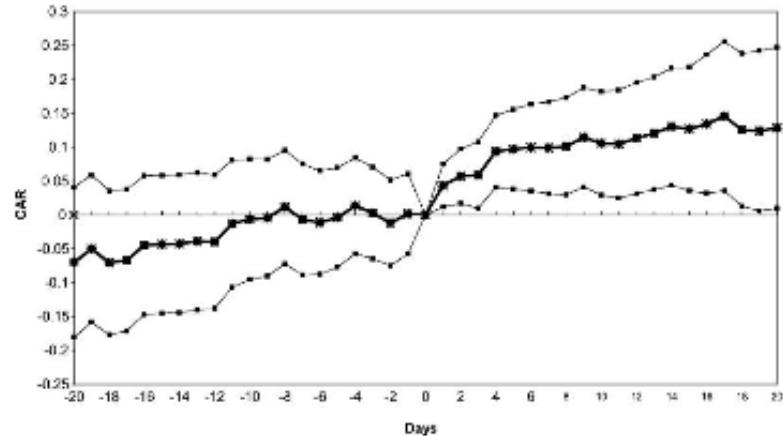


FIGURE I
Cumulative Abnormal Returns: All Countries

TABLE II
AUTHORIZATION EVENT SELECTION

Date	Country	Description	Good	Cancelled
September 15, 1970	Chile	Nixon Authorizes Anti-Allende Plan (Incl. Pinochet Coup)	Y	N
January 28, 1971	Chile	40 Committee Appropriates \$1.2 Million	Y	N
October 26, 1972	Chile	40 Committee Appropriates \$1.4 Million	Y	N
August 20, 1973	Chile	40 Committee Appropriates \$1 Million	Y	N
August 18, 1960	Congo	Eisenhower Endorses Lumumba's Elimination	Y	Y
September 12, 1960	Congo	Belgian Operation Barracuda Begins	Y	Y
October 11, 1960	Congo	Operation Barracuda Cancelled	N	Y
December 5, 1960	Congo	CIA Steps Operation	N	Y
January 18, 1961	Congo	Lumumba Secretly Killed	Y	N
March 17, 1960	Cuba	Eisenhower Approves Plan to Overthrow Castro	Y	N
August 18, 1960	Cuba	Eisenhower Approves \$18 Million to Overthrow Castro	Y	N
January 30, 1961	Cuba	Kennedy Authorizes Continuing Bay of Pigs Op	Y	N
November 4, 1961	Cuba	Operation Mongoose Planning Authorized	Y	Y
February 26, 1962	Cuba	Operation Mongoose Scaled Back	N	Y
October 30, 1962	Cuba	Operation Mongoose Cancelled	N	Y
August 18, 1952	Guatemala	DCIA Approves PBFortune (Coup to Overthrow Arbenz)	Y	Y
October 8, 1952	Guatemala	PBFortune Halted	N	Y
December 9, 1953	Guatemala	DCIA Approves PBSuccess (Coup to Overthrow Arbenz)	Y	N
April 19, 1954	Guatemala	Full Approval Given to PBSuccess	Y	N
June 19, 1953	Iran	CIA/MI6 Both Approve Coup	Y	N
July 1, 1953	Iran	Churchill Approves Coup	Y	N
July 11, 1953	Iran	Eisenhower Approves Coup	Y	N

Notes. Date is the date of the event. Country is the target country of the coup attempt. Description gives a brief description of the event. Good is coded as Y if the event should raise the share value of the company and N if the event should lower the share value of the company. Cancelled is coded as Y if the operation was cancelled and N if it was executed; the 40 Committee was the subgroup of the executive branch National Security Council responsible for authorizing covert actions after 1964.

Today

Global comparative advantage:

- Countries have an incentive to implement policies that will concentrate their comparative advantage in a leading sector
- A few countries—South Korea or Taiwan—appear to have been successful at this.
- Many other times, these policies failed spectacularly
- Development economists in the 1940s and 50s challenged the conventional wisdom that globalization had been beneficial for developing countries
- Classical economists argued that trade integration should—if anything—benefit developing countries in the long-run because the supply of land is inelastic
- Economists started to question this conventional wisdom in the aftermath of the Great Depression:
 - Kindleberger (1943): The terms of trade of agriculture decline over the long run due to Engel's law.
 - Prebisch (1950): The terms of trade of agriculture decline; emphasized organized labor and industrial monopolies in developed countries as mechanisms.
 - Singer (1950): Agricultural terms of trade in decline. De-industrialization in developing countries.
 - Lewis (1954): Surplus labor leads the gains from technological progress in agriculture to accrue to consumers in the developed world.
 - Baran (1957); Furtado (1959): Most of the returns from trade accrue to large landowners or foreign investors and are spent abroad
- But ISI was no more successful in the post-WWII world

Foreign Aid

The history of post-WWII foreign aid:

- The heyday of foreign aid was in the 1950s
- The Marshall Plan is the most famous instance, but large amounts of foreign aid also went to economies that would soon become the East Asian Tigers
- Various qualitative accounts claim that the aid to these developing countries was highly successful, but to my knowledge no one has had an empirical strategy to test this hypothesis
- A major motivation of this aid was to prevent the spread of Communism

The Sachs-Easterly Debate

- Sachs: Aid does incredible good, and we just be serious about giving more of it
- Easterly: Most aid is siphoned off by corrupt governments and naive aid agency employees
- Easterly: Most never reaches its intended recipient
- Easterly: Aid focuses governments and entrepreneurs on pleasing foreign governments & NGOs, and diverts them from taking steps to raise productivity

5:15 minutes of audio

Fueling Civil Wars with Food Aid

Nathan Nunn and Nancy Qian (2014): US Food Aid and Civil Conflict:

- <https://github.com;braddelong/public-files/blob/master/readings/article-nunn-qian-aid.pdf>

- We study the effect of US food aid on conflict in recipient countries. Our analysis exploits time variation in food aid shipments due to changes in US wheat production and cross-sectional variation in a country's tendency to receive any US food aid. According to our estimates, an increase in US food aid increases the incidence and duration of civil conflicts, but has no robust effect on interstate conflicts or the onset of civil conflicts. We also provide suggestive evidence that the effects are most pronounced in countries with a recent history of civil conflict...
- 1971-2006: UCDP/PRIO Armed Conflict Dataset (25 or more battle deaths a year)
- Instrument: the interaction of last year's US wheat production and the frequency that a country receives any US food aid
- If (a) the U.S. harvest was big last year and (b) the country usually receives U.S. food aid and (c) there is an extra 1000 tons of food aid this year, then (d) the chance of a civil war starting or continuing is 25% higher...

TABLE 2—THE EFFECT OF FOOD AID ON CONFLICT: BASELINE SPECIFICATION WITH $P_{t-1} \times D_{it}$ AS THE INSTRUMENT

Dependent variable (panels A, B, and C):	Parsimonious specifications				Baseline specification		
	Any conflict (1)	Any conflict (2)	Any conflict (3)	Any conflict (4)	Any conflict (5)	Intrastate (6)	Interstate (7)
<i>Panel A. OLS estimates</i>							
US wheat aid (1,000 MT)	-0.00006 (0.00018)	-0.00007 (0.00018)	-0.00005 (0.00017)	-0.00007 (0.00017)	-0.00011 (0.00017)	-0.00005 (0.00017)	-0.00011 (0.00004)
<i>R</i> ²	0.508	0.508	0.518	0.534	0.549	0.523	0.385
<i>Panel B. Reduced form estimates</i> ($\times 1,000$)**							
Lag US wheat production (1,000 MT)	0.00829 (0.00257)	0.01039 (0.00263)	0.01070 (0.00262)	0.01133 (0.00318)	0.01071 (0.00320)	0.00909 (0.00322)	-0.00158 (0.00121)
<i>R</i> ²	0.511	0.512	0.521	0.536	0.551	0.525	0.382
<i>Panel C. 2SLS estimates</i>							
US wheat aid (1,000 MT)	0.00364 (0.00174)	0.00303 (0.00125)	0.00312 (0.00117)	0.00343 (0.00106)	0.00299 (0.00096)	0.00254 (0.00088)	-0.00044 (0.00033)
Dependent variable (panel D):	US wheat aid (1,000 MT)						
<i>Panel D. First-stage estimates</i>							
Lag US wheat production (1,000 MT)	0.00227 (0.00094)	0.00343 (0.00126)	0.00343 (0.00120)	0.00330 (0.00092)	0.00358 (0.00103)	0.00358 (0.00103)	0.00358 (0.00103)
<i>x avg. prob. of any US food aid</i>							

Foreign Intervention: Army vs. Marines

Melissa Dell & Pablo Querubin (2016) on two branches of America's armed forces with very different attitudes:

- Army: overwhelming firepower (the shadow of Cold Harbor)
- Marines: accomplish the mission
- In Vietnam:
 - Army in Corps Region II: search-&-destroy
 - Marines in Corps Region I: embed & build
 - Public goods that the Marines targeted—primary education, health, and infrastructure—were substantially higher on their side of the boundary
 - On the Marines' side, there were fewer VC attacks
 - Attitudes towards Americans and all levels of SVN government were more positive
 - The top-down overwhelming-firepower approach can backfire when targeted insurgents are embedded in civilian population centers
- JFK (1954): “I am frankly of the belief that no amount of American military assistance in Indochina can conquer an enemy which is everywhere and at the same time nowhere...and which has the sympathy and covert support of the people...”

17:00 minutes of audio

Marines Ideology

The *Small Wars Manual* (1940):

- “In small wars the goal is to gain decisive results with the least application of force.... The end aim is the social, economic, and political development of the people subsequent to the military defeat of the enemy insurgent...”

Official History of the USMC in Vietnam:

- “Marines units built schools, roads, marketplaces, and hospitals; set-up the Medical Civic Action Program (MEDCAP) to provide the rural population with regular medical care and to help develop hygienic and sanitary practices; and provided training and equipment to local and regional militia under the CAP and Combined Unit Pacification Program (CUPP) to enhance security in the rural areas...”

Army Ideology

Six American policymakers: The first four:

- General William Westmoreland: “[Overwhelming firepower] will hamper [the VC’s] operations, reduce his forces, destroy his morale and materially detract from his ability to prosecute the war effectively...” “To thwart the communist’s designs, it is necessary to eliminate the ‘fish’ from the ‘water’, or dry up the ‘water ‘...”
- General William DePuy: “The solution in Vietnam is more bombs, more shells, more napalm...”
- NSA Mcgeorge Bundy: “A reprisal policy—to the extent that it demonstrates U.S. willingness to employ this new norm in counter-insurgency—will set a higher price for the future upon all adventures of guerrilla warfare, and it should therefore increase our ability to deter such adventures...” “ Even if it fails... [bombing] will be worth it. At a minimum, it will damp down the charge that we did not do all that we could have done...”
- NSA Walt Whitman Rostow: “[Needed:] a ruthless projection to the peasantry that the central government intends to be the wave of the future...”



Misdirected napalm bombing attack, South Vietnam, June 8, 1972

Army Ideology II

Six American policymakers: Numbers five and six:

- Advisor Sam Huntington: “The principal reason for this massive influx of population into the urban areas is, of course, the intensification of the war... refugees.... dramatic and often heartrending.... In the past the Viet Cong could expect to win the war simply by preventing Saigon from extending its control in the rural areas. This... is no longer sufficient to achieve victory.... The Viet Cong... have been even less successful in... [the cities] than the Government has been... in the countryside.... In an absent-minded way the United States in Viet Nam may well have stumbled upon the answer to ‘wars of national liberation’... neither... conventional military victory nor... the... gimmicks of counter-insurgency warfare. It is instead forced-draft urbanization and modernization which rapidly brings the country in question out of the phase in which a rural revolutionary movement can hope to generate sufficient strength to come to power...”
- Robert McNamara: “The f***ing bombing campaign. It’s been worth nothing. It’s done nothing. They’ve dropped more bombs than in all Europe in all of World War II and it hasn’t done a f***ing thing...”

Sam Huntington on the Cuban-Americans of Miami

He did not like them:

- “Latinos have not assimilated into mainstream U.S. culture, forming instead their own political and linguistic enclaves... rejecting the Anglo-Protestant values that built the American dream.... The Hispanization of Miami is without precedent.... The Cuban takeover.... By 1999, the heads of Miami’s largest bank, largest real estate development company, and largest law firm... the mayor of Miami and the mayor, police chief, and state attorney of Miami-Dade County... two-thirds of Miami’s U.S. Congressional delegation... nearly one half of its state legislators.... Anglos (as well as blacks)... outside minorities that could often be ignored. Unable to communicate with government bureaucrats and discriminated against by store clerks, the Anglos... could accept their subordinat[ion]... assimilate into the Hispanic community... or... leave... their exodus reflected in a popular bumper sticker: 'Will the last American to leave Miami, please bring the flag'... ”

Readings

Optional: For Reference Only:

- **Bill Easterly** (2014): *The Aid Debate Is Over: The Failure of Jeffrey Sachs's Millennium Villages* <<https://github.com/braddelong/public-files/blob/master/readings/article-easterly-aid.pdf>>
- **Niall Ferguson** (2007): *The Least Among Us: Review of Paul Collier: "The Bottom Billion"* <<https://github.com/braddelong/public-files/blob/master/readings/article-ferguson-bottom-billion.pdf>>
- **Nina Munk** (2007): *Letter from Uganda: Jeffrey Sachs's \$200 Billion Dream* <<https://github.com/braddelong/public-files/blob/master/readings/article-munk-sachs.pdf>>
- **Nathan Nunn & Nancy Qian** (2014): *US Food Aid and Civil Conflict* <<https://github.com/braddelong/public-files/blob/master/readings/article-nunn-qian-aid.pdf>>
- **Melissa Dell & Pablo Querubin** (2016): *Nation Building Through Foreign Intervention: Evidence from Discontinuities in Military Strategies* <<https://github.com/braddelong/public-files/blob/master/readings/article-dell-querubin-vietnam.pdf>>
- **W. Arthur Lewis** (1977): *The Evolution of the International Economic Order* <<https://github.com/braddelong/public-files/blob/master/readings/book-lewis-evolution-a.pdf>> <<https://github.com/braddelong/public-files/blob/master/readings/book-lewis-evolution-b.pdf>>

Big Ideas: Lecture 23: Trade and Development; Foreign Aid; Foreign Interventions

Takeaways from this class:

Roadmap for the Next Two Weeks...

23b. Tu Apr 28: 6.3. Growth & Fluctuations

- **Read Before:** Barry Eichengreen (2015): Hall of Mirrors: The Great Depression, The Great Recession, and the Uses-and Misuses-of History, selections <<https://github.com;braddelong/public-files/blob/master/readings/book-eichengreen-selections-mirrors.pdf>>
- **Slides:** <<https://github.com;braddelong/public-files/blob/master/econ-135-lecture-23b.pptx>>

24. Th Apr 30: 6.4. Populism, Plutocracy, Kleptocracy, & Neo-Fascism

- **Read Before:** Ernest Gellner (1973): *Nations & Nationalism*, selections <<https://delong.typepad.com/files/gellner-nations.pdf>>
- **Read Before:** Barry Eichengreen (2018): *The Populist Temptation Economic Grievance & Political Reaction in the Modern Era*, selections <<https://delong.typepad.com/files/eichengreen-populist.pdf>>

26. Tu May 5: 6.5. The Pace and Meaning of Economic Growth

- **Read Before:** William Nordhaus: Do Real-Output and Real-Wage Measures Capture Reality? <<https://www.nber.org/chapters/c6064.pdf>>
- **Read Before:** John Maynard Keynes: Economic Possibilities for Our Grandchildren <<<https://delong.typepad.com/files/keynes-persuasion.pdf>><
- **Read Before:** Edward Bellamy (1887): Looking Backward 2000-1887, selections <<https://delong.typepad.com/files/bellamy-backward.pdf>>

7. Conclusion

27. Th May 7: 7.1. The Future?

- **Read Before:** Robert Allen (2011): Global Economic History: A Very Short Introduction, selections <<https://delong.typepad.com/files/allen-geh.pdf>>

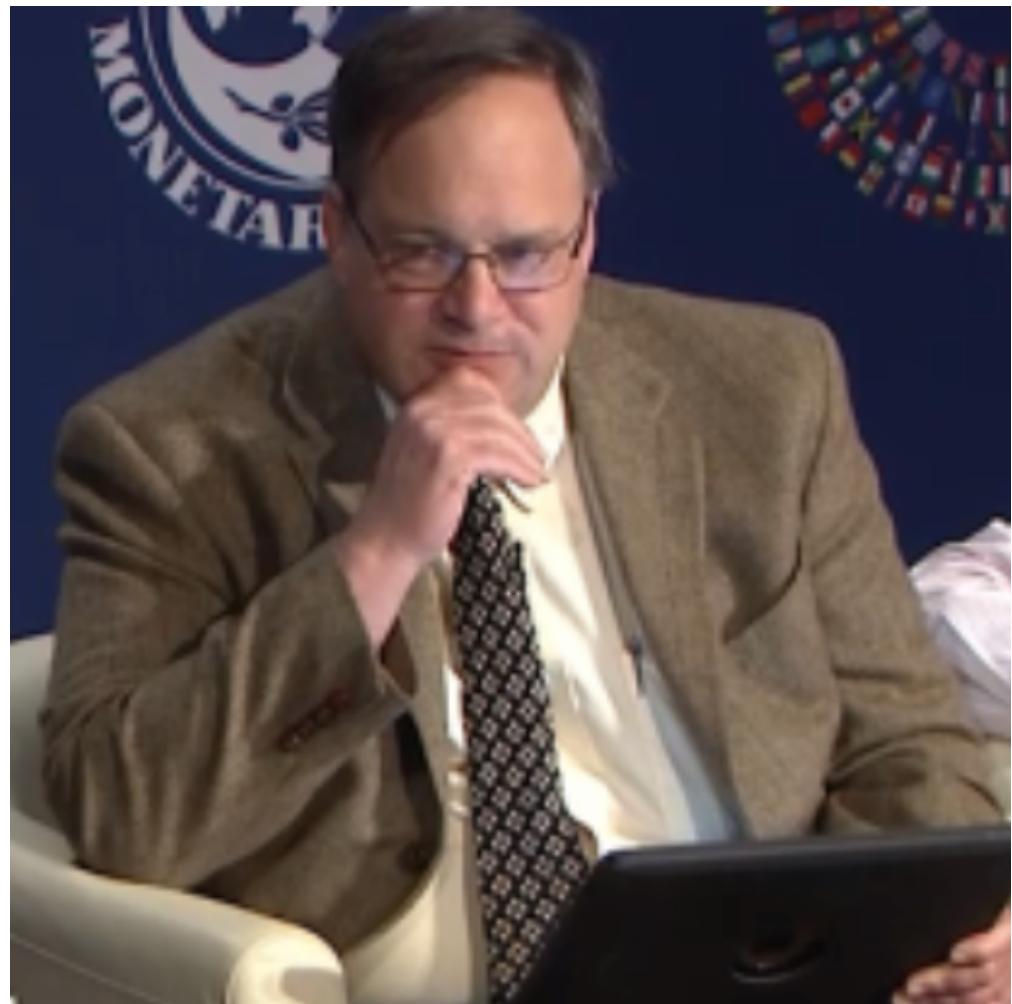
8. And it looks like we will not get to...

25. 6.6. Global Warming

- **Read Before:** Melissa Dell et al. (2012): *Temperature Shocks & Economic Growth: Evidence from the Last Half Century* <https://scholar.harvard.edu/files/dell/files/aej_temperature.pdf>
- **Read Before:** Melissa Dell et al. (2014). *What Do We Learn from the Weather? The New Climate-Economy Literature*, selections <<https://economics.mit.edu/files/9138>>

Catch Our Breath...

- Ask a couple of questions?
- Make a couple of comments?
- Any more readings to recommend?



Notes, etc....



Coronavirus!

Members of the public were told to avoid gatherings of 10 or more



ABC News



Trump warns coronavirus crisis could stretch into summer

Watch

Members of the public were told to avoid gatherings of 10 or more and older people and those with underlying condition were asked to stay home.

Coronavirus

Where we think we are, as of Th Apr 09:

- We really do not know
- No random samples...
- If we extrapolate out the past week straight-line log:
 - We will have 440,000 deaths in three weeks
 - But it is unlikely to be that bad
- Best thing I have read comes from Jim Stock <<https://drive.google.com/file/d/12MV466ZZy5xHir4xdPhoTrL1oQ8CbZU-/view>>:
 - The basic SIR epidemiological model of contagion
 - The effect of social distancing and business shutdowns on epidemic dynamics enters the model through a single parameter: the case transmission rate β
 - Re-express the model in terms of β and the asymptomatic (or not very symptomatic) hence non-tested rate—the fraction of the infected who are not tested
 - The COVID-19 non-testing rate is unidentified in our model
 - Estimates in the epidemiological literature range from 0.18 to 0.86.
 - The asymptomatic rate could be estimated accurately and quickly by testing a random sample
 - The optimal policy response and its economic consequences hinge critically on the asymptomatic rate

Coronavirus Extrapolations						
Date	Deaths	Cases = Deaths x 100	Constant Weekly New Cases	Cases = 5 x Cases(-3)	Cases = 20 x Cases (-3)	Cases = Cases (-3) x exp(3 x week ch)
2020-04-05	9618		3,102,000	4,809,000	19,236,000	55,832,145
2020-03-29	2484		869,400	1,242,000	4,968,000	53,654,400
2020-03-22	414		144,900	207,000	828,000	8,942,400
2020-03-15	69	961,800	19,800	34,500	138,000	128,966
2020-03-08	26	248,400	10,100	13,000	52,000	45,697,600
2020-03-01	1	41,400	370	500	2,000	100,000
2020-02-23		6,900	37	50	200	10,000
2020-02-16		2,600	4	5	20	
2020-02-09		100				
2020-02-02		10				
2020-01-26		1				
		0				

<https://www.incloud.com/numbers/0FzRFAnAOnIAin4VJWWiWIC0>

Coronavirus Cases:  United States

1,342,235

[view by country](#)

Coronavirus Cases:

364,059

Deaths:

74,554

Deaths:

10,792

Recovered:

278,182

Recovered:

19,536

USA State	Tot Cases/ 1M pop	Deaths/ 1M pop
USA Total	1,100	33
New York	6,662	243
New Jersey	4,626	113
Michigan	1,729	73
California	404	10
Louisiana	3,188	110
Massachusetts	2,026	38
Florida	662	12
Pennsylvania	1,016	13
Illinois	956	24
Washington	1,095	46
Texas	263	5
Georgia	710	22

Coronavirus II

We do not really know where we are, as of Mo Apr 6:

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10,792

Recovered:

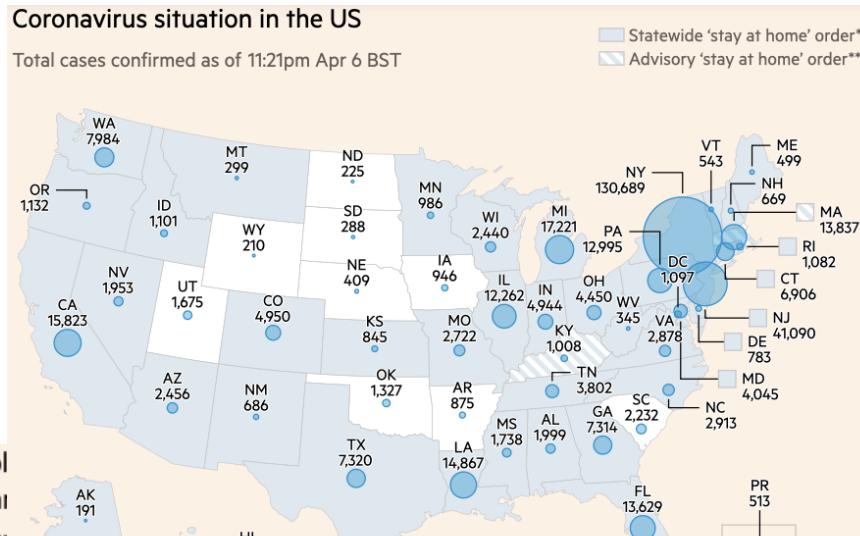
278,182

Recovered:

19,536

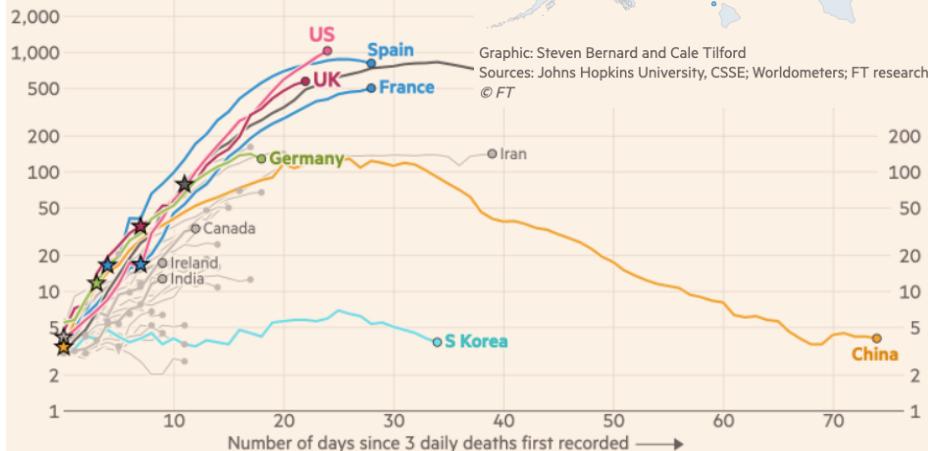
USA State	Tot Cases/ 1M pop	Deaths/ 1M pop
USA Total	1,100	33
New York	6,662	243
New Jersey	4,626	113
Michigan	1,729	73
California	404	10
Louisiana	3,188	110
Massachusetts	2,026	38
Florida	662	12
Pennsylvania	1,016	13
Illinois	956	24
Washington	1,095	46
Texas	263	5
Georgia	710	22

Financial Times Graphs Blown Up...



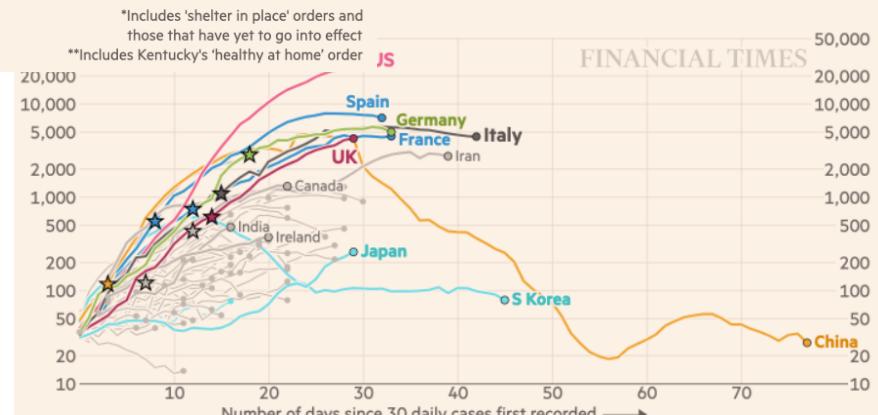
Italy and Spain's daily death tolls are plateauing, while the US and UK are still rising.
 Every day brings more new deaths than the day before.

Daily coronavirus deaths (7-day rolling avg.), by number of days since 30 daily cases first recorded



numbers of new cases now in decline,

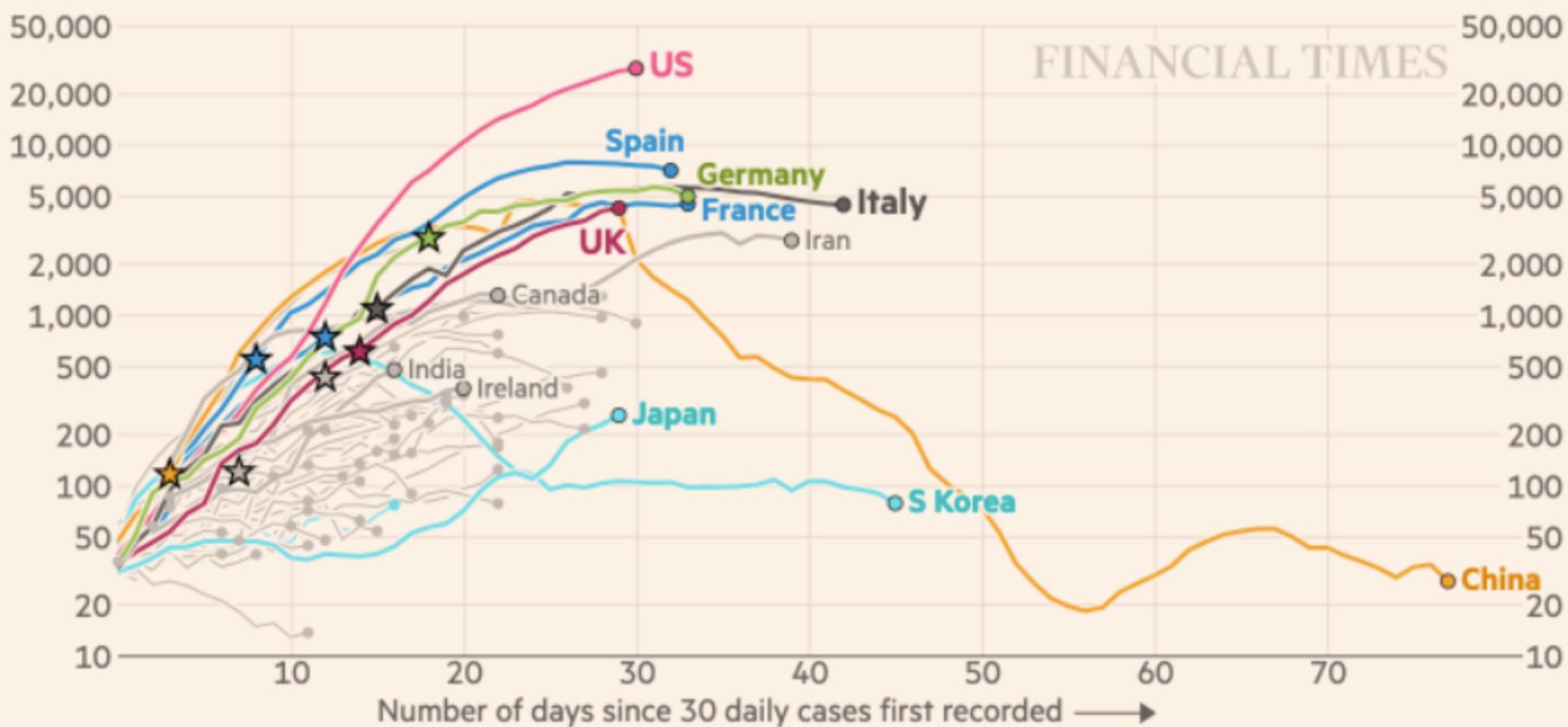
by number of days since 30 daily cases first recorded



Italy has turned the corner, with numbers of new cases now in decline, following in China's footsteps

Daily confirmed cases (7-day rolling avg.), by number of days since 30 daily cases first recorded

Stars represent national lockdowns ★



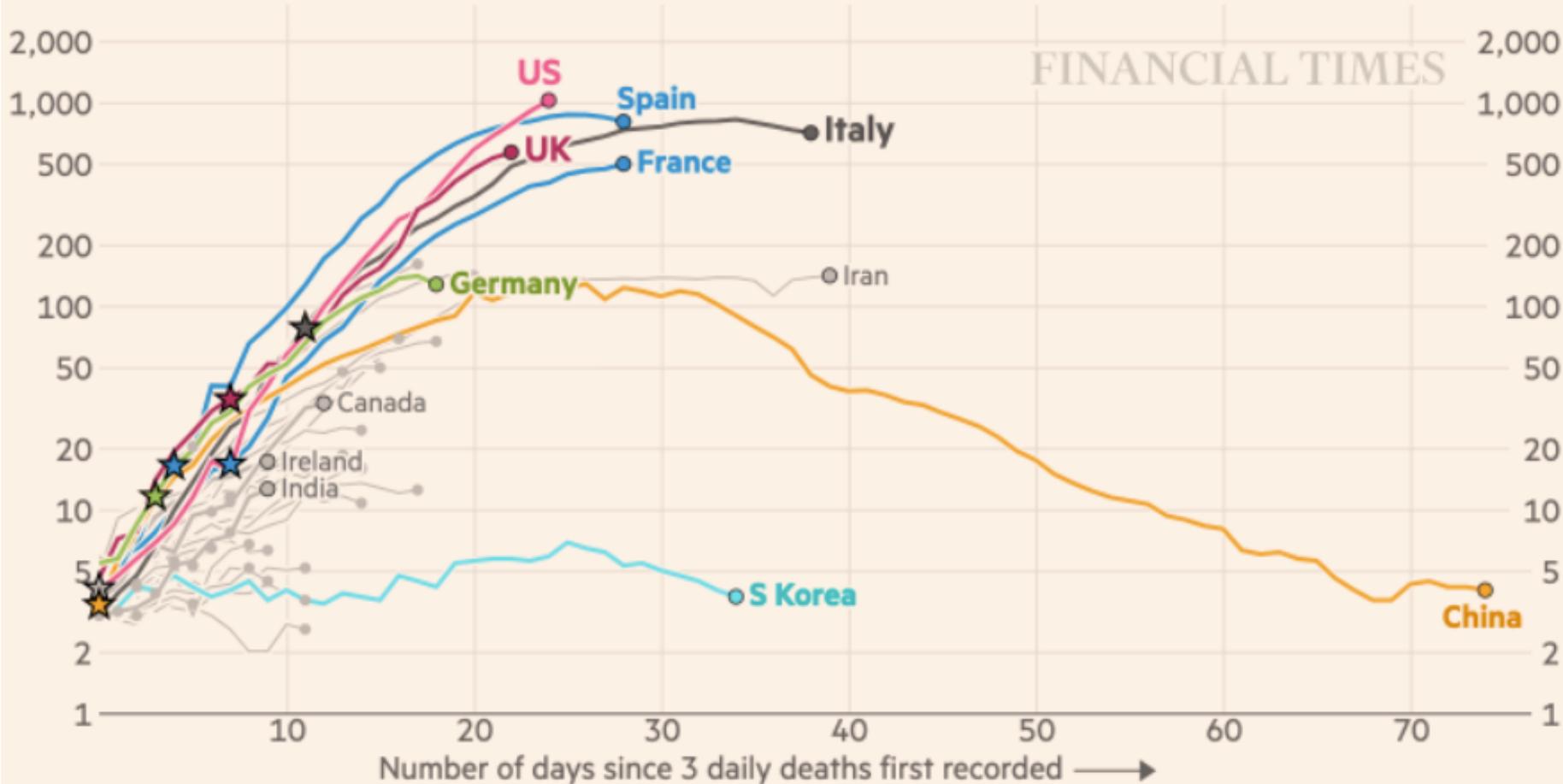
FT graphic: John Burn-Murdoch / @jburnmurdoch

Source: FT analysis of European Centre for Disease Prevention and Control; Worldometers; FT research. Data updated April 06, 19:00 GMT

© FT

Italy and Spain's daily death tolls are plateauing, but in the UK and US every day brings more new deaths than the last

Daily coronavirus deaths (7-day rolling avg.), by number of days since 3 daily deaths first recorded



FT graphic: John Burn-Murdoch / @jburnmurdoch

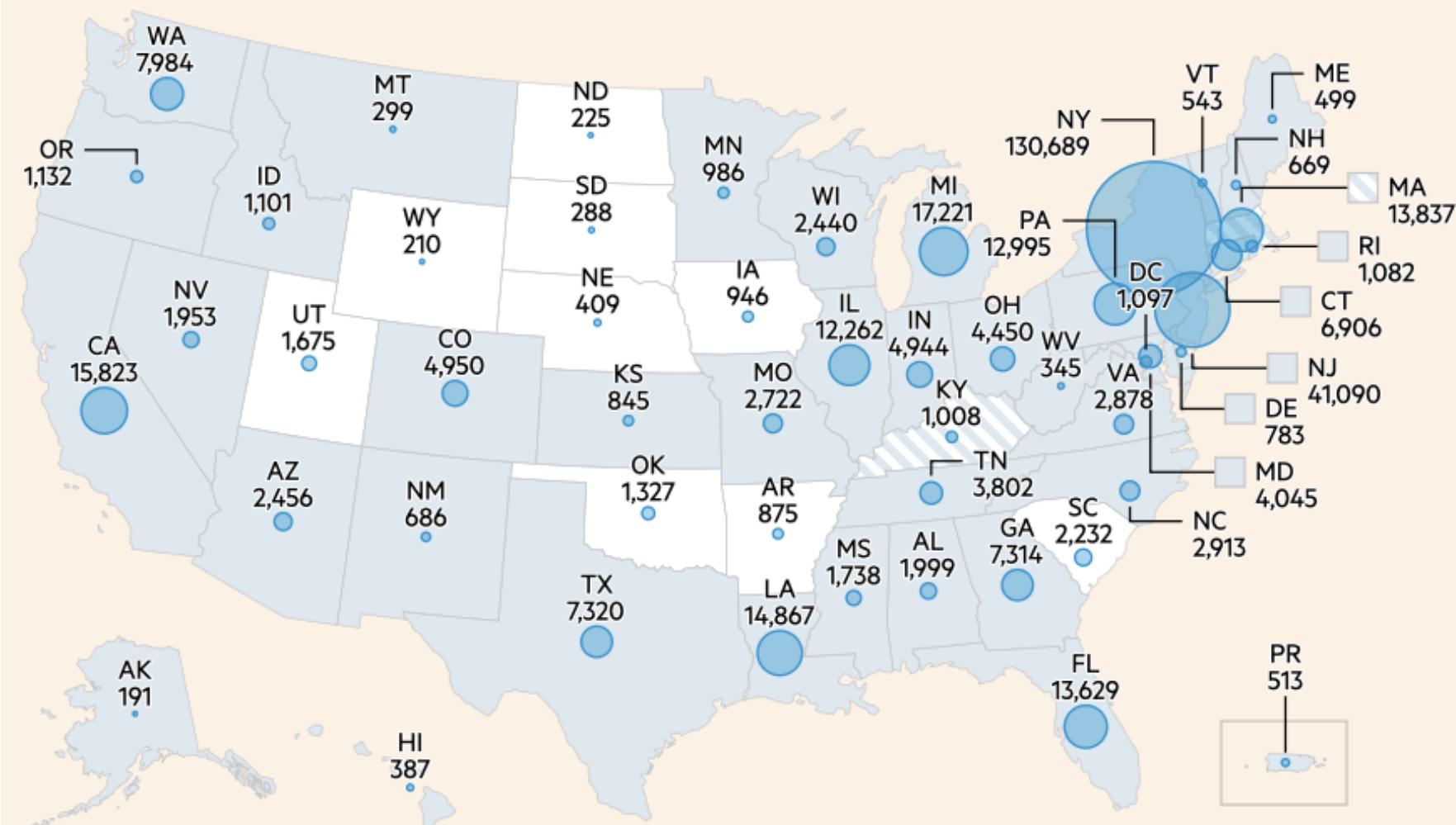
Source: FT analysis of European Centre for Disease Prevention and Control; Worldometers; FT research. Data updated April 06, 19:00 GMT

© FT

Coronavirus situation in the US

Total cases confirmed as of 11:21pm Apr 6 BST

- Statewide 'stay at home' order*
- Advisory 'stay at home' order**



Graphic: Steven Bernard and Cale Tilford

Sources: Johns Hopkins University, CSSE; Worldometers; FT research

© FT

*Includes 'shelter in place' orders and those that have yet to go into effect

**Includes Kentucky's 'healthy at home' order

James Stock (2020)

Standard SIR model: <<https://drive.google.com/file/d/12MV466ZZy5xHir4xdPhoTrL1oO8CbZU-/view>>:

- Susceptible, Infected, Recovered (& immune), transmission rate β , recovery rate γ , reproduction number R_0 , asymptomatic hence non-tested rate π_0
- Calibration: half-life of infection one week: $\gamma = 0.5$, $s_0 = 0.02$, 50 cases on Jan 24
- For March 21, 2020, the positive test rate in the United States is approximately 10%...

$$\Delta S_t = -\beta I_{t-1} \frac{S_{t-1}}{N}$$

$$\Delta R_t = \gamma I_{t-1},$$

$$\Delta I_t = \beta I_{t-1} \frac{S_{t-1}}{N} - \gamma I_{t-1}$$

<<https://drive.google.com/file/d/12MV466ZZy5xHir4xdPhoTrL1oO8CbZU-/view>>

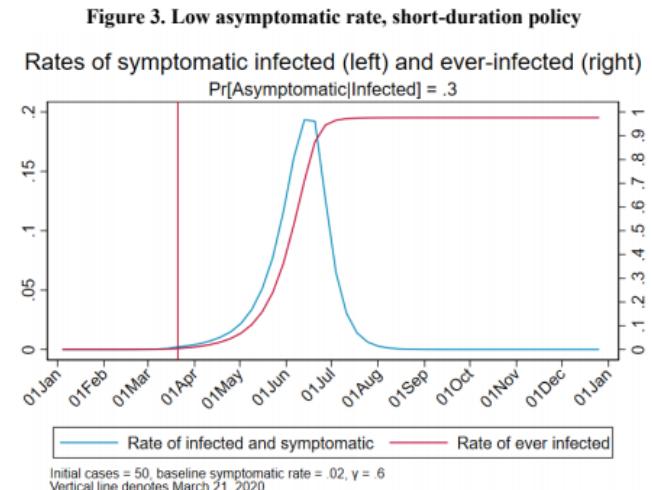


Figure 2. High asymptomatic rate, short-duration policy

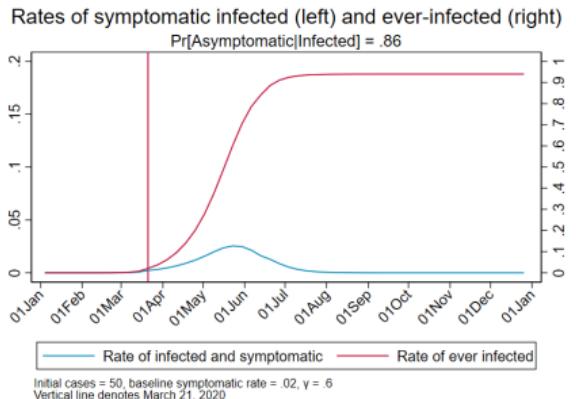


Figure 4. Low asymptomatic rate, severe long-duration policy

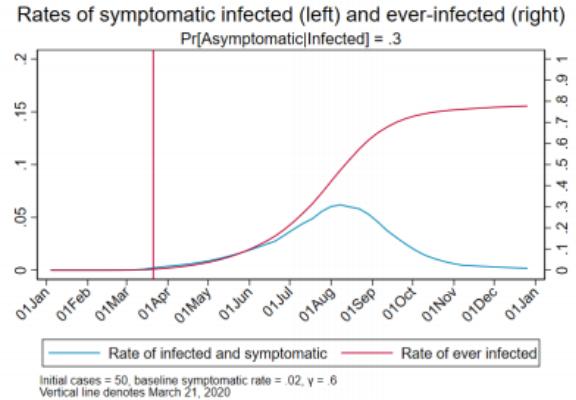
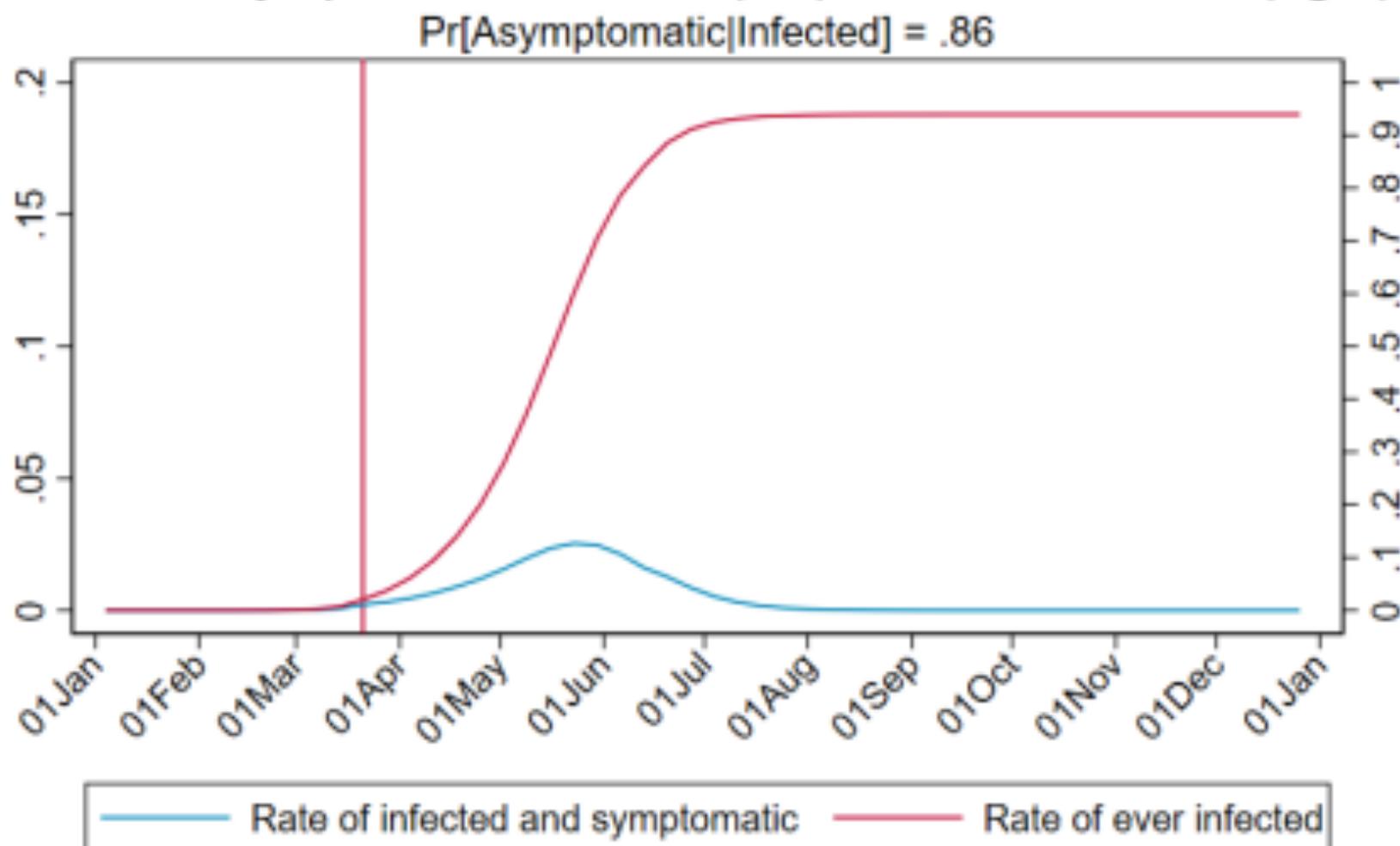


Figure 2. High asymptomatic rate, short-duration policy

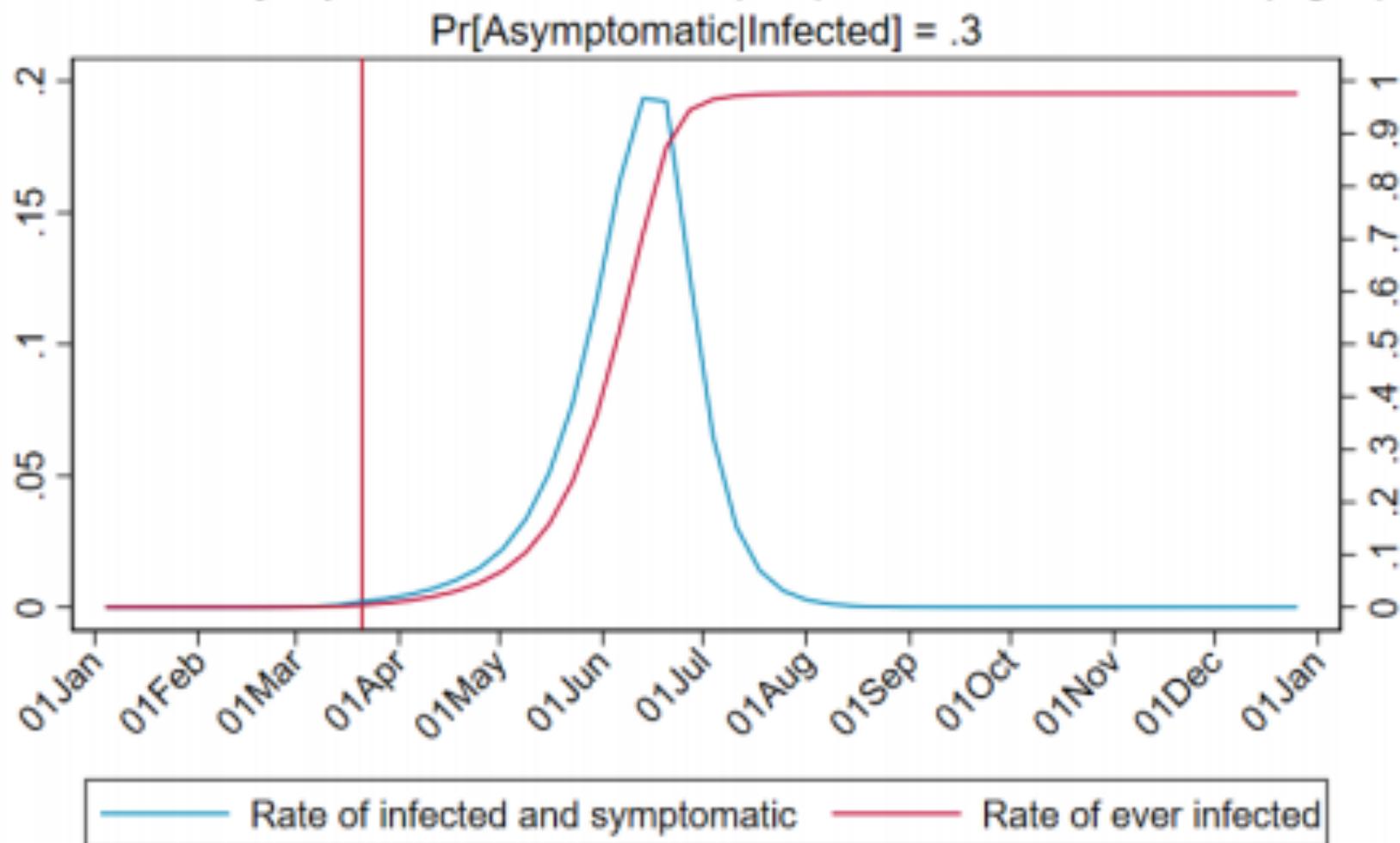
Rates of symptomatic infected (left) and ever-infected (right)



Initial cases = 50, baseline symptomatic rate = .02, $\gamma = .6$
Vertical line denotes March 21, 2020

Figure 3. Low asymptomatic rate, short-duration policy

Rates of symptomatic infected (left) and ever-infected (right)

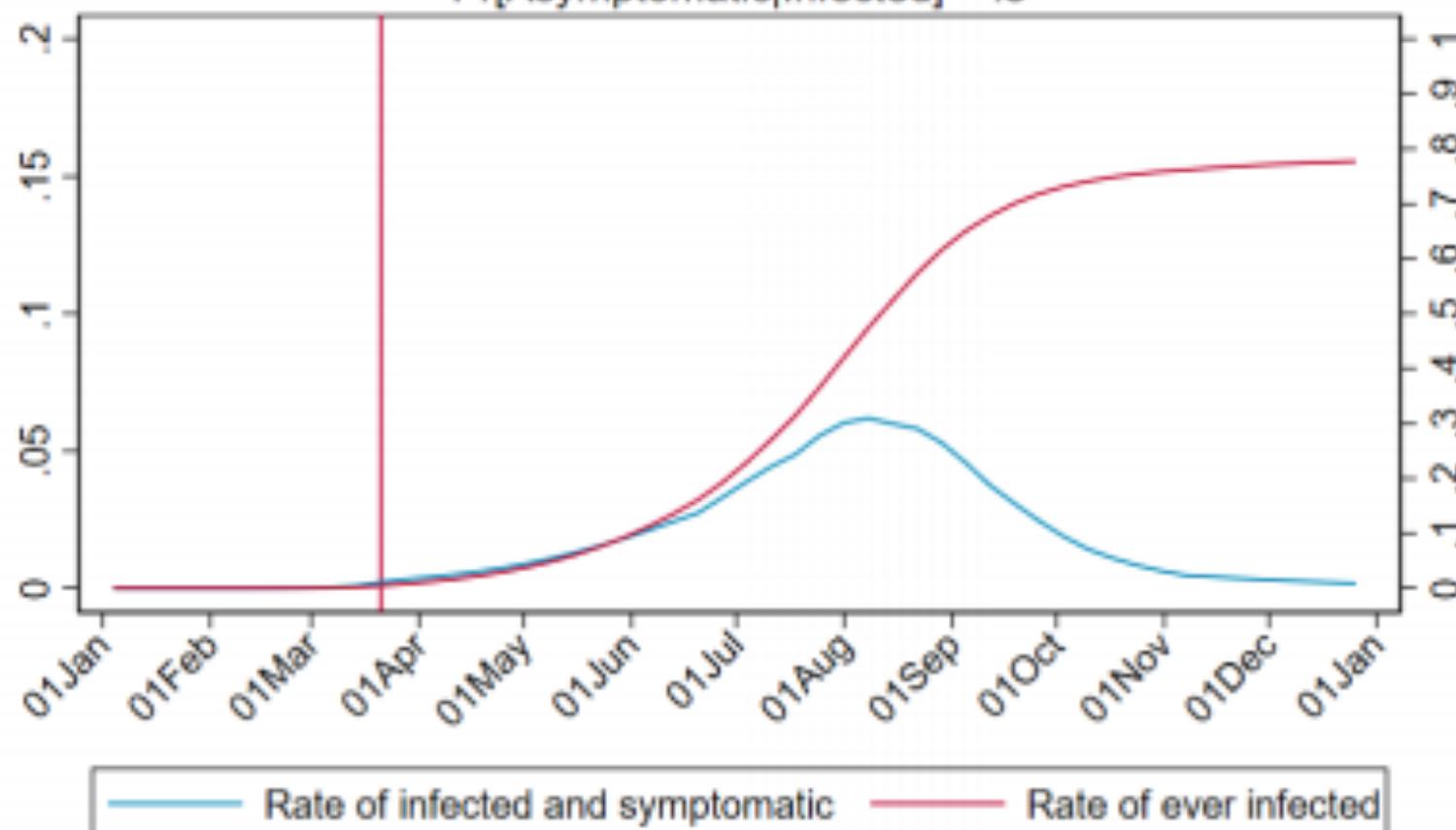


Initial cases = 50, baseline symptomatic rate = .02, $\gamma = .6$
Vertical line denotes March 21, 2020

Figure 4. Low asymptomatic rate, severe long-duration policy

Rates of symptomatic infected (left) and ever-infected (right)

$$\Pr[\text{Asymptomatic} | \text{Infected}] = .3$$



Initial cases = 50, baseline symptomatic rate = .02, $\gamma = .6$
Vertical line denotes March 21, 2020

$$\Delta S_t = -\beta I_{t-1} \frac{S_{t-1}}{N}$$

$$\Delta R_t = \gamma I_{t-1},$$

$$\Delta I_t = \beta I_{t-1} \frac{S_{t-1}}{N} - \gamma I_{t-1}$$

Bringing the Economy Back Up from Anæsthesia

Major issues:

- Certificates of immunity:
 - Which requires test, test, test:
 - And not just disease virus tests
 - Presence-of-antibodies tests
- How quickly can we match the immune with public-contact jobs?
- What jobs can be done with minimal infection risk?
- What minimal-infection substitutes can we find for previous jobs?
- How quickly can restrictions be relaxed without the virus coming roaring back?
- How do we avoid having the market give a “shutdown” signal to enterprises we in fact want restarted?
 - Which is pretty much all of them
- How much of the potential caseload do we want to push out beyond the vaccine-arrival date?

ALL THESE QUESTIONS ARE ANSWERABLE IF WE LEARN THE ASYMPTOMATIC HENCE NON-TESTED RATE!!

Keeping the Economy from Crashing During the Lockdown

Nick Rowe: We have a 50% output cut in 100% of the sectors:

- A temporary 100% output cut in 50% of the sectors (what the Coronavirus does) is very different from a 50% output cut in 100% of the sectors
- Nick's thought experiment:
 - In three months we are going to invent unobtanium:
 - Substantial intertemporal substitutability
 - Plus lower cross-good contemporaneous substitutability
 - Hence high desired savings rate now
 - Flex-price market thus produces a nominal rate at the zero lower bound and a high inflation rate over the next three to six months
 - Plus liquidity-constrained workers in affected sectors see their demand go to zero immediately
 - Can we get there? Should we get there? What should we do instead?
 - We need a good RBC economist: are there any?...

Keeping the Economy from Crashing During the Lockdown II

Nick Rowe:

- <https://worthwhile.typepad.com/worthwhile_canadian_initi/2020/03/relative-supply-shocks-unobtainium-walras-law-and-the-coronavirus.html>
- Plus: to extend the thought experiment:
 - We just lost the ability to make “unobtainium”
 - So we *should* be substituting leisure for work, and moving workers into relatively unproductive labor, making the commodities we can still produce right now
 - How should relative prices move as a result? How should we make them move?

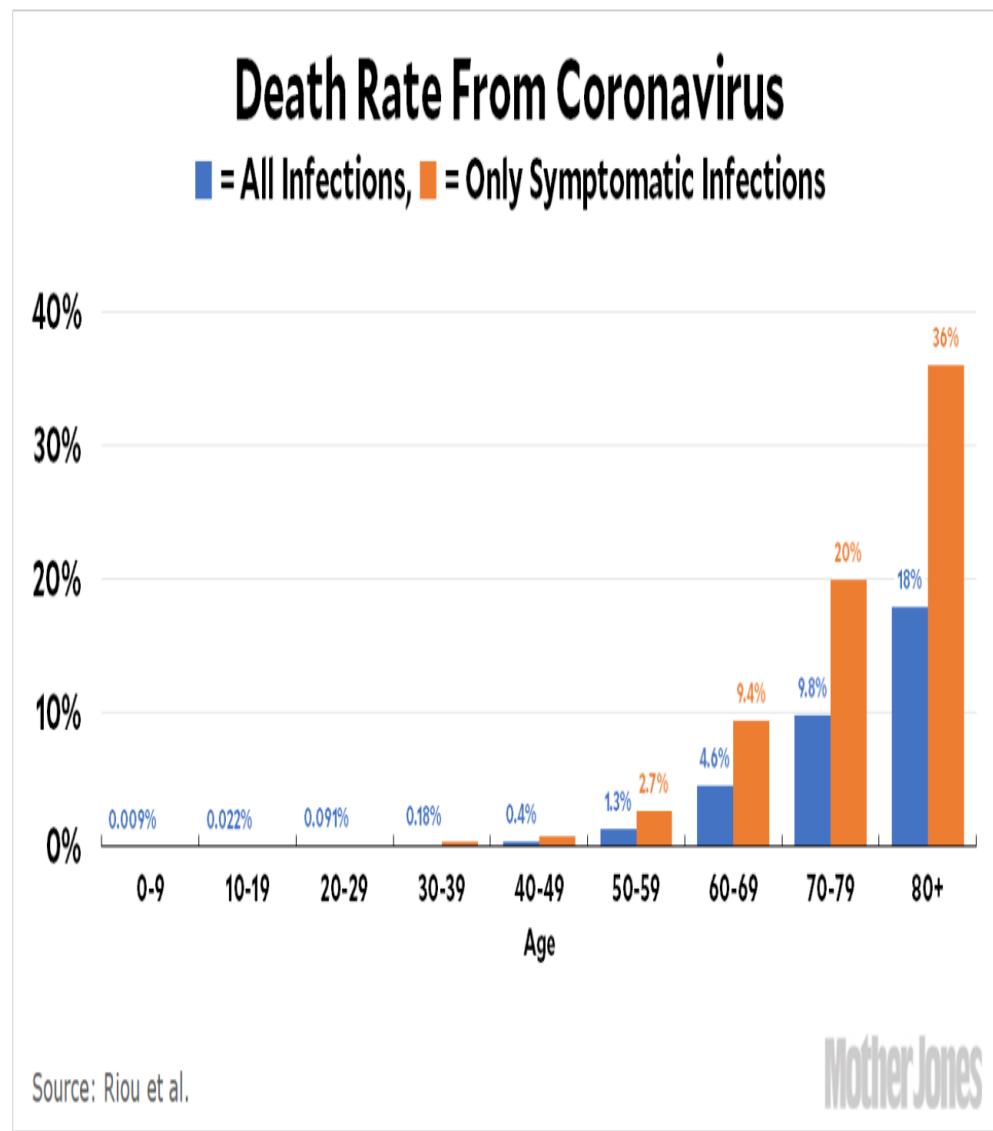
Plus: distributional issues

Plus: bankruptcy and credit chain issues

MOAR Coronavirus!

Death for Geezers!

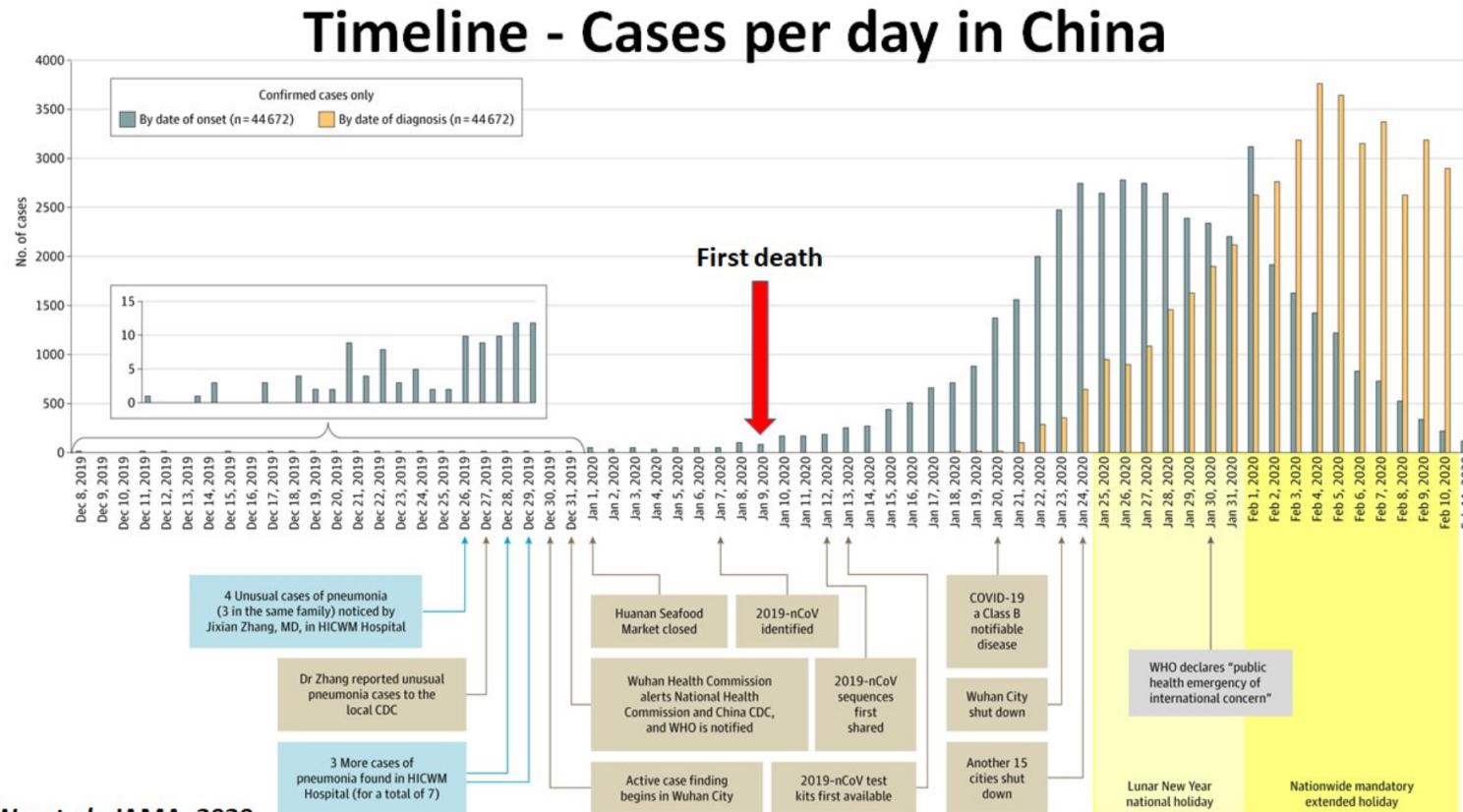
- Mortality for the Youngs very low...
- It's the flu for them—for you...
- And an extra doubling—or is it 5%?—mortality for the asthmatic
- And an extra doubling—or is it 5%?—mortality for the overweight



What We Think Happened in Wuhan

China beat it quickly & relatively easily!

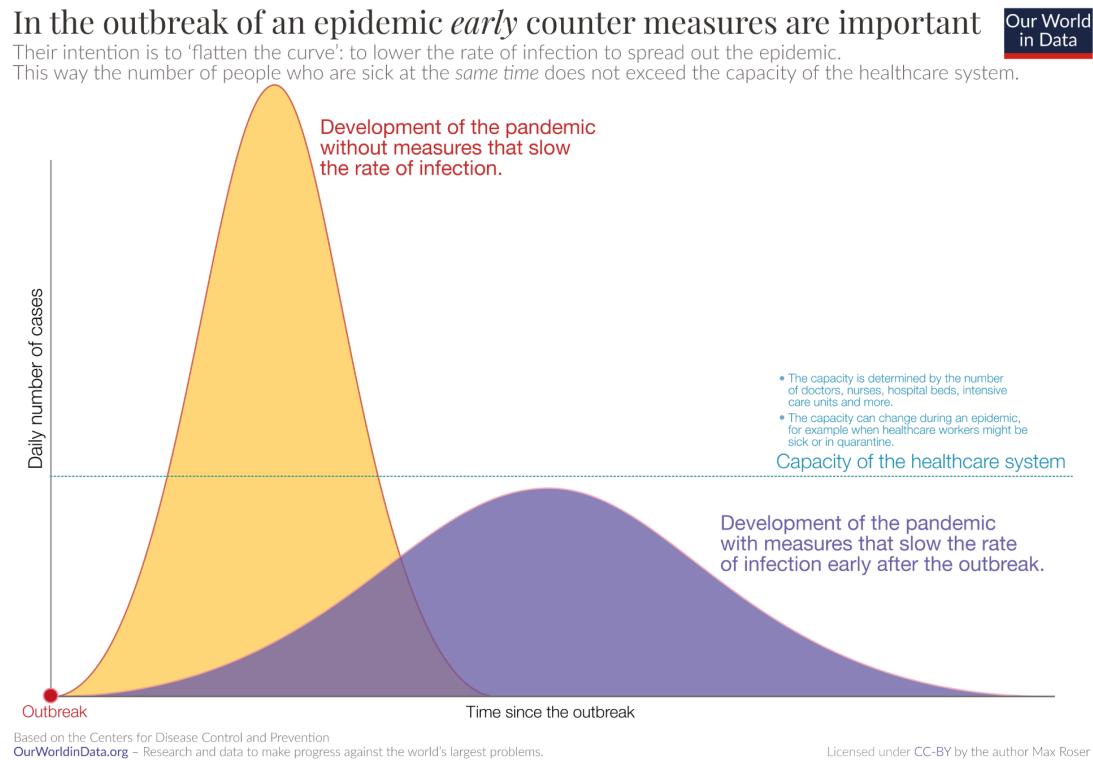
- We think
- Shut down Wuhan when 200 cases per day
- That seems to have been a good decision



The Goal

When Is It Appropriate to Move on This?

- Immediate social distancing...
- Self-isolate if you have a cough and a fever...
- Hope that warmer temperatures will do to this what they did to SARS...
- Otherwise, when do you want to start spreading out transmission. It seems that early is as good as later, so do it early...
 - I have no good intuition on why you want to move early
 - Plus your moving early will be wasted if you get reinfected
 - Plus the sparks you throw off making others' lives more difficult



References

- **Financial Times** (2020): Coronavirus Tracked: The Latest Figures as the Pandemic Spreads <<https://www.ft.com/coronavirus-latest>>
- **Nick Rowe** (2020): *Relative Supply Shocks, Unobtainium, Walras' Law, and the Coronavirus* <https://worthwhile.typepad.com/worthwhile_canadian_initi/2020/03/relative-supply-shocks-unobtainium-walras-law-and-the-coronavirus.html>
- **Jim Stock** (2020): *Coronavirus Data Gaps and the Policy Response* <<https://drive.google.com/file/d/12MV466ZZy5xHir4xdPhoTrL1oO8CbZU-/view>>

MOAR Coronavirus!

What I am watching:

- **Max Roser & Hannah Ritchie:** *Coronavirus Disease (COVID-19)* <<https://ourworldindata.org/coronavirus>>...
- **Worldometer:** *Coronavirus Update (Live)* <<https://www.worldometers.info/coronavirus/>>: '125,599 Cases and 4,605 Deaths from COVID-19 Virus Outbreak...'
- *FT Coronavirus Tracker* <<https://www.ft.com/content/a26fbf7e-48f8-11ea-aeb3-955839e06441>>
- Josh Marshall's COVID Twitter List <<https://twitter.com/i/lists/1233998285779632128>>
- NEJM Group: Updates on the Covid-19 Pandemic <http://m.n.nejm.org/nl/jsp/m.jsp?c=%40kxNtXckRDOq8oG0jJvAXsIzN4mPECIPhtxoTSdTU9k%3D&cid=DM89089NEJM_COVID-19_Newsletter&bid=173498255>: 'From the New England Journal of Medicine, NEJM Journal Watch, NEJM Catalyst, and other trusted sources...'

Catch Our Breath...

- Ask a couple of questions?
 - Make a couple of comments?
 - Any more readings to recommend?
-
- <<https://www.icloud.com/keynote/0YKEi7HeOrVGvKYtt9FEqH7nA>>
 - <<https://www.bradford-delong.com/2020/04/coronavirus.html>>
 - github:<<https://github.com/braddelong/public-files/blob/master/coronavirus.pptx>>
 - <https://github.com/braddelong/public-files/blob/master/coronavirus.pdf>
 - html File: <<https://www.bradford-delong.com/2020/04/coronavirus.html>>
 - Edit This File: <<https://www.typepad.com/site/blogs/6a00e551f08003883400e551f080068834/post/6a00e551f080038834025d9b3bd66a200c/edit>>
 - <<https://delong.typepad.com/files/2020-04-01-coronavirus.pdf>>



Coronavirus! (March 16)

With 31 deaths in the U.S. as of March 11, a 1% death rate, and up to 4 weeks between infection and death, that means that as of Feb 12 there were 3100 coronavirus cases in the United States.

With 87 deaths in the U.S. as of Mar 16, a 1% death rate, and up to 4 weeks between infection and death, that means that as of Feb 17 there were 8700 coronavirus cases in the United States

If it is doubling every seven days, then now about 150,000 people have and in the next week about 150,000 more people in the U.S. will catch coronavirus—which means 1/2200, currently 3500 of the 7.6 million inhabitants of San Francisco Bay. Touch a hard surface that any of those 3500 has touched in the last 48 hours, and the virus has a chance to jump to you...

These numbers could be five times too big. These numbers are probably not five times too small unless the thing is a lot less deadly, and there are a lot of asymptomatic cases...

- What is wrong with this analysis?

MOAR Coronavirus!

As of March 21: Things are not moving in the right direction:

- What is the R_0 ?
- How can the R_0 be changed?
- How will the R_0 change?
- What is the asymptote share of the population?
- What is the mortality rate?

Country, Other	Total Cases	New Cases	Total Deaths	New Deaths	Total Recovered	Active Cases	Serious, Critical	Tot Cases/1M pop
China	80,880	+36	3,213	+14	67,819	9,848	3,226	56.2
Italy	27,980	+3,233	2,158	+349	2,749	23,073	1,851	462.8
Iran	14,991	+1,053	853	+129	4,590	9,548		178.5
Spain	9,428	+1,440	335	+41	530	8,563	272	201.6
S. Korea	8,236	+74	75		1,137	7,024	59	160.6
Germany	7,241	+1,428	15	+2	65	7,161	2	86.4
France	5,423		127		12	5,284	400	83.1
USA	4,186	+506	73	+5	73	4,040	12	12.6
Switzerland	2,353	+136	19	+5	4	2,330		271.9
UK	1,543	+152	55	+20	52	1,436	20	22.7
Netherlands	1,413	+278	24	+4	2	1,387	45	82.5
Norway	1,323	+67	3		1	1,319	27	244.0

Coronavirus Cases:

179,836

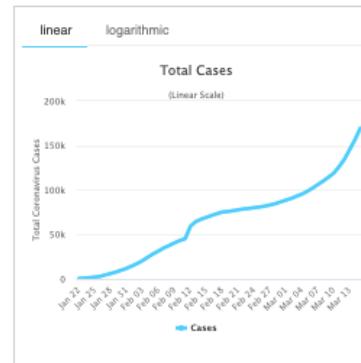
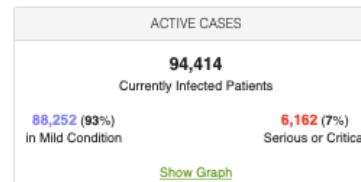
[view by country](#)

Deaths:

7,098

Recovered:

78,324



MOAR Coronavirus!

As of March 10: Things are not moving in the right direction:

- What is the R_0 ?
- How can the R_0 be changed?
- How will the R_0 change?
- What is the asymptote share of the population?
- What is the mortality rate?

Coronavirus Cases:

125,599

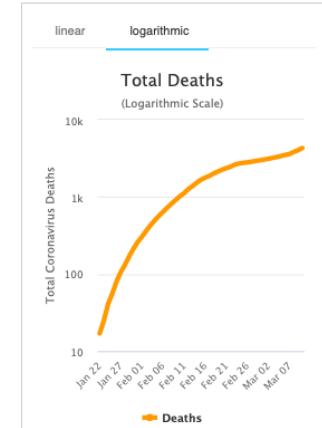
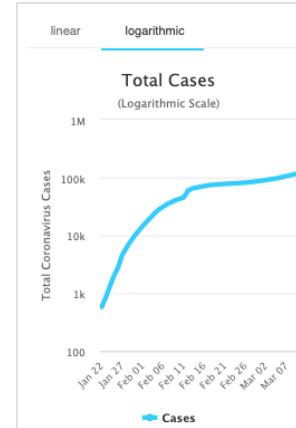
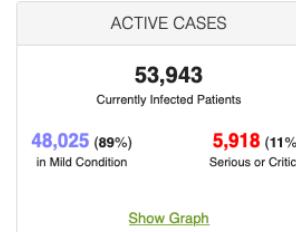
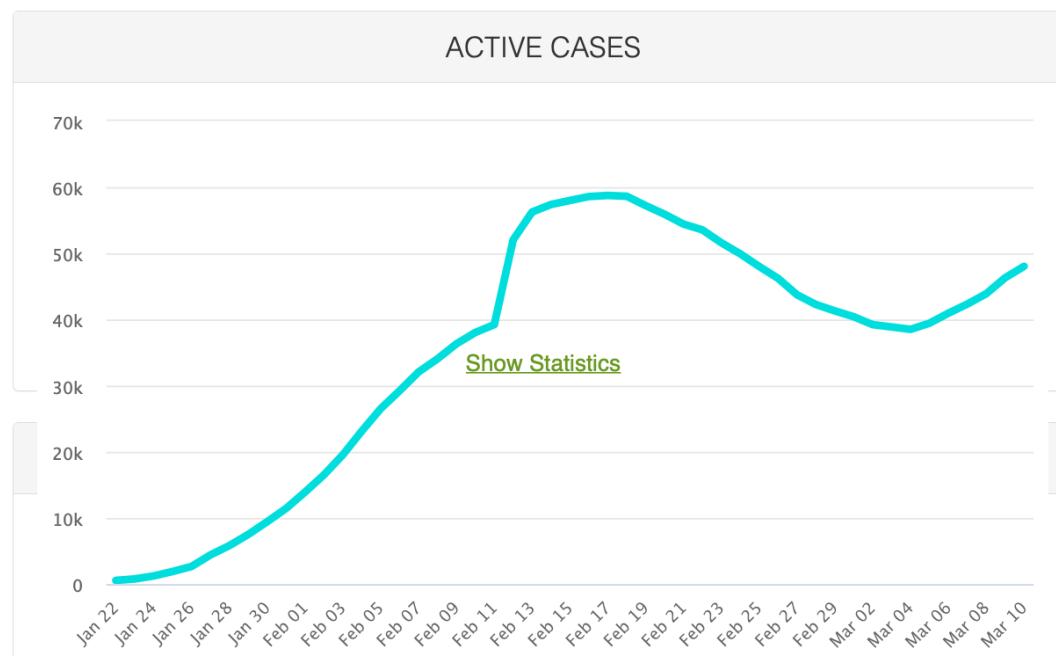
[view by country](#)

Deaths:

4,605

Recovered:

67,051



Notes

