

# Lecture 21:

## 5.4.1. South Asia & Middle East

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last revised: Th 2020-04-02

for presentation: Th 2020-04-09

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

<<https://github.com;braddelong/public-files/blob/master/econ-135-lecture-20.pptx>>

<<https://www.icloud.com/keynote/0xRRhkj7cn2vsAXbYKCH4E9Ug>>

# Discussion

## **South Asia & Middle East:**

- What strikes you as important here?

# Asia

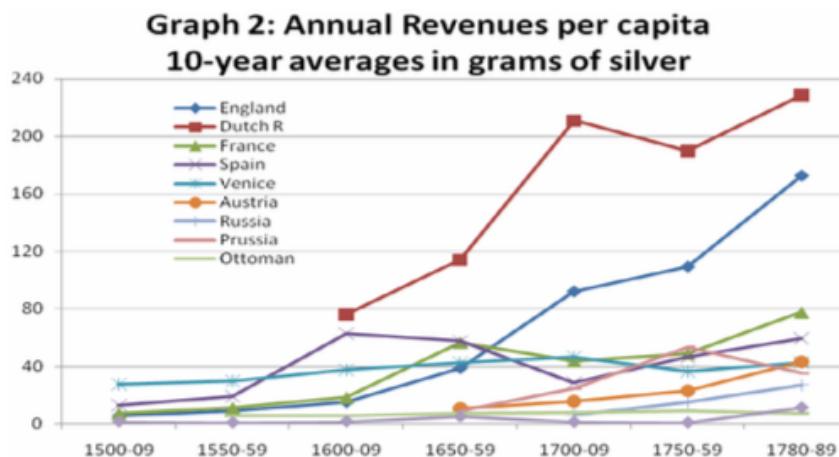
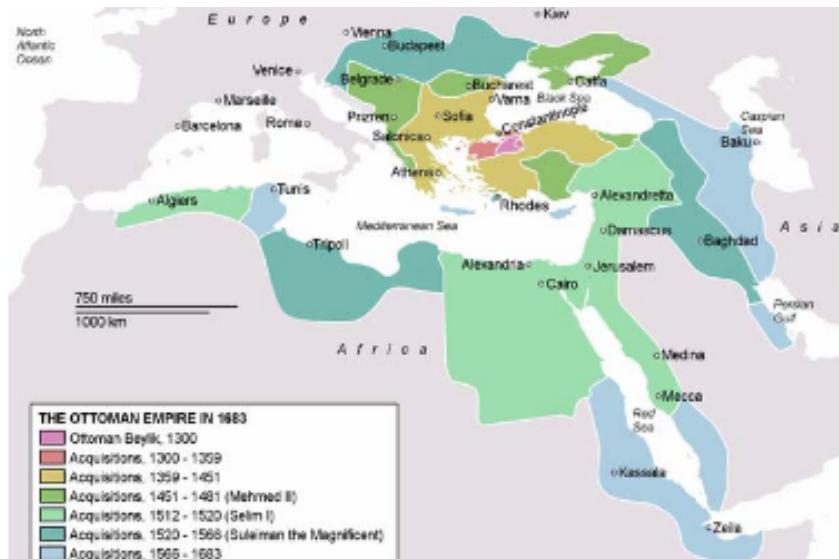
## Tu Apr 14: 5.4. Asia:

- Read Before: **Sevkut Pamuk** (2014): *Institutional Change and Economic Development in the Middle East, 700-1800* <<https://github.com/braddelong/public-files/blob/master/readings/article-pamuk-middle-east.pdf>>
- Slides: <<https://github.com/braddelong/public-files/blob/master/econ-135-lecture-21.pptx>>
- Discussion Thread: <>
- Zoom Q&A Session: <>
- Asia is really big!
  - Just look at a few places:
  - Ottoman Empire:
  - Qing China:
  - Dutch colonialism in Indonesia

# Ottoman Empire

## Mehmet II “the Conqueror”’s army takes Constantinople in 1453

- Most successful gunpowder empire of its day:
  - Biggest and most effective artillery park in the world
  - Best-disciplined infantry soldiers in the world: the *janissaries*
  - Highly-motivated professional, feudal, and conquistador cavalry: timarli sipahilar, kapikulu sipahilar, & akincilar
- But in the Outer Empire state both predatory & weak:
  - Around 1800 in Egypt the Mamluks were extracting 2/3 of peasant incomes through taxes (Owen, p. 36).
  - In Anatolia about 50% (p. 37).
  - Owen: “not a situation which permitted any accumulation of capital in the agricultural sector nor any regular increase in production...”



Source: Karaman, K. Klvanç and Şevket Pamuk (2010) “Ottoman State Finances in European Perspective, 1500-1914,” *Journal of Economic History*, 70, pp. 593-627.

# Urbanization

**The Ottoman Empire had a few very large cities:**

- Parasitic rent extraction-funded cities...

**The Number of Cities**

Country	nr. cities >=10000 inhabitants										
	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
Scandinavia	-	-	-	-	-	-	-	-	2	6	
Great Britain	-	1	4	4	4	6	4	4	8	12	65
Ireland	-	-	1	-	-	2	1	-	-	3	12
Low Countries	-	-	2	2	7	13	9	21	28	32	37
France	10	10	17	18	30	34	27	34	43	64	91
Germany	6	6	10	9	13	24	22	25	33	29	58
Austria/Switzerland	-	-	-	-	1	1	2	3	3	5	10
Italy	5	9	18	19	31	47	28	44	77	68	128
Iberia	9	15	21	19	22	24	21	34	55	35	85
Poland	-	-	-	-	1	2	4	6	9	8	8
Czech Rep.	-	-	1	1	1	3	1	3	1	4	3
Hungary/Slovakia	-	-	-	-	-	-	3	3	4	18	
Yugoslavia/Albania	-	1	2	2	1	4	4	3	6	6	15
Bulgaria/Rumania	1	1	3	3	4	8	5	8	9	10	22
Greece	1	2	2	2	2	2	2	2	2	2	2
Turkey	6	8	9	9	8	10	9	9	9	6	7
Lebanon/Israel	2	4	4	5	3	4	2	2	1	1	1
Syria	3	3	3	3	4	3	2	2	2	2	2
Iraq	4	4	5	4	5	5	5	3	3	3	3
Egypt	2	4	4	4	4	3	3	3	2	2	1
North Africa	4	5	6	8	7	9	8	7	7	8	10
Latin-West	30	41	74	72	110	156	119	178	261	267	522
Balkan	2	4	7	7	7	14	11	16	20	22	57
ME-NA	21	28	31	33	31	34	29	26	24	22	24
Total	53	73	112	112	148	204	159	220	305	311	603

**Middle East had a few very Big Cities**

Country	Urban primacy (population largest city / total population in cities >= 10,000)										
	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
Scandinavia	-	-	-	-	-	-	-	-	-	-	0.80 0.55
Great Britain	-	1.00	0.40	0.44	0.48	0.53	0.58	0.57	0.68	0.75	0.39
Ireland	-	-	1.00	-	-	0.54	1.00	-	-	0.63	0.43
Low Countries	-	-	0.50	0.53	0.27	0.16	0.38	0.13	0.08	0.20	0.21
France	0.16	0.19	0.10	0.19	0.18	0.26	0.29	0.21	0.23	0.26	0.21
Germany	0.24	0.20	0.20	0.17	0.18	0.13	0.11	0.11	0.07	0.11	0.13
Austria/Switzerland	-	-	-	-	1.00	1.00	0.67	0.48	0.65	0.63	0.63
Italy	0.33	0.19	0.15	0.12	0.09	0.08	0.11	0.10	0.13	0.15	0.13
Iberia	0.31	0.26	0.17	0.16	0.14	0.19	0.16	0.09	0.10	0.17	0.09
Poland	-	-	-	-	1.00	0.55	0.33	0.24	0.34	0.21	0.23
Czech Rep.	-	-	1.00	1.00	0.60	1.00	0.74	1.00	0.52	0.62	
Hungary/Slovakia	-	-	-	-	-	-	-	-	0.41	0.38	0.35 0.11
Yugoslavia/Albania	-	1.00	0.73	0.50	1.00	0.34	0.39	0.50	0.24	0.29	0.14
Bulgaria/Rumania	1.00	1.00	0.43	0.38	0.37	0.23	0.24	0.30	0.18	0.20	0.11
Greece	1.00	0.83	0.73	0.66	0.60	0.67	0.55	0.66	0.60	0.75	0.85
Turkey	0.54	0.54	0.52	0.37	0.40	0.31	0.24	0.32	0.56	0.67	0.65
Lebanon/Israel	0.56	0.40	0.39	0.42	0.56	0.47	0.75	0.83	1.00	1.00	
Syria	0.42	0.46	0.50	0.52	0.50	0.50	0.56	0.57	0.56	0.56	0.56
Iraq	0.54	0.65	0.70	0.74	0.69	0.50	0.55	0.63	0.46	0.46	0.70
Egypt	0.51	0.45	0.38	0.37	0.51	0.72	0.75	0.89	0.91	0.95	1.00
North Africa	0.56	0.46	0.30	0.25	0.28	0.23	0.32	0.33	0.32	0.34	0.41
Latin-West	0.12	0.11	0.06	0.05	0.04	0.06	0.06	0.05	0.04	0.07	0.07
Balkan	0.60	0.40	0.22	0.25	0.21	0.17	0.16	0.17	0.12	0.11	0.09
ME-NA	0.22	0.24	0.17	0.14	0.12	0.24	0.24	0.26	0.28	0.38	0.34
Total	-	-	-	-	-	-	-	-	-	-	0.80 0.55

Source: Bosker, Maarten, Eltjo Buringh and Jan Luiten van Zanden (2007) "From Baghdad to London: The Dynamics of Urban Growth in Europe and the Arab World", Unpublished.

# Qing Dynasty China

## Factor accumulation and technology transfer:

- Factor accumulation
  - Highest savings rates in the world
  - Massive educational expansion
  - Rapid transfer from farm to city, and from agriculture to manufacturing
- Where did demand for manufactured goods come from?
  - The Japanese state: rich country-strong army
  - The open world economy: neocolonial origins of comparative development
  - State capitalism with Chinese characteristics (and utopian socialist aspirations)
- Yet also:
  - Getting institutions and incentives right
  - Success at technology transfer
  - Avoiding rent-seeking and other elite-corruption political economy traps

TABLE II  
EDUCATIONAL ATTAINMENT OF THE WORKING POPULATION (PERCENT)

	Hong Kong		Singapore		South Korea		Taiwan	
	1966	1991	1966	1990	1966	1990	1966	1990
None	19.2	5.6	55.1	§	31.1	6.4	17.0	4.5
Primary	53.6	22.9	28.2	33.7	42.4	18.5	57.2	28.0
Secondary+	27.2	71.4	15.8	66.3	26.5	75.0	25.8	67.6

Self-taught are included under primary. Hong Kong, Korean, and Taiwanese data refer to highest level of education "attended" rather than completed. All percentages are calculated net of those reported as "unknown."

TABLE XIII  
AVERAGE TOTAL FACTOR PRODUCTIVITY GROWTH  
(PERCENT PER ANNUM)

	Hong Kong (1966–1991)	Singapore (1966–1990)	South Korea (1966–1990)	Taiwan (1966–1990)
Economy*	2.3	0.2	1.7	2.1
Manufacturing#	NA	-1.0	3.0	1.7
Other industry	NA	NA	1.9	1.4
Services	NA	NA	1.7	2.6
Private sector	NA	NA	NA	2.3

NA-not available. \*In the case of Korea and Taiwan, agriculture is excluded. #In the case of Singapore, the years are 1970–1990.

Investment as a % of GDP

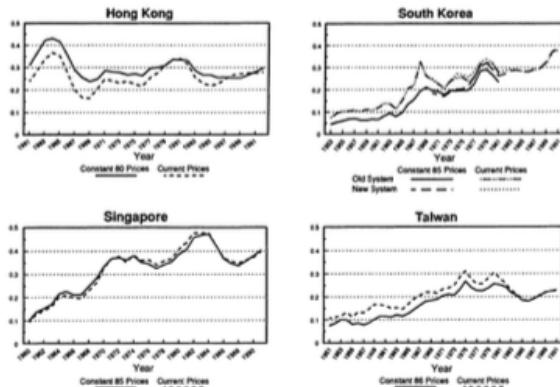


FIGURE I  
I/GDP Ratios

Source: Alwyn Young (1995) "The Tyranny of the Numbers: Confronting the Statistical Realities of the East Asian Growth Experience," Quarterly Journal of Economics, 110, 641–680.

# Dutch Colonial Indonesia

**In the 16th century, Java (in modern Indonesia) and Malaysia were amongst the most urbanized places in the world:**

- Then the Dutch show up, with ships and cannon and muskets and well-drilled infantry...
- And by 1900 Indonesia is very poor...
- Ambon and Banda:
  - In Ambon the V.O.C. took over the existing feudal structure, which they used to monopolize supply.
  - In Banda, the V.O.C.:
    - killed most of the population in 1621 (probably over 20,000 people)
    - reorganized the production of nutmeg
    - established slavery system
    - ex-employees of the VOC as planters
- “Comprador” elites...
- De-economization: Reid (1993, Chapter 5): “When a Dutch factor visited Magindanao in 1686 he was told “Nutmeg and cloves can be grown here, just as in Malaku. They are not there now because the old Raja had all of them ruined before his death. He was afraid the Dutch Company would come to fight with them about it...”

Expansion and Decline

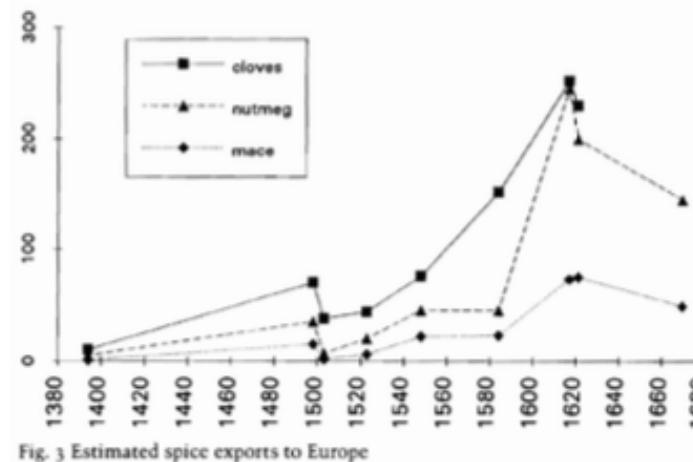


Fig. 3 Estimated spice exports to Europe



Map 2 Political centres in Southeast Asia, c. 1600

Source: Reid, Anthony (1988) Southeast Asia in the Age of Commerce 1450-1680: The Land below the Winds, Yale University Press. P. 9.

# The Dutch Cultivation System on Java

## Java was the center of the Dutch colonial empire:

- Forced sugar cultivation 1830-1880 on the northern coast of Java
  - 94 water-powered processing factories
  - Villages within three miles forced to grow cane
  - 2.5M forced workers in the sugar sector
- What happens to a village close to a factory?
  - People living near historical sugar factories more likely to be working in manufacturing in the late 20th century
  - More infrastructure near historical factories
- Villages forced to grow sugar cane:
  - Have more village-owned land
  - Modest boost to education
  - More workers in secondary and tertiary sectors



# **Big Ideas: Lecture 21: South Asia & Middle East**

**Takeaways from this class:**

# Roadmap for the Next Two Weeks...

## 6. Policy Issues

### 22. Th Apr 16: 6.1. "Deep Roots" vs. Path Dependence

- **Read Before:** Nathan Nunn (2012): Culture and the Historical Process <<https://delong.typepad.com/files/nunn-culture.pdf>>
- **Read Before:** Melissa Dell (2015): Path Dependence in Development: Evidence from the Mexican Revolution <<https://scholar.harvard.edu/files/dell/files/revolutiondraft.pdf>>
- **Slides:** <<https://github.com;braddelong/public-files/blob/master/econ-135-lecture-22.pptx>>

### 23. Tu Apr 21: 6.2. Growth and Fluctuations; Trade and Development, Foreign Aid

- **Read Before:** Barry Eichengreen (2015): Hall of Mirrors: The Great Depression, The Great Recession, and the Uses-and Misuses-of History, selections <<https://delong.typepad.com/files/eichengreen-mirrors.pdf>>
- **Read Before:** David Atkin (2014): Endogenous Skill Acquisition and Export Manufacturing in Mexico <<https://delong.typepad.com/files/atkin-skill.pdf>>
- **Slides:** <<https://github.com;braddelong/public-files/blob/master/econ-135-lecture-23.pptx>>

### 24. Th Apr 23: 6.3. 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>>

### 25. Tu Apr 28: 6.4. 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](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>>

# Roadmap Following...

Th Apr 30: 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

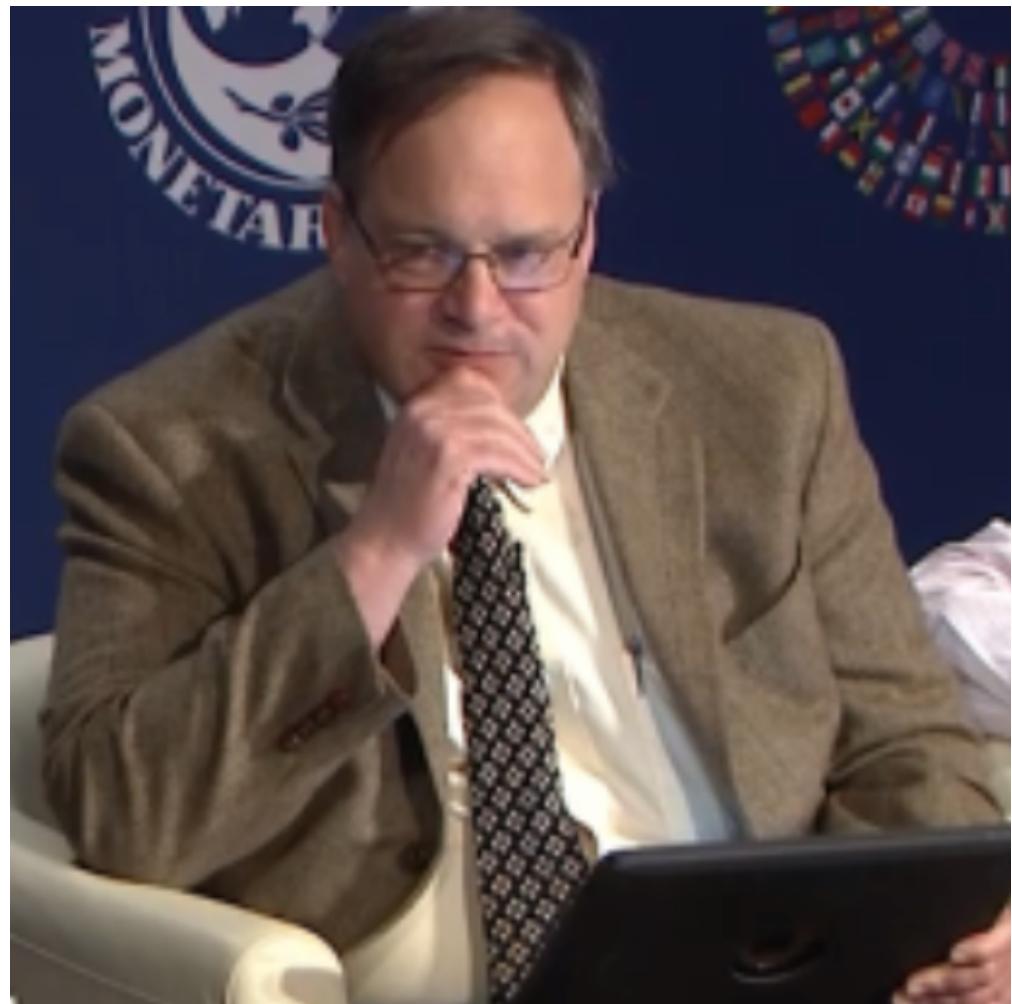
Tu May 5: 7. Conclusion: The Future?

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

W May 13 11:30-14:30: FINAL PAPER/PROJECT DUE

# 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  $\beta$
  - Re-express the model in terms of  $\beta$  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:**

- Best thing I have read comes from Jim Stock <<https://drive.google.com/file/d/12MV466ZZy5xHir4xdPhoTrL1oO8CbZU-/view>>:
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Coronavirus Case



United States

**1,342,235**

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Deaths:

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Recovered:

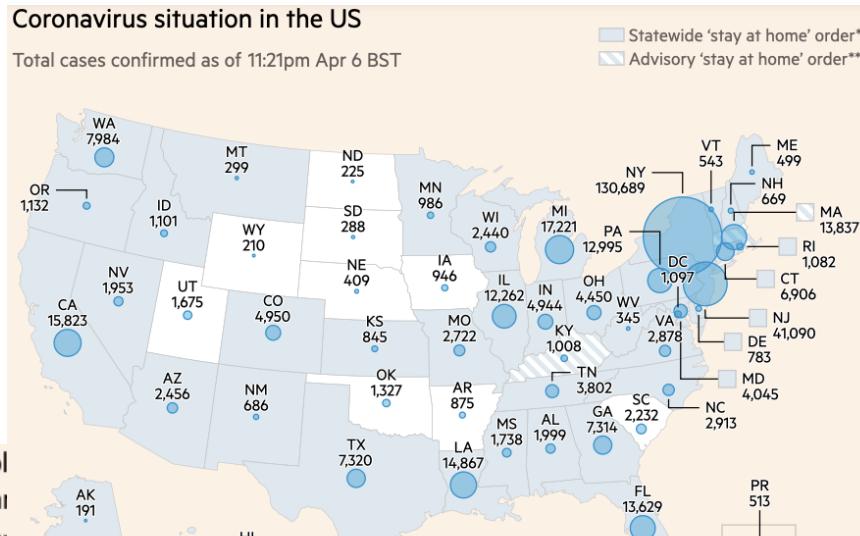
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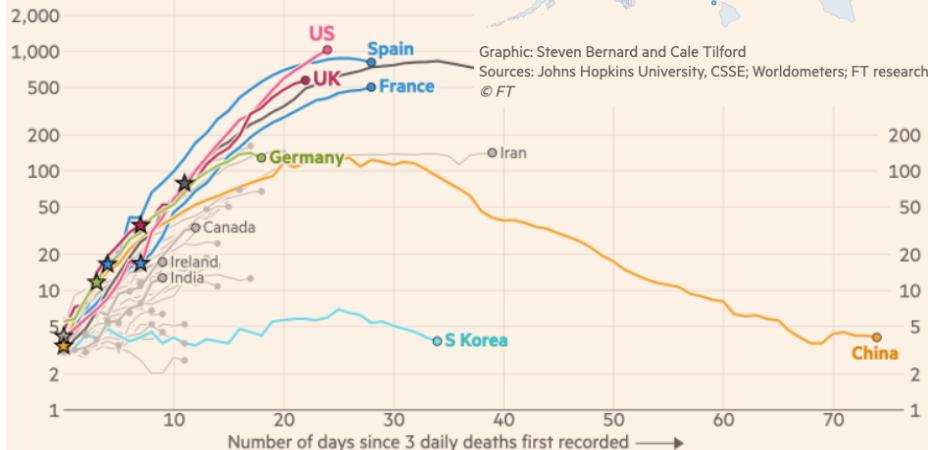
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# Financial Times Graphs Blown Up...



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



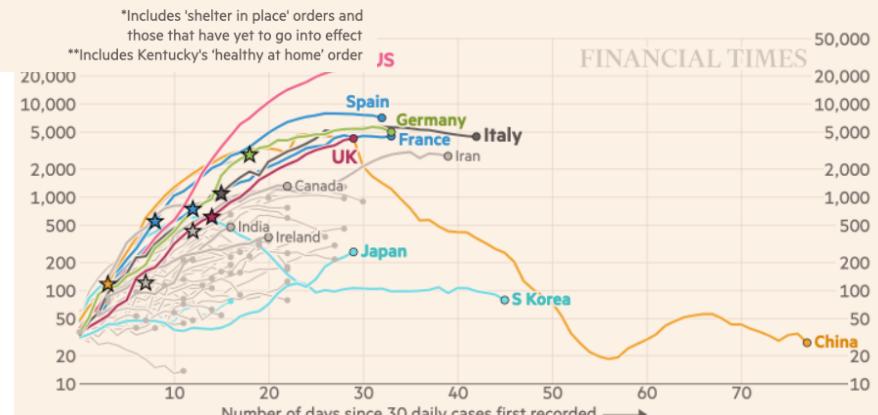
FT graphic: John Burn-Murdoch / @jburnmurdoch

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

© FT

numbers of new cases now in decline,

by number of days since 30 daily cases first recorded



FT graphic: John Burn-Murdoch / @jburnmurdoch

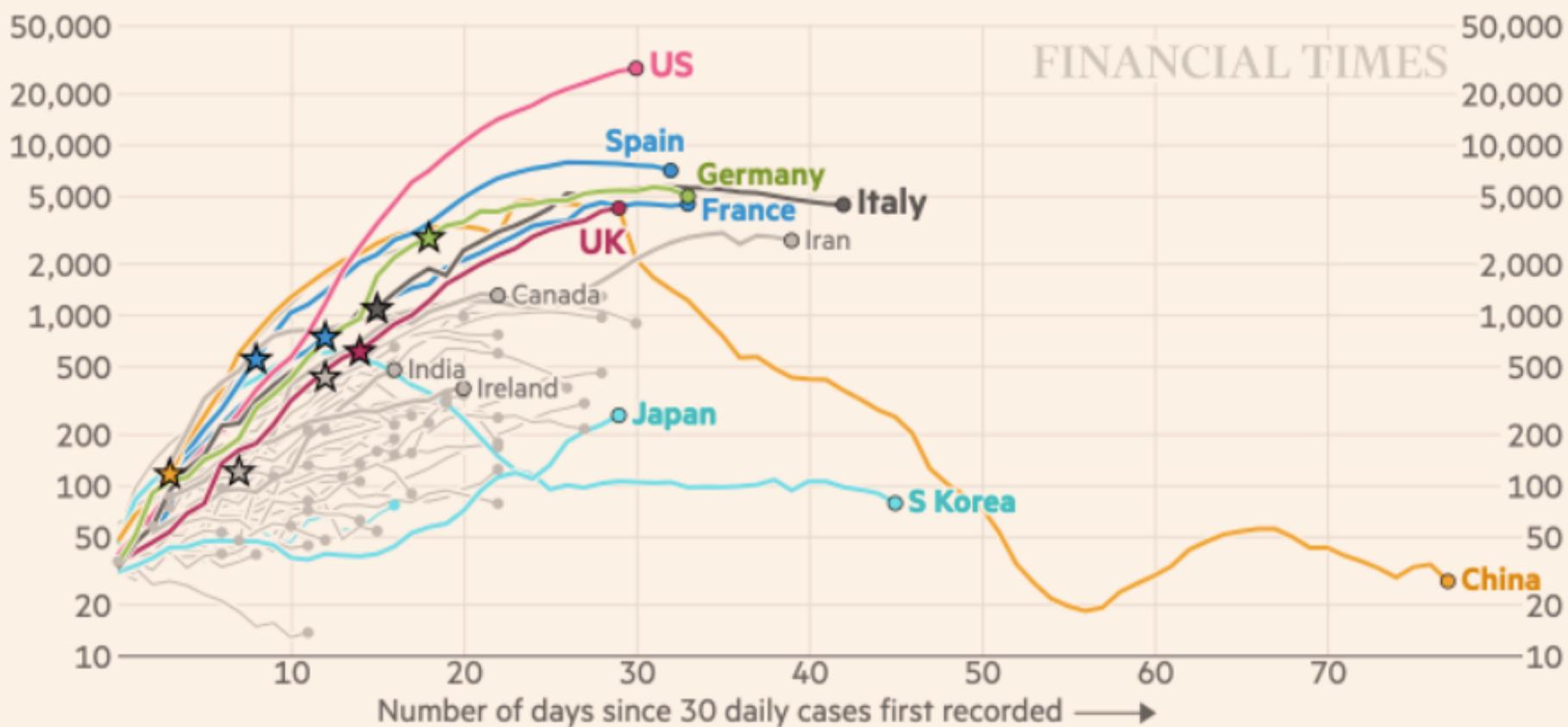
Source: FT analysis of European Centre for Disease Prevention and Control; Worldometers; FT research. Data updated April 06, 19:00 GMT

© FT

# 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 ★



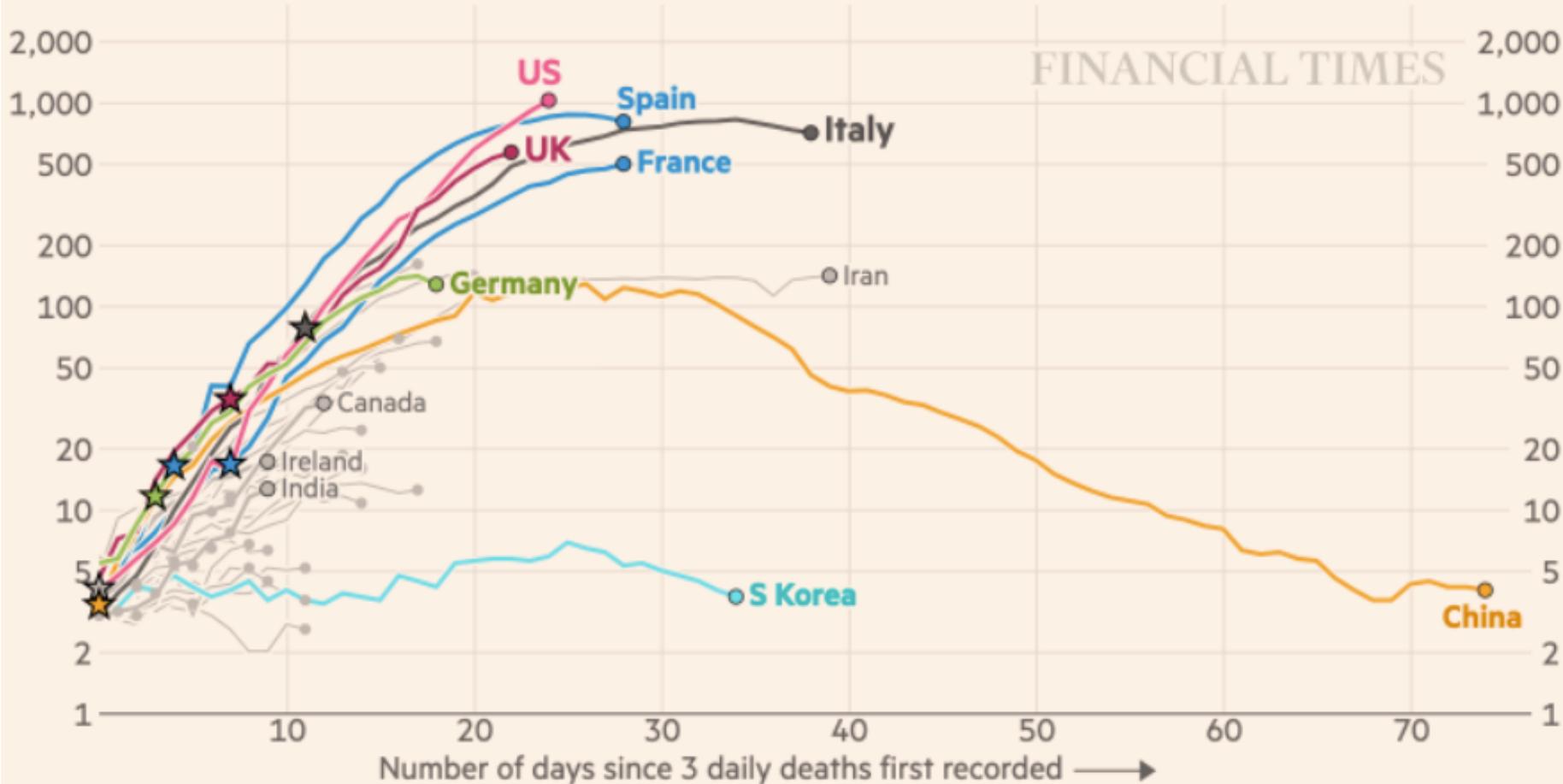
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Source: FT analysis of European Centre for Disease Prevention and Control; Worldometers; FT research. Data updated April 06, 19:00 GMT

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# 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

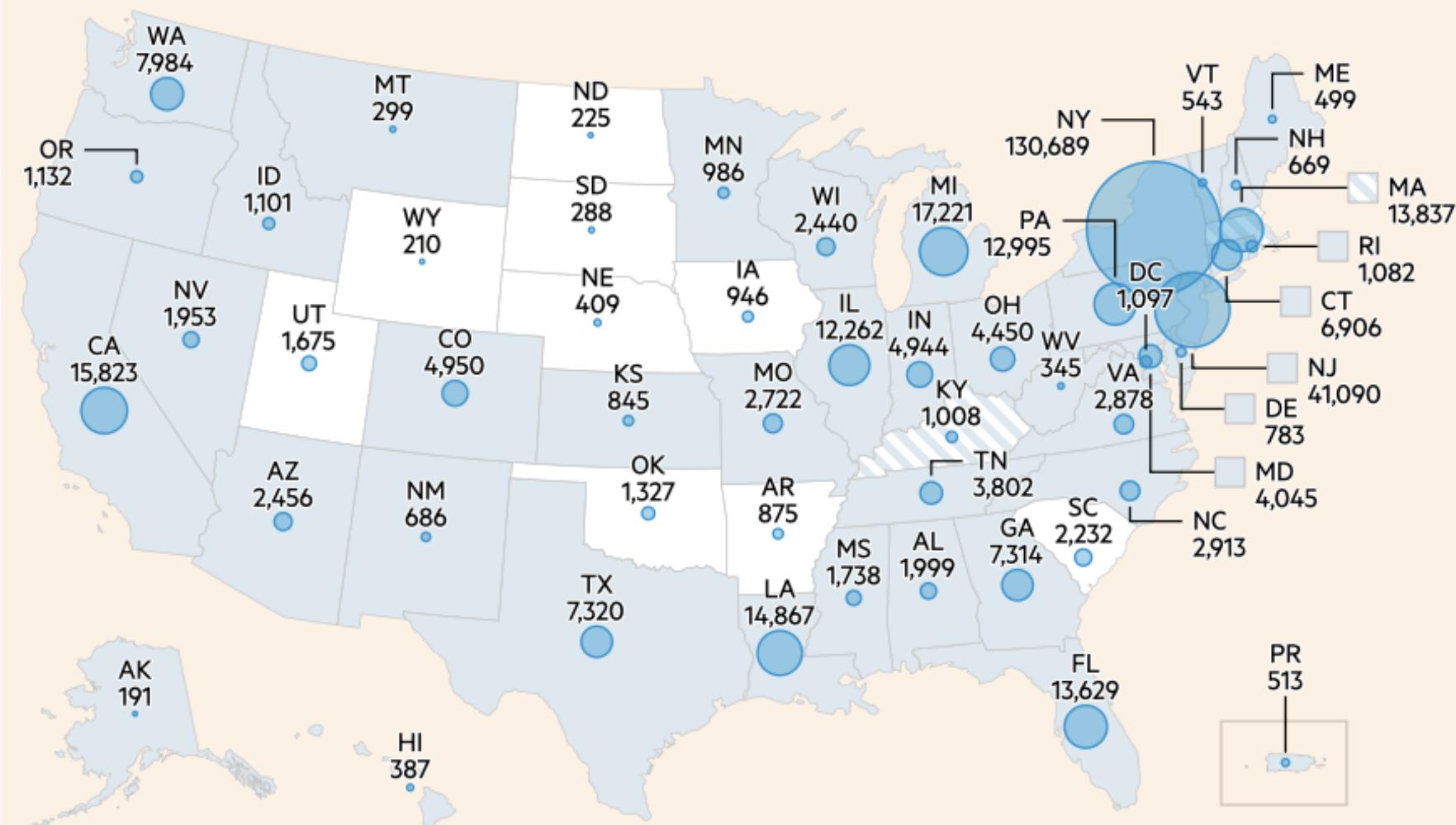
Source: FT analysis of European Centre for Disease Prevention and Control; Worldometers; FT research. Data updated April 06, 19:00 GMT

© 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

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\*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>>:

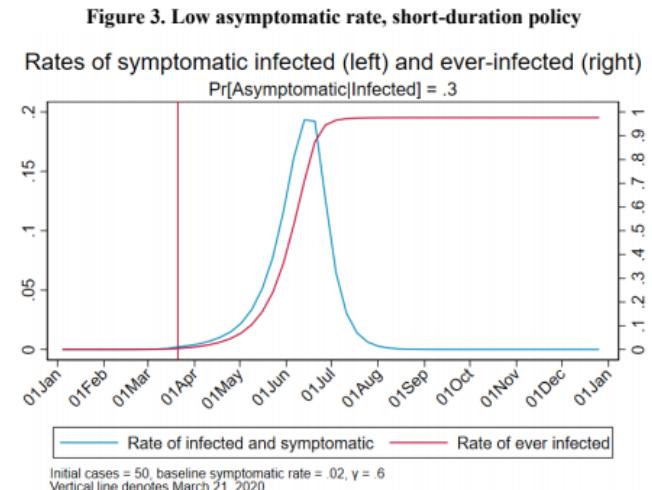
- Susceptible, Infected, Recovered (& immune), transmission rate  $\beta$ , recovery rate  $\gamma$ , reproduction number  $R_0$ , asymptomatic hence non-tested rate  $\pi_0$
- Calibration: half-life of infection one week:  $\gamma = 0.5$ ,  $s_0 = 0.02$ , 50 cases on Jan 24
- For March 21, 2020, the positive test rate in the United States is approximately 10%...

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

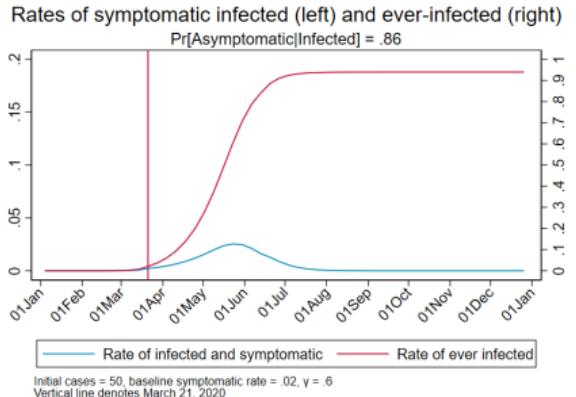
$$\Delta R_t = \gamma I_{t-1},$$

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

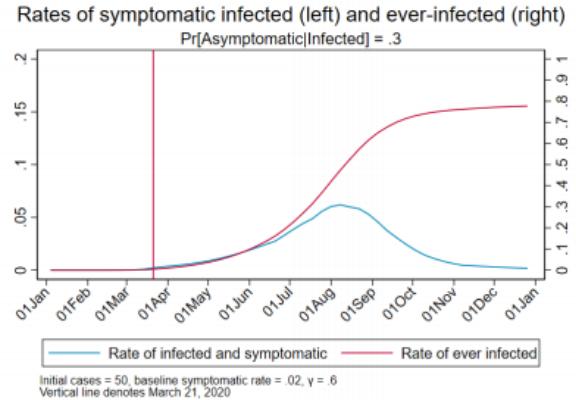
<<https://drive.google.com/file/d/12MV466ZZy5xHir4xdPhoTrL1oO8CbZU-/view>>



**Figure 2. High asymptomatic rate, short-duration policy**

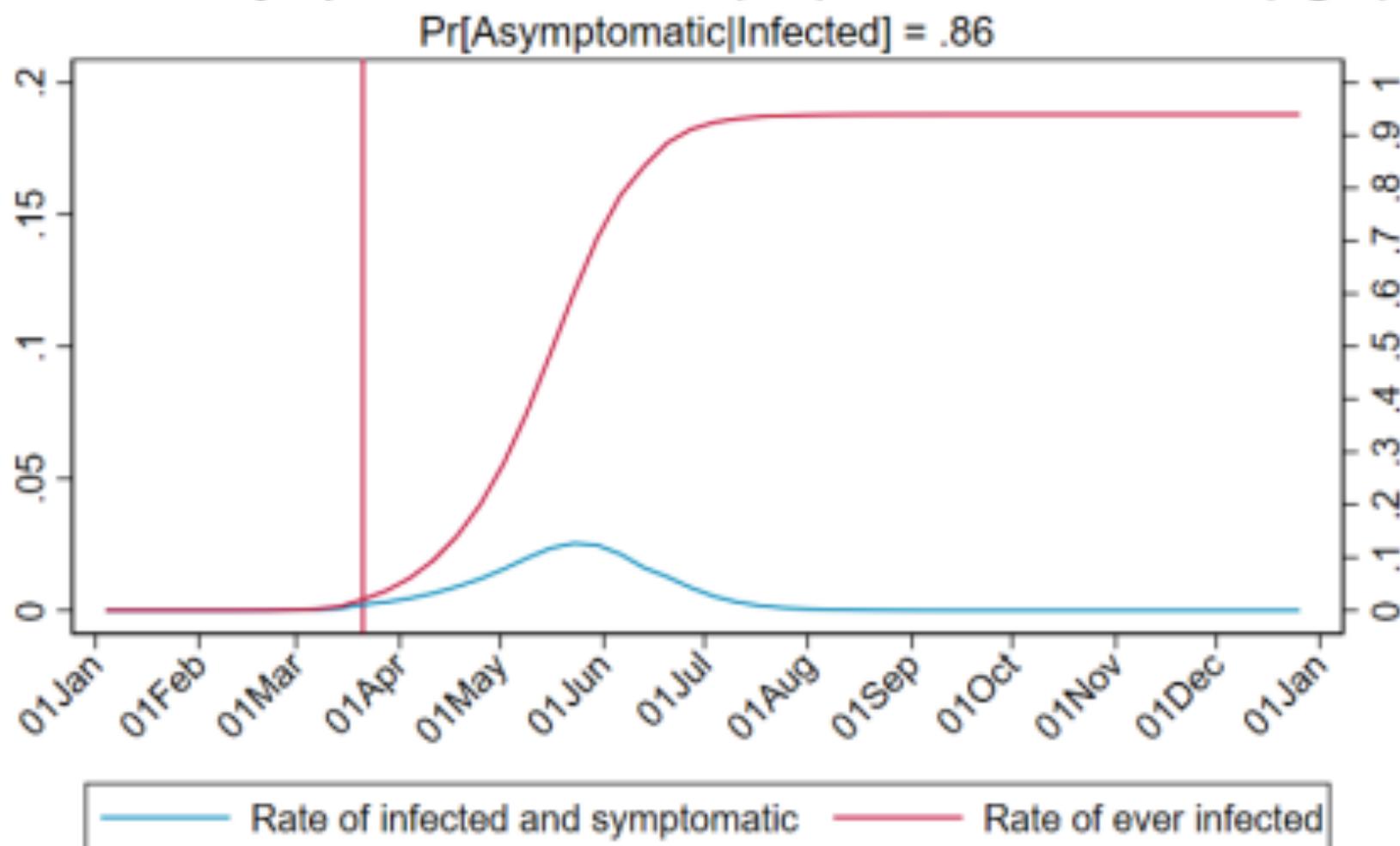


**Figure 4. Low asymptomatic rate, severe long-duration policy**



**Figure 2. High asymptomatic rate, short-duration policy**

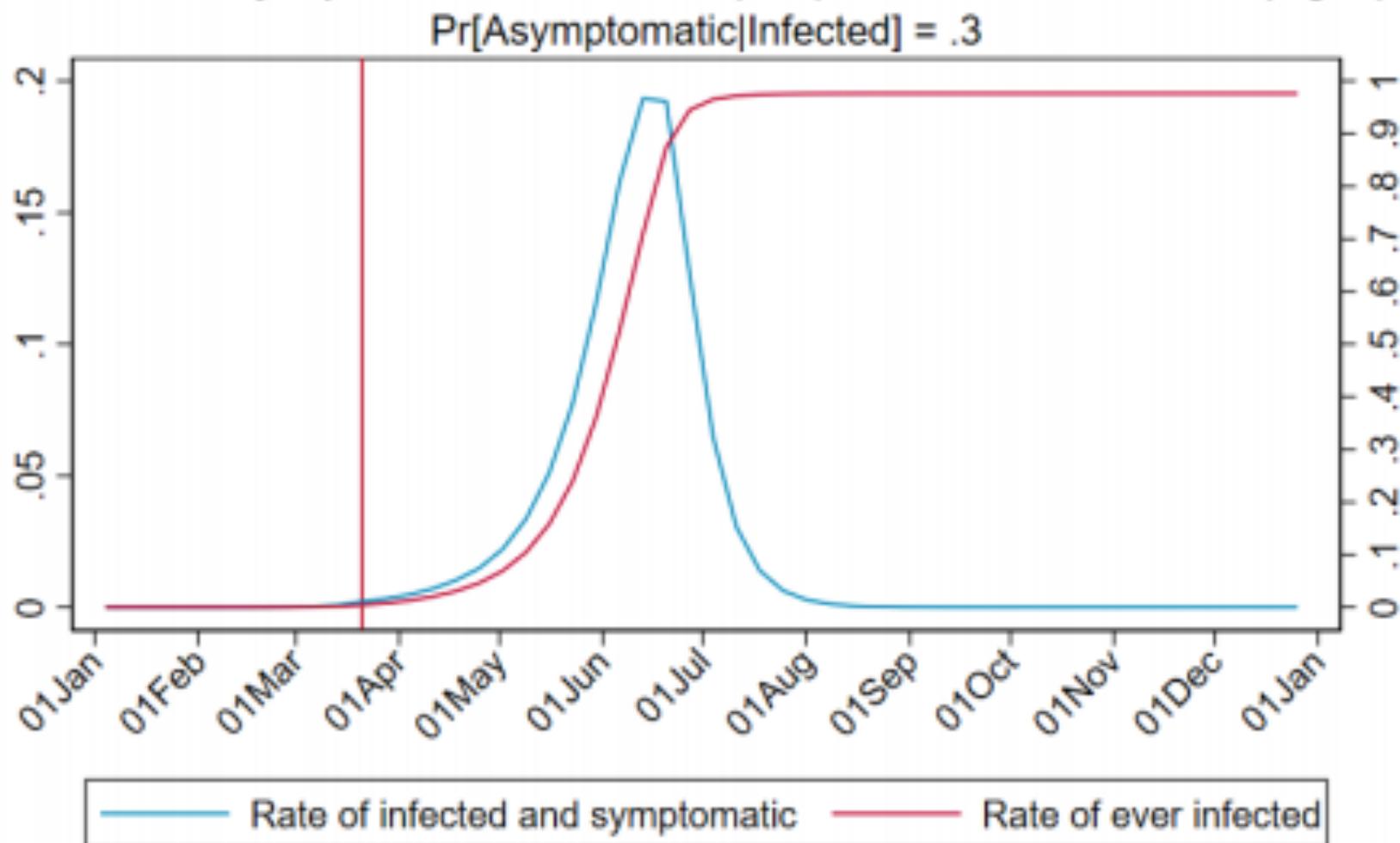
Rates of symptomatic infected (left) and ever-infected (right)



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)

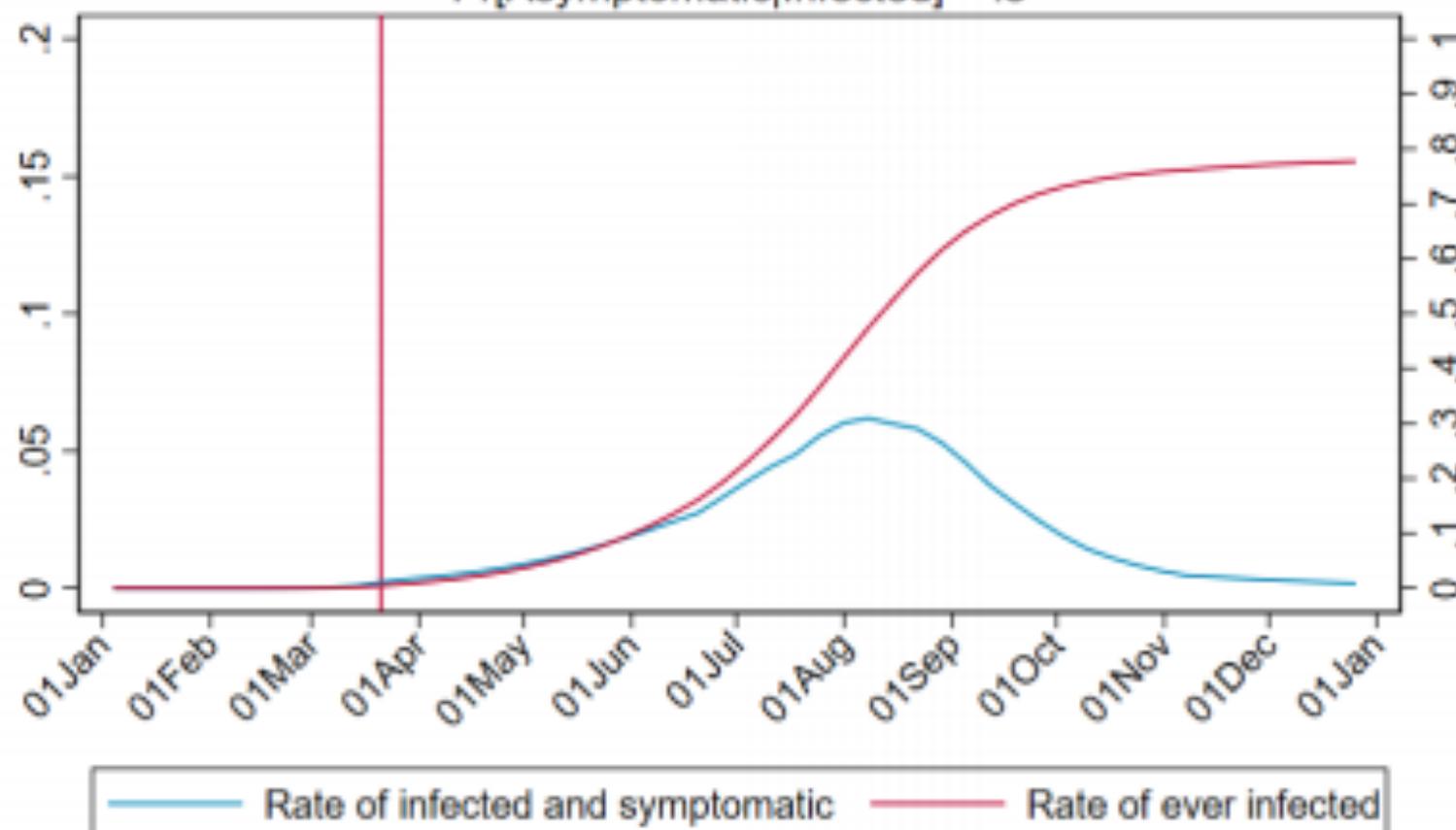


Initial cases = 50, baseline symptomatic rate = .02,  $\gamma = .6$   
Vertical line denotes March 21, 2020

**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](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?

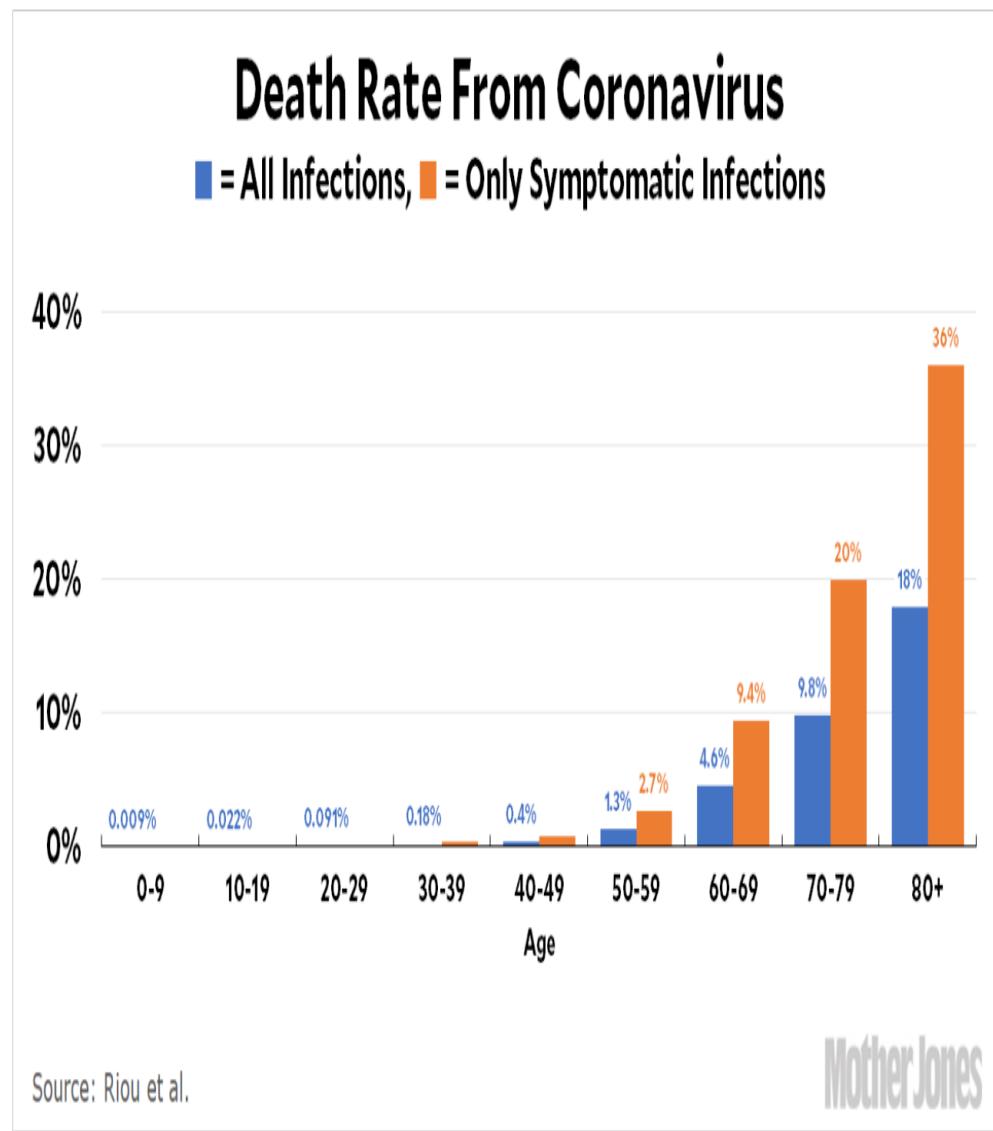
**Plus: distributional issues**

**Plus: bankruptcy and credit chain issues**

# MOAR Coronavirus!

## Death for Geezers!

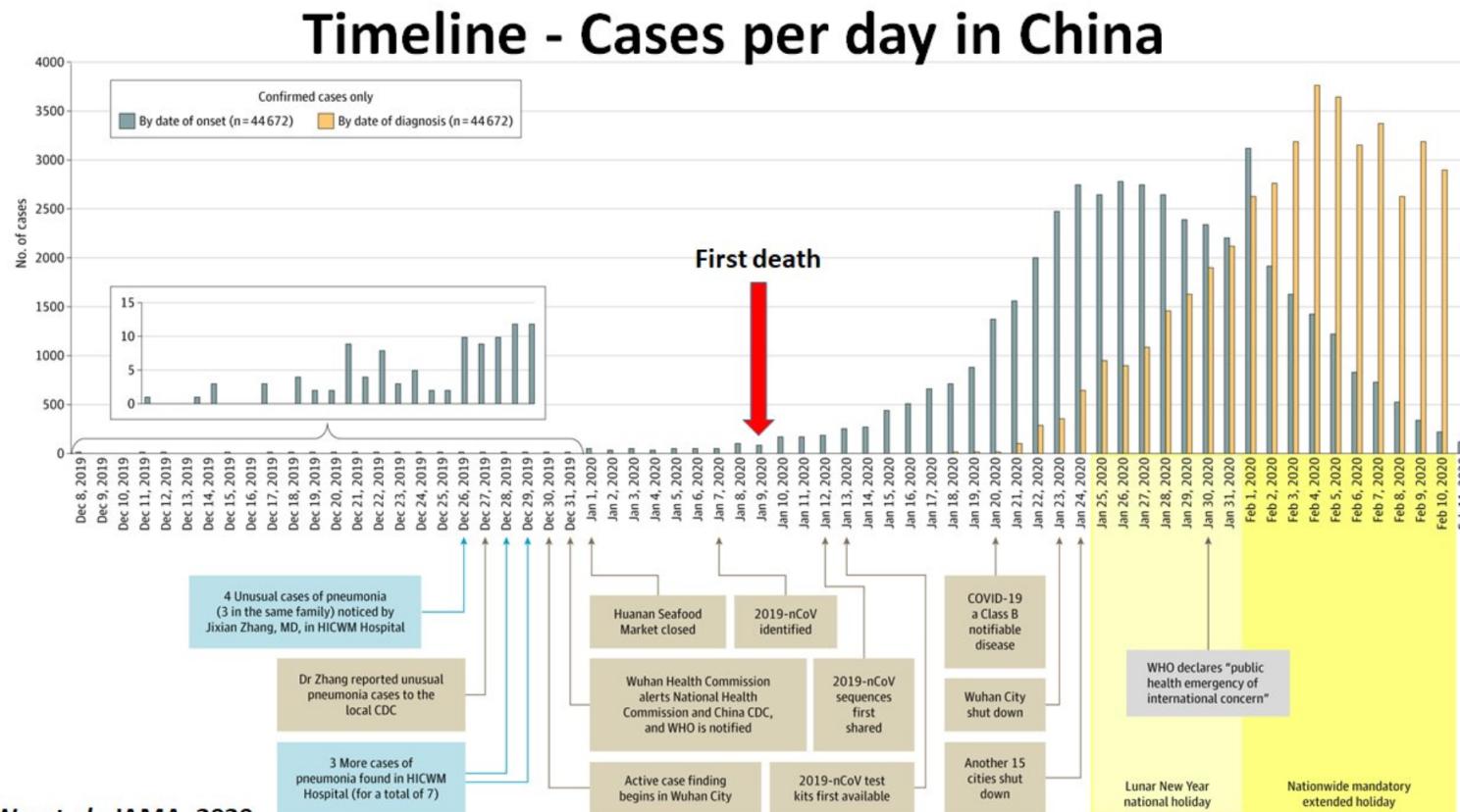
- Mortality for the Youngs very low...
- It's the flu for them—for you...
- And an extra doubling—or is it 5%?—mortality for the asthmatic
- And an extra doubling—or is it 5%?—mortality for the overweight



# What We Think Happened in Wuhan

China beat it quickly & relatively easily!

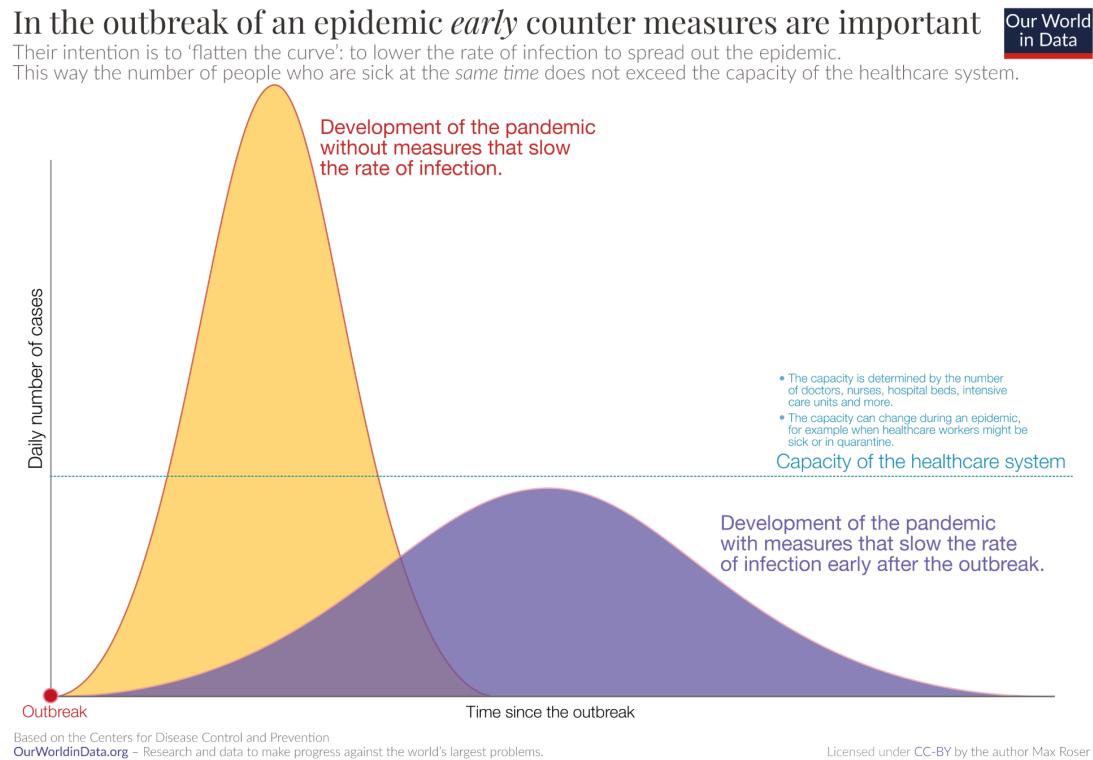
- We think
- Shut down Wuhan when 200 cases per day
- That seems to have been a good decision



# 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](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>>

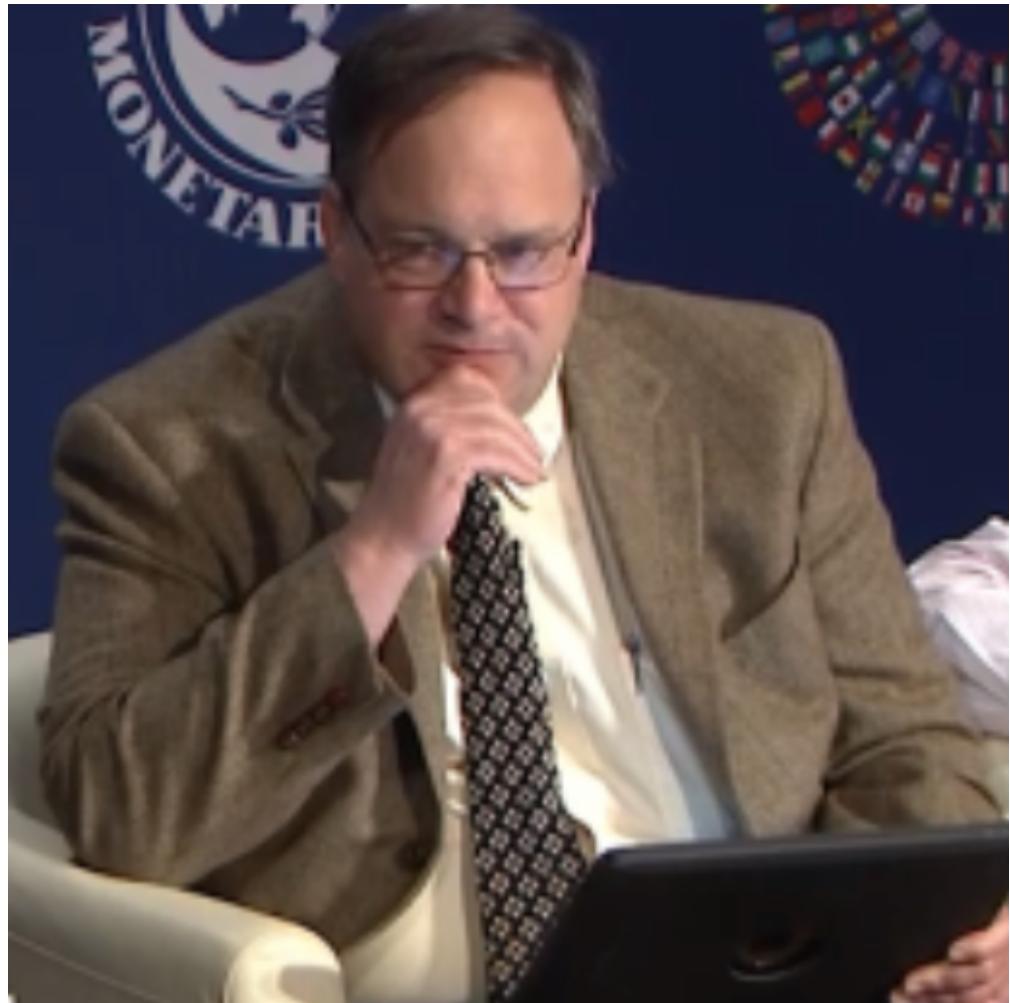
# MOAR Coronavirus!

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

Coronavirus Cases:

**179,836**

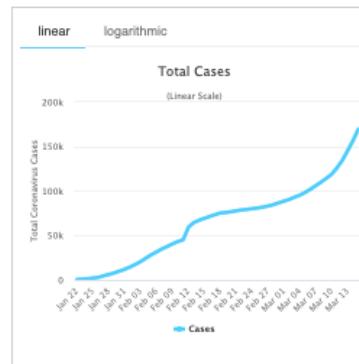
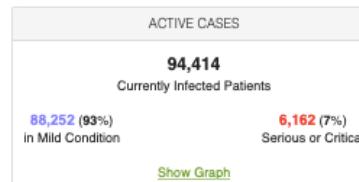
[view by country](#)

Deaths:

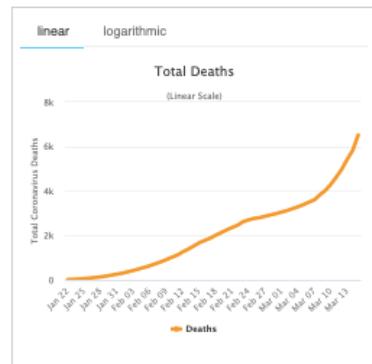
**7,098**

Recovered:

**78,324**



[More Case Statistics](#)



[More Death Statistics](#)

# 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**

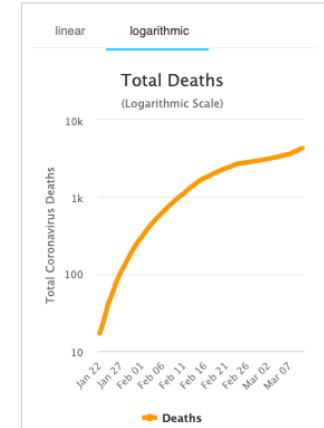
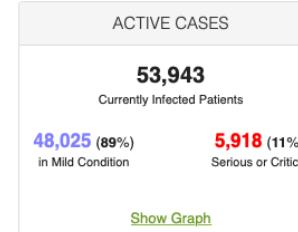
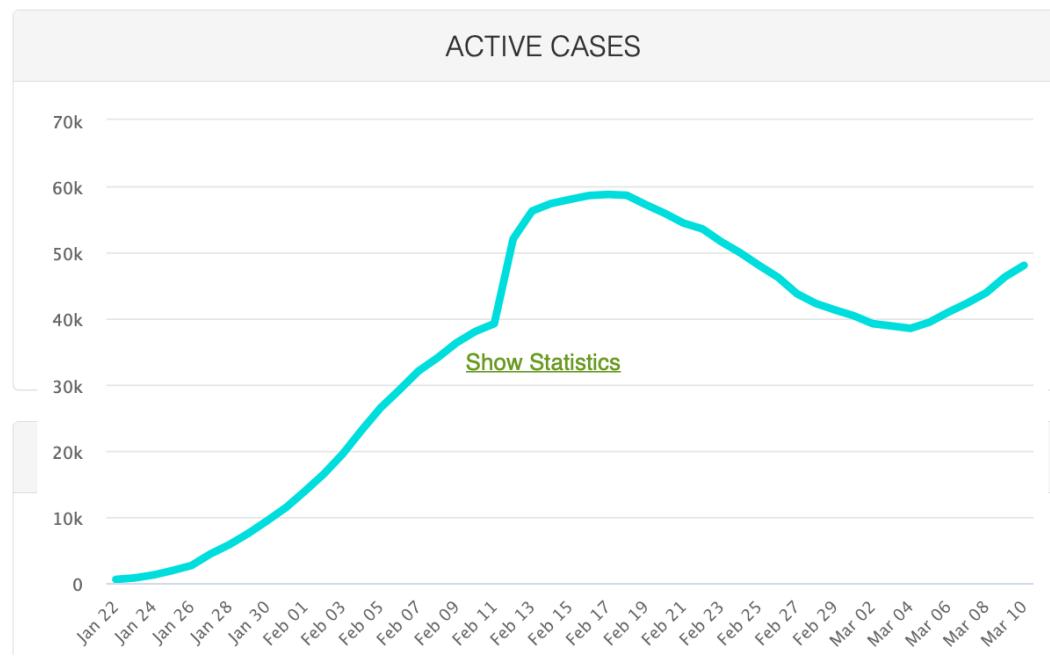
[view by country](#)

Deaths:

**4,605**

Recovered:

**67,051**



# Notes

