HEDGEYE

COVID-19:
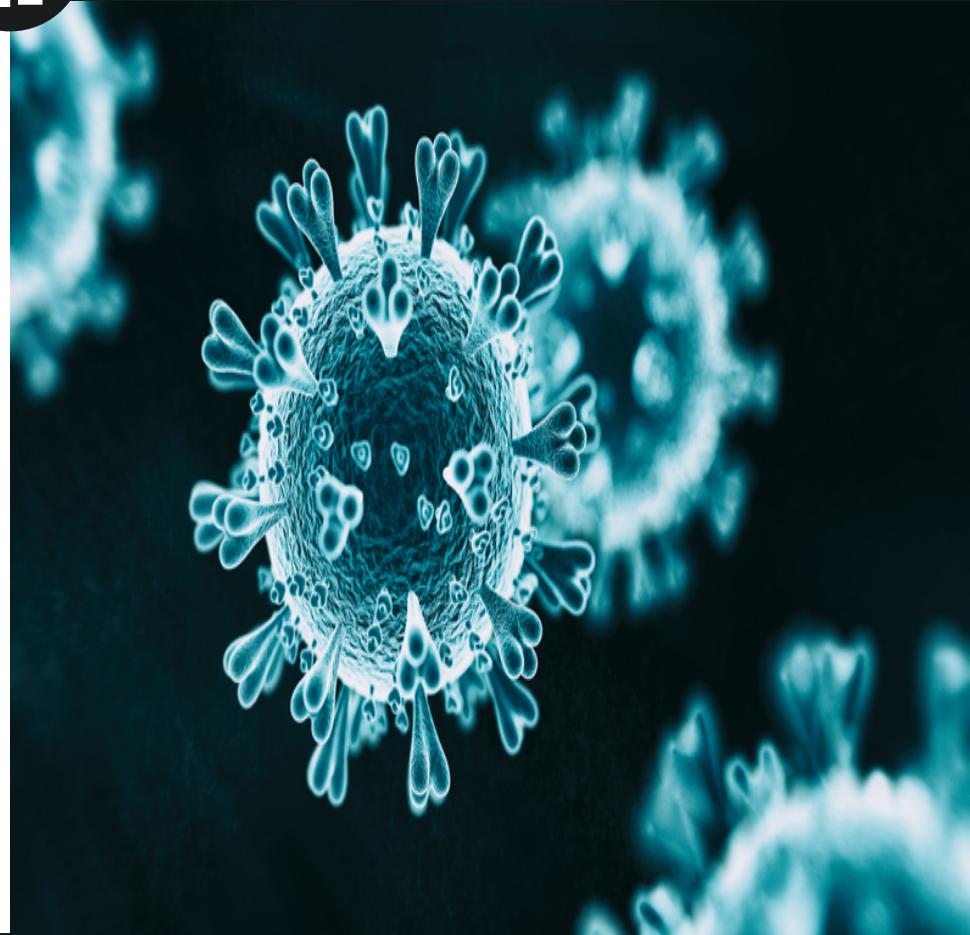# MARCH 11
UPDATE

March 11, 2021

Legal

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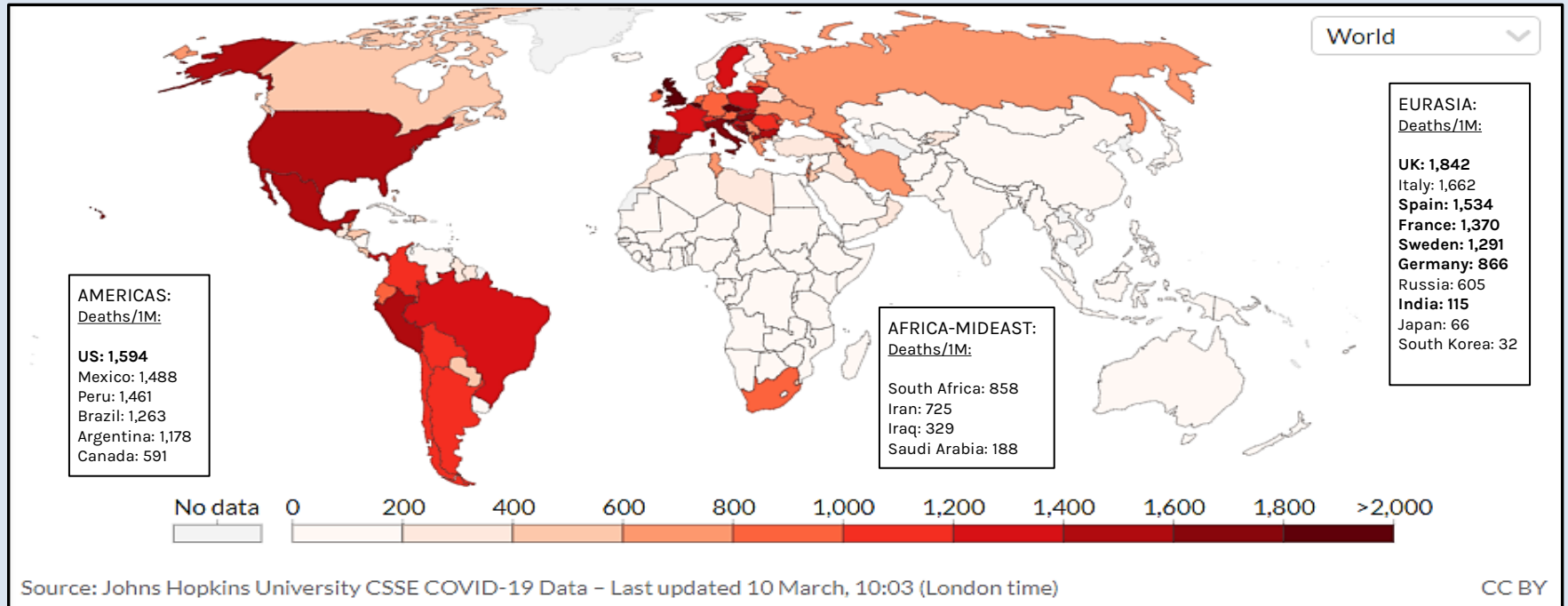# COVID-19 UPDATE, MARCH 11

OUTLINE

- Overall Observations

- C19 Case and Death Count Update, by Country

- Vaccine Rollout

- Variant Watch

- Face Masks: Revisiting the Evidence

- Q & A

FOR STARTERS…

OVERALL OBSERVATIONS

o Summary: <u>Near-term indicators: very strong/positive; but rate of change is slowing down</u>.
  - 7d-trend in cases (now 56K) is -46% since last report (<u>decelerating decline, +Δ11%</u>).
  - 7d-trend in hospitalizations (now at 77K) is -48% (<u>rapid decline, -Δ8%</u>).
  - 7d-trend in deaths (now at 2818) is -44% (accelerating decline –Δ26%).
  - Very mixed trends in EU; <u>growing certainty of double-dip recession</u>.

o US mobility: Show in large gains over last month in tandem with <u>accelerated employment gains and declining new claims</u>. Nearly-full Biden stimulus package now a certainty. <u>All engines ahead full… for now</u>.

o <u>Positive C19 trends</u>: (1) rapid rollout in US of world's two best vaccines; (2) warmer, drier spring weather. <u>Negative C19 trends</u>: (1) relaxation of social distancing; (2) variant "undertow"; (3) declining marginal vaccination gains; (4) antivax resistance.

o Antivax resistance? Latest KFF survey: 44% of Americans say: "wait and see" (22%), "only if required (7%), "definitely not" (15%). For Republicans it's 56% (18%, 10%, and 28%, respectively).

o <u>My outlook for C19, economy, & markets</u>: very positive to mid-May. Thereafter, headwinds: first, hit of rising inflation expectations followed (late spring/summer) by post-vaccine reality that C19 was slowed but not eliminated.
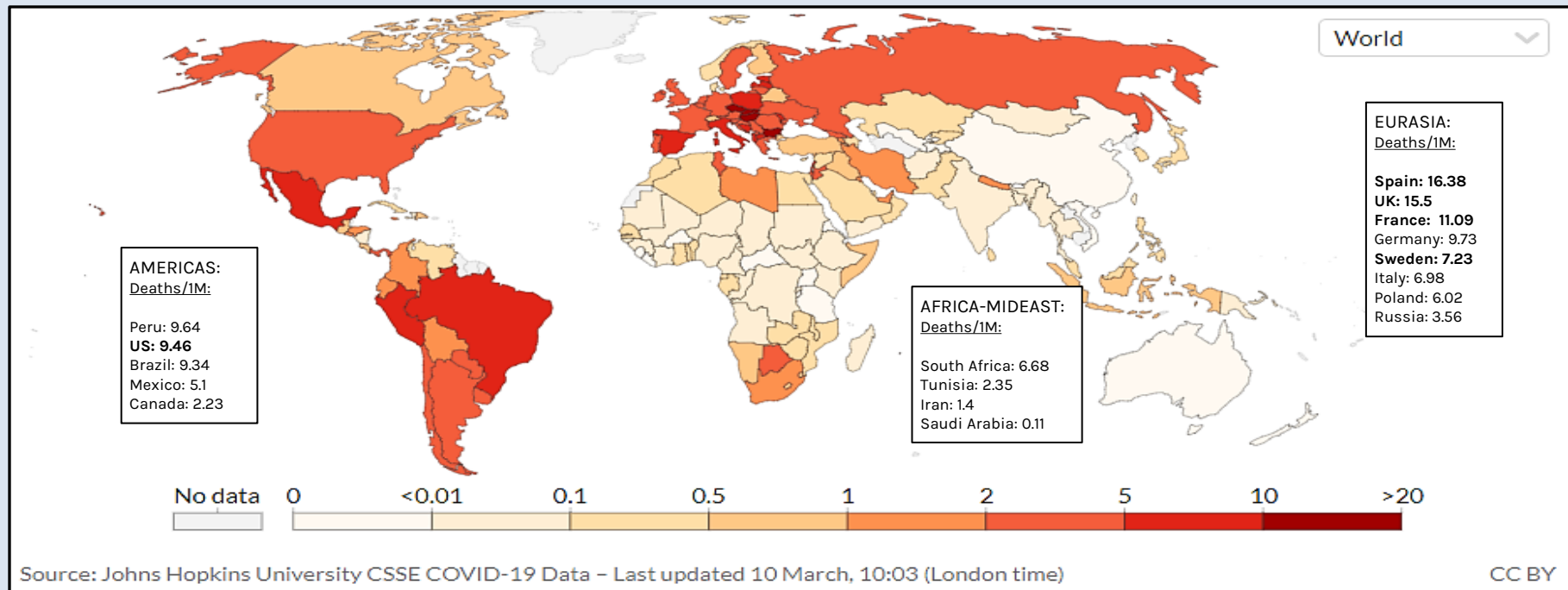
TOTAL DEATHS WORSE IN THE WEST

Total Confirmed COVID-19 Deaths Per Million People March 11, 2021

AMERICAS:
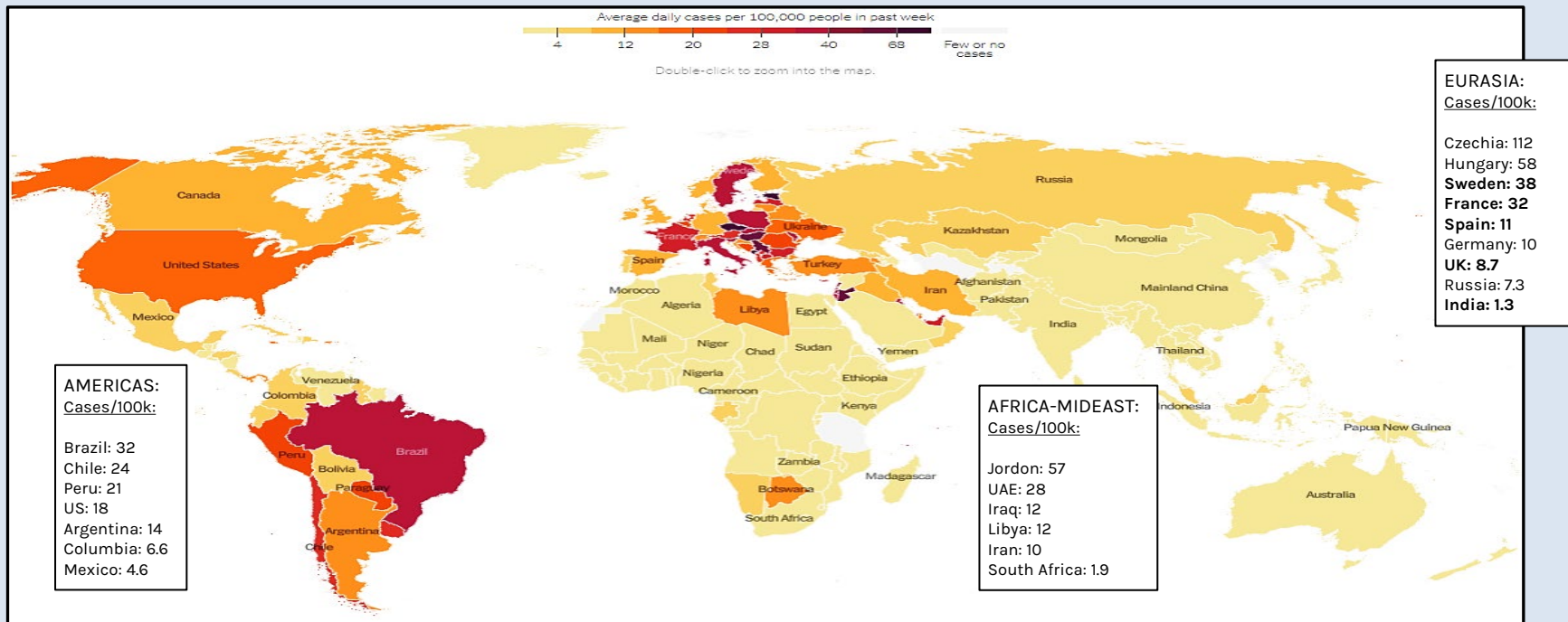Deaths/1M:

US: 1,594
Mexico: 1,488
Peru: 1,461
Brazil: 1,263
Argentina: 1,178
Canada: 591

AFRICA-MIDEAST:
Deaths/1M:

South Africa: 858
Iran: 725
Iraq: 329
Saudi Arabia: 188

EURASIA:
Deaths/1M:

UK: 1,842
Italy: 1,662
Spain: 1,534
France: 1,370
Sweden: 1,291
Germany: 866
Russia: 605
India: 115
Japan: 66
South Korea: 32

World

| No data | 0 | 200 | 400 | 600 | 800 | 1,000 | 1,200 | 1,400 | 1,600 | 1,800 | >2,000 |

Source: Johns Hopkins University CSSE COVID-19 Data – Last updated 10 March, 10:03 (London time)

CC BY

DAILY DEATHS

Daily Confirmed COVID-19 Deaths Per Million People, 7-Day Average. March 10, 2021

World

EURASIA:
Deaths/1M:

Spain: 16.38
UK: 15.5
France: 11.09
Germany: 9.73
Sweden: 7.23
Italy: 6.98
Poland: 6.02
Russia: 3.56

AMERICAS:
Deaths/1M:

Peru: 9.64
US: 9.46
Brazil: 9.34
Mexico: 5.1
Canada: 2.23

AFRICA-MIDEAST:
Deaths/1M:

South Africa: 6.68
Tunisia: 2.35
Iran: 1.4
Saudi Arabia: 0.11

No data   0   <0.01   0.1   0.5   1   2   5   10   >20

Source: Johns Hopkins University CSSE COVID-19 Data – Last updated 10 March, 10:03 (London time)   CC BY

EUROPE SUFFERS

Average Daily Covid-19 Cases Per 100,000 People In the Last Week. Updated March 11, 2021.

Average daily cases per 100,000 people in past week

| 4 | 12 | 20 | 28 | 40 | 68 |

Few or no cases

Double-click to zoom into the map.

EURASIA:
Cases/100k:

Czechia: 112
Hungary: 58
Sweden: 38
France: 32
Spain: 11
Germany: 10
UK: 8.7
Russia: 7.3
India: 1.3

AMERICAS:
Cases/100k:

Brazil: 32
Chile: 24
Peru: 21
US: 18
Argentina: 14
Columbia: 6.6
Mexico: 4.6

AFRICA-MIDEAST:
Cases/100k:

Jordon: 57
UAE: 28
Iraq: 12
Libya: 12
Iran: 10
South Africa: 1.9

THE SITUATION IN… INDIA

COVID-19 Daily Cases/Deaths, R_0, and Mobility, Updated Mar 11, 2021

Deaths per Day
Data as of 0:00 GMT+8

March 10:
134 New Deaths

Daily Deaths   3-day moving average   7-day moving average

Cases per Day
Data as of 0:00 GMT+0

March 10:
22,841 New Cases

Daily Cases   3-day moving average   7-day moving average

Effective R0 (90% Credible Interval)	Expected Change In Daily Cases	Govt Stringency Index
1.1 (0.94-1.3)	Likely Increasing	63

Total Cases	Total Deaths	Tests/Deaths Per 1 Mil Pop
11,248,311	158,213	160,853/114

Mobility	Retail: -21%	Parks: -12%	Workplace: -14%
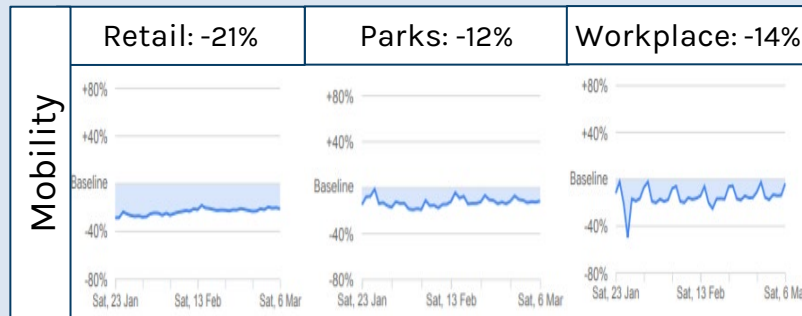
THE SITUATION IN... UK

COVID-19 Daily Cases/Deaths, R_0, and Mobility, Updated Mar 11, 2021

Deaths per Day
Data as of 0:00 GMT+8

March 10:
1190 New Deaths

Daily Deaths · 3–day moving average · 7–day moving average ✔

Cases per Day
Data as of 0:00 GMT+0

March 10:
5,926 New Cases

Daily Cases · 3–day moving average · 7–day moving average ✔
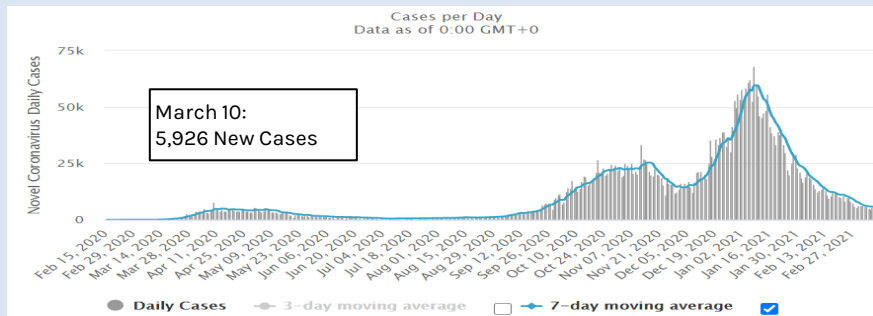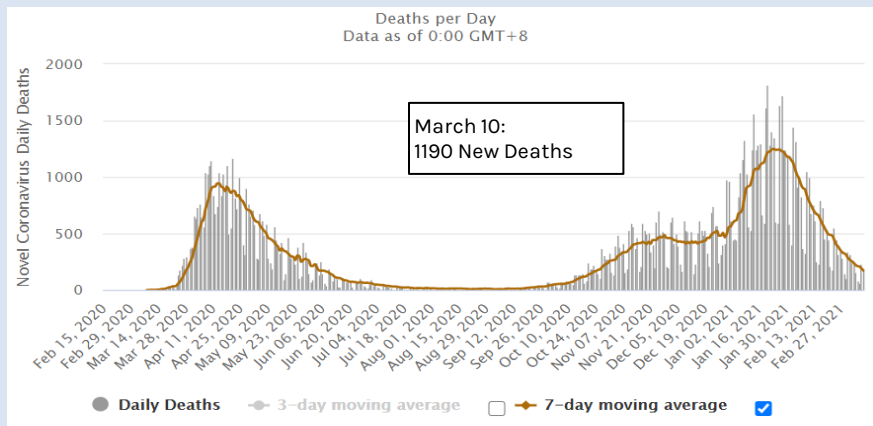
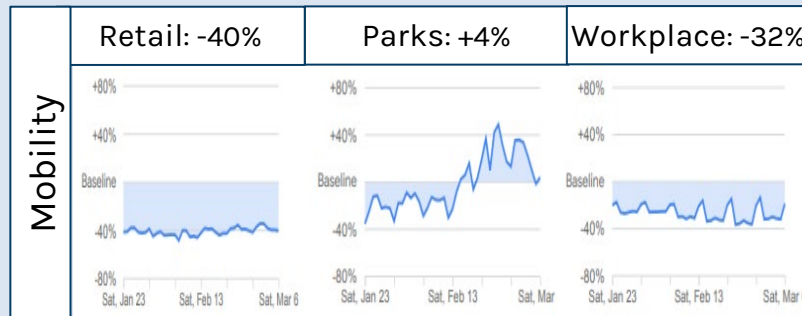| Effective R0 (90% Credible Interval)	Expected Change In Daily Cases	Govt Stringency Index
0.81 (0.62-1.1)	Likely Decreasing	88
Total Cases	Total Deaths	Tests/Deaths Per 1 Mil Pop
4,234,924	124,987	1,462,465/1,834

Mobility	Retail: -57%	Parks: +10%	Workplace: -44%
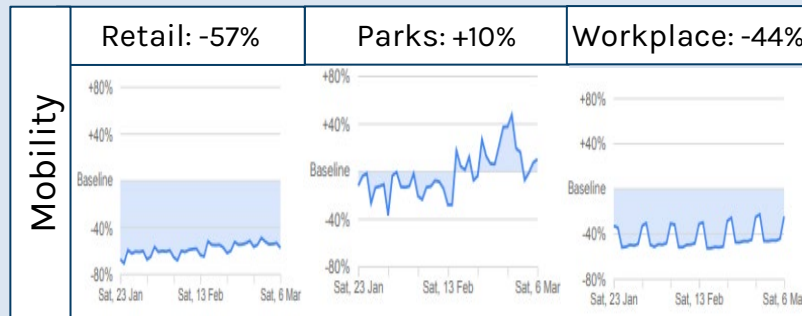
THE SITUATION IN... SPAIN

COVID-19 Daily Cases/Deaths, R_0, and Mobility, Updated Mar 11, 2021

Deaths per Day
Data as of 0:00 GMT+8

March 10:
234 New Deaths

Daily Deaths · 3-day moving average · 7-day moving average ☑

Cases per Day
Data as of 0:00 GMT+0

March 10:
6,672 New Cases

Daily Cases · 3-day moving average · 7-day moving average ☑
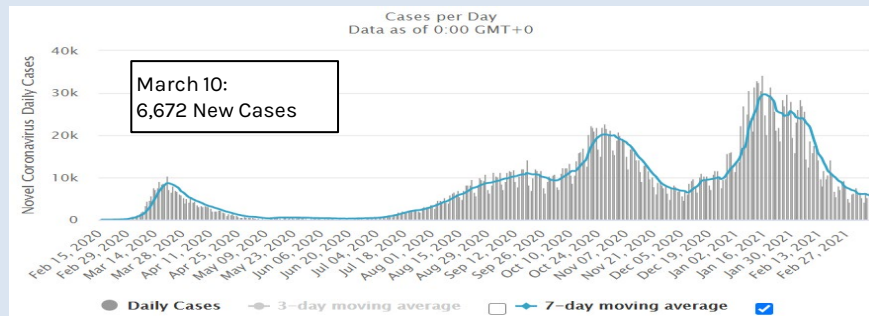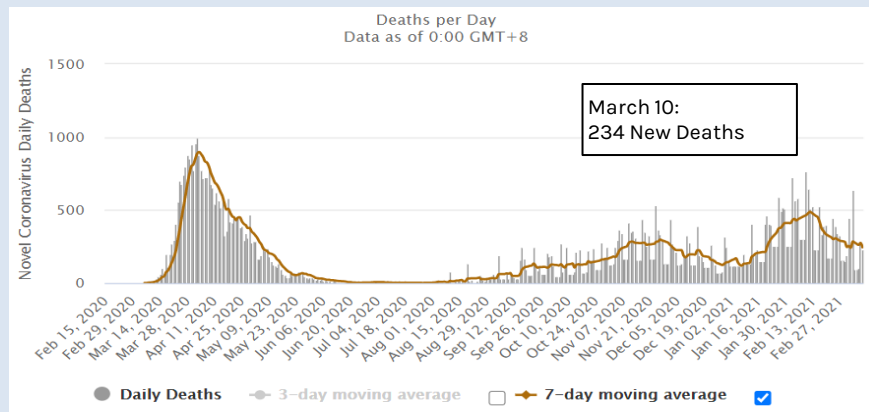
Effective R0 (90% Credible Interval)	Expected Change In Daily Cases	Govt Stringency Index
0.73 (0.42-1.1)	Likely Decreasing	71

Total Cases	Total Deaths	Tests/Deaths Per 1 Mil Pop
3,178,442	71,961	861,550/1,539
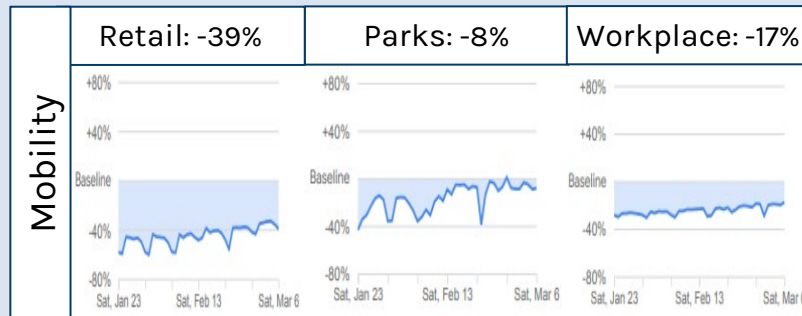
Mobility	Retail: -39%	Parks: -8%	Workplace: -17%

THE SITUATION IN… FRANCE

COVID-19 Daily Cases/Deaths, R_0, and Mobility, Updated Mar 11, 2021

Deaths per Day
Data as of 0:00 GMT+8

March 10:
264 New Deaths

- Daily Deaths   3-day moving average   7-day moving average

Cases per Day
Data as of 0:00 GMT+0

February 10:
30,303 New Cases

- Daily Cases   3-day moving average   7-day moving average
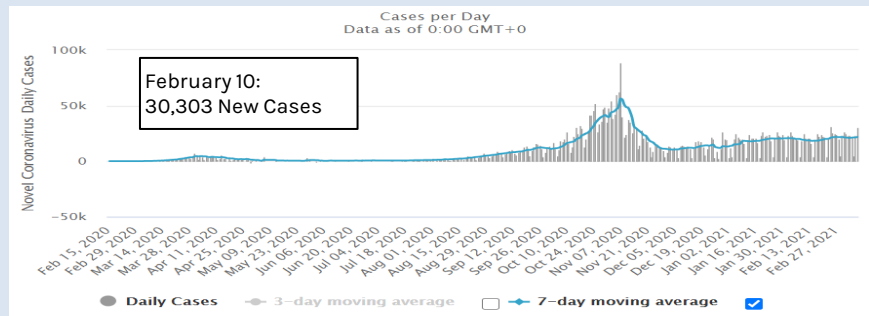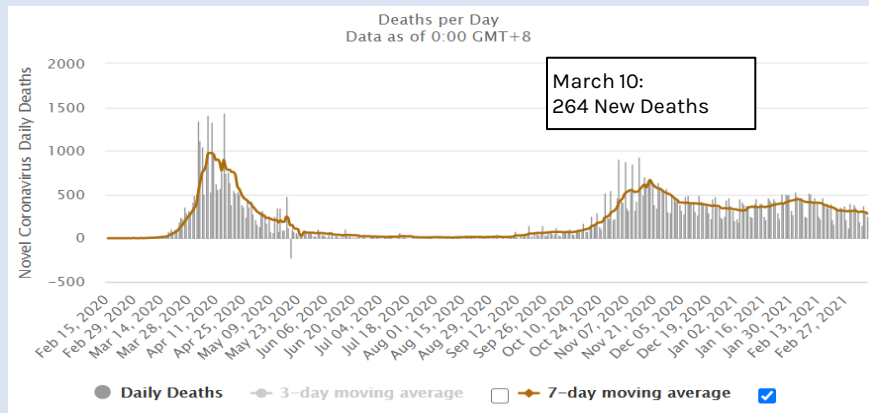
Effective R0 (90% Credible Interval)	Expected Change In Daily Cases	Govt Stringency Index
1.0 (0.84-1.3)	Likely Increasing	82
Total Cases	Total Deaths	Tests/Deaths Per 1 Mil Pop
3,963,165	89,565	851,361/1,370

Mobility	Retail: -40%	Parks: +4%	Workplace: -32%

THE SITUATION IN... SWEDEN

COVID-19 Daily Cases/Deaths, R_0, and Mobility, Updated Mar 11, 2021
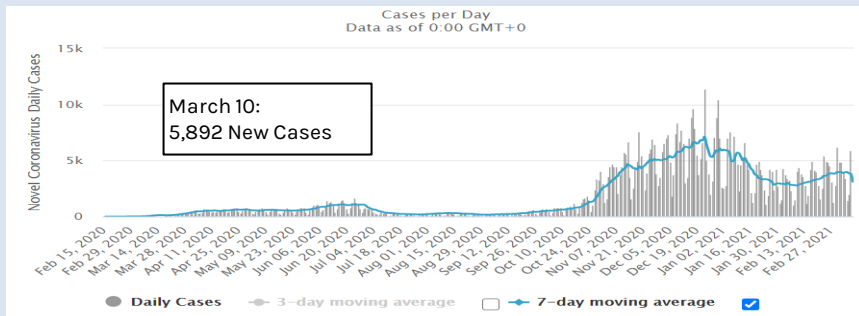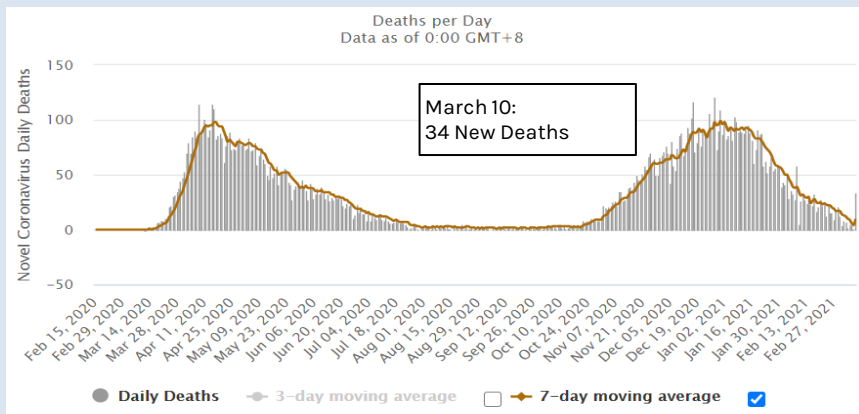
Deaths per Day
Data as of 0:00 GMT+8

March 10:
34 New Deaths

Daily Deaths · 3–day moving average · 7–day moving average ☑

Effective R0 (90% Credible Interval)	Expected Change In Daily Cases	Govt Stringency Index
1.1 (0.94-1.3)	Likely Increasing	69

| Total Cases	Total Deaths	Tests/Deaths Per 1 Mil Pop
701,892	13,088	628,879/1,290
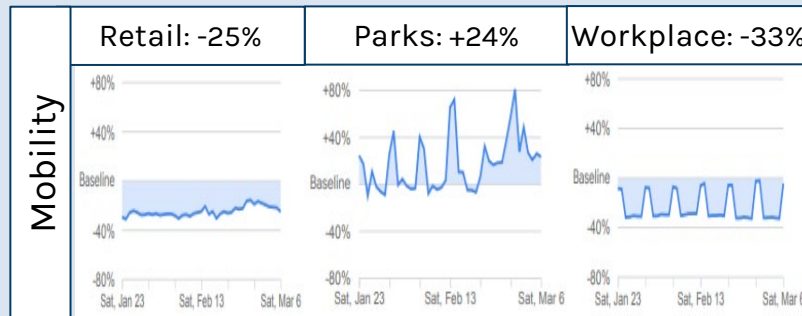
Cases per Day
Data as of 0:00 GMT+0

March 10:
5,892 New Cases

Daily Cases · 3–day moving average · 7–day moving average ☑

	Retail: -25%	Parks: +24%	Workplace: -33%
Mobility			

THE SITUATION IN... US

COVID-19 Daily Cases/Deaths, R_0, and Mobility, Updated Mar 11, 2021

Deaths per Day
Data as of 0:00 GMT+8

March 10:
1,610 New Deaths
7-Day Avg: 1,477 Deaths

● Daily Deaths   ─ 3–day moving average   □ ─ 7–day moving average ☑

Cases per Day
Data as of 0:00 GMT+0

March 10:
60,355 New Cases

● Daily Cases   ─ 3–day moving average   □ ─ 7–day moving average ☑
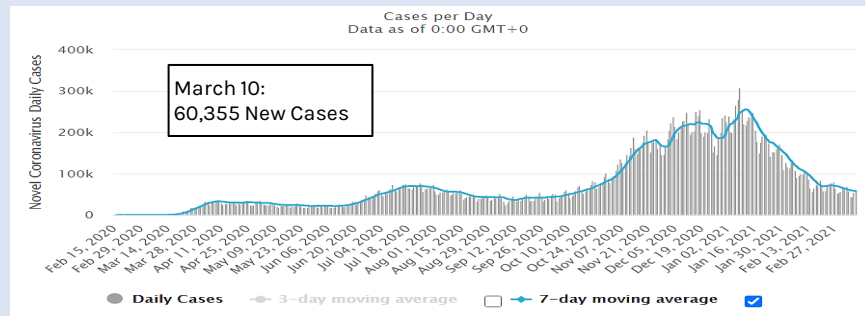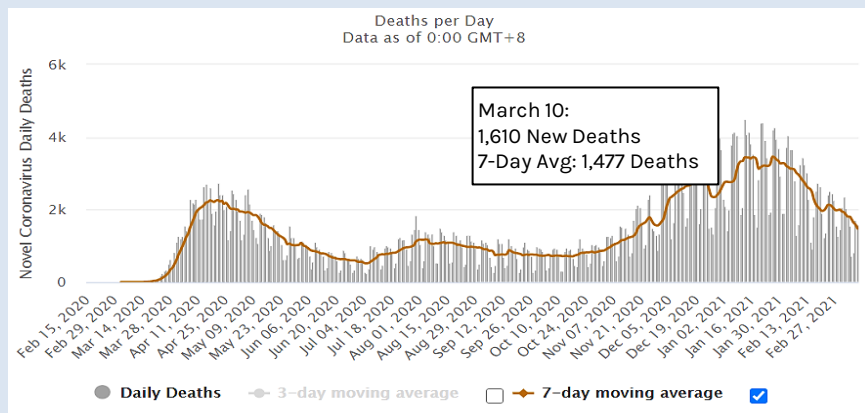
Effective R0 (90% Credible Interval)	Expected Change In Daily Cases	Govt Stringency Index
1.0 (0.569-1.4)	Stable	64

Total Cases	Total Deaths	Tests/Deaths Per 1 Mil Pop
29,862,124	542,191	1,122,655/1,631

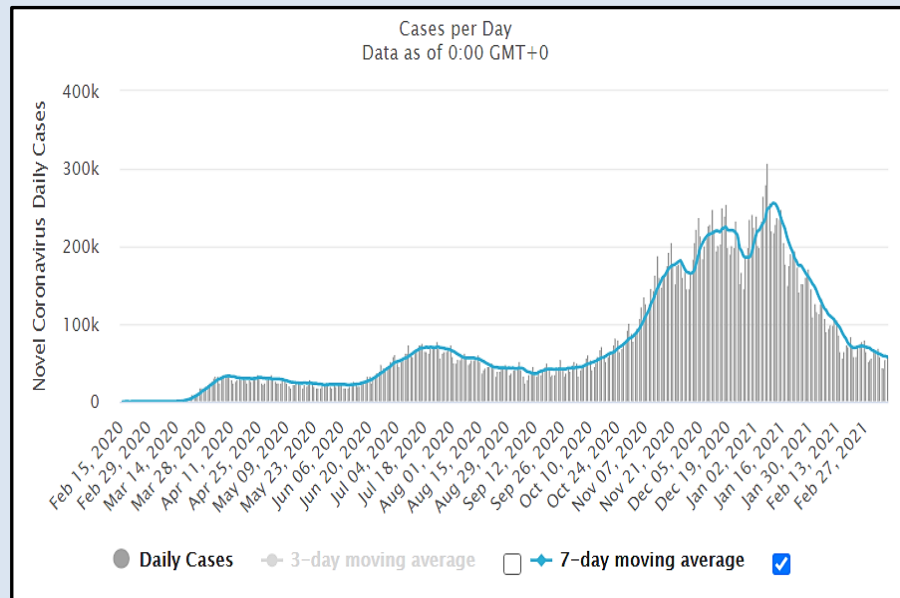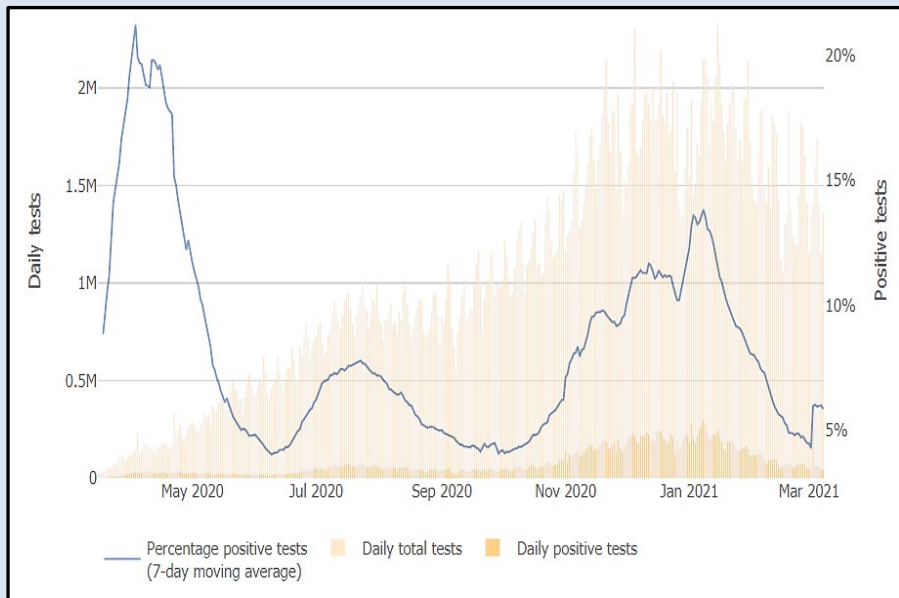| Mobility	Retail: -13%	Parks: +7%	Workplace: -29%
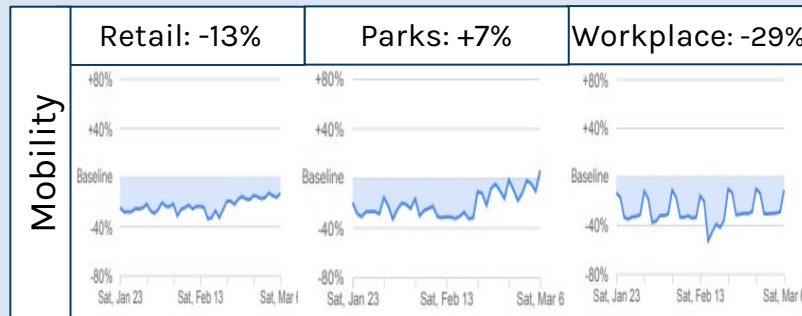
MOBILITY

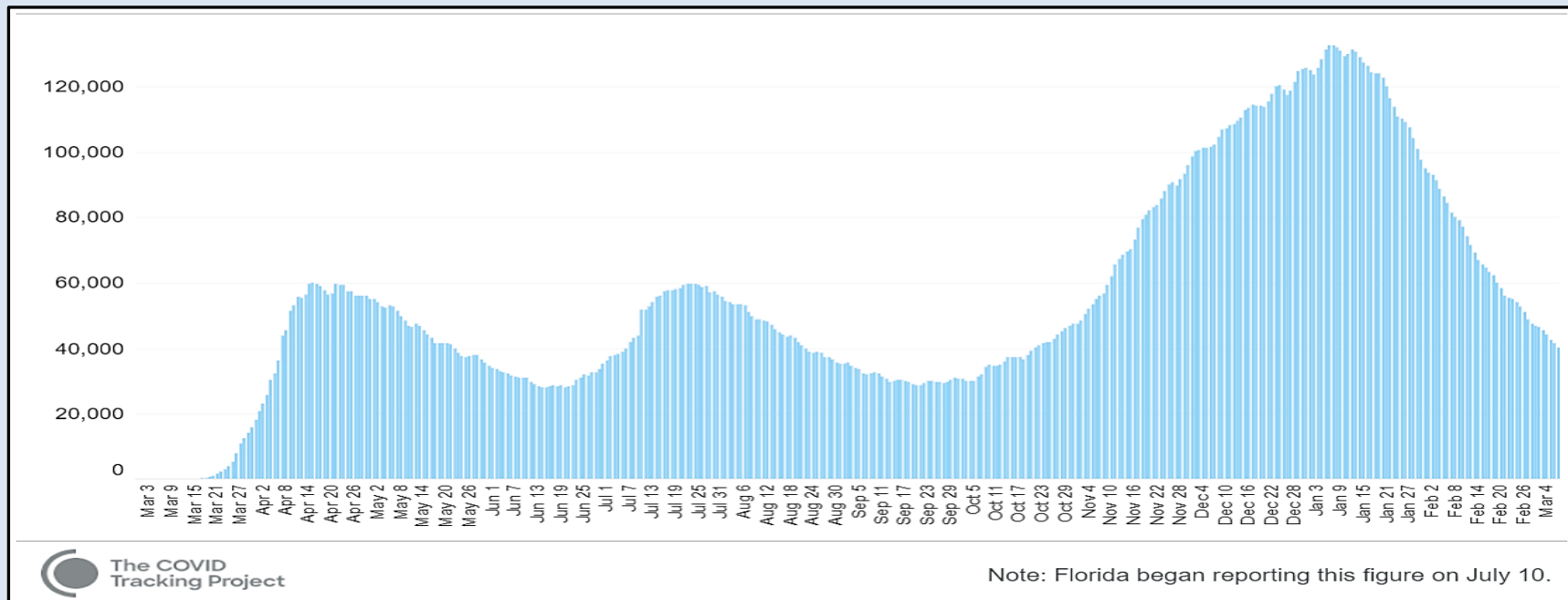Google Mobility Index- US Trend
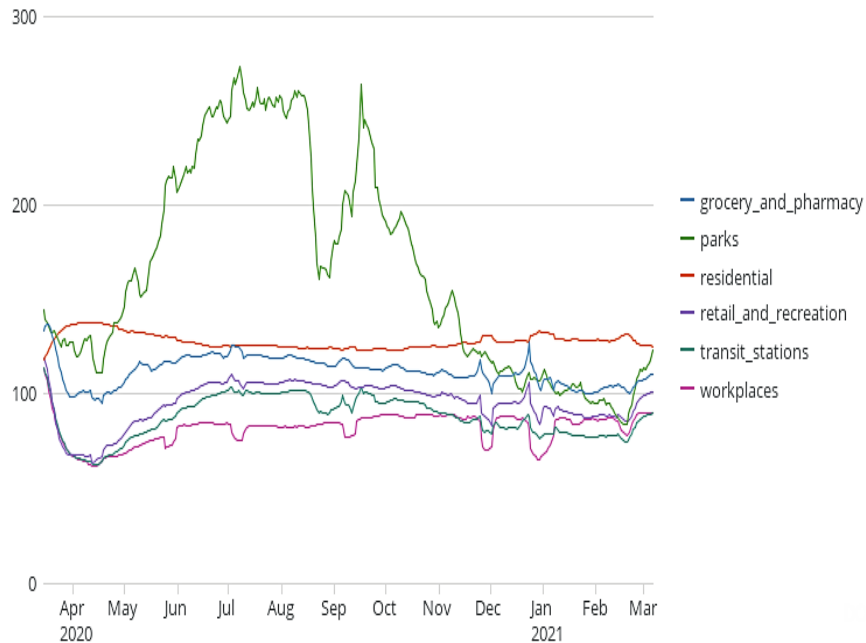
Apple Mobility Index-Trend
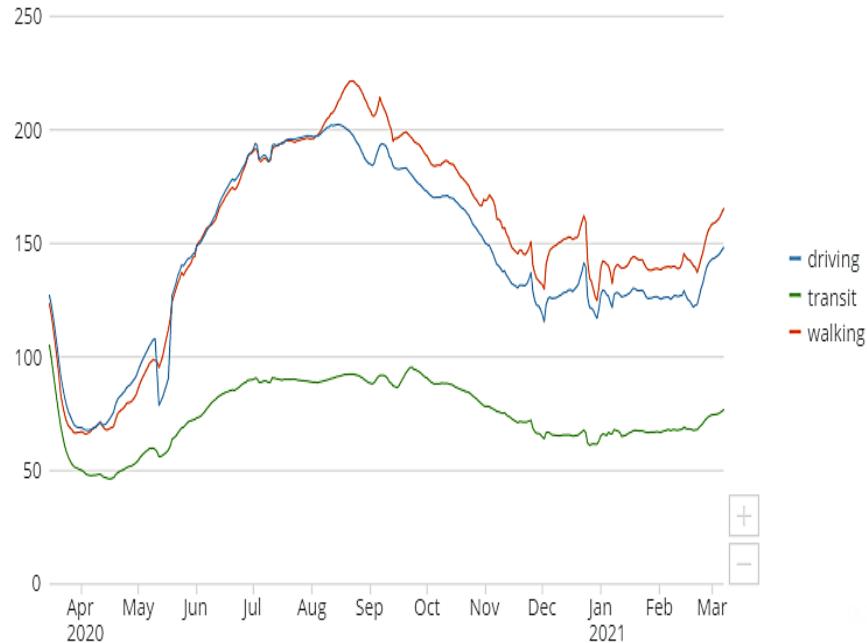
FALLING CASES

US Daily COVID-19 Tests/Positive Tests and Daily Cases. Updated March 11, 2021.

HOSPITALIZATIONS FALLING

Number of Covid-19 Patients in Hospitals.
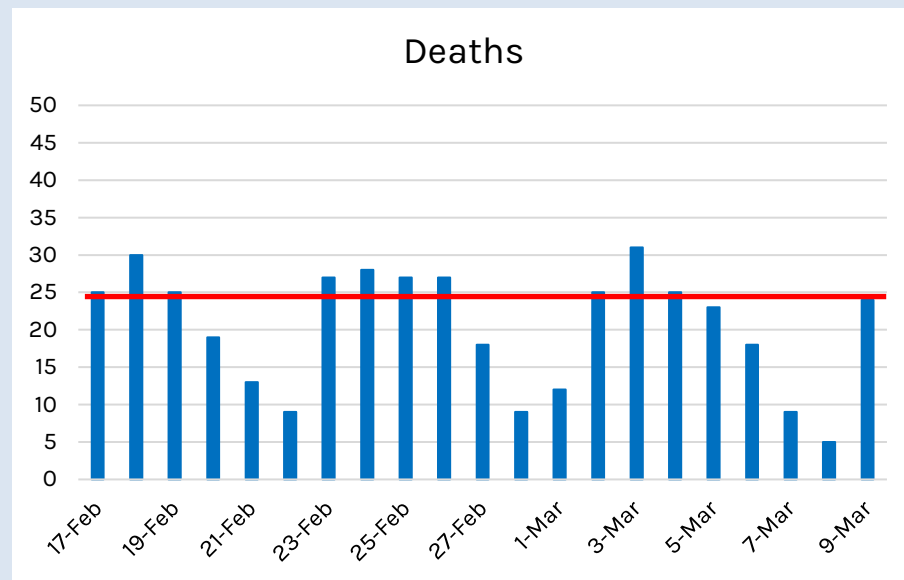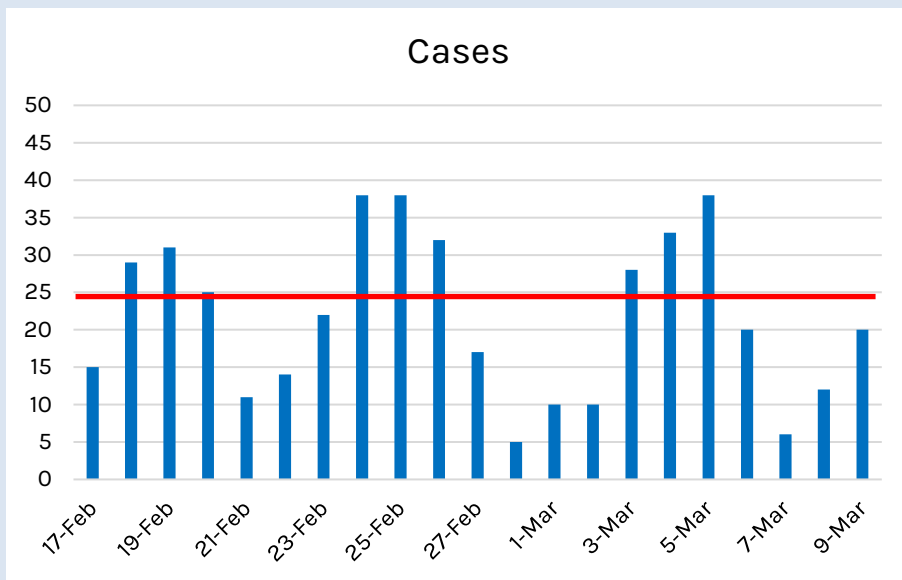## Updated March 10, 2021.

Note: Florida began reporting this figure on July 10.

The COVID Tracking Project

C19 GEOGRAPHY

Average Daily Covid-19 Cases Per 100,000 People In The Last Week. Updated March 10, 2021.

Average daily cases per 100,000 people in past week

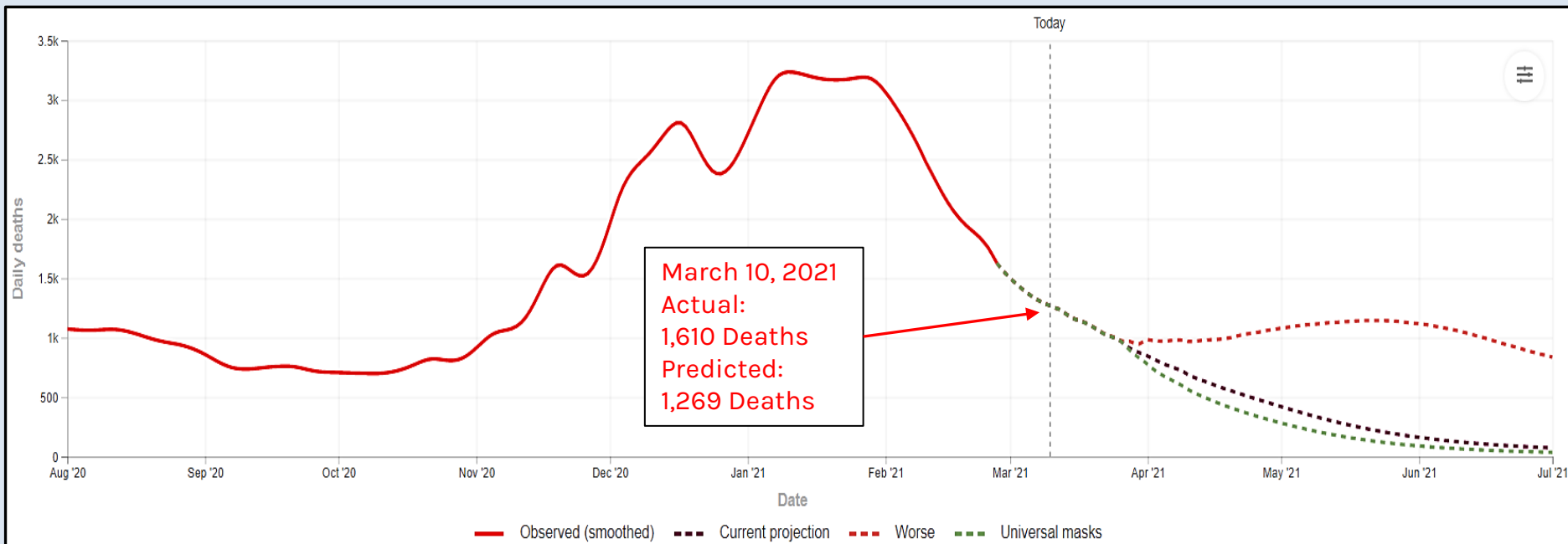10 30 50 70 100 250 Few or no cases

Double-click to zoom into the map.
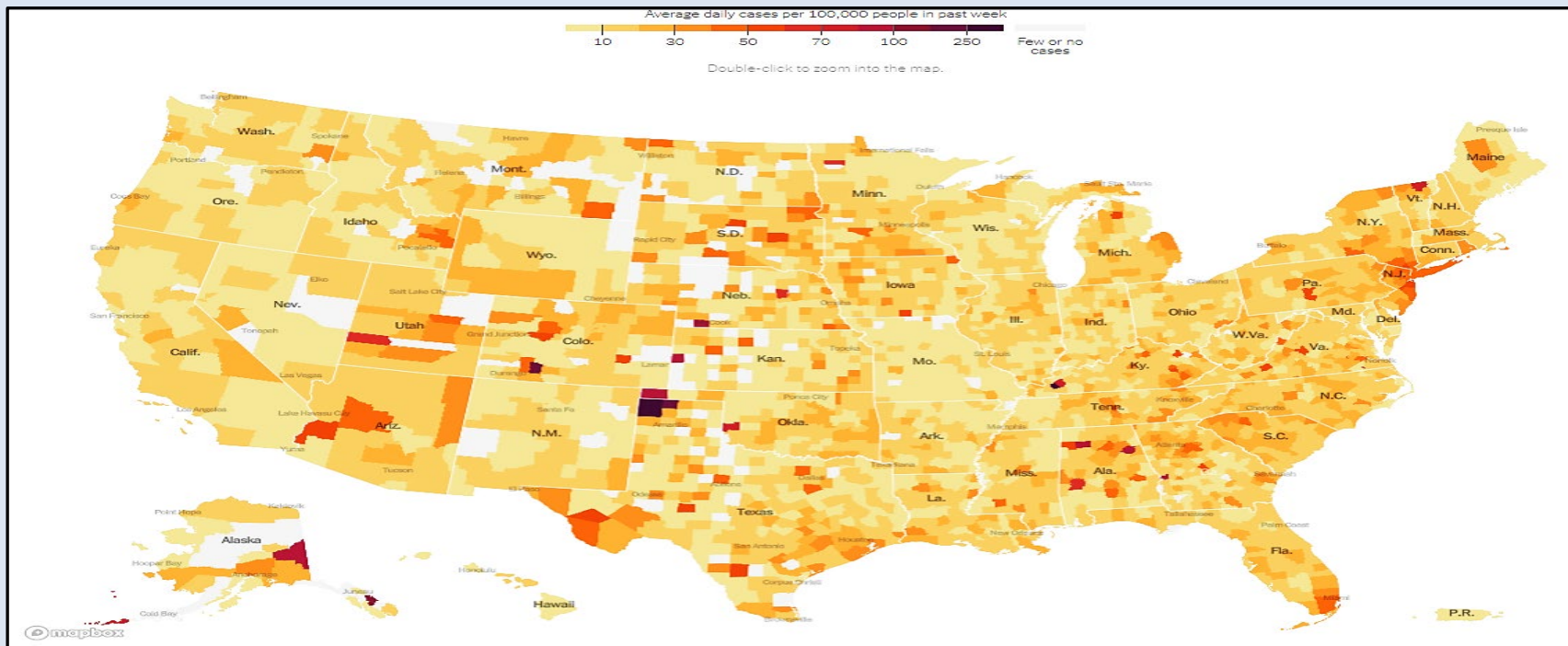
STATE DIFFUSION INDEX IN CASES & DEATHS

## Number of US States Whose Case and Death Count Was Larger or Equal Than Previous Week's Average.

Cases

Deaths

THE PEAK IS OVER?

Projection of Daily COVID-19 Deaths, Last Updated March 11, 2020.

March 10, 2021
Actual:
1,610 Deaths
Predicted:
1,269 Deaths

Observed (smoothed) ···· Current projection ···· Worse ···· Universal masks

Current Projection Only Differs From "Mandates Easing" When Deaths/Day Rise Above 2,500

THE PEAK IS OVER?

Projection of Total COVID-19 Deaths, Last Update March 11, 2020

Projected July 1, 2021
Worse: 641,332
Current: 576,026
Universal Masks: 567,126
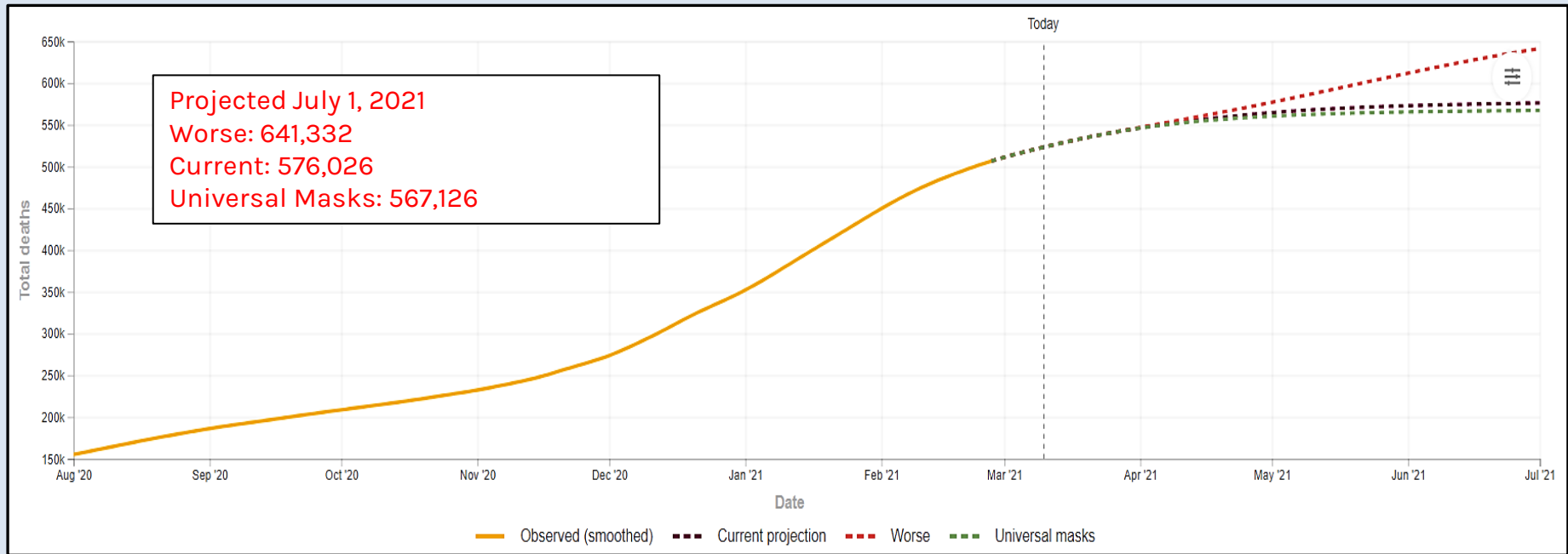
Current Projection Only Differs From "Mandates Easing" When Deaths/Day Rise Above 2,500

WHO'S STAYING HOME?

Stay-at-Home Lockdown Measures By Country.

WHO'S GOING INTO THE OFFICE?

Workplace Lockdown Policy Measures By Country.

Brazil

Infections trend

Jan 1   Mar 20   Mar 10

South Africa

Infections trend

Jan 1   Mar 26   Mar 10

Germany

Infections trend

Jan 1   Mar 22   Mar 10

United Kingdom

Infections trend

Jan 1   Mar 16   Mar 10
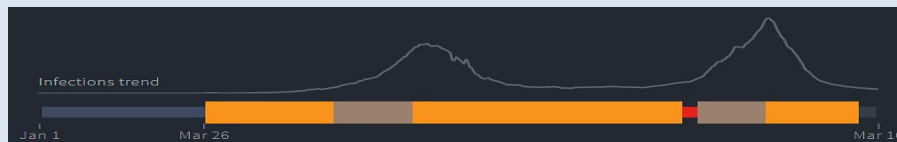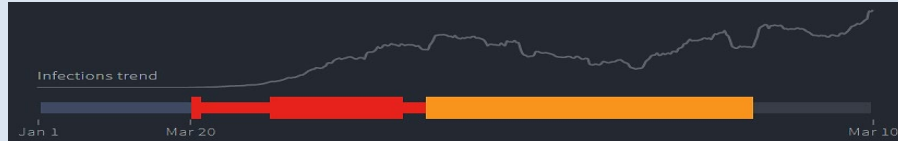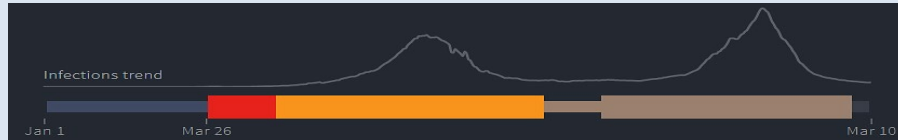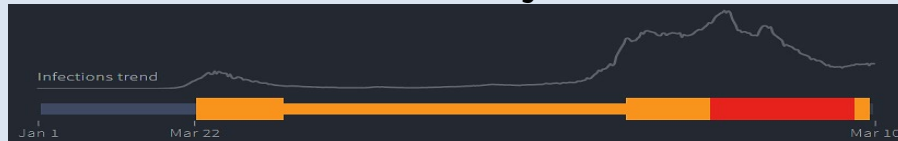
Lockdown policy implemented:

locally   nationwide

Require closing all but essential workers
Require closing some sectors
Recommend closing
No lockdown measures

No data

VACCINE APPROVAL TIMELINE

Progress: Trial | Awaiting approval | Available to public

Trial size | Doses required | Storage temperature | Efficacy

Pfizer/BioNTech

44K | 2 | −70℃ | 95%

Pfizer was the first company to report positive phase 3 clinical data. It plans to produce 50M doses in 2020 and 1.3B in 2021.

Trial start — Approvals — Results

Moderna

30K | 2 | 2–8℃ | 95%

Moderna and Pfizer both use a new vaccine approach involving messenger RNA. Moderna expects to have 20M doses for the U.S. in December and 100M globally in Q1.

Trial start — Approvals — Submitted for review

AstraZeneca/Oxford

65K | 2 | 2–8℃ | 70%

AstraZeneca struck deals for 3 billion doses even before any late-stage study results. That's more than twice as many as any other candidate. Initial clinical results were mixed.

Trial paused — Results — Approvals — Trial start — Trial resumed

Novavax

45K | 2 | 2–8℃ | 89%

This small biotech firm has never brought a product to market. It received more than $1.6 billion from the U.S. and $399 million from the Coalition for Epidemic Preparedness. The stock rose 3,000% in nine months.

Trial start — Results — Enrollment update

Johnson & Johnson

70K | 1 | 2–8℃ | 66%

Of the leading candidates, this is the easiest to distribute, requiring just one dose and standard refrigeration. To hedge its bets, J&J announced a separate trial with two doses in November.

Trial start — Enrollment update — Approval — Trial expanded — Results

Russia and China took the unusual step of allowing vaccine distribution before conducting large-scale clinical trials.

Sinovac Biotech

26K | 2 | 2–8℃ | 50%

Sinovac's vaccine triggers an immune response using the Covid-19 virus itself, after it has been chemically inactivated.

Early approval — Trial start — Approval

Gamaleya

40K | 2 | −18℃ | 92%

A variation of the Russian vaccine, known as Sputnik V, can be stored using standard refrigeration temperatures of 2–8℃. It's currently available in limited quantities.

Early approval — Trial start — Approval — Results

CanSino Biologics

40K | 1 | 2–8℃ | 66%

CanSino's shot was approved for the Chinese military even before late-stage tests began. It uses a harmless cold virus to deliver its genetic payload.
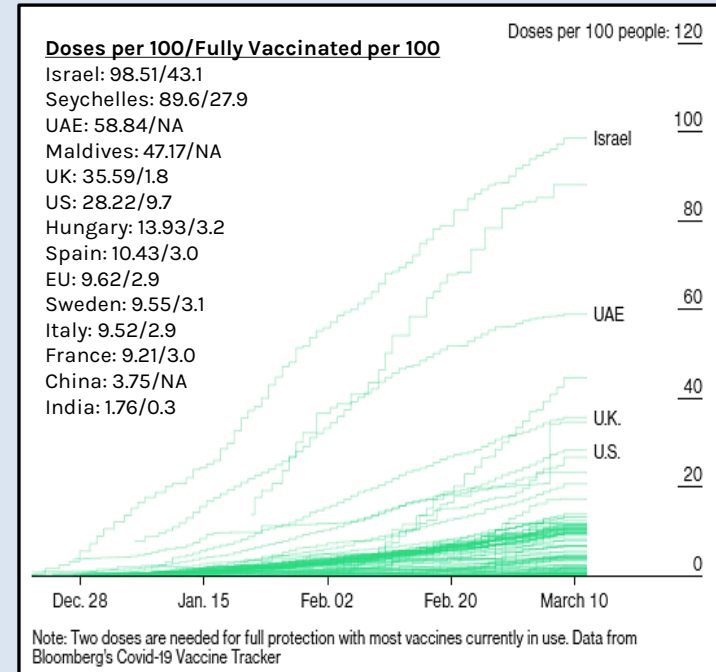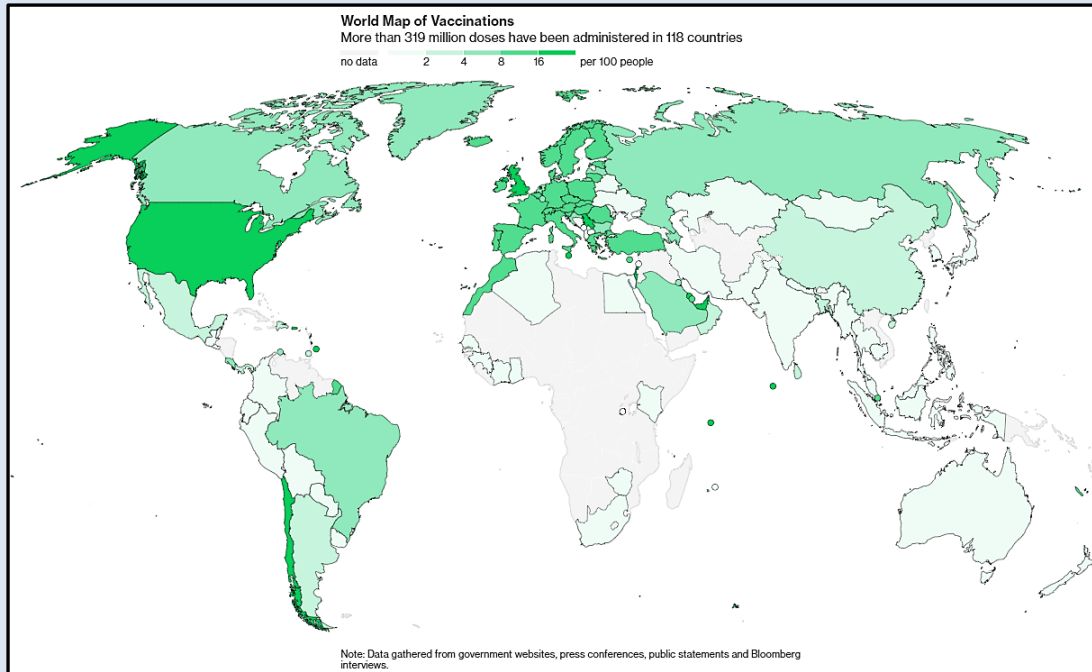
Early approval — Trial start — Approval

Sinopharm

50K | 2 | 2–8℃ | 79%

Sinopharm administered hundreds of thousands of doses before its vaccine was fully tested.

Early approval — Trial — Approval
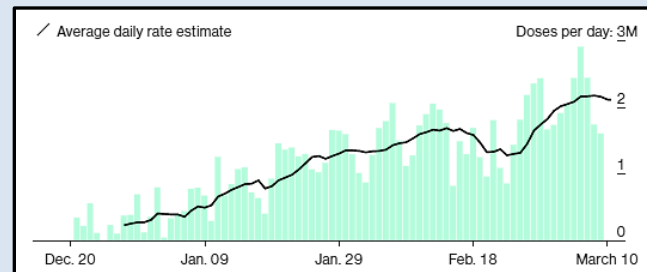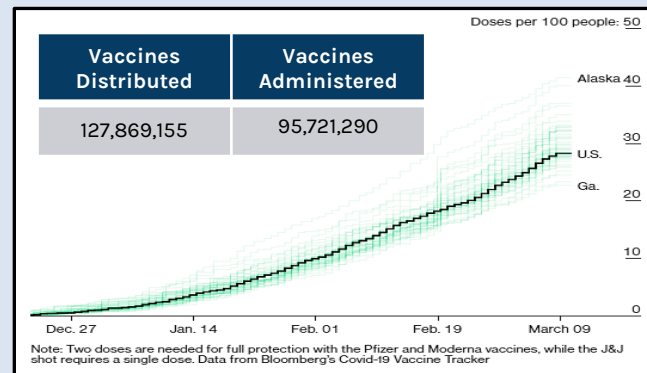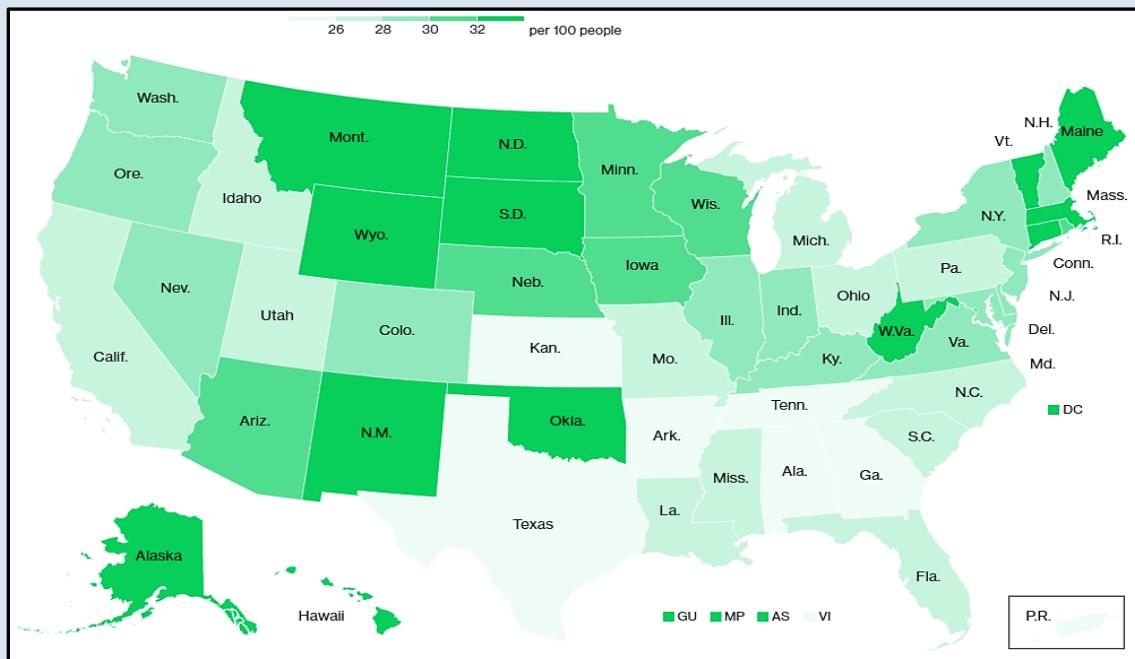
VACCINES ADMINISTERED

Number of Covid-19 Doses Administered Per 100 People.
Updated on March 10.

World Map of Vaccinations
More than 319 million doses have been administered in 118 countries

no data   2   4   8   16   per 100 people

Note: Data gathered from government websites, press conferences, public statements and Bloomberg interviews.

Doses per 100 people: 120

Doses per 100/Fully Vaccinated per 100
Israel: 98.51/43.1
Seychelles: 89.6/27.9
UAE: 58.84/NA
Maldives: 47.17/NA
UK: 35.59/1.8
US: 28.22/9.7
Hungary: 13.93/3.2
Spain: 10.43/3.0
EU: 9.62/2.9
Sweden: 9.55/3.1
Italy: 9.52/2.9
France: 9.21/3.0
China: 3.75/NA
India: 1.76/0.3

Israel   100
          80
UAE   60
          40
U.K.
U.S.   20
          0

Dec. 28   Jan. 15   Feb. 02   Feb. 20   March 10

Note: Two doses are needed for full protection with most vaccines currently in use. Data from Bloomberg's Covid-19 Vaccine Tracker

VACCINES ADMINISTERED

Number of Covid-19 Doses Administered Per 100 People In US. Updated on March 10.

Vaccines Distributed	Vaccines Administered
127,869,155	95,721,290

Doses per 100 people: 50

Note: Two doses are needed for full protection with the Pfizer and Moderna vaccines, while the J&J shot requires a single dose. Data from Bloomberg's Covid-19 Vaccine Tracker

Average daily rate estimate — Doses per day: 3M

VACCINE ROLLOUT

- Biden has announced that there will be enough vaccines for the entire US adult population by the end of May. He previously said they would reach this milestone by the end of July.

- The White House has brokered a deal between the competitors Merk and J&J. Under the agreement, Merk will help produce the J&J vaccine in two of its manufacturing facilities. Biden is determined this will significantly increase vaccine availability. A few anonymous J&J officials have cast doubts on Merk's ability to quickly transform its factories to produce the vaccine. Nevertheless, Biden has ordered 100M more doses from J&J.

- **Percentage of Distributed Vaccines That Have Been Administered:**
  - **Fastest States:**
    - North Dakota: 87.23%
    - Minnesota: 86.87%
    - New Mexico: 86.31%
    - Arizona: 85.11%
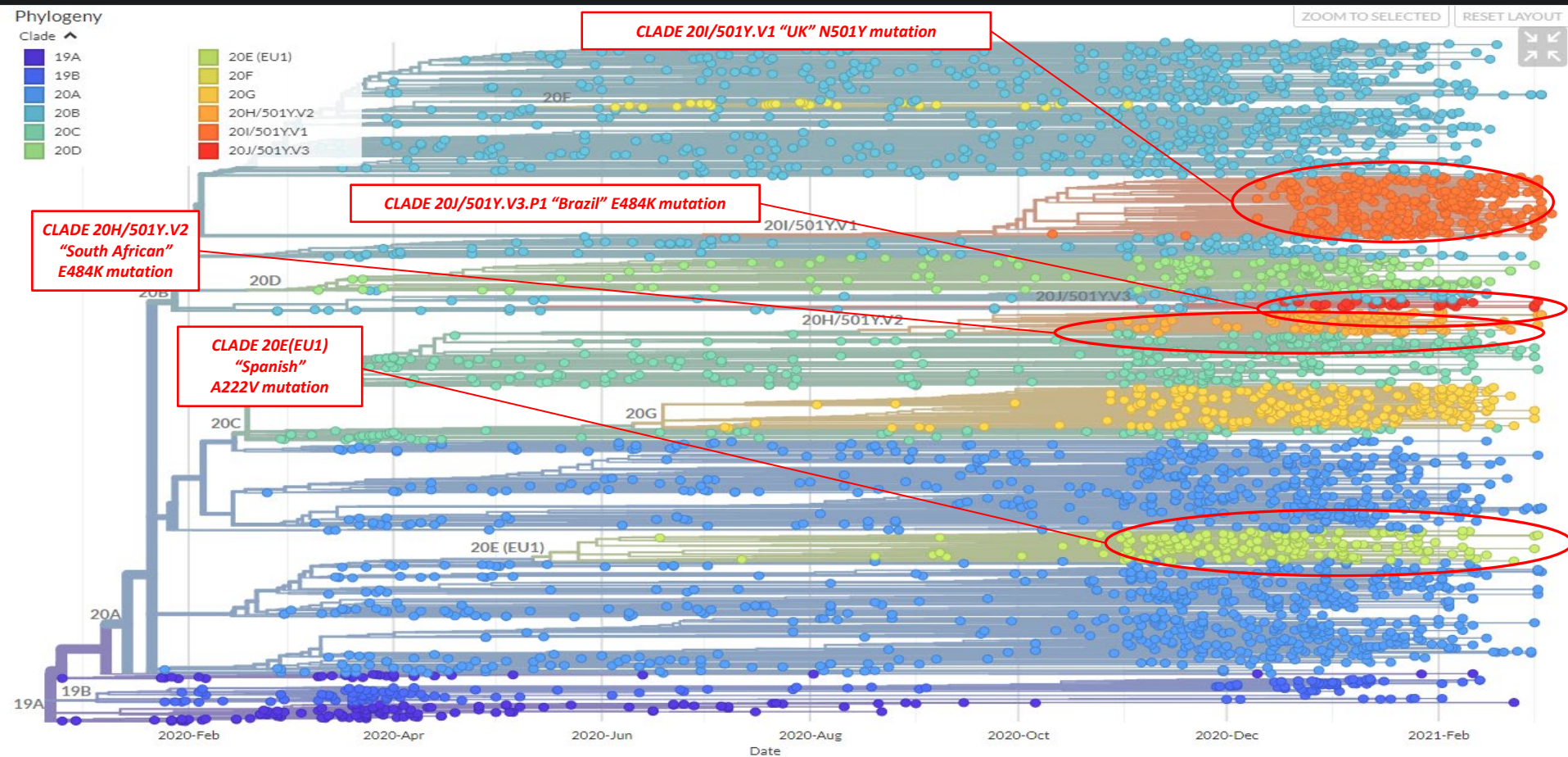   - Wisconsin: 84.12%
  - **Slowest States:**
    - Alaska: 70.28%
    - Kansas: 68.66%
    - Arkansas: 67.56%
    - Alabama: 67.55%
    - Georgia: 64.91%

U.S. COVID-19 Vaccine Delivered by Vaccine Type

Pfizer-BioNTech 59,046,975
Moderna 60,875,300
J&J/Janssen 3,310,500
Not Identified 0

Vaccine Type / Total Doses Delivered
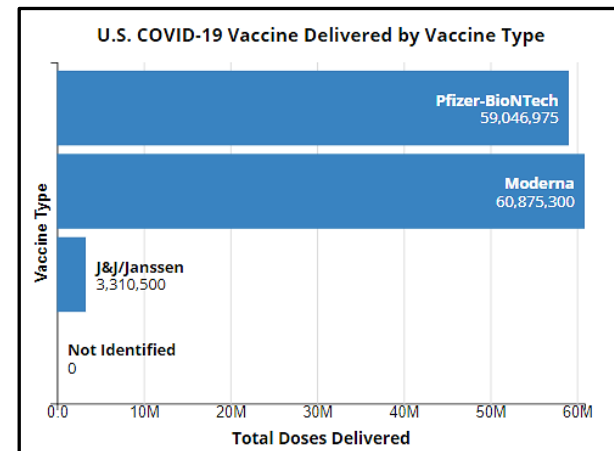
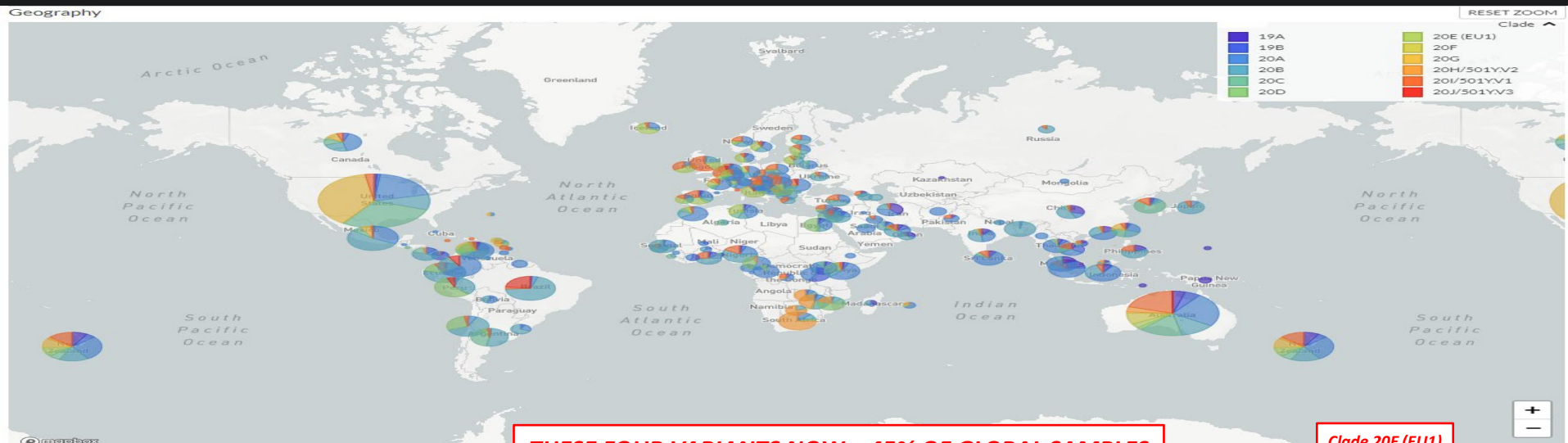# TRACKING THE VARIANTS

- As a share of global genomic samples, <u>adaptively mutating variants are growing:</u>
    - Over last month (Feb 6 to Mar 7), <u>Big Four share has grown from 35% to 45%</u>
        - "UK" Variant (B.1.1.7). from 23% to 34% (+11%)—now dominant in 10 Western European nations
        - "Brazil" Variant (P.1). from 2% to 3% (+1%)
        - "South African" Variant (B.1.351). from 6% to 4% (-2%)
        - "Spanish" Variant (EU 1). from 4% to 4% (--)

- In U.S., <u>all Big Four variants continue to grow as share of all samples</u> (though estimates are highly uncertain):
    - "UK" variant now accounts for <u>est 20-25%</u> of all new U.S. samples in the U.S.
        - Transmission rate within the U.S. is est 30-40% higher than earlier clades
    - "South African" variant new accounts for <u>est 1.0-2.0%</u> of all new U.S. samples
    - "Brazil" variant new accounts for <u>est 0.5-1.0%</u> of all new U.S. samples

- <u>IMPORTANT</u>: Sample magnitude varies according to recent caseload trend <u>AND</u> according to size of national genomic sampling efforts. Consider contrast between UK and US:
    - <u>Testing per 1,000</u>: in UK, 10; in US, 3
    - <u>Positive Rate</u>: in UK, 0.9%; in US, 6%
    - <u>Current share of tests that are genomically sampled</u>: in UK, 33%, in US, 3%
    - Moreover, in US, there is a <u>vast variation in sampling rate by state</u>
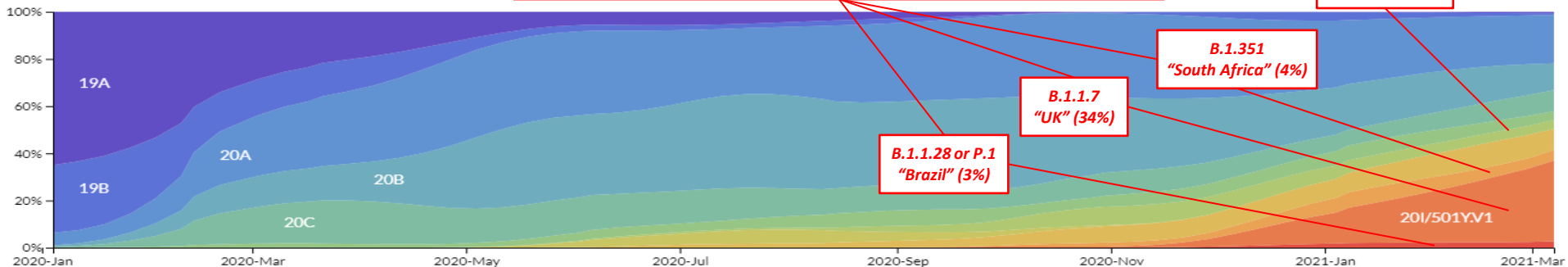
TRACKING THE VARIANTS

SOURCE: Genomic epidemiology of novel coronavirus (Nextstrain.org/GISAID, 2021)

TRACKING THE VARIANTS

THESE FOUR VARIANTS NOW = 45% OF GLOBAL SAMPLES

Clade 20E (EU1) "Spanish" (4%)

B.1.351 "South Africa" (4%)

B.1.1.7 "UK" (34%)

B.1.1.28 or P.1 "Brazil" (3%)

SOURCE: Genomic epidemiology of novel coronavirus (Nextstrain.org/GISAID, 2021)

TRACKING THE VARIANTS

Variant	Reported Cases in US	Number of Jurisdictions Reporting
B.1.1.7	3283	49
B.1.351	91	21
P.1	15	9

CDC C19 Cases Caused by Variants, Updated Mar 9, 2021

Emerging Variant Cases in the United States*†
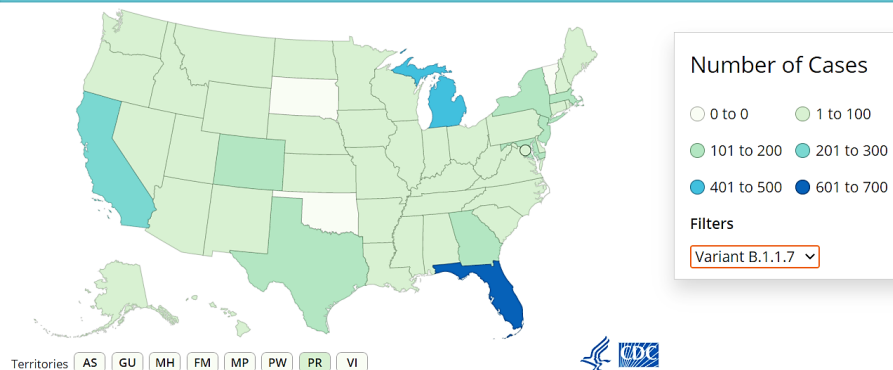
Emerging Variant Cases in the United States*†
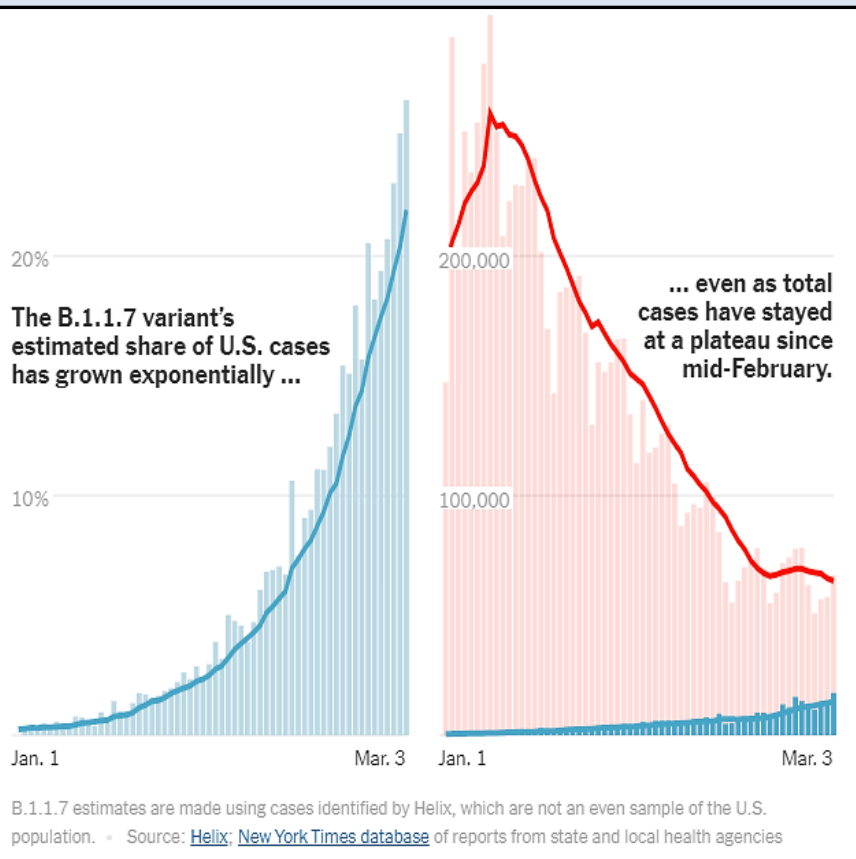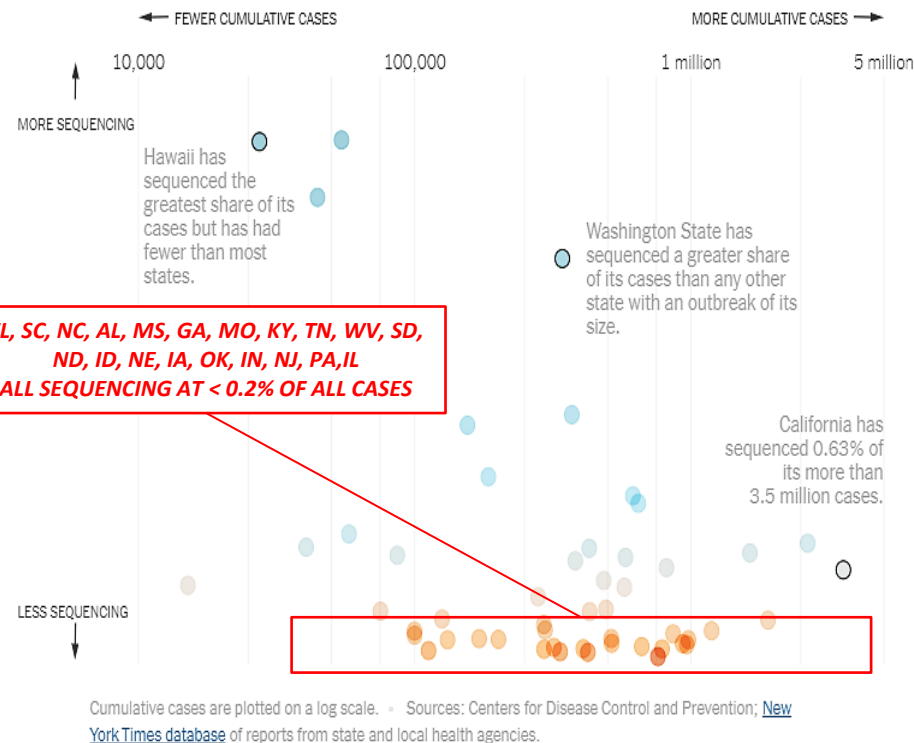

Emerging Variant Cases in the United States*†

SOURCE: cdc.gov/coronavirus/2019-ncov/transmission/variant-cases.html

TRACKING THE VARIANTS

The B.1.1.7 variant's estimated share of U.S. cases has grown exponentially ...

... even as total cases have stayed at a plateau since mid-February.
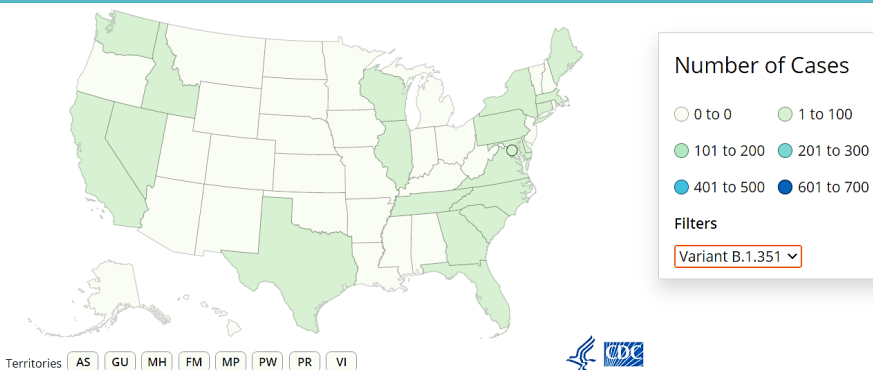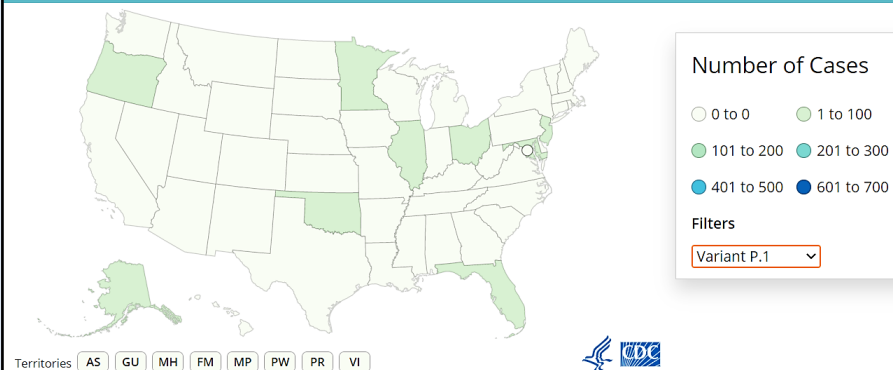
B.1.1.7 estimates are made using cases identified by Helix, which are not an even sample of the U.S. population. • Source: Helix; New York Times database of reports from state and local health agencies

Some states that have sequenced a greater share of their case counts have also had the fewest cases

← FEWER CUMULATIVE CASES   MORE CUMULATIVE CASES →

MORE SEQUENCING

Hawaii has sequenced the greatest share of its cases but has had fewer than most states.

Washington State has sequenced a greater share of its cases than any other state with an outbreak of its size.

California has sequenced 0.63% of its more than 3.5 million cases.

LESS SEQUENCING

FL, SC, NC, AL, MS, GA, MO, KY, TN, WV, SD, ND, ID, NE, IA, OK, IN, NJ, PA, IL ALL SEQUENCING AT < 0.2% OF ALL CASES

Cumulative cases are plotted on a log scale. • Sources: Centers for Disease Control and Prevention; New York Times database of reports from state and local health agencies.

TRACKING THE VARIANTS

o <u>Most positive news about variants</u>: The two identified variants proven to be most resistant to prior wildtype immunity and to existing vaccines—B.1.351 and P.1—<u>are not currently spreading beyond their original borders</u> (South Africa and Brazil) at a worrisome rate.

o <u>More troubling news about variants</u>: Migration of the South African and Brazil variant may be unnecessary. Most or perhaps all of the adaptive mutations needs to evade existing immunity <u>are being generated independently by domestic variants within countries</u>. For example, the key South African mutations (484K, 417N, and 501Y) are turning up in other clades all over the world.
   o After taking its own (1,142) samples, Columbia U now estimates that <u>the E484K mutation is now present in 12% of New York City infections</u>.
   o Many of these are appearing in a whole new variant, B.1.526, <u>which now comprises 39% of NYC infections</u> (up from 27% just one month ago). Total new variants (including UK) now comprise 51% of infections.
   o <u>Two new variants are now spreading in California, B.1.427 and B.1.429</u> (from 20C clade) and are expected to become dominant there in a week or two. These variants have three new spike mutations—whose implications await further research. Most recent research: <u>CA variants have higher transmissivity, higher hospitalized, and are more resistant to prior wildtype immunity (4X) and to mRNA vaccines (2X)</u>.

FACE MASKS: REVISITING THE EVIDENCE

○ <u>Knowledge of the efficacy of face masks has a long pedigree</u>, going back to the Black Death of the 14th c. It was periodically practiced in the 19th c. Received its first data-driven scientific trial in <u>the Manchurian Plague of 1910-11</u> (led by Cambridge-trained doctor Wu Lien-the). Widely practiced around the world (including the U.S.) during the Spanish Influenza. Remained popular in East Asia and was reinforced by SARS in 2002-04,

○ <u>Best summary of evidence against C19</u> recently published by Jeremy Howard et al., "An evidence review of face masks against COVID-19" (*PNAS*, Jan 11, 2021).

○ Types of studies offering the most persuasive evidence of efficacy:

   ○ Models based on understanding of <u>how respiratory pathogens spread</u> (esp when aerosols are operative)
   ○ Empirical comparisons <u>of countries by policy and date</u>.
   ○ Empirical comparisons <u>of states (within U.S.) by policy and date</u>.
   ○ Empirical comparisons <u>of counties (within U.S.) by policy and date</u>.

○ <u>CDC Director Robert Redfield</u> (Sep 2020): "These face masks are <u>the most important, powerful public health tool we have</u>. And I will continue to appeal for all Americans, all individuals in our country, to embrace these face coverings. I've said if we did it for 6, 8, 10, 12 weeks, we'd bring this pandemic under control. I might even go so far as to say that this face mask is <u>more guaranteed to protect me against COVID than when I take a COVID vaccine</u>. "

MASKS: SLOWEST SPREAD BY COUNTRY

Country or region	Daily growth	Reduction from peak	Masking culture?	Universal masking (date made mandatory or recommended)	Strict lockdown (mass home quarantine)
Macau	2.4%	96.0%	yes	Feb 19	
Beijing	3.6%	98.5%	yes	Feb 8	partial
Shanghai	3.7%	83.6%	yes	Feb 8	partial
Guangdong	5.0%	95.8%	yes	Feb 8	partial
Hong Kong	5.5%	69.8%	yes	Jan 15	
Taiwan	5.6%	85.0%	yes	Jan 27	
Singapore	6.8%	23.5%	yes	Jan 30 (sick) Apr 5 (all)	partial
Japan	9.1%	24.5%	yes	Mar 4	partial
Estonia	10.0%	69.4%			
Slovakia	11.3%	29.9%		Mar 24	
S Korea	11.6%	94.4%	yes	Feb 27	
Slovenia	12.0%	46.0%		Mar 19	
Malaysia	13.1%	38.2%			Mar 18
Australia	13.9%	77.7%			Mar 23
Finland	14.2%	27.3%			Mar 27
Hungary	14.3%	26.5%			Mar 28
Norway	14.5%	61.0%			Mar 12
Lithuania	15.5%	46.0%			Mar 16

| Country	Daily growth	Reduction from peak	Universal masking	Strict lockdown
Sweden	15.9%	17.2%		
Denmark	16.2%	20.3%		Mar 11
CZ	16.6%	36.8%	Mar 18	Mar 16
Israel	17.0%	54.9%		
Austria	17.0%	70.3%	Mar 31	Mar 16
Lux	17.0%	63.2%		
IT	17.2%	40.4%		Mar 9
NZ	17.2%	44.3%		Mar 26
CH	17.3%	45.8%		
ND	18.4%	16.6%		Mar 16
Pol	18.5%	17.5%		Mar 13
Belgium	18.5%	20.1%		Mar 18
Ire	18.6%	23.9%		Mar 12
Canada	18.7%	37.1%		
Germany	19.6%	36.0%		(only Bavaria)
France	20.2%	56.6%		Mar 17
Portugal	20.4%	27.1%		Mar 19
UK	20.4%	22.4%		Mar 24
US	21.6%	5.5%		Mar 19-24 (CA, NV, CT, IL, KS, MA, MI, NY, OR, WI)
Spain	21.9%	38.8%		Mar 14

MASKS: SLOWEST SPREAD BY COUNTRY
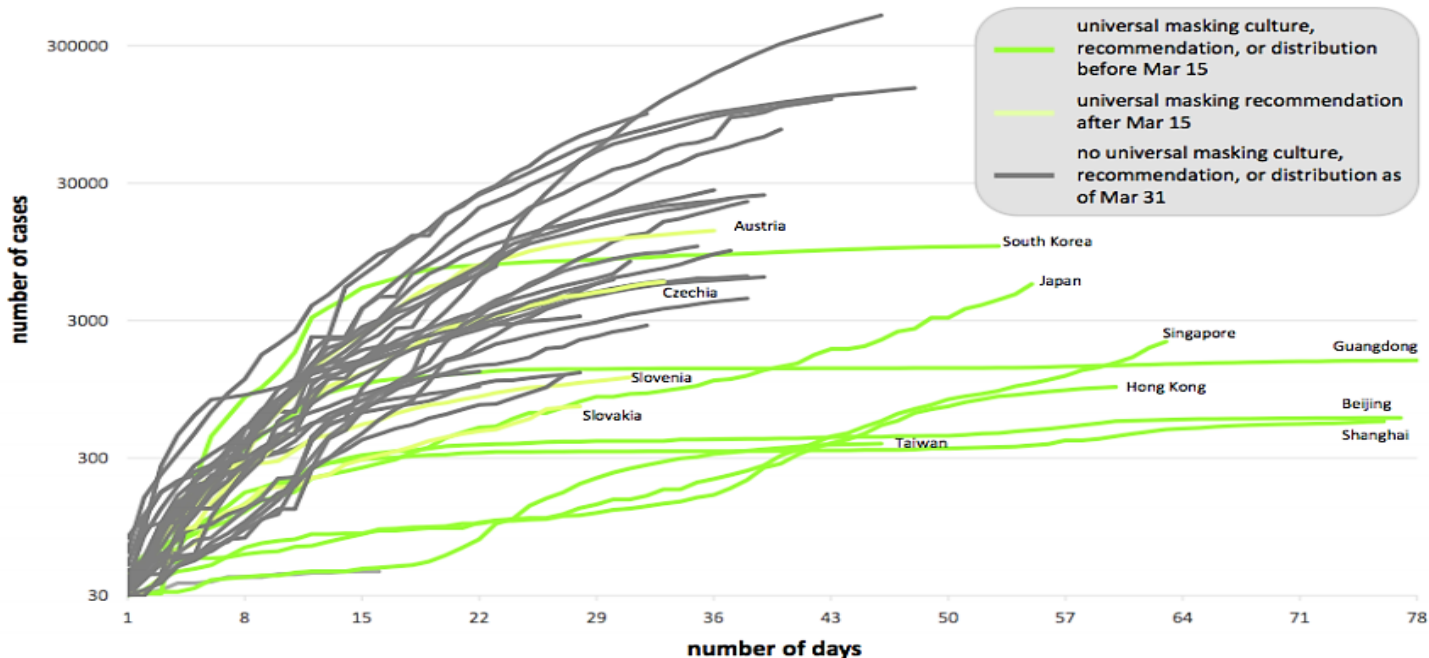
Figure 7: Daily growth curves showing the impact of universal masking on epidemic control: epidemic trajectory after 30 detected cases in universal masking selected countries and provinces (green) vs. others (grey). Masking is nearly perfectly correlated with lower daily growth or strong reduction from peak growth of COVID-19. Sources: John Hopkins, Wikipedia, VOA News, Quartz, Straits Times, South China Morning Post, ABCNews, Time.com, Channel New Asia, Moh.gov.sg, Reuters, Financial Times, Yna.co.kr, Nippon.com, Euronews, Spectator.sme.sk

MASKS: SLOWEST SPREAD BY STATE (U.S.)

EXHIBIT 1

Event study estimates of the effects of states mandating community face mask use in public on the daily county-level growth rate of COVID-19 cases, 2020

COMMUNITY FACE MASK USE WHEN IN PUBLIC
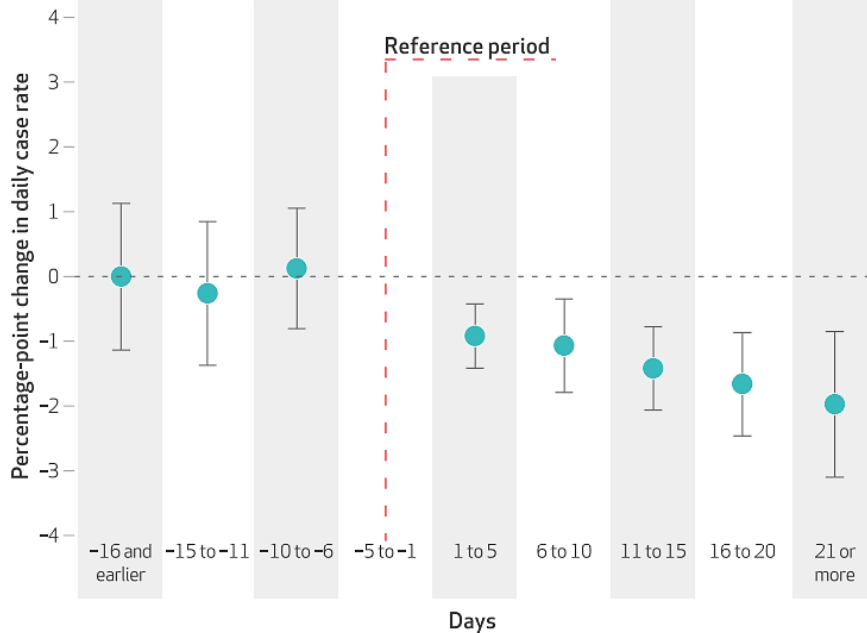
EXHIBIT 2

Event study estimates of effects of states mandating only employee use of face masks during working time on daily county-level growth rate of COVID-19 cases
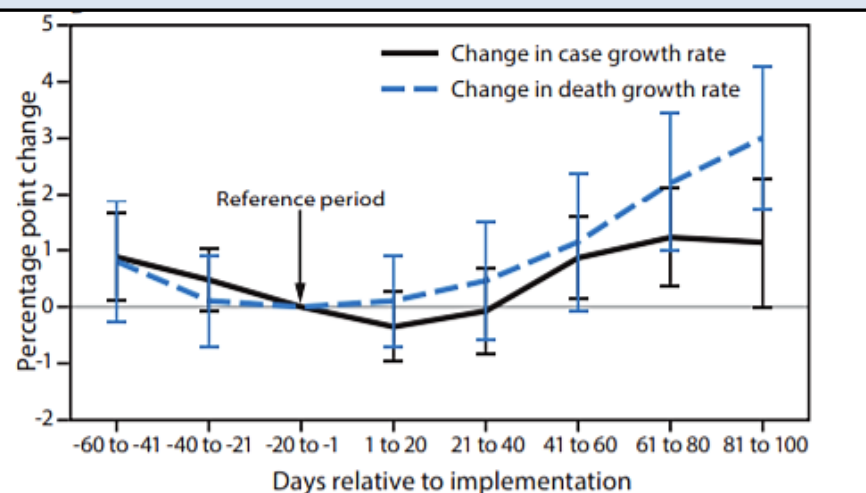
EMPLOYEE-ONLY FACE MASK USE DURING WORKING TIME
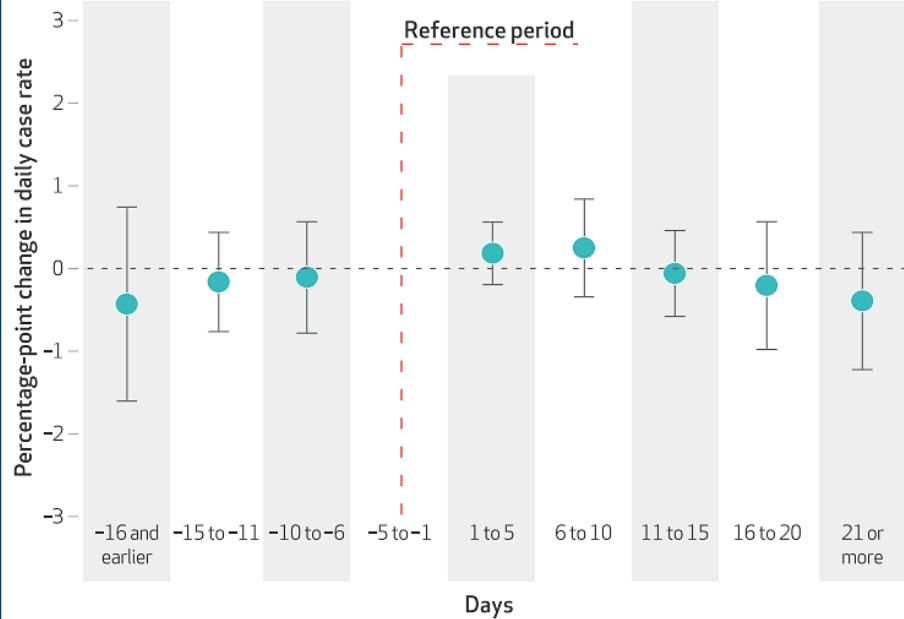
MASKS: SLOWEST SPREAD BY COUNTY (U.S.)

Association Between Policy + Changes in C19 Cases + Deaths Growth Rate. Analysis of Daily County Data: March 1-December 31, 2020

Implementation of State Mask Mandaites

Allowing Any On-Premise Restaurant Dinning

MASKS: SLOWEST SPREAD BY COUNTY (U.S.)

Implementation of State Mask Mandates

Time relative to day state mask mandate was implemented	Case growth rates		Death growth rates	
	Percentage point change (95% CI)	p-value§	Percentage point change (95% CI)	p-value§
41–60 days before	0.0 (−0.7 to 0.7)	0.98	−0.8 (−1.8 to 0.1)	0.07
21–40 days before	0.5 (−0.8 to 1.8)	0.49	0.3 (−0.8 to 1.5)	0.56
1–20 days before	Referent	—	Referent	—
1–20 days after	−0.5 (−0.8 to −0.1)	0.02	−0.7 (−1.4 to −0.1)	0.03
21–40 days after	−1.1 (−1.6 to −0.6)	<0.01	−1.0 (−1.7 to −0.3)	<0.01
41–60 days after	−1.5 (−2.1 to −0.8)	<0.01	−1.4 (−2.2 to −0.6)	<0.01
61–80 days after	−1.7 (−2.6 to −0.9)	<0.01	−1.6 (−2.4 to −0.7)	<0.01
81–100 days after	−1.8 (−2.8 to −0.7)	<0.01	−1.9 (−3.0 to −0.8)	<0.01

-Δ1.6% per DAY
= -Δ62.6% per MONTH

Abbreviation: CI = confidence interval.
* A state-issued mask mandate was defined as the requirement that persons operating in a personal capacity (i.e., not limited to specific professions or employees) wear a mask 1) anywhere outside their home or 2) in retail businesses and in restaurants or food establishments.
† Percentage points are coefficients from the weighted least-squares regression models. Reported numbers are from regression models, which controlled for county, time (day), COVID-19 tests per 100,000 persons, closure of restaurants for any on-premises dining, closure of bars for any on-premises dining, and the presence of gathering bans and stay-at-home orders.
§ P-values <0.05 were considered statistically significant.

Allowing Any On-Premise Restaurant Dinning

Time relative to day states allowed on-premises dining	Case growth rates		Death growth rates	
	Percentage point change (95% CI)	p-value§	Percentage point change (95% CI)	p-value§
41–60 days before	0.9 (0.1 to 1.6)	0.02	0.8 (−0.2 to 1.8)	0.13
21–40 days before	0.5 (−0.1 to 1.0)	0.08	0.1 (−0.7 to 0.9)	0.78
1–20 days before	Referent	—	Referent	—
1–20 days after	−0.4 (−0.9 to 0.2)	0.22	0.1 (−0.7 to 0.9)	0.78
21–40 days after	−0.1 (−0.8 to 0.6)	0.83	0.5 (−0.5 to 1.5)	0.36
41–60 days after	0.9 (0.2 to 1.6)	0.02	1.1 (−0.1 to 2.3)	0.06
61–80 days after	1.2 (0.4 to 2.1)	<0.01	2.2 (1.0 to 3.4)	<0.01
81–100 days after	1.1 (0.0 to 2.2)	0.04	3.0 (1.8 to 4.3)	<0.01

Abbreviation: CI = confidence interval.
* The effective date of the state order allowing restaurants to conduct any on-premises dining or the date a state-issued restaurant closure expired.
† Percentage points are coefficients from the weighted least-squares regression models. Reported numbers are from regression models, which controlled for county, time (day), COVID-19 tests per 100,000 persons, mask mandates, closure of bars for any on-premises dining, and the presence of gathering bans and stay-at-home orders.
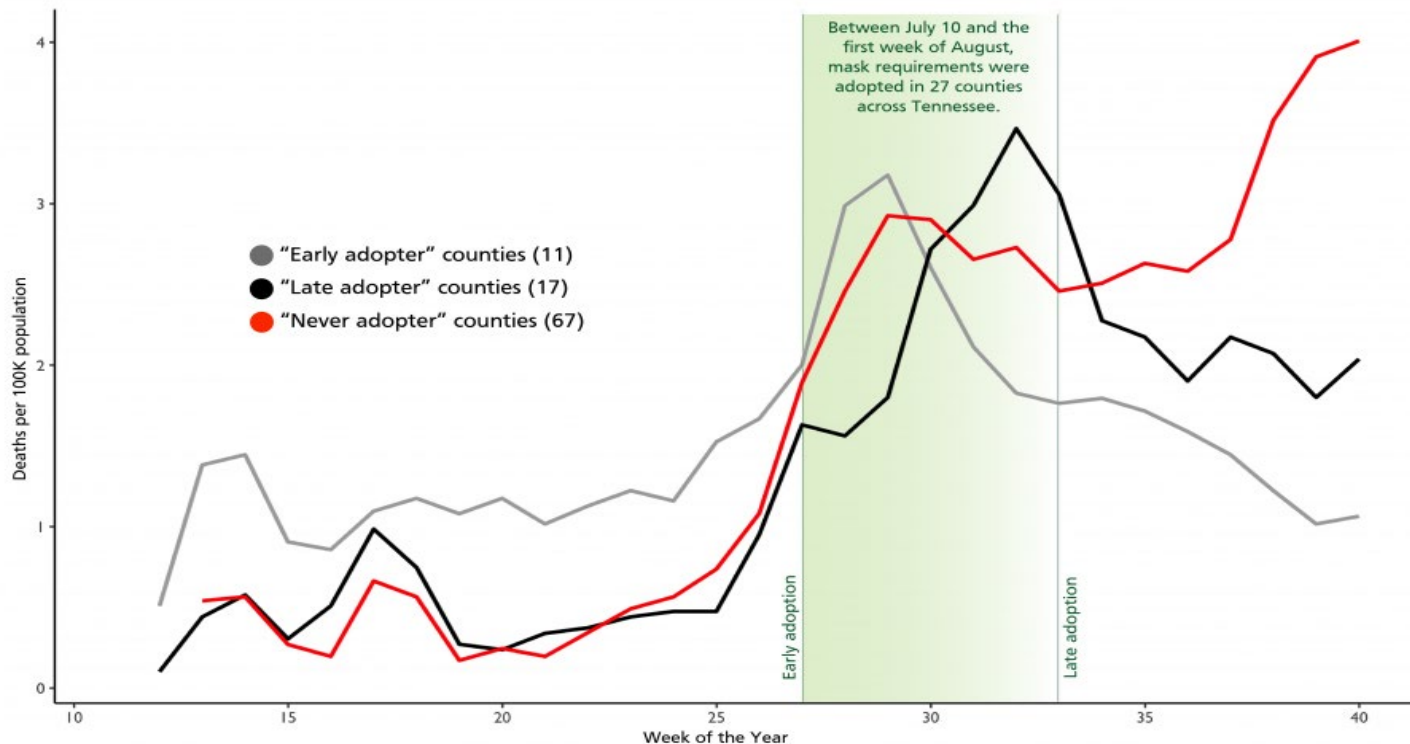§ P-values <0.05 were considered statistically significant.

MASKS: SLOWEST SPREAD BY COUNTY (U.S.)

COVID-19 Deaths in Tennessee and Adoption of Mask Requirements

The following chart shows deaths per 100K population in counties grouped based on date of installment of mask requirements. A total of 27 counties installed mask requirements, some of which remain in effect. Sixty-seven counties have never had a mask requirement to date.

Between July 10 and the first week of August, mask requirements were adopted in 27 counties across Tennessee.

"Early adopter" counties (11)
"Late adopter" counties (17)
"Never adopter" counties (67)

Q&A: SOME SUBMITTED QUESTIONS

- What are your thoughts on the recent AIER article regarding the effectiveness of face masks? See "Another Bungled CDC Study."

- Has the pandemic's effect, and the lockdowns on kids and teens clarified the generational boundary between Millennials and Homelanders?

- What percentage of the population suffers from long-term Covid-19 effects?

- Why is there limited media coverage on the use of Ivermectin against Covid-19?

- Has there been any new research on the effectiveness of Vitamin D?

- What are some possible permanent changes at a social, political, or economic level because of COVID?