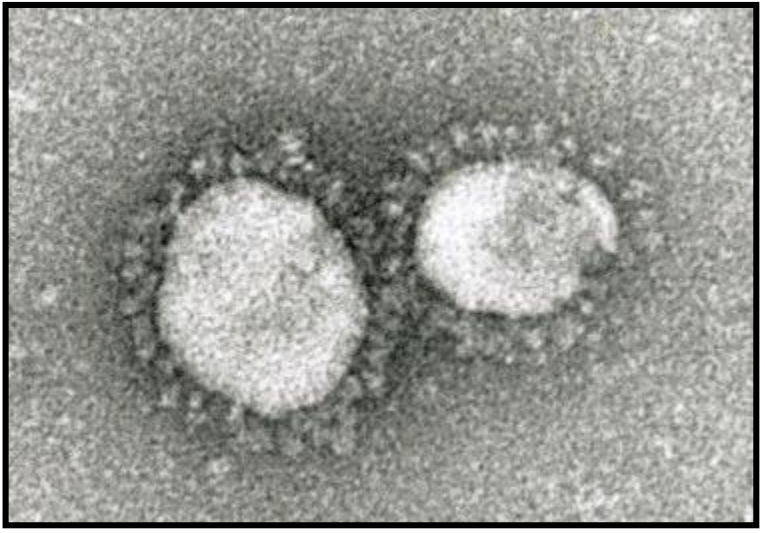


Tufts Medical Center

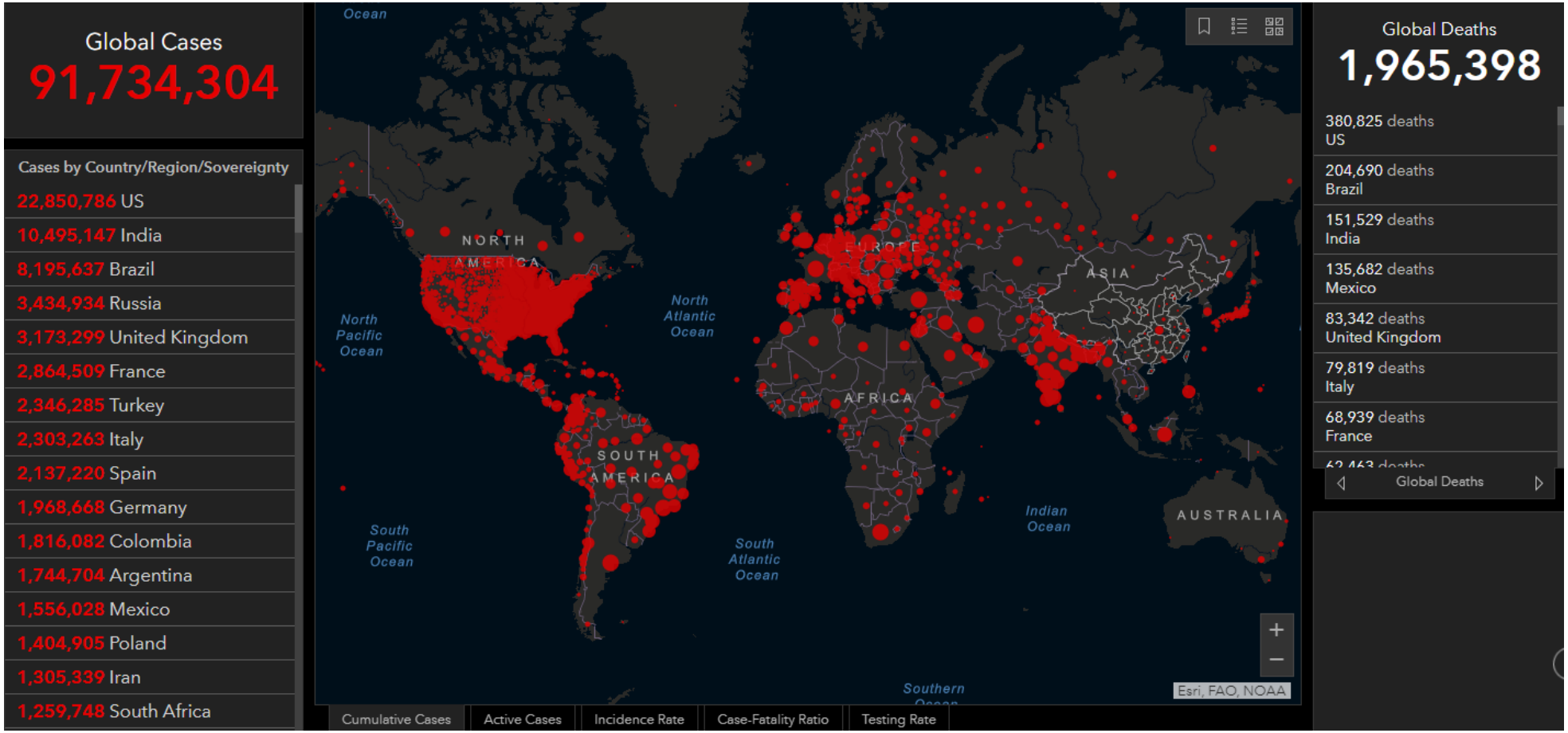
COVID-19 Update

Helen W. Boucher MD FACP FIDSA

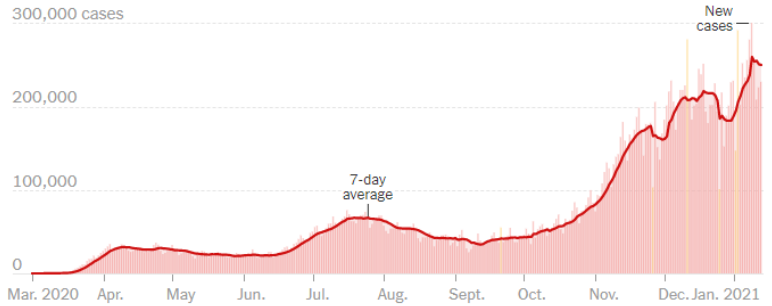
Chief, Division of Geographic Medicine and Infectious Diseases

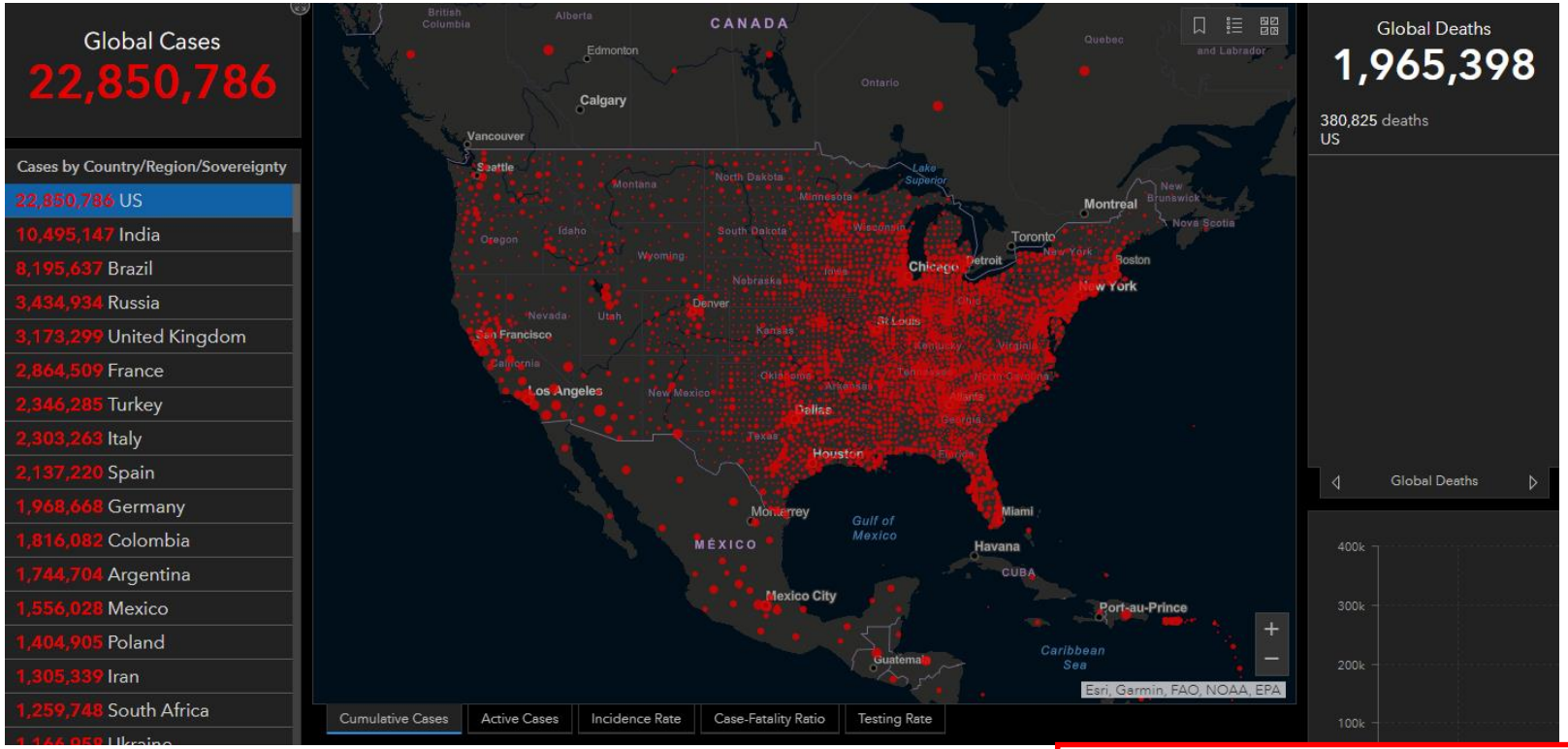
Tufts | STUART B. LEVY CENTER FOR INTEGRATED MANAGEMENT OF ANTIMICROBIAL RESISTANCE

Global COVID-19 Status – January 13th



United States January 13th





- 7-day average = 249,961 infections/day

- 4,406 deaths/24 hours
- 380,825 deaths

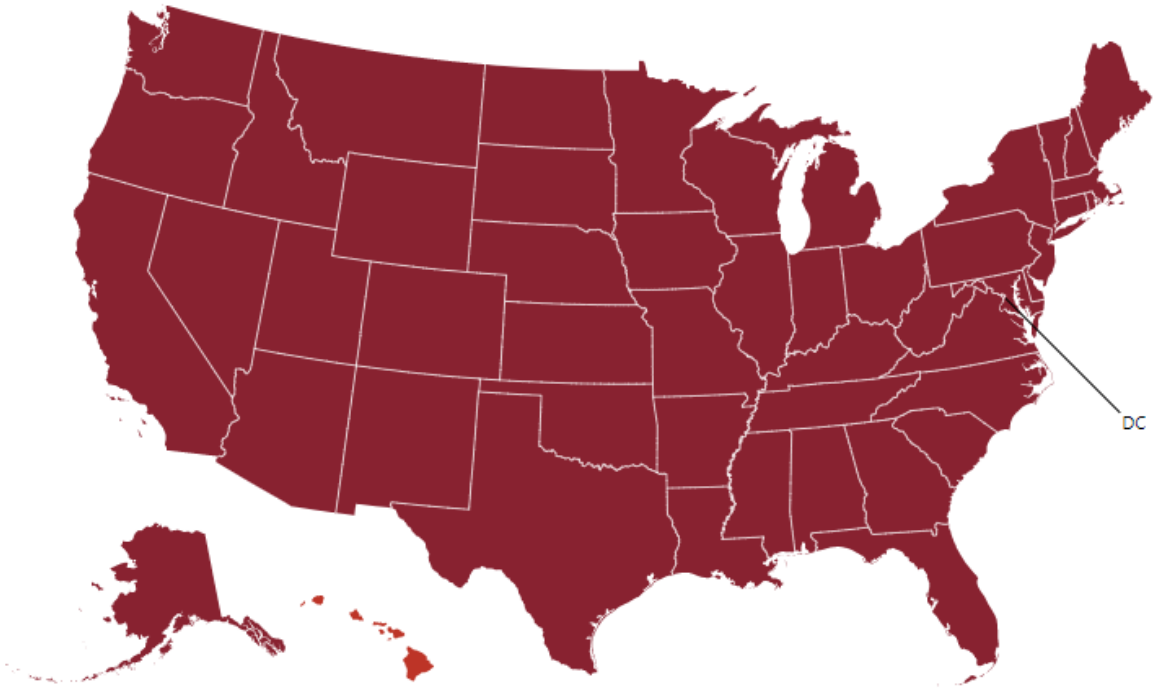
www.covidtracking.com; nytimes.com; CNN.com; Wash Post

US Reopening Progress January 13th

- **19 States + increasing infections last 14 days**
- **35 States with rising death rates (including MA)**
- **31 States have test positivity >10%**

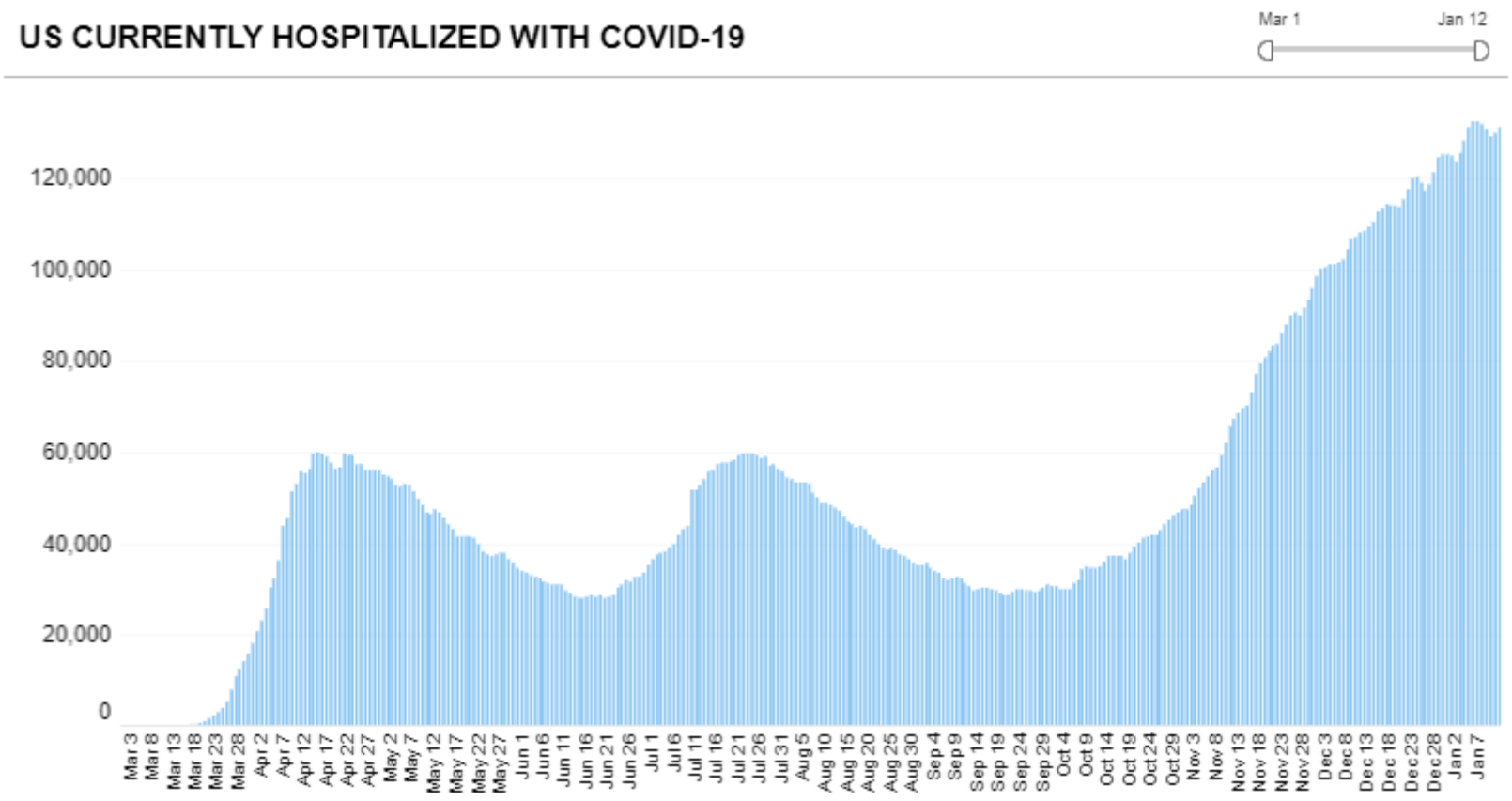
Gating Criteria:

- Symptoms/infections
- Hospitalization/capacity
- Robust Testing
  - >500k tests/day
  - % test positivity



www.covidexitstrategy.org
www.nytimes.com

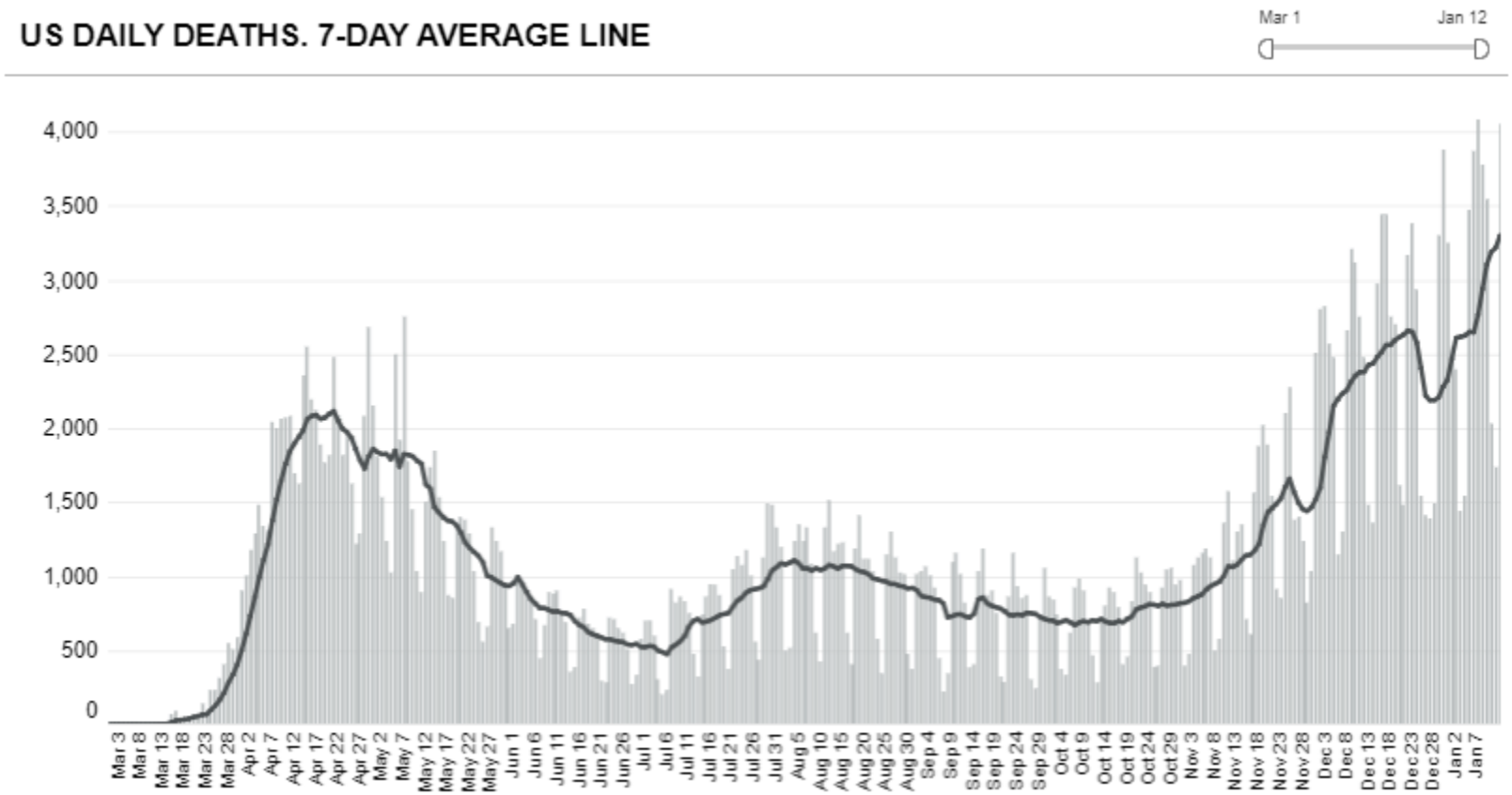
US COVID-19 Hospitalization January 12th



131,326 hospitalized with COVID-19 on 12 January 2021

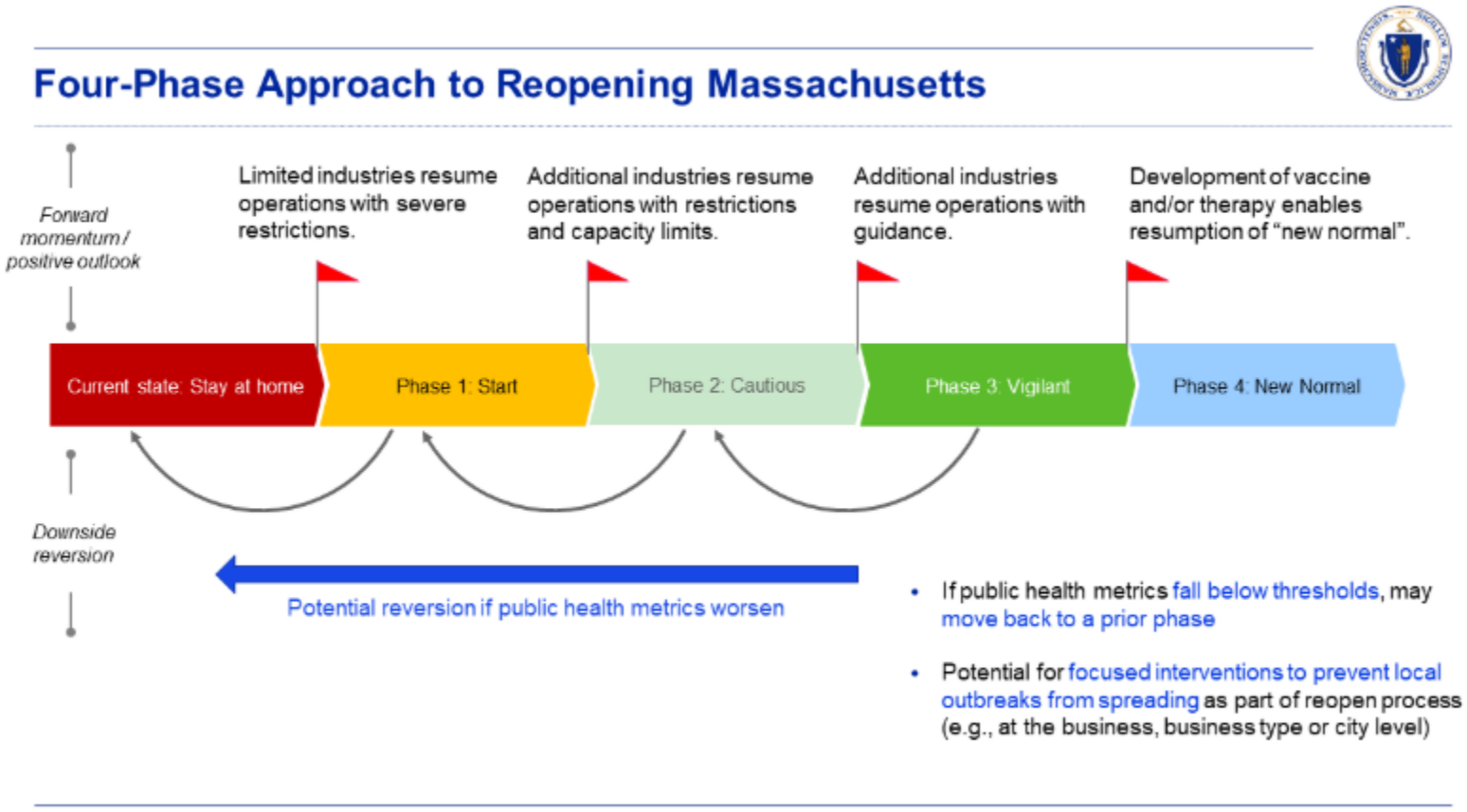
https://covidtracking.com/data/charts/us-daily-positive

COVID-related Deaths in the United States January 12th



https://covidtracking.com/data/charts/us-daily-deaths

Massachusetts Reopening: Four-Phase Approach



Sunday December 26th:

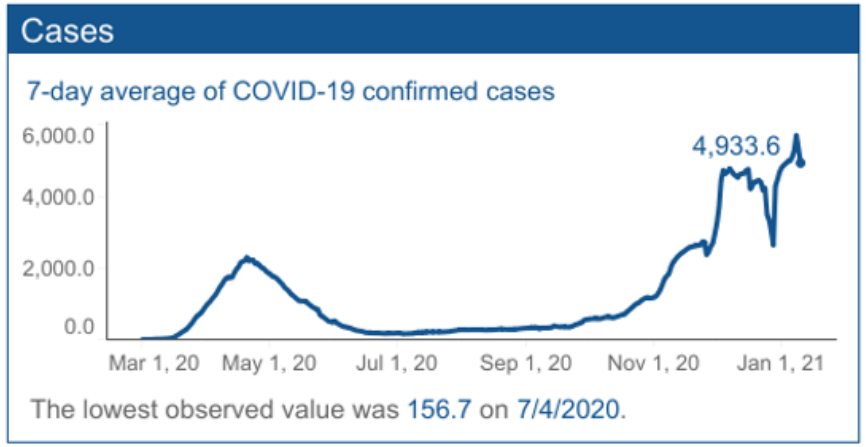
All hospitals:

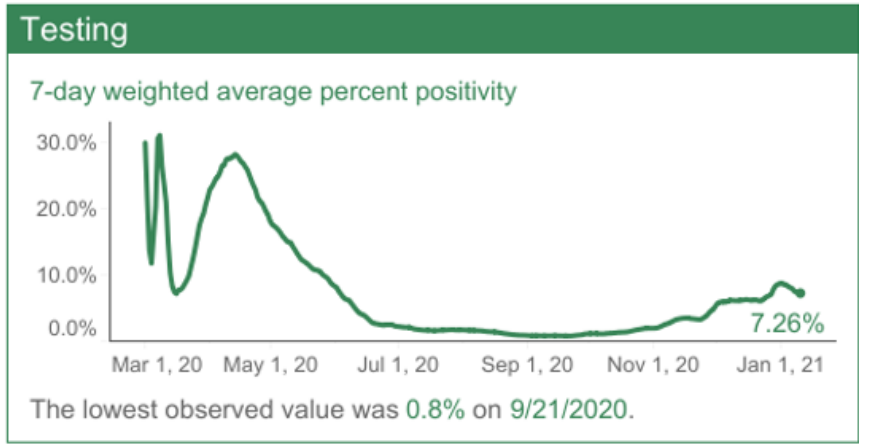
- Postpone or cancel ALL nonessential inpatient elective procedures and redeploy staff

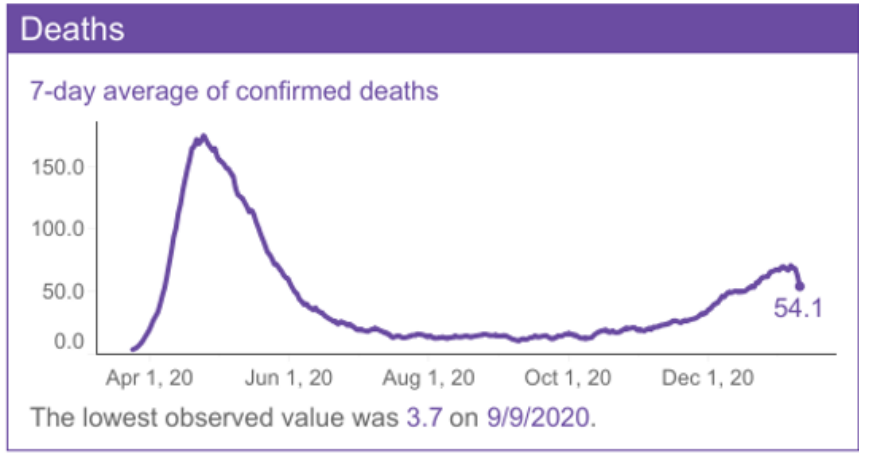
++ reduced capacity limits to allow greater distancing w/in businesses

- Reduce outdoor gathering to 25
- Reduce capacity to 25%
  - Gyms
  - Places of worship
  - Restaurants

MA DPH Dashboard – January 13th
5,278 New Infections Reported







Infections
- +5,278
- 427,752 total

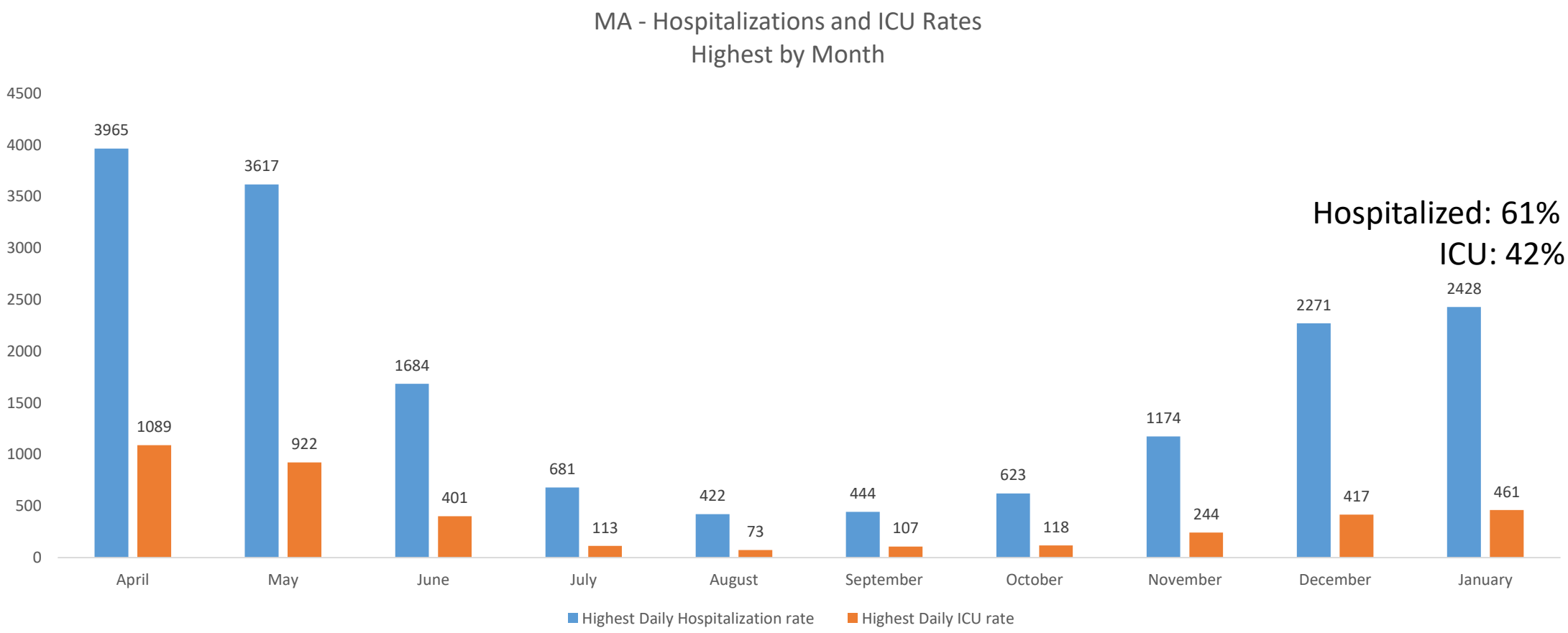
Deaths
- +86
- 13,082 total

Average age of COVID infected = 41 years; hospitalized = 73 years; deaths = 81 years

Active COVID Clusters by Exposure Setting Type December 6th – January 2nd

Exposure	New Clusters (Identified 12/06 – 01/02)			Ongoing Clusters (Cluster Identified Prior to 12/06 But Not Meeting Criteria for Closing)			Total		
Setting	Clusters	Confirmed Cases	Contacts	Clusters	Confirmed Cases	Contacts	Clusters	Confirmed Cases	Contacts
24/7 Congregate Settings	44	162	51	62	128	38	106	290	89
Child Care	155	478	671	157	100	355	312	578	1,026
Colleges & Universities	9	56	20	30	6	2	39	62	22
Corrections	3	89	3	17	1,080	54	20	1,169	57
Hospitals	18	173	15	30	223	74	48	396	89
Household	19,931	51,044		13,783	5,886		33,714	56,930	
Industrial Settings	20	119	61	59	170	69	79	289	130
K-12 Schools	30	121	243	59	64	56	89	185	299
Long Term Care Facilities	122	1,186		206	2,401		328	3,587	
Offices	7	19	2	9	2	0	16	21	2
Organized Athletics/Camps	14	63	171	19	12	62	33	75	233
Other	0	0	0	6	1	0	6	1	0
Other Food Establishments	6	30	29	11	25	1	17	55	30
Other Healthcare	21	127	57	27	50	14	48	177	71
Other Workplaces	20	87	30	27	38	41	47	125	71
Places of Worship	5	55	4	12	4	1	17	59	5
Recreation/Cultural	5	23	17	4	0	0	9	23	17
Restaurants & Food Courts	25	223	40	50	78	34	75	301	74
Retail & Services	15	41	24	23	23	11	38	64	35
Senior Living	52	396	33	79	440	195	131	836	228
Shelters	3	37	0	4	3	0	7	40	0
Social Gatherings	49	307	42	38	30	26	87	337	68
Travel & Lodging	1	2	0	2	10	0	3	12	0
Total	**20,555**	**54,838**	**1,513**	**14,714**	**10,774**	**1,033**	**35,269**	**65,612**	**2,546**

Massachusetts COVID – Hospitalization and ICU Rates Monthly view



Hospitalized: 61% peak
ICU: 42% peak

2,200 Hospitalized in MA on 1/12/2021

SARS CoV-2 Variants of Interest

- UK Variant B.1.1.7 or VUI 202012/01 – > 30 Countries
  - 71% (95% CI 67-75%) higher transmission than other variants
  - ? Higher SARS CoV-2 viral load
  - 14 mutations including
    - N501Y = receptor binding mutation also seen in S African variant
    - Deletion 69/70 that affects PCR assays that use Spike gene target
  - Unlikely to make vaccines less effective
- Houston Variant
  - 5,085 genomes sequenced in 2 waves
  - "All" strains in 2nd wave +Gly614 variant
    - Significantly higher viral loads in nasopharynx at diagnosis
- Response:
  - Mitigation (#MaskUpAmerica), Vaccination

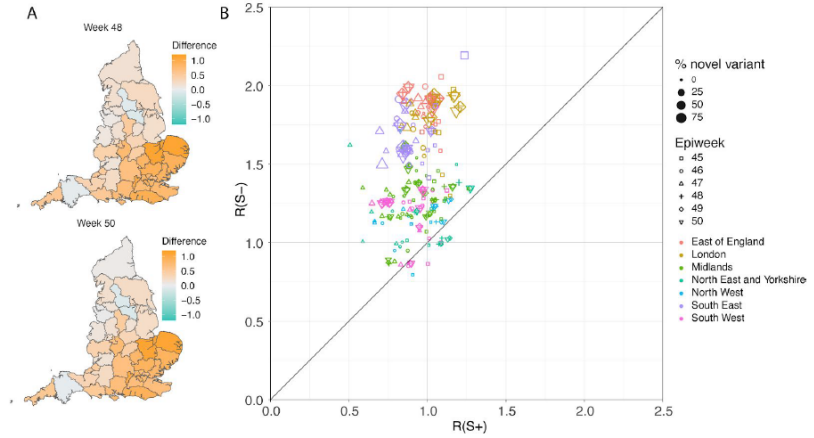
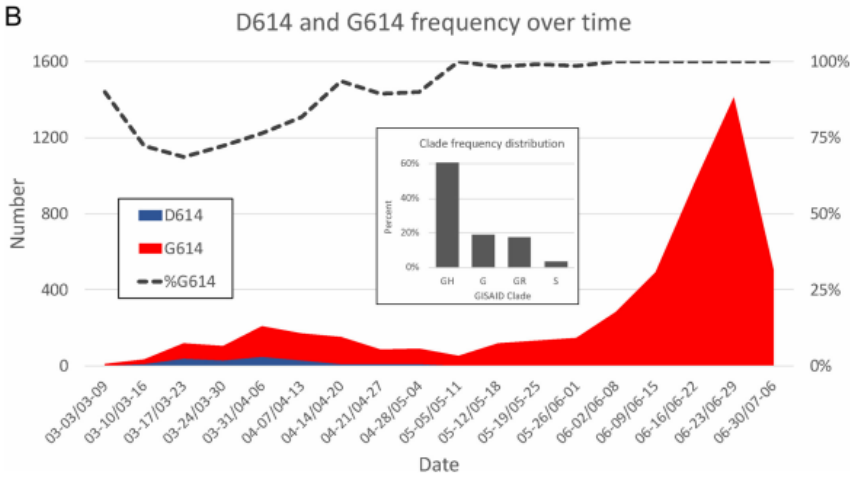
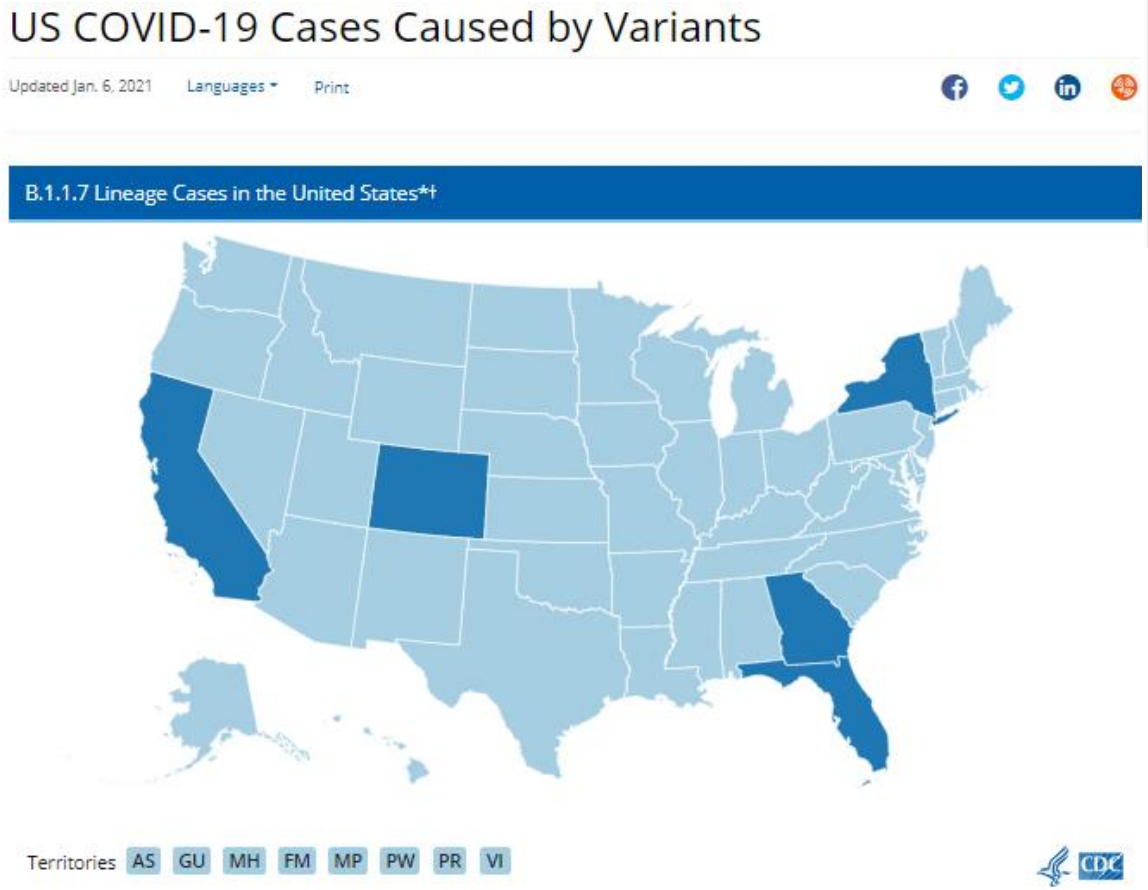


Figure 6: (A) Map of the difference in median R_t estimates for VOC and non-VOC variants for all STPs for weeks 48 and week 50. (B) Scatterplot of the reproduction numbers of VOC (S-) and non-VOC (S+) by STP and week. Point size indicates frequency of the VOC, while shape and colour signify week and NHS region, respectively. **VOC=Variant of Concern**

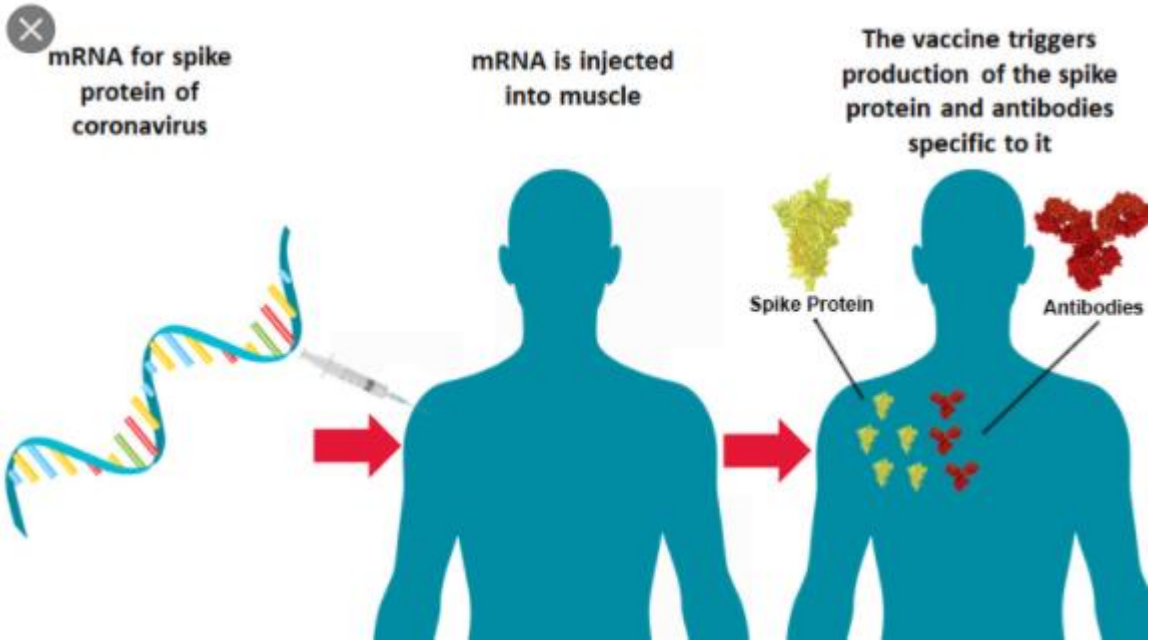


https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/covid-19/report-42-sars-cov-2-variant/
https://www.bmj.com/content/bmj/371/bmj.m4944.full.pdf;
file:///H:/COVID%2019/SARS%20CoV%202%20variant%20mBio-2020-Long-e02707-20.full.pdf

US B.1.1.7 Lineage Cases = 72



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

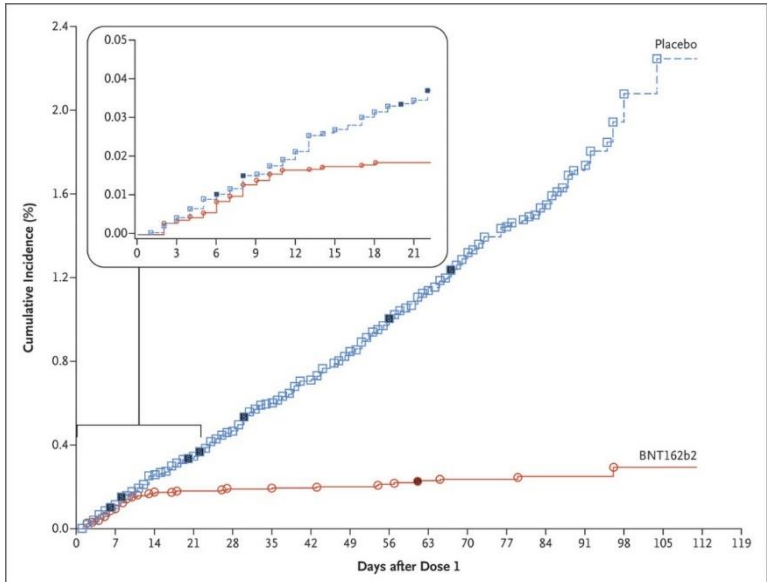


mRNA Vaccines

- Take advantage of process used by cells to make proteins in order to trigger an immune response
- mRNA technology is new but not unknown; it has been studied > a decade
- mRNA vaccines do NOT contain live virus
  - No risk of causing disease
- Vaccine mRNA never enters the nucleus of the cell and does NOT affect or interact with a person's DNA

BNT162b2 vs Placebo for SARS-CoV-2

- 43,448 treated
  - 21,720 BNT162b2 (30mcg dose) vs 21,728 placebo x 2 doses, 21 days apart
  - 38% + diverse backgrounds
  - 42% age > 55 years
  - **Primary endpoint: 170 confirmed, adjudicated symptomatic COVID cases 7 days+ p 2nd dose**
    - **162 placebo vs. 8 vaccine**
    - **95% efficacy (p < 0.0001)**
      - **Age > 65 years - 94% efficacy**
  - Severe COVID: 10 cases
    - **9 placebo vs. 1 vaccine**
- Most common AEs: fatigue 59%, headache 52%
- Fever p 2nd dose: 16% of younger vaccine recipients
- AEs more frequent in < 55 years
- Reactogenicity mild/moderate, more common in younger patients

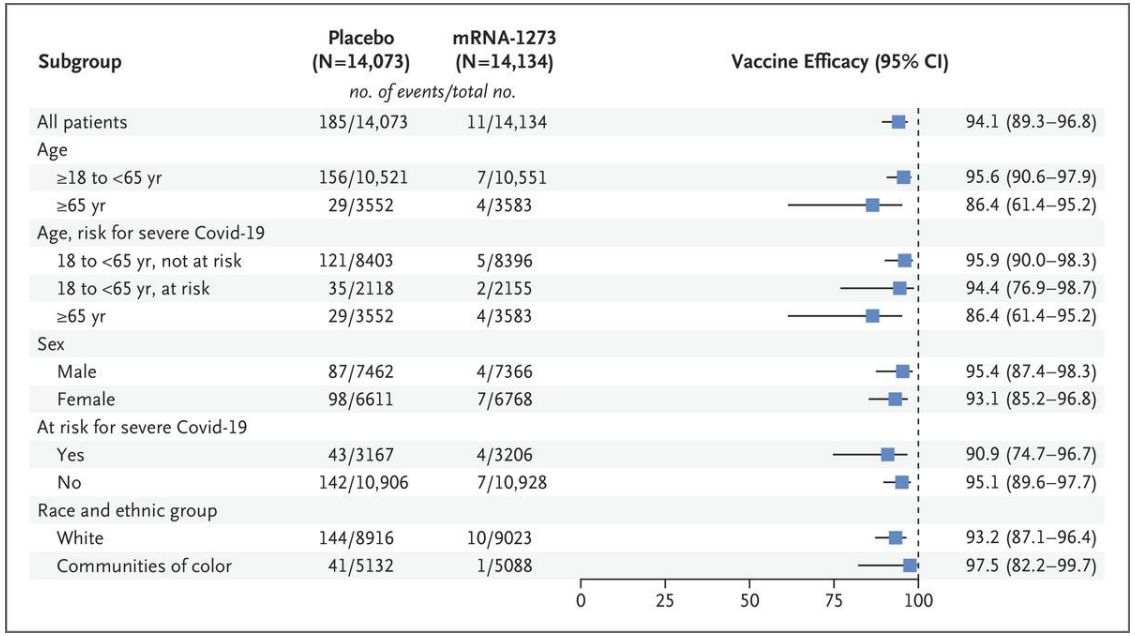


Efficacy End-Point Subgroup	BNT162b2, 30 μg (N=21,669) No. of participants	BNT162b2, 30 μg (N=21,669) Surveillance time person-yr (no. at risk)	Placebo (N=21,686) No. of participants	Placebo (N=21,686) Surveillance time person-yr (no. at risk)	VE (95% CI) percent
Covid-19 occurrence					
After dose 1	50	4.015 (21,314)	275	3.982 (21,258)	82.0 (75.6–86.9)
After dose 1 to before dose 2	39		82		52.4 (29.5–68.4)
Dose 2 to 7 days after dose 2	2		21		90.5 (61.0–98.9)
≥7 Days after dose 2	9		172		94.8 (89.8–97.6)

FP Polack et al. N Engl J Med 2020. DOI: 10.1056/NEJMoa2034577

mRNA-1273 vs Placebo for SARS-CoV-2

- 30,420 randomized
  - 15,210 each group, mRNA-1273 (100mcg) or placebo, x 2 doses, 28 days apart
  - 21% Hispanic/Latino
  - 25% age > 65 years
  - **Primary endpoint: symptomatic COVID-19 onset 14+ days after 2nd dose of vaccine**
    - **185 placebo vs. 11 vaccine**
    - **94.1% efficacy (p < 0.001)**
      - **Age > 65 years - 94% efficacy**
  - Severe COVID: 30 cases
    - **30 placebo vs. 0 vaccine**
- Reactogenicity mild/moderate, more common in younger patients



Subgroup	Placebo (N=14,073)	mRNA-1273 (N=14,134)	Vaccine Efficacy (95% CI)
	no. of events/total no.		
All patients	185/14,073	11/14,134	94.1 (89.3–96.8)
Age			
≥18 to <65 yr	156/10,521	7/10,551	95.6 (90.6–97.9)
≥65 yr	29/3552	4/3583	86.4 (61.4–95.2)
Age, risk for severe Covid-19			
18 to <65 yr, not at risk	121/8403	5/8396	95.9 (90.0–98.3)
18 to <65 yr, at risk	35/2118	2/2155	94.4 (76.9–98.7)
≥65 yr	29/3552	4/3583	86.4 (61.4–95.2)
Sex			
Male	87/7462	4/7366	95.4 (87.4–98.3)
Female	98/6611	7/6768	93.1 (85.2–96.8)
At risk for severe Covid-19			
Yes	43/3167	4/3206	90.9 (74.7–96.7)
No	142/10,906	7/10,928	95.1 (89.6–97.7)
Race and ethnic group			
White	144/8916	10/9023	93.2 (87.1–96.4)
Communities of color	41/5132	1/5088	97.5 (82.2–99.7)

LR Baden et al. N Engl J Med 2020

Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Early Release / Vol. 70
January 6, 2021

Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine — United States, December 14–23, 2020

CDC COVID-19 Response Team; Food and Drug Administration

- 1,893,360 doses Pfizer-BioNTech administered as of Dec 23, 2020
- 4,393 (0.2%) adverse events submitted to VAERS
  - 175 possible allergic reaction
    - Median 13 minutes post vaccination (2-150 minutes)
  - 21 anaphylaxis, 11/1,000,000 doses (flu and other vaccines closer to 1/million)
    - 17 in persons with prior allergy
      - 7 prior anaphylaxis
    - 20/21 had follow-up information, all returned home
- 83 non-anaphylaxis allergic reactions
  - Onset within 0-1 day, median 12 minutes post vaccination (< 1 min – 20 hours)
  - med age 43 years (18-65), 75 (90%) women
  - 72 (87%) non-serious
  - Pruritis, rash, itchy/scratchy throat, mild respiratory symptoms

MA COVID-19 Vaccine Roll-Out

Phase One (December 2020-February 2021):

In order of priority:

1. Clinical and non-clinical healthcare workers doing direct and COVID-facing care
2. Long term care facilities, rest homes and assisted living facilities
3. Police, Fire and Emergency Medical Services
4. Congregate care settings (including shelters and corrections)
5. Home-based healthcare workers
6. Healthcare workers doing non-COVID facing care

https://www.mass.gov/info-details/covid-19-vaccine-distribution-timeline-phase-overview

MA COVID-19 Vaccine Roll-Out

- Phase 2 (February – March 2021; listed in order of priority):
  1. Individuals age 75+ (added January 4th)
  2. Individuals with 2+ co-morbid conditions (high risk for COVID-19 complications)
  3. Early education, K-12, transit, grocery, utility, food and agriculture, sanitation, public works and public health workers
  4. Adults 65+
  5. Individuals with one co-morbid condition
- Phase 3 (Starting in April 2021):
  - Vaccine is expected to be available to the general public.

https://www.mass.gov/info-details/covid-19-vaccination-program

Action Needed NOW!

- **Wear a Mask**
- **Get vaccinated!!**

OPINION

Boston infectious disease specialists: Our New Year's resolutions

As we ring in a new year, here are our resolutions; please consider joining us.

By Boston Infectious Disease Specialists Updated December 31, 2020, 1:36 p.m.