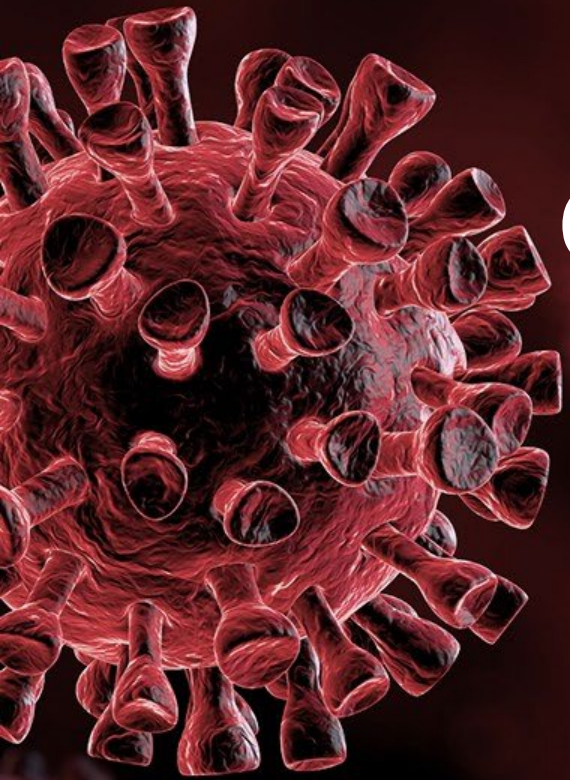
NORTHEAST
BUSINESS GROUP ON HEALTH

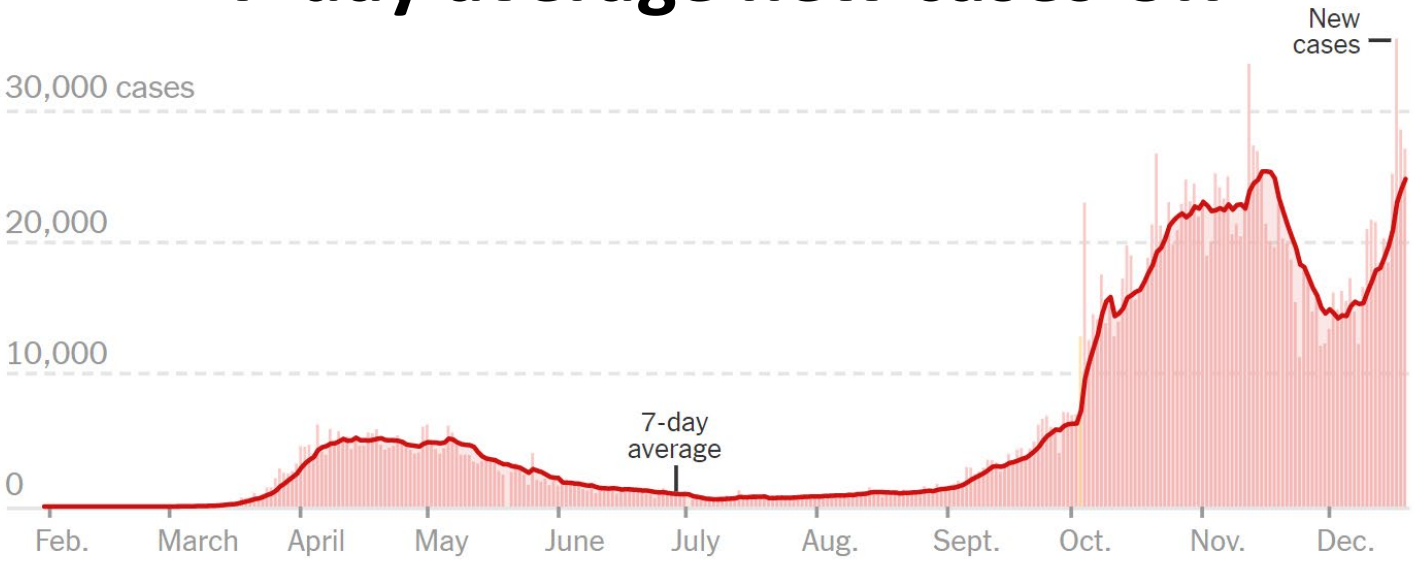


COVID-19 Update

Dr Mark Cunningham-Hill
Medical Director NEBGH

Monday December 21st 2020

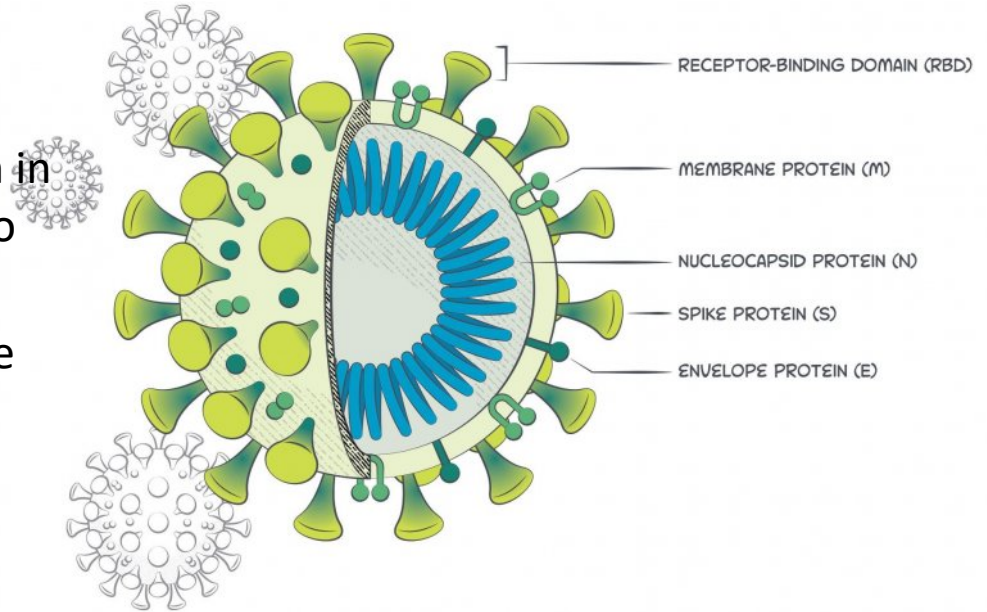
7-day average new cases UK



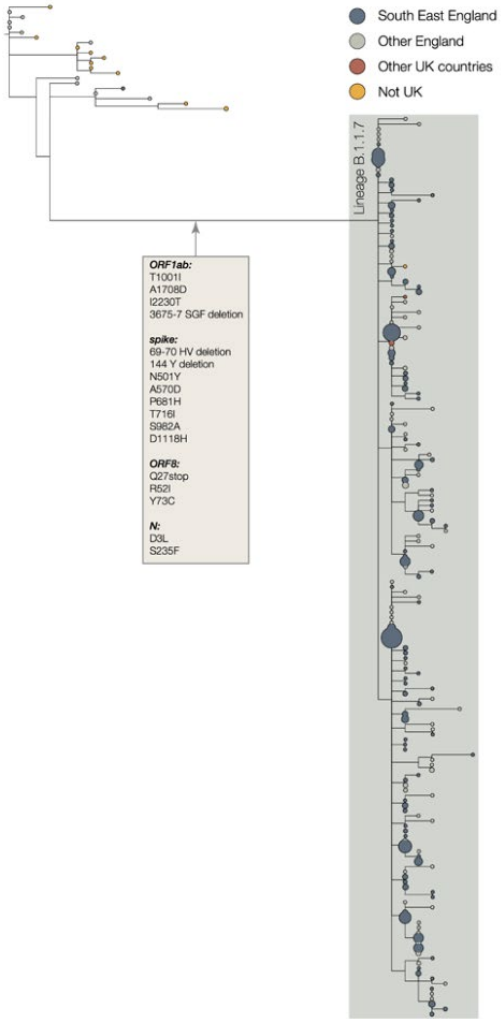
	TOTAL REPORTED	ON DEC. 19	14-DAY CHANGE
Cases	2 million+	27,052	+72% ↗
Deaths	67,401	534	+2% →

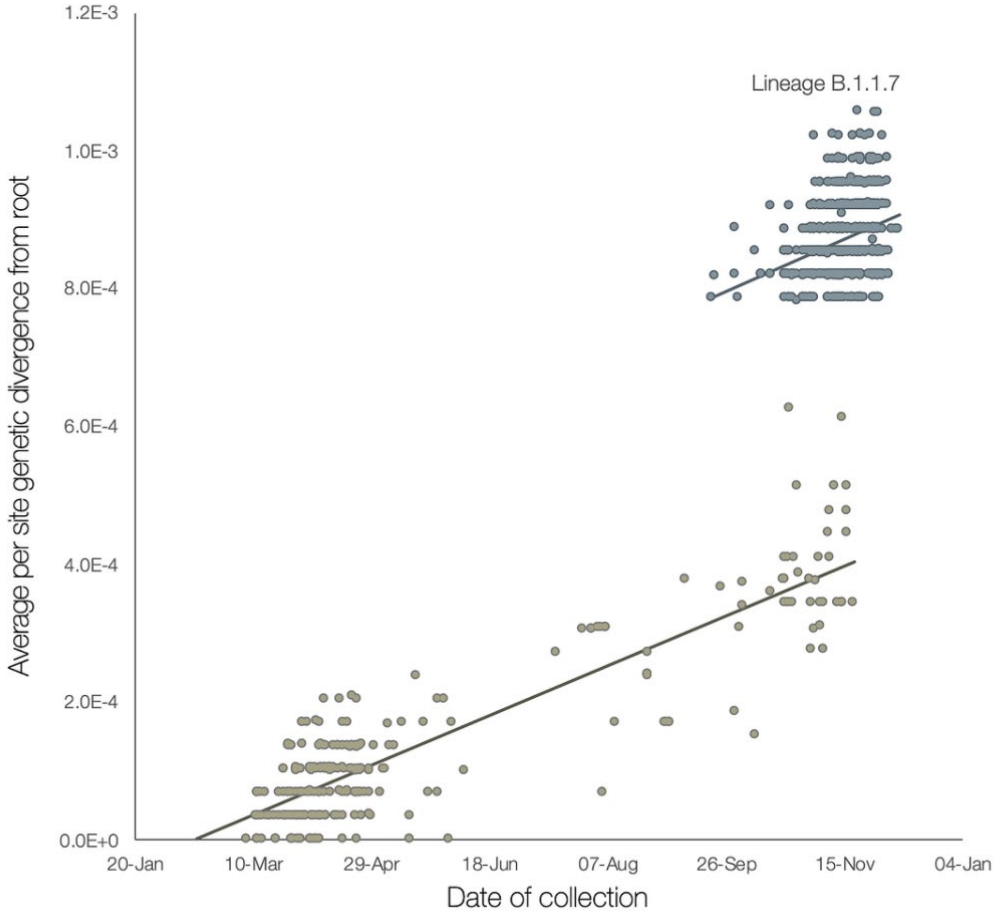
New coronavirus variant is identified in UK

- 23 mutations in the receptor binding area of the spike protein
- Most significant is an N501Y mutation in the spike protein that the virus uses to bind to the human ACE2 receptor
- Appears to be 70% more transmissible from human to human
- Not known if more harmful
- Surges in cases observed in Kent and eastern London → Tier 4 lockdown
- Current vaccine likely to still be effective



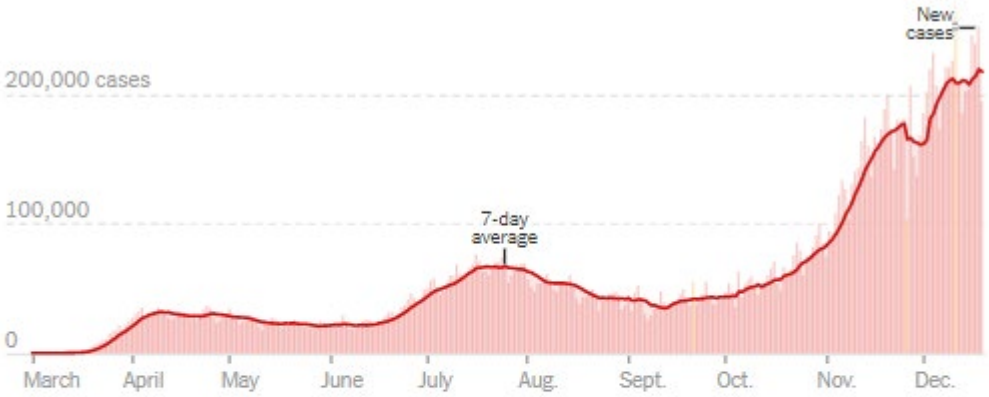
https://www.bmj.com/content/371/bmj.m4857



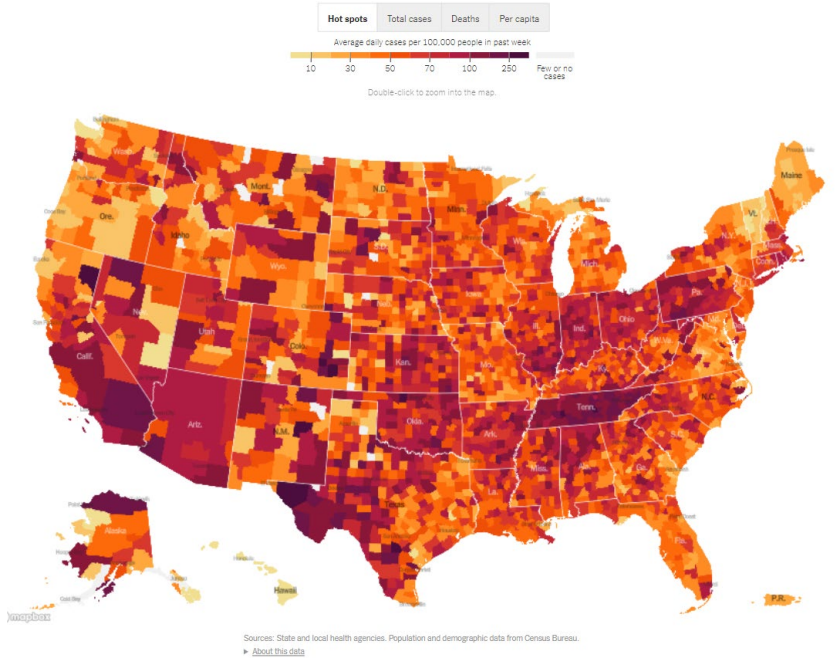


https://virological.org/t/preliminary-genomic-characterisation-of-an-emergent-sars-cov-2-lineage-in-the-uk-defined-by-a-novel-set-of-spike-mutations/563

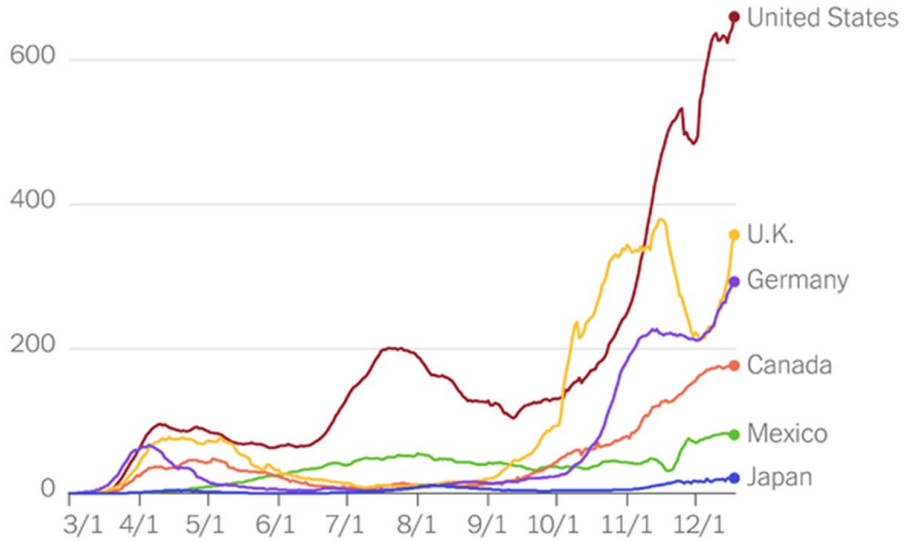
USA



	TOTAL REPORTED	ON DEC. 19	14-DAY CHANGE
Cases	17.7 million+	193,947	+13% →
Deaths	317,120	2,628	+21% →
Hospitalized		113,929	+14% →

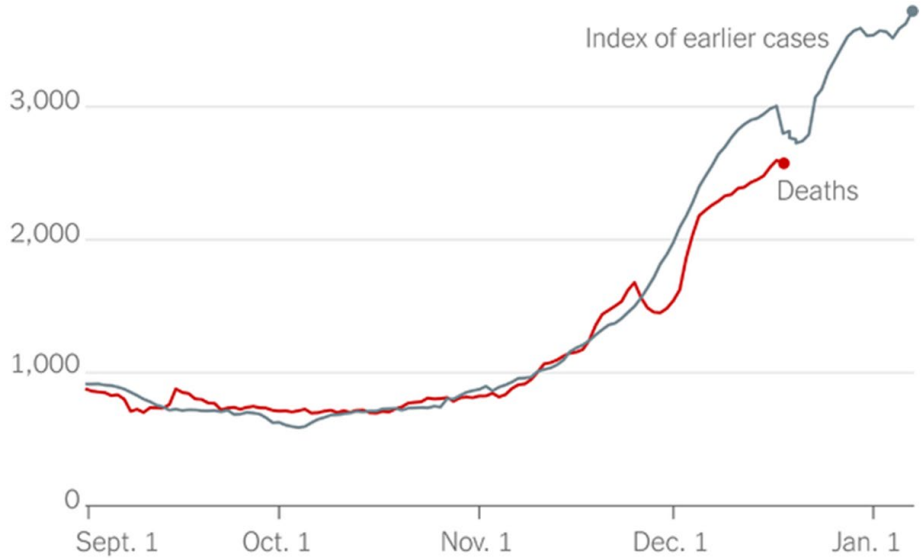


Daily new coronavirus cases per million residents



By The New York Times | Sources: Hospitals and health agencies, World Bank

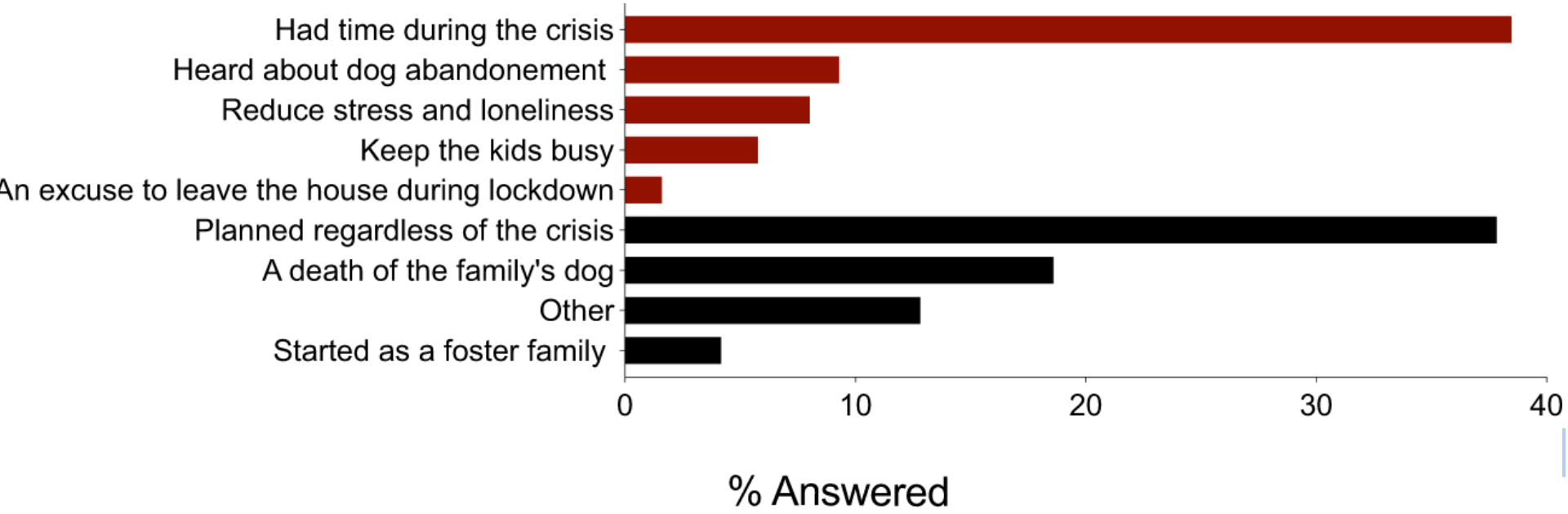
How new coronavirus cases predict deaths three weeks later



By The New York Times | Source: Hospitals and health agencies

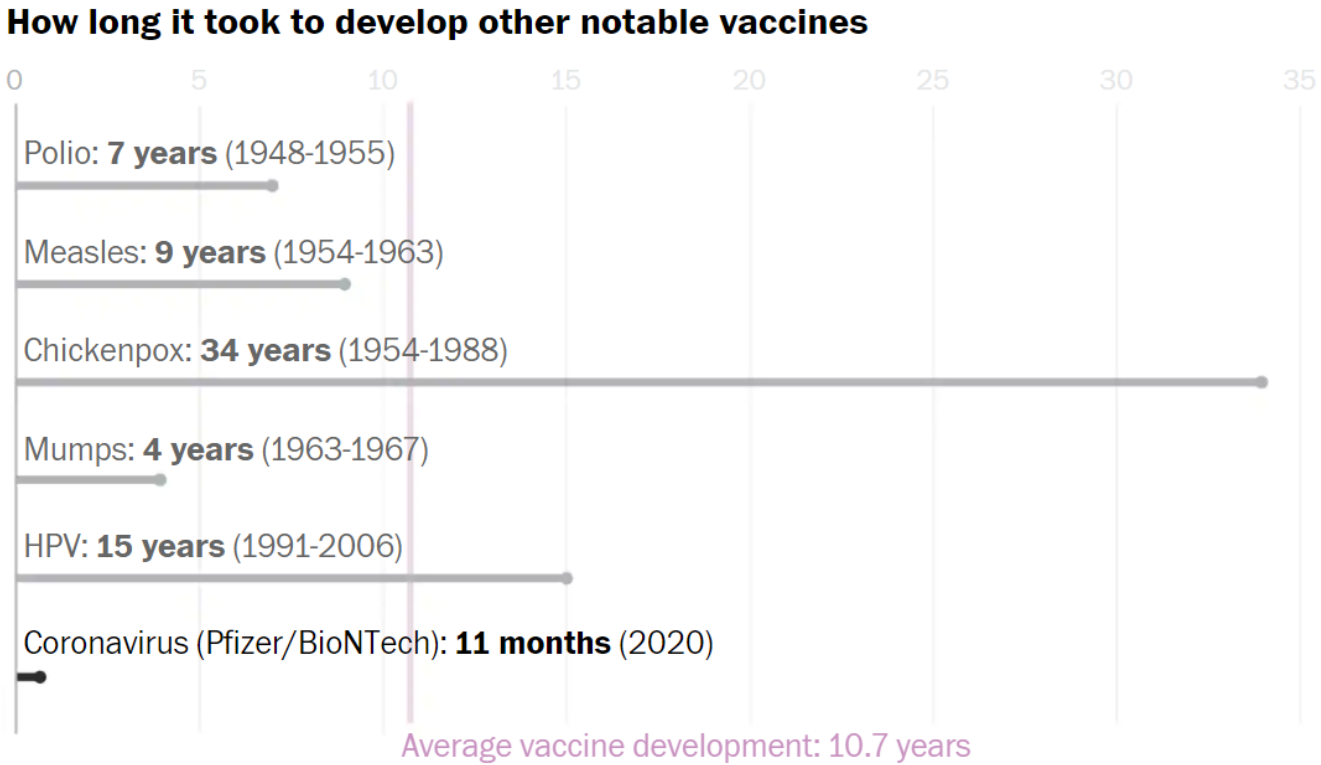
Venice canals are finally clear, two months of pollution reduction in China has probably saved 77,000 lives, and New York researchers found a 50% drop in carbon monoxide emissions. For the first time in decades, the air is so clear the Himalayan mountains are now visible.

Adopting a dog



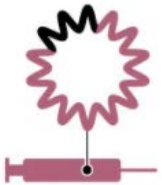
Disruptive Innovation

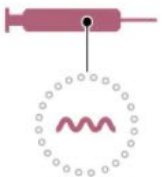
Vaccines


How long it took to develop other notable vaccines
0
5
10
15
20
25
30
35
Polio: 7 years (1948-1955)
Measles: 9 years (1954-1963)
Chickenpox: 34 years (1954-1988)
Mumps: 4 years (1963-1967)
HPV: 15 years (1991-2006)
Coronavirus (Pfizer/BioNTech): 11 months (2020)
Average vaccine development: 10.7 years

DNA vaccine

Spike gene on DNA





mRNA in lipid shell

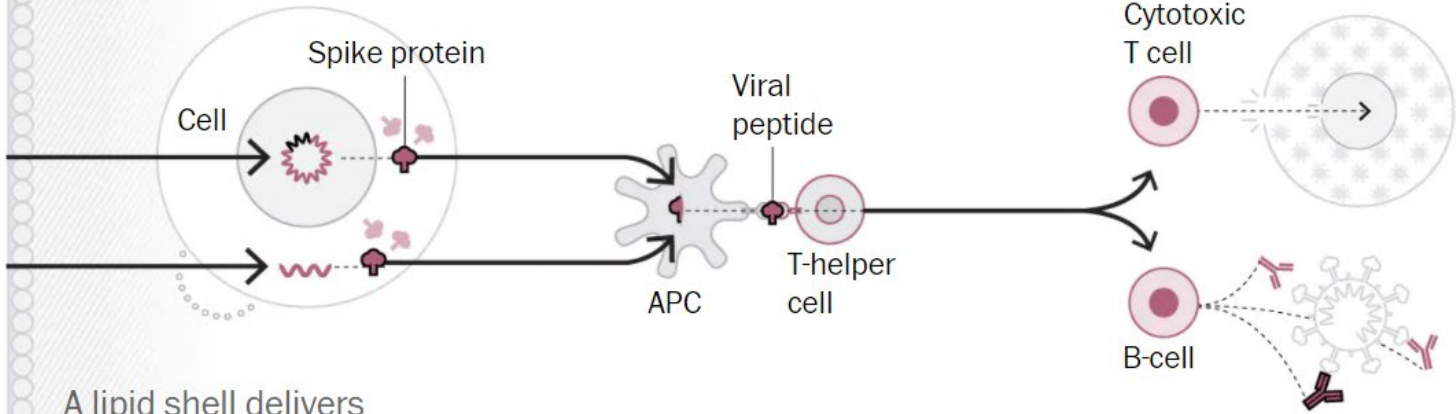
RNA vaccine

An electric pulse allows DNA into the cell's nucleus where it forms mRNA, then creates spike proteins

A lipid shell delivers mRNA into the cell, where it is used to produce proteins

Antigen-presenting cells (APCs) consume the viral proteins and pass viral peptides to T-helper cells

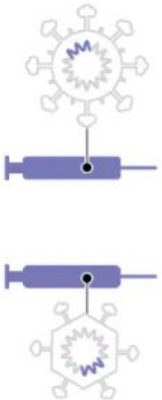
Cytotoxic T cells may eliminate virus-infected cells



Antibodies from B-cells may block the virus

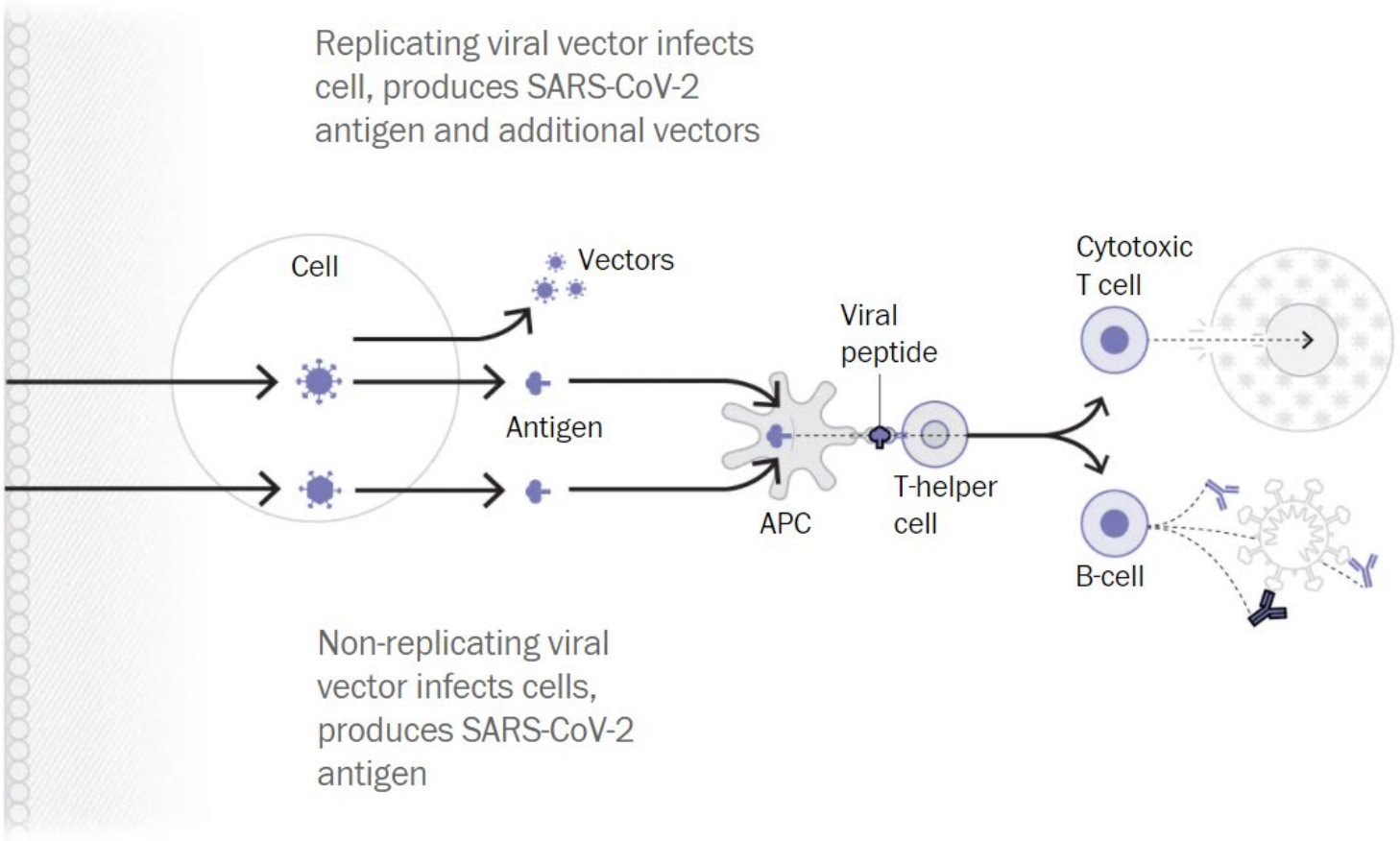
Replicating viral vector

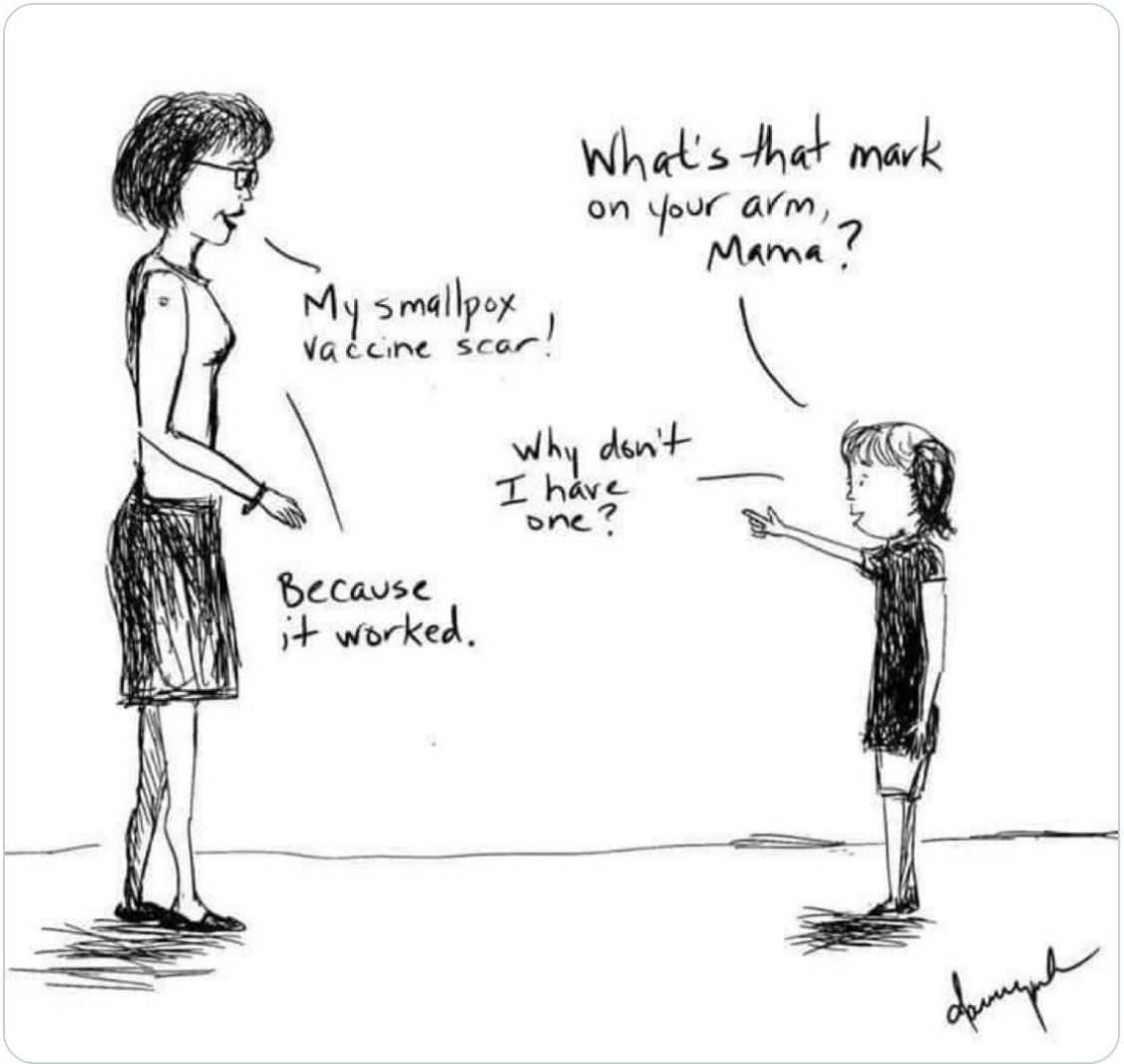
SARS-CoV-2 gene in a different virus



SARS-CoV-2 gene in a different virus

Non-replicating viral vector

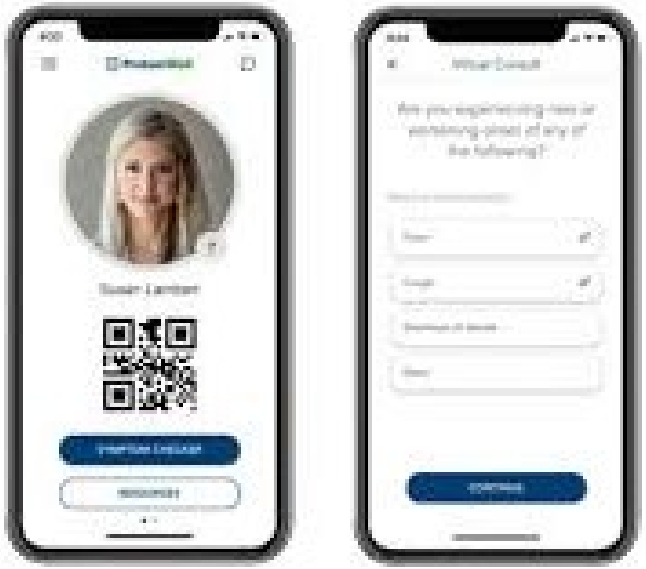



What's that mark on your arm, Mama?
My smallpox vaccine scar!
Why don't I have one?
Because it worked.

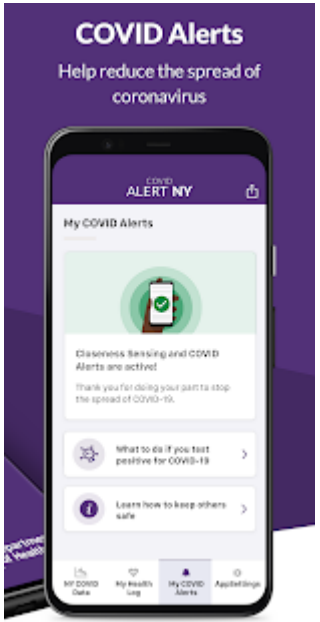
Testing

- PCR – scale, speed, accuracy, sample
- Antibody testing – rapid, scalable
- Antigen testing

Screening & Contact Tracing



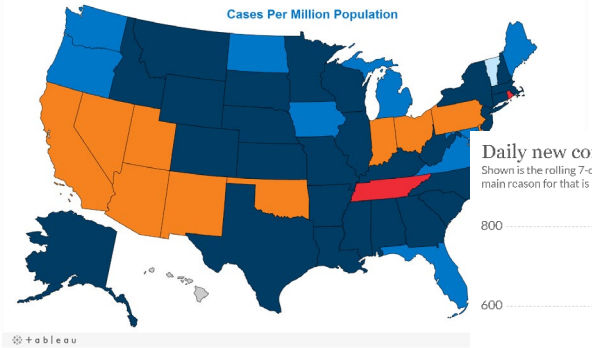
Screening Tools



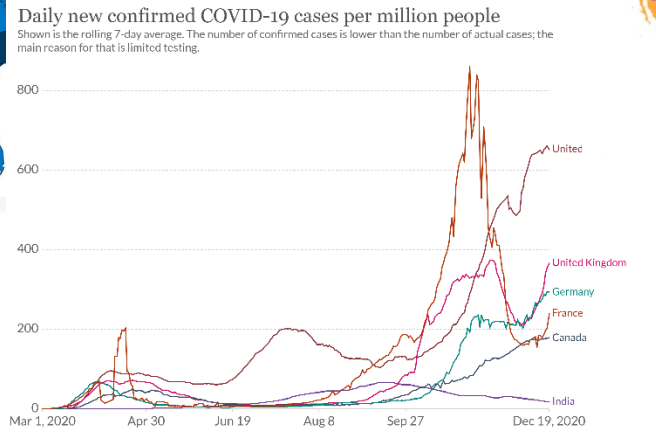
Community contact tracing

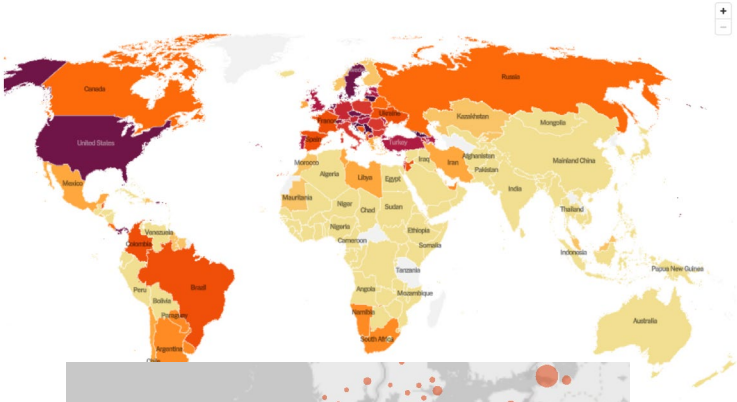
Wearable devices for the workplace

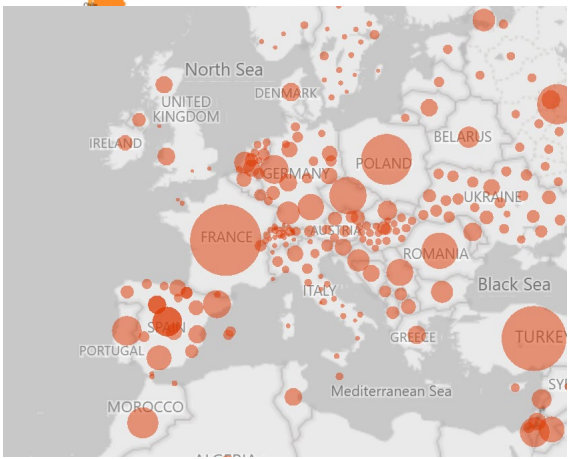
Data, Data, Data



	TOTAL CASES	PER 100,000	DAILY AVG. IN LAST 7 DAYS	▾ PER 100,000	WEEKLY CASES PER CAPITA FEWER … MORE
Lithuania	112,359	4,028	2,739.6	98.2	Jan. 22 … Dec. 19
Liechtenstein	1,758	4,637	32.7	86.3	
Georgia	208,638	5,592	2,843	76.2	
San Marino	2,107	6,236	25	74	
Serbia	300,062	4,298	5,013	71.8	
Croatia	194,962	4,767	2,923.4	71.5	
Luxembourg	43,728	7,195	424.7	69.9	
Sweden	367,120	3,605	6,717.4	66	
Slovenia	105,899	5,122	1,361.7	65.9	
United States MAP »	17,799,669	5,364	216,705.3	65.3	







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www.nebgh.org

New Ways of Working

- Pivoting to work from home
  - Maintaining or increasing productivity
  - Switch to virtual platforms
  - Recruiting in a virtual world for a remote workplace
  - Rethink physical workspaces – reduced footprint
  - A new culture of collaboration
  - Streamlined decision making processes
  - Engagement in online events
  - Break in routine, time to restructure life
  - Work-life balance
  - People are sleeping better

https://www.shrm.org/resourcesandtools/hr-topics/people-managers/pages/coronavirus-silver-linings-.aspx

Society/Community Benefits

- Increase in hobbies
- Less spending on needless consumer goods
- New understanding of personal hygiene
- Generosity and community-mindedness is spiking
- Appreciation of public health and epidemiologists!

Appreciation of essential workers

“There’s no place like home for the holidays,”

- Stick to your “bubble”
- Use technology to connect with friends
- Meet outdoors
- Wear your mask
- Keep your distance
- Wash those hands
- Eat and be merry!


Questions