

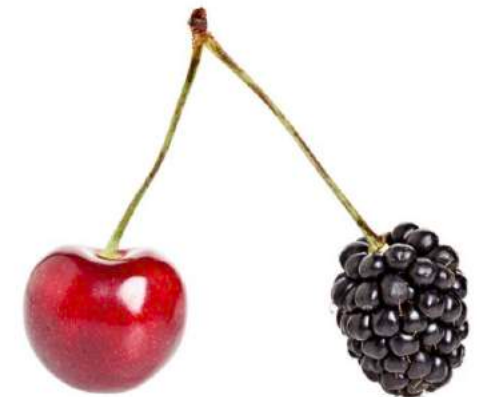
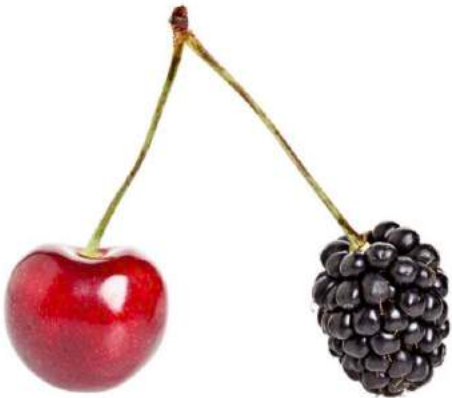


AFRICA AND COVID-19: LESSONS FROM OTHER REGIONS

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Richard.Mariita@microbialbiosolutions.com

Saturday 16th May 2020, 7-9 am New York



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Coping: walks..modeling..dance..exercises..planting



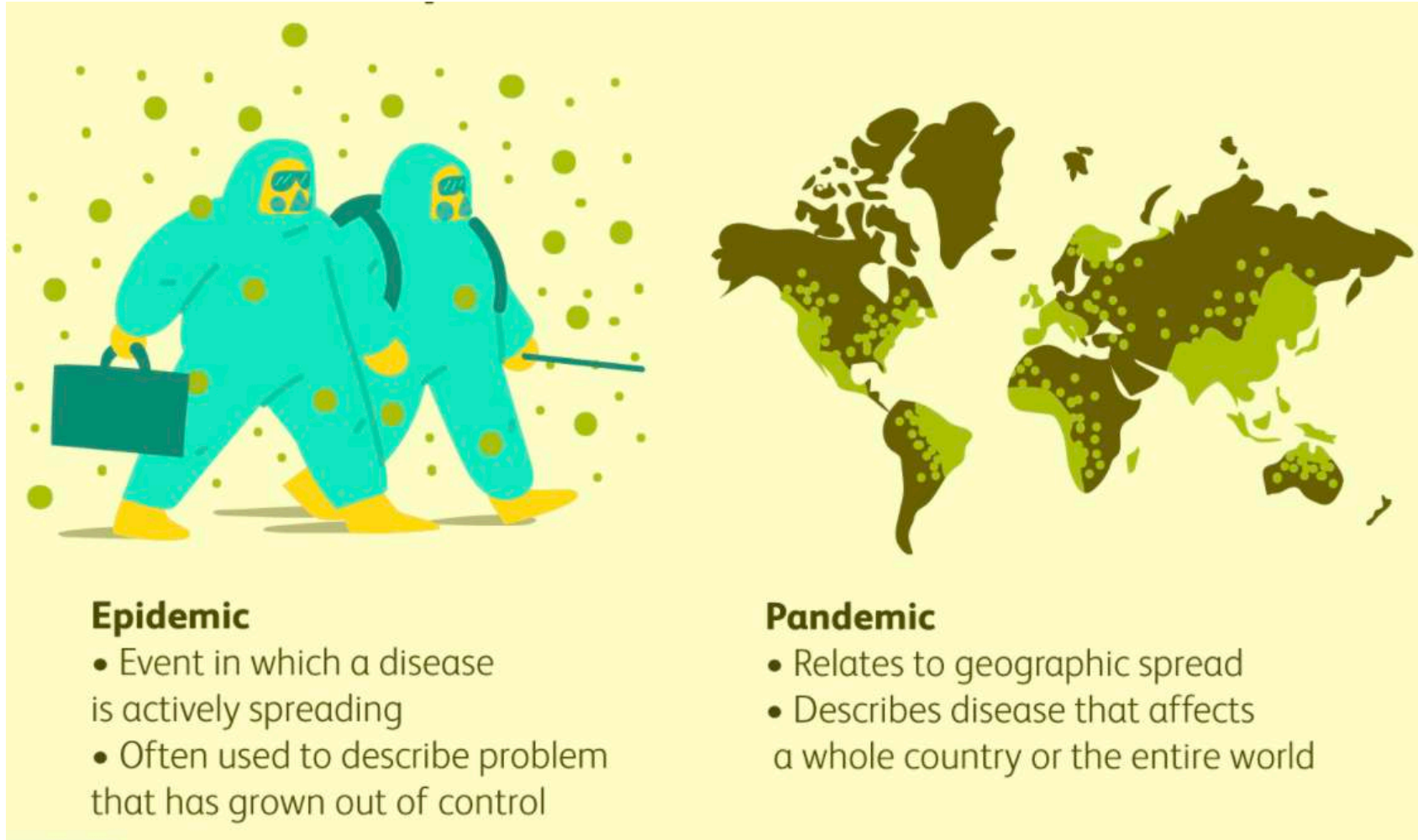


Disclosure

- The lecture does **NOT represent** the views of any company or institution.
- Personal professional opinion
- Not endorsing any product
- Microbial BioSolutions a New York State registered sole proprietorship located in my basement to occupy my weekends (Thinking cubicle)

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PANDEMIC



EBOLA=EPIDEMIC/OUTBREAK

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What have we learned?

Bill Gates, Who Has Warned About
Pandemics For Years, On The U.S.
Response So Far

April 9, 2020 · 4:04 PM ET
Heard on All Things Considered

HEIDI GLENN

NPR

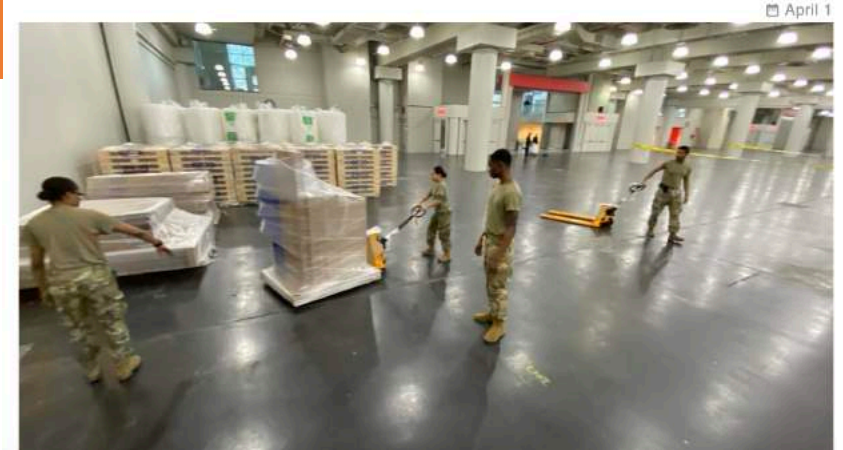
5-Minute Listen



It was a matter of when not if.....

<https://www.militarytimes.com/>

**Military memo from 2017 warned of pandemic's
impact on combat readiness and risk of war**

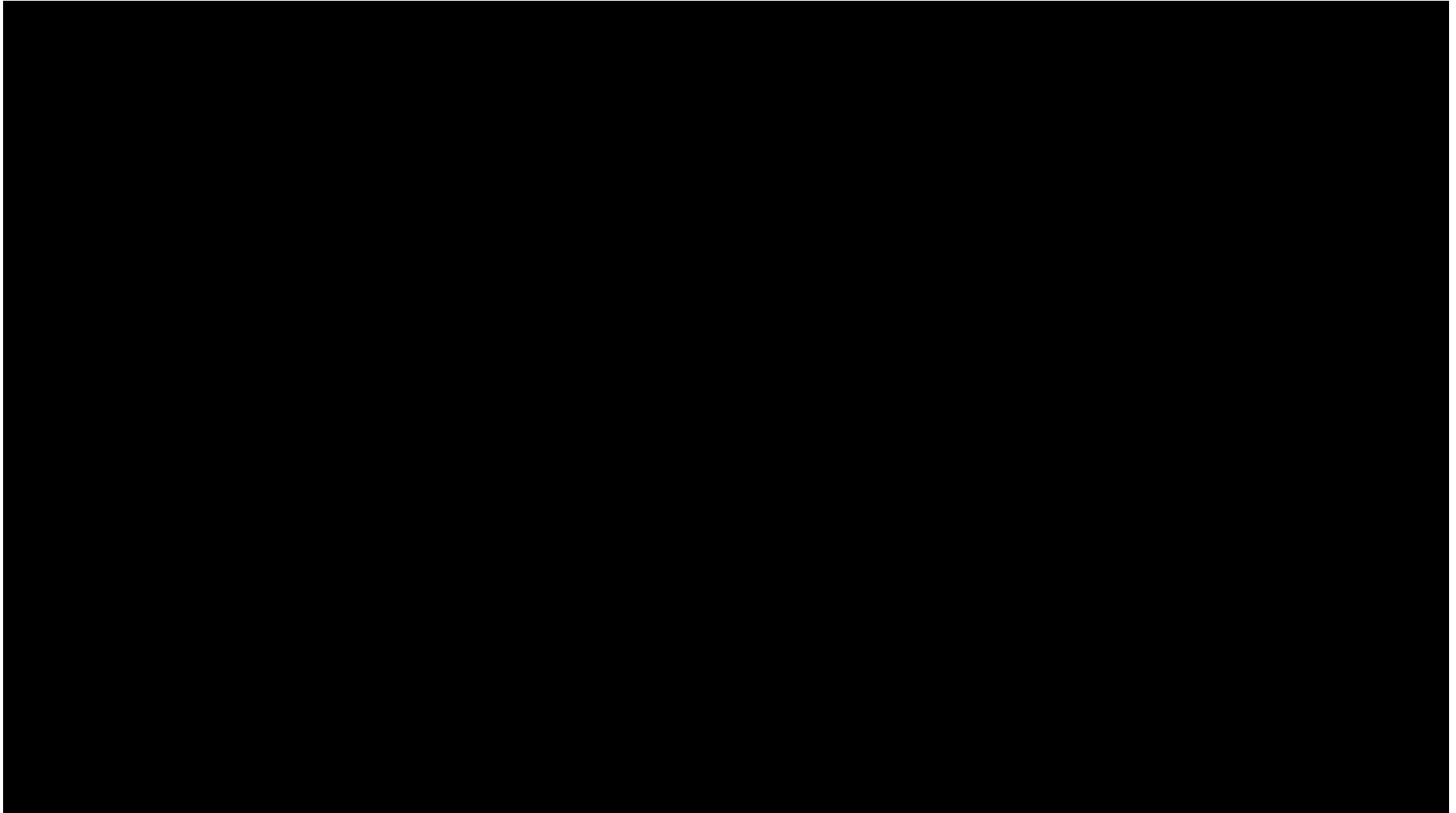


Movies

- >Contagion 2011
- >Pandemic 2016
- >Outbreak 1995

What have we learned?

https://www.youtube.com/watch?time_continue=1&v=6Af6b_wyiwl&feature=emb_logo



Pandemics and politics

Beware of politics (Origin does not matter)

This will not be the last pandemic

Use playbooks

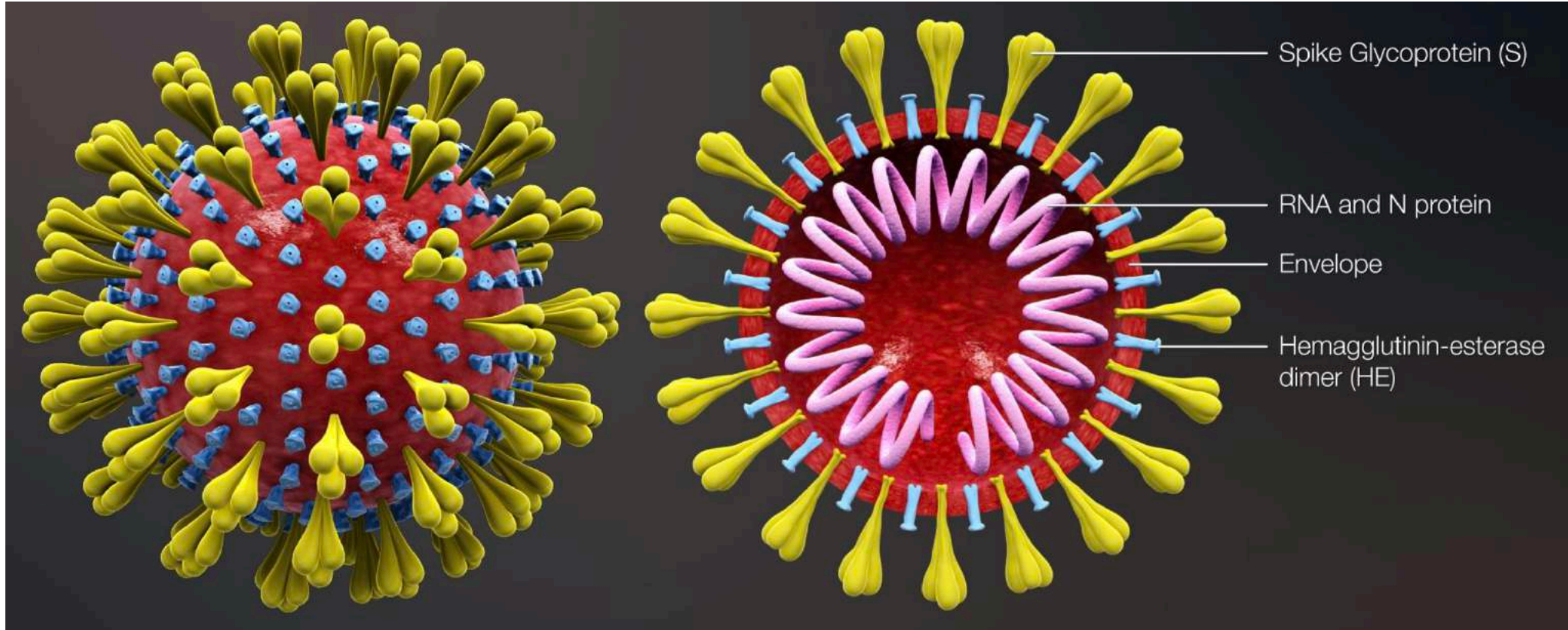
Climate change. Uncharacterized viruses

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CORONAVIRIDAE

+ssRNA



-4 subgroupings (α , β , γ & δ)

-Alphacoronavirus : HCoV-229E, HCoV-NL63; Pig, dog, and cat CoVs • Betacoronavirus : HCoV - OC43, HCoV - HKU1, HCoV-SARS, MERS-CoV, SARS CoV-2, rodent pig, bats and cattle CoVs • Gamma and Delta : Birds and mammals

-~30 kb

Size

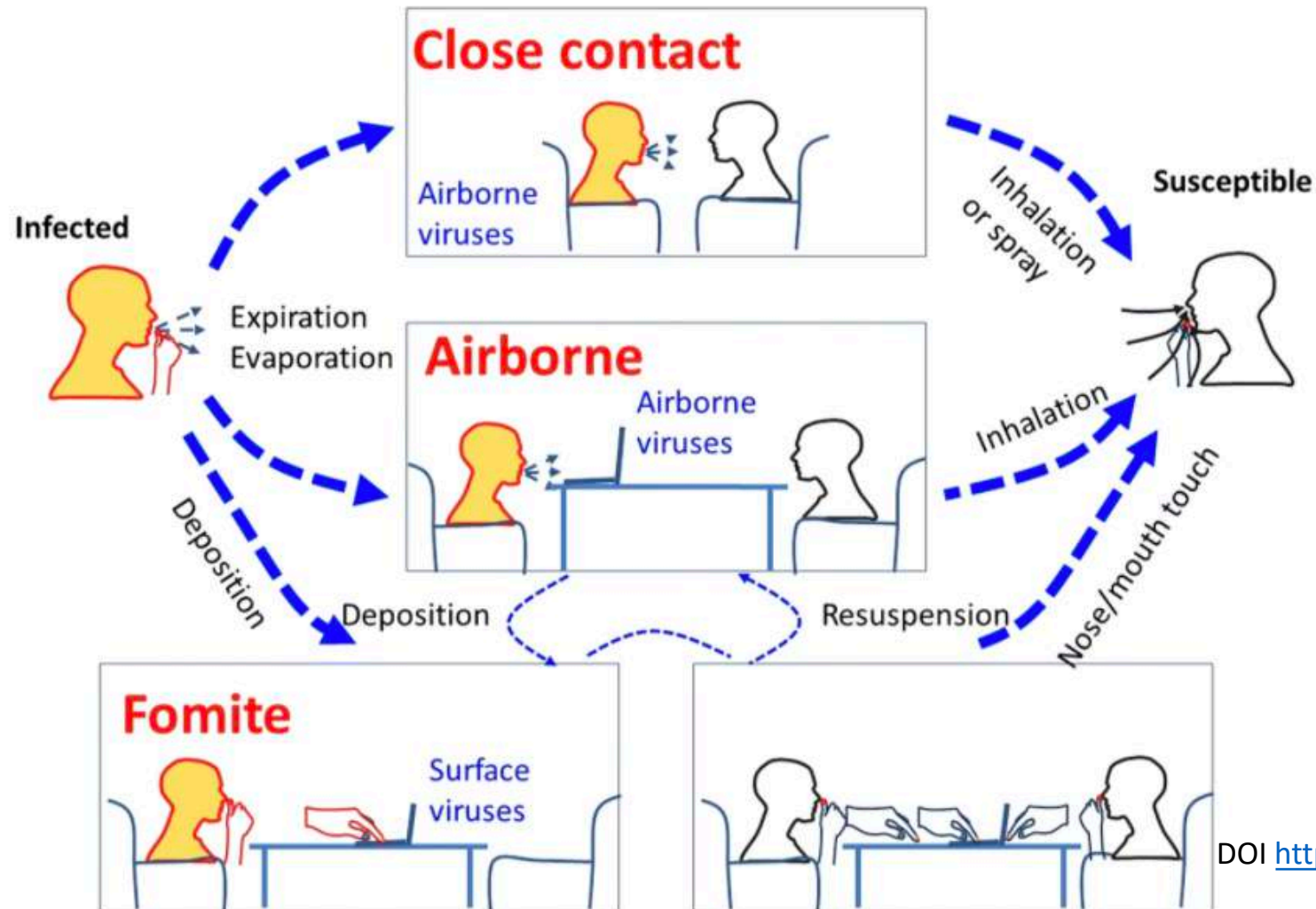
- Covid-19 size: (100-160 nm) = 0.1-0.16 μM
- What is the pore size of n95?



<https://www.nature.com/articles/d41586-020-00502-w>

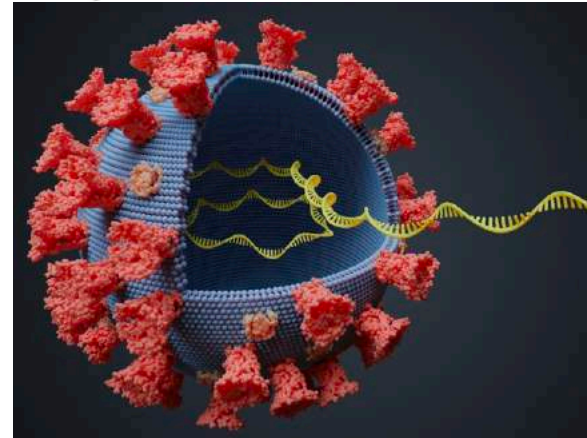
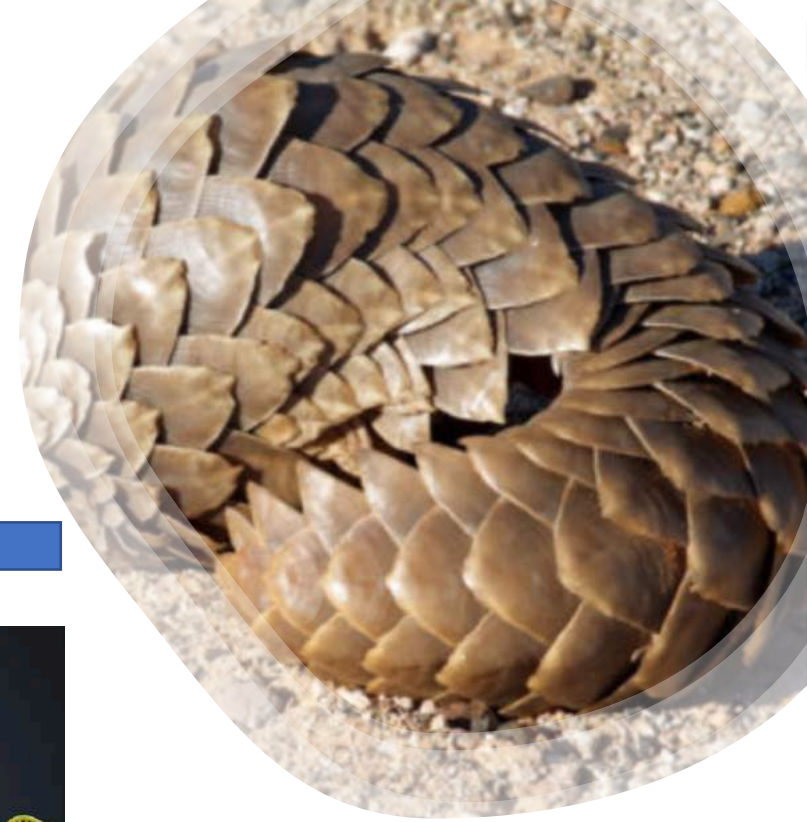
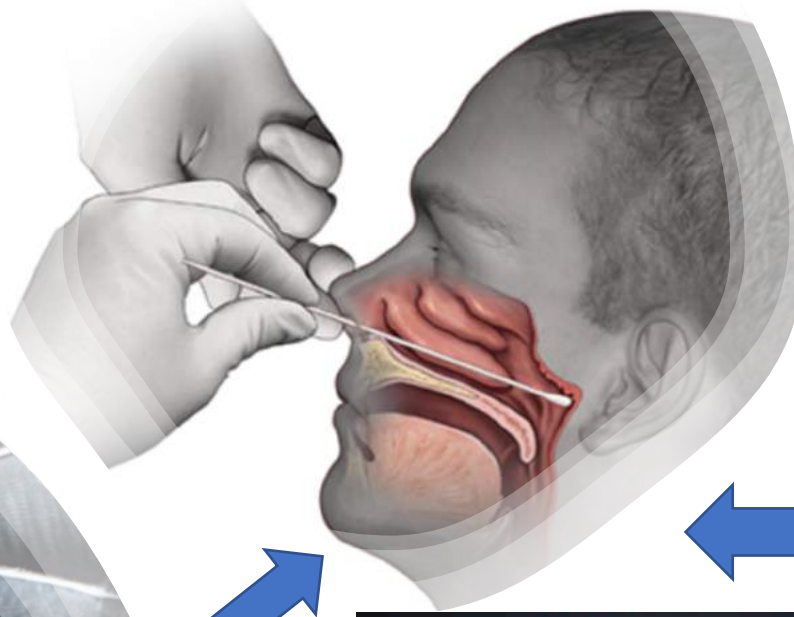


Infection route



EYES?

BATS AND INTERMEDIATE HOSTS



Pongolins:

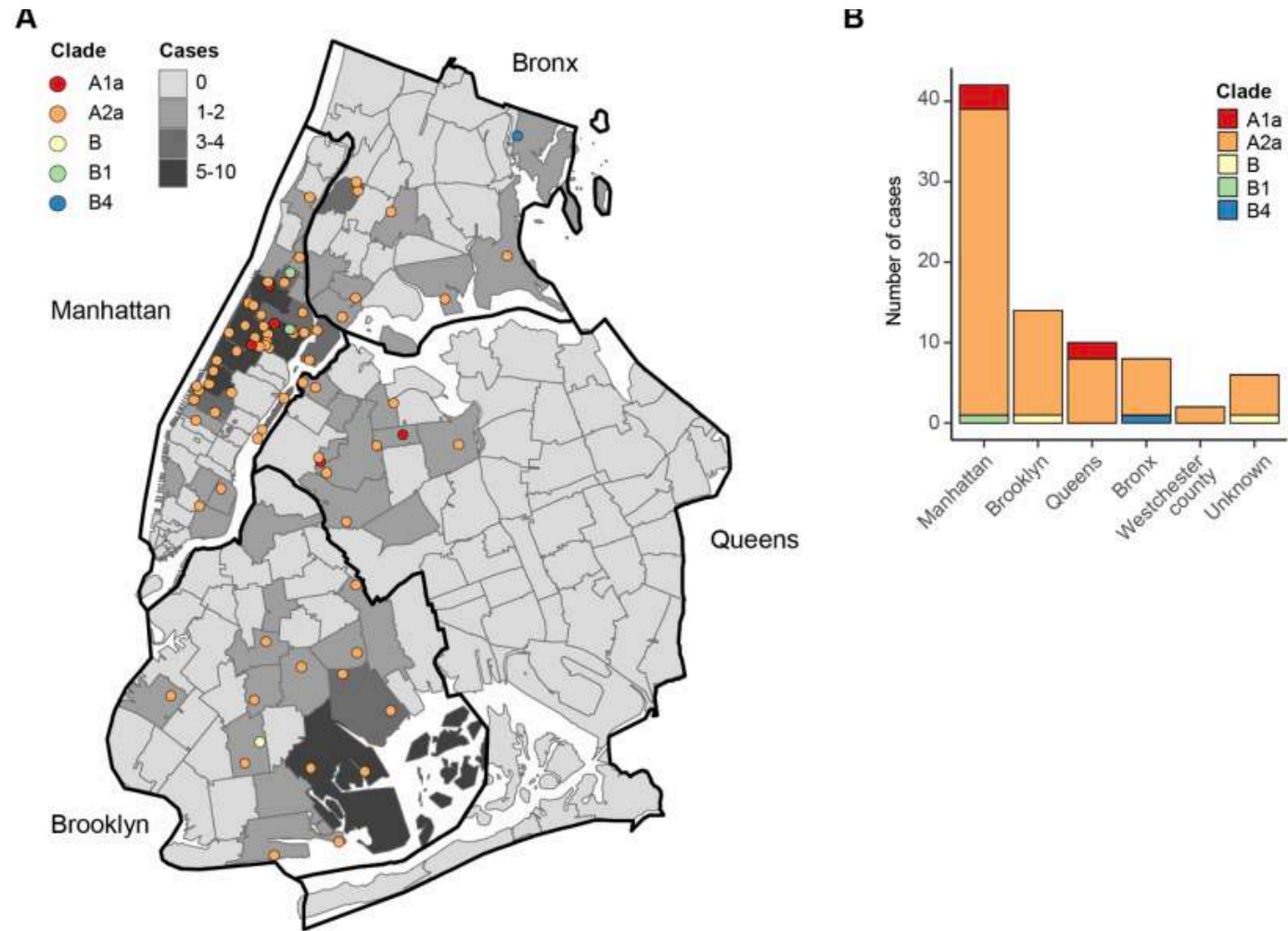
<https://www.nature.com/articles/s41586-020-2169-0>

The Wall Street Journal

Symptoms

- **Symptoms that may appear 2-14 days after exposure to the virus:**
 - Cough
 - Shortness of breath or difficulty breathing
- Or at least two of the following:
 - Fever
 - Chills
 - Repeated shaking with chills
 - Muscle pain
 - Headache
 - Sore throat
 - **New loss of taste or smell**

Why has New York been worst hit?



Our strength was our weakness

- Visits/JFK
- Housing
- Public transit
- Comorbidity
- United Nations
- NYSE
- Focused on pandemic source

Gonzalez-Reiche et al., 2020: doi: <https://doi.org/10.1101/2020.04.08.20056929>

Perspectives

Mathare slum



Kibera slum



Refugee camps



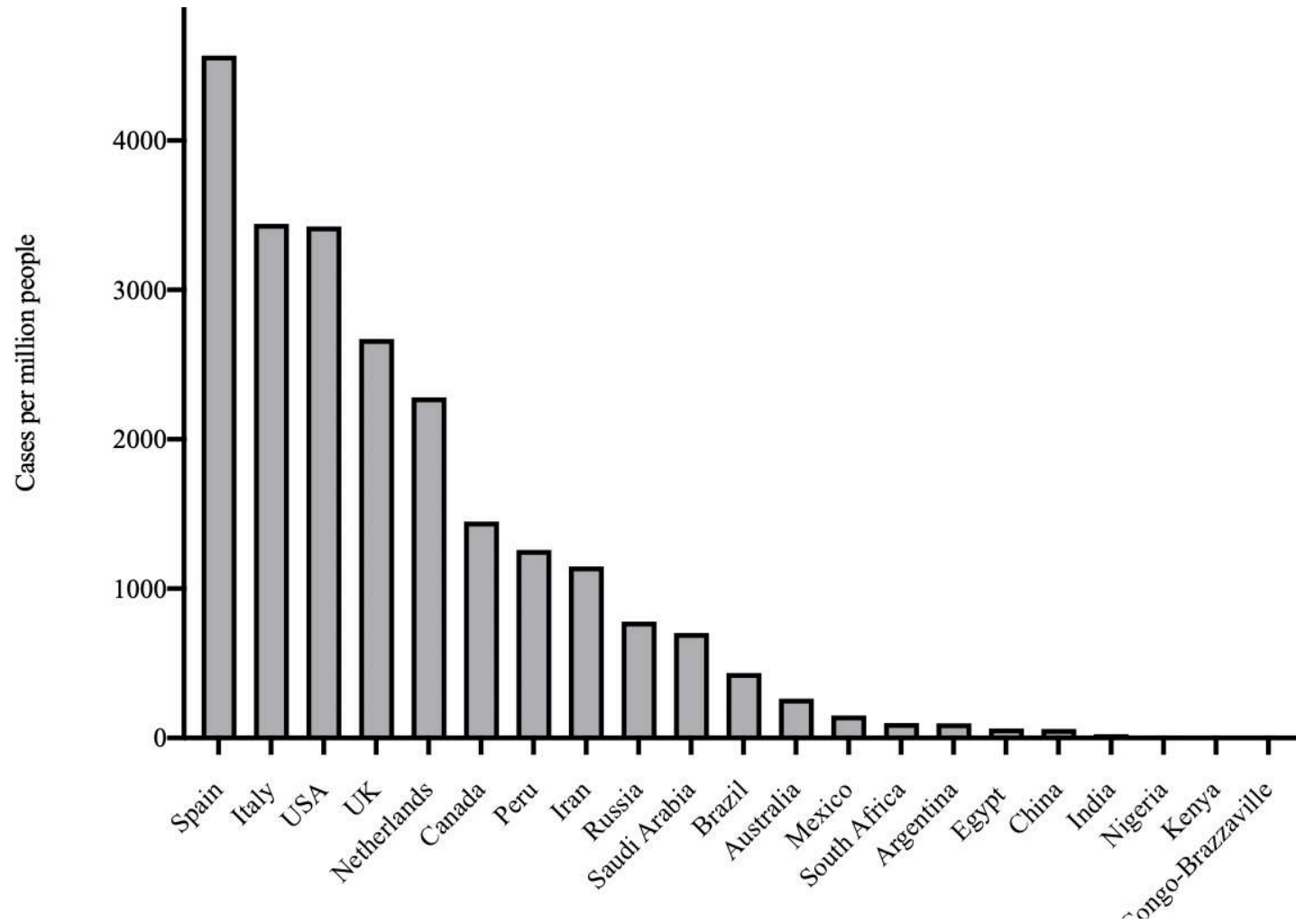
- Syria
- Mongolia
- Pakistan
- Somalia
- Palestine

Reported Incidences as of End of April 2020



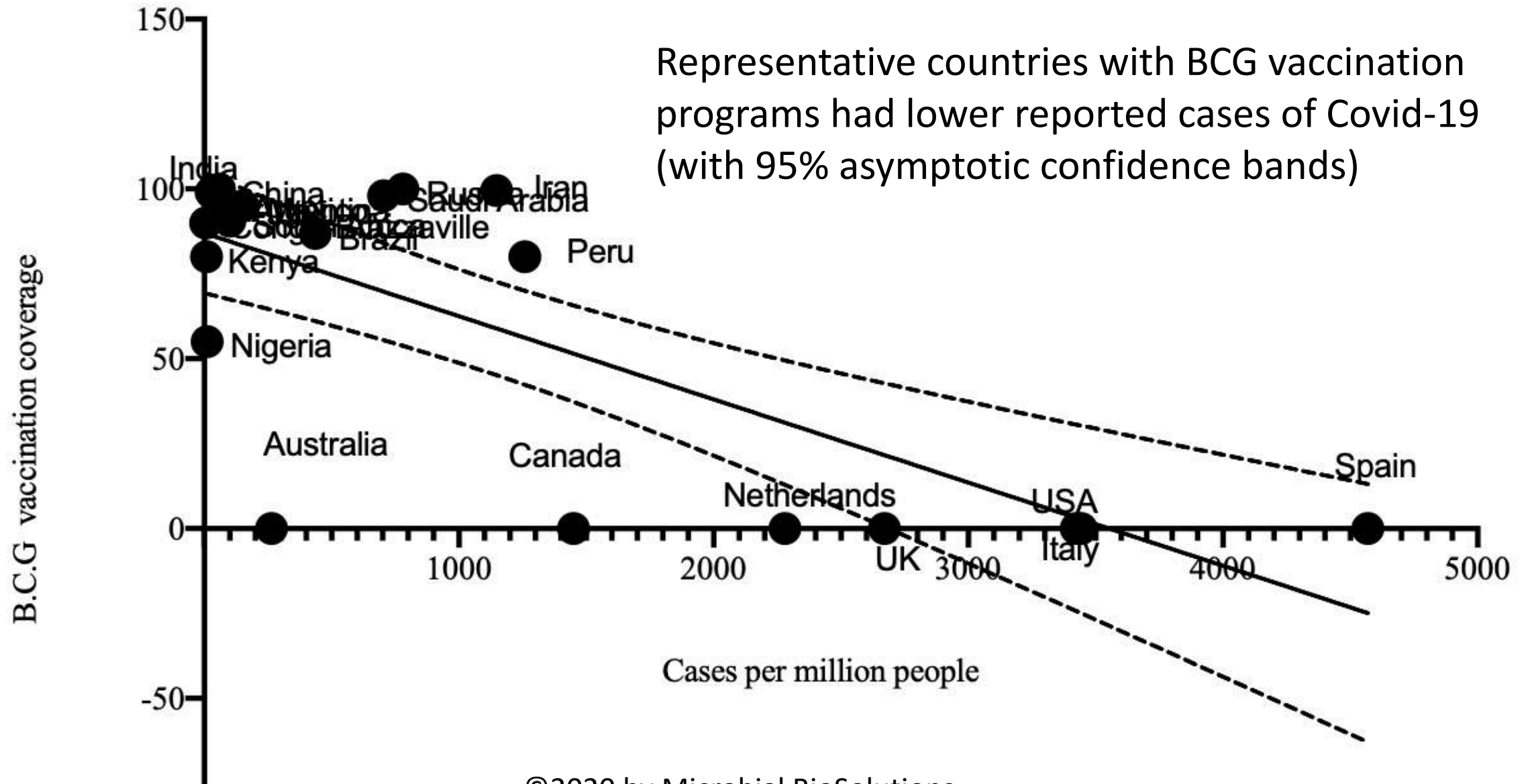
Proportion of Covid-19 cases, BCG vaccination coverage and affected population as of end of April 2020

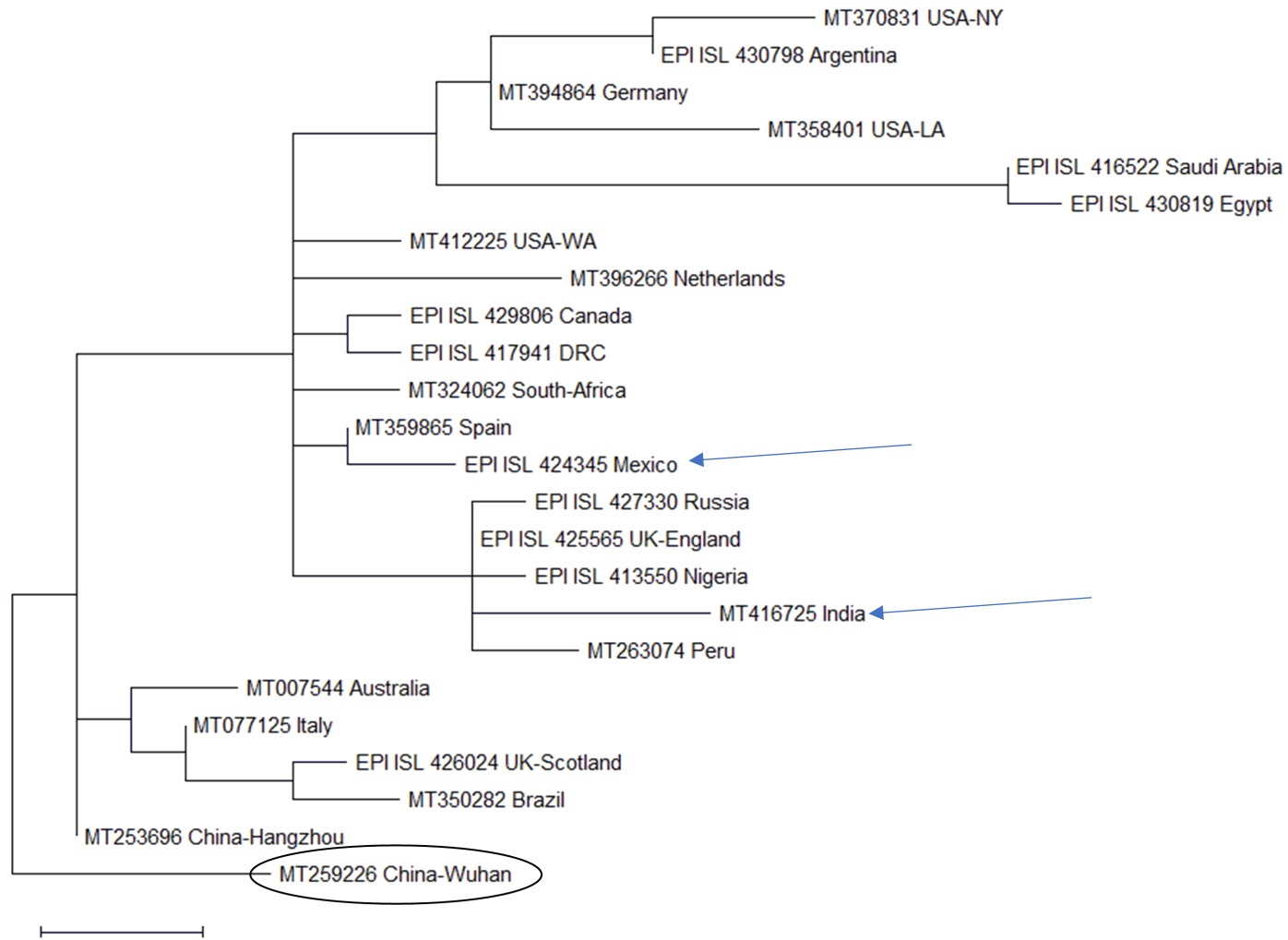
Country	Population	BCG coverage (%)	Covid-19 cases/million	Confirmed Cases	Deaths	Recovered	First reported case dates
Spain	46,754,778	<1	4,569	215,216	24,824	114,678	1/29/2020 (Spiteri et al., 2020)
Italy	60,461,826	<1	3,443	207,428	28,236	78,249	1/19/2020 (Giovanetti et al., 2020)
USA	331,002,651	<1	3,424	1,128,460	65,435	137,944	1/19/2020 (Holshue et al., 2020)
UK	67,886,011	<1	2,671	177,454	27,510	892	1/23/2020 (Lillie et al., 2020)
Netherlands	17,134,872	<1	2,280	39,791	4,893	138	2/27/2020 (Reusken et al., 2020)
Canada	37,686,512	<1	1,450	55,061	3,391	22,751	1/23/2020 (Marchand-Sen�cal et al., 2020)
Peru	31,036,656	80	1,259	40,459	7,703	11,129	3/6/2020 (Aquino, 2020)
Iran	83,992,949	99.5*	1,148	95,646	6,091	76,318	2/19/2020 (Abdi, 2020)
Russia	142,257,519	100	780	114,431	1,169	13,220	1/28/20 (Spiteri et al., 2020)
Saudi Arabia	28,251,770	98	704	24,097	169	3,555	3/2/2020 (Arab News, 2020)
Brazil	207,353,391	86.9	436	92,109	6,410	38,039	2/21/2020 (Rodriguez-Morales et al., 2020)
Australia	25,450,478	<1	264	6,767	93	5,745	1/24/2020 (Caly et al., n.d.)
Mexico	124,574,795	95	152	19,224	1,859	11,423	2/28/2020 (Lopez-Mejia, 2020)
South Africa	54,841,552	90.5	101	5,951	116	2,382	3/5/2020 (Ministry of Health, 2020)
Argentina	44,293,293	95	98	4,415	218	1,299	3/3/2020 (Galinsky, 2020)
Egypt	97,041,072	96	65	6,465	429	1,562	2/15/2020 (Makoni, 2020)
China	1,439,323,776	100	60	84,385	4,643	77,685	11/25/2019 (Benvenuto et al., 2020)
India	1,281,935,911	99	27	37,257	1,223	10,007	1/30/2020 (Chatterjee et al., 2020)
Nigeria	190,632,261	55	11	2,170	68	351	2/27/2020 (Makoni, 2020)
Kenya	47,615,739	80	9	411	21	150	3/12/2020 (Ombok, 2020)
Congo-Brazzaville	4,954,674	90	6	575	31	73	3/14/2020 (Reuters, 2020)



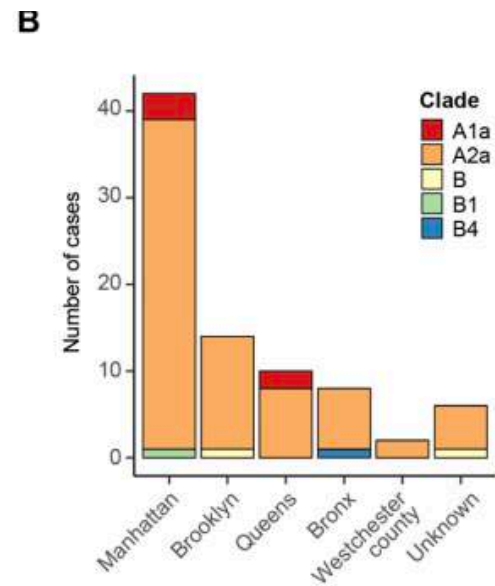
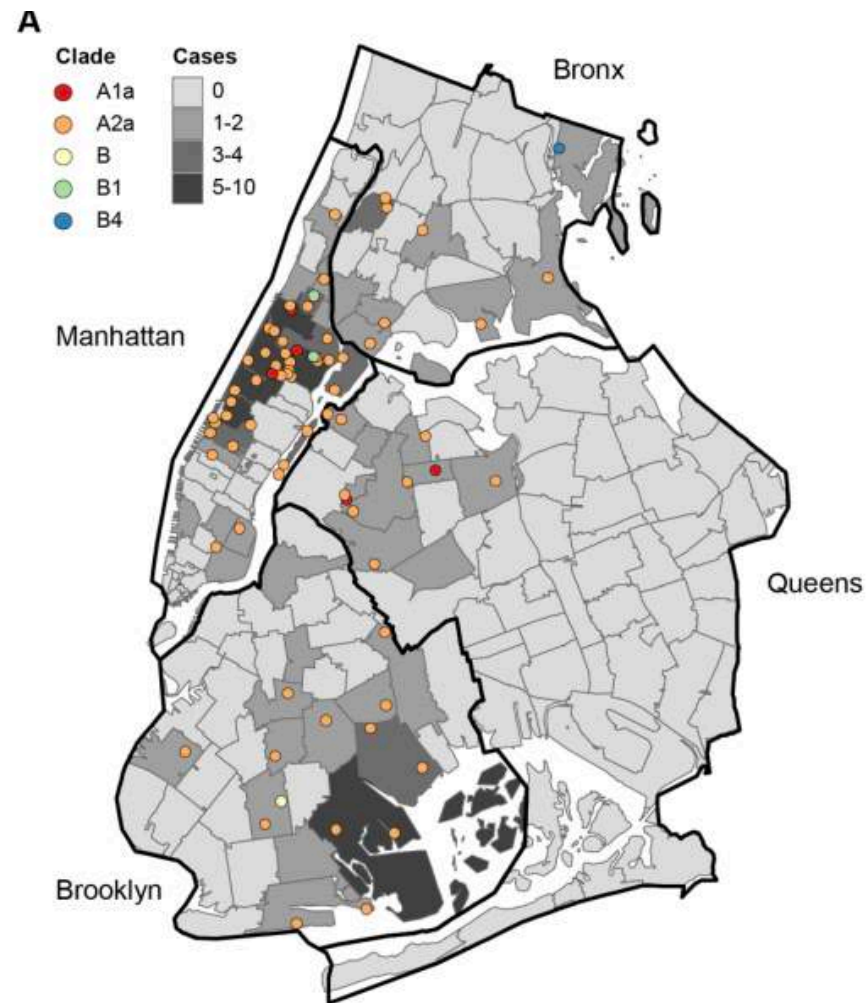
Cases per million for representative countries revealed high cases in developed countries

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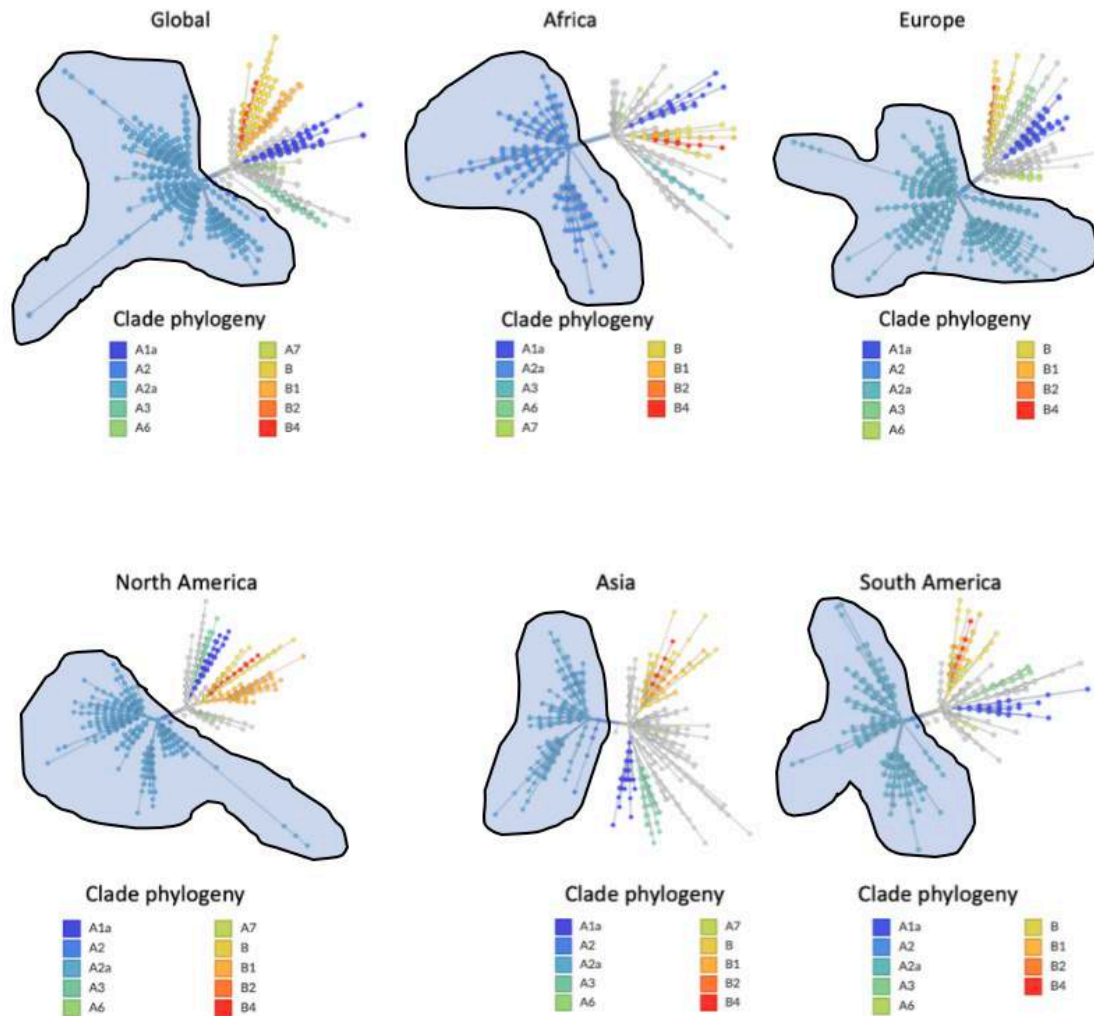


Strain Phylogenetics



Gonzalez-Reiche et al., 2020: doi: <https://doi.org/10.1101/2020.04.08.20056929>

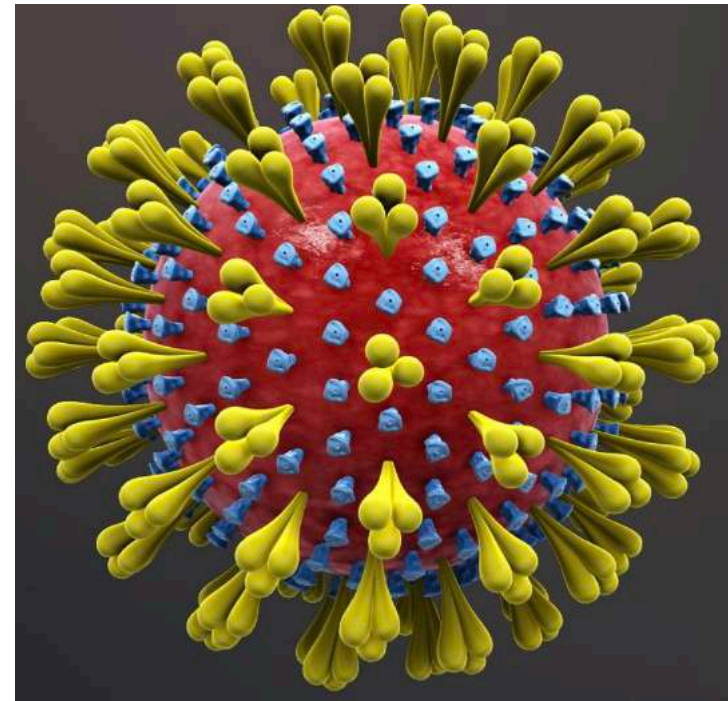
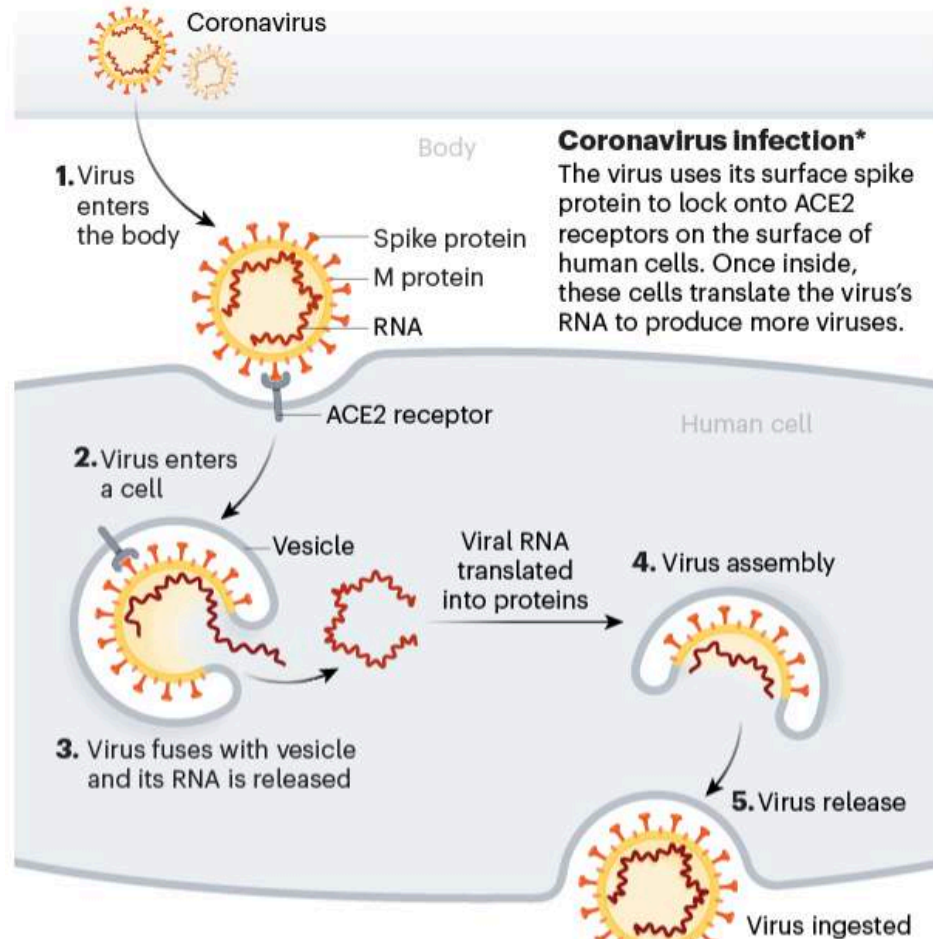
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Phylogeny showed that clade A2a (indicated in freeform) was the most common in representative geographical locations

Solutions

- Eight ways in which scientists hope to provide immunity to SARS-CoV-2.



QUESTIONS AND DISCUSSION