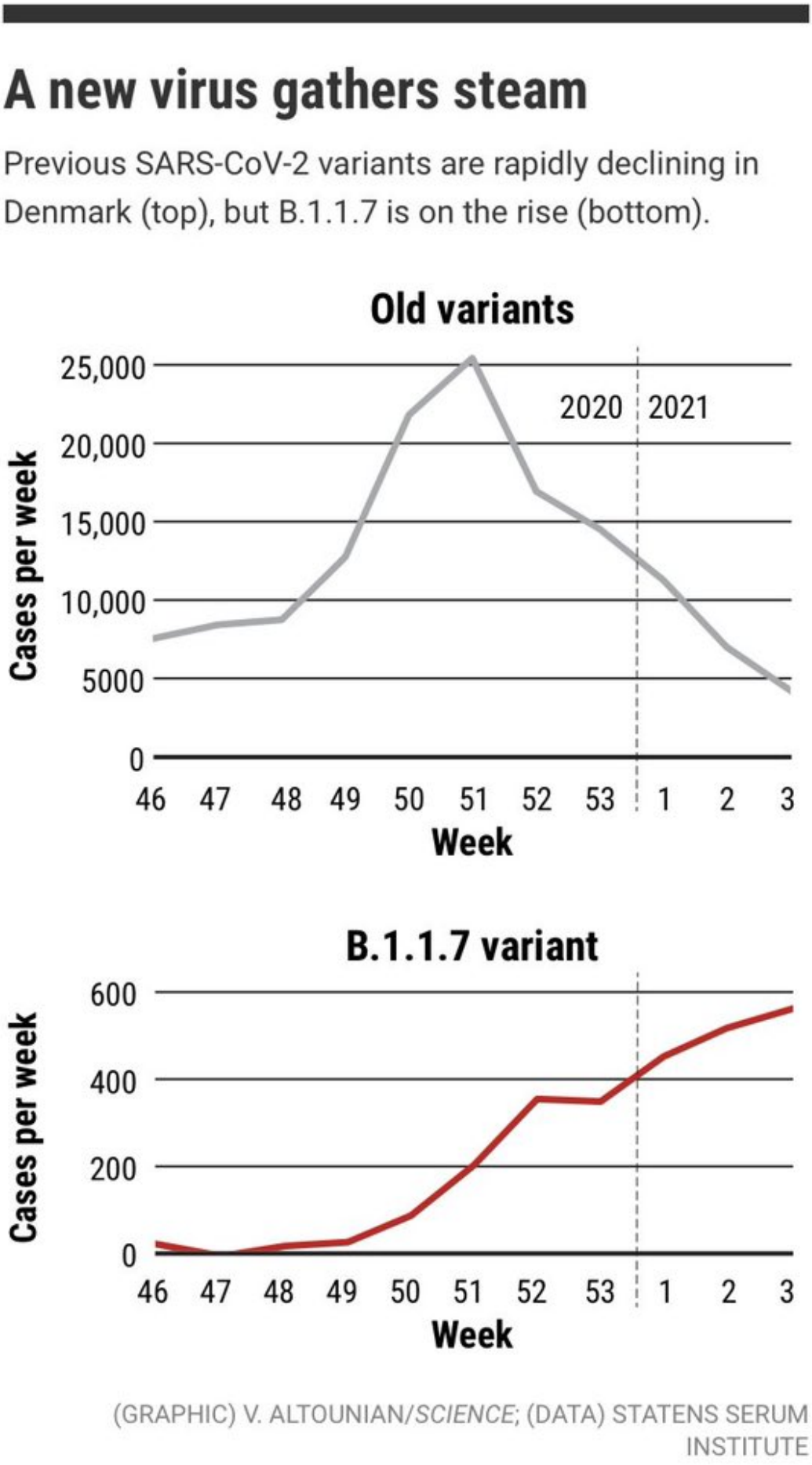
Twitter Thread by Eric Feigl-Ding

Eric Feigl-Ding
@DrEricDing

■■TWO DIFFERENT #COVID19 PANDEMICS—Many think with cases dropping that pandemic is nearly over. But truth is, there are now 2 different #SARSCoV2 pandemics diverging—old strain is waning, while the more contagious #B117 strain is dominating. We will be soon slammed very hard. ■



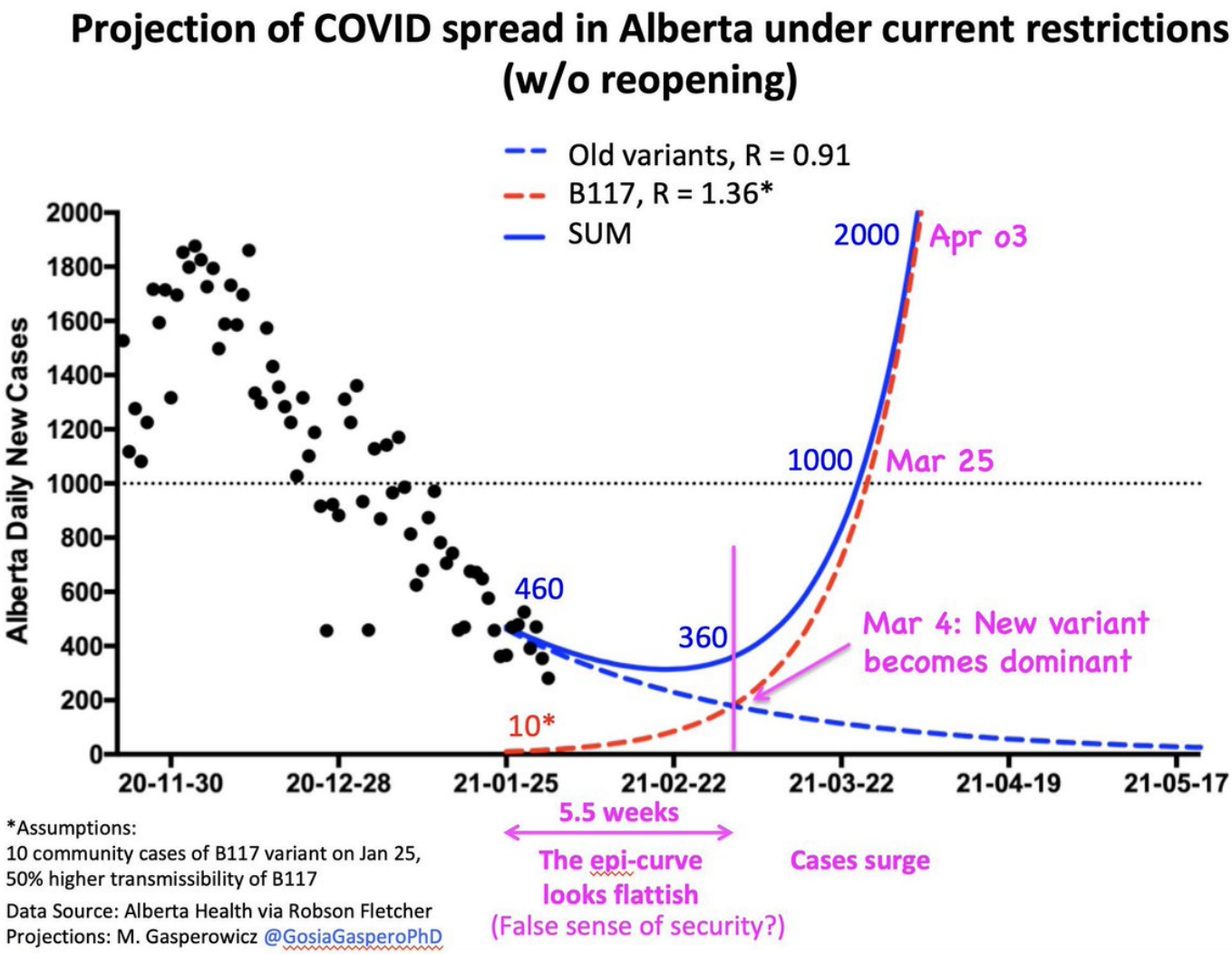
2) Here is what is really going to happen... most countries are having a gentle case decline with R(e) currently around 0.9. But this is deceiving. The #B117 is still relatively rare so far, so the R is being influenced mostly by the old common variant.

But not for long...

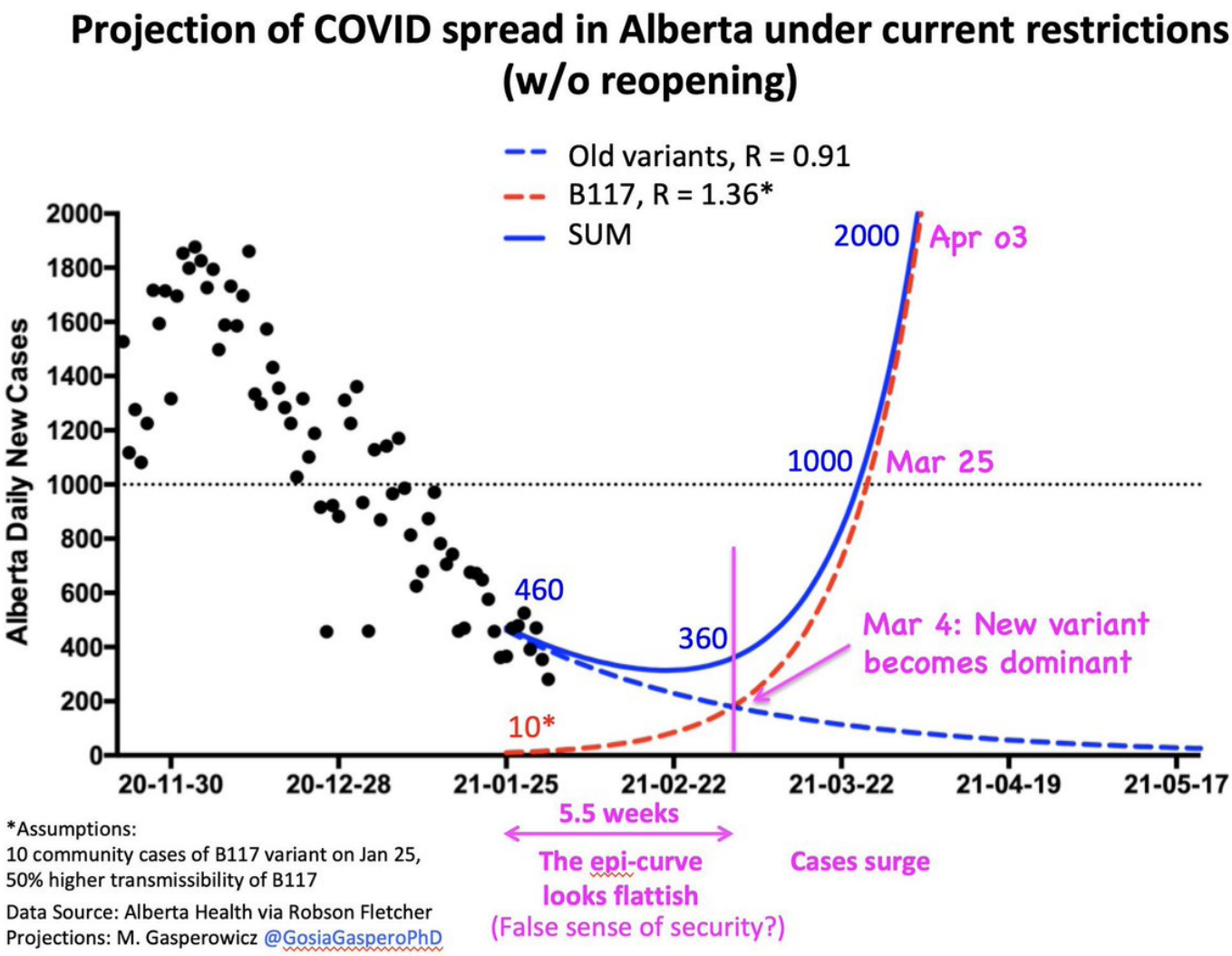
epiforecasts.io

State	New confirmed cases by infection date	Expected change in daily cases	Effective reproductic no.
Oregon	1053 (502 -- 2198)	Likely increasing	1.2 (0.88 -- 1.
Texas	21070 (14700 -- 28592)	Stable	1 (0.92 -- 1.1)
Kansas	2003 (581 -- 4466)	Likely decreasing	0.98 (0.72 -- 1.1)
Iowa	811 (352 -- 2123)	Stable	0.98 (0.69 -- 1.5)
Virgin Islands	14 (2 -- 66)	Stable	0.98 (0.55 -- 1.4)
Alabama	2409 (1659 -- 4184)	Likely decreasing	0.97 (0.86 -- 1.2)
Colorado	1119 (616 -- 2343)	Likely decreasing	0.96 (0.75 -- 1.3)
Northern Mariana Islands	0 (0 -- 1)	Likely decreasing	0.96 (0.68 -- 1.4)
North Carolina	5304 (2769 -- 9175)	Likely decreasing	0.95 (0.79 -- 1.1)

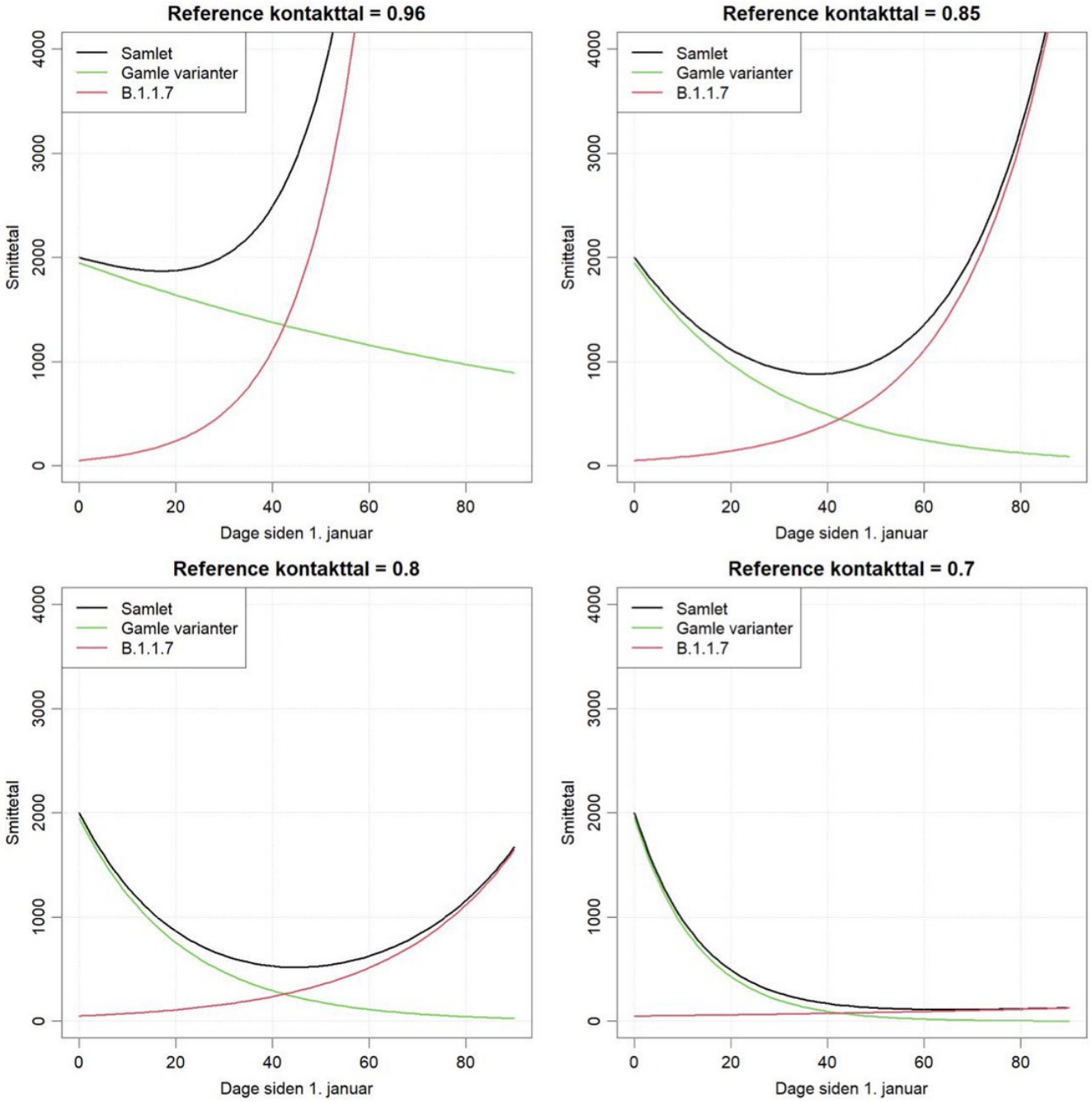
3) Here is what is going to happen... currently R is ~0.9 in many places, but with the more infectious #B117, the R will jump 50% approximately. And it is inevitable (all CDC and Danish models say this) that B117 will take over as the reigning dominant variant soon...



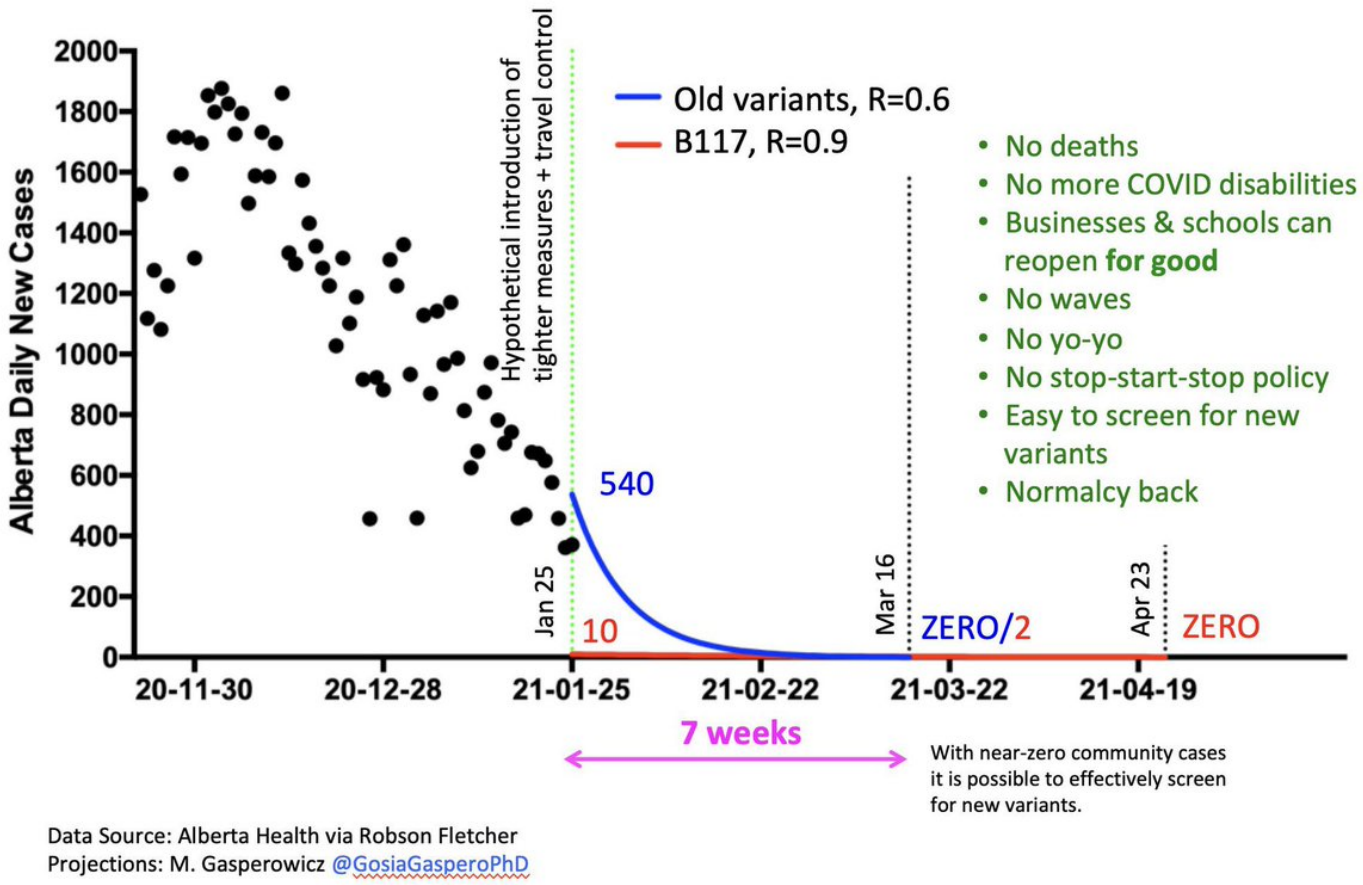
4) and when that happens, what worked before to keep the pandemic contained at R of 0.9 will no longer work. Here is the model for Alberta, ■■ by @GosiaGasperoPhD. The B117 dotted red line will soon dominate and drive a new surge in latter half of March and April.



5) And Denmark ■■ CDC has found the same thing. I GQR works now for keeping R around 0.9 or even 0.8, will absolutely not work anymore once #B117 variant takes over. Forget about it. We will be hit hard. But there is a way—if we suppress R to 0.7 or less.
https://t.co/gOq0put4H5

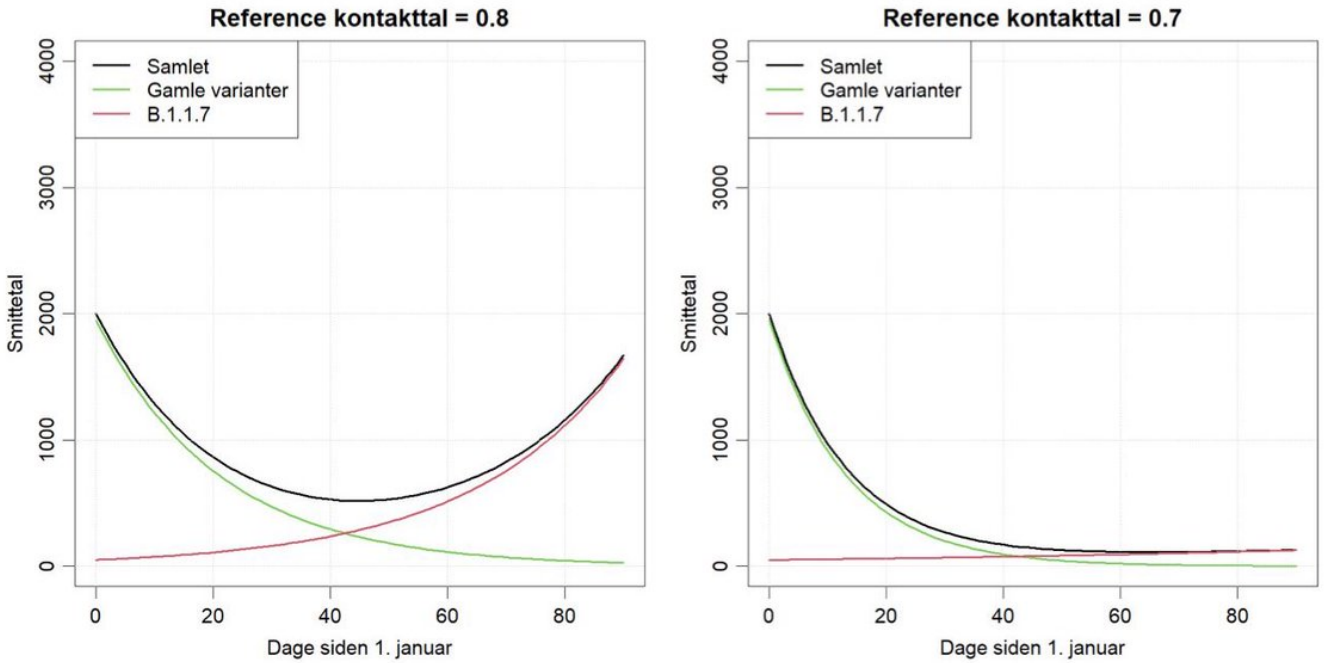


6) The solution to defeating the #B117 is to chase a #ZeroCovid approach and slam the R even lower to below 0.7.... but optimally 0.6 or less. So that even when the #B117 arises, it will keep R under 1 (0.6*1.5=0.9). And by keeping R at 0.6 now—we will have buffer room for B117.



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7) And again Denmark ■■ CDC agrees with that assessment. Their model for R of 0.8 shows it is insufficient to defeat #B117. But its model for R 0.7 shows it can be enough.
https://t.co/gOq0put4H5



8) The problem is that of the declining states, only 1 state is under R 0.7... which is Wyoming (figure below sorted from lowest to highest R). Every other state’s R is over 0.7. Thus while they would yield decreases now—they won’t once #B117 takes over.
https://t.co/EWqtBZpsuh

epiforecasts.io

State	New confirmed cases by infection date	Expected change in daily cases	Effective reproduct no.
Wyoming	49 (16 -- 124)	Decreasing	0.68 (0.43 - 0.94)
California	6327 (3254 -- 11071)	Decreasing	0.72 (0.53 - 0.91)
New Hampshire	221 (111 -- 387)	Decreasing	0.76 (0.57 - 0.93)
Nebraska	233 (98 -- 496)	Likely decreasing	0.78 (0.55 -
Maryland	791 (428 -- 1371)	Decreasing	0.78 (0.57 -
Virginia	2020 (1019 -- 3449)	Decreasing	0.78 (0.58 - 0.94)
Illinois	1612 (800 -- 3092)	Likely decreasing	0.79 (0.58 -
Delaware	241 (122 -- 428)	Decreasing	0.8 (0.6 -- (
South Dakota	74 (43 -- 125)	Decreasing	0.8 (0.66 -- 0.97)
Maine	200 (89 --	Decreasing	0.81 (0.58 -

9) Meanwhile, the replacement thing is happening in England. #B117 is dominating while old common #SARSCoV2 is all but nearly gone. Total cases dropping only because of tight UK lockdown. But can UK sustain & not let up on gas pedal before politics caves to reopen too soon?

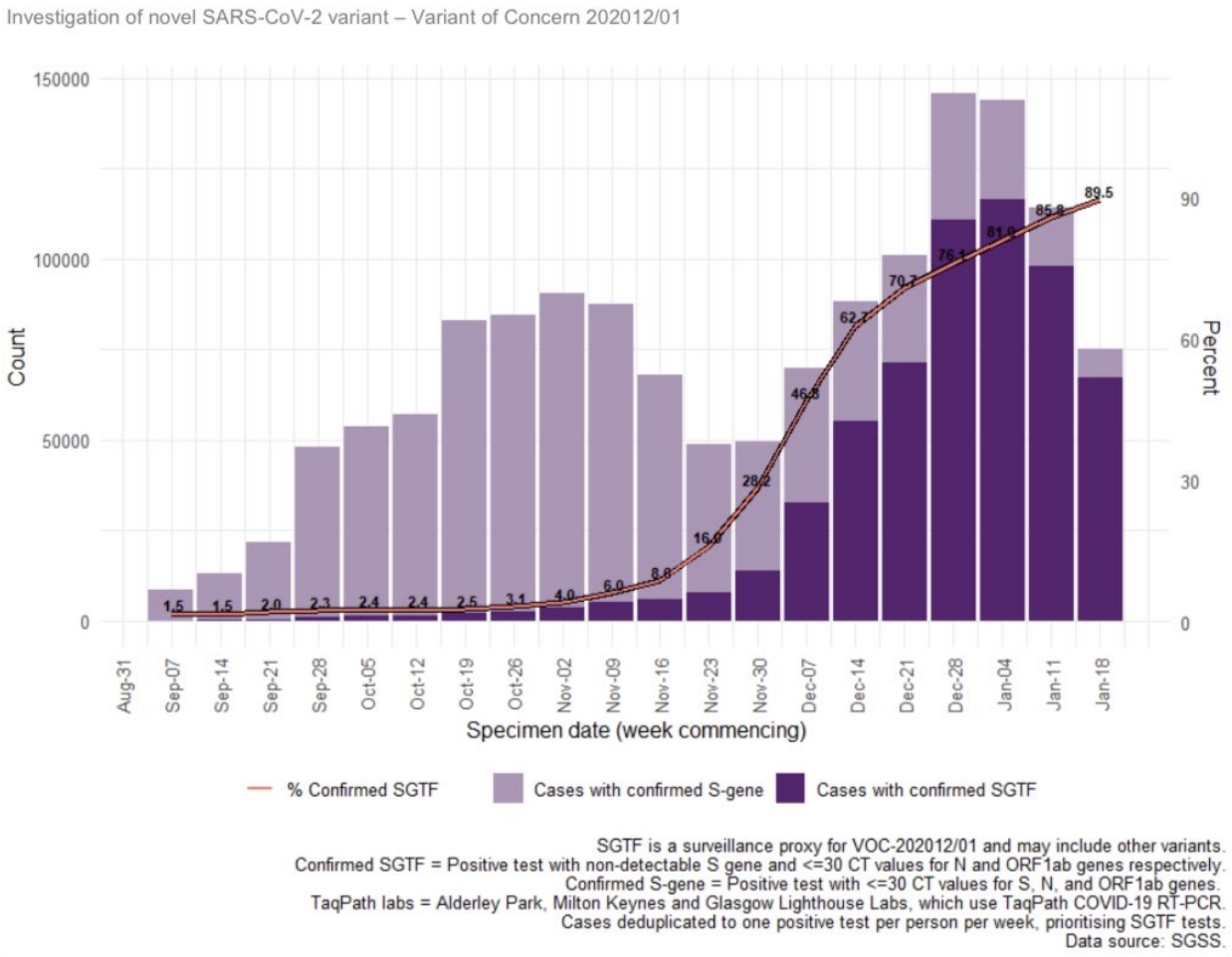
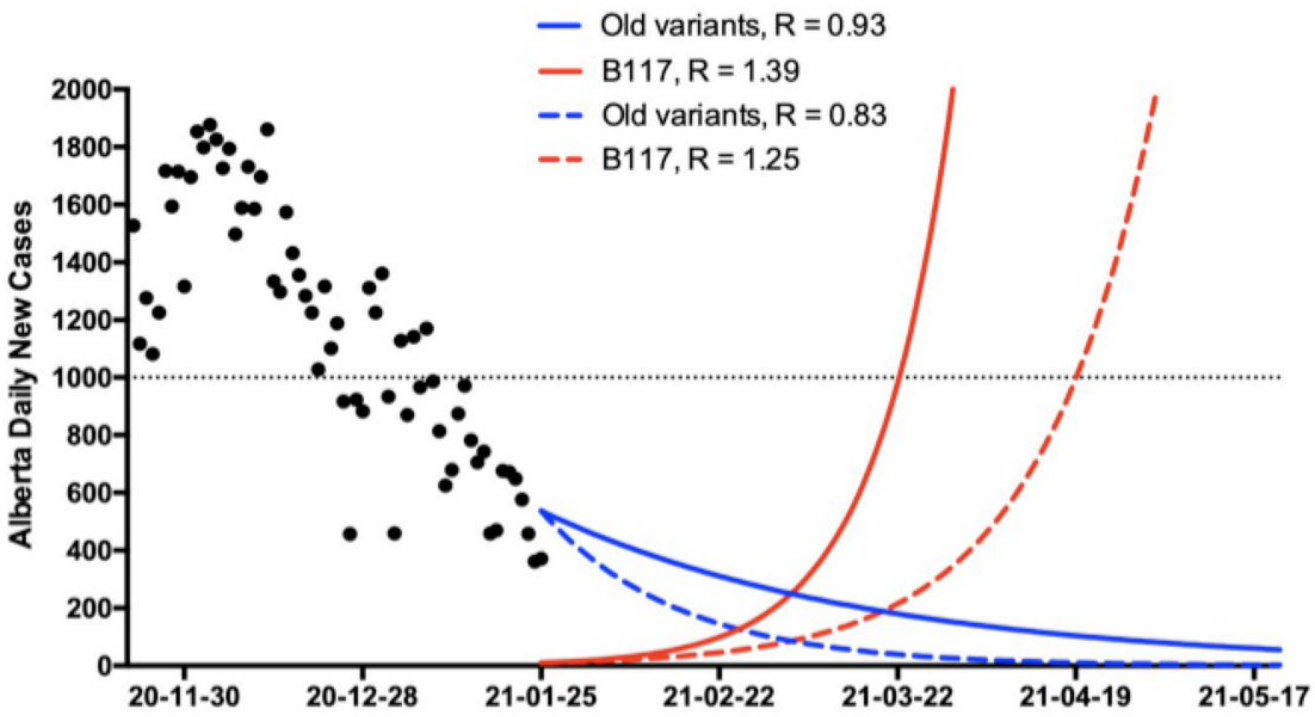


Figure 3. Weekly number (bars) and proportion (line) of England Pillar 2 COVID-19 cases with SGTF among those tested in TaqPath laboratories and with S gene detection results (7 September 2020 to 24 January 2021).

10

10) Here is another @GosiaGasperoPhD model of the same thing. Keeping the R at 0.8 level is not enough to stop the spread once #B117 takes over.



Data Source: Alberta Health via Robson Fletcher
Projections: M. Gasperowicz @GosiaGasperoPhD

11) Denmark ■■ CDC @SSI_dk has been warning about this for over a month. The world hasn't been listening. Aggressive mitigation for keeping R under 0.7 now is the only way. https://t.co/XfZOC7UXXB

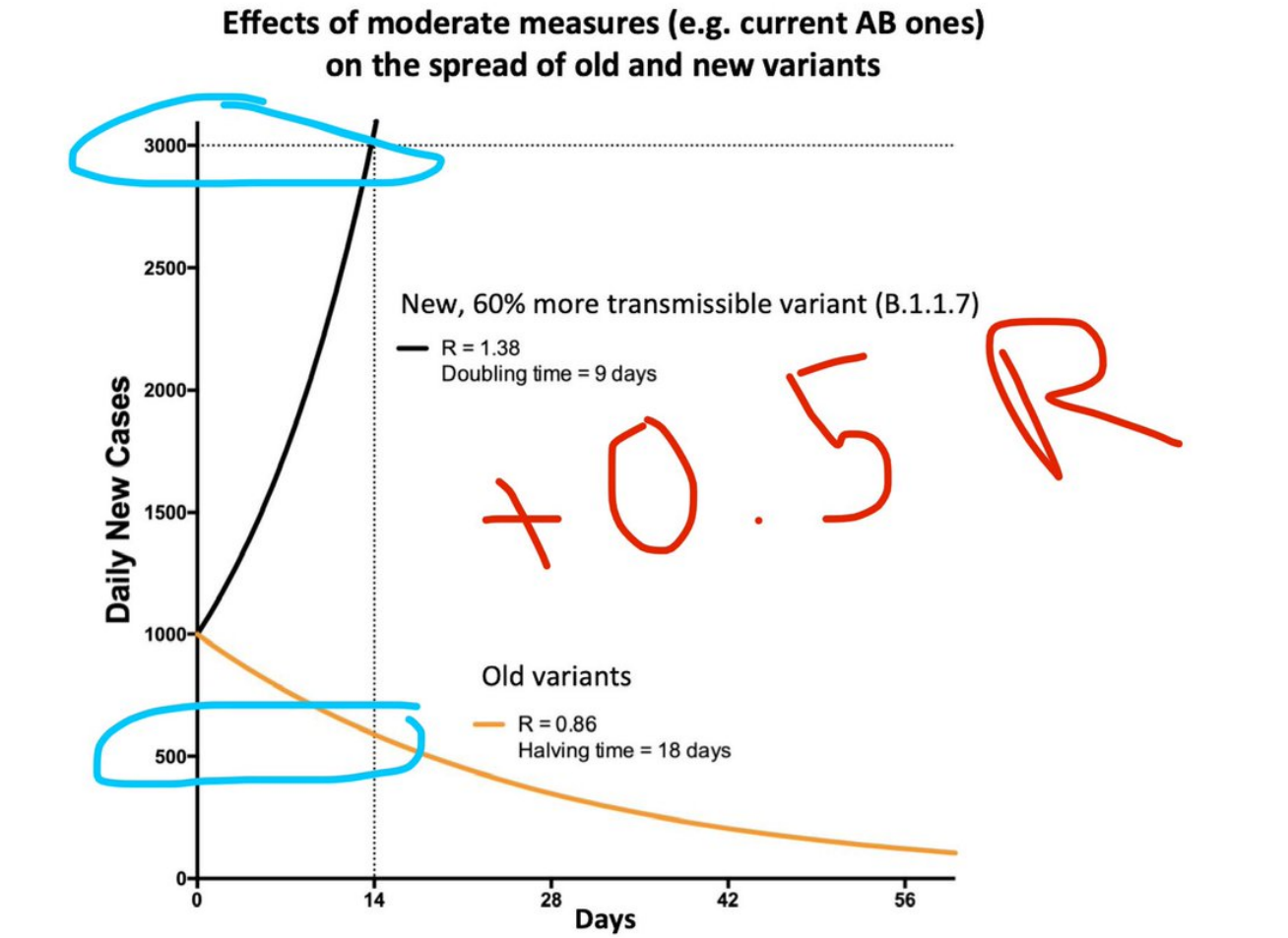
> \u26a0\ufe0fCRUSH VIRUS NOW OR ELSE WE ARE SCREWED: Denmark\u2019s CDC thinks new B117 #SARSCoV2 variant is so much more contagious (R +0.4 to +0.7) & inevitable that **if any country does not crush the R<0.7 now**, we will be completely #COVID19 screwed by Feb/March.\U0001f9f5 https://t.co/CG1iZNx6uI pic.twitter.com/W7v1iAsgw3
>
> — Eric Feigl-Ding (@DrEricDing) January 6, 2021

12) Let's slam this home. suppose we have 1000 cases/day now... with an R=0.86 we could reduce it to 500/day in 2 weeks.

➡■But w/ added contagiousness of B117 variant that has ~60% higher R, in 2 weeks, 3000 new cases/day instead.

➡■6x difference in 2 wks

HT @GosiaGasperoPhD



AB daily cases halving time calculated for Dec 13 – Dec 29 was 18 days, which corresponds to R = 0.86
I assumed that currently AB has predominantly old variants.
Assuming that the new variant is 60% more transmissible, $R_{new} = R_{old} * 1.6 = 0.86 * 1.6 = 1.38$, which corresponds to 9 days doubling time.
Pls note: Starting @1000, w/ current measures, w/ the new variant, in 2 weeks we would be @3,000 daily new cases

Chart and Analysis: M. Gasperowicz @GosiaGasperoPhD

13) The problem is that to get R low enough, what used to work won't work anymore. When we previously could afford to open schools, it may be that when B117 becomes dominant, we might lose that buffer to keep R<0.7. https://t.co/yVld1eSrQS

> 7) Now how does the new B117 variant change public health measures? What used to work for Australia and Canada will no longer work anymore. Only aggressive New Zealand and Austria 1st wave restrictions would now be able to stop the more transmissible B117 strain. pic.twitter.com/S2FKXF8g1n
>
> — Eric Feigl-Ding (@DrEricDing) January 6, 2021

14) Denmark CDC is becoming more right — contagious #B117 variant is continuing to solidify itself as 12.1% of sequenced #SARSCoV2 samples. 70% increase per week!

■

2.4%

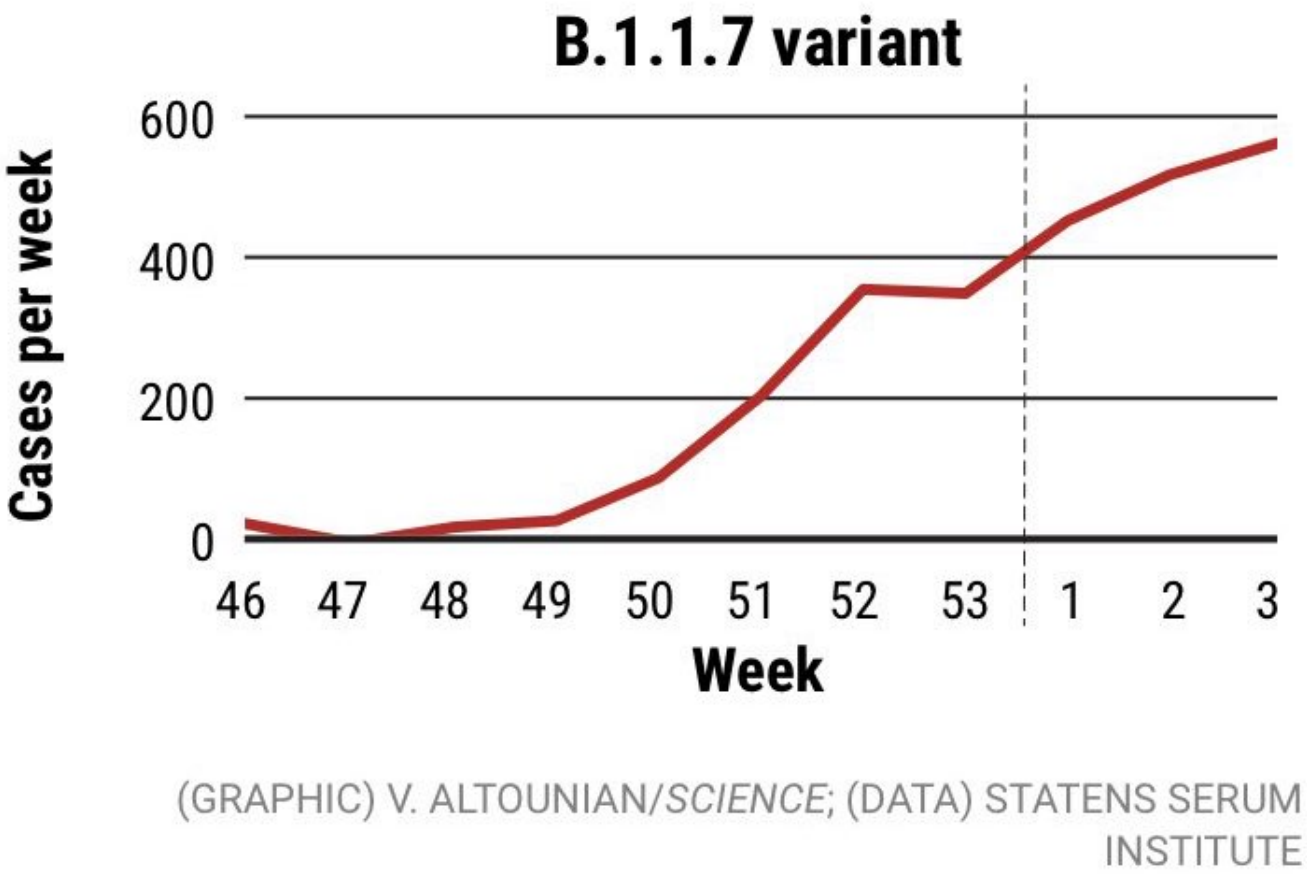
■

4.0%

■

7.4%

■
12.1%

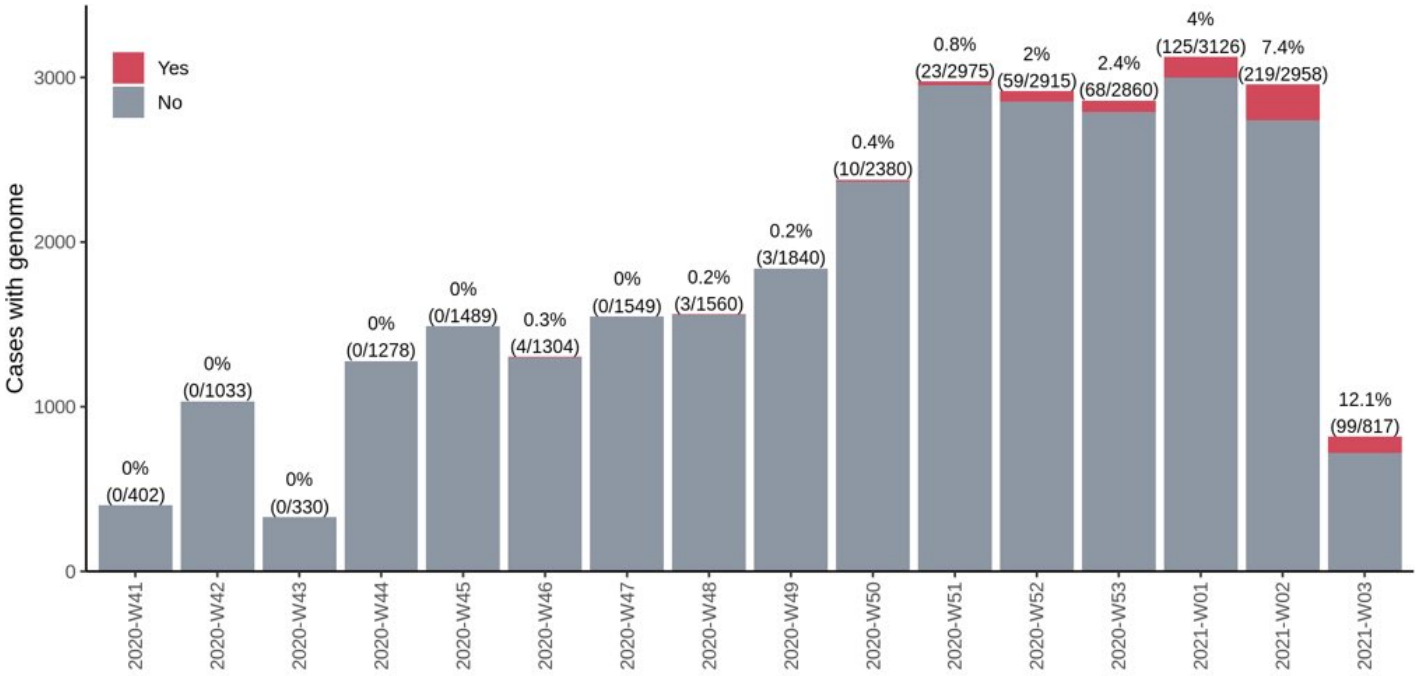


15) Denmark officials, despite their lockdown induced case drop, are really panicking. Seriously— read the WaPo article or this thread ■ below. They express that without the 100% sequencing, they would have been lulled into complacency. https://t.co/gMiJdcc6MC

> Denmark\U0001f1e9\U0001f1f0 even more worried than ever about new #B117 variant\u2014B117 cases increasing 70% a week **despite strict lockdown**, says Denmark\u2019s CDC genome sequencing *every single case in the country* for mutation. By contrast, \U0001f1fa\U0001f1f8 sequencing 0.3%. #COVID19 \U0001f9f5https://t.co/SPTy0cDkEH pic.twitter.com/8fCCyPwxPW
>
> — Eric Feigl-Ding (@DrEricDing) January 24, 2021

16) “Without this variant, we would be in really good shape,” said Camilla Holten Moller, co-leader of the @SSI_dk group modeling the spread of the virus.

“If you just look at the reproduction number, you just wouldn’t see that it was in growth underneath at all,”



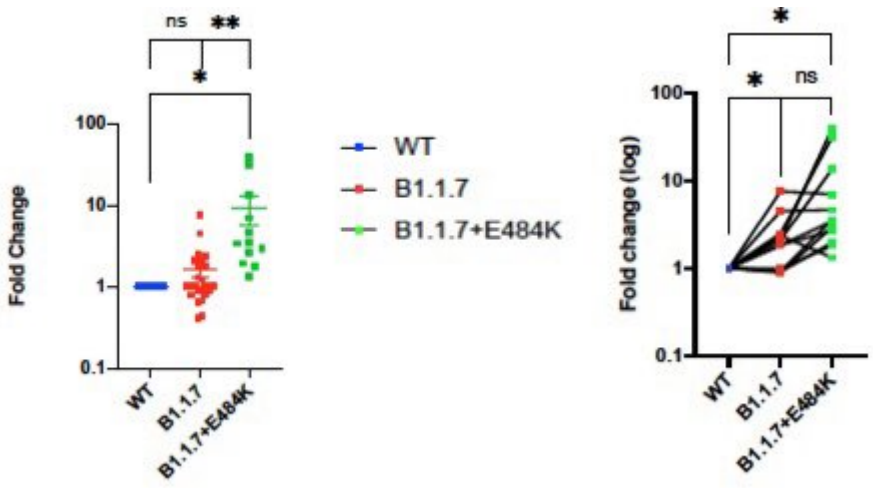
17) The good news so far is that all the vaccines tested so far perform decently against the main #B117 variants, but maybe less so against the ■■ #B1352 and ■■#P1 variants. Pfizer, Moderna, etc mostly good for B117. See thread ■ below to catch up. https://t.co/x30ufKmTW8

> BREAKING\u2014Good & bad news\u2014The Moderna #COVID19 vaccine fully protected against the UK \U0001f1ec\U0001f1e7 #B117 variant... but was 6x less efficient at neutralizing the South African #B1351 variant in lab test. Moderna is testing a newly synthesized booster for it\u20143rd shot. https://t.co/4s4Ysr5cSp pic.twitter.com/CrCTrgNsre
>
> — Eric Feigl-Ding (@DrEricDing) January 25, 2021

18) So here comes the “but”... there is a new subtype of #B117 emerging... a mutated sublineage of regular main #B117 that had acquired the troublesome E484K mutation. This is the bad mutation that ■■ CDC & other studies helps B1351 evade antibodies. https://t.co/3Ktkb9Iv8n

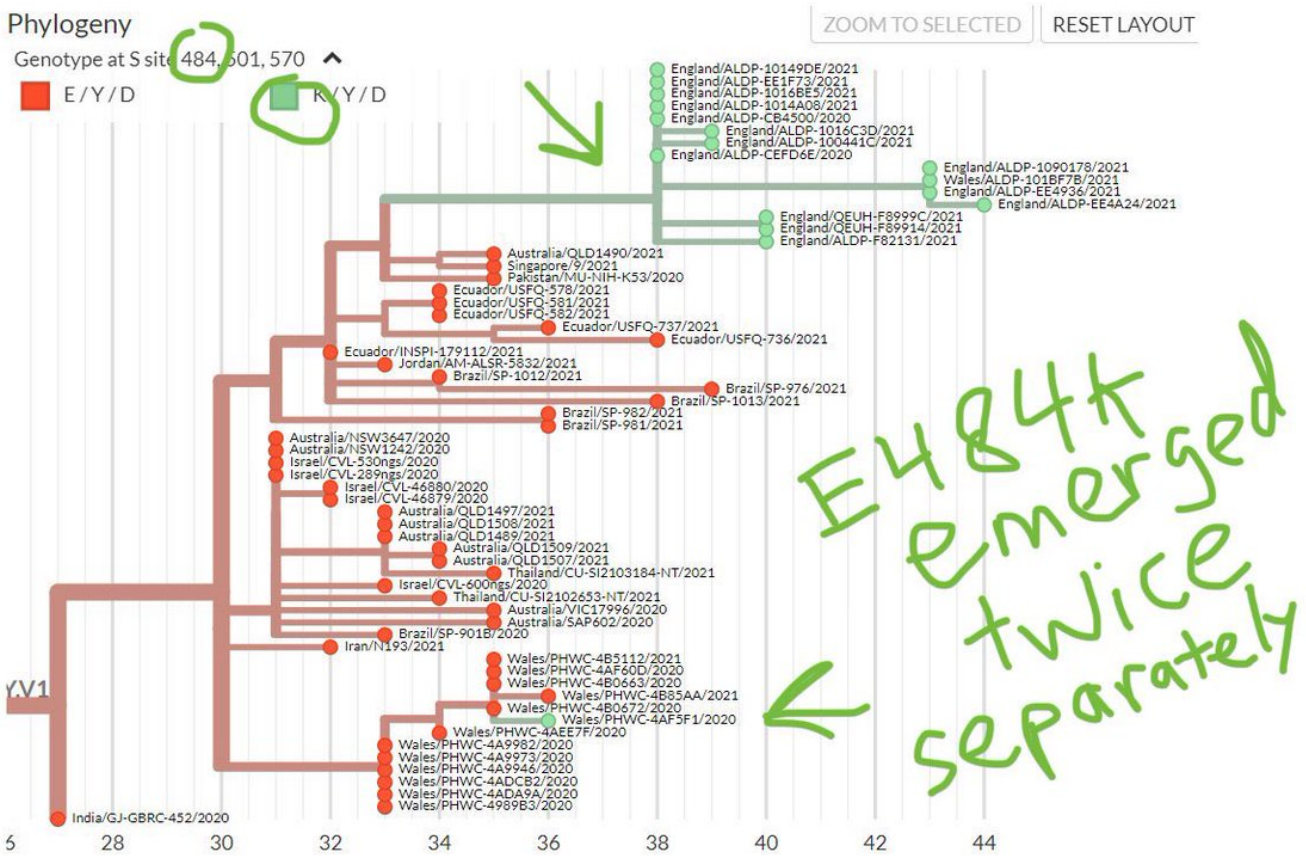
> NOT GOOD\u2014so it seems \U0001f1ec\U0001f1e7 government researchers have discovered that the already more contagious #B117 has further acquired the other troublesome E484K mutation seen in \U0001f1ff\U0001f1e6#B1351 & \U0001f1e7\U0001f1f7#P1 variants\u2014in 11 patients. E484k is blamed for partial vaccine-evasion.\U0001f9f5https://t.co/VwjT1WxVL8 pic.twitter.com/HAOahtFqcN
>
> — Eric Feigl-Ding (@DrEricDing) February 1, 2021

19) So what do we know about the #B117+E484K combo sublineage? Not much except this preprint study showing it is might be more resistant to antibody neutralization (more antibodies needed in lab study to neutralize the pseudovirus) than the common strain and the regular B117.

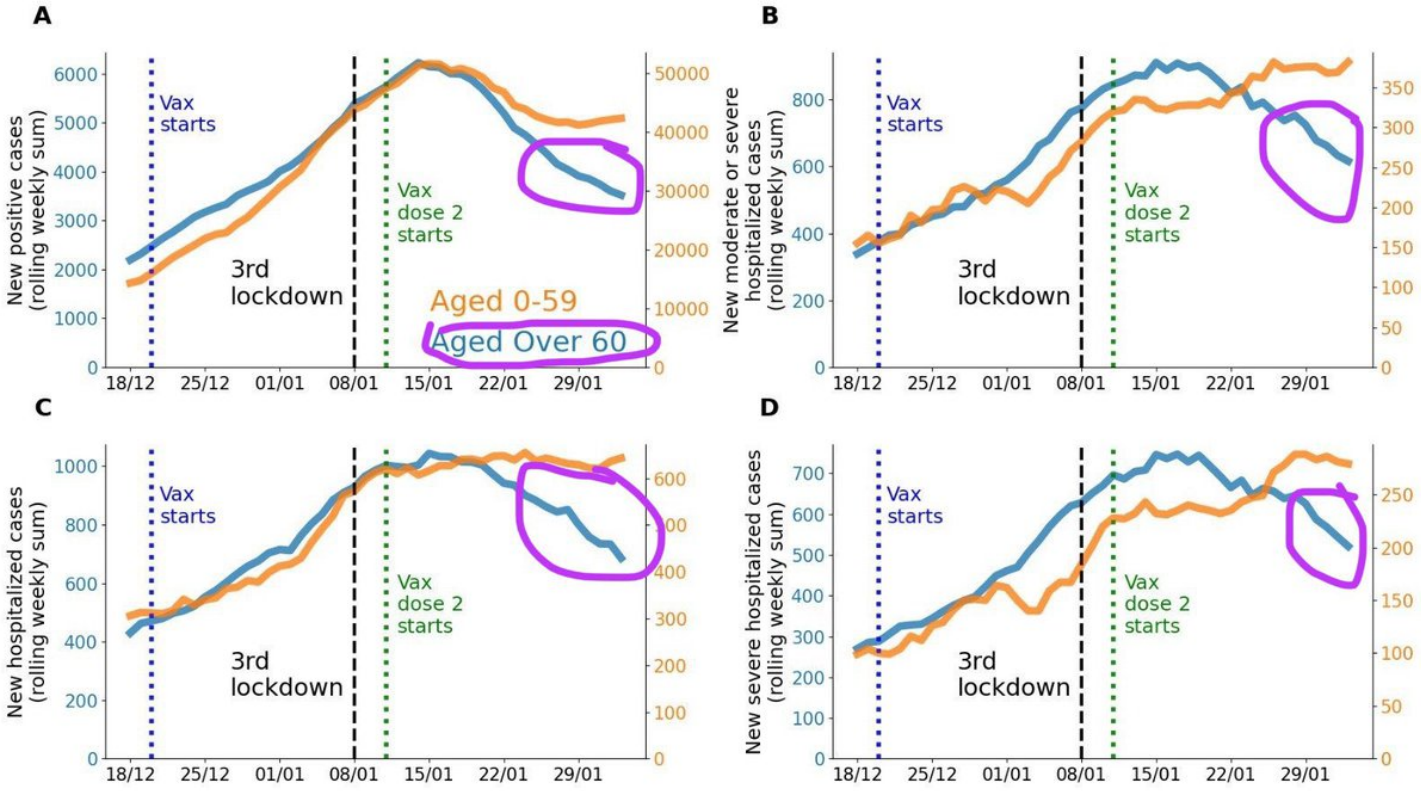


20) This #B117+E484K isn't for sure resistant to vaccine. We don't know yet. And we don't know if it will still be more contagious like the main B117 is, but we should assume it is—& take precautions that it might be the double combo of more contagious & maybe antibody resistant.

21) could #B117+E484K be a fluke? Maybe. But it emerged recently in UK twice—independently arising in Wales, and arising in England. Just like in ■■ and ■■—so 4 times means convergent evolution is real. And convergent evolution is usually always greater survival fitness.



22) The other way to win is with mass vaccination like in Israel ■■ that has already vaccinated 50 shot per 100 people in the elderly. Hence now look how fast the cases, hospitalizations are diverging for those age 60+ vs 59 or under. That is the effect of **mass** vaccinations.

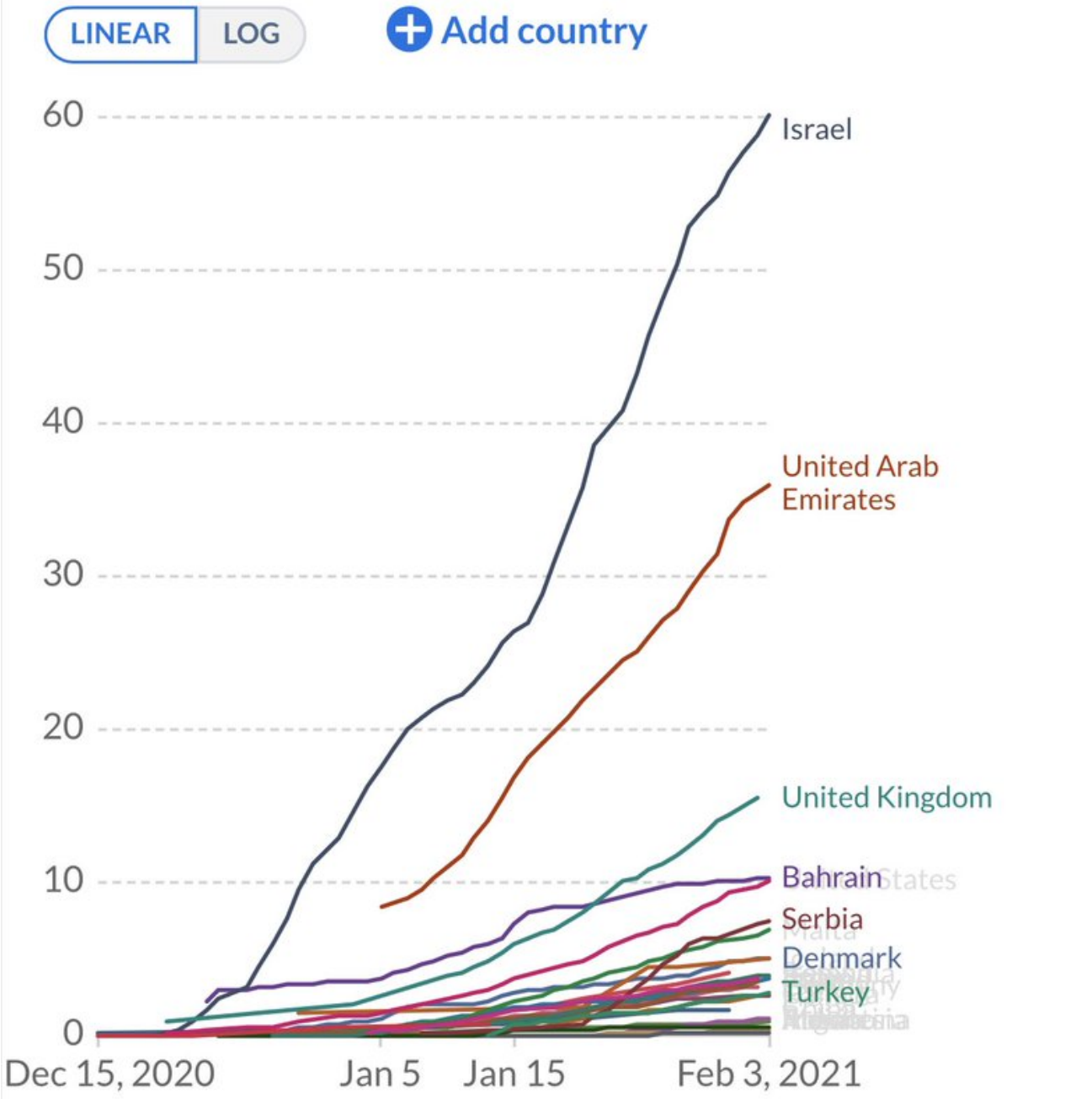


23) Actually, Israel ■■ has now reached 60 vaccination shots per 100 people: 4x UK ■■ and 6x the ■■. Rest of EU is much much lower.

COVID-19 vaccine doses administered per 100 people

Our World in Data

Total number of vaccination doses administered per 100 people in the total population. This is counted as a single dose, and may not equal the total number of people vaccinated, depending on the specific dose regime (e.g. people receive multiple doses).



Source: Official data collated by Our World in Data – Last updated 4 February, 09:30 (London time)
OurWorldInData.org/coronavirus • CC BY



24) Another alarming datapoint: 10% of the village of Corzano ■■ has the #B117 variant—10% of all residents!!! https://t.co/edbN2KYihV

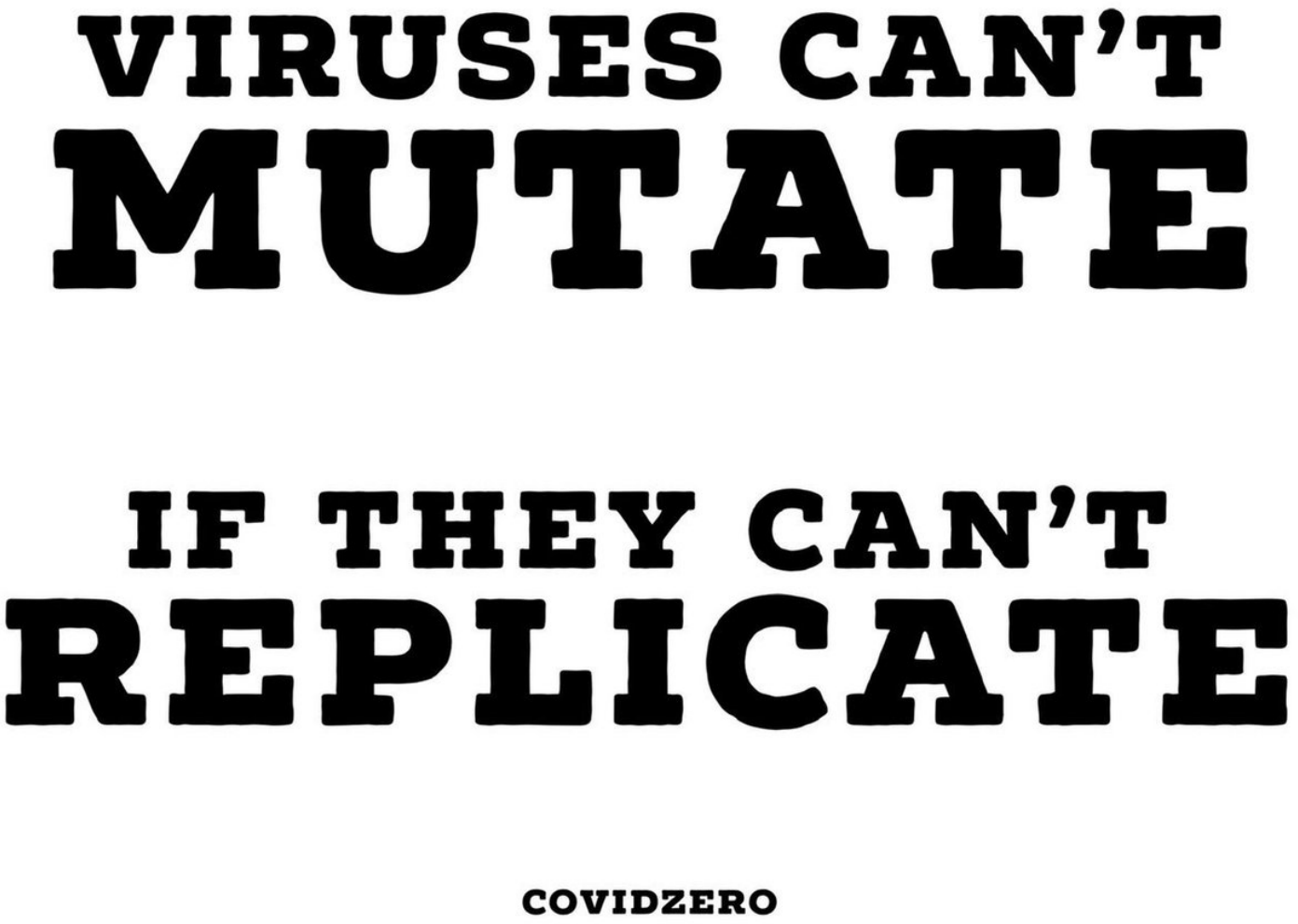
25) Moreover, of the 10% of the infected ■■ village with #B117 UK variant, 60% of cases are kids from kindergarten and primary school, while other 40% are their parents. Schools in the village have closed now. https://t.co/xdiZqKOLVc

> Holy cow: 10% of the village of Corzano \U0001f1ee\U0001f1f9 has the #B117 variant\u201410% of all residents! 60% of cases are kids from kindergarten and primary school, other 40% are their parents, says the mayor. Schools in the village now closed. https://t.co/LhfmnuPdUP pic.twitter.com/htN5s0dbCU
>
> — Eric Feigl-Ding (@DrEricDing) February 5, 2021

26) BOTTOMLINE: unless we can mass vaccinate quickly like Israel (which is still not 1/3 of the way done), we must continue to mitigate with *premium* masks preferably and with airborne virus precautions to ventilate.

■No virus = No mutation.

#ZeroCovid #COVID19 #COVIDzero



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27) here is where you can find the R(e) or R(t) in your US state. https://t.co/EWqtBZpsuh

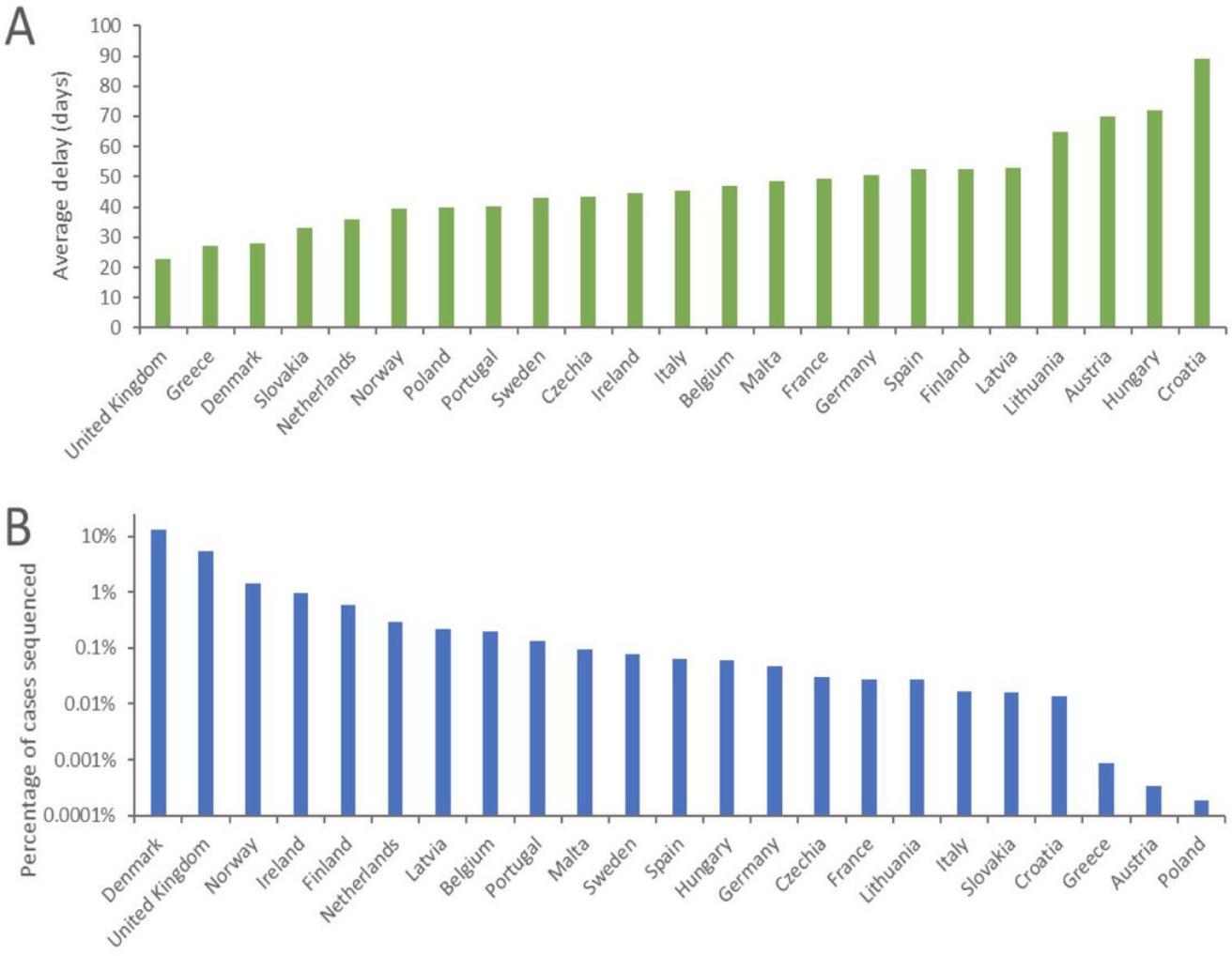
28) Please switch to premium masks if you can. KN95, KF94, FFP2, etc.... the new variant is just too contagious not to take extra precautions. https://t.co/5pDv4nloRi

> SWITCH TO PREMIUM MASKS\u2014I\u2019ve been saying it for months. We need to switch to KN95, KF94, or European FFP2 masks ASAP. The new #b117 #COVID19 is just too contagious. Cloth isn\u2019t enough anymore folks. Germany \U0001f1e9\U0001f1ea & Austria \U0001f1e6\U0001f1f9 mandating on all public transits. https://t.co/MfZhK4Uacg pic.twitter.com/iKQB4yNQrA
>
> — Eric Feigl-Ding (@DrEricDing) January 24, 2021

29) If you're skeptical, you don't have to take my word alone. Read this article in Science magazine by @kakape, he essentially outlines the same thing as I have with the ominous pandemic future of #B117. I trust my colleagues at Denmark ■■ @SSI_dk a lot. https://t.co/5i0oMxNrh1

30) Also why aren't we aware of that much #B117 in other countries besides Denmark and UK? Well because most countries sequence almost nothing (panel B is a log scale - so the drop off is much much worse as you go down), and also very slow in sequencing even when they do.

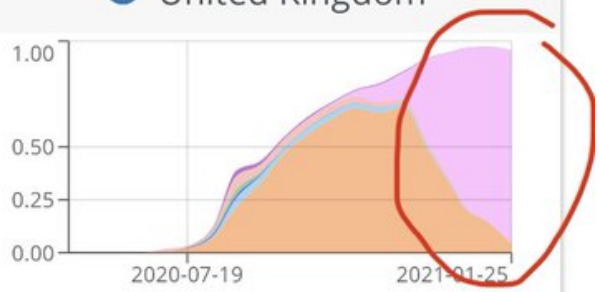
Figure 7. Average time from sample collection to sequence publication (A) and percentage of cases reported with sequence (B) in the GISAID EpiCoV database, for samples collected between 1 September 2020 and 27 December 2020, per EU/EEA country having submitted sequenced cases during the period, and the UK



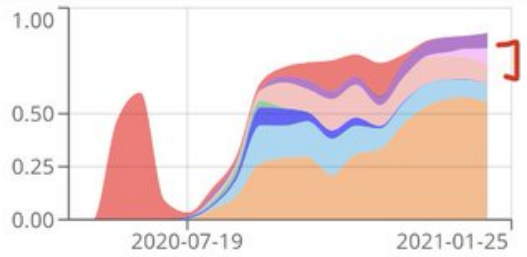
Source: GISAID EpiCoV database (filtered for human SARS-CoV-2 samples only) and TESSy. Cases recorded after 13 December 2020 are not included in the denominator.
Note that all generated sequences are not always uploaded to GISAID EpiCov, which may lead to an underestimation of the ability of some countries to detect the variant through their national genomic surveillance activities. Iceland has reported to ECDC that all cases in the country are sequenced within 48 hours, although these have not been uploaded to GISAID recently.

31) Based on the limited #SARSCoV2 genomic sequencing that we do have... here is how different mutations are growing in each country so far (data slightly older by 1.5 weeks). Pink is the N501 mutation (seen in a few, but #B117 is the main variant with it)
https://t.co/Dz6NYYEdaX

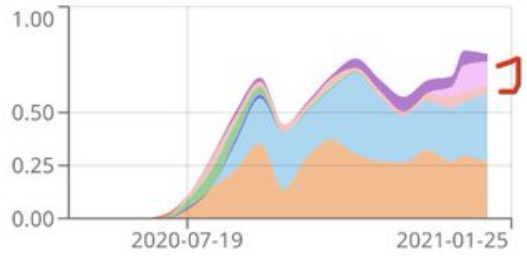
United Kingdom



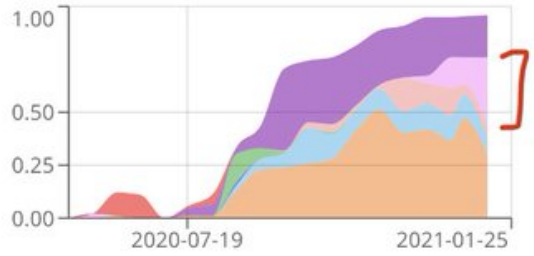
Denmark



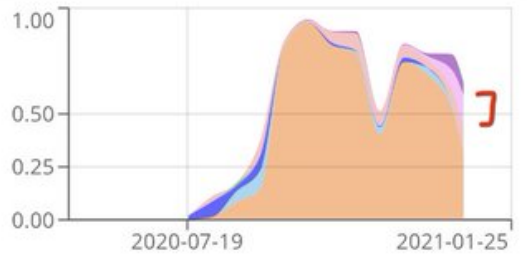
Switzerland



Netherlands



Iceland



32) Is #B117 a VARIANT or new STRAIN? People are now use them interchangeably. Let’s end the confusion. Experts say a variant is crowned a new strain when:

■Becomes dominant (B117 ■■)

■More transmissible (B117), deadlier, or modifies immunity. #COVID19
https://t.co/nBnmm6gdV4

Medical Assn. “Strictly speaking, a variant is a *strain* when it has a demonstrably different phenotype.”

ADVERTISEMENT

In other words, a particular coronavirus specimen may contain one or more mutations that another specimen lacks. If there is no detectable functional difference, it is merely a variant.

B117

However, if those mutations make the specimen more transmissible than its predecessors, or endow it with an added ability to evade a drug or vaccine, or alters it in another meaningful way, then it qualifies as a distinct strain.