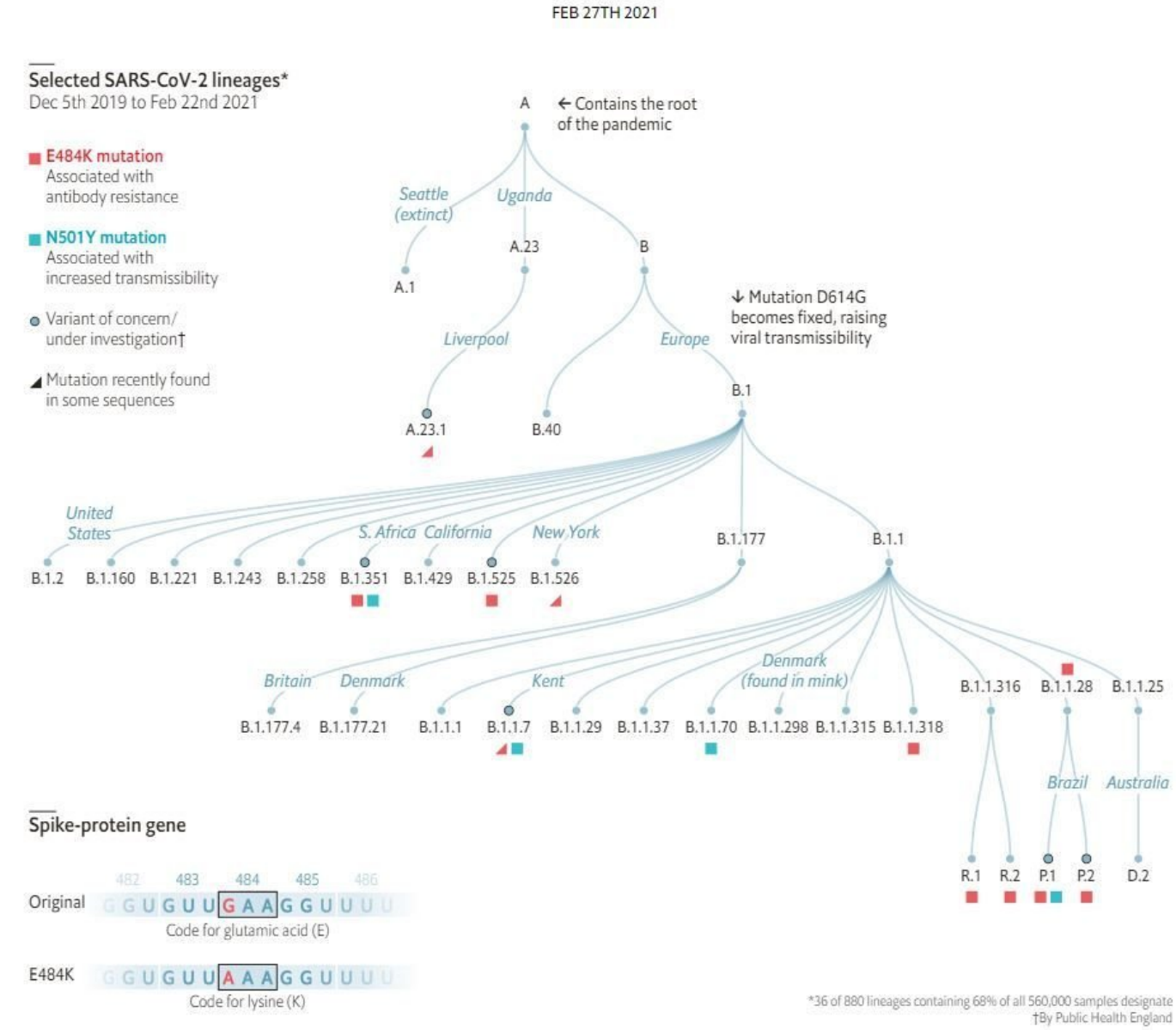
Twitter Thread by Billy Bostickson ■■&■ ■

Billy Bostickson ■■&■ ■
@BillyBostickson

Same covid-19 mutations are appearing in different places, which may or may not be strange....
41,000 mutations documented in 880 lineages.
Most in spike protein
What explains it?



https://t.co/MvHzUb4peo

1. From Day 1, SARS-COV-2 was very well adapted to humans .....and transgenic hACE2 Mice https://t.co/TNE4tuLkqN

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 18, 2021

https://t.co/PAwgC3lgsO

2. High Probability of serial passaging in Transgenic Mice expressing hACE2 in genesis of SARS-COV-2 https://t.co/B3eR764c1Z

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 18, 2021

https://t.co/f9rnyFI0vq

1. Reversion of molecularly engineered, partially attenuated, very virulent infectious bursal disease virus during infection of commercial chickenshttps://t.co/wOg1Ekl3Xp
2. Reversion to Virulence of Attenuated Canine Distemper Virus In Vivo and In Vitrohttps://t.co/xhjOEYEWTY

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 24, 2021

https://t.co/wAlyNzuI0W

3. pathogenic reversion of simian immunodeficiency virus SIVmac239Deltanef increases viral replicationhttps://t.co/jHmujgDVAC

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 24, 2021

https://t.co/xwVXm8r5EW

4. Genetic suppression in
reovirus: Ramig et al. 1977
papovavirus: Shortle et al. 1979
picornavirus: King et al. 1980
vaccinia virus: McFadden et al. 1980
influenza virus: Tolpin et al. 1981
herpesvirus: Hall and Almey 1982
adenovirus: Kruijer et al. 1983https://t.co/4zARJZWBzk

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 24, 2021

https://t.co/3GLXTyT54W

5. reversion to virulence of live attenuated vaccines
1. Evolutionary reversion of live viral vaccines: Can genetic engineering subdue it?https://t.co/9lY6ji88Gr
2. Mechanisms Causing Reversion to Virulence in an Attenuated SARS-CoVhttps://t.co/ogvKaqiQj8

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 24, 2021

https://t.co/0YqMa5GKEY

6. reversion to virulence of live attenuated vaccines
3. The double-edged sword: How evolution can make or break a live-attenuated virus vaccinehttps://t.co/jRJNTAR6tn
4. Selection Versus Mutation: Reducing the Risk of Vaccine Reversionhttps://t.co/dkVs3wTkve

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 24, 2021

https://t.co/sF0iIybMuB

7. NSP16 mutant reverts in immune-compromised model
and SARS-CoV dNSP16 can revert to virulence
Menachery, Yount & Baric 2018
Combination attenuation offers strategy for live-attenuated coronavirus vaccineshttps://t.co/q2oQQzc1SG pic.twitter.com/RhnBtrGhVW

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 24, 2021

https://t.co/dpqjYhTqCY

Was sars-cov-2 or its progenitor adapted to hACE2 during serial passage in human xenograft lung-transplanted mice at WIV?
We know that several mink variants and B.1.1.7 are well adapted to murine ACE2.
This may imply reversion of sars-cov-2 to a murine adapted progenitor.

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 20, 2021

https://t.co/fH9yDfvph2

Just to annoy people
Virology: the problem with \u2018leaky\u2019 vaccines
Fresh evidence supports the theory that some vaccines lead to the evolution of more virulent viral strainshttps://t.co/ttyM9J2idI

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 18, 2021

https://t.co/W4APXfRVbu

B.1.1.7 has an unusually large number of genetic changes, ... found to date in mouse-adapted SARS-CoV2 and is also seen in ferret infections.https://t.co/9Z4oJmkcKj pic.twitter.com/1Q65DpHboK

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 18, 2021

Are Mice the Key to the Mutation Mystery?https://t.co/qAyRuI0ivc

Mice!
A mink-associated variant carrying \u0394(69-70)-Y453F-F486L-N501T-M1229I mutations was also able to utilize mouse Ace2. In addition, all variants carrying an N501Y mutation, a shared feature of UK, South Africa, & Brazil VOC strains, efficiently use mouse Ace2 orthologs.

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 18, 2021

https://t.co/UarD78wTVC

Topolino!
"Moreover, the K417N-E484K-N501Y mutations found in the South Africa variant 501Y.V2 even enable the virus to utilize rat Ace2 more efficiently than using human ACE2. These data suggest that rats and mice may (have) be(en) able to harbor and spread these variants"? pic.twitter.com/kC3dVwmTyg

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 18, 2021

https://t.co/lRAck6josG

Above taken from:
Circulating SARS-CoV-2 variants B.1.1.7, 501Y.V2, and P.1 have gained ability to utilize rat and mouse Ace2 and altered in vitro sensitivity to neutralizing antibodies and ACE2-Ighttps://t.co/j9qEcUz4ea
Well worth a read! pic.twitter.com/w6VLjhpjf4

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 18, 2021

https://t.co/jCBQCLNRSV

even the mink variants were mouse ACE2 adapted, what a surprise...now, who would have expected that? pic.twitter.com/AVPwXeJ1tT

— Billy Bostickson \U0001f3f4\U0001f441&\U0001f441 \U0001f193 (@BillyBostickson) February 18, 2021