Desk of Senator Boquist

Asymptomatic infection fuels spread of more infectious SARS-CoV-2 variants

G. Vanden Bossche, DVM, PhD

April 21th 2021

Website: geertvandenbossche@org

Sars-CoV-2 has a highly 'insidious' strategy

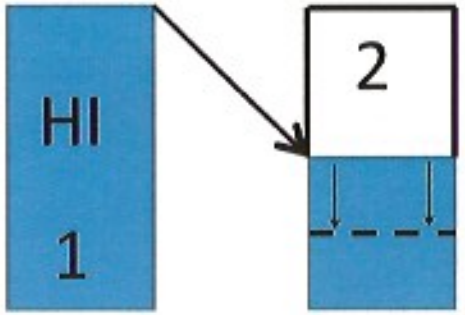
Sars-CoV-2 shed and transmitted by asymptomatically infected people

Promote fitness & propagation of immune escape variants capable of overcoming suboptimal immune pressure on spike (S) protein

This will breed 'more infectious' variants

Natural CoV pandemic: Infection pressure and occurrence of 2nd wave of disease

- The level of infection pressure determines the time length between the first and second wave of disease
- After 1st wave, the infection pressure will steadily increase and lead to 2nd wave of disease in an important part of naturally protected people (in blue)



HI: Herd immunity
AI: Asymptomatically infected

← Erosion of natural immunity in large part of AI population + infection pressure rapidly grows at high level →2nd wave of (severe) disease in younger age groups

→ Erosion of natural immunity in smaller, additional part of AI population + infection pressure slowly grows at low level → enabling (local) viral replication on background of suboptimal αS-Abs → 'more infectious' variants (plateau

Infection pressure will ultimately increase till 'more infectious' variants break through innate immune barrier of those who asymptomatically resisted 2nd wave → delayed 3rd wave of (severe) disease in youngsters

Infection pressure and occurrence of 2nd wave of disease (cont'nd)

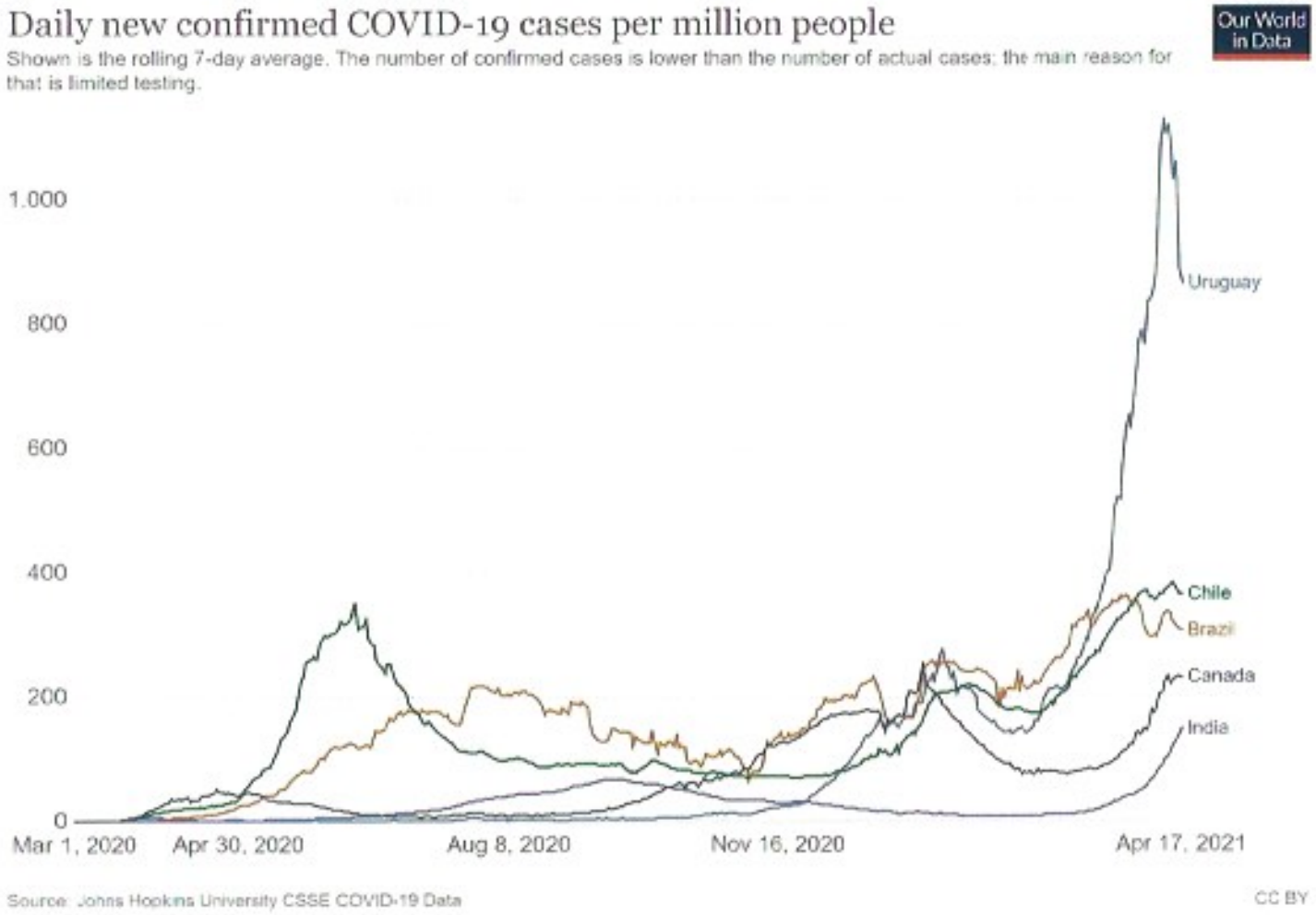
- Stringent infection prevention measures will delay 2nd wave of disease in previously protected subjects while promoting breeding of infectious variants
- Introduction of highly infectious variants will expedite this process
- Mass vaccination on the background of 'more infectious' variants will enhance immune pressure exerted on their infectiousness, regardless of viral infection pressure* (due to anti-RBD Abs)

Due to suboptimal immunity in an important part of vaccinees (mass vaccination!), viral variants will increasingly select escape mutations within RBD. As those will have a competitive advantage, this will promote breeding of variants that are even more infectious and finally lead to vaccine-resistant variants

RBD: receptor-binding domain

* except if full lock-down

Starting mass vaccination on backgrounds of different infectivity



Efficiency of conventional vaccines to control a pandemic is *conditional*

- Pandemic: NEW virus; innate herd immunity only
- Mass vaccination with conventional (i.e., non-sterilizing vaccines) *could control and even eradicate infection* IF and only IF:

❑ not highly mutable virus

\+ ❑ no asymptomatic/ animal reservoir

Conditions NOT fulfilled in case of SARS-CoV-2:

❑ highly mutable virus

❑ ∃ asymptomatic carriers → 'more infectious' variants (especially if more infection-prevention measures)

Mass vaccination of youngsters is going to result in enhanced morbidity and mortality rates in this age group!