



**UNIVERSITÉ
DE GENÈVE**

FACULTÉ DE MÉDECINE
Institut de santé globale



ETH zürich **EPFL**



COVID-19: International Performance Comparisons

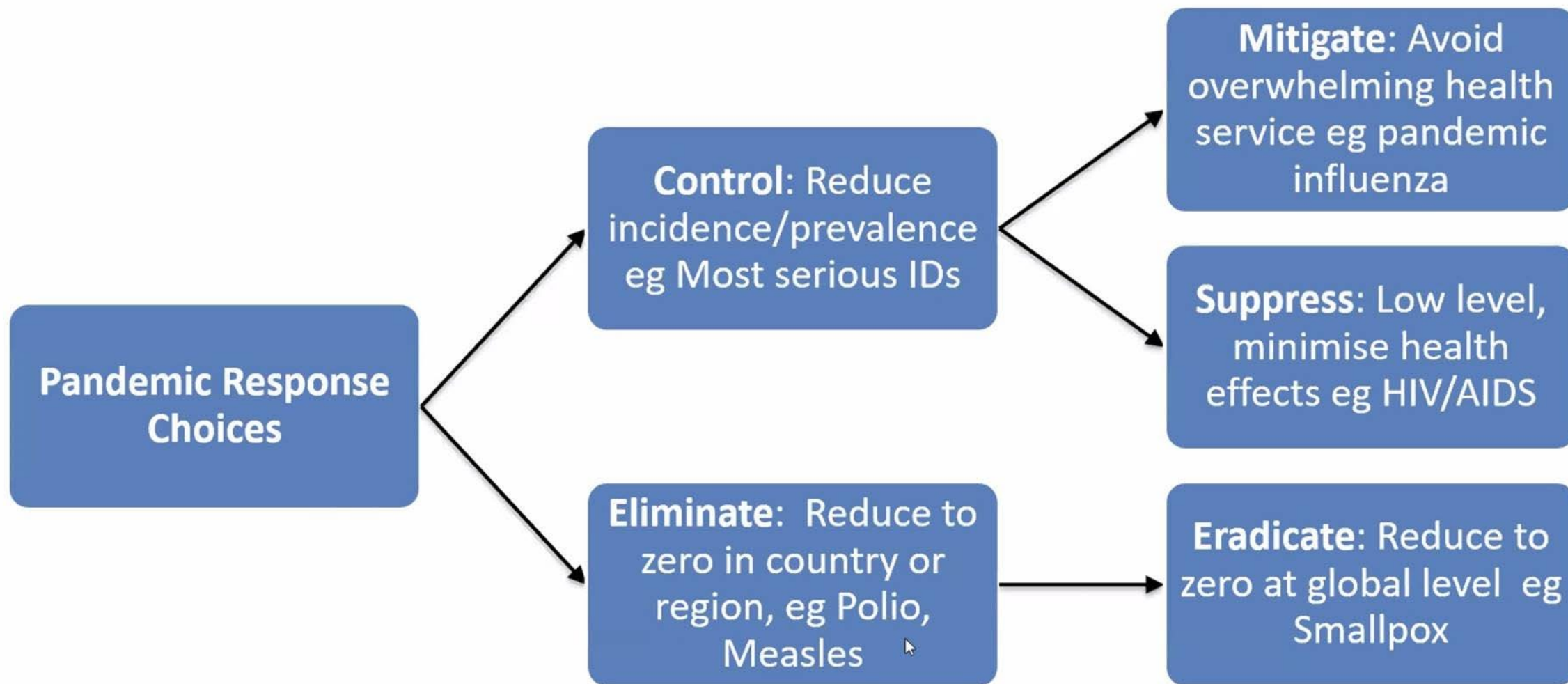
Swiss TPH VIRTUAL Symposium 2021

Global Health in the 21st Century

Antoine Flahault
29 June 2021



Strategic Choices for Pandemic Response

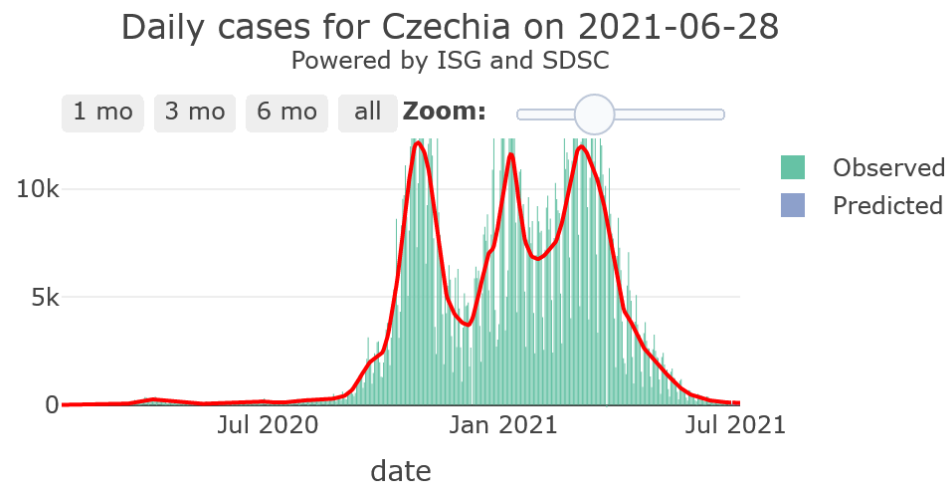


Source: Dowdle, MMWR Supple. December 1999 / 48 (SU01);23-7

Mitigation

Western COVID strategy (reactive)

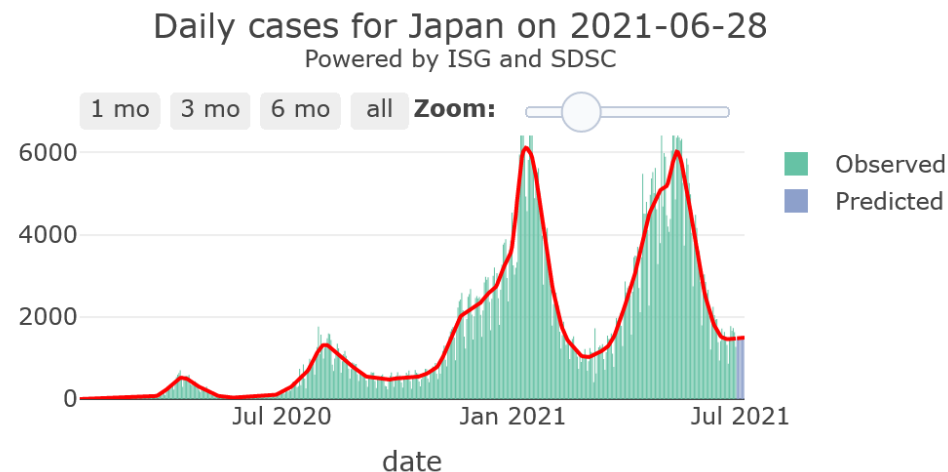
- EU, Russia, Switzerland, Central Europe, Middle-East, Canada, USA, Latin America
- Mortality > 90 Covid deaths/100,000 population
- When incidence increases, $R > 1$ (exponential growth)
 - To avoid overwhelming health care system (ICUs)
 - Lockdown measures
 - At last resort
 - Closing schools



Suppression

Asian response (proactive)

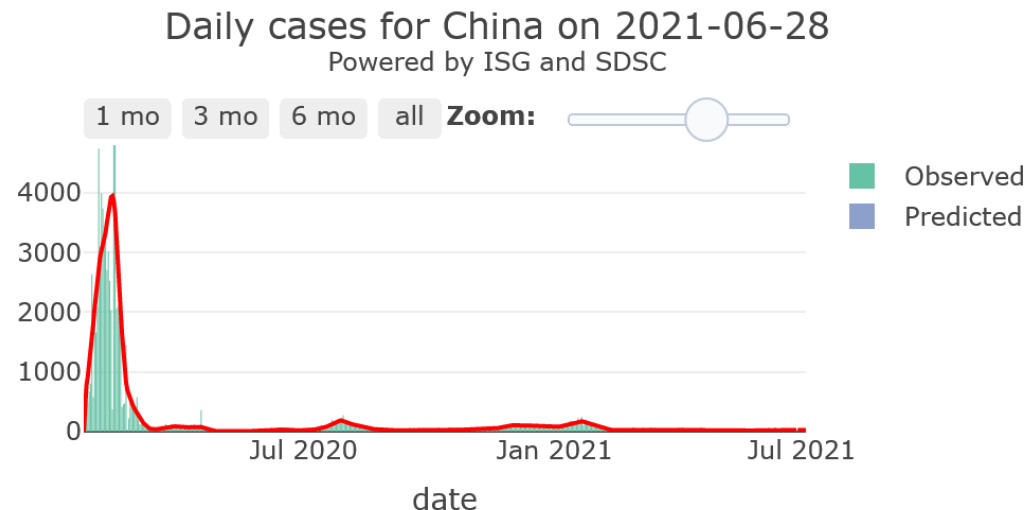
- Japan, South Korea, Pakistan, Finland, Norway
- $4 < \text{mortality} < 20$ Covid deaths/100,000 population
- Not allowing high waves (= much earlier reaction than mitigation)
 - Strict border control
 - Backward Tracing
 - Extensive use of digital traces
 - Effective quarantines and isolation (hospital, hotels)
 - As soon as incidence increases
 - Local or regional lockdown measures



Elimination (“Zero Covid”)

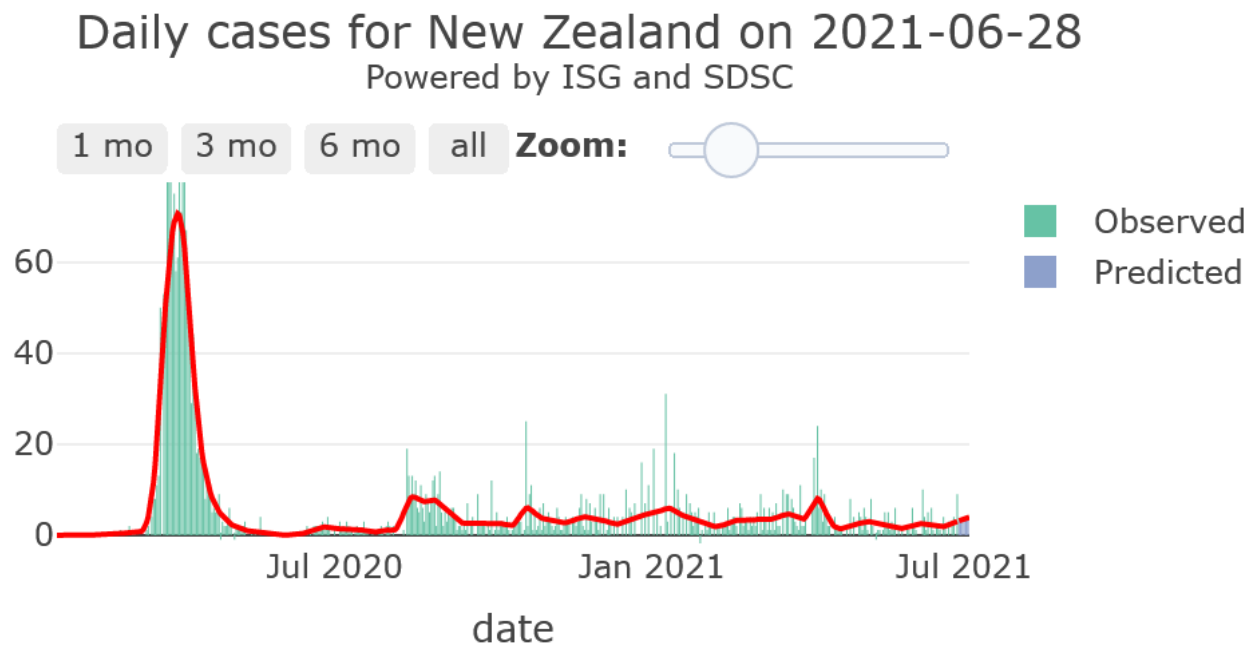
Asia-Pacific response

- China, Taiwan, (Vietnam), New Zealand, Australia, New Caledonia, Iceland
- Mortality < 4 Covid death/100,000 population
- Zero tolerance to virus circulation
 - Strict border control
 - Backward Tracing
 - Extensive use of digital traces
 - Effective quarantines and isolation (hospital, hotels)
 - At the first identified case: local and short duration lockdowns

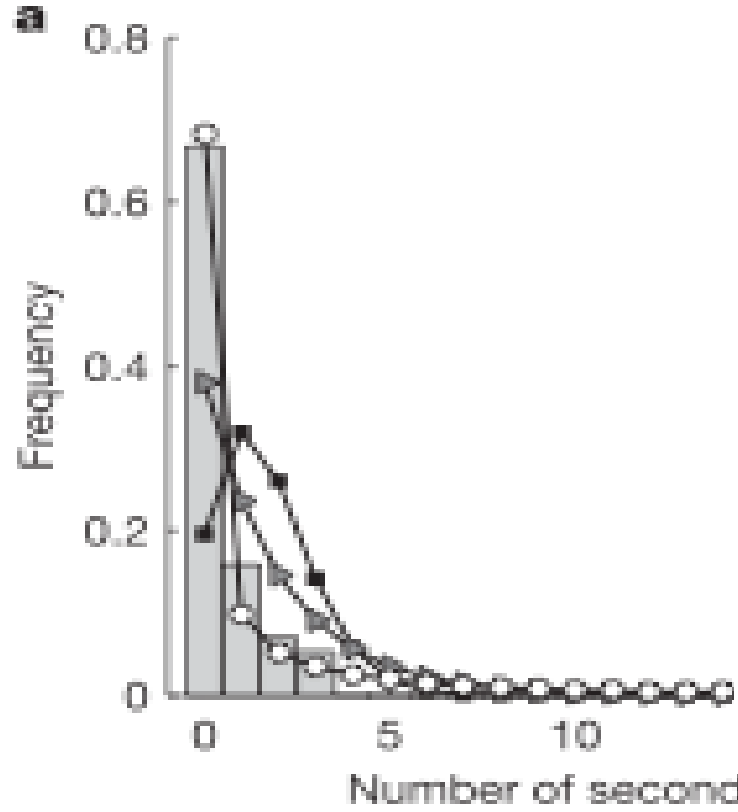


From mitigation to elimination *e.g. New Zealand*

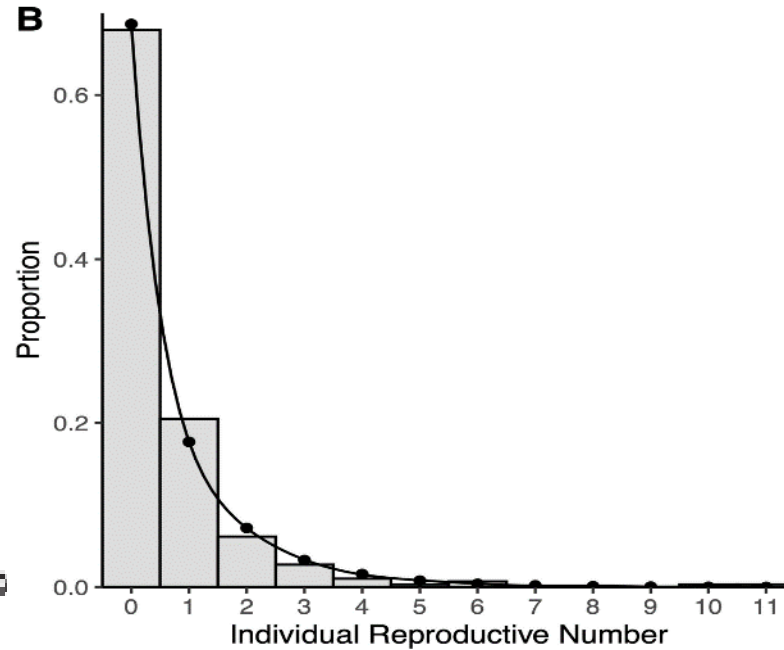
- Management of the first wave: strict lockdown, *mitigation*
- Then after the outbreak: *elimination* (Zero Covid)



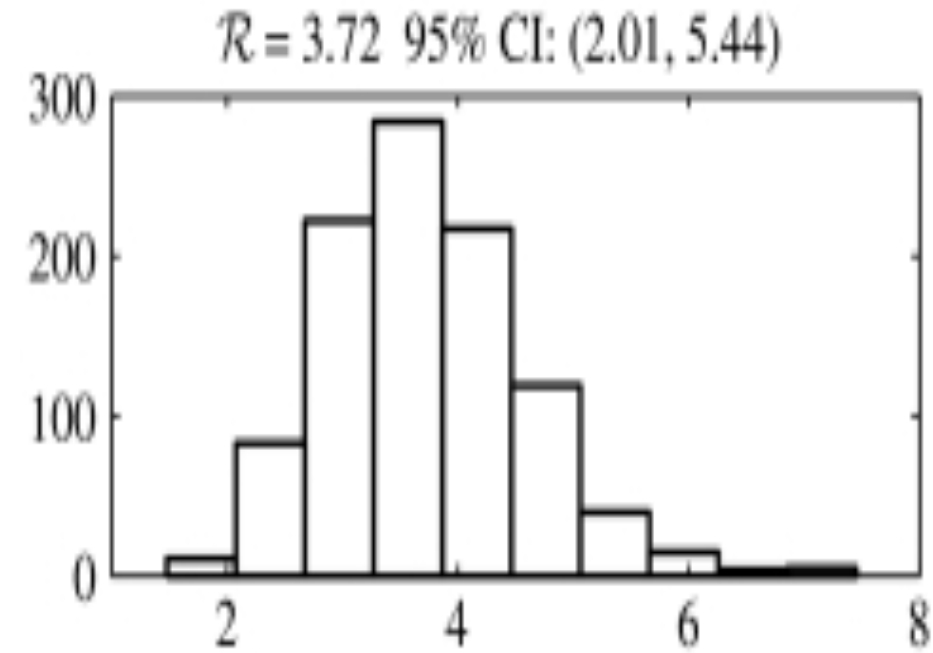
COVID-19 is not Influenza: overdispersion



*Ro for SARS in Singapore
(Lloyd-Smith, 2005)*

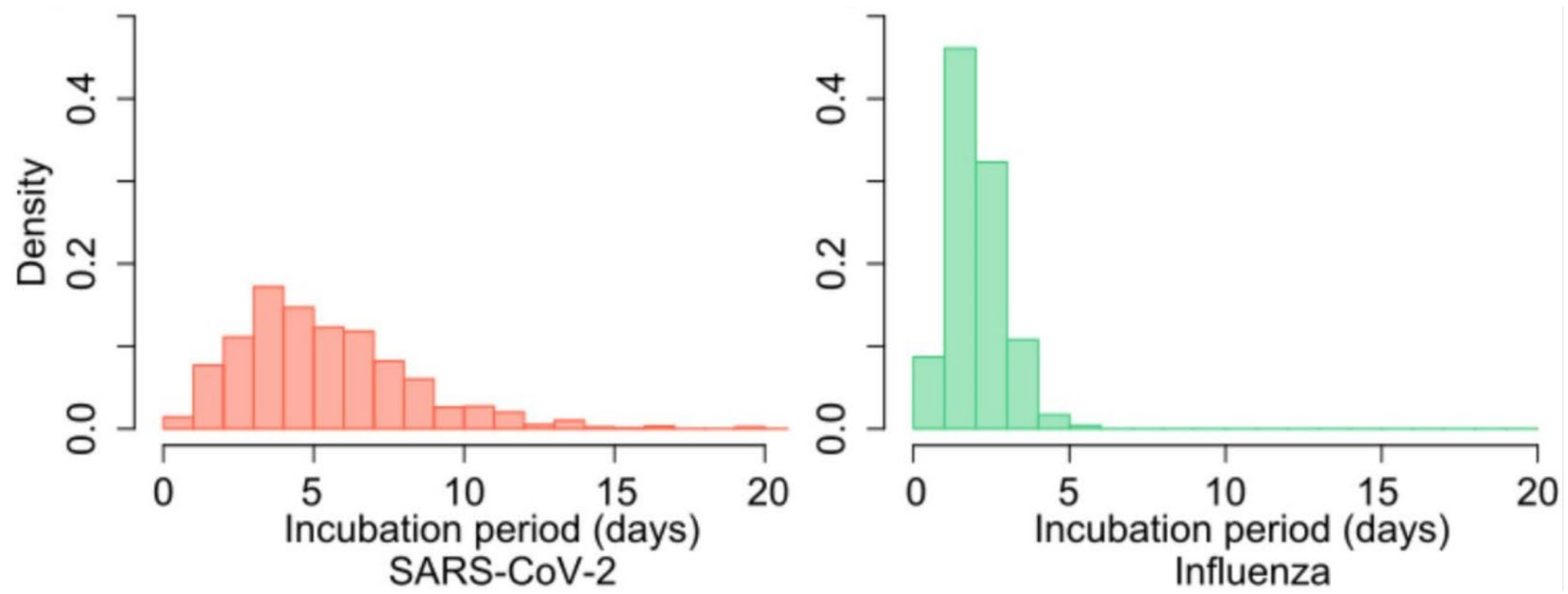


*Ro for COVID-19 in Hong-Kong
(Adam D, 2020)*

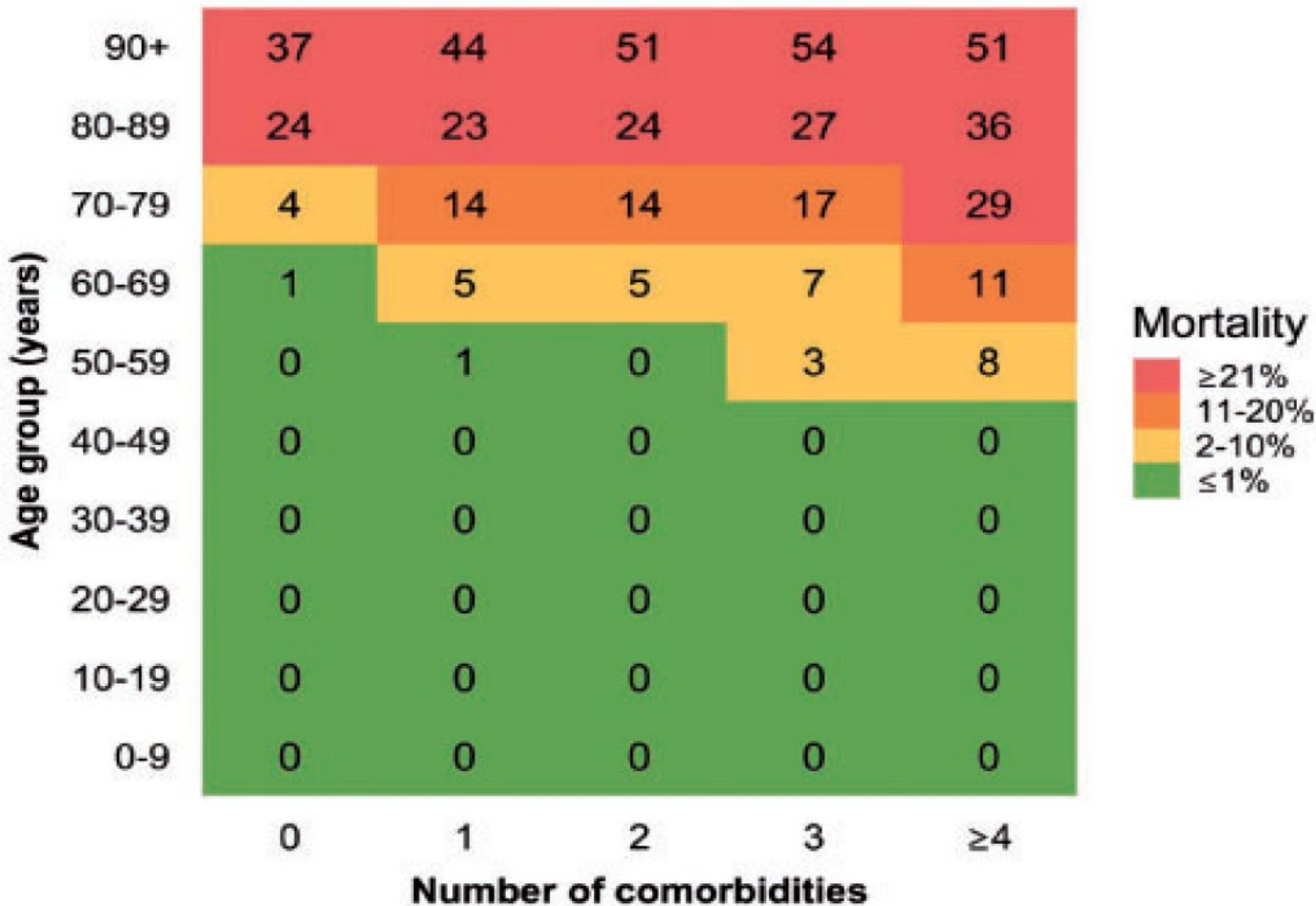


*Ro for Influenza in San Francisco
(Chowell G, 2007)*

COVID-19 is not Influenza: Incubation period

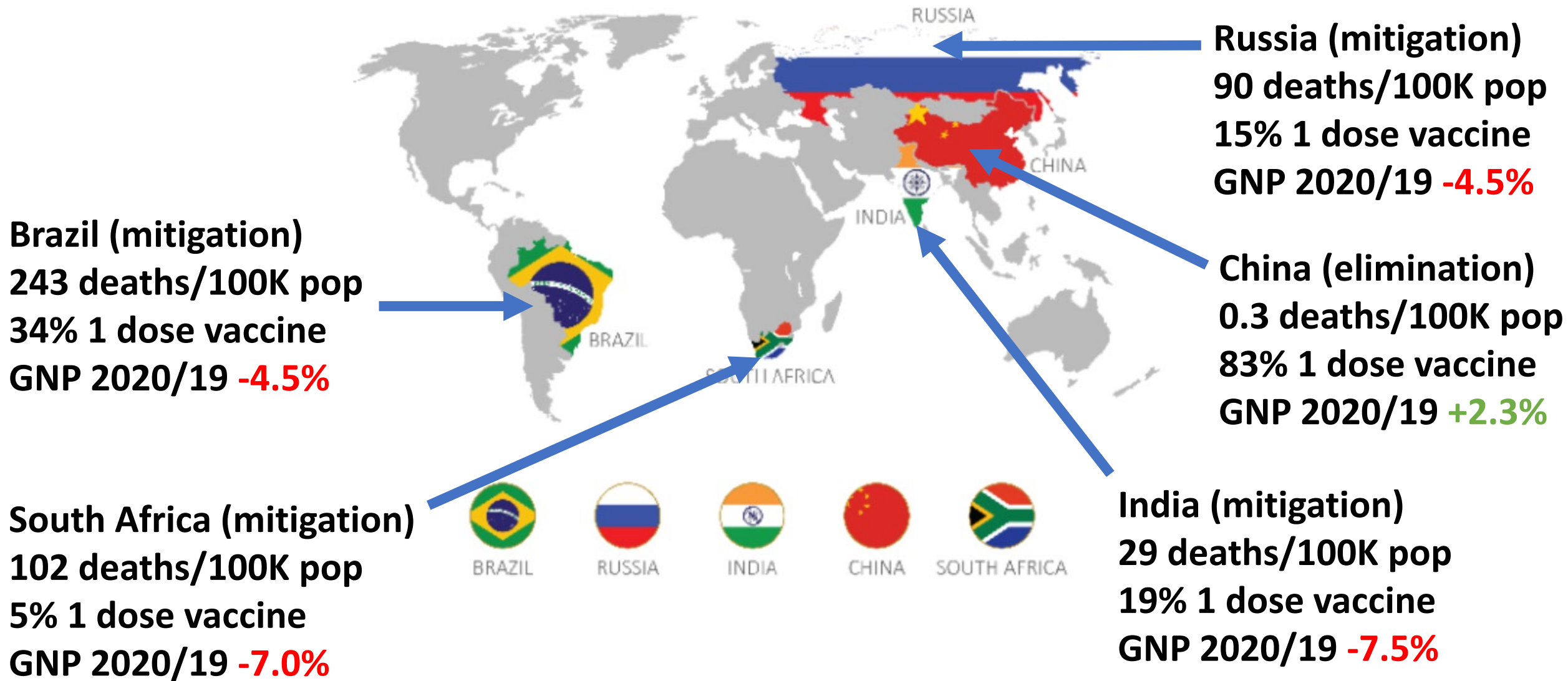


COVID-19 is not Influenza: severity



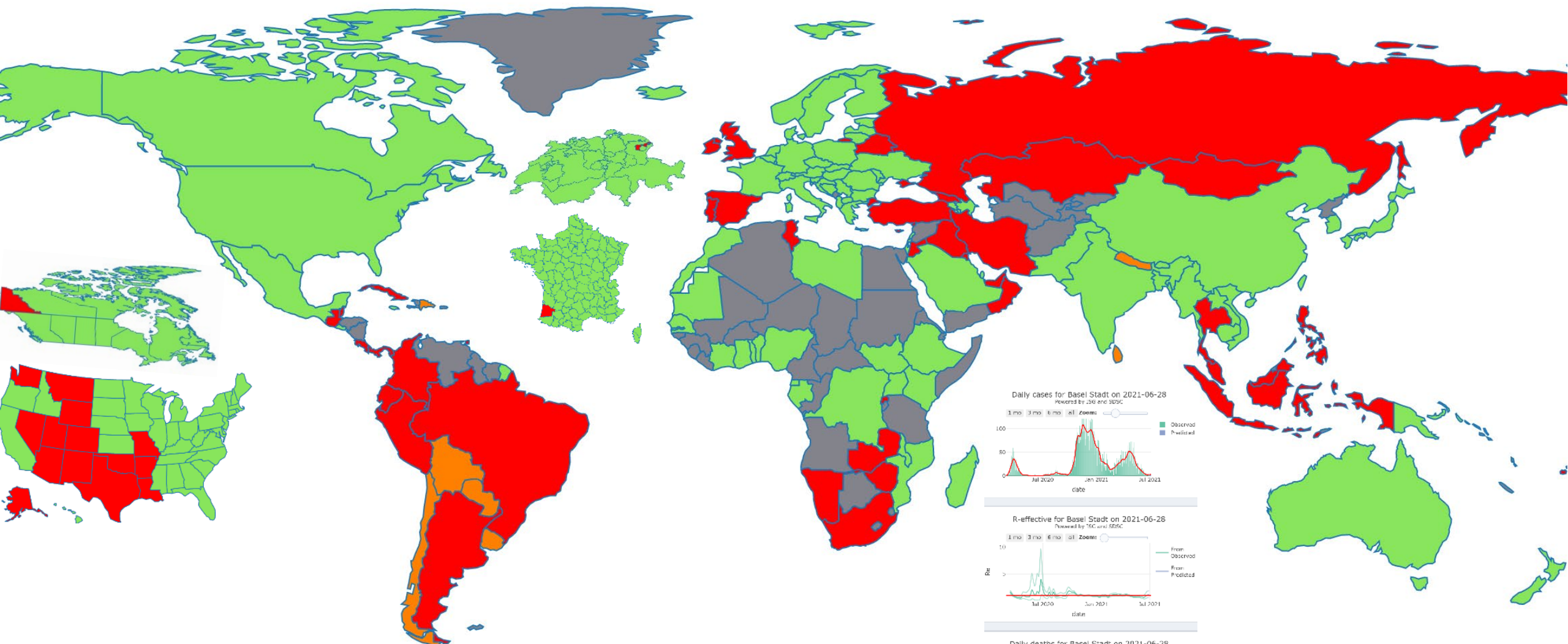
Source: Reilev M et al. Int J Epidemiol 2020
 Etude danoise en population portant sur les 11 122 cas détectés positifs entre le 27 février et le 19 mai 2020

Performance During the COVID-19 Crisis in the BRICS



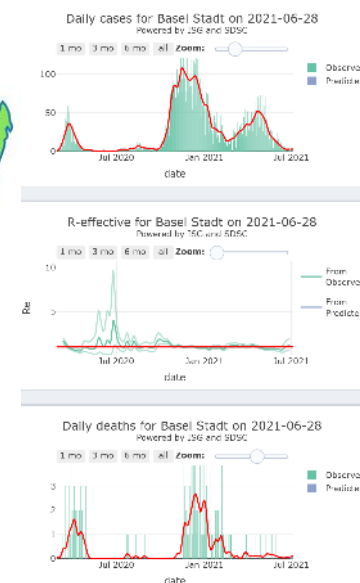
COVID-19 daily epidemic forecasting

Powered by ISG and SDSC



June 28 2021

<https://renkulab.shinyapps.io/COVID-19-Epidemic-Forecasting/>



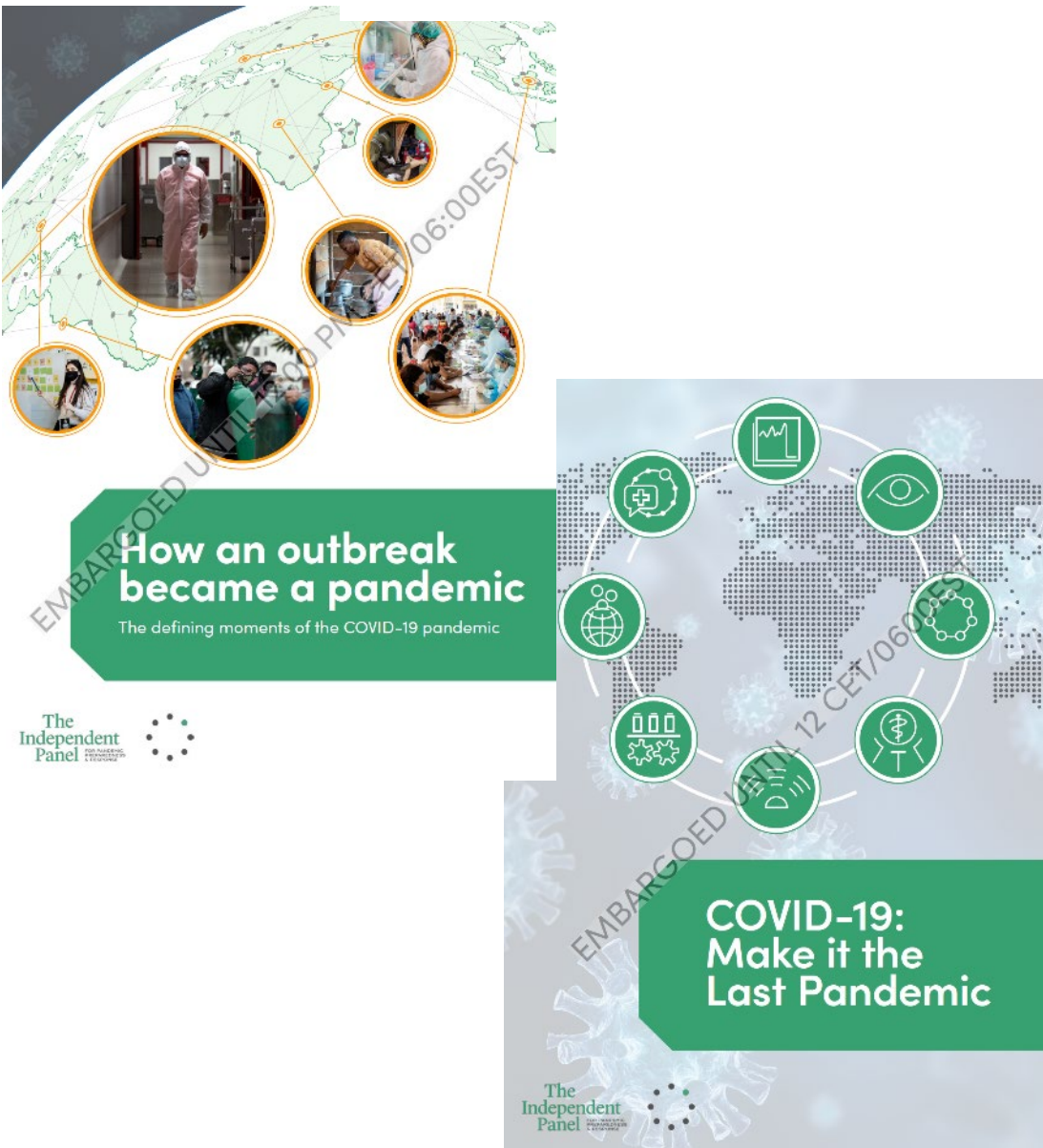
Conclusions 1/2

June 2021

- **Impredictibility** of the pandemic
- (Too much) **hope in vaccines?**
- **Mitigation** has failed (health, social, economics)
- **Suppression** performed better
- **Elimination** (even without any vaccine) performed the best
- Next step: **eradication?**
 - Need to be discussed
 - Need to be prepared: universal immunization program (production, logistics,...)
 - Need to be coordinated: **WHO**
 - Need to be funded (HICs)

Conclusions 2/2

June 2021



1. On-site WHO investigations
2. Technology transfer for tests, drugs and vaccines: in each continent
3. Data science and epidemic forecasting
4. «One Health» approach (human/animal/environmentinterface)



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No Covid ? yes, but on islands only...

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