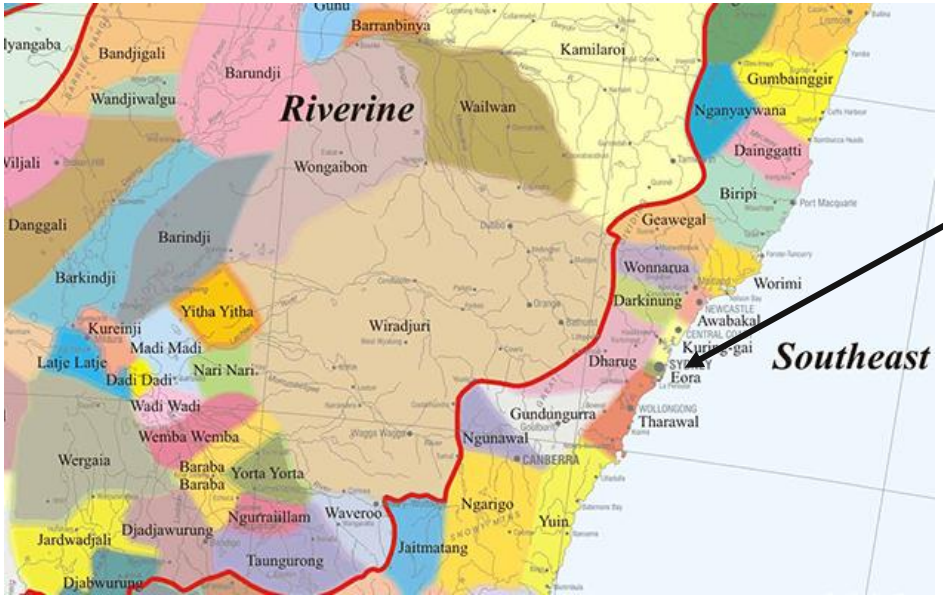
Professor Mary-Louise Mclaws
Professor of Epidemiology, Healthcare Infection and Infectious Diseases Control
School of Public Health and Community Medicine
UNSW Global Water Institute 'Water and Health' lead

Balmain Institute

COVID-19: global and local updates and emerging issues

13 May 2021

Acknowledgement of Country – UNSW located on land of the Bedegal and Gadigal people



I would like to show my respects and acknowledge the traditional Custodians of the land. I would like to pay my respects to Elders both past, present and emerging and extend that respect to other Aboriginal and Torres Strait Islanders who are present here today.

“We do not learn from experience...
We learn from reflecting on experience.”

John Dewey

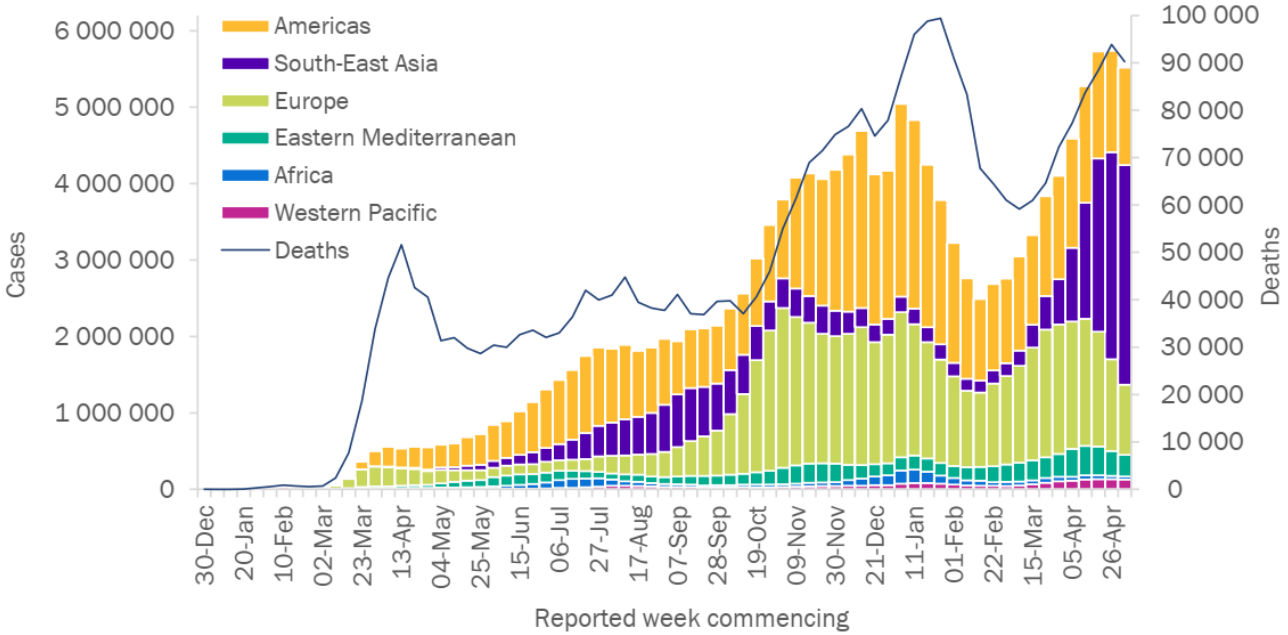
1859-1952, educator and philosopher John Dewey was born in Burlington, Vermont. He earned his doctorate in 1884 from Johns Hopkins University. He was founder of the philosophical movement known as **pragmatism,** a pioneer in functional psychology, and a leader of the progressive movement in education in the United States

Five messages

1. “..it is, perhaps, the end of the beginning”

Winston Churchill 1942: Now this is not the **end**. It is not even the **beginning** of the **end**. But it is, perhaps, the **end of the beginning**.

Global situation



Global 3rd wave

May 9, 2021

Total Cases 157M

Total deaths 3.3M

7-day new cases 5.5M

7-day new death 90K

India 2nd wave

Source: https://covid19.who.int/

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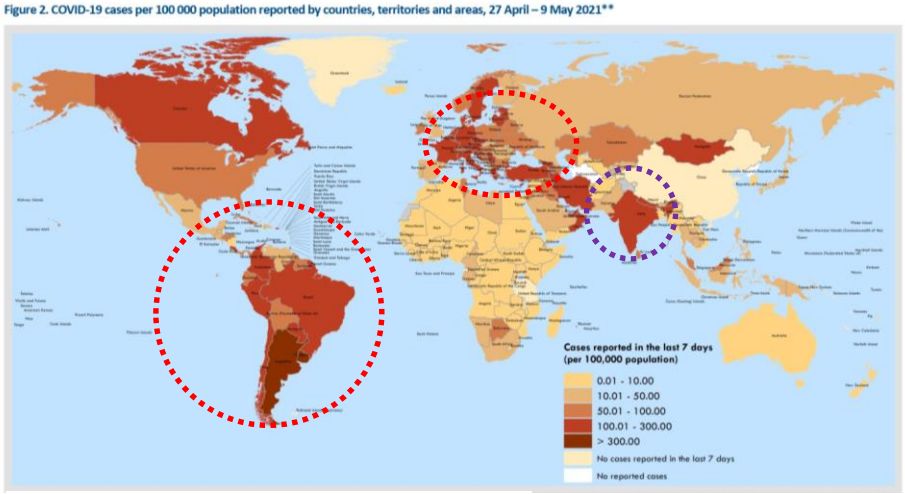
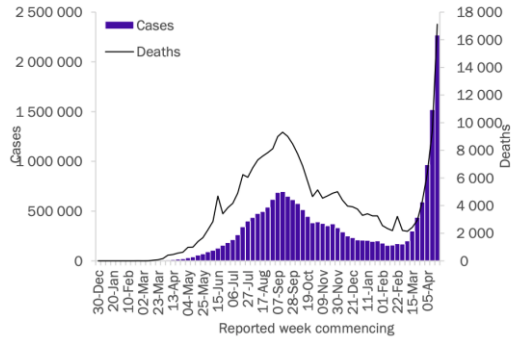
Risk in last 7-day hot spots





India (last 24 hours)

49% of global new cases

Concern in neighbouring countries

Global 7 days to 9th May

Europe/Americas/SE Asia

92% new global cases

91% new global deaths

Americas

23% new cases (33% Brazil)

38% new deaths (45% Brazil)

Europe

17% new cases (18% Turkey)

21% new deaths (13% Russia)

SE Asia

52% new cases (95% India)

32% new deaths (93% India)

Data: https://covid19.who.int/

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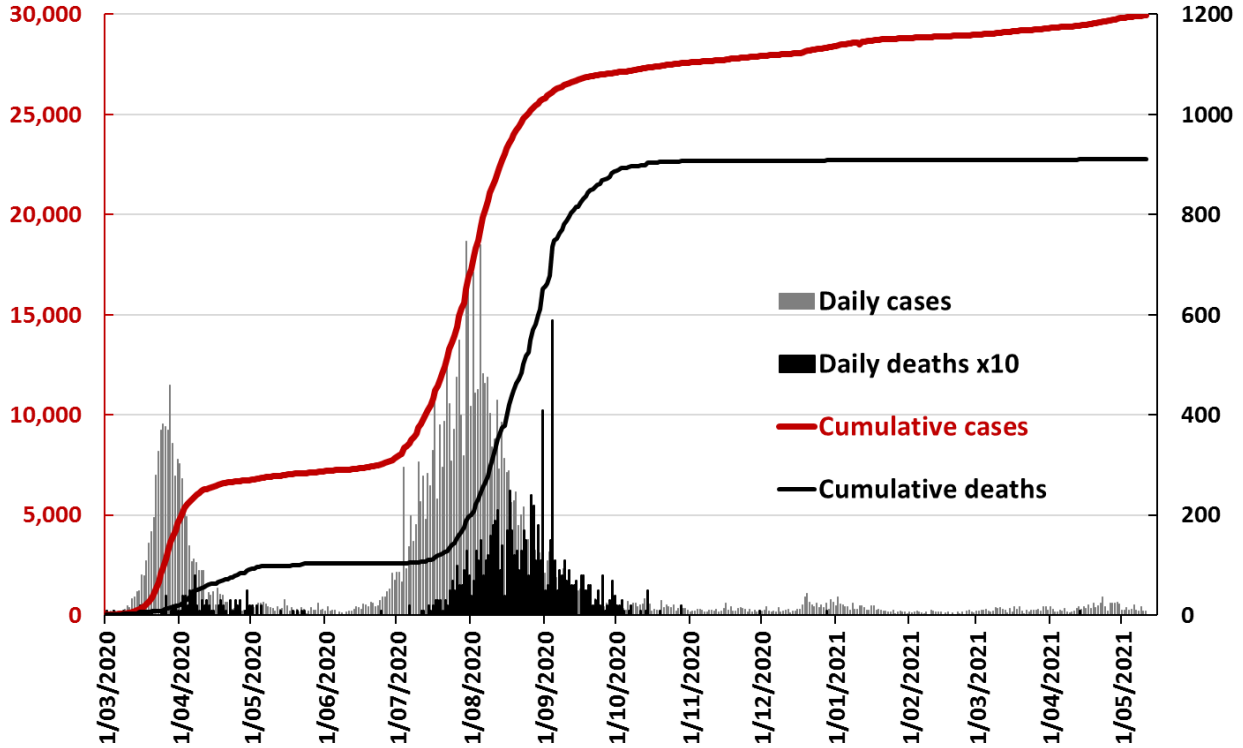
Australia- Covid19 infection history



Source: ML McLaws 2021

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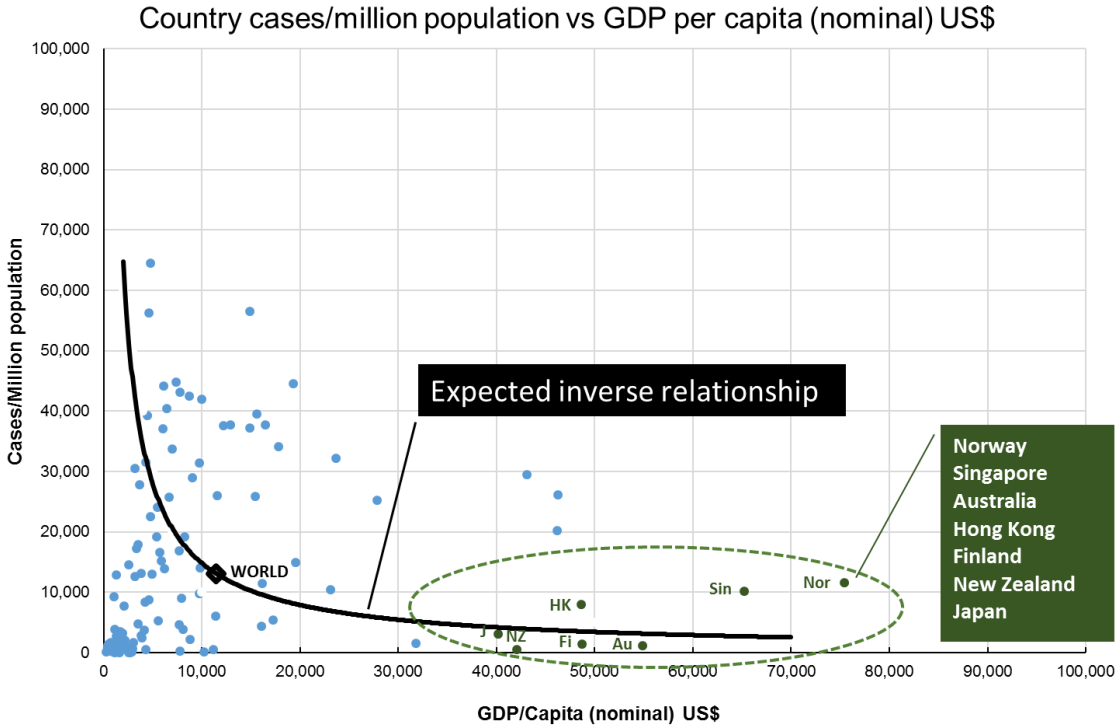
2. Elimination beats suppression

Risk reduction you would have been expected by GDP



Source: ML McLaws 2021

Actual risk reduction

Should have acted faster

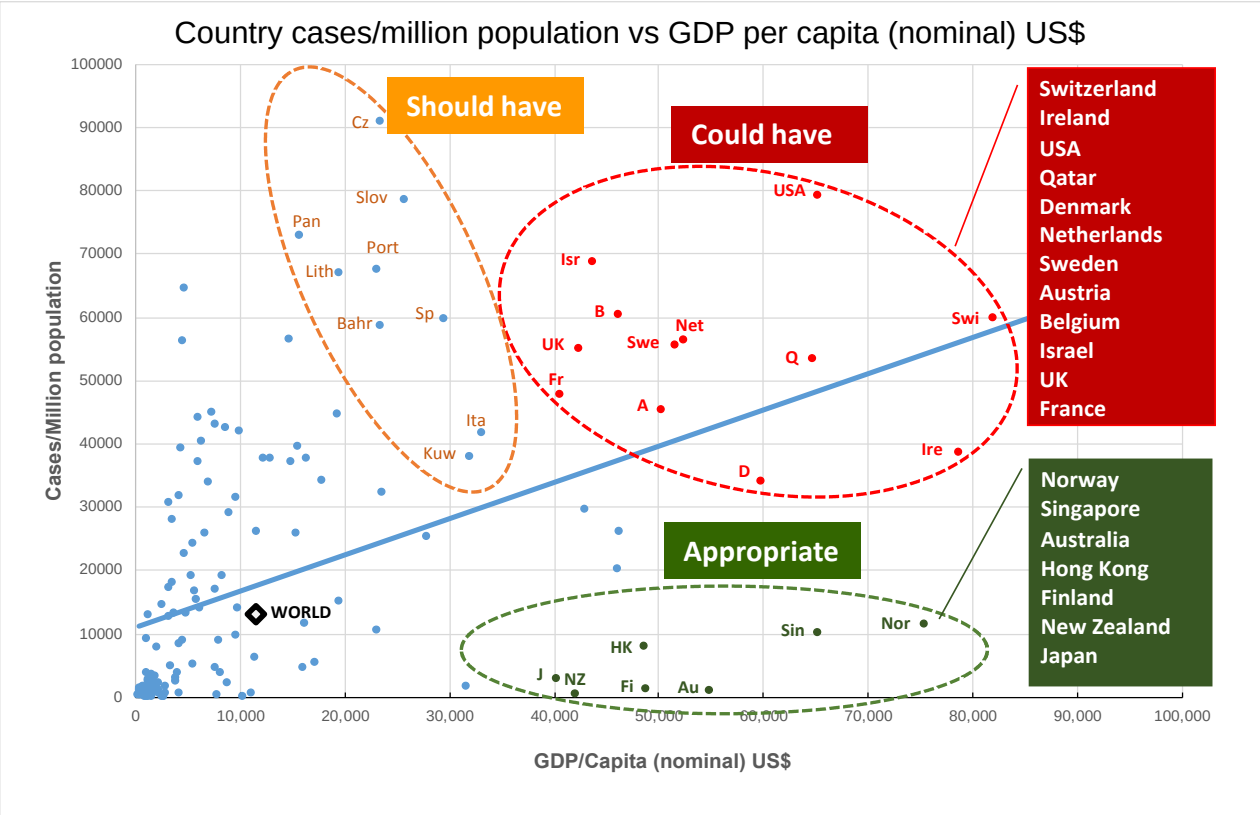
- Middle GDP
- Later outbreak
- High cases/mill pop

Could have acted faster

- Mostly High GDP
- Later uptick in cases
- High cases/mill pop
- Relying on high tech solution

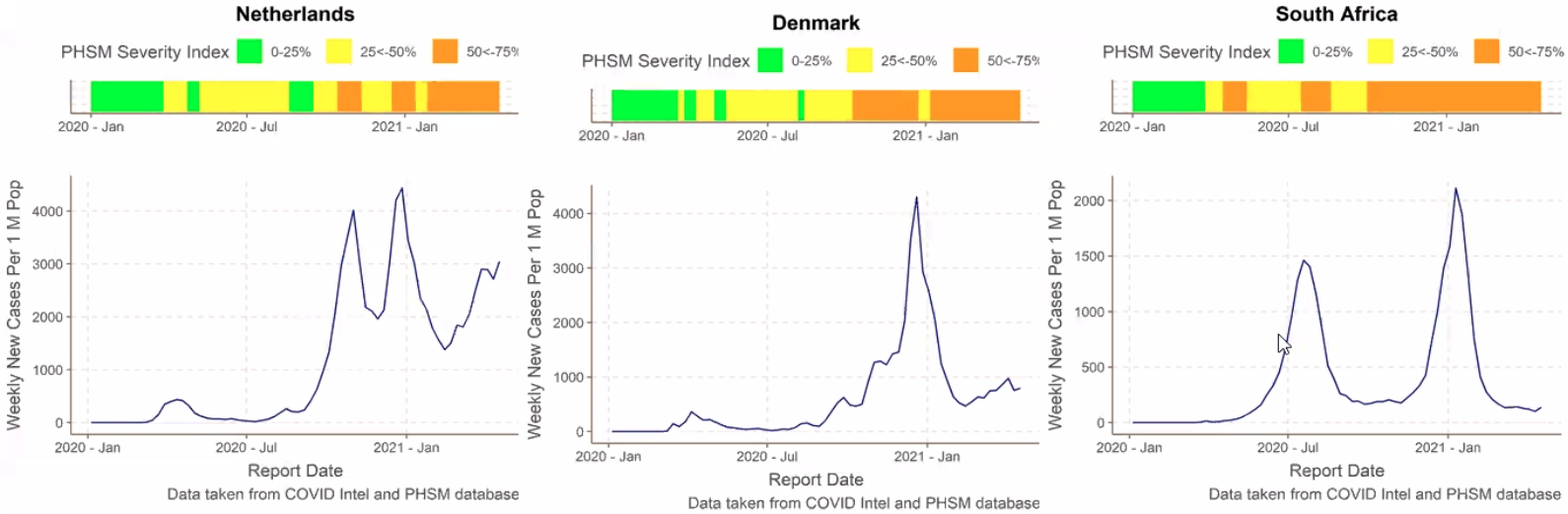
Appropriate

- Higher GPD
- Earlier outbreaks
- Low cases/mill pop



Source: ML McLaws 2021

WHO PHSM severity index and trends in countries reporting high rates of VOCs



World Health Organization

Australia learnt to continue lockdown

Many countries restriction periods were too short

Source: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/phsm

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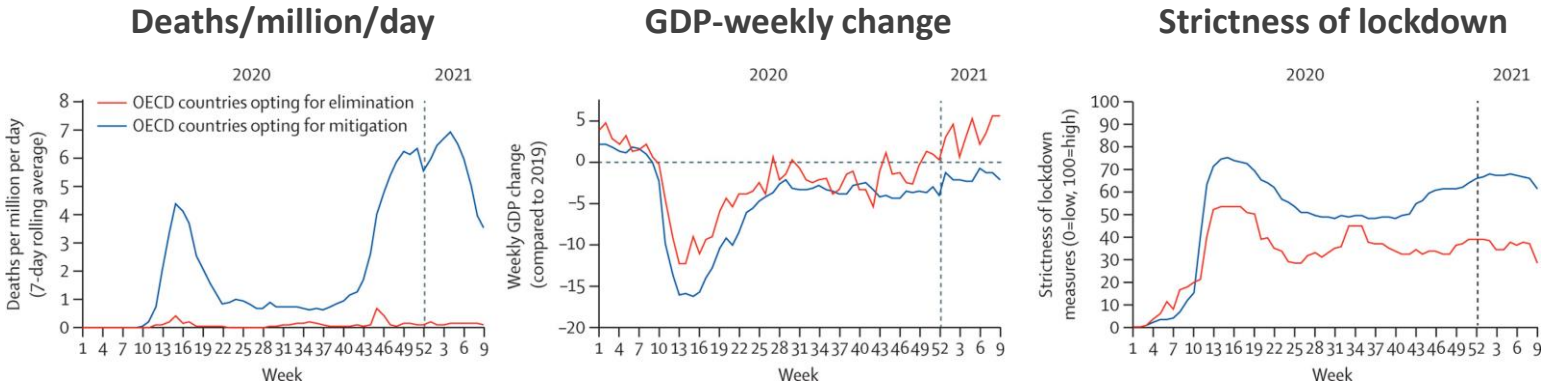
Elimination beats suppression



Elimination: lower deaths, …….. faster GDP recovery & ……..less strict lockdown

COVID-19 deaths, GDP growth, and strictness of lockdown measures for OECD countries choosing SARS-CoV-2 elimination versus mitigation OECD countries opting for elimination are Australia, Iceland, Japan, New Zealand, and South Korea. OECD countries opting for mitigation are Austria, Belgium, Canada, Chile, Colombia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, the UK, and the USA. Data on strictness of lockdown measures are from Oxford COVID-19 government response tracker.

Source: Miquel Oliu-Barton, *Bary S R Pradelski, Philippe Aghion, Patrick Artus, Ilona Kickbusch, Jeffrey V Lazarus, Devi Sridhar,Samantha Vanderslott DOI: https://doi.org/10.1016/S0140-6736(21)00978-8

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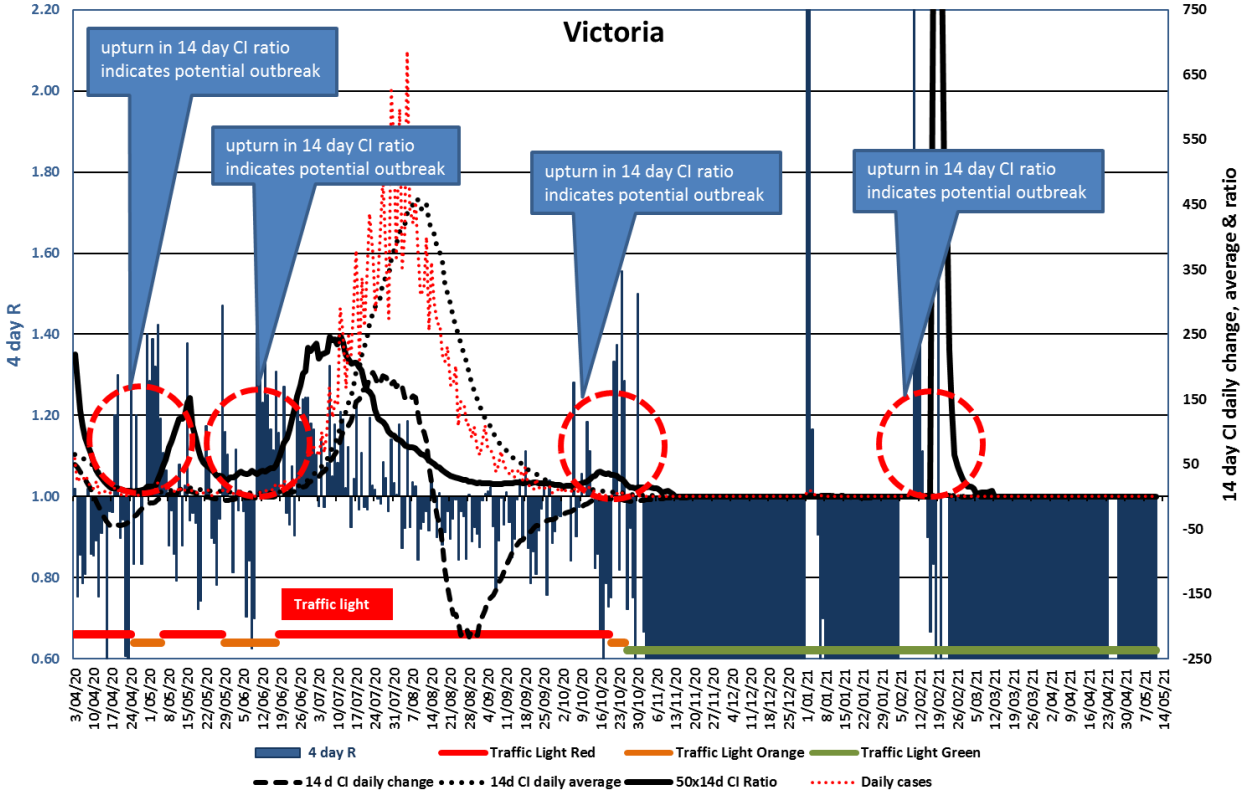
3. Proactive is more effective than reactive

“Go early go hard”

Pre-emptive response to reduce risk



Source: ML McLaws 2021

Australia's Covid19 response

The good-ish

- Early-ish initial response – but confused and inconsistent
- Listening to science – but selective
- Quarantine & banning overseas travellers – but selective/exemptions
- Banning cruise ships – but confused implementation
- Ring-fencing using state borders – but inconsistent
- Daily updates – but some opaque publications and communications
- Testing & tracing – but initially slow then ramped up well

Source: ML McLaws 2021

The bad & ugly - continuously reactive not proactive

- Ineffective
  - Initial quarantine of overseas travellers – chaos at airports
  - Lack of border security control and federal IPC of cruise ships (Ruby Princess, Greg Mortimer)
  - Inability to learn from first quarantine hotels breach and 22 others
  - Tracing App (CovidSafe)
  - Residential aged care facilities (Sydney, Melbourne)
- State border arguments and political arguments
- IPC lacked uniformity – masks for public & on transport (aeroplanes
- Threat of fines and/or jail for returning Australian citizens from India

Source: ML McLaws 2021

What could have been done better?

- National uniformity - borders, RACFs, public health & social measures
- More investment in testing laboratories for quicker results
- More/better resourced testing clinics for quicker turnaround
- If RACFs and hotels are used as proxy hospitals they must be expected to comply with same stringent IPC policies
- More effective communication for CLAD & 20-39 years
- Develop a tracing opal card
- Formulate a shared future vision: climate, inequality, jobs, finance→ hope
- Effective quarantine but that's next

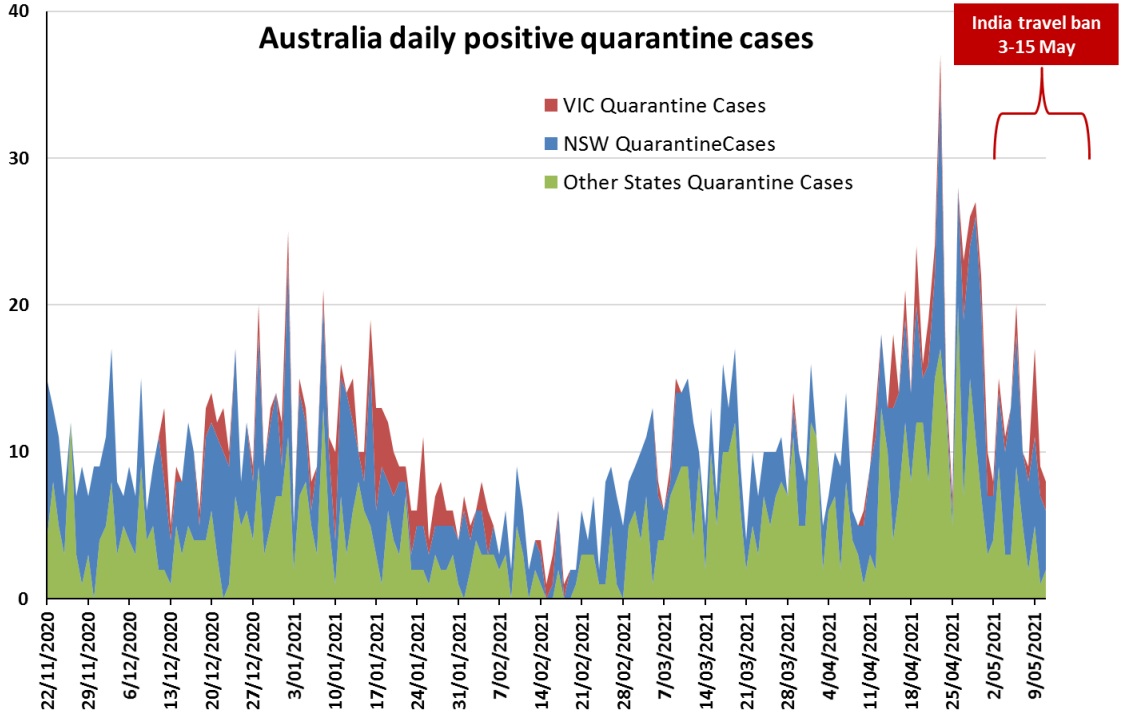
Source: ML McLaws 2021

4. Hotel quarantine is a temporary solution

STOP PRESS- May 11th 2021

Federal budget revealed Australia's border will likely remain shut until the middle of next year

Quarantine positive cases are increasing



Mid March '21 India 2nd COVID wave explosion

21st April '21
3rd hotel transmission incident in a week

21st April '21
India COVID-19 positive arrivals surge in Howard Springs

Source: ML McLaws 2021

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Total Breaches	NSW	VIC	QLD	WA	SA	NT
23	9	6	3	4	1	0

State	Date	Facility	Case	Variant
WA	12-May-20	Pan Pacific Perth	Contractor	-
VIC	25-May-20	Ridges Hotel	Staff and Security Guards	-
VIC	14-Jun-20	Stamford Hotel	Security Guard	-
VIC	15-Jun-20	Stamford Hotel	Couple	-
NSW	17-Aug-20	Marriot Hotel	Security Guard	-
NSW	20-Aug-20	Marriot Hotel	Security Guard	-
SA	14-Nov-20	Peppers	Parafield	-
NSW	4-Dec-20	Novotel	HQ Cleaner	USA
NSW	17-Dec-20	Airport Hotel	Bus Driver	USA
NSW	17-Dec-20	Airport Hotel	Avalon	USA
NSW	3-Jan-21	Airport Hotel	Patient Transport	USA
QLD	7-Jan-21	Grand Chancellor	Cleaner	UK
WA	31-Jan-21	Four Points Sheraton	Case 903	UK
VIC	3-Feb-21	Park Royal Hotel	Nigeria Family	UK
VIC	5-Feb-21	Grand Hyatt	Resident Support Officer	UK
VIC	8-Feb-21	Holiday Inn Hotel	Nebuliser	UK
QLD	12-Mar-21	Princess Alexandria	Doctor	UK
NSW	14-Mar-21	Sofitel Wentworth	HQ Worker	UK
QLD	26-Mar-21	Princess Alexandria	Nurse	UK
NSW	17-Apr-21	Adina Apartments	Families	SA
WA	21-Apr-21	Mercure Hotel	Guests	UK
NSW	21-Apr-21	Mercure Hotel	Adjacent Room	SA
WA	1-May-21	Pan Pacific Hotel	Case 1001	USA

Improving the safety of hotel quarantine

Bundling measures

- CCTV every floor for real-time evaluation of noncompliance
- Proxy hospital for infectious agent needs hospital ACH per hour
- Or move positive travellers to a seconded hospital
- Triage on arrival from day-0 RAT
- Constant testing augmenting PCR day-2,4,6,8,10,12, day-14
- Check all air pressure:

  lifts moving, >1 room doors opening, interconnecting rooms

Source: ML McLaws 2021

Improving the future of quarantine

- **Development of national policy and leadership**
- **Purpose-built & staffed facilities**
  - near hospital & near airport
  - still requires continuous real time testing augment with PCR
  - single story: natural ventilation or no less than 10 ACH
    - outdoor courtyard without supervision
    - separate cohort areas for positive & negative travellers
- **Home quarantine**
  - triage: vaccine + RAT + RAntiB T results
  - supervised by geolocator technology
  - household vaccinated & follow-up with take-home RAT

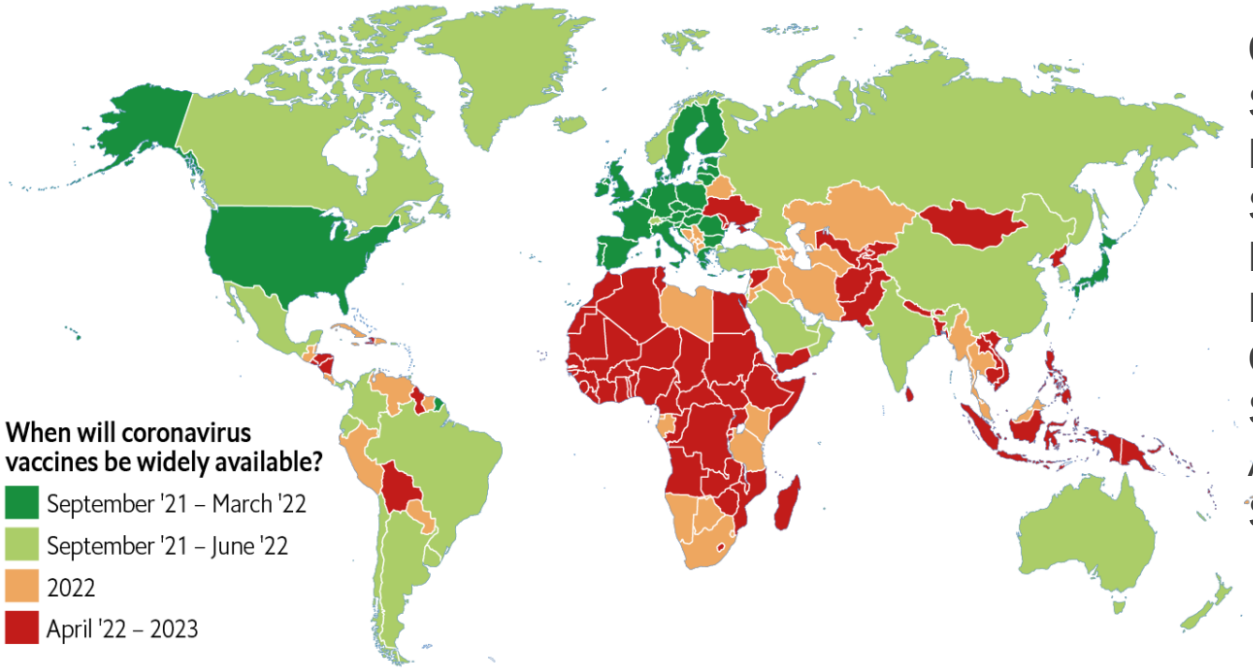
Source: ML McLaws 2021

5.“None of us will be safe until everyone is safe”

1. Vaccine inequality
2. Vaccination & transmission
3. Vaccination rates
4. Vaccination targets
5. Vaccine hesitancy

Source: Dr Tedros https://www.who.int/news-room/commentaries/detail/a-global-pandemic-requires-a-world-effort-to-end-it-none-of-us-will-be-safe-until-everyone-is-safe

Can we open our border to vaccine inequality



Source: The Economist Intelligence Unit, January 2021.

Origins of our families

Southern & Central Asia
North-East Asia
South-east Asia
North Africa & Middle East
North-west Europe
Oceania & Antarctica India
Sub-Saharan Africa
Americas
Southern & eastern Europe

Source: Second report on progress from the Independent Panel for Pandemic Preparedness and Response, January 2021

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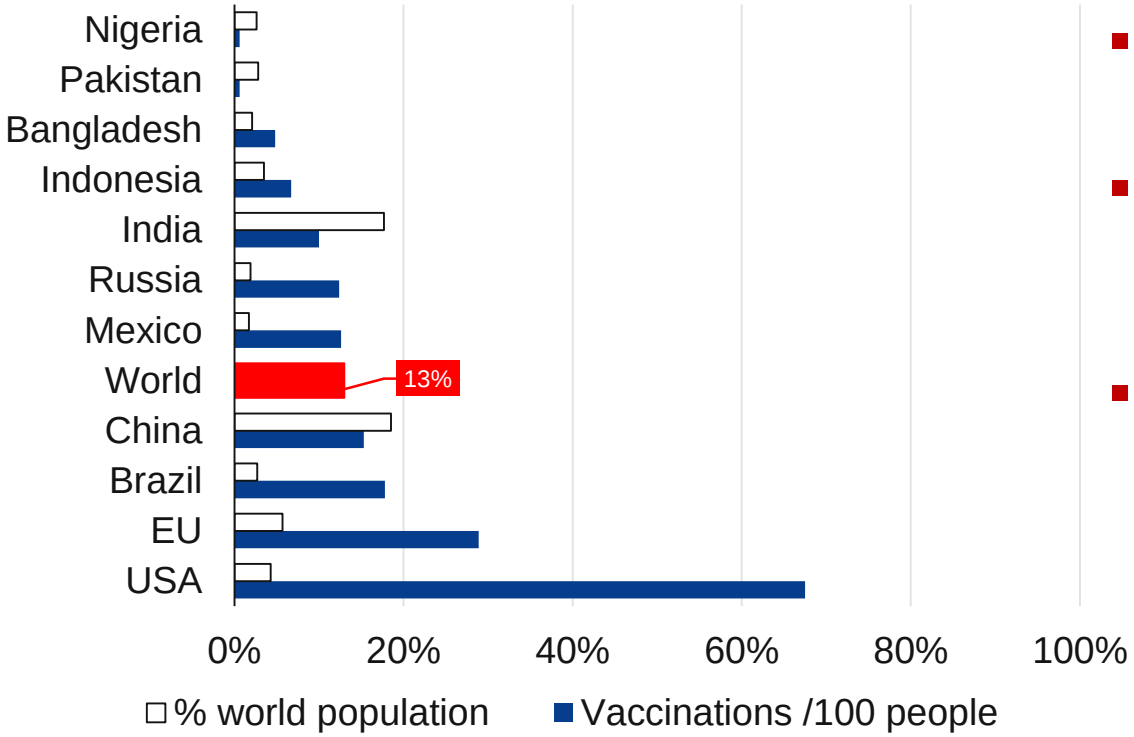
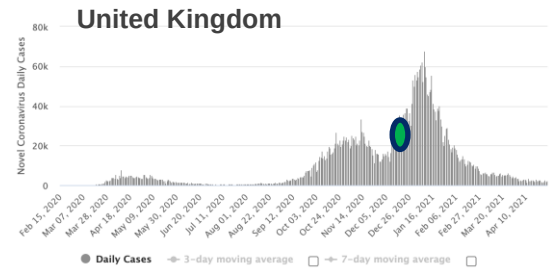
Vaccination inequality



- Just 10 countries + EU = 64% global population
- **Only 13/100** persons current global vaccination rate
- **Over 3 years** to fully vaccinate the world at current vaccination rate
- “The inequitable distribution of vaccines is not just a moral outrage, it is also economically and epidemiologically self-defeating.” -@DrTedros

Source: ML McLaws 2021

Vaccination reduces transmission

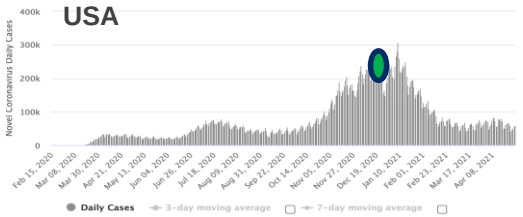


Dec 13: 18,413 daily & peaked Jan 08: 67,928 daily

137 days post rollout 69 in 100 vaccinated

7.5-fold decline since rollout

28-fold decline since peak

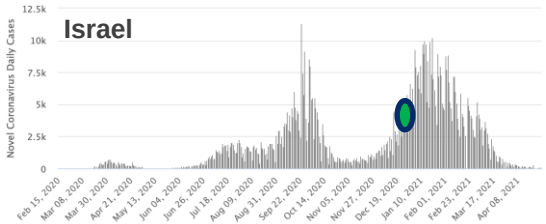


Dec 23: 23,3587 daily & peaked Jan 08: 307,516 daily

97 days post rollout 70 in 100 vaccinated

3.9-fold decline since rollout

5-fold decline since peak



Dec 26: 4,273 daily & peaked Jan 20: 10,213 daily

125 days post rollout 121 in 100 vaccinated

51-fold decline since rollout

122-fold decline since peak

Source: ML McLaws 2021 Data: https://covid19.who.int/

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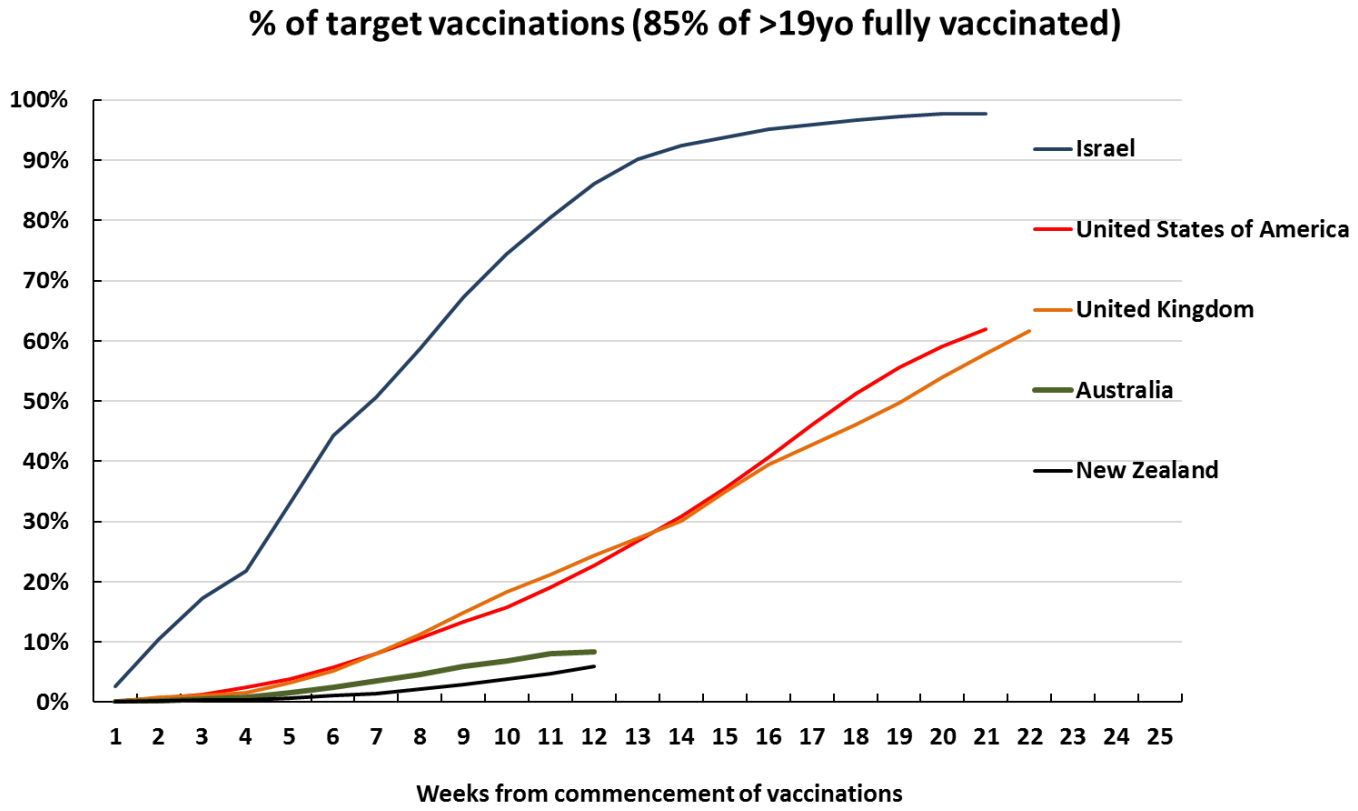
Comparison of vaccination rates



Source: ML McLaws 2021

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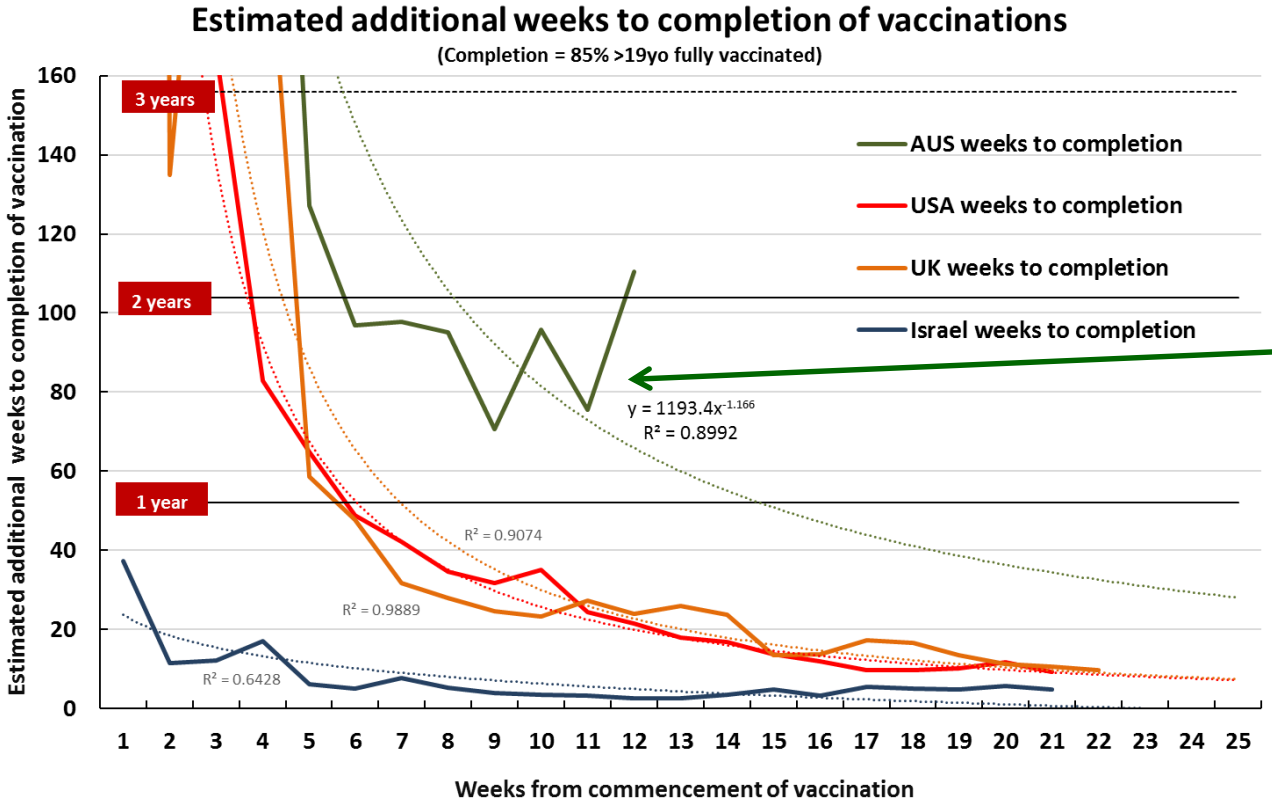
Vaccination rates & completion



At current rate we need another ~80 weeks (90 weeks in total)

Source: ML McLaws 2021

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Government vaccination announcements

Summary	Aim: vaccinate 85% of 75% of population	Month-Year		Total	Vaccinations
Strategy	**Government announcement**	**Start**	**Last**	**Months**	**Daily Average**
1	**All fully vaccinated by 31 October**	Apr-21	Oct-21	**7**	**182,000**
2	**All at least one vaccination by 31 October**	Apr-21	Jan-21	**10**	**132,000**
3	**All at least one vaccination by 31 December**	Apr-21	Mar-22	**12**	**107,000**
4	**All fully vaccinated by 31 December**	Apr-21	Dec-21	**9**	**140,000**
4a	**All fully vaccinated by 31 December + accelerated AZ**	Apr-21	Dec-21	**9**	**141,000**
5	**All fully vaccinated by 30 June 2022**	Apr-21	Jun-22	**15**	**80,000**

Current Strategy (?)

Source: ML McLaws 2021

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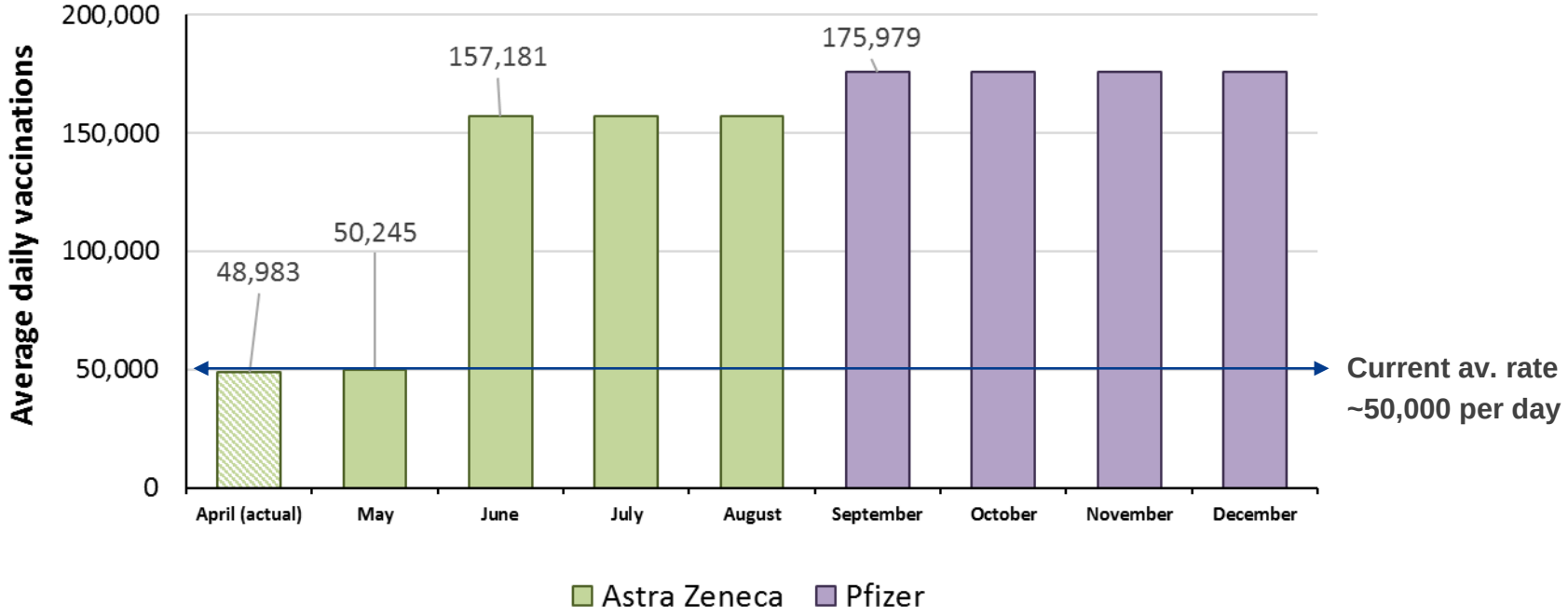
Strategy 4a: vaccinate by December 2021 with accelerated AZ



Many mass vaccination sites will be needed

Source: ML McLaws 2021

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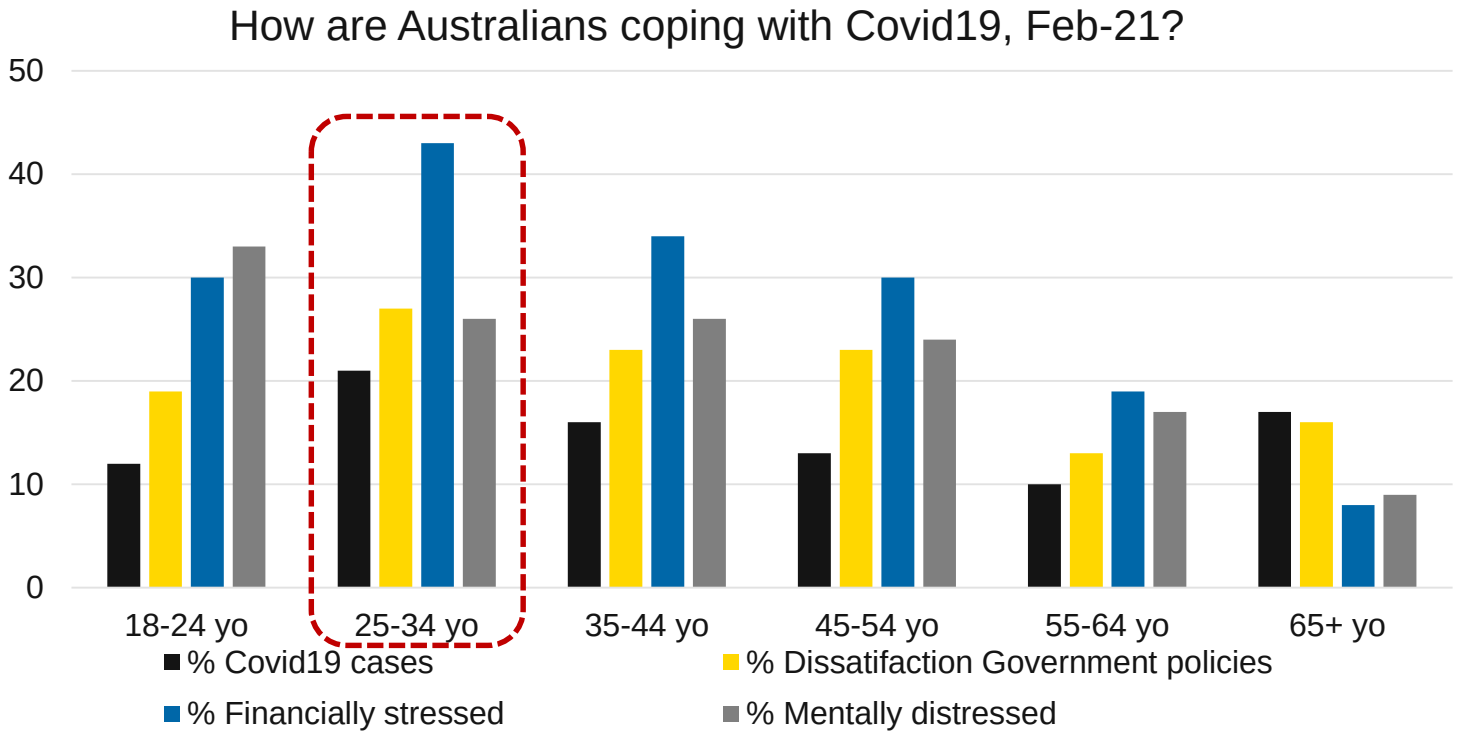
Vaccine hesitancy



Source: Melbourne Institute: Applied Economic & Social Research at the University of Melbourne & www.health.gov.au

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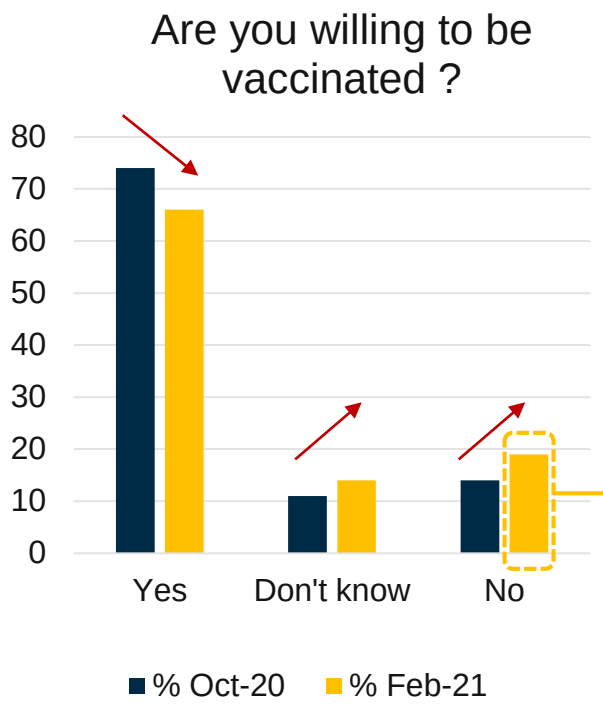
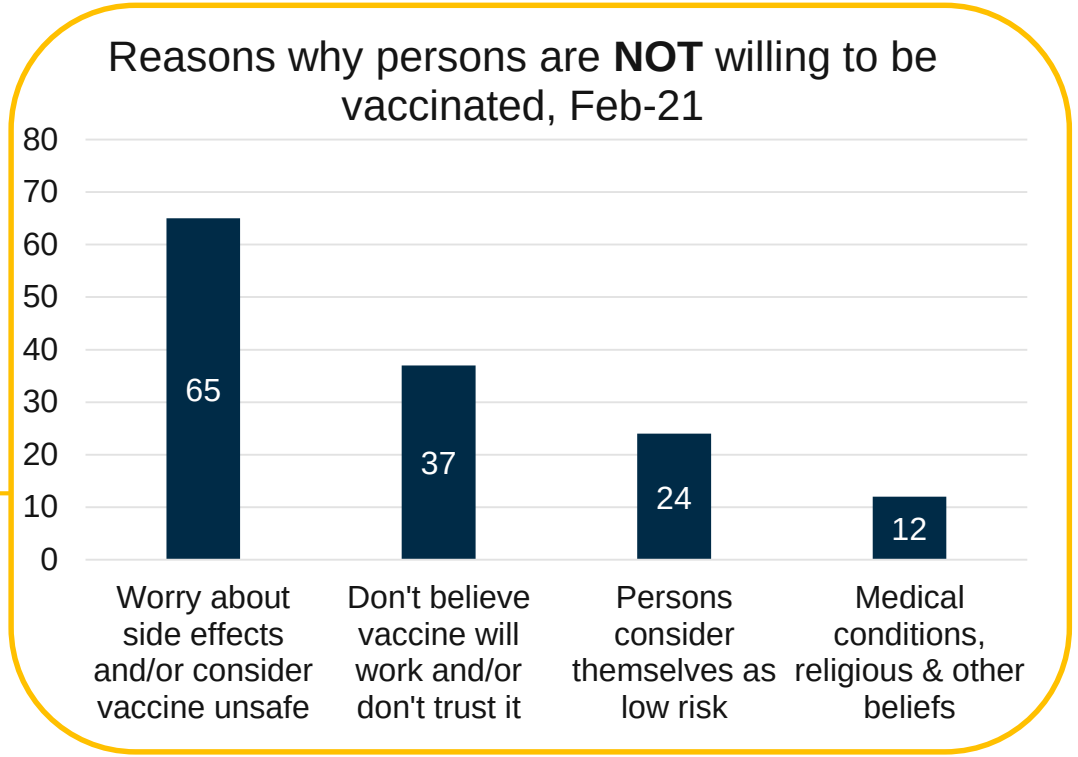
Vaccine hesitancy





Source: Melbourne Institute: Applied Economic & Social Research at the University of Melbourne

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Five Messages

1. “..it is, perhaps, the end of the beginning”
2. Elimination beats suppression
3. Proactive is more effective than reactive
4. Hotel quarantine is a temporary solution
5. “None of us will be safe until everyone is safe”

Source: ML McLaws 2021

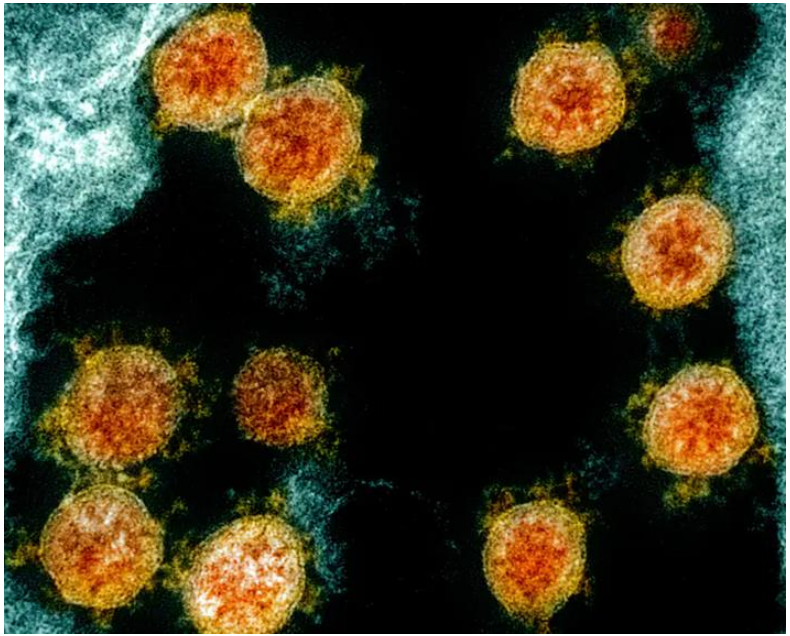
More surprises?

Listen to the science

Climate change+Pandemic

Current issues

- Australian quarantine future
- Vaccine nationalism
- Global vaccination
- Vaccination passport
- Overseas travel
- Future pandemics & climate change



This electron microscope image made available and color-enhanced by the National Institute of Allergy and Infectious Diseases Integrated Research Facility in Fort Detrick, Md., shows SARS-CoV-2 virus particles, orange, isolated from a patient. (NIAID/NIH/AP)

Relevant background & experience

- Member **World Health Organization Health Emergencies Program Experts Advisory Panel for Infection Prevention and Control Preparedness, Readiness and Response to COVID-19**
- **World Health Organization Advisor to China and Malaysia** surveillance
- Reviewed Beijing and Hong Kong designated hospital response to **SARS outbreak**
- Reviewed evidence of **Australian Pandemic Influenza Infection Control Guidelines**
- Professor Epidemiology, Hospital Infection and Infectious Diseases Control

About the author

Professor McLaws is a member of **World Health Organization Health Emergencies Program Experts Advisory Panel for Infection Prevention and Control (IPC) Preparedness, Readiness and Response to COVID-19** now the ad hoc **IPC Discussion Group**. She was a short mission W**orld Health Organization Advisor to China and Malaysia** for surveillance development. She collaborated with Beijing to review the response to the **Severe Acute Respiratory Syndrome (SARS) outbreak** and healthcare worker safety for the Hong Kong SARS designated hospital. Mary-Louise provided advice for 9 years to the WHO programs including WHO **Clean Care is Safer Care Challenge** program. She was commissioned by the Commonwealth to review the **Pandemic Influenza Infection Control Guidelines** for evidence of protection for healthcare workers.

Honorary Advisor to the **Clinical Excellence Commission** for many years she collaborated on several world class patient safety interventions. Her research has included performing the seminal Australian survey of healthcare associated infections in 1984 and developing the first pilot for surveillance system for healthcare associated infections on behalf of **NSW Health Department**. She enjoys capacity building infection control and research in Cambodia, China, Mali, Indonesia, Iran, Viet Nam, Taiwan and Turkey.

Currently

UNSW Professor of Epidemiology, Hospital Infection and Infectious Diseases Control

Deputy President UNSW Academic Board

UNSW Global Water Institute - Water-Health Leader

Table 3: SARS-CoV-2 Variants of Concern and Variants of Interest, as of 11 May 2021

PANGO lineage Nextstrain clade GISAID clade	Alternate name	First detected in	Earliest samples	Characteristic spike mutations
Variants of Concern (VOCs)				
B.1.1.7 20I/501Y.V1 GR/501Y.V1	VOC 202012/01†	United Kingdom	Sep 2020	69/70del, 144del, N501Y, A570D, D614G, P681H, T716I, S982A, D1118H
B.1.351 20H/501Y.V2† GH/501Y.V2	VOC 202012/02	South Africa	May 2020	D80A, D215G, 241/243del, K417N, E484K, N501Y, D614G, A701V
B.1.1.28.1, alias P.1† 20J/501Y.V3 GR/501Y.V3	VOC 202101/02	Brazil	Nov 2020	L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G H655Y, T1027I, V1176F
B.1.617*† - G/452R.V3	-	India	Oct 2020	L452R, D614G, P681R, ± (E484Q, Q107H, T19R, del157/158, T478K, D950N)
Variants of Interest (VOIs)				
B.1.525 20A/S.484K G/484K.V3	-	Multiple countries	Dec 2020	Q52R, A67V, 69/70del, 144del, E484K, D614G, Q677H, F888L
B.1.427/B.1.429 20C/S.452R GH/452R.V1	CAL.20C/L452R	United States of America	Mar 2020	S13I, W152C, L452R, D614G
B.1.1.28.2, alias P.2 20B/S.484K GR	-	Brazil	Apr 2020	E484K, D614G, V1176F
B.1.1.28.3, alias P.3 - -	PHL-B.1.1.28	Philippines	Jan 2021	141/143del, E484K, N501Y, D614G, P681H, E1092K, H1101Y, V1176F
B.1.526 (+E484K/S477N) 20C GH	-	United States of America	Nov 2020	L5F, T95I, D253G, D614G, A701V, + (E484K or S477N)
B.1.616 - GH	-	France	Feb 2021	H66D, G142V, 144del, D215G, V483A, D614G, H655Y, G669S, Q949R, N1187D

†*While work is ongoing to establish standardized nomenclature for key variants, these are the names we will use in this publication.*
** B.1.617 is divided in three sublineages (B.1.617.1, B.1.617.2 and B.1.617.3), which differ in mutations and phenotypic characteristics. Current available data is too limited to make clear distinctions between sublineage at this time.*

Variants of Interest (VOI)

- have the potential to be dangerous but haven't caused much disruption yet

Variants of Concern (VOC)

- more contagious, evade some treatments, cause more severe disease or get past diagnostic tests

Variants of High Concern (VOHC)

- significantly evade the effects of vaccines or treatments. **NONE YET**

Data: https://covid19.who.int/

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Table 4. Summary of vaccine performance against variants of concern (VOC) relative to ancestral stains

VOC 202012/01 (B.1.1.7)	501Y.V2 (B.1.351)	P.1 (B.1.1.28.1)
Efficacy/effectiveness against disease or infection		
Protection retained against disease • Severe disease: No/minimal loss: Pfizer BioNTech-Comirnaty[1-3] • Infection & symptomatic disease: ○ No/minimal loss: AstraZeneca-Vaxzevria, Novavax-Covavax, Pfizer BioNTech-Comirnaty[2-13] • Asymptomatic infection: ○ No/minimal loss: Pfizer BioNTech-Comirnaty[2,14] ○ Inconclusive/moderate/substantial loss, limited sample size: AstraZeneca-Vaxzevria[5]	Reduced protection against disease, limited evidence • Severe disease: No/minimal loss: Janssen Ad26.COV 2.5, PfizerBioNTech-Comirnaty[3,35] • Mild-moderate disease: ○ Moderate loss: Janssen-Ad26.COV 2.5, Novavax-Covavax[35,36] ○ Inconclusive/substantial loss, limited sample size: AstraZeneca-Vaxzevria[37] • Infection: Moderate loss: Pfizer BioNTech-Comirnaty[3] • Asymptomatic infection: No evidence	Limited evidence • No/minimal loss: Sinovac-CoronaVac [44]
Neutralization		
• No/minimal loss: Bharat-Covaxin, Gamaleya-Sputnik V, Moderna-mRNA-1273, Novavax-Covavax, Pfizer BioNTech-Comirnaty, Beijing CNBG-BBIBP-CorV, Sinovac-CoronaVac[16-35] • Minimal/moderate loss: AstraZeneca-Vaxzevria[5,31]	• Minimal/modest loss: Beijing CNBG-BBIBP-CorV, Sinovac-CoronaVac[39,40] • Minimal to large loss: Moderna-mRNA-1273, Pfizer BioNTech-Comirnaty[15,16,20-22,24-27,29-32,38,40-43] • Moderate to substantial loss: AstraZeneca-Vaxzevria, Gamaleya-Sputnik V, Novavax-Covavax[22,30,33,42]	• No/Minimal reduction: AstraZeneca-Vaxzevria, Sinovac-CoronaVac[30,45] • Minimal/moderate reduction: Moderna-mRNA-1273, Pfizer BioNTech-Comirnaty [16,17,24,27,29,30,41,43,45,46]

Data: https://covid19.who.int/

UNSW SYDNEY

How long will the vaccines protect you?

- No definitive answer. Three months minimum but expected to increase
- People who have been infected with covid-19 retained immunity that was robust after eight months
- Once antibodies decline to a level that is no longer protective, reinfection is possible although the reinfection is likely to be milder
- Immunity could also depend on what happens with future variants
- Evidence suggests the available vaccines are still effective against most variants, but that could change if the virus continues to mutate
- Clinical trials are underway to determine how long a booster shot will extend protective immunity and to determine whether current vaccines can be tailored to combat new variants of the virus

Source: ML McLaws 2021