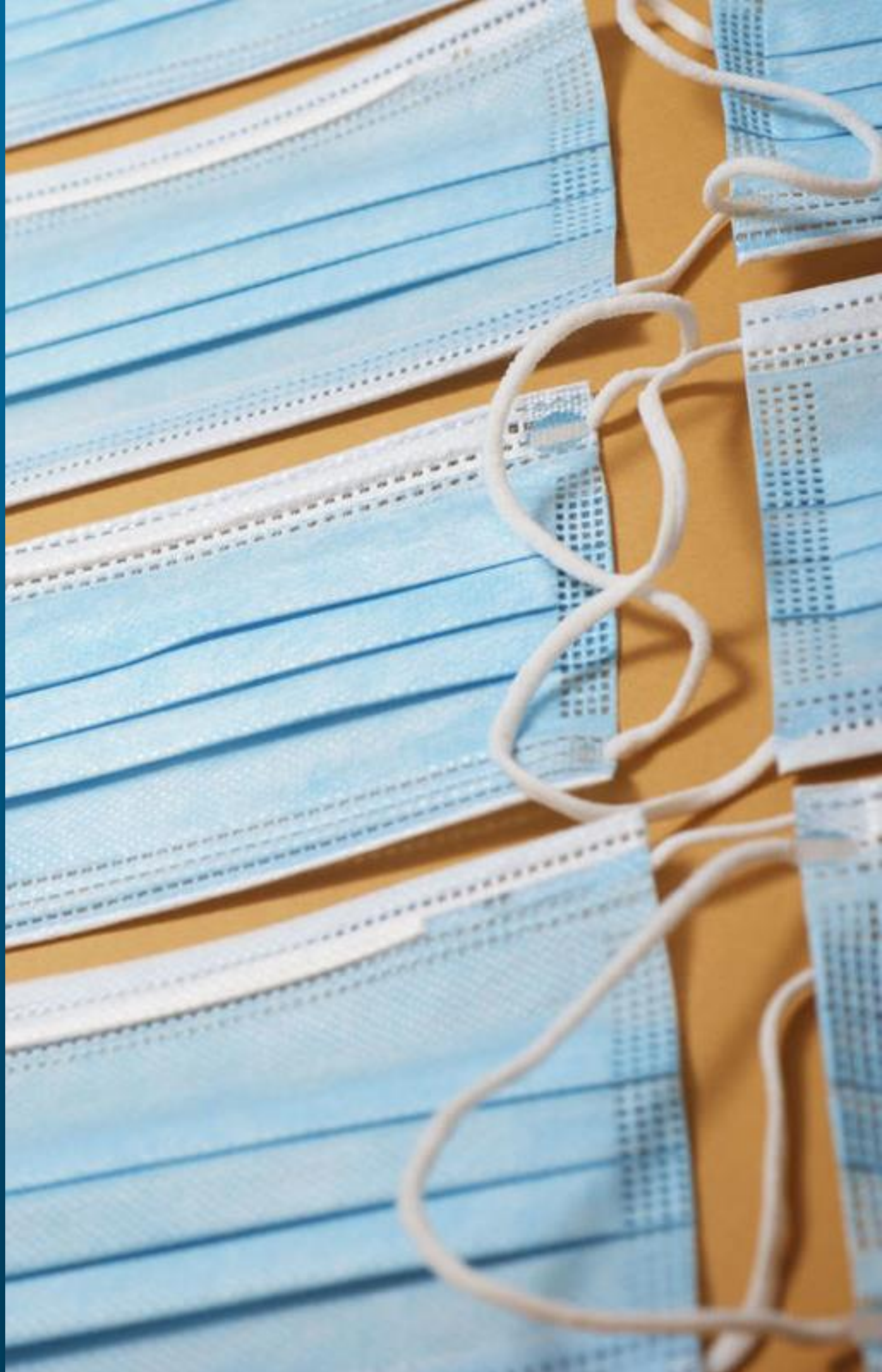
Part 1:
The new reality of COVID-19: Endemic, Eliminated, or Eradicated?

by Trish Stroman, Managing Director and Senior Partner, BCG



Where we are today | Two possible scenarios to consider in planning for the evolution of COVID-19

Unlikely scenario

Eradication

Eradication of community transmission achieved across the globe

Unlikely scenario

Sustained global elimination

No community transmission over a certain time period achieved

Focus of 2nd presentation

Mix of elimination and endemicity

Global proliferation of both elimination and endemicity 'pockets' within countries and/or regions

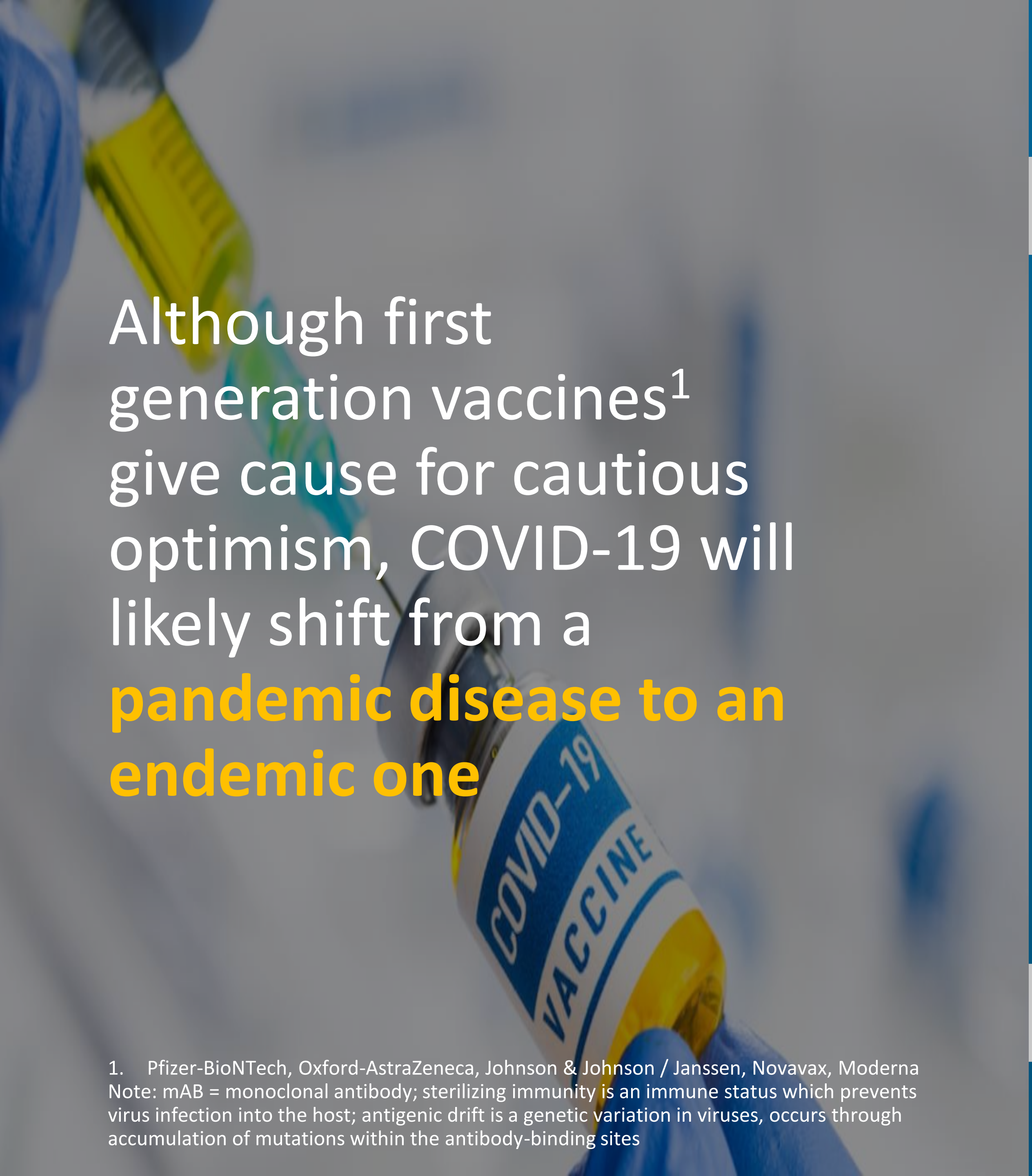
Focus of this presentation

Global endemicity

Persistent low-level community transmission with sporadic outbreaks seen in most countries

What is the time horizon? (i.e., Short term vs mid-term vs long-term)

← *Feasibility may shift over time* →



Although first generation vaccines[1] give cause for cautious optimism, COVID-19 will likely shift from a **pandemic disease to an endemic one**

Sustained sterilizing immunity may be difficult to achieve, necessitating periodic **vaccine boosters** to reduce risk over time, especially for the vulnerable population

- Antigenic Drift has caused the emergence of several **variants of concern** with varying ability to escape first generation vaccines[1] and mAbs (esp. B.1.351 variant first detected in South Africa)
- **Global vaccine rollout will be prolonged** due to availability, distribution challenges, and hesitancy, enabling continued transmission and opening the door to emergence of more variants esp. when uncontrolled (i.e., India)
- If COVID-19 establishes itself in a wild-animal population, eradication becomes unlikely due to persistent animal reservoirs (e.g., minks)

Vaccine protection levels, including duration of protection still **unclear**

1. Pfizer-BioNTech, Oxford-AstraZeneca, Johnson & Johnson / Janssen, Novavax, Moderna

Note: mAB = monoclonal antibody; sterilizing immunity is an immune status which prevents virus infection into the host; antigenic drift is a genetic variation in viruses, occurs through accumulation of mutations within the antibody-binding sites

Herd immunity increasingly unattainable

Calculation of herd immunity threshold for COVID-19

Base calculation		No variants	With variants
Natural rate of transmission[1]	R_0	2.5 – 3.0	4.0 – 5.0
Herd immunity threshold (% of pop'n) at true immunity[2]	$H_T=1-(1/R_0)$	60 - 67%	75 - 80%
Vaccine immunity against transmission[3]	VI	~70 - 90%	~70 - 90%
Herd immunity threshold adjusted for vaccine immunity	$H_V=H_T/VI$	**~67 - 96%**	**~83 - 100+%**

Adjustment factors	Impact to threshold
High % of pop'n not immunized (e.g., ages <16, vaccine-hesitant)	*Reduces likelihood of reaching threshold*
Shorter duration of vaccine protection	
Lower rate of vaccine immunity against transmission	
Emergence of more transmissible or evasive variants	
High levels of recovered immunity	

1. Based on estimates from the CDC; variants that are emerging are estimated to have ~60% higher transmissibility 2. True immunity being fully effective at preventing transmission 3. Range based on preliminary data from manufacturers and the CDC's Morbidity and Mortality Weekly Report
Source: COVID Act Now, CDC, Manufacturer press releases, BCG analysis

Key takeaway:

- Unless a vaccine offers sterilizing immunity, herd immunity thresholds **will remain increasingly unattainable**
- Several factors already at play to **prevent broader immunization,** in turn **moving the threshold to even higher levels**

What an endemic COVID-19 will look like | Analogous to a **more transmissible, non-seasonal**, and **global version** of the seasonal flu

"MERS/Ebola-like"

Highly lethal illnesses with pockets of outbreak in LMICs and occasionally in HICs

Increased mortality and lower transmissibility **limits COVID-19 comparison**

Limited comparability

"HIV-like"

Clinically severe though non-respiratory, widespread transmission pockets in LMICs with global underlying endemicity

Lower transmissibility and antigenic drift **limits COVID-19 comparison**

Limited comparability

"Measles-like"

Very highly transmissible respiratory illness (R_0 of 12-18), demonstrating genetic stability, and with vaccines producing effective sterilizing immunity

Genetic stability and sterilizing vaccine profile limit COVID-19 comparison and high transmissibility **may allow for comparability**

Potential comparability

"Flu-like"

Highly transmissible respiratory illness (R_0 of 1-2) demonstrating significant antigenic drift/shift and endemic in vast pockets of world

Possible to extend scenario to consider a global, non-seasonal, and potentially more clinically severe virus enabling comparability **to an endemic form of COVID-19**

Likeliest to be comparable

Note: Diseases are examples for illustrative purposes only
Source: Scientific American, National Center for Biotechnology Information

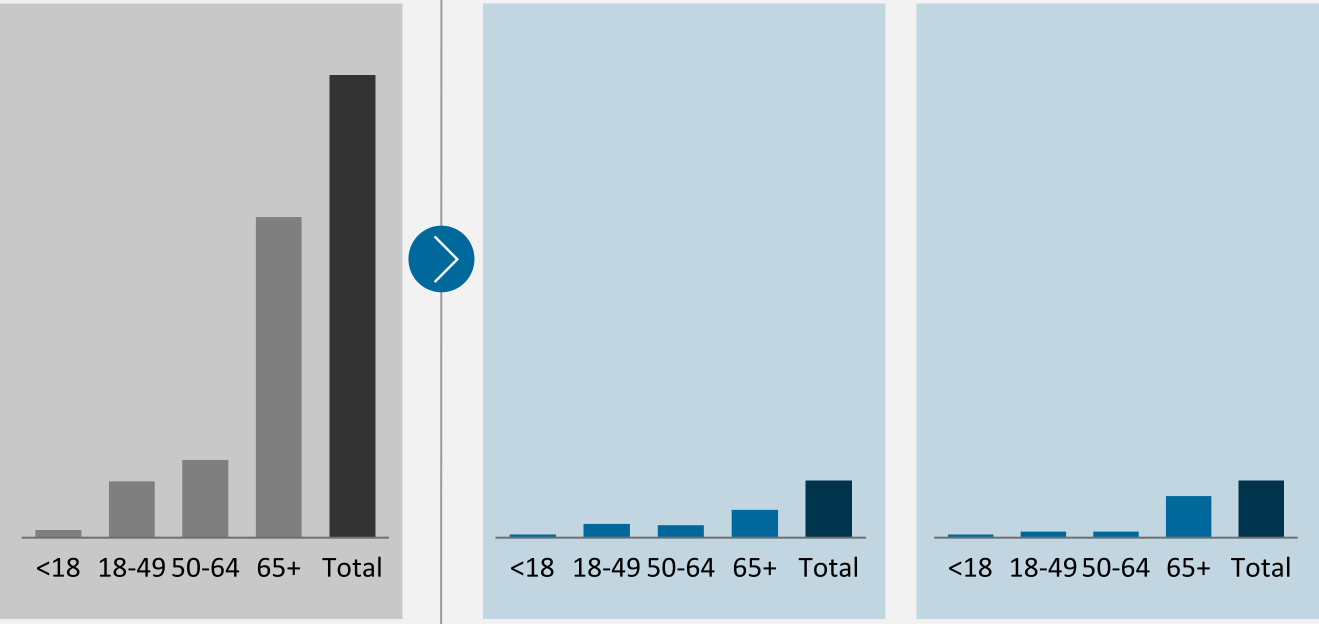
With extensive vaccination, hospitalization rates for endemic COVID-19 could be comparable to seasonal influenza….

Estimated annual hospitalizations (relative)

COVID-19 – Without vaccine

COVID-19 – With vaccine[1]

Seasonal Influenza[1]



	<18	18-49	50-64	65+	Total
COVID-19 – With vaccine: Vaccination rate	30%	60%	75%	88%	60%
Seasonal Influenza: Vaccination rate	58%	32%	45%	66%	46%

Key assumptions:

Hospitalization reduction: *Based on real-world data from Israel*

Influenza hospitalizations: *Based on 10-year average of US influenza data (2010-20)*

1. Assumes 10% IR for the flu, 20% IR for COVID post-vaccination, and 27% IR for non-vaccinated populations

Sources: CDC, New York City Department of Health and Mental Hygiene, Real world data in South Korea & Israel, BCG analysis

…but, its global reach, greater severity, and year-round impact demands a more rigorous response

Policy-makers should monitor key factors that may impact future severity, such as:

- − Variant evolution (changes in severity, transmissibility, and resistance to current vaccines)
- − Changes in severity based on age and co-morbidity profile
- − Length of stay for endemic COVID vs flu
- − Severity of long-haul COVID impacts versus influenza
- + Advances in treatment that may shorten or eliminate hospital stay

Controlling endemic COVID-19 will require significant investment against backdrop of constrained fiscal space

Expected impact to health financing sources

Government Health Expenditure

- Growth per capita levels **likely to decline** due to **GDP contraction** and **revenue reduction** (e.g., 4.1% decline in share vs pre-crisis)
- Deficit taken on for COVID-19 response may rise by 8% and **continue to threaten future health spending**

Out-of-Pocket

- **Falling employment and household income** expected to cause **decreased out-of-pocket spending** per capita
- Southeast and East Asia will need to **increase health share of public spending by 1.1% pts** in order to off-set negative impact

Development Assistance

- **Development assistance** for health post-COVID is **uncertain**
- Convergence of (1) **many more countries needing assistance**; (2) the **donor countries themselves facing downturns**; and (3) **larger direct support** are not tracking favorably

Source: The World Bank (Tandon et al, "Economic Impact of COVID-19: Implications for Health Financing in Asia & the Pacific")

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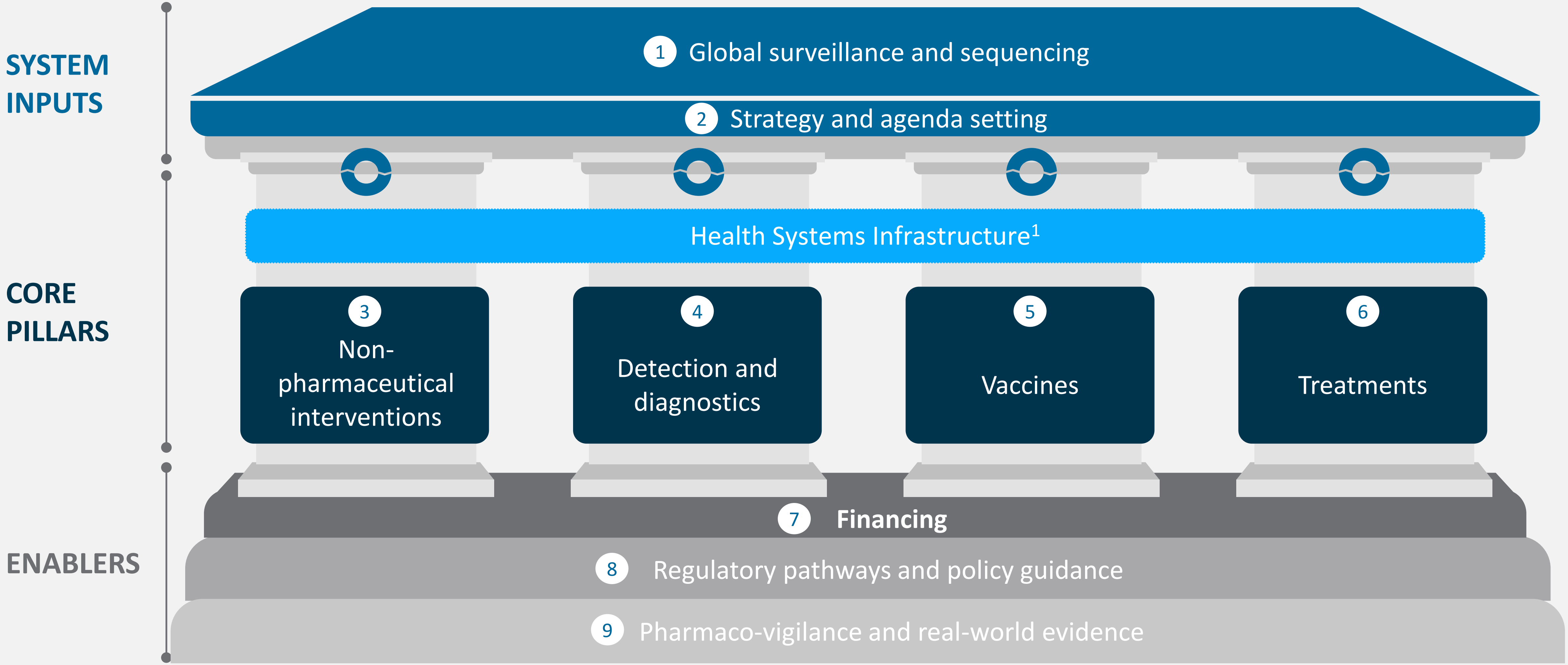
Nine inter-dependent health system elements to manage against an endemic COVID-19

Framework for Global Protection against Endemic COVID-19



1. Includes tools, research & development, delivery and human resource

Where we stand today? | Endemic Covid-19 would require ongoing investment, capacity building, and integration into health programming

Component	Readiness	Degree of readiness for endemic vs. pandemic COVID-19
System inputs	Low readiness / scalability	• Regional efforts set up (e.g., GISRS, CEPI, PAHO in LATAM, some in SA and SEA); need **more systematic coordination** between national, regional and global entities (E.g., WHO, regional CDCs) • Need to **further bolster surveillance capabilities** to ensure global coverage and **standardized data collection & sharing**
NPIs	Somewhat ready and scalable approach	• NPIs generally established and accepted • Need to have a **more global coordination** to reduce fragmentation and **develop the right decision framework** for an endemic COVID-19
Detection & diagnosis	Ready and scalable approach	• Testing strategy well-established in some countries during COVID-19 • Need to **build capacity in LMICs** through novel and lower-cost technologies (e.g., self-testing, antigen rapid diagnostic tests)
Vaccines	Low readiness / scalability	• Strong foundation for 1st generation vaccine; R&D to continue across dosing regimens, booster shots, pediatric vaccines • Need to **strengthen LMIC's infrastructure and mechanisms;** i.e., set up widespread LMIC demand generation, distribution, and delivery programs
Therapeutics	Somewhat ready and scalable approach	• Screening library efforts underway; **Need to increase global coordination for R&D efforts**; e.g., via WHO, ACT-A1 • Need to **continue search for effective therapeutics for acute and long-term morbidities** • Need to **address O2 shortages in LMICs**; bolster delivery channels for re-purposed O2 and treatments
Enablers	Low readiness / scalability	• Accelerated vaccine WHO processes established; initial vaccine regulatory pathway carried out swiftly • Need to **clarify WHO processes for vaccine boosters and novel Tx** and **standardized EUA guidelines** across reg. bodies • PV & RWE efforts largely dis-jointed & sporadic; ad-hoc in LMICs • **Unclear financing requirements** in endemic COVID-19; Need to clarify role of private & public sector and existing organizations like CEPI and COVAX

Note: NPI = Non-pharmaceutical interventions

Degree of approach readiness shifting from pandemic to endemic COVID-19 for the global community

Ready and scalable approach | Somewhat ready and scalable approach | Low readiness / scalability

Note:

- EAP has countries ranging from **HIC, UMIC, LMIC and unique contexts like the Pacific islands**
- The **degree of readiness as well as the next step approaches will vary depending on each country's contexts** - e.g., capabilities, geography, needs, etc.

What does it mean for policymakers? | Three key questions to answer

What is your response goal?

i.e., Control or Elimination

How to prioritize scarce resources across these 9 elements AND other health priorities?

1. Leverage regional and global infrastructure
2. Transition from "campaign mode" to routine services
3. Leverage COVID-19 financing for broader health system strengthening

How to define a strategy that is fit-for-purpose to the local context?

i.e., high-income, low-middle income and small island countries

Leverage regional and global infrastructure – *e.g., Genomic Surveillance*

Immediate priorities differ across EAP based on existing testing and sequencing capacities

Archetypes	Testing capacity[1]	Sequencing capacity	On-going sequencing	Immediate priorities
Strengthen 	Existing	Existing	On-going	• Ensure sequencing strategy connected to public health response • Provide capacity to neighboring countries with limited resources
Leverage 	Existing	Existing	On-going but limited	• Plan for capacity builds across facilities, equipment, and personnel as next phase (either from scratch or by initiating sequencing networks)
Connect 	Existing	Little to none	Little to none	• Use testing capabilities to send samples for sequencing to nearby countries with sequencing capacity or to sequencing networks
Test 	Little to none	Little to none	Little to none	• Build out capabilities to deploy adequate levels of testing, after which samples may be sent for sequencing

Where possible, LMICs should leverage regional/global networks to build capacity

Key takeaway:

- **Leveraging available regional infrastructure** key to capacity expansion in near-term
- After which, countries can decide to **conduct own build-outs** and/or **connect across the region through sequencing networks**

1. Demonstrated reliable testing capacity, based on WHO COVID 2020 External Quality Assessment Project

Source: GISAID, Our World in Data, WHO NGS capacity map, NGS manufacturers

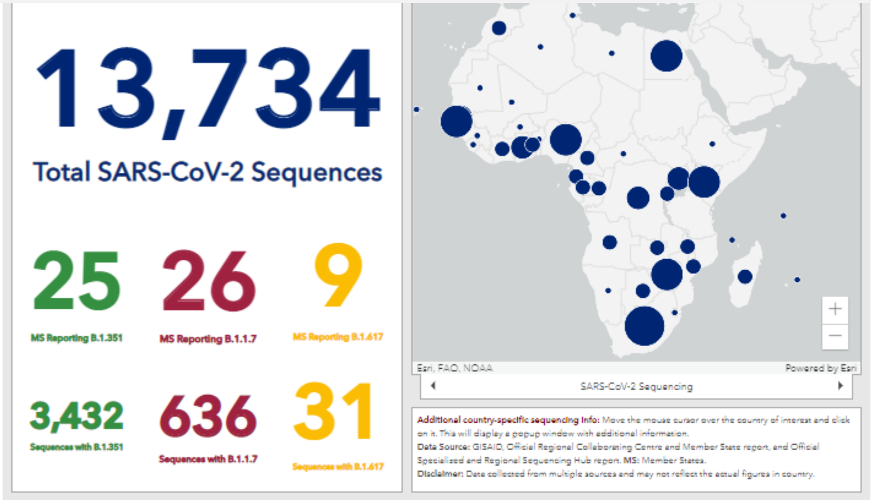
1

Sequencing networks created in Africa, Latin America may be models for other resource-constrained regions

Africa Pathogen Genomics Initiative

Launched Oct 2020 across 55 member states with WHO

Africa PGI- Monitoring SARS-Cov-2 Sequencing in Africa as of 5/21/21



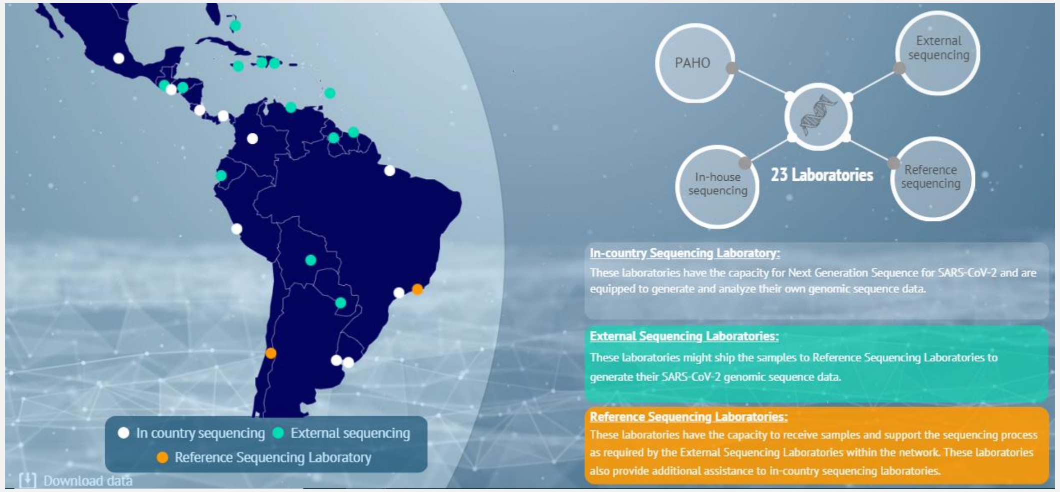
- Initiative established with primary goal of detecting emerging disease threats, of which Africa sees 140 outbreaks annually, to enable interventions across disease prevention and therapeutics development
- Ambition to build continent-wide network of facilities, encompassing 20 national public health institutes that will be provided laboratory upgrades and technical capacity and connecting them to 5 regional hubs that will be created to facilitate training and technical support

[Apr '21] Illumina, provider of next-generation sequencing technology, has announced further donations of $60m worth of equipment & technical support for global sequencing networks, building on the success of the Africa PGI framework

PAHO COVID-19 Genomic Surveillance Regional Network

Launched in 2020 covering 22 countries in the region

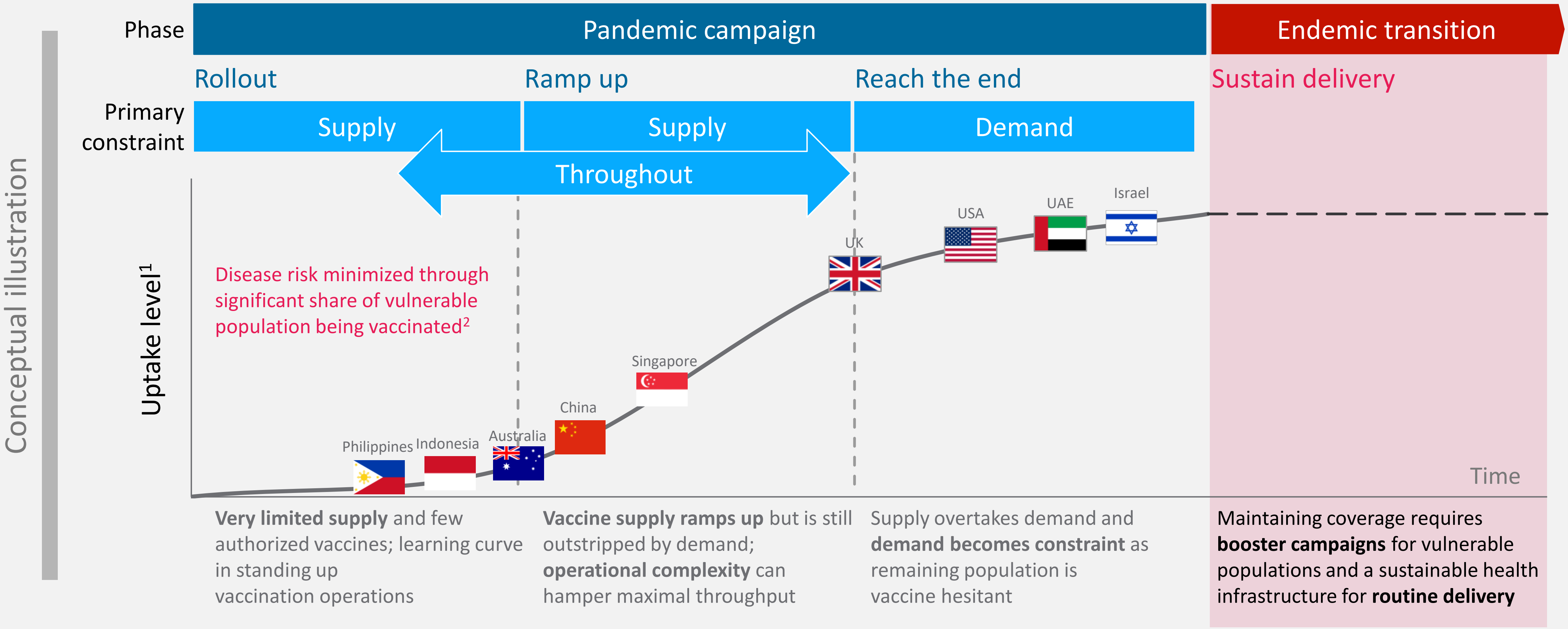
PAHO: SARS-CoV-2 Genomic Sequencing Laboratories



- Established primarily to strengthen sequencing capacity in participating laboratories and also to enable routine sequencing to add to global data sharing
- 23 laboratories spanning in-country sequencing, external sequencing, and reference sequencing capabilities connected via this initiative and supported with regional training and technical support
- [May '21] 29k COVID-19 samples sequenced by the network across the 23 laboratories since its launch, with the network confirming detection of at least one of the 4 variants of concern being present in 37 countries and territories

Source: WHO, Africa CDC , PAHO, Illumina

Transition from "campaign mode" to routine services – *e.g., Routine immunization*



1. Does not distinguish between 1 vs. 2-dose regimen (i.e., Those who have had 1 out of 2 doses are considered as “vaccinated”) 2. Disease risk minimization dependent on the share of vulnerable people that get vaccinated

Vaccination programs transition from 'campaign mode' to 'routine mode'

	'Campaign mode'	'Routine mode'
Target population	• All adults, expanding to also include children	• TBD (vulnerable populations vs all adults and children)
Supply	• Constrained volumes • Untested supply chains • Challenging product profile (e.g., ultra-cold chain, large pack sizes, unknown optimal dosing)	• Sufficient volumes • Reliable supply chains • More optimized product profile (e.g., lower cost, easier to deliver, adapted to variants, dose sparing)
Throughput	• Mass vaccination sites • Use of hospitals to accommodate challenging product profile • Mobile/pop-up sites	• GP clinics/primary HC facilities • Pharmacy-based vaccination
Demand	• Hesitancy driven by safety concerns (i.e., accelerated development, platform unknown, etc.,)	• Better understanding of safety profile • Full regulatory approval (vs emergency use authorization) • Included in routine immunization schedule

Cost

Per dose	'Campaign mode'	'Routine mode'
Vaccine cost:	$ 7.00	$ <5.00[1]
Internationall delivery:	0.89	0.89
Domestic delivery:	1.66	1.40[2]
Total cost[3] :	**$ 19.10**	**$ <10.00**

• Cost potentially optimized to less than $10 per dose

Key takeaway:

- Transition can **significantly reduce costs** and enable **better synergies with routine health services**
- Country health systems can **start planning the transition now**, especially for more controllable factors in throughput and demand

1. Assumed based on most expensive vaccine in Gavi portfolio (HPV vaccine at $4.6/dose) 2. Based on estimated country-level immunization delivery unit cost estimates for 136 LMICs 3. Assumes 2 doses in campaign mode and single dose for routine mode

Source: UNICEF, World Health Organization, immunizationeconomics.org, Portnoy A, Vaughan K, Clarke-Deelder E, Suharlim C, Resch SC, Brenzel L, Menzies NA. Producing standardized country-level immunization delivery unit cost estimates. PharmacoEconomics. Sept 2020;38(9):995-1005

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Leverage Covid-19 financing for broader health system strengthening

Non exhaustive

Select examples

Infrastructure Strengthening

- **Institution building:** Strengthen existing orgs to focus on key functions – e.g., surveillance, testing
- **Healthcare Systems:** Improved oxygen and treatment capacity
- **Manufacturing:** Local manufacturing of essential supplies to prevent over-reliance on imports

Green supply chain

- **Cold chain capacities:** Additional capacity up to rural/district levels, upgraded cold chain facilities
- **Green supply chain:** Use of environment friendly channels such as renewable energy-driven manufacturing facilities, solar-powered refrigerated storage, electric transport vehicles

Robust Data Systems and Digitization

- **Centralized registries:** Monitor prevalence of NCDs, co-morbidities and general healthcare trends of population; set up sentinel surveillance sites
- **Logistics Systems:** Centralized stock management and distribution system
- **Surveillance Tools:** Real-time monitoring of infectious disease outbreaks and pharmacovigilance

Innovative Delivery Models

- **Tele-medicine platforms:** Online primary care consultations and follow-up of NCD[1] patients
- **E-ICUs:** Secondary care and emergency referrals
- **Health care workers' training via online platforms**

1. Non-communicable diseases

3

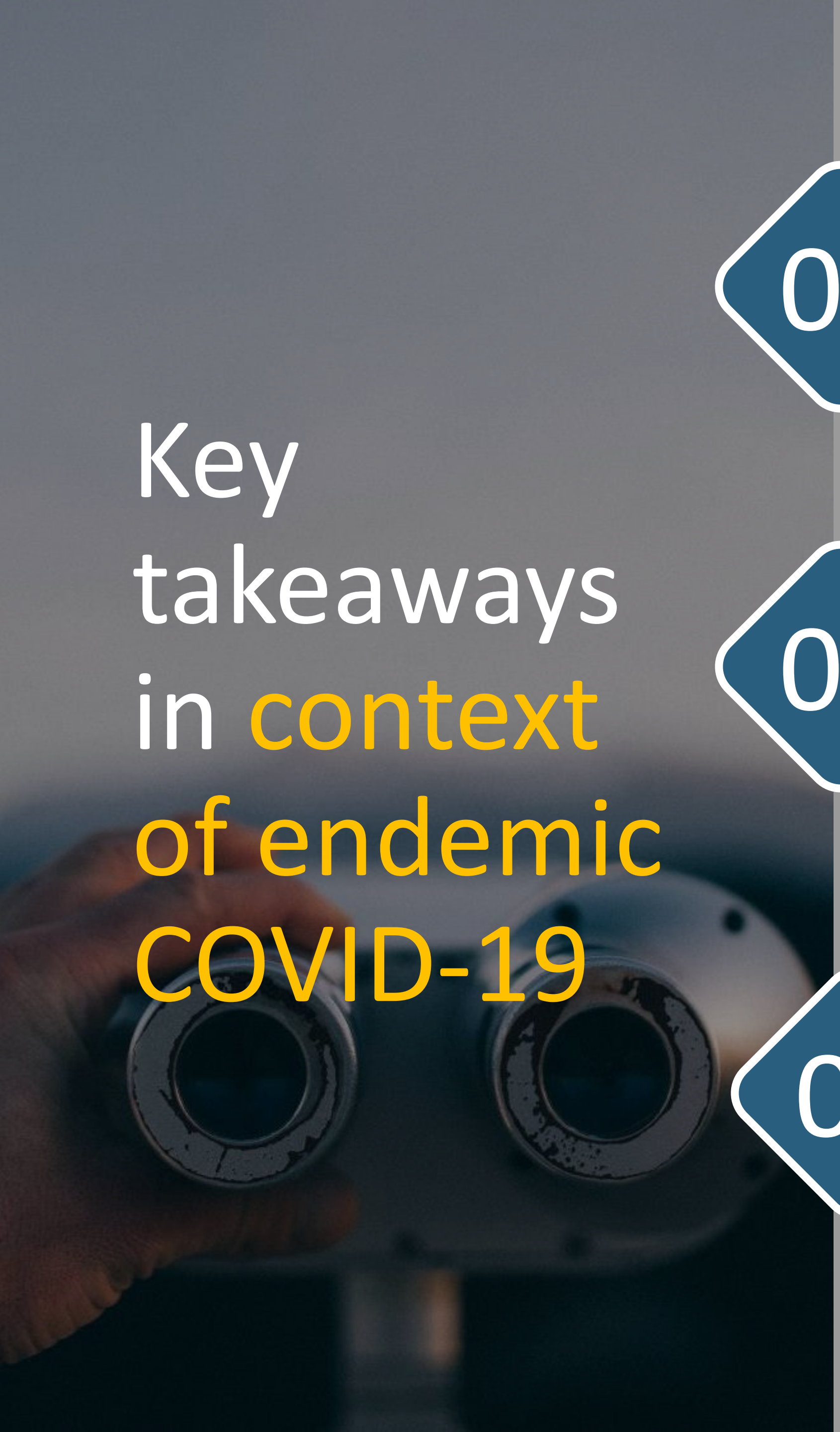
Country context to determine priorities for broad health systems strengthening across key thrusts

Non-exhaustive

Potential applications

	High income countries	Middle-income countries	Small island nations
Infrastructure Strengthening *e.g., testing*	**Institutionalize COVID-19 systems** (e.g., testing, public health response) into permanent health system frameworks & governance	Align **testing capacity strengthening with novel scalable technologies** (e.g., antigen RDTs[1]) to enable more agile response	**Build scalable testing capacity** (e.g., via novel lower cost technologies) and enable regional cooperation to strengthen surveillance
Green supply chain *e.g., cold chain*	**Incentivize private sector development** of environment-friendly and accessible technologies across medical supply chains	**Engage private sector** in cold chain infrastructure build and **enable scaling** of novel green technologies within supply chain	**Focus on baseline cold chain build** and **explore regional purchasing platforms** to drive cost-effective volume aggregation (e.g., AMSP[2])
Robust Data Systems and Digitization *e.g., national health registries*	**Connect national health registries to global platforms** for real-time infectious disease monitoring and surveillance	**Strengthen national health registries** to incorporate monitoring of disease outbreaks along with general population health	**Institute collaborative regional health registries** to monitor disease prevalence and general population health across a larger base
Innovative Delivery Models *e.g., channel*	**Explore development of alternative channels such as e-ICUs** to enable remote care for high-risk diseases such as COVID-19	**Build capacity** for self-care approaches such as **e-consultation**	Build capacity with **community health workers using online training platforms** to address healthcare facility and manpower constraints

1. Antigen rapid diagnostic tests 2. Africa Medical Supplies Platform



Key takeaways in context of endemic COVID-19

01 Leverage regional and global infrastructure

- Build sequencing capacity in the near term by leveraging regional infrastructure – e.g., Africa Pathogen Genomics Initiative for genomic surveillance

02 Transition from "campaign mode" to routine services

- Transition can significantly reduce distribution costs and enable better synergies with routine health services

03 Leverage COVID-19 for broader health system strengthening

- Approach will need to be customized to country's context – e.g., country's health system priorities, maturity level, etc.

The case for Covid-19 elimination

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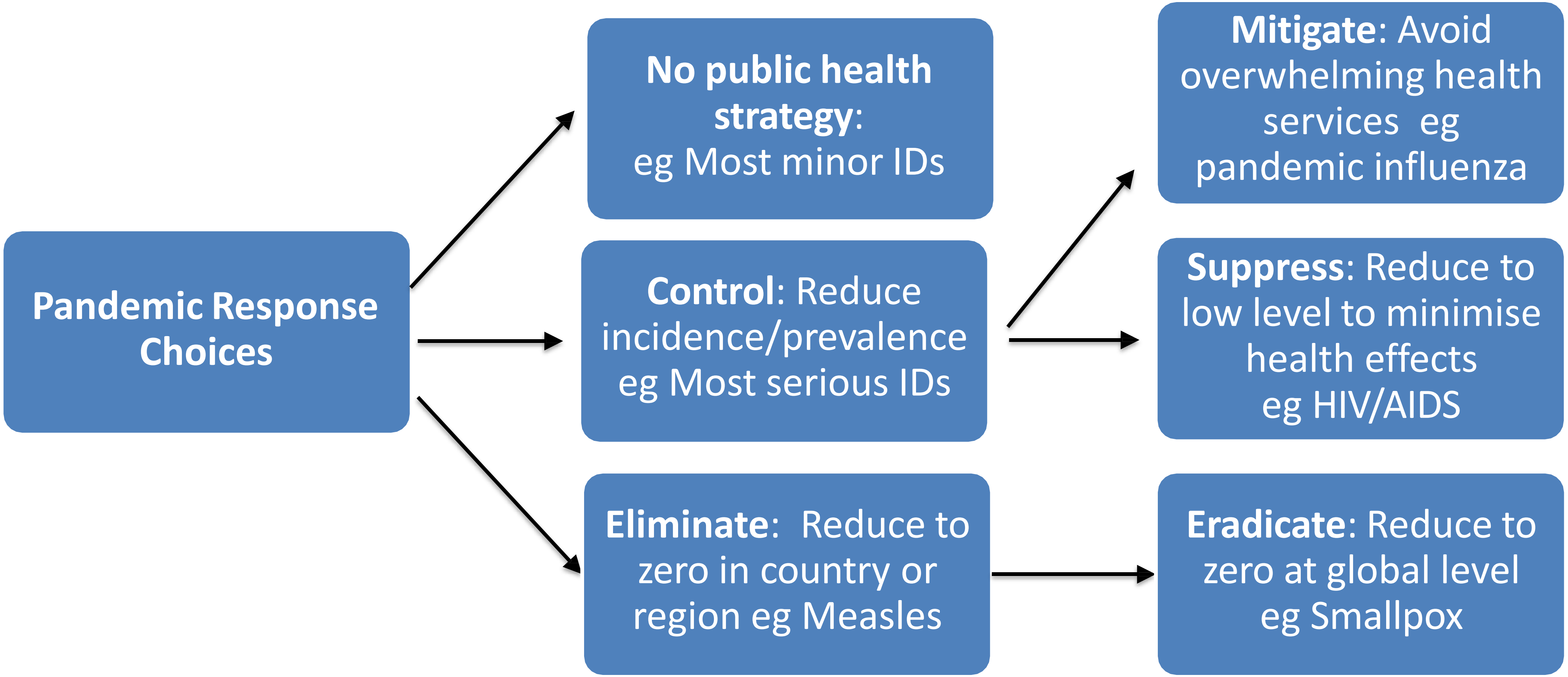
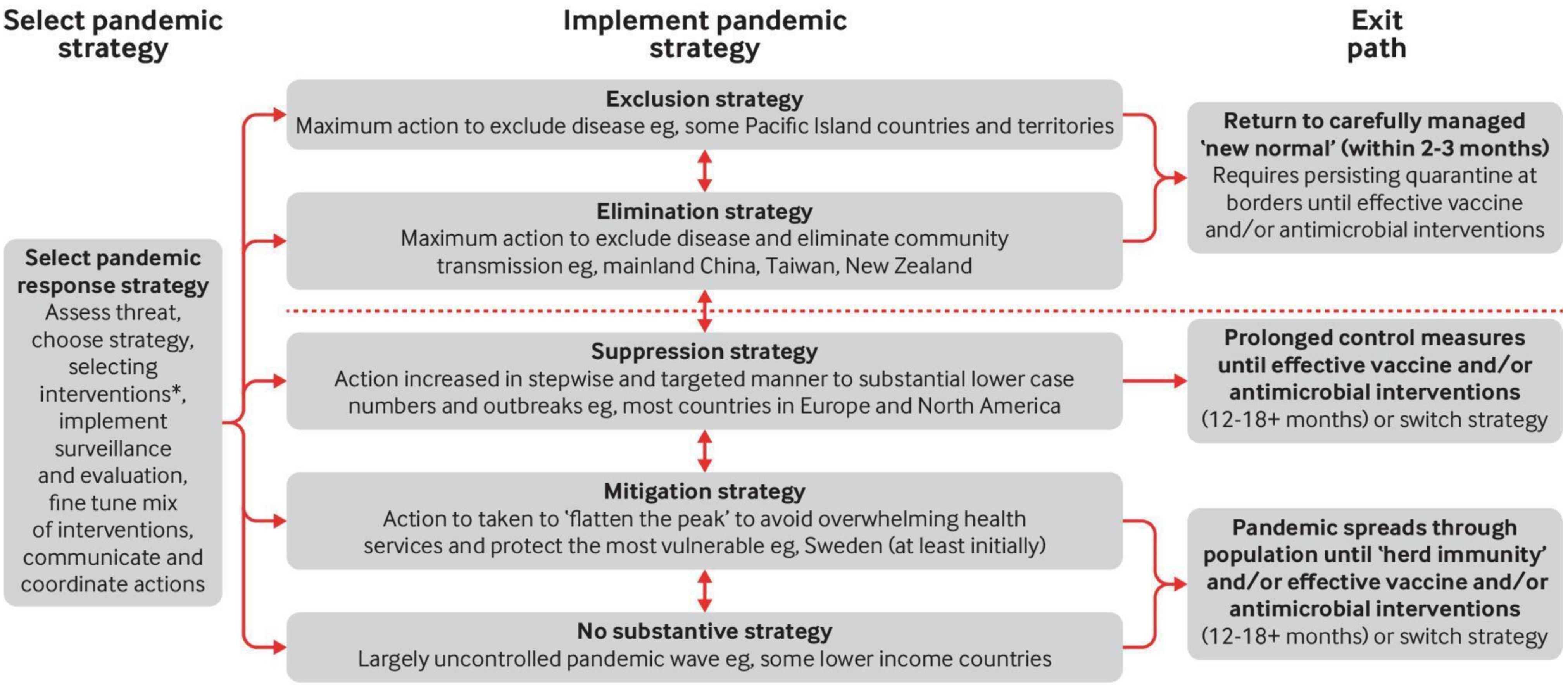
The Elimination Strategy



Source: Kvalsvig & Baker, J Royal Soc NZ, 2021

The Elimination Strategy



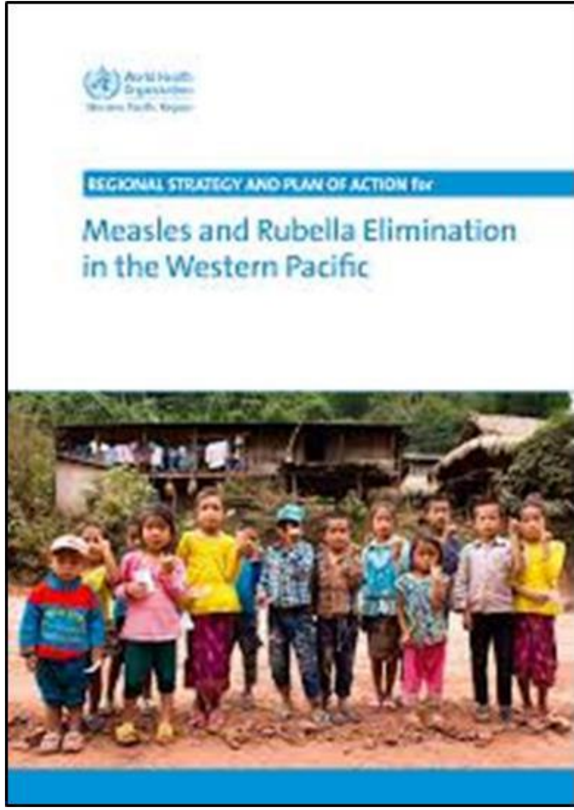
* **Pandemic interventions:** Border controls to "keep it out"; testing, contact tracing, case isolation and contact quarantine to "stamp it out"; improved hygiene behaviours and use of masks; physical distancing; movement restrictions; combinations including "lockdown"; vaccines; antimicrobials

NB. There are multiple other interventions to reduce harm, including protecting vulnerable populations, reorienting health services, social and economic support

Source: Baker et al. BMJ 2020;371:bmj.m4907

The Elimination Strategy

Effectively **adopted by NZ Gov on 23 March** with decision to pursue rapid lockdown with ~100 COVID-19 cases, no deaths



New Zealand's elimination strategy for the COVID-19 pandemic and what is required to make it work

Michael G Baker, Amanda Kvalsvig, Ayesha J Verrall, Lucy Telfar-Barnard, Nick Wilson

In this editorial we summarise the threat posed by the COVID-19 pandemic, the justification for the elimination strategy adopted by New Zealand, and some of the actions required to maximise the chances of success.

What is the size and nature of the threat?

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, has shown a relentless ability to infect the world's population. The virus is highly infectious, with each case typically infecting 2–3 others (a reproduction number [Ro] of about 2.5). Consequently, it has the potential to infect the fact that populations take measures to protect themselves.[3] Under one of the more likely scenarios if the country's current elimination strategy fails, New Zealand could expect approximately 14,400 deaths.[3] In addition, large numbers of people who are ill and hospitalised could swamp health services at all levels and prevent the delivery of elective services and preventive care.

A poorly controlled pandemic will greatly increase health inequities. Like seasonal influenza in New Zealand, risk is particularly concentrated in older people and those with severe comorbidities.[4] Therefore Māori and Pacific peoples could be more

Source: Baker et al. NZ Med J, 3 April 2020
First published Covid-19 elimination strategy

The Elimination Strategy

1. Exclusion of cases

- *Keep it out* – Border Management

2. Case and outbreak management

- *Stamp it out* – Testing, contact tracing, isolation/quarantine

3. Preventing community transmission

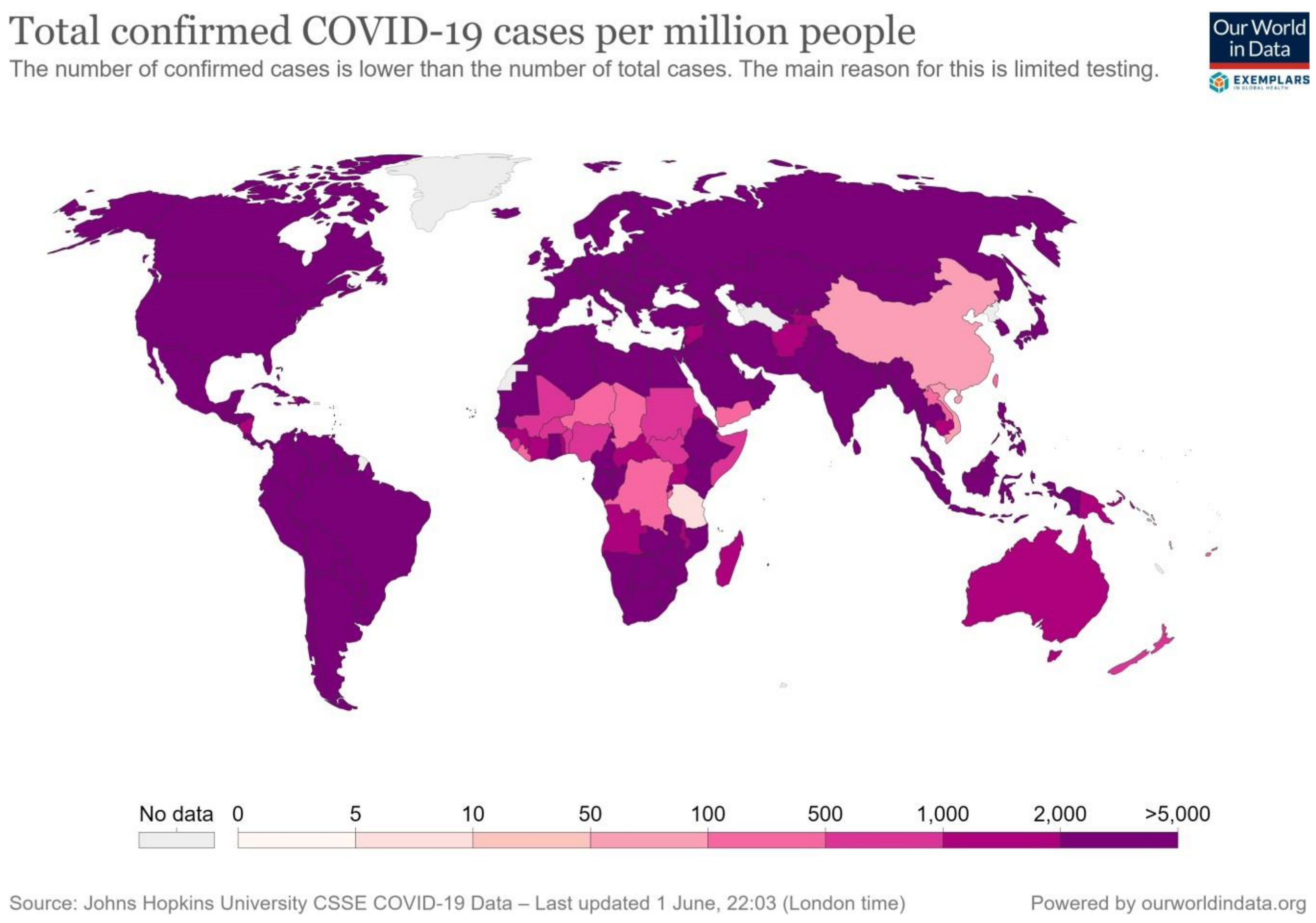
- Hygiene measures, masks
- Physical distancing & travel restrictions
- Vaccination (increasingly available in year 2 of pandemic)

4. Social safety net

- Wage subsidy scheme & many other forms of support

Source: Baker et al 2020, *NZ Med J; Baker et al 2020 Med J Australia*

The Elimination Strategy



Source: Our World in Data, 1 June 2021

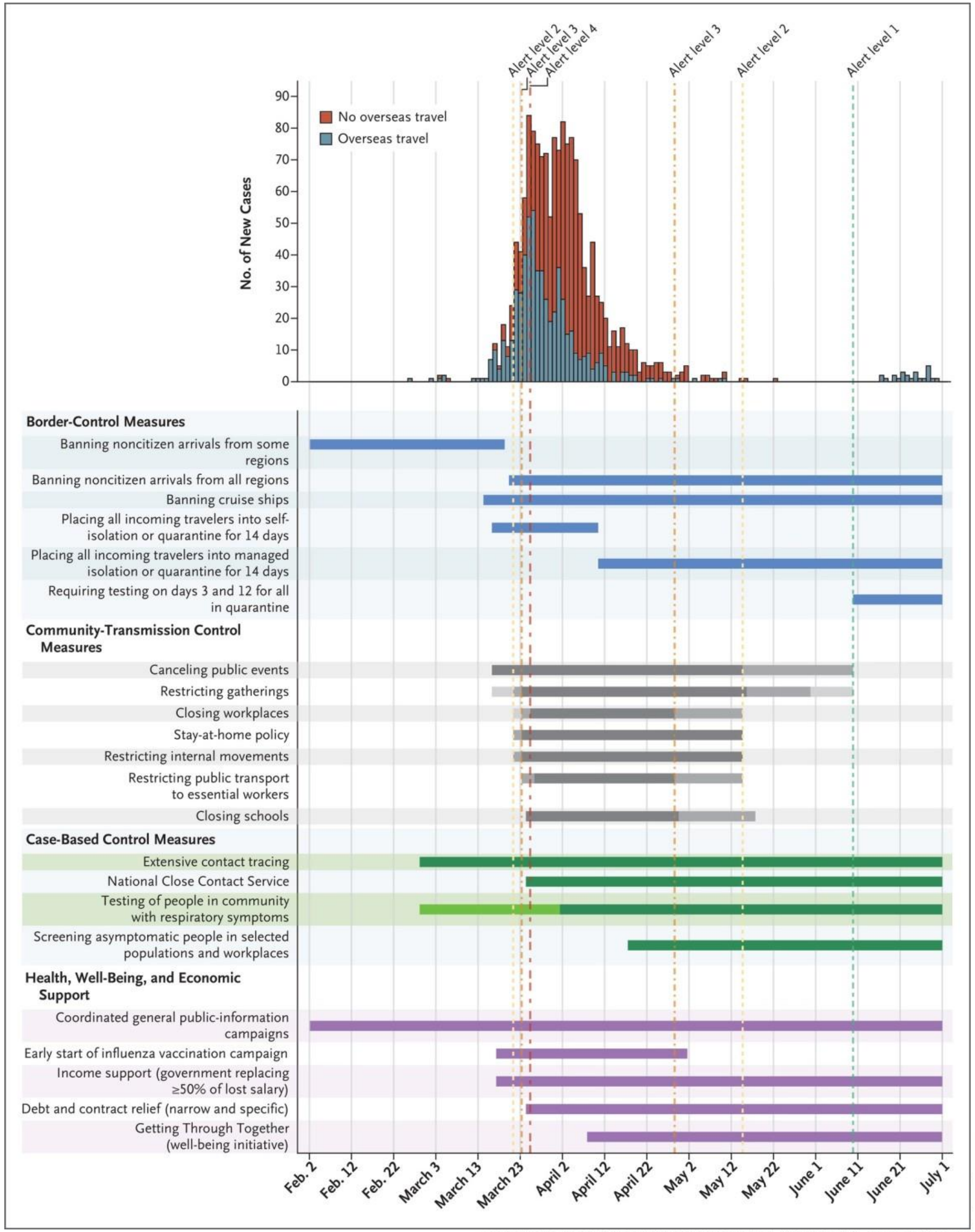
Elimination has been dominant strategy in Asia-Pacific region, including:

- China, Hong Kong
- Taiwan
- Singapore,
- Vietnam, Cambodia, Laos
- Thailand
- Mongolia
- New Zealand
- Australia

>20% world's population

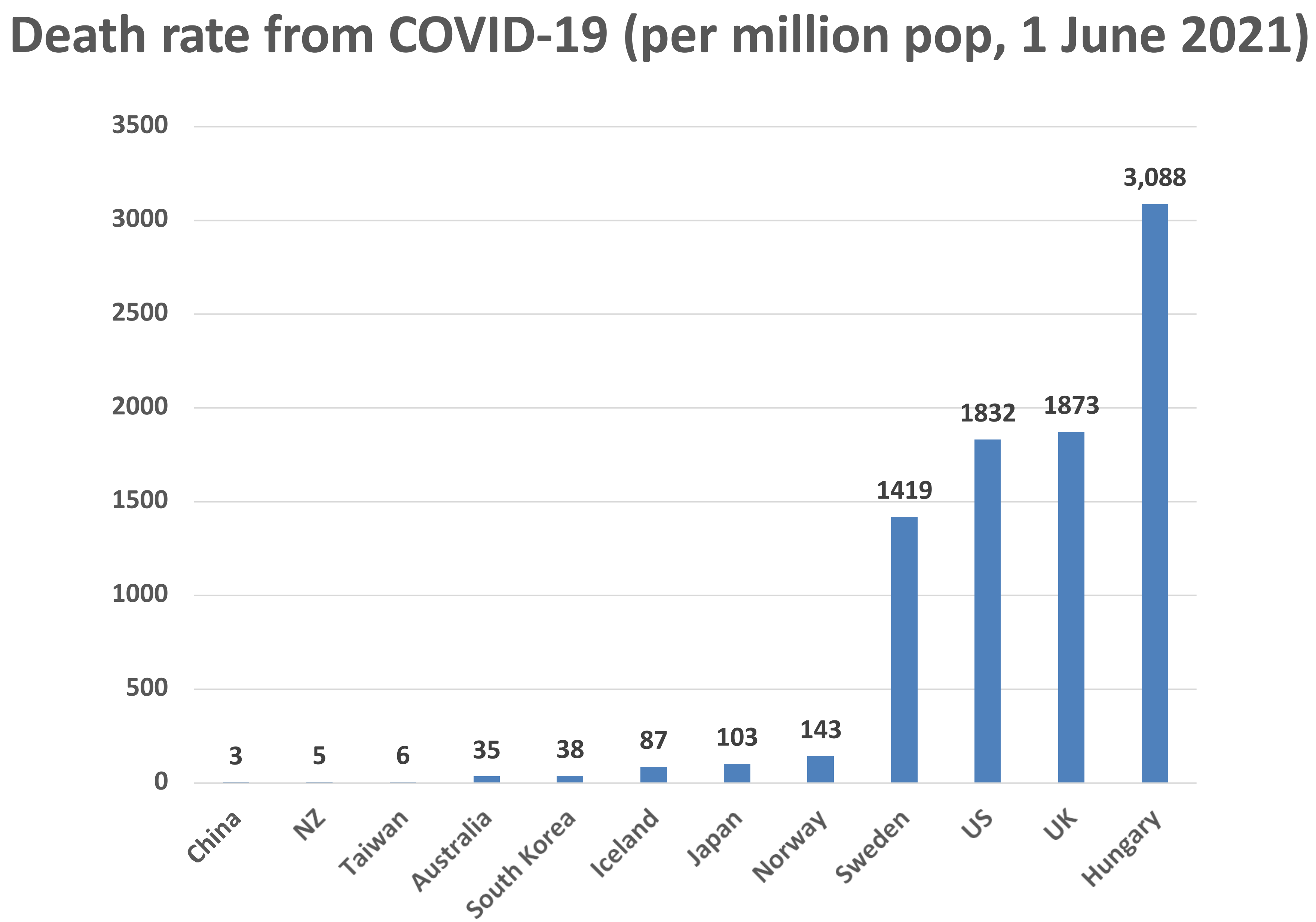
Impact of Elimination Strategy

Rapid decline & end of community transmission of COVID-19



Source: Baker, Wilson, Anglemyer. NEJM e56 DOI: 202010.1056/NEJMc2025203, 20 August 2020

Impact of elimination strategy



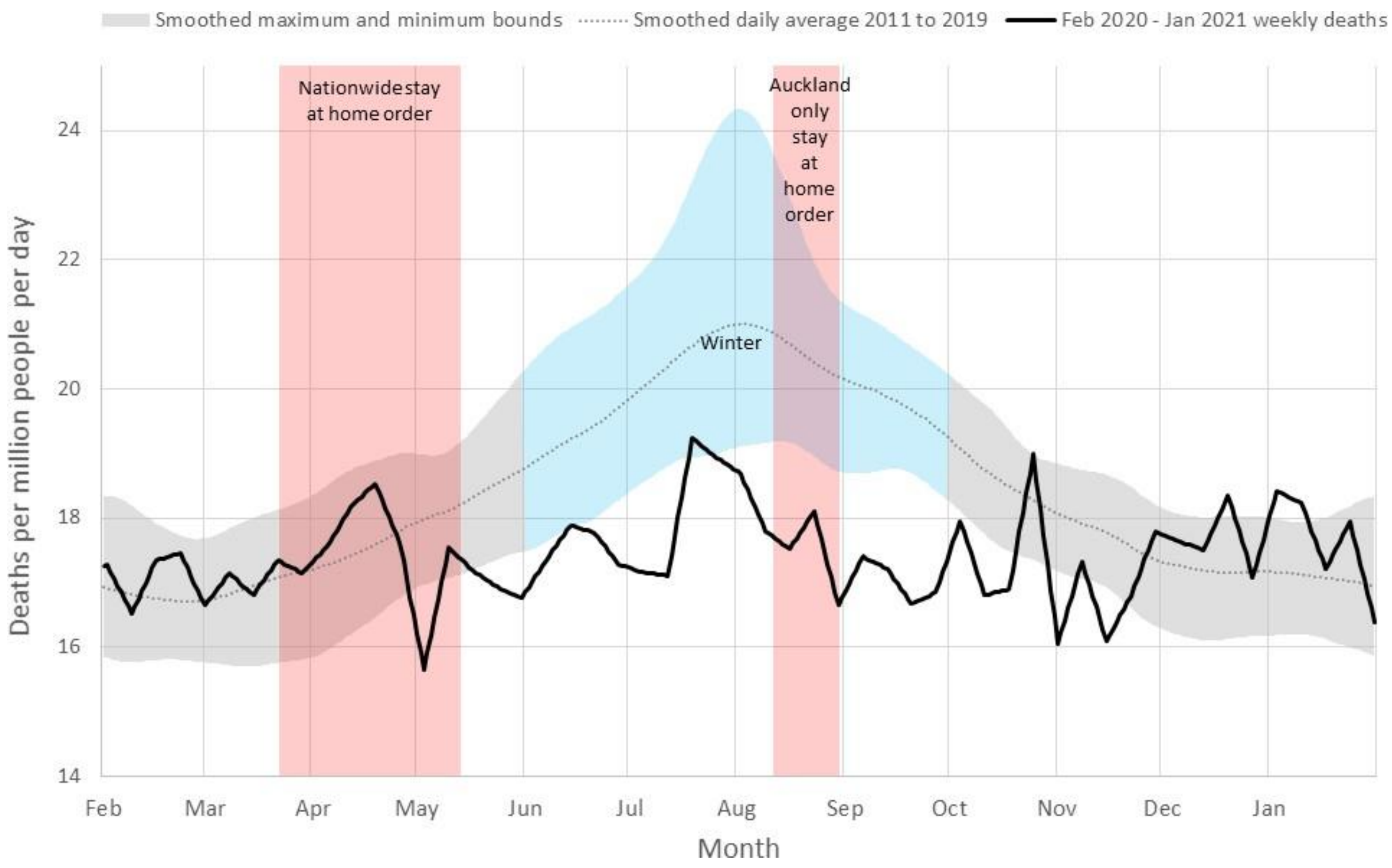
NZ Lives saved by elimination <u>~7,000</u> (based on Sweden mortality = 0.14%)

Av 16 YLL per death

Source: Sci Rep 2021; 11, 3504

Impact of elimination strategy

Effects on Excess Winter Mortality



NZ Lives saved by reduced excess winter mortality (including influenza) ~1,500

Source: Telfar Barnard et al. Under-review Dec 2020

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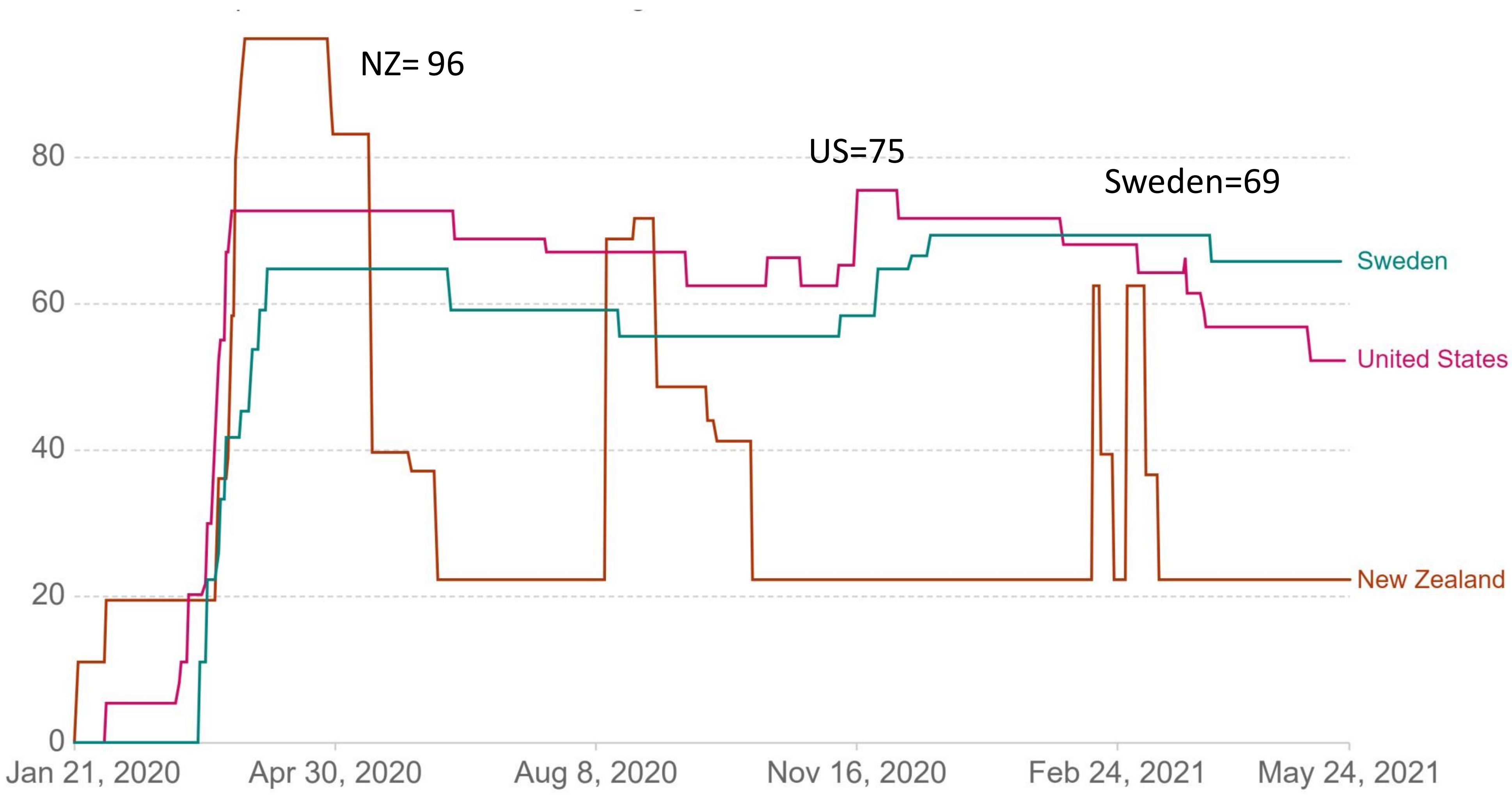
Impact of elimination strategy: Economy

Region	Cumulative mortality rate (per million)	GDP change in 2020 (%), (IMF Projection)
UK	838	-9.8
USA	812	-4.3
Mean Europe +North America (n=16)	**618**	**-7.5**
Median Europe +North America (n=16)	**606**	**-7.2**
China	3.0	1.9
Taiwan	0.3	0.0
Australia	35.0	-4.2
New Zealand	5.0	-6.1
Mean Asia + Australasia (n=4)	**11.0**	**-2.1**
Median Asia + Australasia (n=4)	**4.0**	**-2.1**

Source: Baker et al. BMJ 2020;371:bmj.m4907

Impact of Elimination: Physical distancing (lockdown)



Source: Hale, Angrist, Goldszmidt, Kira, Petherick, Phillips, Webster, Cameron-Blake, Hallas, Majumdar, and Tatlow (2021). "A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker)." Nature Human Behaviour. – Last updated 29 May, 14:00 (London time)
OurWorldInData.org/coronavirus • CC BY

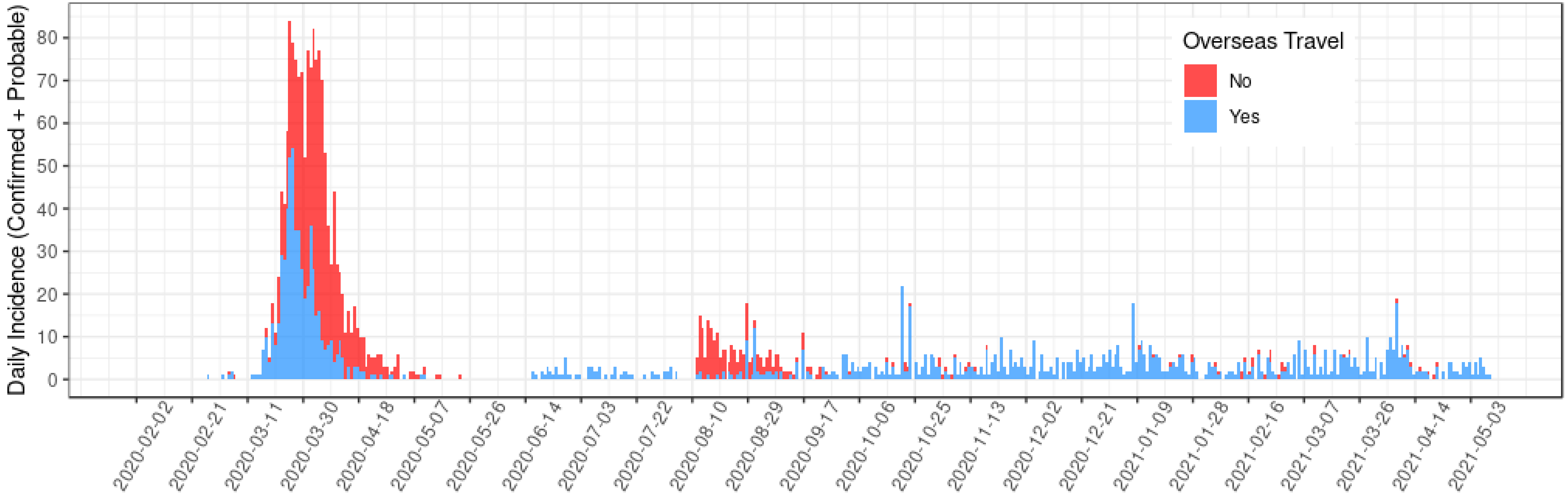
Source: Oxford Stringency Index, Our World in Data

Impact of Elimination: Sustainability

NZ Border failures – 13+ outbreaks have all been successfully managed

1. Auckland August **Community** cluster – 179 cases (incl. 3 deaths)
2. Auckland **MIQ** facility maintenance worker Aug) – 1 case
3. Auckland **MIQ** facility nurse infected (Sept) – 1 case
4. Christchurch **MIQ** facility cluster (Sept) – 6 cases
5. Auckland **Marine employee** cluster (Oct) – 3 cases
6. Christchurch **MIQ** facility nurse #1 (Nov) – 2 cases
7. Christchurch **MIQ** facility nurse #2 (Nov) – 1 case
8. Auckland **MIQ** armed forces cluster (Nov) – 5 cases (incl. Case D + E)
9. Auckland **MIQ** Pullman case (Jan) – 1 case
10. Auckland **MIQ** Pullman cases (Jan) – 3 cases
11. Auckland Valentines day **Community** cluster (Feb) – 15 cases
12. Auckland **Aircrew** (Feb) – 1 case
13. Auckland **MIQ** (March) – 3 cases

NZ Epidemic curve of Covid-19 cases

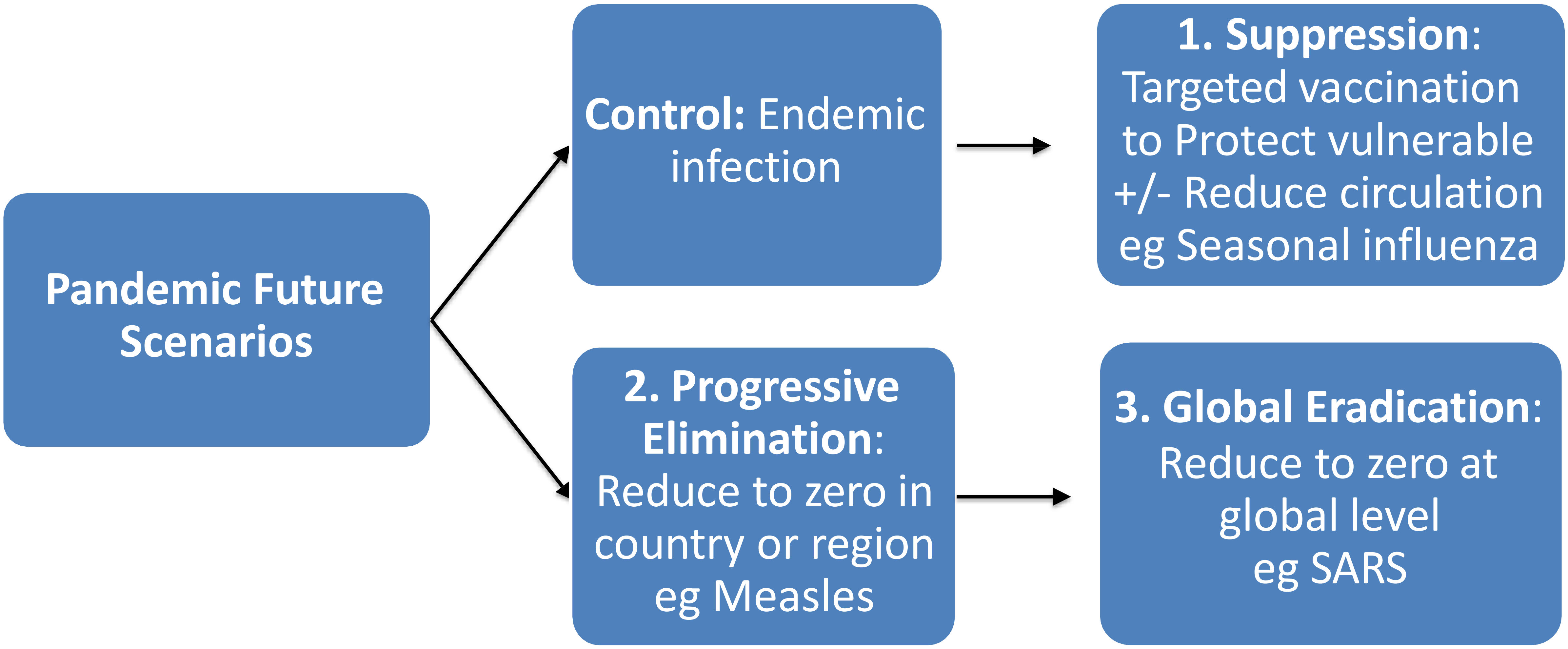


Impact of elimination: Multiple benefits

1. Saves lives
2. Prevents morbidity from long-COVID
3. Is pro-equity
4. Benefits economies
5. Achievable in diverse settings
6. Achievable even after intense local transmission
7. Easier if more countries adopt this approach
8. Easier with effective vaccines
9. Provides an explicit “zero-COVID” goal as a motivating and coordinating focus
10. Is sustainable
11. Still works if the SARS-CoV-2 mutates to escape vaccine immunity
12. Still works if vaccines provide only limited long-term protection.
13. Reduces opportunities for emergence of more dangerous virus variants
14. Reduces risk of establishing zoonotic reservoirs
15. Reduced need for lockdowns
16. Has co-benefits, eg preventing influenza
17. Provides a good interim strategy while we identify an optimal long-term approach
18. Provides a model and infrastructure for rapidly responding to future emerging IDs

Source: Michael Baker and Martin McKee. All countries should pursue a COVID-19 elimination strategy: here are 16 reasons why. Guardian. 28 Jan 2021

Where to from here: Strategic choices



Source: Baker et al. BMJ 2020;371:bmj.m4907

Key lessons for the future

Implications for tackling future pandemics and other public health challenges:

1. Improving evidence-informed decision-making (incl. crises)
2. Adapting responses to future threats (‘all hazards’)
3. Building effective public health infrastructure
4. Supporting effective global health institutions
5. Seizing public health opportunities provided by the Covid-19 reset

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Key lessons for the future

Effective Science + Good Political Leadership
= Evidence-Informed Decision Making

The conversation
Coronavirus outbreak

Michael Baker and Nick Wilson
Mon 8 Jun 2020
04.02 BST

308 205

This article is more than 2 months old

Five ways New Zealand can keep Covid-19 cases at zero

Modelling shows it is very likely New Zealand has eliminated coronavirus. Keeping it that way is the next big challenge

- Coronavirus - latest updates
- See all our coronavirus coverage

Key lessons for the future

All hazards approach to other pandemics

	Relatively low transmissibility	Relatively high transmissibility
Relatively high case fatality risk	• Middle East Respiratory Syndrome (MERS) • Ebola virus disease (EVD) • Severe Acute Respiratory Syndrome (SARS) • Avian Influenza A(H5N1)	• **Severe non-seasonal influenza*** • **Smallpox** • **Emerging Disease X (e.g. emerging zoonotic disease)** • **Novel synthetic Disease X (e.g. a bioweapon)**
Relatively low case fatality risk	• Influenza A(H1N1) – 2009 pandemic • Poliomyelitis	• Chickenpox • Measles

***Approaching the severity potential of the 1918 influenza pandemic**

Source: Boyd, Baker, Wilson. Aust N Z J Public Health. 2020 Apr; 44(2): 89–91.

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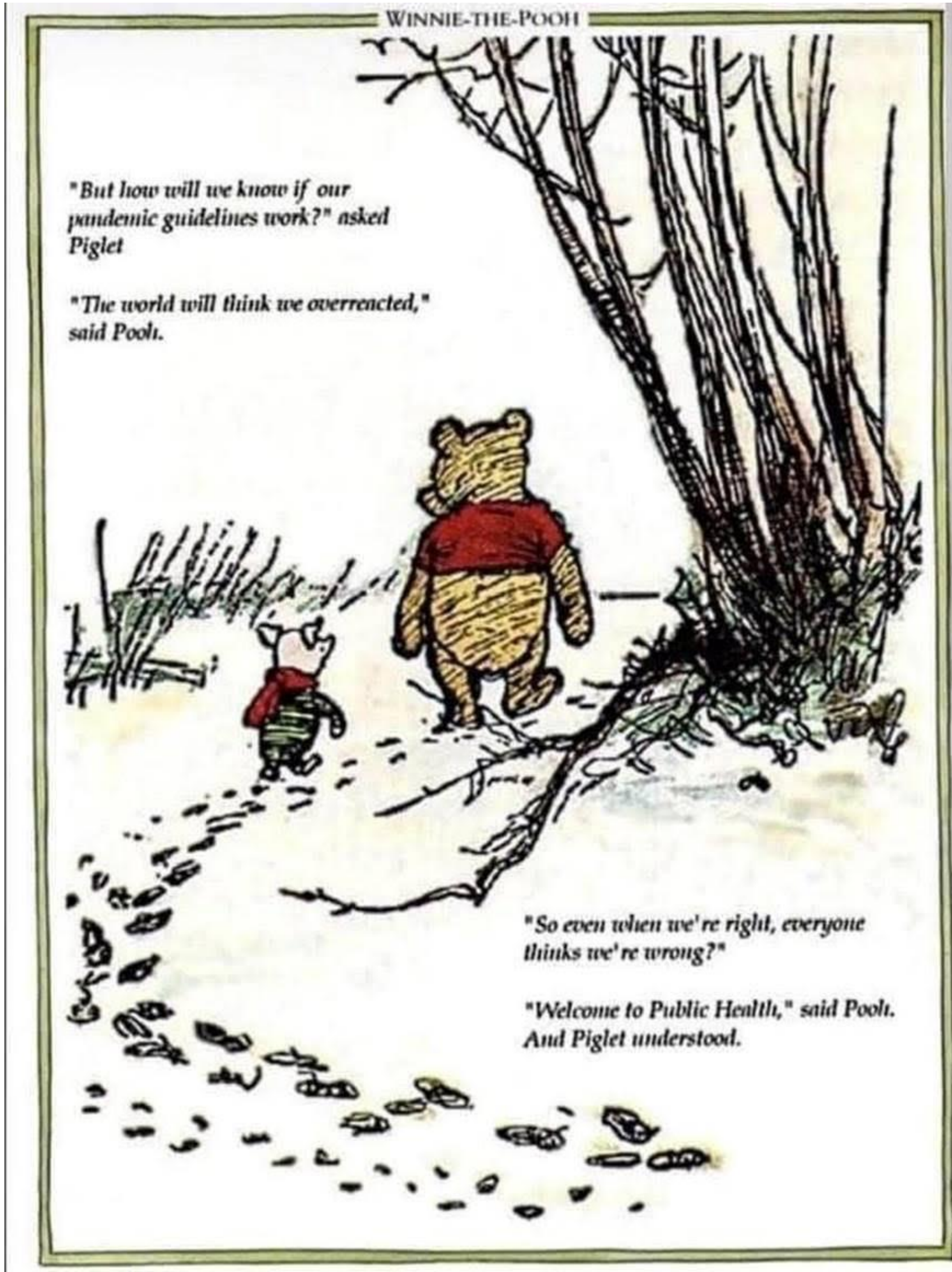
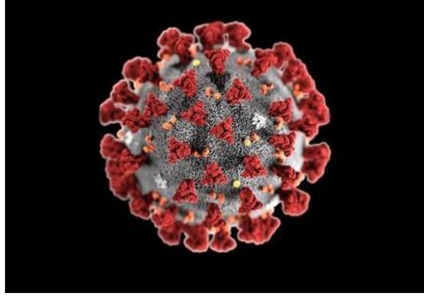
Key lessons for the future

A public health triumph: nothing happened



Summary



1. **Elimination strategy appears an optimal interim response** for new emerging infectious diseases like Covid-19*
2. Elimination will become easier as vaccine coverage increases and **progressive elimination may be the optimal long-term strategy**, though more information & analysis is needed
3. We need to **prepare for far more serious threats** than COVID-19, other pandemics, climate change, growing inequity
4. **Investing in public health and science infrastructure** is critical and COVID-19 has shown us what this looks like at national & international levels

*Source: Baker et al. BMJ 2020;371:bmj.m4907


Thank you
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