

Workshop 2: Re-opening safely



World Bank EAP COVID-19 Vaccine Strategy Workshop Series

May 26, 2021

Part 1a: Policymaker's toolkit for re-opening safely

by Dr. Marin Gjaja, Managing Director and Senior Partner, BCG



Context | Policymaker's toolkit contains four elements to re-open safely



PUBLIC HEALTH MEASURES (PHM)

- Degree of domestic opening
- **Policies on different societal guidelines, e.g.,**
 - School/business closures
 - Social distancing
 - Mask requirements
 - Capacity restrictions
 - Etc.
- **PHMs** are typically measured on "stringency" with a goal of reducing contact rates and thus spread
- **Greater stringency** typically means greater impact on virus but also socioeconomically



BORDER CONTROL

- Degree of international opening
- **Status of international borders**
- Policies include
 - Open/closed
 - Testing
 - Quarantining
 - Vaccine status treatment (e.g., Vaccine Passports)
 - Etc.



VIRUS MONITORING

- **An integrated system that typically includes**
 - Testing
 - Tracking
 - Tracing
 - Technology
 - Isolation
 - Quarantine
- **Monitor new risks, i.e., Variants**
- **Seeking to break transmission chains and inform other policy choices**

Not covered in depth today



VACCINE ROLLOUT

- **Overall approach to vaccine distribution and uptake**
- **Multiple different strategies can be deployed**
 - Sequence of eligible groups
 - Dose interval
 - Mix of vaccines
- **Considerations include**
 - Available supply
 - Vulnerable populations
 - Presence of variants
 - Current prevalence and trajectory
 - Hotspots

Context | Policymakers need to trade off across the elements to achieve integrated goals across three important dimensions



PUBLIC HEALTH

Minimizing disease risk to flu-like levels to protect population

3.3m Global deaths due to COVID-19 vs annual flu-related deaths (300-650k)

26days Duration of hospitalization vs flu level at 17 days



FINANCIAL & ECONOMIC HEALTH

Recovery of lost economic value and building back better

131m People pushed to poverty in 2020 globally

42% Estimated revenue loss of global tourism industry in 2020 vs 2019



SOCIETAL HEALTH

Reversing negative societal impact to vulnerable in society

9mos Math learning lost by elementary students in the US

50% Women in Asia Pacific reported drop in working time in formal jobs vs. 35% men

Context | EAP countries have historically deployed the four elements to varying degrees along the continuum of these three response strategies

	Crush & Contain	Flatten & Fight	Sustain & Support
Strategy Objective	<p>Full containment to drive cases to ~zero by one of following:</p> <ul style="list-style-type: none"> Act early and aggressively Stringent PHMs and border controls Fast, long, local lockdowns Extensive virus monitoring 	<p>Lockdown and/or open containment to decrease case count and buy time for system investment: increase healthcare system capacity, testing, contact tracing infrastructure</p>	<p>Short or no lockdown period. Lockdown could result in negative humanitarian outcome and/or is not needed to build infrastructure</p>
Restart Implications	<p>Open economy by managing disease with strong monitoring: prevent new cases from spreading by conducting widespread testing</p>	<p>Progressive lifting of restrictions and reopening of economy without surpassing healthcare system limits</p>	<p>Prolonged isolation of vulnerable population. Economy resumes activity w/ fewer restraints, but continued health precautions (e.g., PPE)</p>
Typical Prerequisites	<ul style="list-style-type: none"> Strict border control High capacity for testing and contract tracing High compliance with stringent measures 	<ul style="list-style-type: none"> Increase healthcare system capacity Increase virus monitoring Compliance with PHMs during period of gradual reopening 	<ul style="list-style-type: none"> Ability to isolate, support socio-economic wellness of vulnerable pop. Population with high trust in government actions
Example countries	<ul style="list-style-type: none"> Australia Singapore New Zealand China 	<ul style="list-style-type: none"> Philippines Malaysia Thailand Cambodia <p><i>And many more...</i></p>	<ul style="list-style-type: none"> Sweden Iran

F&F countries that are able to contain the disease spread and improve testing move to C&C



Countries have shifted strategies over time



F&F countries that reduce stringency without containing the disease spread move to S&S

1. Disease Tolerance Ratio calculated as daily cases per 1M divided by stringency; Oxford's COVID-19 Government Response Tracker creates an additive, composite score countries' COVID-19 policies across nine indicators (school, workplace, and public transit closings, public event cancellations and info campaigns, stay at home requirements, restrictions on internal and international travel. Source: World Bank, Passport, Oxford University COVID-19 Government Response Tracker, Worldometer, BCG Analysis

Example | In Flatten & Fight countries, focus has shifted across different elements over time and will continue to shift with further re-opening

Approach to maintaining $R_t < 1$

Flatten: PHMs drive down prevalence

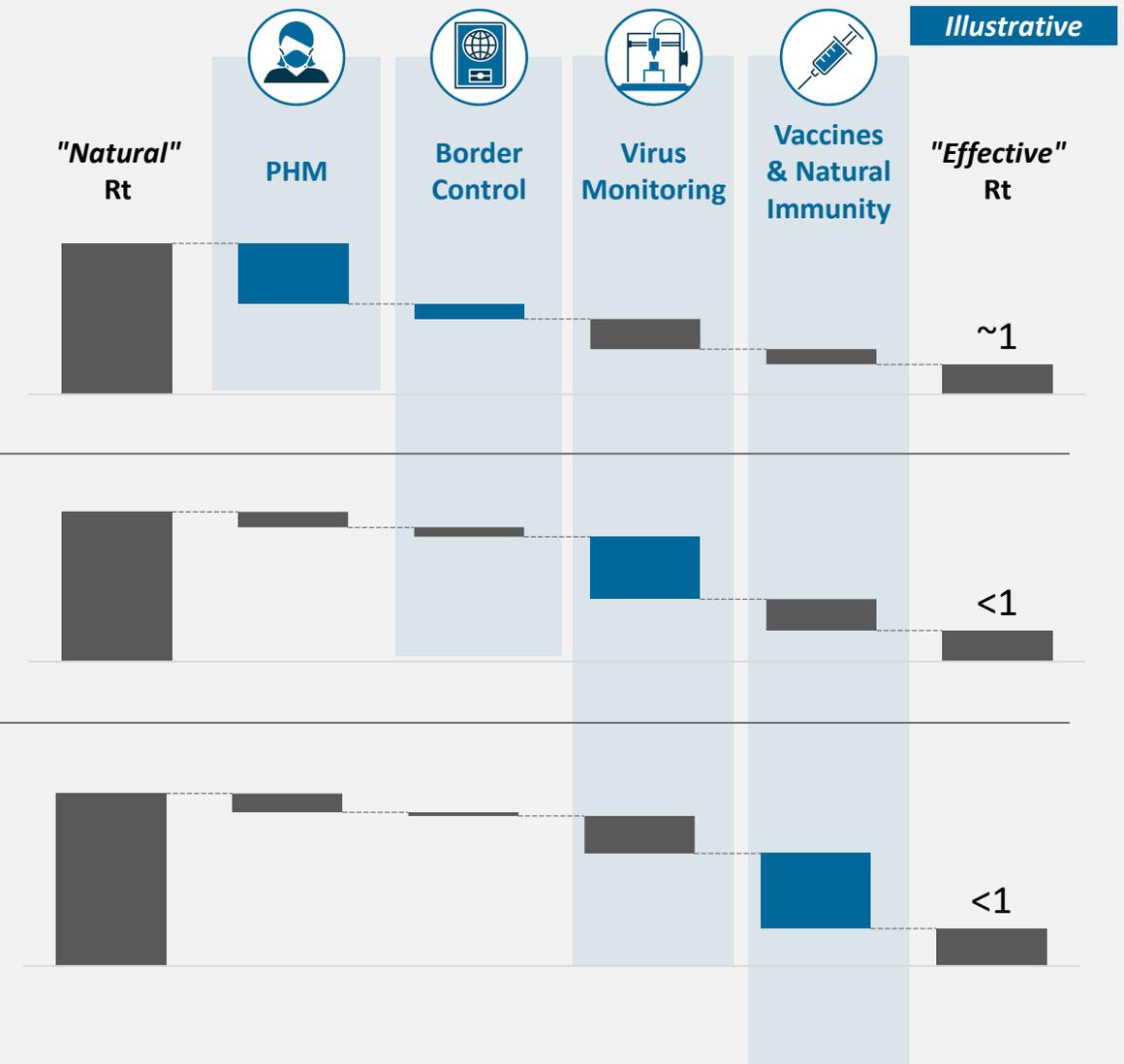
- Maintain **strict PHMs** to drive down prevalence
- Ramp up Virus Monitoring
- Strict border controls

Fight: PHMs relax, virus monitoring contains, vaccines ramp

- Contain the virus with **full-scale Virus Monitoring** as vaccine roll-out accelerates with supply
- Relax PHMs with caution; preserve healthcare system capacity

Re-open: Vaccines reduce risk; apply ongoing pressure

- Focus on **vaccinating the remaining eligible population** to achieve disease risk minimization
- Continue to relax PHMs to get closer to "normal"
- Consider scaling down virus monitoring as immunity increases



Public health measures need to be customized, guided by key indicators while balancing "epinomic" trade-offs

When?

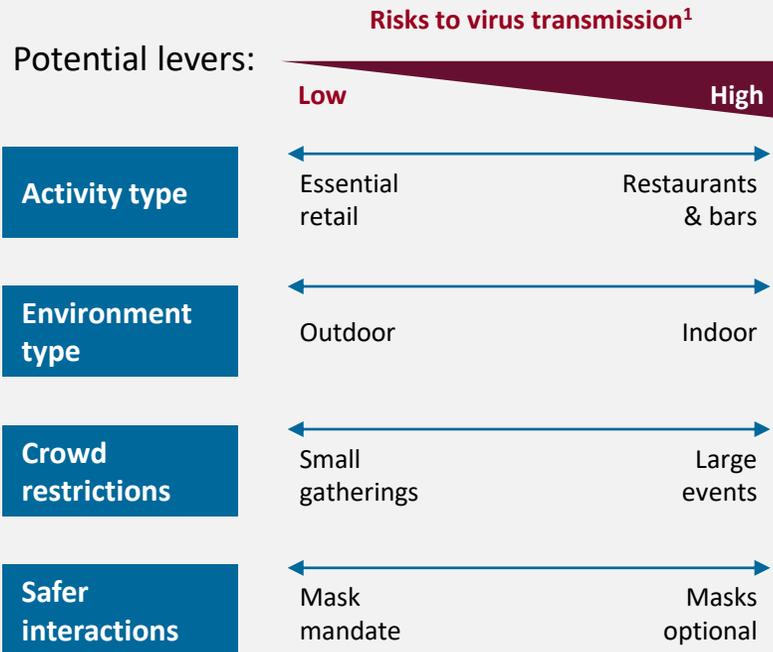


- PHM release based on key indicators of **virus threat and readiness of available tools**
- **Potential Indicators:** *Epidemiological Status, Healthcare Capacity, Testing Rates, Vaccination Rate*



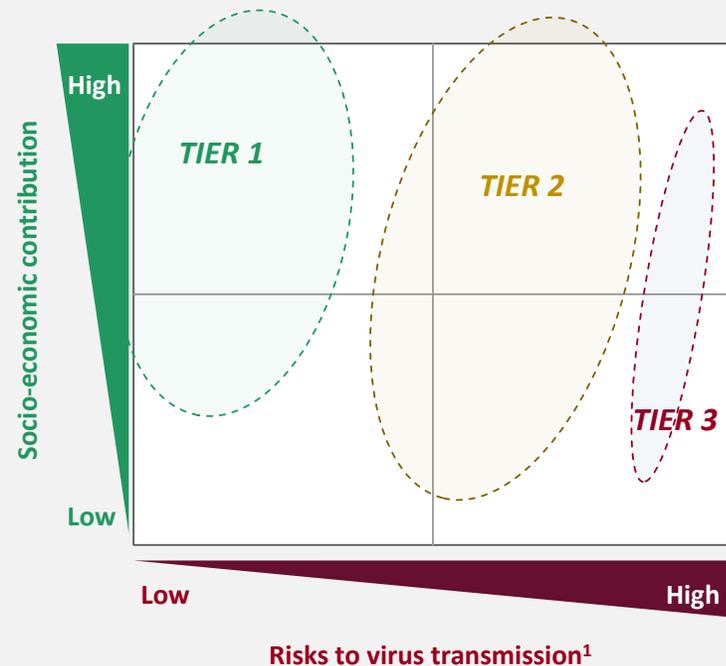
What?

Use of different PHM levers to ensure safe & sustainable reopening of the economy



How?

Phases of release to balance trade-offs between **virus transmission and localized socio-economic contribution**



Key learnings:

- Plans to lift PHMs need to be tied to key indicators (i.e., virus threat) and context (i.e., testing & tracing capacity and vaccination rate)
- PHM release aligned to tiered approach have acceptable outcomes; "rushed" release can lead to challenges

1. Directional

Domestic reopening: PHM easing tied to vaccination rollout and reduced disease burden, starting with schools and crowd-restricted outdoor gatherings

When?

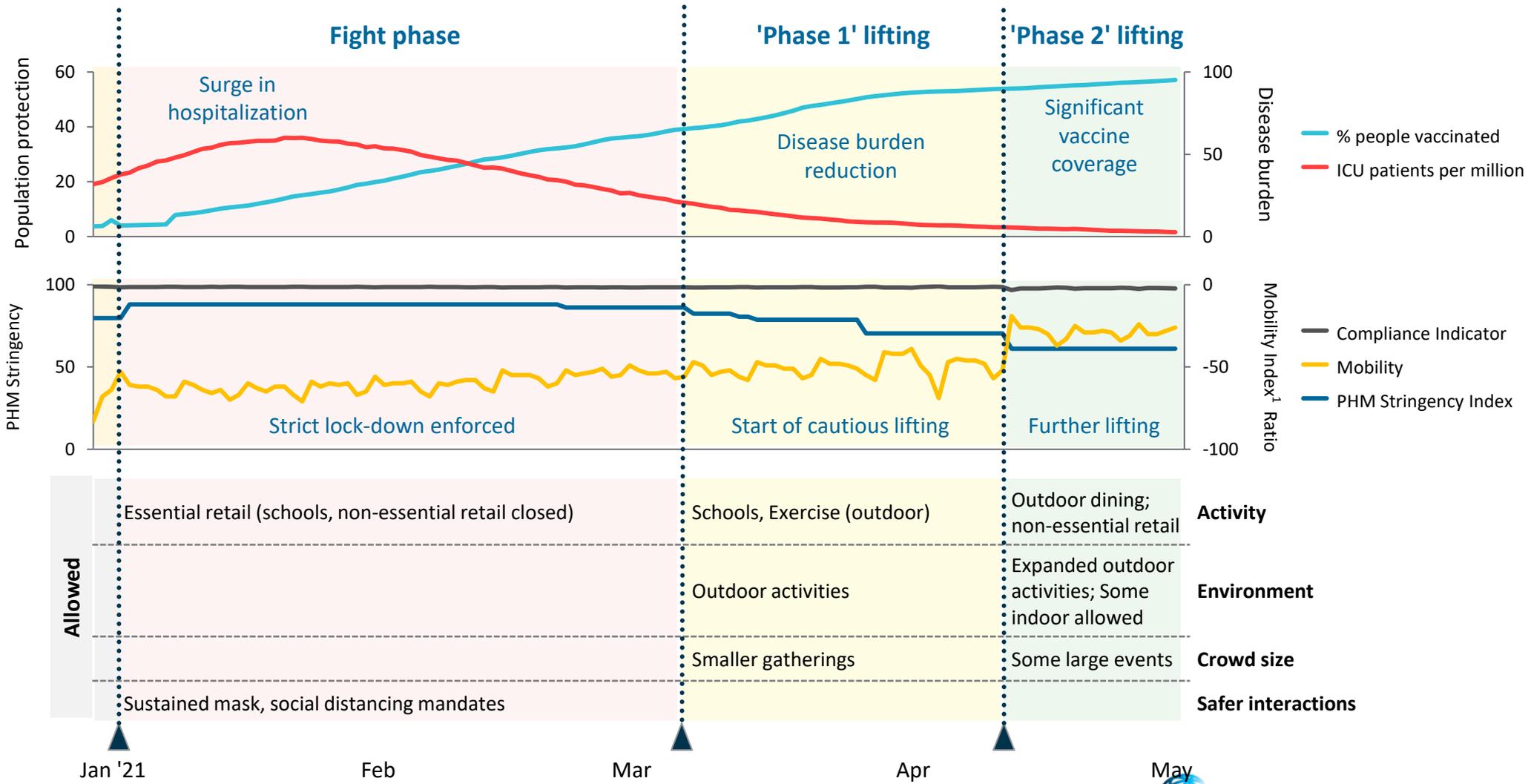
Key indicators used

How?

Phasing of PHM relaxation

What?

PHM levers activated



1. Retail & recreational, vs. baseline of median value from 5-week period Jan 3 – Feb 6, 2020; Source: Our World in Data, Google Community Mobility Report; Oxford Stringency; UK COVID-19 Response doc; Press search

Domestic reopening: Phases of PHM easing tied to sustained reduction in disease burden prior in 2020, PHM expected to be maintained until broader vaccine coverage

When?

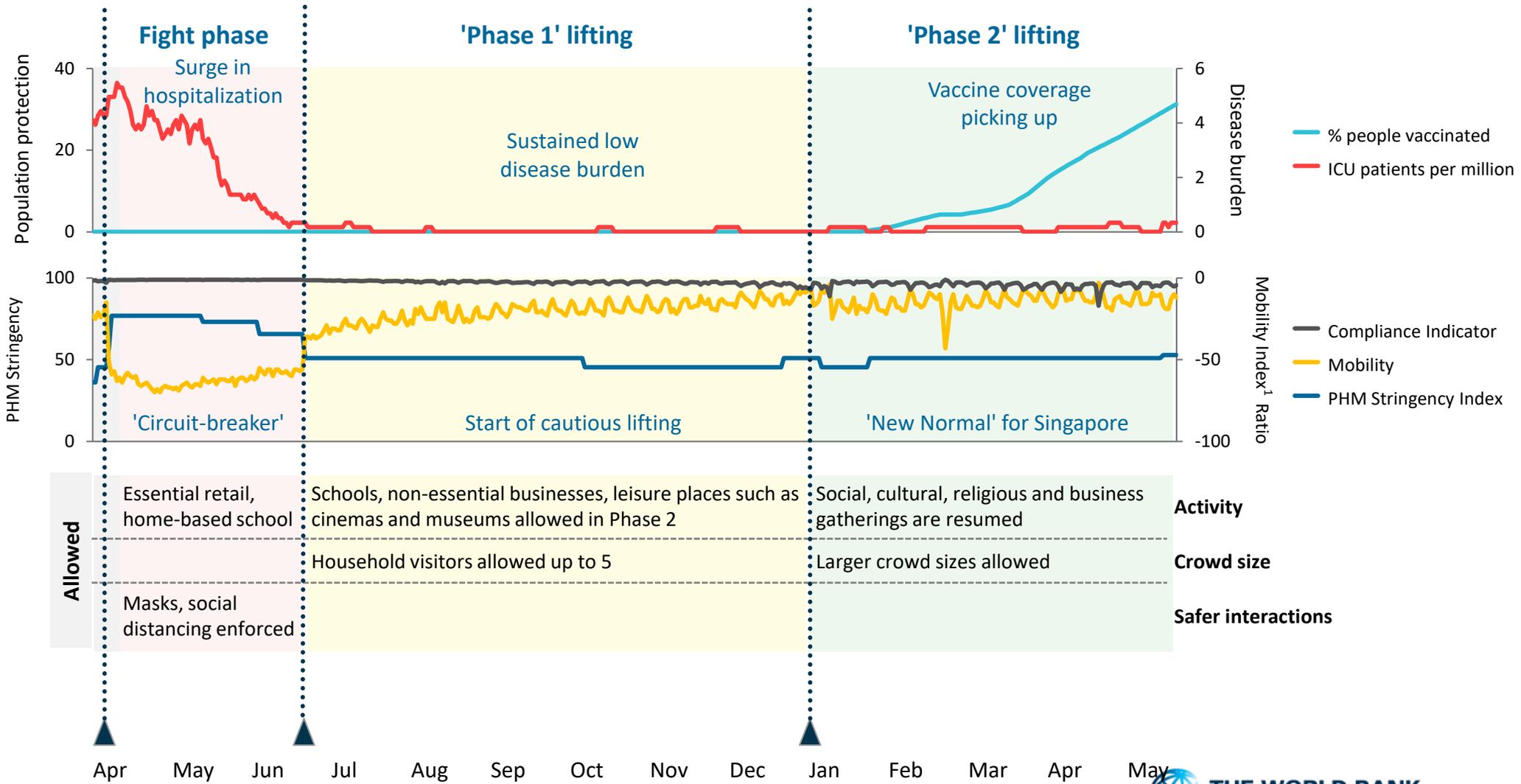
Key indicators used

How?

Phasing of PHM relaxation

What?

PHM levers activated



1. Retail & recreational, vs. baseline of median value from 5-week period Jan 3 – Feb 6, 2020;
 Source: Our World in Data, Government website, Google Community Mobility Report; Oxford Stringency; Press search



Four main border measures employed by countries to manage disease import risk while re-opening internationally

Virus import risk



Temporary border closures

Limiting import risk by closing borders:

- Extend beyond origin countries for variant risk
- Categorize risk by country – e.g., traffic light system in UK



Quarantine tracking and enforcement

Tracking and enforcement mechanisms of quarantine compliance (e.g., dedicated quarantine hotels, random house checks, location tracking, etc.)



Testing regimen throughout travel

Testing throughout:

- Pre-departure
- On-arrival
- Post-arrival/in-quarantine

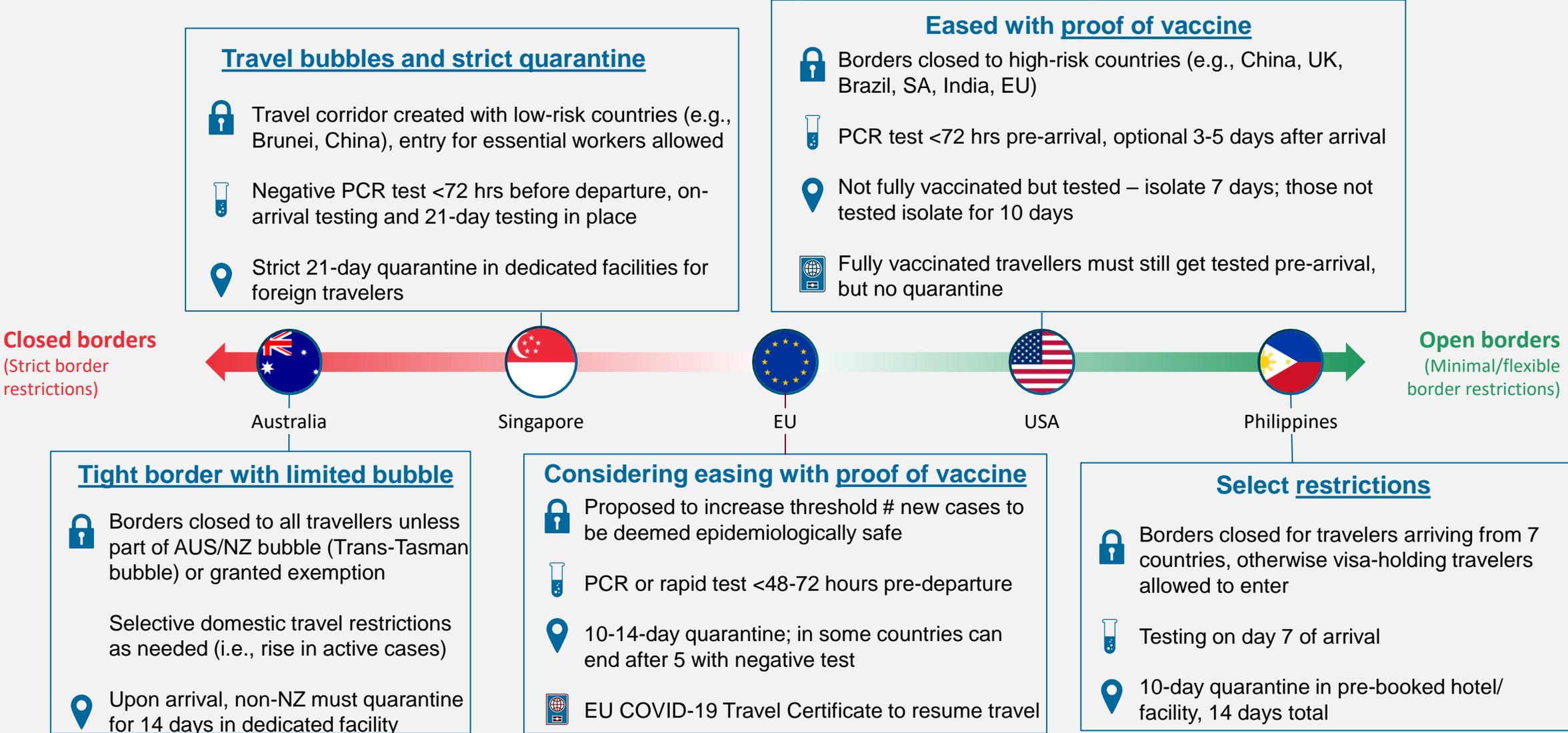


Vaccine / immunity certification

Accreditation of individuals with low transmission and infection risk (e.g., vaccinated or recently recovered)



Border measures employed to varying degrees of stringency and with different combinations based on government capabilities



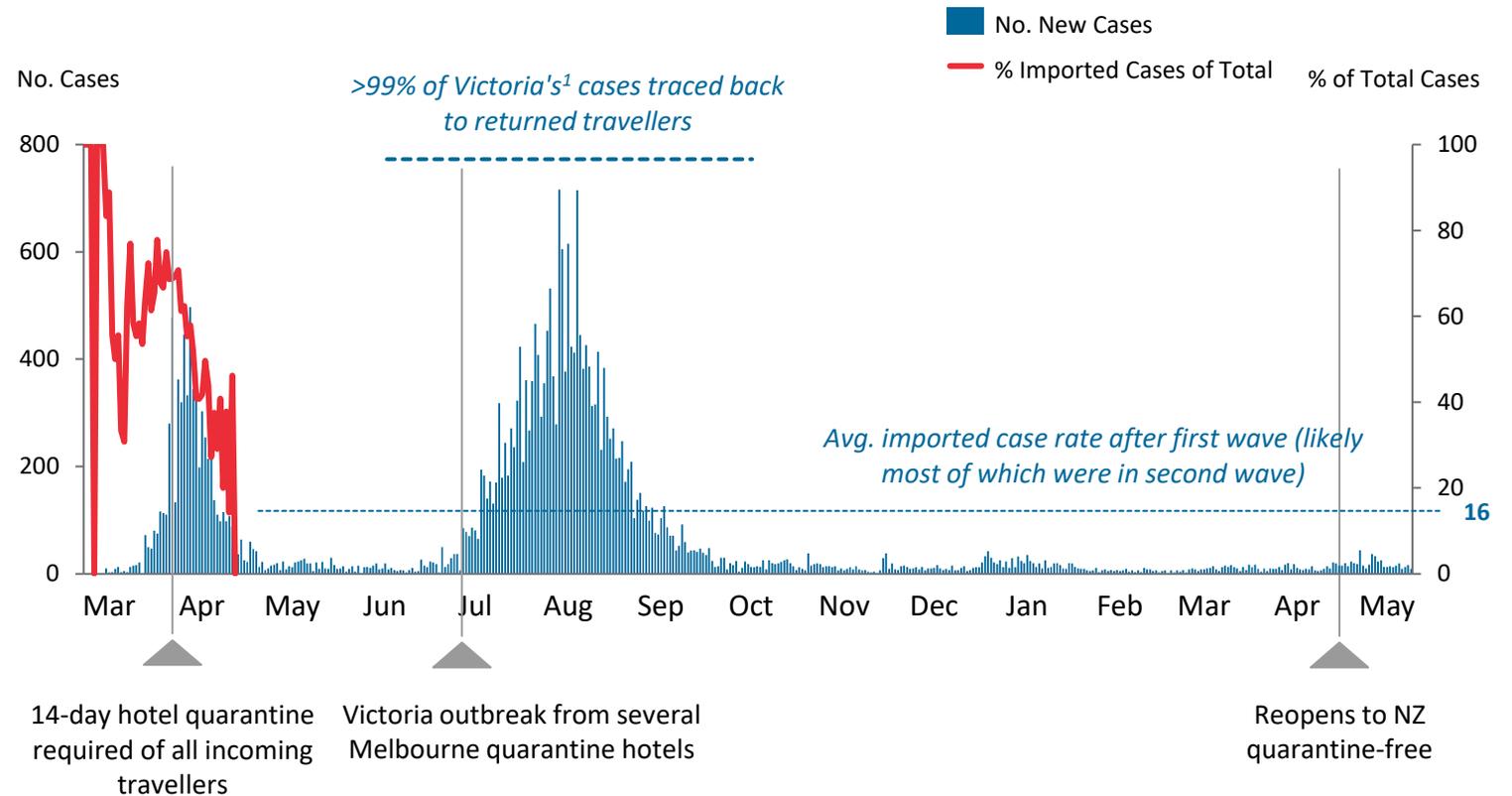
Source: Government websites, Thomson Reuters, Press search



Australia

Closed borders to end first wave, quarantine breaches caused second wave

Early border closures & quarantine effective, but only if well enforced; reopen to similarly safe countries



Note: No public data available for day-by-day infection source after April 14, 2020

1. Where second wave was contained in Australia

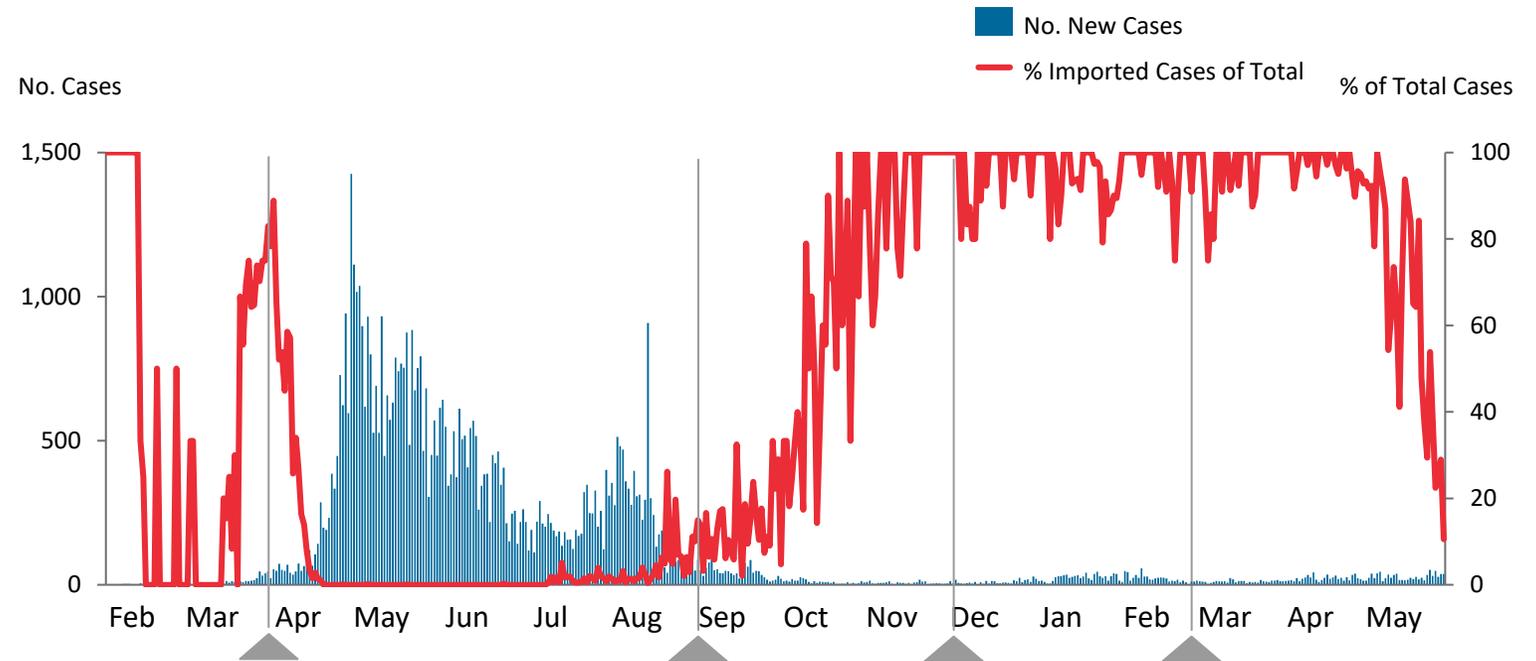
Source: [Australian Department of Health, Early Analysis of the Australian COVID-19 Epidemic](#), [Our World in Data](#), [National Review of Hotel Quarantine](#)



Singapore

Quarantine and testing measures highly effective in shielding local population from out-breaks

Travel allowed but risk minimized via robust testing and de-averaged quarantine process; flexible corridor creation & suspension



Borders closed against all countries

Travel corridor scheme started with NZ, Brunei

Added corridors for Australia, Vietnam, etc.

Start of corridor suspensions due to variants

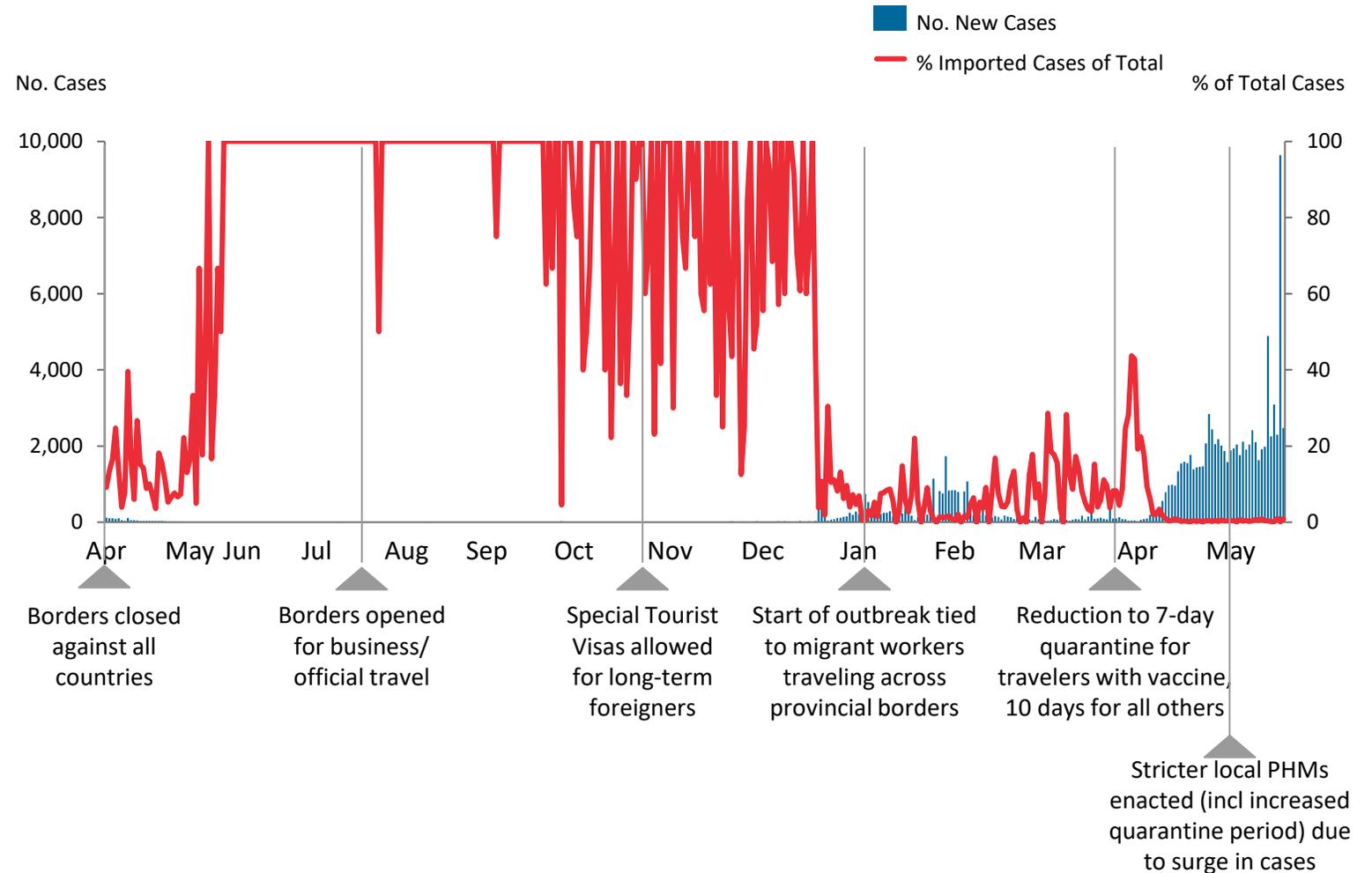
Extended quarantine period to 21 days for incoming travellers



Thailand

Quarantine and testing measures effective during 2020 as borders opened; recent lax quarantine may prove costly

Tourism industry necessitated further border opening; recent surges potentially driven by shorter quarantine periods impacting local population already lax with PHMs



Source: Our World in Data, Government website, Press search



Test, trace & isolate: Robust systems, built early by EAP countries, have enabled full containment of the virus

4TIQs work in synchrony to quickly identify and isolate positive cases and suspected contacts

Prioritize high-quality testing of key individuals

 Sustained leads in tests per case containment, now at 3500+ tests per case vs WHO benchmark of ~20

Understanding local epidemiological conditions (e.g. true infection rate), location and patterns of hotspots

 Integration of tracing app data and tracking sources such as CCTV cameras with MoH data



At the individual level: Trace and quarantine contacts of infected individuals to prevent spread

Digital/app-based solutions deployed to enable continuous and comprehensive contact tracing 



Selective Quarantine and Isolation of infected individuals and their contacts

 Localized quarantine measures made based on app & MoH data; very strict monitoring and isolation measures for infected people and suspected contacts

Key learning:

- Robust monitoring systems have been central to crush & contain strategies
- But will not be sufficient as **variants continue to pose challenges**



Genomic surveillance: What are the priorities of genomic surveillance?

Four main use cases under consideration when setting priorities for genomic surveillance activities

USE CASES	TESTING TECHNOLOGY	SAMPLING METHOD	VALUE FOR COUNTRIES
Monitor in-country prevalence of existing variant	Cheaper point mutation assays	Random & representative sample	<ul style="list-style-type: none"> • Enable clinical & public health response if variant affects severity • Assess therapeutics, testing, vaccine performance
Assess how variants impact disease severity & transmissibility	Both PCR & NGS can yield useful results		<ul style="list-style-type: none"> • Enable clinical & public health response
Detect & control outbreak of new variants	Whole-genome sequencing technology	Identify hotspots & transmission routes	<ul style="list-style-type: none"> • Anticipate spreading of potentially dangerous variants
Characterize variants response to Vx, Dx and Tx		Random & representative sample	<ul style="list-style-type: none"> • Enable clinical & public health response • Enable critical research on vaccine, testing, therapeutics development

Note: NGS = Next Gen Sequencing
Source: Expert consultation

Key learnings:

Building tailored approaches

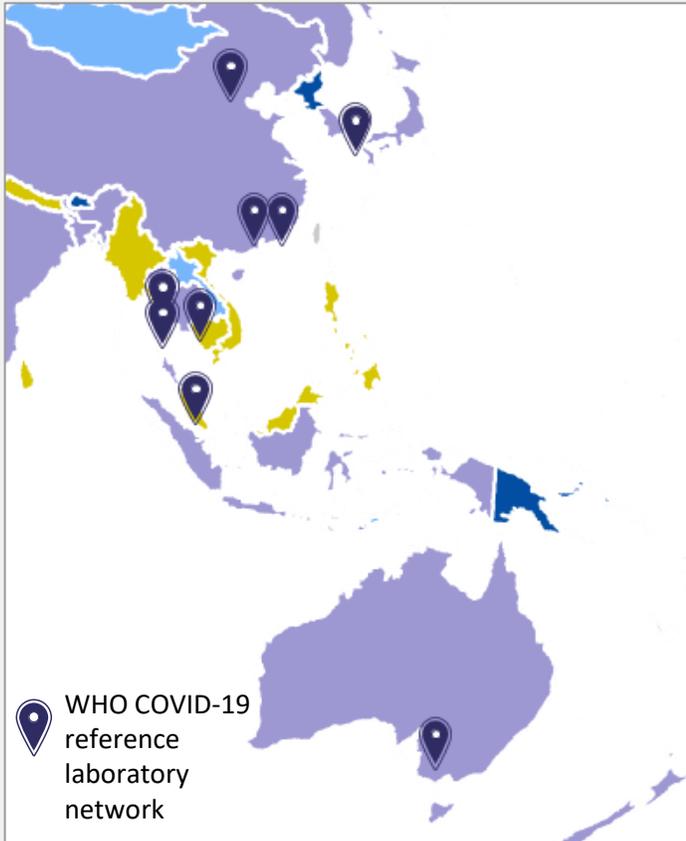
There are no universal targets for genomic data collection, and genomic surveillance strategies will adapt to local contexts



Genomic surveillance: Where do we start setting up sequencing capacity?

Country archetypes defined based on needs and sequencing capacity gaps...

Mapping of current capacity across EAP



... along with corresponding interventions tailored to country context

Archetype	Interventions
Strengthen	<ul style="list-style-type: none"> • Increase sequencing capacity for scale-up • Link genomic data with epidemiology to inform public health response
Leverage	<ul style="list-style-type: none"> • Leverage/repurpose existing sequencing capacity • Link sequencing capacity with existing molecular testing networks
Connect	<ul style="list-style-type: none"> • Set up sample referral networks • Build and link sequencing capacity with existing molecular testing networks
Test	<ul style="list-style-type: none"> • Increase diagnostic/molecular testing capacity

Key learnings:

Mapping country needs

Mapping existing capacity is the first step to guide interventions addressing disparities in global coverage of genomic data



Dates to achieve broader coverage vary; potential for EAP to fast-track based on context

Archetypes (% of global pop'n)	Supply	Demand	Throughput	Urgency	Broader coverage
Roll-out leaders (6) 	Sufficient purchase and prioritized delivery	Possible risk of vaccine hesitancy	Accelerated due to robust healthcare infrastructure	Decreased urgency as cases decline	Q2 '21
High income laggards (6) 	Sufficient purchase but lower delivery priority vs roll-out leaders	Possible risk of vaccine hesitancy	Potential delays from regulatory and bureaucratic issues	Sustained urgency as COVID-19 still wide-spread	Q3 '21
Crush & contain countries (21) 	Sufficient purchase with deliveries ramping up	High expected uptake	Large opportunity to accelerate with robust HC infra	Lowest urgency as disease burden minimized	Q3–Q4 '21
Leading LMICs (32) 	Supply covered by own capacity and/or purchases	Mix of low and extreme vaccine hesitancy	Current HC infra will pose challenges	Mixed urgency ; some countries with high spread	Q3 '21– Q2 '22
COVAX dependents (35) 	Supply contracts yet to be completed; to depend on int'l support	Potential uptake unknown	Lack of HC infra may prolong distribution	Mixed urgency	Q4 '21 – 2022+

Where most EAP countries are

Key learnings:

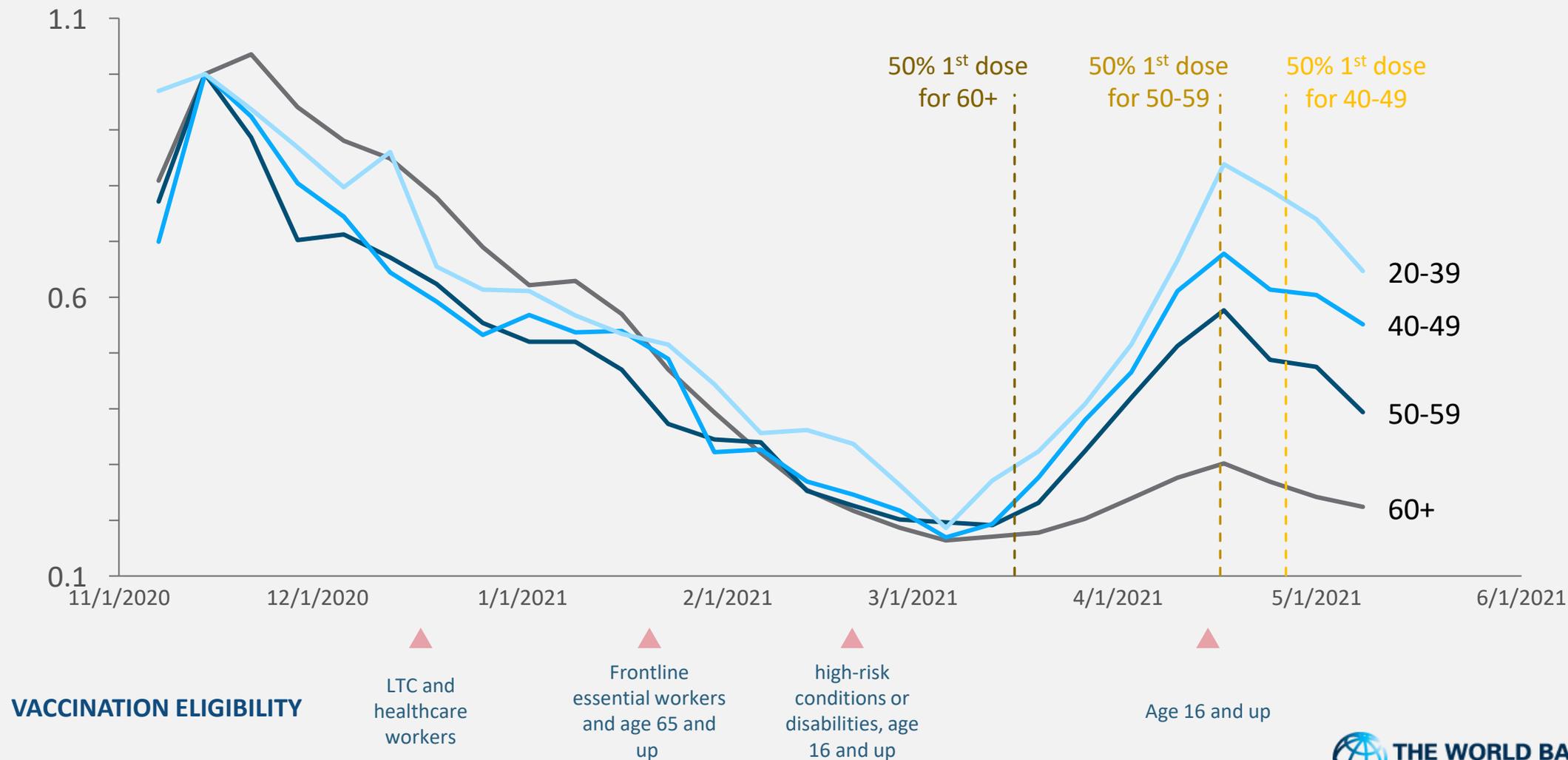
- Vaccines are excellent at preventing severe disease and death in vulnerable populations
- High levels of coverage are needed before vaccination has an impact on transmission

Vaccination rollout critical to reduce disease burden



Accelerated elder vaccination in the US helped mitigate hospital rates in recent surge

Hospitalization vs. Index [1= new admissions in week of 11/14/2020, peak of fall surge]



VACCINATION ELIGIBILITY

LTC and healthcare workers

Frontline essential workers and age 65 and up

high-risk conditions or disabilities, age 16 and up

Age 16 and up

Summary | Country context will determine balance of elements required to reach national objectives

Sample country contexts and objectives...

Flatten & Fight: Tourism-dependent with vaccine delays

- Enforce **strict PHMs** especially on indoor activities
- **Ramp up virus monitoring**
- Open borders while ensuring strict border measures in place

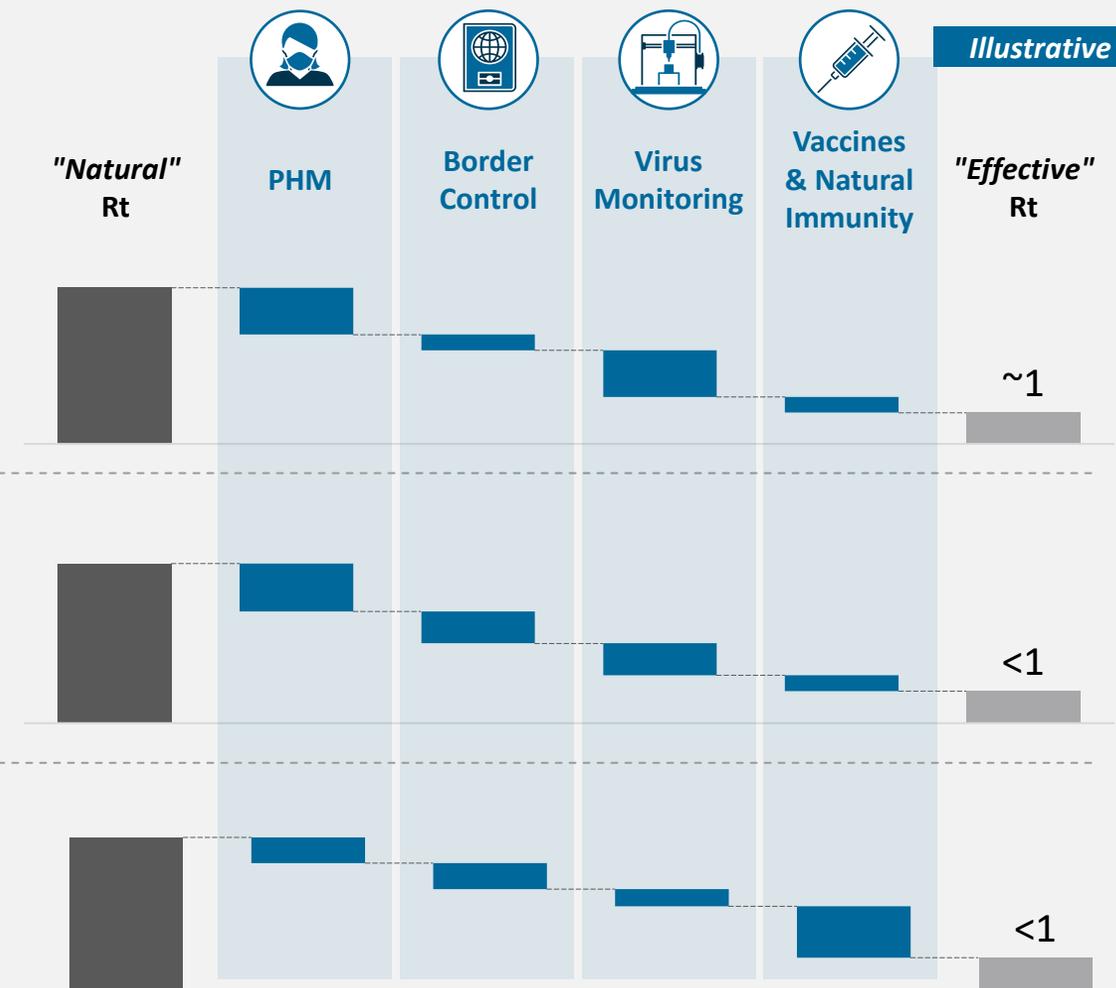
Flatten & Fight: Low middle-income with vaccine supply gaps

- Enact **highly targeted PHMs** considering economic prioritization
- Concentrate available vaccine supply on vulnerable
- Ensure sufficient balance of monitoring and border control

Crush & Contain: Trade-dependent with early vaccine supply

- Continue to **ramp up vaccinations**, focusing on increasing population's immunity as a whole
- Relax more public health measures as vaccine coverage widens

... and resulting balance of tool-kit required



EU Digital COVID Certificate

Overview of the key aspects, technical architecture and timeline

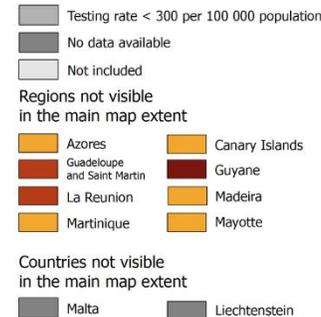
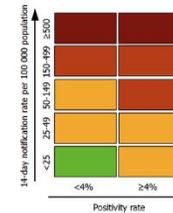
Konstantin Hyppönen, Policy Officer, European Reference Networks and Digital Health, DG
SANTE

Status quo

- Many different free movement restrictions in place across the EU
- MS require **various types of documents** (medical certificates, tests results etc.)
- Several MS already exempt vaccinated/recovered persons from restrictions (or plan to do so)
- Absence of standardised and secured formats cause **problems for acceptance and fraud**



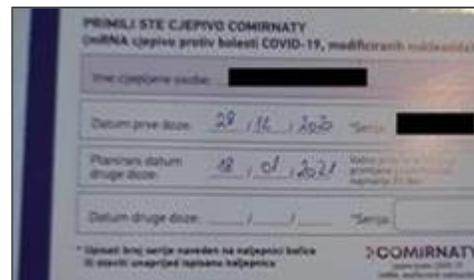
14-day COVID-19 case notification rate per 100 000 population and test positivity, EU/EEA weeks 18 - 19



Administrative boundaries: © EuroGeographics © UN-FAO © Turstat © Kartverket © Instituto Nacional de Estadística - Statistics Portugal. The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union. ECDC, Map produced on: 20 May 2021

Examples of the current fragmented approach – vaccines certificates

- 27 Member States, 27 types of certificates, with different data fields, verification and authentication mechanisms
- EU citizens should not suffer from the adverse effects of fragmentation and divergent approaches which are not interoperable



Regulation – outline

- **Legal basis:** Art 21(2) TFEU – free movement of EU citizens within the EU
 - + a “twin regulation” to cover third country nationals legally residing in the EU
- **Objective:** to facilitate safe free movement during the pandemic by establishing a common framework – the EU Digital COVID Certificate – for the **issuance, verification and acceptance of interoperable:**
 - **vaccination certificates**
 - **test certificates**
 - **certificates of recovery**
- **Not covered:** Other uses – would have to be based on national law

The vaccination journey – an example



Identification

The citizen is identified by the vaccine provider

Vaccination

The citizen is vaccinated



Data registration

The vaccine provider registers information about the event in a national (or regional/local) database



Storage

The citizen stores the certificate



Issuance

The certificate issuer issues a vaccination certificate (digital/paper)



Certificate request

The citizen requests a certificate from a certificate issuer. Certificates can also be issued automatically.

Verification request

The verifier asks the citizen for the vaccination certificate



Presentation

The citizen presents the vaccination certificate to the verifier



Verification

The verifier checks the authenticity, integrity and validity of the certificate



What is the EU Digital COVID Certificate?



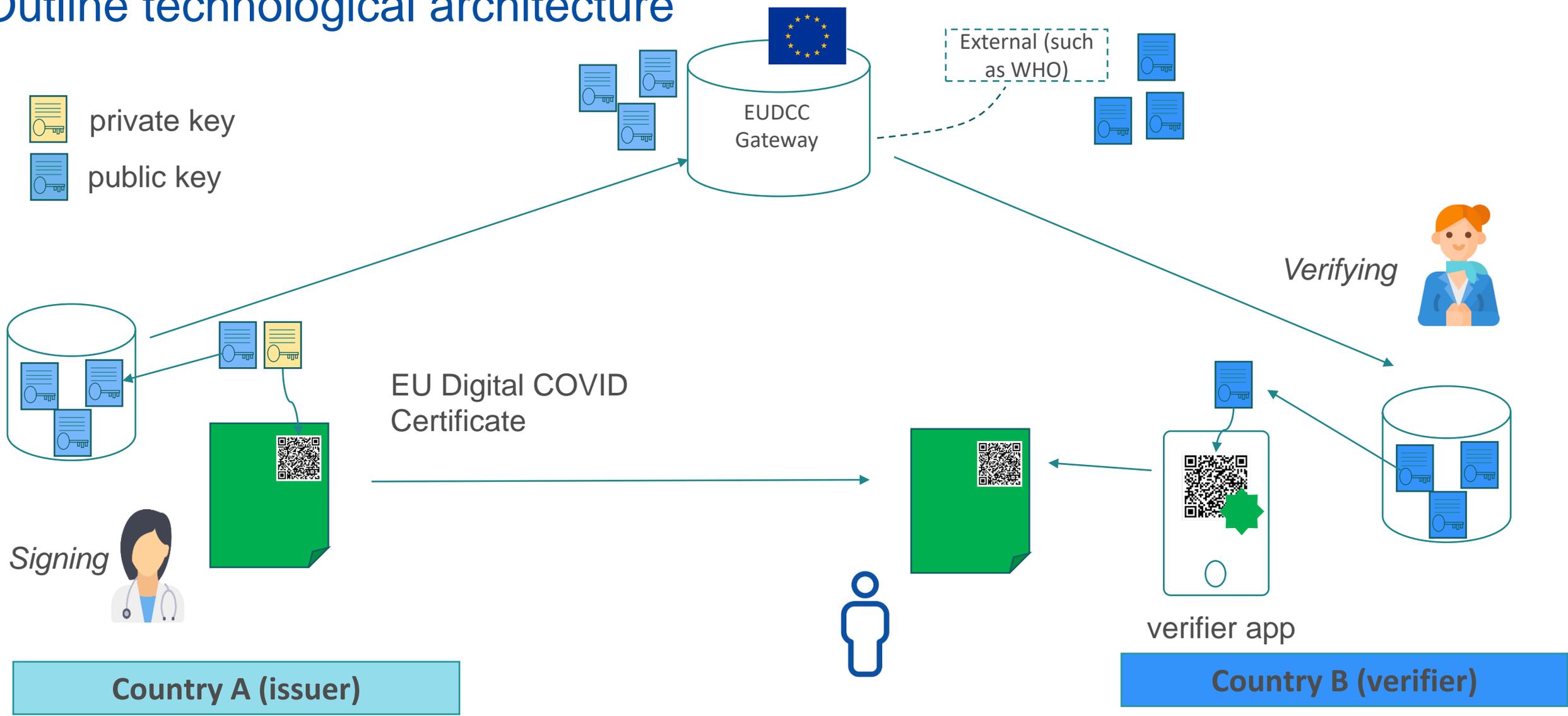
Digital proof that a person has either

- been vaccinated against COVID-19
- received a negative test result
- recovered from COVID-19

Barcode technicalities

- Specified by European expert group
- Technically robust, easy to read (Paper print out & phone screen support)
- Bound to an EU citizen: 1 certificate, 1 holder
- Europe-wide validity
- Data is encoded, compressed and digitally signed in barcode
- Signature validation key exchange is done via an EU Gateway

Outline technological architecture



Guidelines and technical specifications

- Technical specifications were adopted on 21 April 2021 and are available at https://ec.europa.eu/health/ehealth/covid-19_en
 - [Value sets](#)
 - [JSON Schema for EU Digital COVID Certificates](#)
 - [Volume 1: formats and trust management](#)
 - [Volume 2: EU Digital COVID Certificate Gateway](#)
 - [Volume 3: 2D Barcode Specifications](#)
 - [Volume 4: EU Digital COVID Certificate Applications](#)
 - [Volume 5: Public Key Certificate Governance](#)
- Already in January-March, the eHealth Network adopted the following earlier guidelines to support the interoperability of EU Digital COVID Certificates:
 - [Interoperability of health certificates - Trust framework](#) (outline)
 - [Verifiable vaccination certificates - basic interoperability elements](#)
 - [COVID-19 citizen recovery interoperable certificates - minimum dataset](#)
- In addition, the Health Security Committee has adopted guidelines for test certificates:
 - [A common list of COVID-19 rapid antigen tests, and a common standardised set of data to be included in COVID-19 test result certificates](#)

Deployment roadmap

Work on technical specifications

March-April, eHealth Network supported by COM (including contractor)

Technical specifications

Published 22 April

Development and first tests of the EUDCC Gateway

Beginning of May

Mid-May



Wallet app

The citizen stores the certificate



Verification app

Reference app for Member States to verify EU Digital COVID Certificates



Certificate issuance app

Template software for Member States to issue EU Digital COVID Certificates



On-boarding

Technical support to Member States to connect and on-board EU Gateway



Financial support

Financial support to Member States (€ 1M per Member State)



EU Gateway

Hosted by Commission – 1st week of June

Transparency and data protection

- **EU General Data Protection Regulation applies**, including data minimisation (only necessary data on cert.)
- Privacy and security by design
- Software is developed by the Commission in Open Source and made publicly available to the community for scrutiny
- The EU Gateway stores only Public Keys and other basic data necessary for the functioning of the system – no personal data
- Verifier app does not store personal data
- Both paper and digital versions are supported

Collaboration with international organisations

- The eHealth Network, the Commission, and individual European experts have actively participated to the work of the WHO expert group on [Smart Vaccination Certificates](#).
- The Commission and eHN experts have also exchanged views with and provided input to the work of the International Civil Aviation Organisation (ICAO) and other relevant international organisations.
- In addition, the Commission is exchanging information about the EU DCC and similar systems used by non-EU countries.

International travel

- An EU Digital COVID Certificate is not a travel document
- Acceptance of certificates from third countries to be governed by Regulation
 - Adequacy decisions
 - Adopted through secondary legislation
- Process not yet formalised
 - However, if a system used by a third country is based on the same specifications, preparing an adequacy decision is likely to be easier.



Thank you



THE WORLD BANK

IBRD • IDA | WORLD BANK GROUP