1ST INSPIRE HEALTH FORUM

ADB

Inclusive, Sustainable, Prosperous and Resilient Health Systems in Asia and the Pacific

INSPIRE Health Forum

7–11 July 2025 • A Hybrid Event

PARALLEL SESSION # INSPIREhealth2025

1ST INSPIRE HEALTH FORUM

Building Diagnostic Readiness for Future Pandemics

08 July 2025 • 9:00 AM-10:15 AM

ADB, Multifunction Hall 2

The Importance of Diagnostics in Pandemic Preparedness and Response

Rosanna W Peeling, PhD

Emeritus Professor,

London School of Hygiene & Tropical Medicine

Professor, University of Manitoba, Canada

Founding Director, International Diagnostics Centre Network

Diagnostics for the COVID-19 Pandemic Response

The Director-General of the World Health Organization urged countries to “test, test, test.”

He said testing, isolation, and contact tracing should be the backbone of the global pandemic response.

World Health Organization. Director general’s opening remarks at the March 16 2020 media briefing. https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---16-march-2020

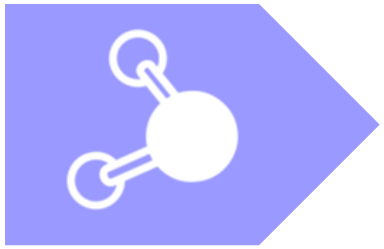
Role of Diagnostics in the COVID-19 Pandemic Response

Ref: Peeling RW, Heymann DL, Teo YY, Garcia PJ. Lancet. 2022 Feb 19;399(10326):757-768.

Confirm clinical diagnosis to guide patient management and implement public health measures

Refine clinical case definition to standardise case reporting

Enable research to identify vulnerable populations, understand modes of transmission, facilitate modelling to estimate impact of control strategies

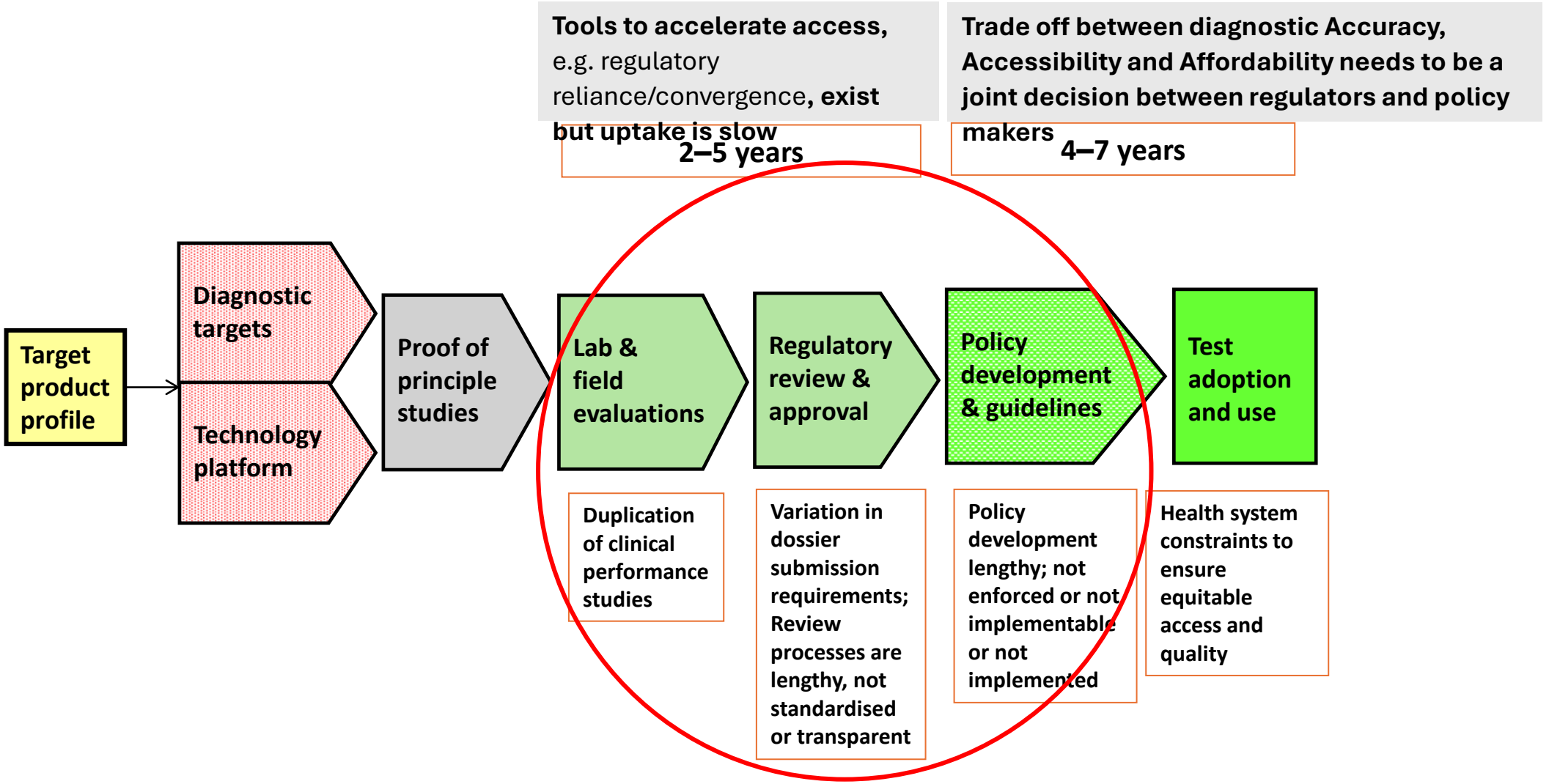


Facilitate surveillance and data display to show extent of outbreak, hotspots and evolving trends

Enable drug and vaccine trials

Before availability of drugs and vaccines, diagnostic testing for case detection to enable the implementation of public health measures is the only tool countries have to control disease transmission within communities

Lessons Learnt #1: Pathway to Access for Diagnostics is lengthy and fragmented, leading to delays in case detection



Regional Networks to Streamline and Enhance Timely and Equitable Access:

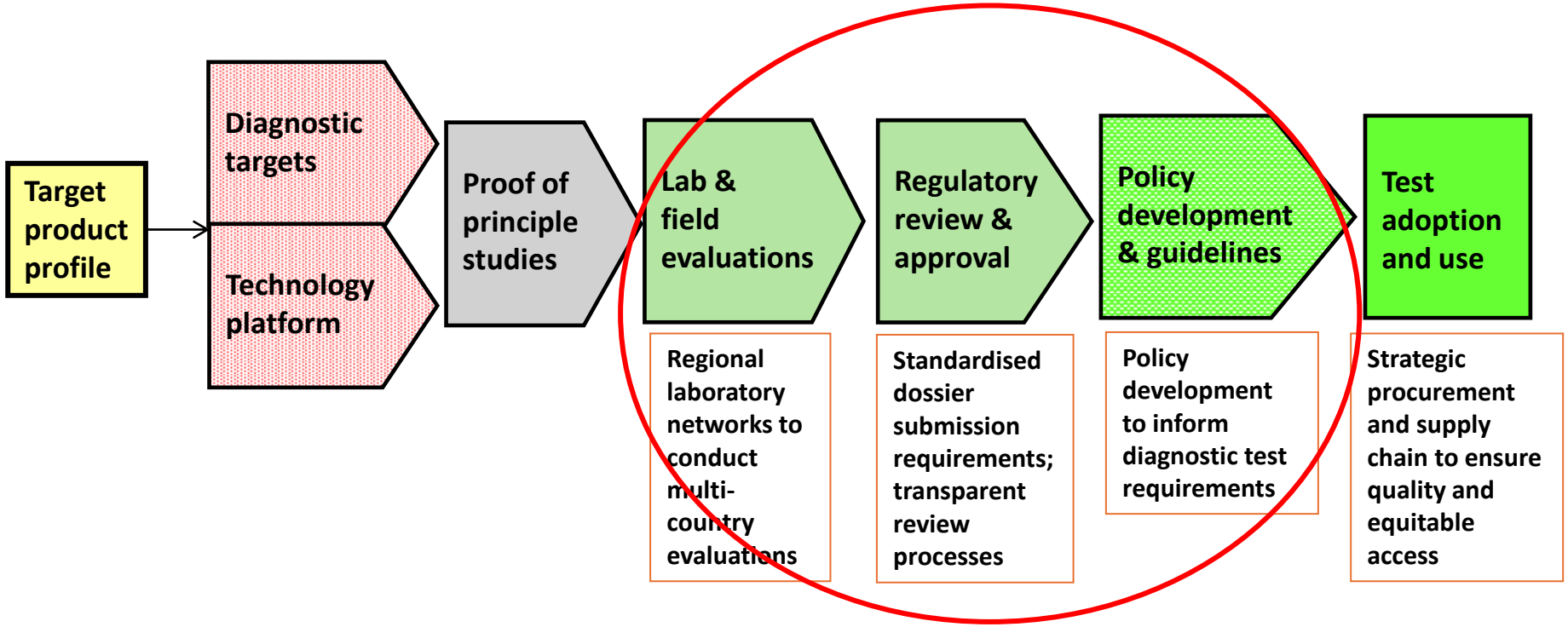
Asia Diagnostics, Vaccine and Therapeutics Network to Counter Epidemics (ADVanCE)

Global Harmonization Working Party
GHWP Towards Medical Device Harmonization

Joint review of diagnostic evaluation protocol and performance data by policy makers, regulators and subject matter experts

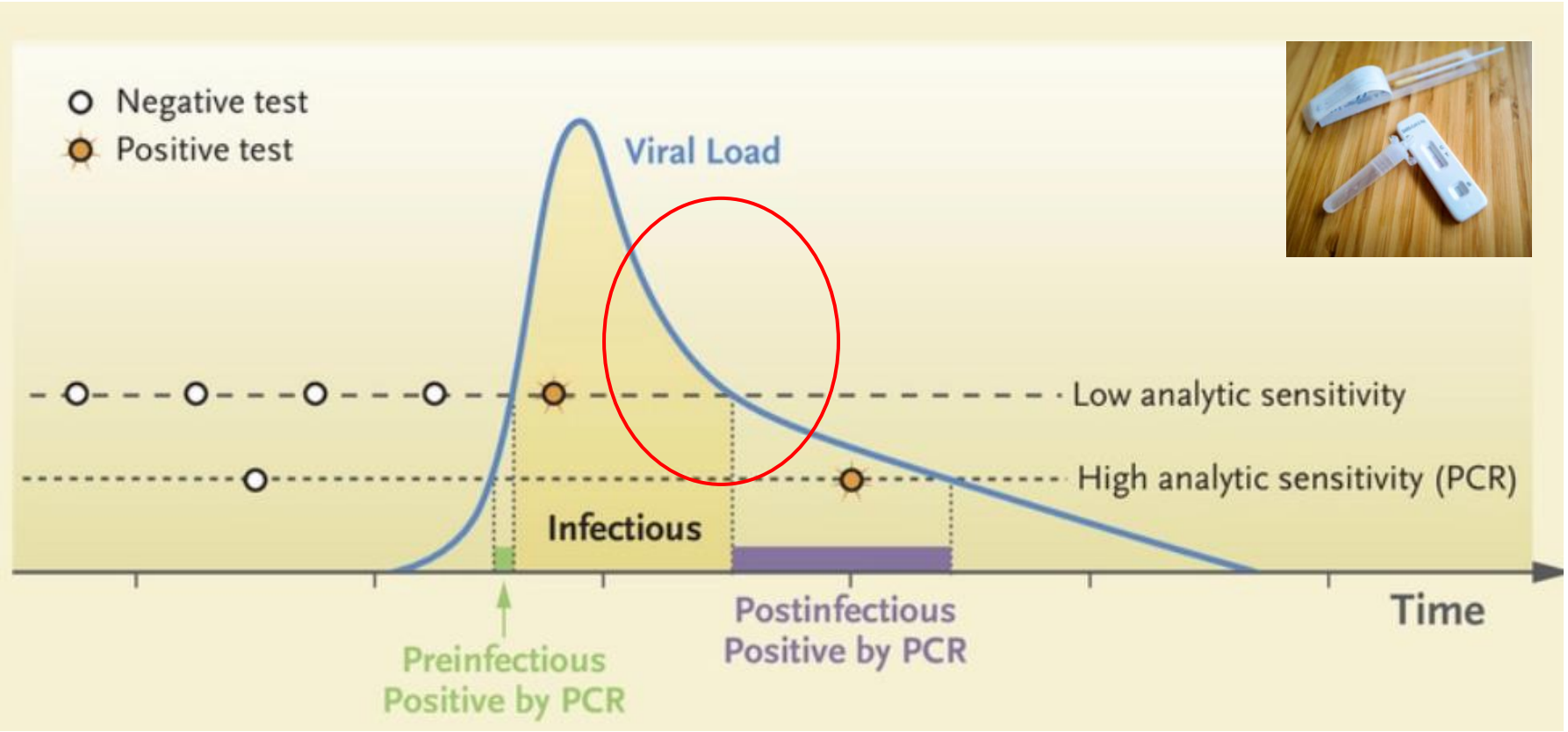
INTER-AMERICAN COALITION FOR REGULATORY CONVERGENCE
MEDICAL TECHNOLOGY SECTOR

ARPA
Asia Regulatory Professionals Association



Invest in public/private partnerships for diagnostic development and manufacturing in the region

Rapid Antigen Tests as a Public Health Tool



Larremore et a. Test Sensitivity is Secondary to Frequency and Turnaround time for COVID-19 Screening. Sci Adv 2020

Mina MJ et al. Rethinking strategy for containment. N Engl J Med 2020; 383:e120

Molecular tests to detect virus RNA tend to be positive for weeks after a person is no longer infectious

Although less sensitive, most rapid antigen tests should be able to detect individuals who are at risk of transmission

Rapid antigen tests are more affordable than molecular tests; can be done anywhere by anyone; results are ready in 15 minutes; and they can be manufactured in large volumes by many companies for scaling up country pandemic responses

Diagnostic Tests as a Public Health Tool to Save Lives and Livelihoods

- Lockdowns and border closures impose mental, social and financial hardships in many societies
- Testing with rapid antigen tests with layered interventions to reduce risk of transmission (face masks, distancing, hand hygiene and ventilation) provided a safe environment for the resumption of schools, workplaces and mass gatherings

> "High-quality rapid tests…are key to quickly tracing and isolating contacts and breaking the chains of transmission. The tests are a critical tool for governments as they look to reopen economies and ultimately save both lives and livelihoods."
>
> Tedros Adhanom Ghebreyesus, Director-General of WHO, Sept 28 2020

https://www.who.int/publications/i/item/considerations-for-school-related-public-health-measures-in-the-context-of-covid-19

Tests to Protect: Test Sensitivity vs Time to Result

WHO to screen: at increased risk of acquisition and transmission of COVID-19.

- **Healthcare and elder care home workers**
- **essential frontline workers (including first responders)**
- **public and aviation transport operators**

Testing sensitivity and time to result:

With R_0=1.5, daily testing:	Effectiveness
Test sensitivity ↓ 20%	85% → 81%
Test result delay of 3 days	85% → 57%
Test result delay of 5 days	85% → 26%

What test to use: Rapid antigen tests should therefore be considered

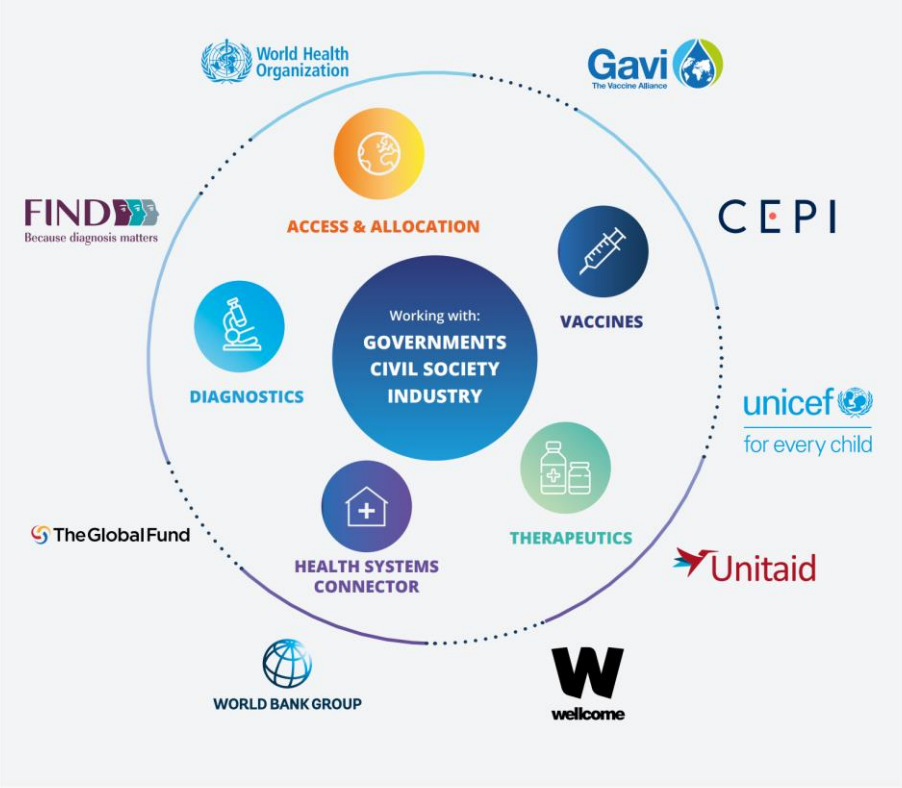
Ref: Chin et al. Frequency of Routine Testing for COVID-19 in High-risk Healthcare Environments to Reduce Outbreaks. Clin Infect Dis. Oct 2020.

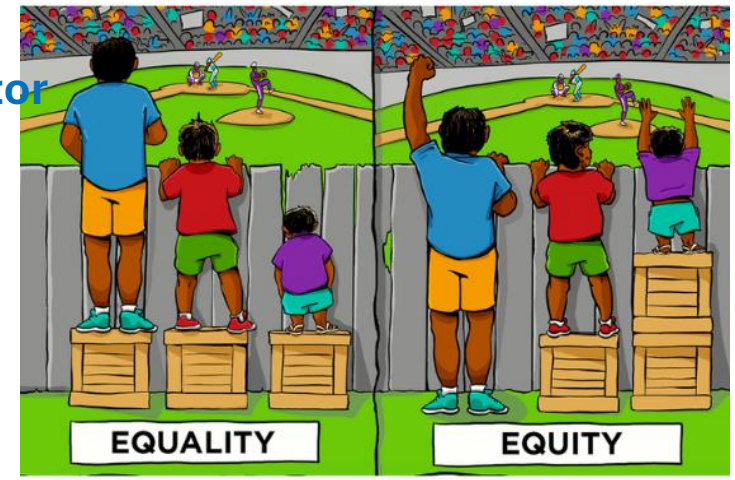
Black et al. COVID-19: the case for health-care worker screening to prevent hospital transmission. Lancet. 2020;395:1418–20.

Lessons Learnt #2: Inequity of Access to Diagnostics and Other Countermeasures within Countries and across Regions

Pandemics do not create new problems, they just make us face problems we have long ignored:

Access to COVID-19 Tools (ACT) Accelerator





https://media.nature.com/original/magazine-assets/d41586-020-01265-0/d41586-020-01265-0.pdf 30 April 2020

A personal take on science and society

World view

By John Nkengasong

Let Africa into the market for COVID-19 diagnostics

Africa is boosting its capacity to respond to COVID-19, but lack of solidarity will cost lives, warns Africa CDC head John Nkengasong.

The first case of COVID-19 in Africa was reported in Egypt on 14 February 2020. Since then, 52 countries in Africa have reported more than 30,000 cases and about 1,400 deaths from the new coronavirus. This count is likely to be an underestimate; Ethiopia has run about 11,000 tests – only 10 for every 100,000 people. Much-richer South Africa has

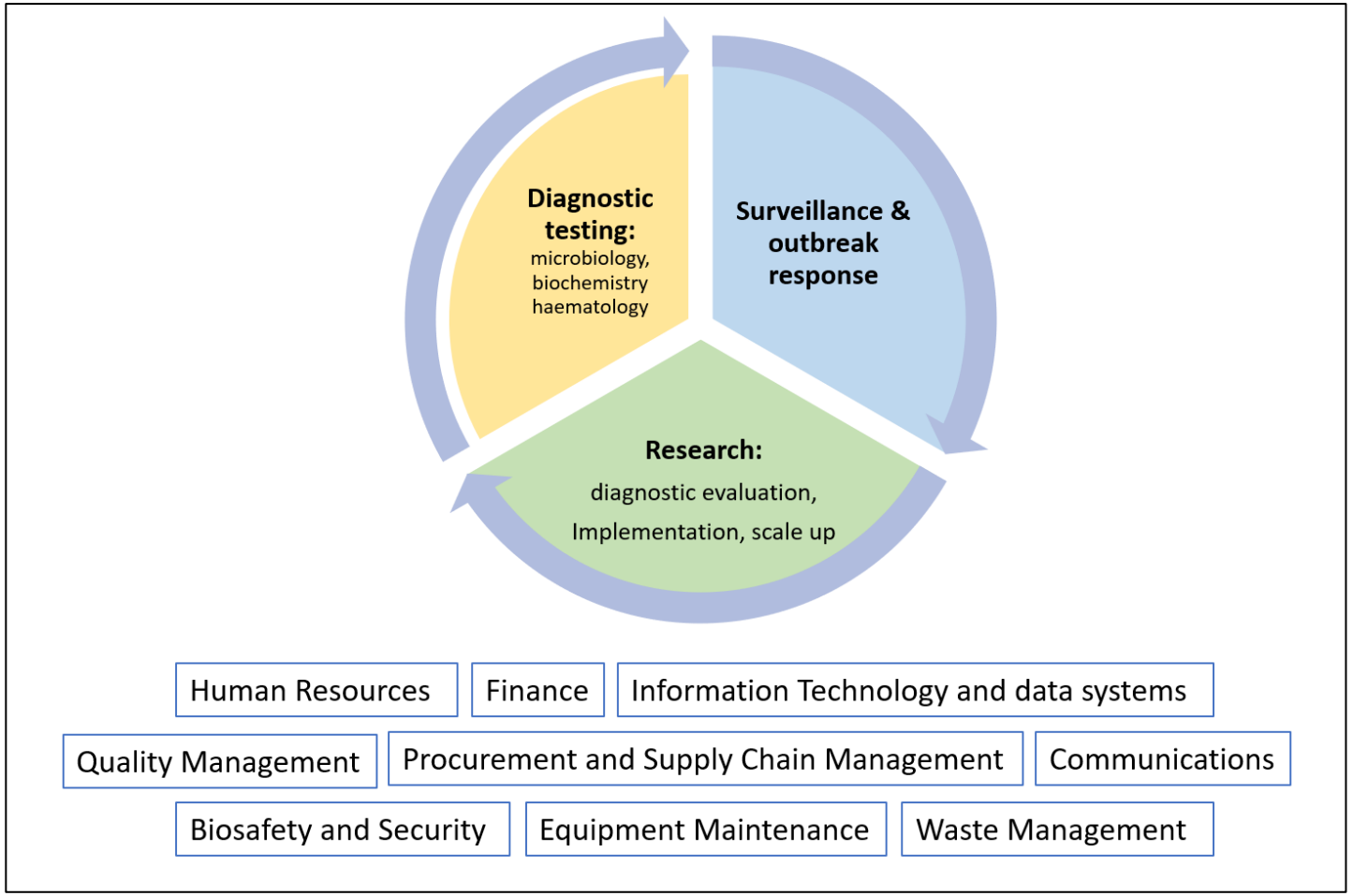
"African countries have funds to pay for reagents but cannot buy them."

buyers fighting for a seat at the table.

Cooperation across Africa is starting to happen. Africa CDC has a plan to distribute one million test kits by mid-May, which we started implementing earlier this month.

The strategy to increase testing for COVID-19 is fourfold. First, we need to pool the procurement and distribution of tests across the continent. This will create synergies and block counterproductive competition. Second, we have to work with non-government laboratories and the private sector to roll out testing on the subnational level. In many countries, samples must be shipped to a centralized diagnostic laboratory, which adds cost and delay. Third,

Lessons Learnt #3: Need for a Public Health Infrastructure to mount a swift and efficient response and translate research to policy and implementations

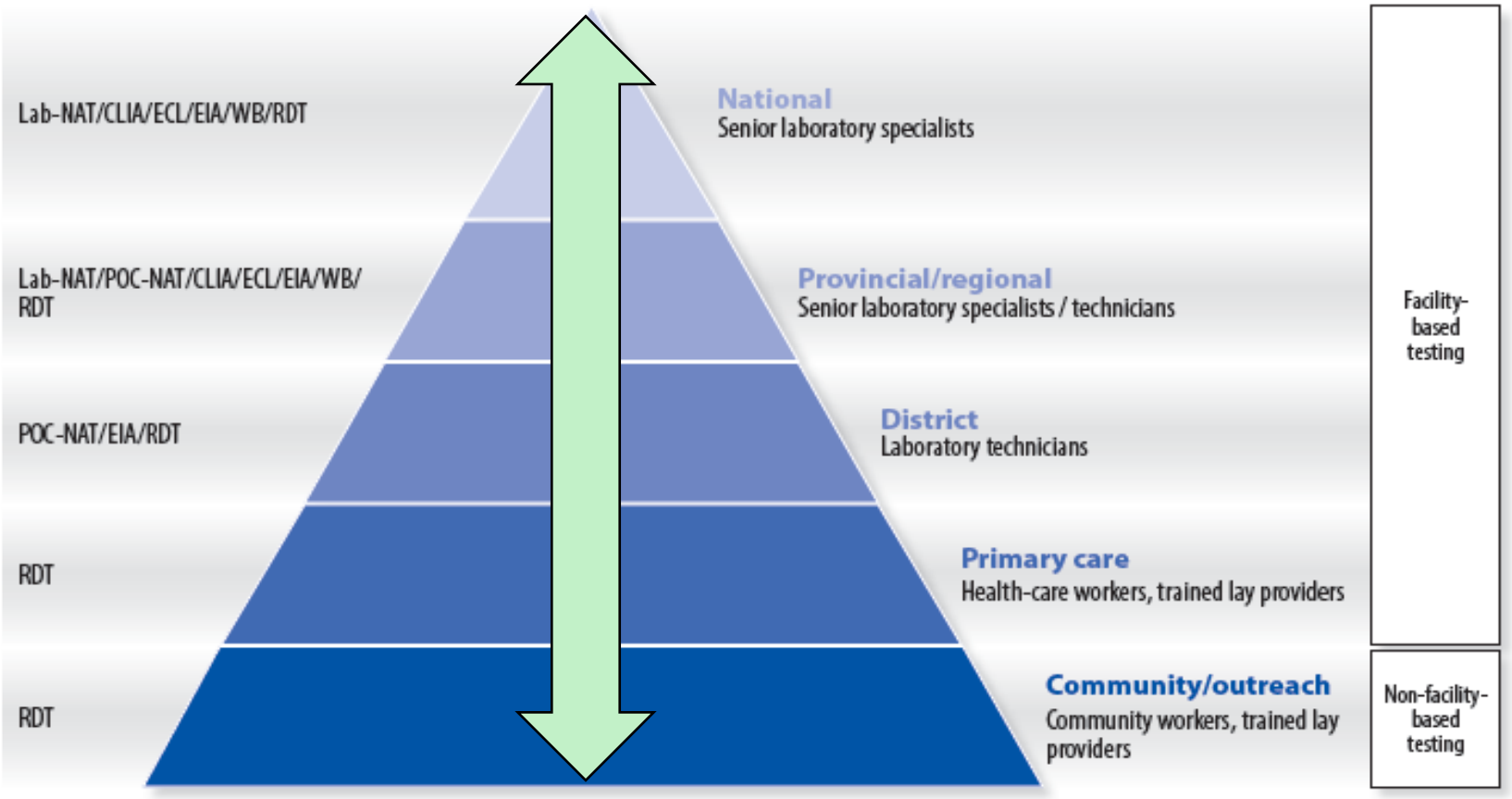


Core Functions of a Laboratory for Emergency Preparedness and Response. https://emergencies.pubpub.org/pub/laboratory-capacity/release/3?readingCollection=36ef2bb3

During the COVID pandemic, Brazil scaled up testing by passing legislation to allow its 94,000 pharmacies to offer COVID testing

This led to the discovery of millions of people who only use pharmacies and have never accessed the formal healthcare system

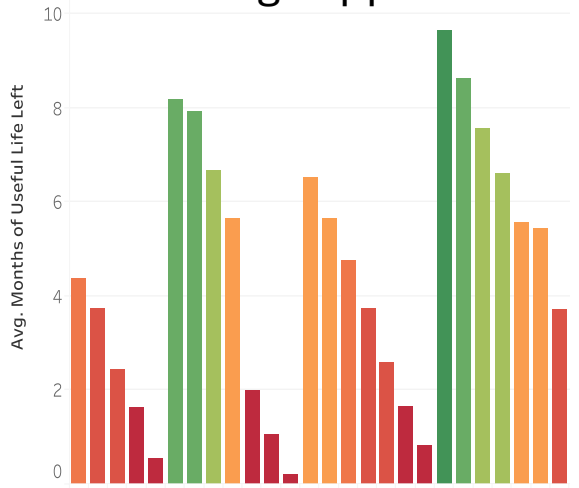
Lessons Learnt #4: Data systems and Connectivity



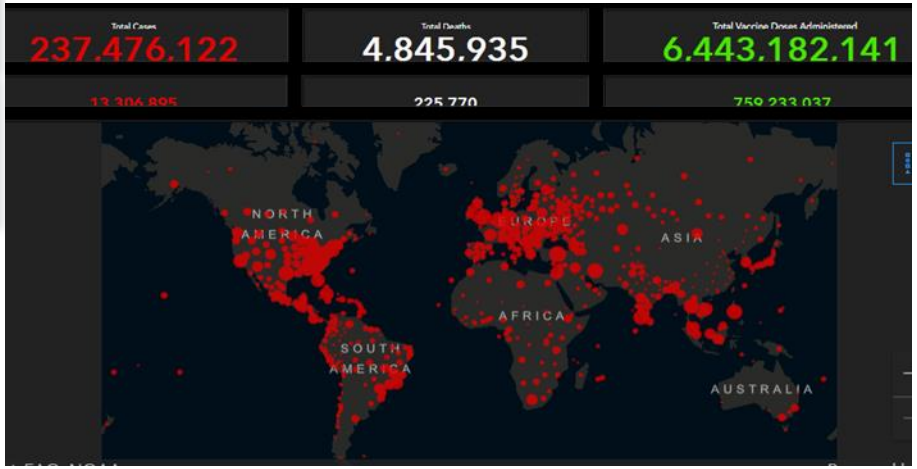
NAT: Nucleic acid tests: Lab-NAT: laboratory-based; POC-NAT: at point-of-care;
CLIA: chemiluminescence immunoassay; ECL: electrochemiluminescence immunoassay;
EIA: enzyme immunoassay; RDT: rapid diagnostic test

Source: Adapted from WHO 2017 Guidance for procurement of *in-vitro* diagnostics and related laboratory items and equipment

Monitoring supplies:



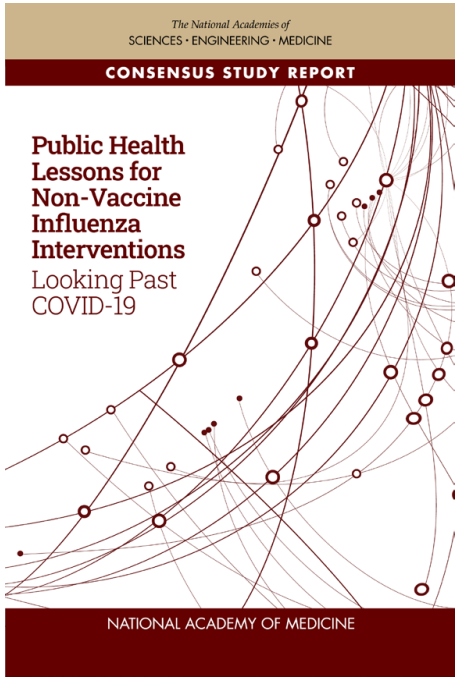
Data Display: dashboards



Investing in Connected Diagnostics for Health Security

Countries need to invest in a robust and connected **diagnostic and laboratory infrastructure that forms the backbone of a healthcare system**, serving as the eyes and ears of the system, sounding alarms of unusual disease patterns, sending early outbreak alerts, and monitoring the effectiveness of the response.

Ref: Peeling et al. Diagnostics for COVID-19: Moving from pandemic response to control. Lancet Dec 20 2021

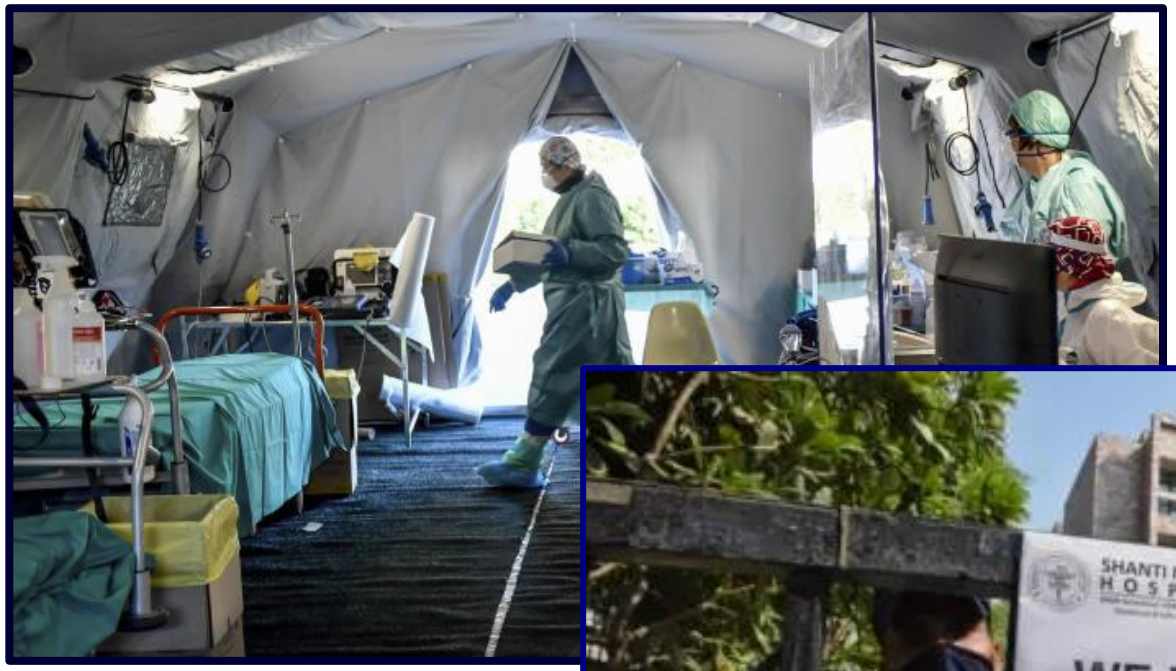


the U.S. Academies of Science, Engineering and Medicine published a study report entitled, "Public Health Lessons for Non-Vaccine Influenza Interventions: Looking Past COVID-19", which noted:

"Countries should institute surveillance as the backbone of their health care systems, which should include submitting aggregated clinical data feeding into public health agencies. To ensure that policy makers have access to accurate, timely, and comprehensive risk assessments, national authorities—with the advice and assistance of regional and global public health agencies—should establish more robust surveillance systems, involving public hospitals and academic medical centers, manufacturers of diagnostics, and social network platforms."

https://www.nationalacademies.org/flu-countermeasures

Lessons Learnt #5: Health System Resilience



COVID-19 Italy

COVID-19 India

https://www.who.int/teams/primary-health-care/health-systems-resilience

The Community as an Important Component of a Resilient Health System

Community-based surveillance: detection and reporting of public health events within communities by community members.

Examples:

- **Influenza-like illness (ILI) surveillance: community-based reporting with based on symptoms and/or self-testing for COVID or COVID/influenza/RSV rapid diagnostic tests**

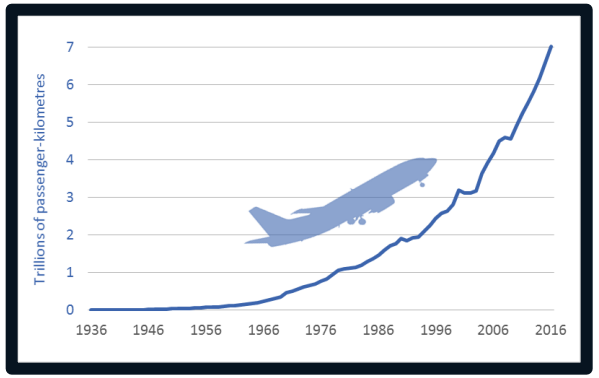
"The integration of community pharmacy into the health system may translate into better access for patients to primary care services, contribute to cost effectiveness, and promulgate the sustainability of the system."

Lab Information Systems

Byrne A, Nichol B (2020) A community-centred approach to global health security: implementation experience of community-based surveillance (CBS) for epidemic preparedness, Global Security: Health, Science and Policy, 5:1, 71- 84, 2020. DOI: 10.1080/23779497.2020.1819854

Celia Piquer-Martinez C et al. Integration of community pharmacy in primary health care: The challenge. Research in Social and Administrative Pharmacy, Vol 18 (8): 3444-7, 2022. https://doi.org/10.1016/j.sapharm.2021.12.005.

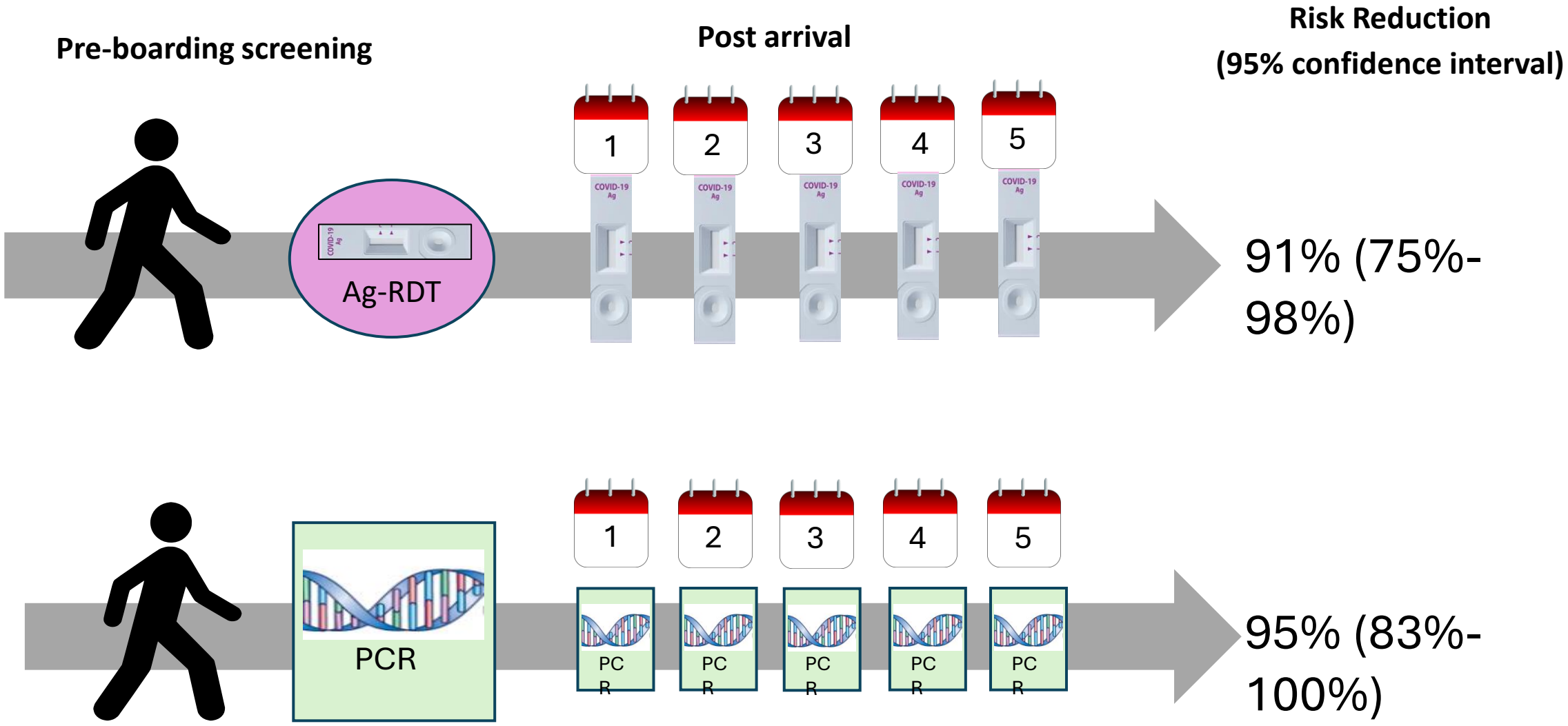
Lessons Learnt #6: Effectiveness of Border Control Measures on Transmission of SARS-CoV-2: Systematic Review



- Symptomatic screening measures were not particularly effective, but diagnostic-based screening methods were more effective at identifying infected travellers
- Quarantine of inbound travellers was likely effective at reducing transmission, but only with relatively long quarantine periods, and came with important economic and social effects
- There is little evidence that most travel restrictions, including border closure and those implemented to stop the introduction of new variants of concern, were particularly effective
- Border control measures need to be coupled with strong domestic public health measures
- In future outbreaks, if border control measures are to be adopted, they should be seen as part of a broader strategy that includes other non-pharmaceutical interventions

Grepin et al. 2023. Effectiveness of international border control measures during the COVID-19 pandemic: a narrative synthesis of published systematic reviews *Phil. Trans. R. Soc. A.***381**20230134 http://doi.org/10.1098/rsta.2023.0134

Testing on Arrival + No Quarantine



Quilty BJ, et al. Quarantine and testing strategies to reduce transmission risk from imported SARS-CoV-2 infections: a global modelling study. medRxiv preprint doi: https://doi.org/10.1101/2021.06.11.21258735; posted June 14, 2021.

Lessons Learnt #7: Communications and Trust: Need for Governance and Collaborative Relationships

Scaling up testing – policy decision-making needs to be:

- **Science-based**
- **Inclusive** – not limited to:
  - Public health, health professionals
  - Education
  - Civil societies e.g. indigenous groups, disabled persons
  - Finance
  - Trade
  - Tourism
  - Border security
- **Context specific**: political, cultural, social, and economic
- **Agile** – evolve with pandemic trends and new issues:
  - Variants of concern
  - Vaccination
- **Conveyed in clear and compelling messages to the public**

Testing in healthcare settings to save lives

- Hospitals

- Care homes for the elderly

- Clinics/doctor's offices

- Nursing stations in remote settings

Testing in non-healthcare settings to save livelihoods:

- Pharmacies

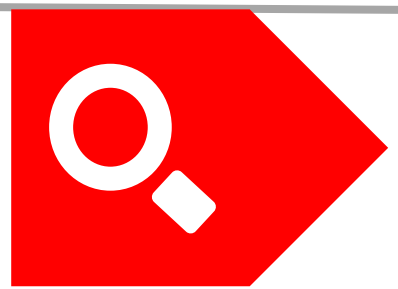
- Schools

- Workplaces

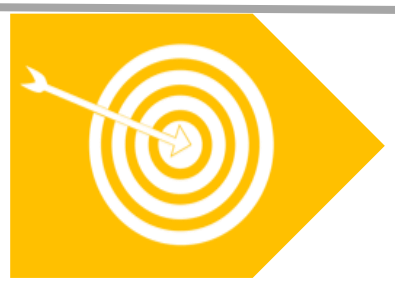
- Mass gatherings

- Border crossings

Summary: Diagnostic Readiness for Future Pandemics

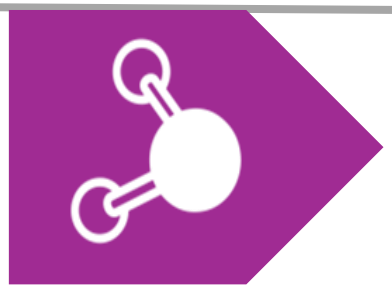


Strengthen public health infrastructure by improving laboratory and surveillance capacity to provide outbreak alerts and mount a swift and effective response

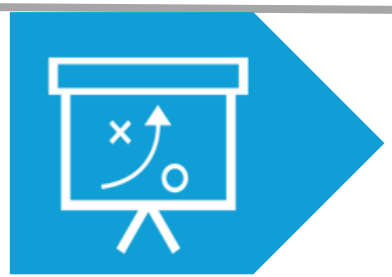


Accelerate access to diagnostics by building regional networks for evaluation and convening joint data review by regulators and policy makers

Build health system resilience by building capacity for community testing and developing a road map for improving health system resilience



Invest in ecosystems for data connectivity to turn data into real-time intelligence to inform and monitor the effectiveness of public health interventions



Ensure equitable access to diagnostics through community engagement, regional manufacturing and strategic procurement

Develop trust and collaborative relationships among different stakeholders and with the public during inter-epidemic periods and not during infectious disease emergencies


Thank you