



UK Health
Security
Agency

UKHSA Presents

The power of vaccine development and global partnerships

Chair: Dr Bassam Hallis, Head of Vaccine Development
and Evaluation Centre, UKHSA

Thursday 10 July 2025

#UKHSAPresents



Head of Vaccine Development and Evaluation Centre, UKHSA

Dr Bassam Hallis

Agenda:

- **UKHSA's response to vaccine development and importance of global partnerships**
Yper Hall and Sue Charlton, UKHSA
- **Working with Academia**
Oxford Vaccines Group
- **Working with Not-for-Profit and Industry**
Adam Hacker, Coalition for Epidemic Preparedness Innovations (CEPI)
- **Q&A and discussion**

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#UKHSAPresents

UKHSA: Who we are

The UK Health Security Agency (UKHSA) is an executive agency of the UK government, responsible for protecting every member of every community in the UK from the impact of a range of health risks.

The threats we protect against range in type, scale and intensity, and include:

- 1 Biological threats: Infectious diseases – from new and emerging infections including pathogens with pandemic potential to endemic infections
- 2 Environmental threats - radiation, chemical, and other environmental hazards such as extreme weather events

We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation's health secure.



Science at UKHSA: Securing Health and Prosperity

We protect health and prosperity by rapidly identifying and addressing threats to health, preventing costs associated with major outbreaks and incidents, and reduces the burden on the National Health Service (NHS)

Our Science underpins our work to protect health in the UK and globally, including our efforts to reduce inequalities and protect the most vulnerable

We develop and strengthen our skills and capabilities to deliver the governments ambition for the UK to be a science superpower, working in partnership with industry and academia, for better outcomes in saving lives and contribute to prosperity



Health threats such as new and emerging infections, antimicrobial resistance, climate and environmental change, air pollution and chemical and radiological incidents

Reducing sickness is fundamental to health and prosperity. Our scientific work supports the development of tools and strategies to control the spread of infection and reduce the burden on and costs to the NHS

VDEC - facilitating the development of new vaccines and therapeutics

Capabilities



World-leading expertise with multiple high consequence pathogens

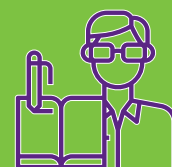
High Containment capabilities at BSL 2,3&4, Select Agent accreditation, Schedule 5 compliant facilities



Unique capabilities in preclinical model development & testing
Approved partner for BARDA, part of NIAID's network & CEPI's Central Lab Network
Implementing partner CEPI preclinical models network.



Comprehensive assay development & clinical testing for vaccine evaluation studies for regulators and industry



Expert business partners focused on delivering to appropriate quality standards



Two new buildings, with state of the art laboratories with over 200 highly trained scientists

Partnerships



Academia



NfP &
Industry



PSREs*



Clinical
Networks

VDEC is UKHSA's specialist capability for the development and evaluation of vaccines & therapeutics.

Prepare We work with partners to develop the tools we need to protect health from infections of major public health consequence and support preparedness for future threats including against disease X contributing to the delivery of the 100 Days Mission.

Respond: We work in partnership, supporting and enabling vaccine developers to ensure we have the vaccines needed to save lives. We work with policy makers to optimise the benefits from vaccines and ensure the most effective vaccinations programmes

Build: We maintain and build specialist capacity and capabilities to protect health against vaccine preventable disease

VDEC Pre-Clinical Evaluation

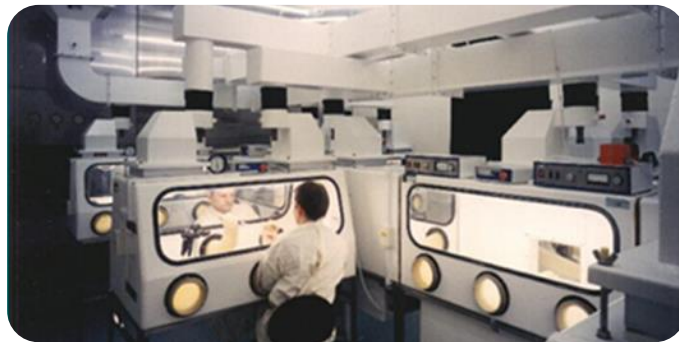
Dr Yper Hall



Pre-Clinical Evaluation



Ability to handle a wide range of species; from small rodents up to non-human primates (NHP)



Accreditation to perform infectious disease research at high-containment biosafety levels 3 and 4 for ACDP and SAPO



An enhanced quality management system suitable for good laboratory practice (GLP) and good manufacturing practice (GMP) compliance

Pre-Clinical Evaluation Facilities



- Biological Services Group of >50 staff

- Rhesus and Cynomolgus macaque breeding colonies



- Flexible laboratory complex for housing/procedures
 - 9 clean rooms
 - 8 BSL2 laboratories
 - 30 BSL3/SAPO laboratories
 - 1 BSL4/SAPO4 suite

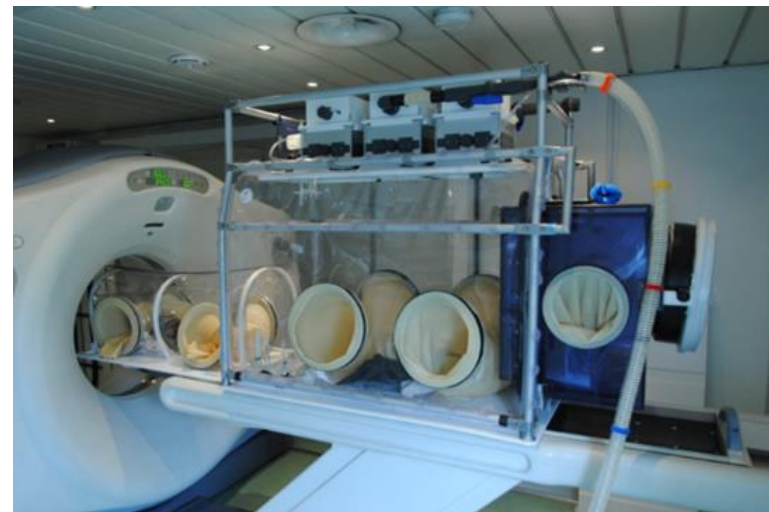
- Wide range of species
 - Rats, guinea pigs, hamsters, mice
 - Rabbits, ferrets
 - Farm animals
 - Non-human primates



Range of Pre-Clinical Models

BSL2 Pathogens	BSL3 Pathogens	BSL4 Pathogens
Seasonal influenza	LPAI (H7N1)	HPAI (H5N1) *BSL3/SAPO4
Zika	SARS-CoV-2	Ebolavirus
<i>Clostridiodes difficile</i>	<i>Bacillus anthracis</i>	Lassa
	<i>Burkholderia pseudomallei</i>	CCHF
	<i>Coxiella burnetii</i>	Nipah
	<i>Mycobacterium tuberculosis</i>	Marburg
	Rift Valley Fever	
	<i>Yersinia pestis</i>	
	Monkeypoxvirus	

Additional Capabilities



- Microphysiological System Technology
- Aerobiology expertise for controlled pathogen exposure
- Surgery and telemetry
- MRI, CT and PET-CT, inc. NHPs infected with BSL3 pathogens
- ISO9001:2015 accredited
- Pathology Department; board certified veterinary pathologists

VDEC Clinical Evaluation

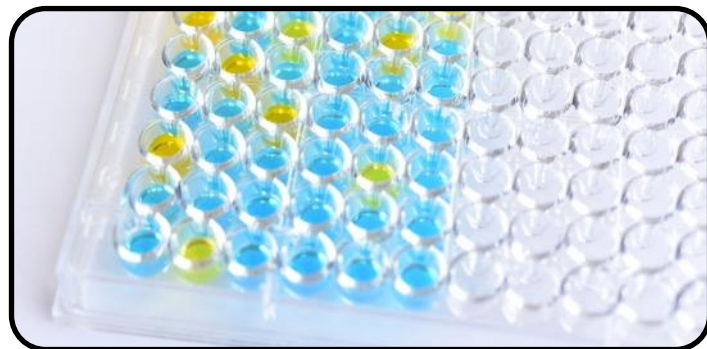
Dr Sue Charlton



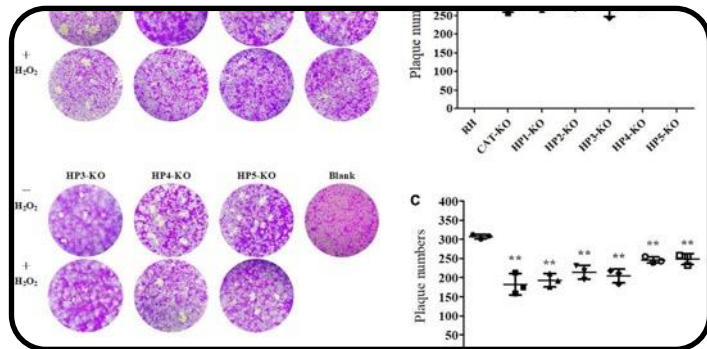
Clinical Evaluation



Develop and validate analytical methods to support clinical trial testing (Phases I-IV)



Assays to quantitate antibody responses (ELISAs, multiplexed assays)



Assays to measure functional immune responses (virus neutralisation, toxin neutralisation, HAI, SBA)

VDEC's clinical testing facilities



- Team of approx. 60 staff

- Purpose built BSL2 and BSL3 laboratories part of the GXP testing facility

- **Flexible laboratory complex**

- 11 BSL2 laboratories
- 6 BSL3 laboratories
- Dedicated ULT freezer rooms & sample reception areas
- Equipment monitored 24/7 by Eurotherm systems

- Dedicated GXP QA and validation teams

Range of methods

Target	Binding assays	Functional assays	PV assays	T cell
SARS-CoV-2	✓	✓	✓	
SARS-1		✓		
MERS		✓		
Seasonal Influenza	✓	✓*		✓
HPAI	✓	✓*	✓	✓
Paediatric schedule	✓			
RSV	✓	✓		
B anthracis	✓	✓		
Mpox	✓	✓		✓
EBOV Sudan			✓	*HAI, MNA

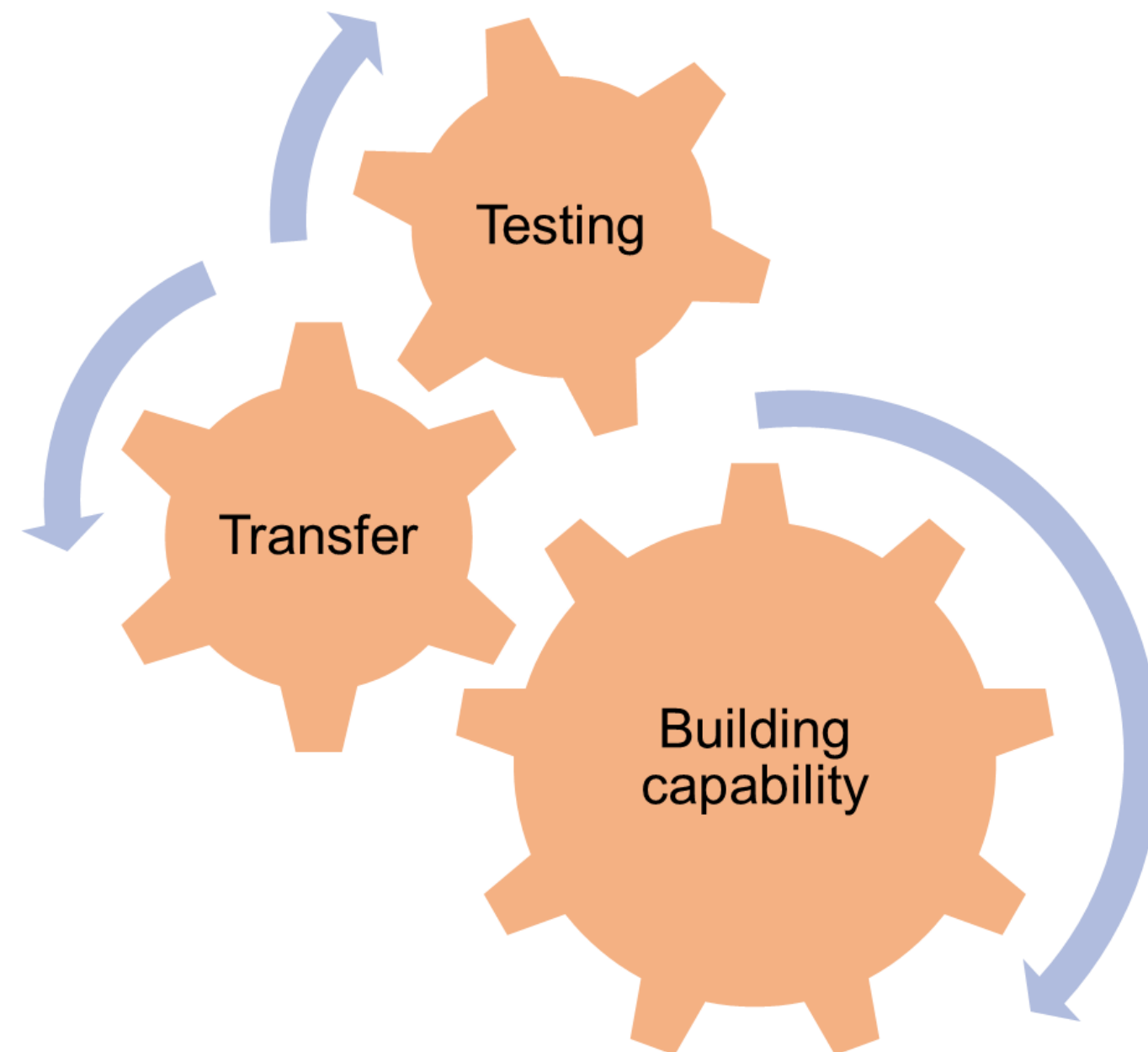
VDEC Global Partnerships

Dr Sue Charlton and Dr Yper Hall



Global Partnerships

- Models
- Analytical methods
- Materials

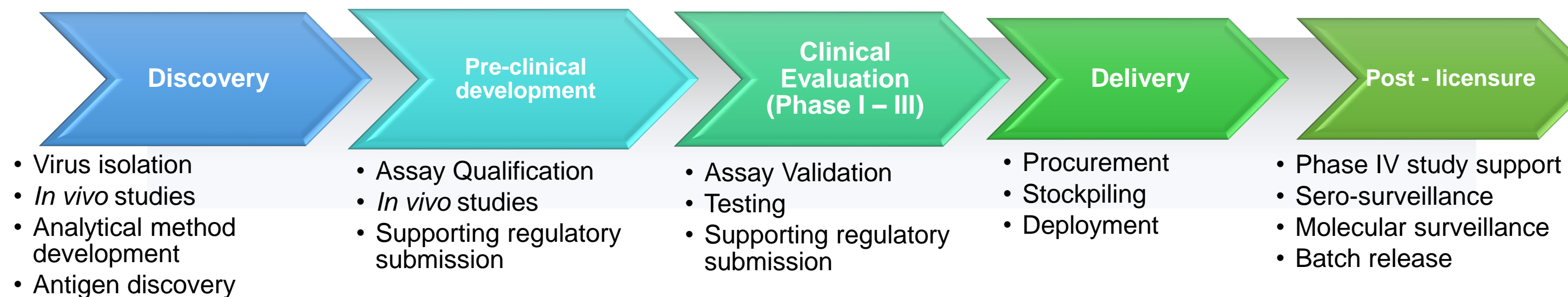


- Supporting clinical trials around the world
- Evaluation of vaccines & therapeutics in Pre-clinical models

- Training provision (GCP/ analytical methods)
- Establishment of labs
- Sharing expertise

VDEC's Global Partnership Network

Academia / NGOs / Industry / Governments Worldwide



Work is performed in compliance with the appropriate regulatory framework:

ISO9001:2015

GLP

GCP

GMP

VDEC and the CEPI Centralised Laboratory Network

CLN is the largest global network of vaccine testing labs

- Use of standardised protocols & shared reagents supports the 100DM:
- reduced sample shipping times
- harmonised analysis
- global capacity

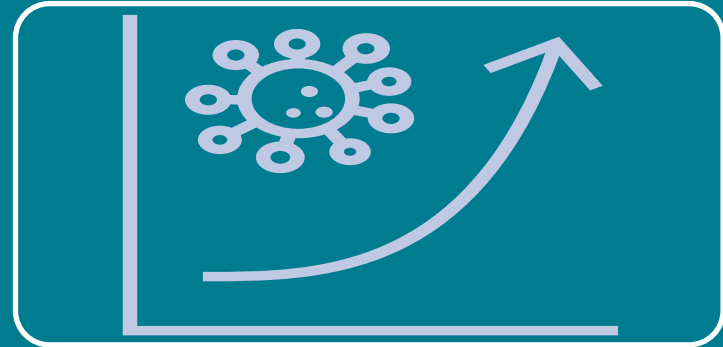
CEPI's Centralised Laboratory Network



UKHSA's contribution

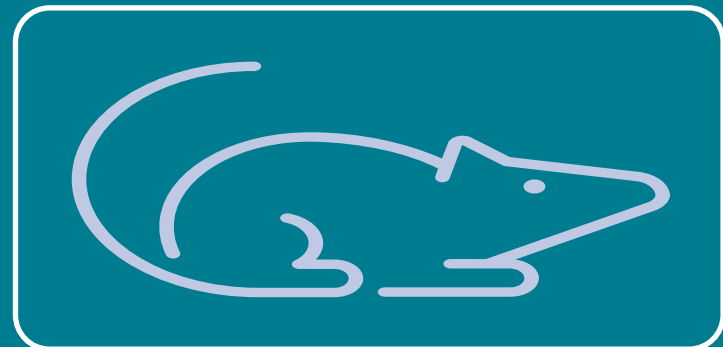
- Clinical (& pre-clinical) sample testing
- Transfer of validated assays to labs in the network, supporting development of COVID vaccines
- Proficiency testing of network labs
- Qualification of assays to support vaccine development (Mpox, Lassa, Marburg, Sudan, MERS, SARS1)
- Cross validation of live virus assays to PV assays

VDEC and the UK Vaccine Network



Analytical methods

- Live virus neutralisation assays
- PV assay capability
- Novel assay technologies



Pre-clinical Models

- Pathogenicity studies
- Defined end-points for countermeasure development



New technologies

- Novel vaccine candidates
- Whole virus vaccine development



UNIVERSITY OF
OXFORD



Endemics & Pandemics – collaborations to strengthen vaccine preparedness

Prof Teresa Lambe OBE FMedSci



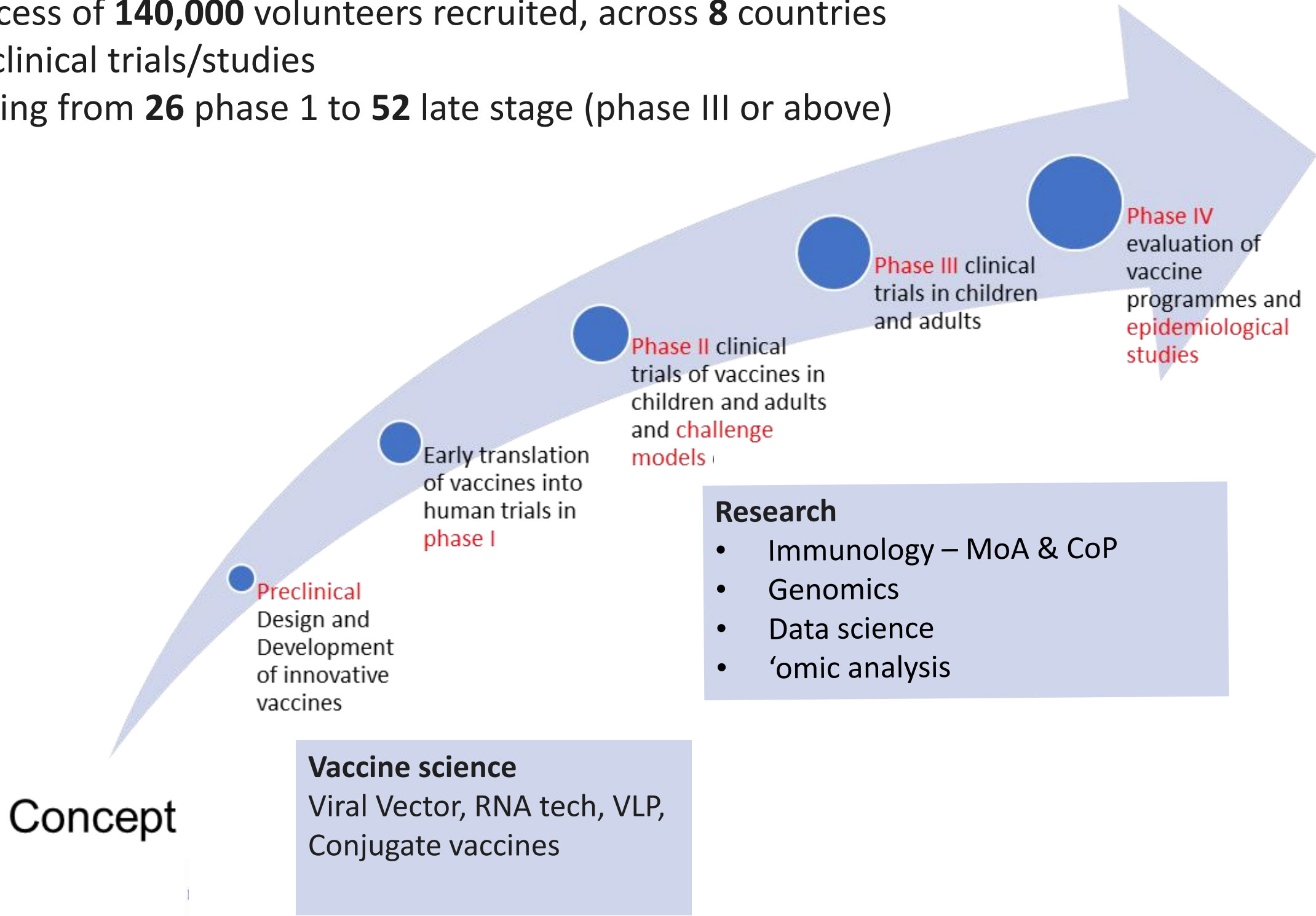
OXFORD
VACCINE GROUP



Bench to Bedside - since 1994



In excess of **140,000** volunteers recruited, across **8** countries
170 clinical trials/studies
Ranging from **26** phase 1 to **52** late stage (phase III or above)



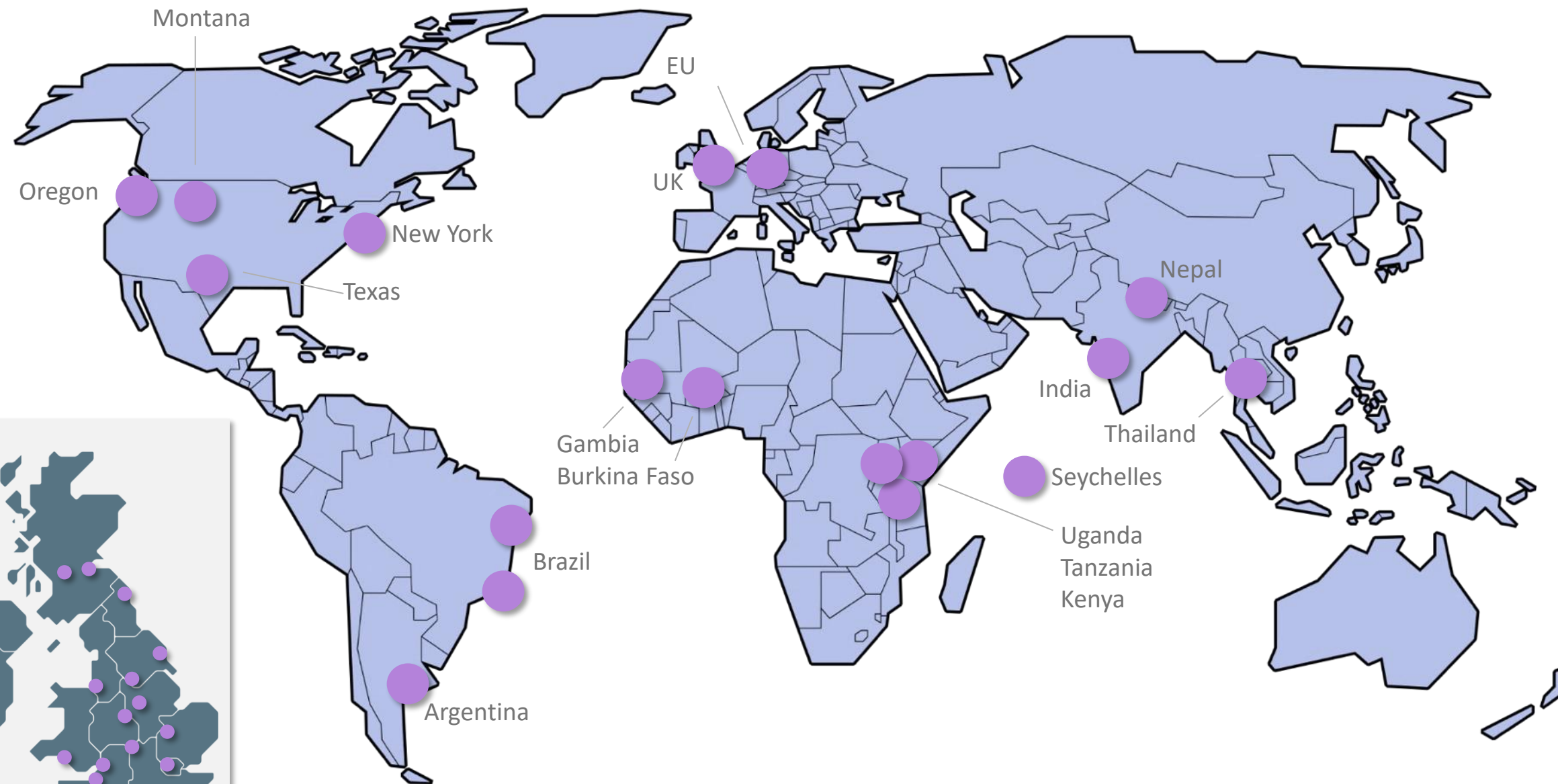
Policy

Proactive Vaccinology

Induce an effective long-lasting immune response that confers protection against disease

- How do early signals shape long-term memory?
- How is protective immunity maintained?
- How is protective mucosal immunity generated and maintained?
- What do correlates of protection reflect in the periphery and the mucosa?
- What goes awry in at-risk groups?

Global network

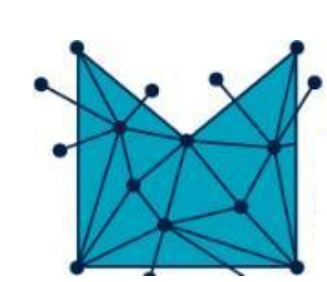


To impact human health, large-scale scientific collaborations & programmes are needed

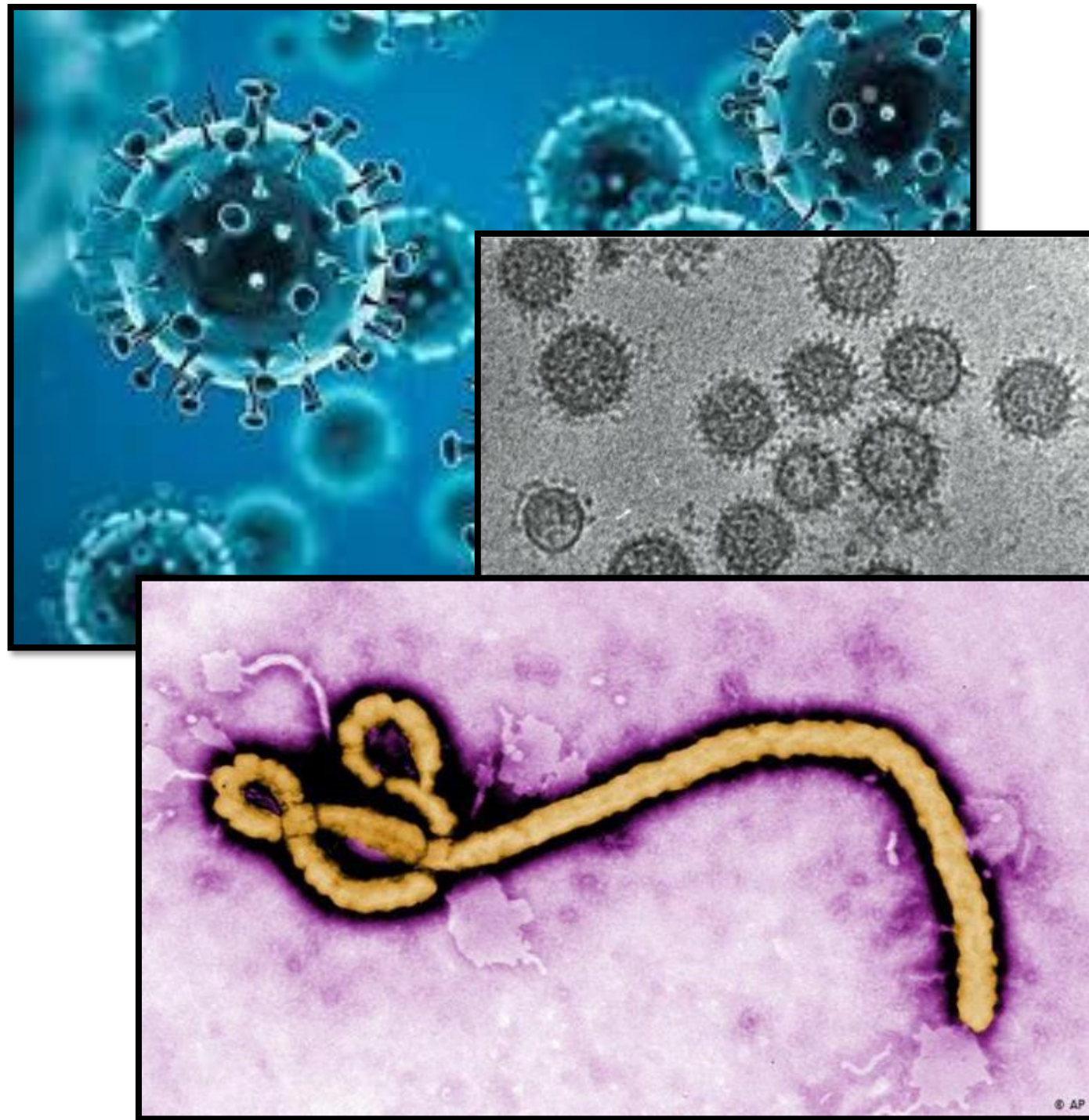
You can't be expert on everything!

Inclusive not exclusive practices

- Basic science
- Translation Research
- Clinical trials
- Manufacturing
- Regulators
- Govt Bodies
- *Right people*
- *Right place*
- *Right attitude*



Activities....



Respiratory infections

- Respiratory Syncytial Virus
- Influenza
- COVID19
- Pneumococcus
- Meningococcus
- Pertussis
- Measles

Challenge models

- Respiratory Syncytial Virus
- Influenza
- COVID19
- Typhoid
- Paratyphoid

Other

- Clostridium difficile
- Non-typhoidal salmonella

- Malaria
- TB

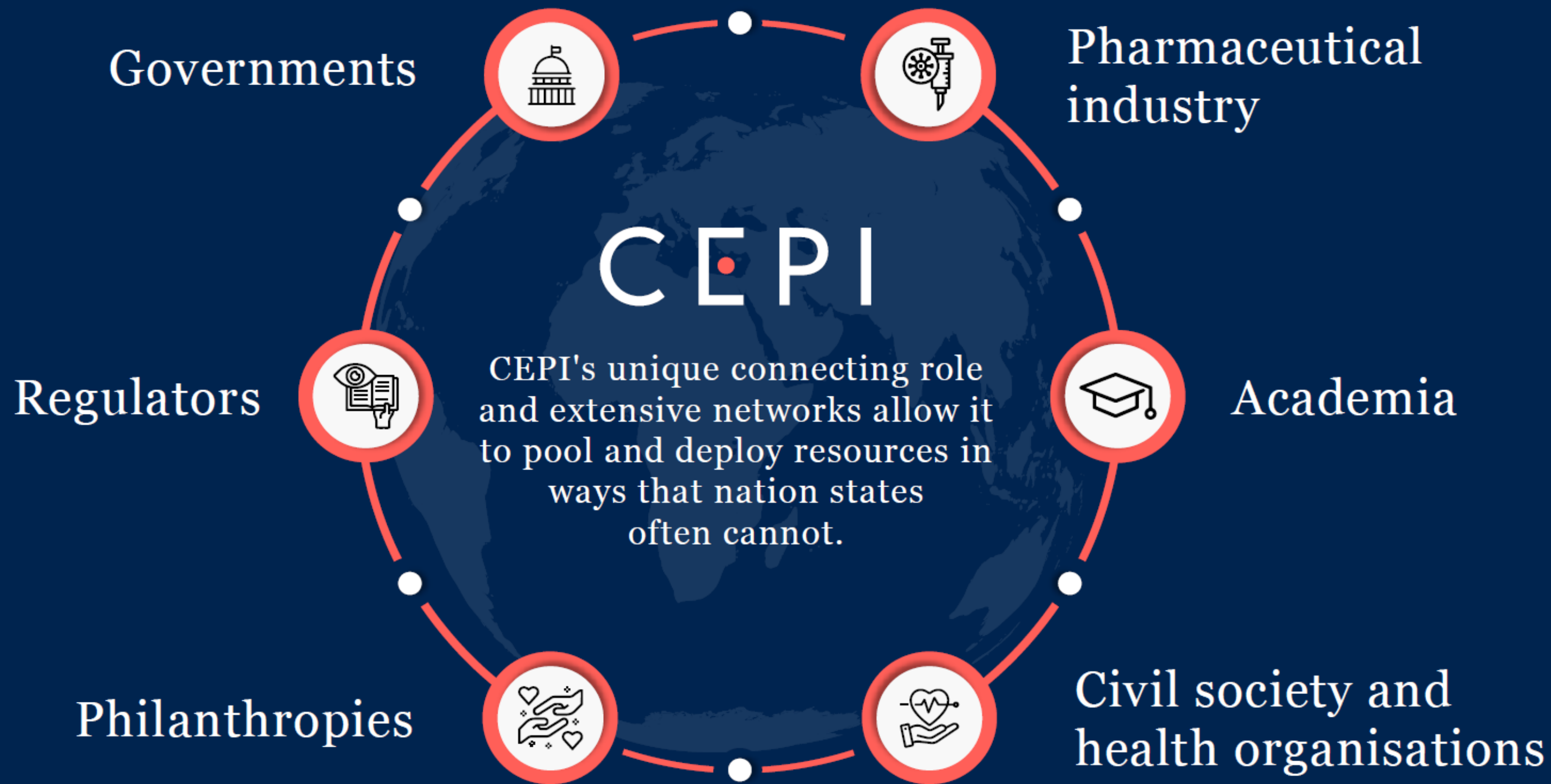
Outbreak Pathogens

- Q Fever
- Plague
- Congo-Crimean Haemorrhagic Fever
- Marburg virus
- Ebolavirus (sudan)
- Lassa virus
- Nipah virus
- Middle East Respiratory syndrome
- Junín virus
- Hantavirus
- Chikungunya virus
- Mayaro virus
- Oropouche virus

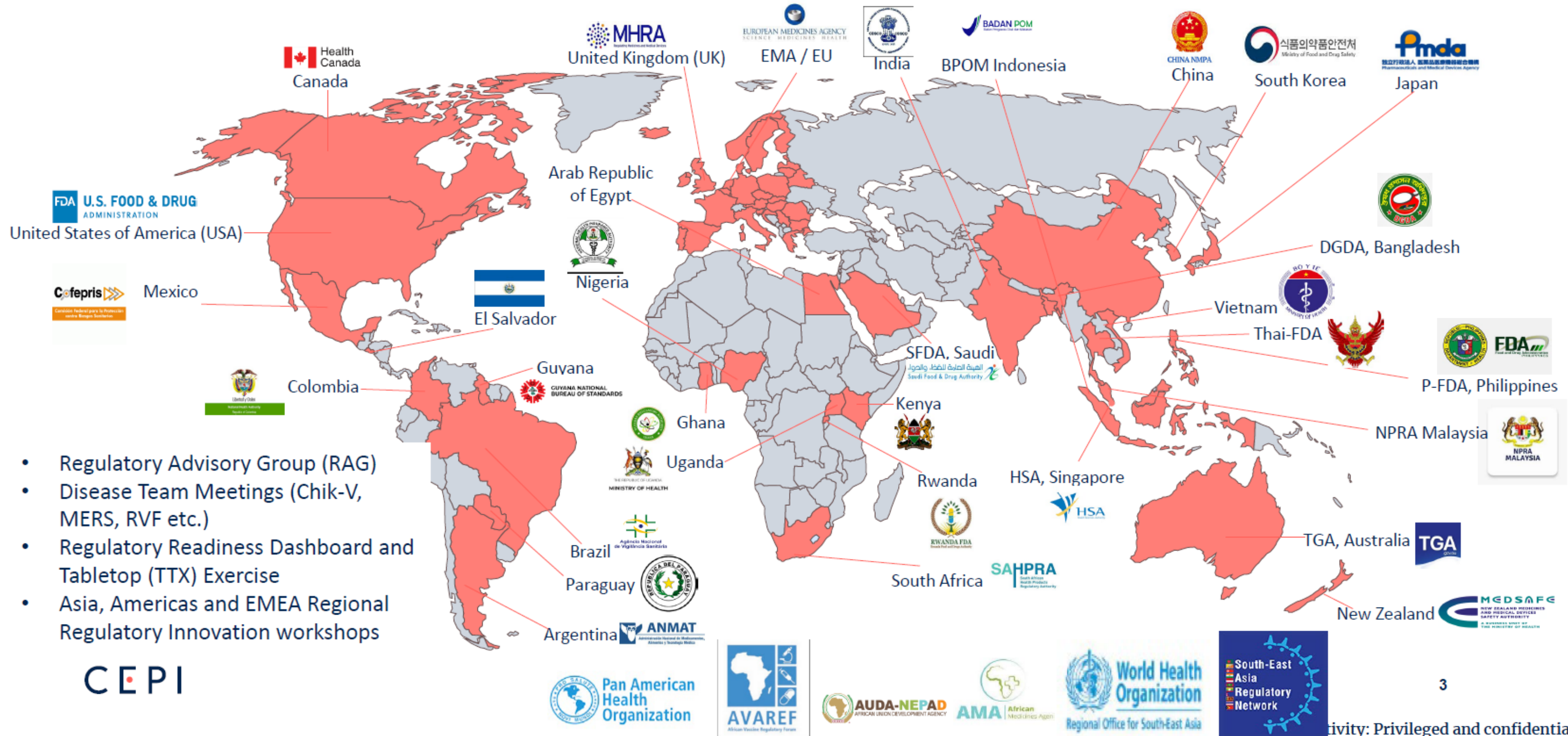


An introduction to CEPI

UKHSA Presents
Adam Hacker PhD, Valentina Bernasconi PhD
10 July 2025

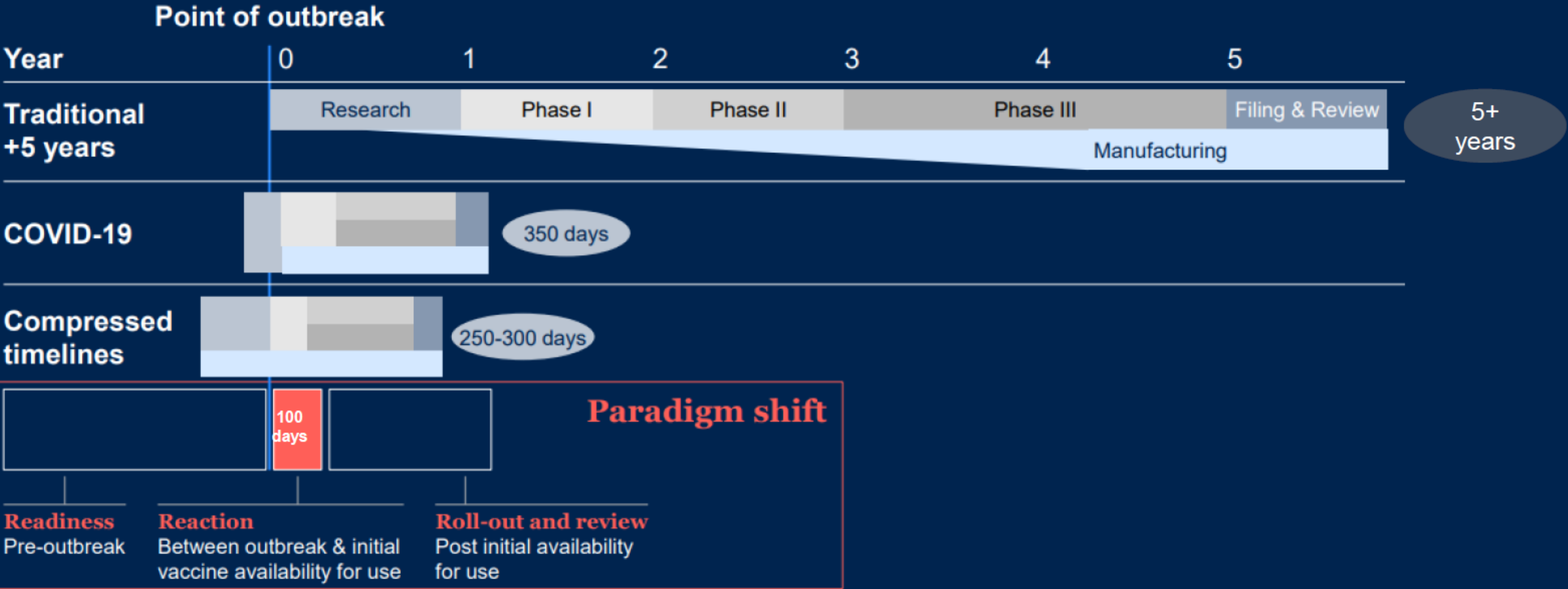


CEPI Regulatory network



Paradigm shift towards preparedness

Vaccine development timeline



CEPI's vaccine portfolio and networks

50+

Investments in
vaccine candidates or
platform technologies

3

Chikungunya
2 active

6

Lassa Fever
3 active

4

MERS-CoV
2 active

4

Nipah Virus
3 active

14

SARS-CoV-2
4 WHO EUL. 3
approved for
domestic use

13

Broadly
protective CoV
vaccines
10 active

3

Rift Valley
Fever

15

Disease X
platforms

5

Vaccine
Manufacturing
Network

18

Centralized
Laboratory
Network Labs

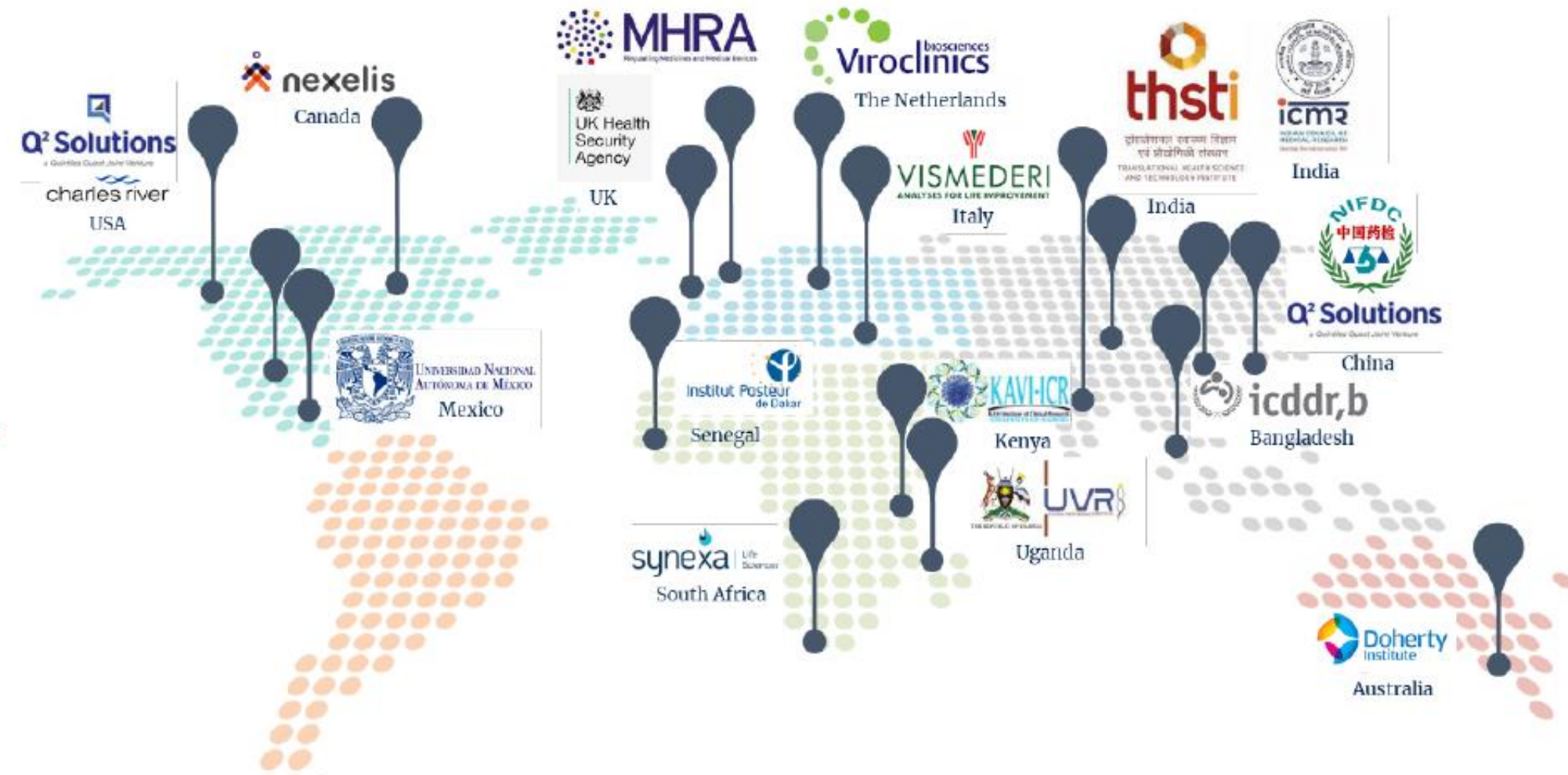
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Preclinical
Models Network
Labs

The CEPI Centralized Laboratory Network (CLN)

CEPI CL Network: Standardized and validated clinical immunogenicity assays

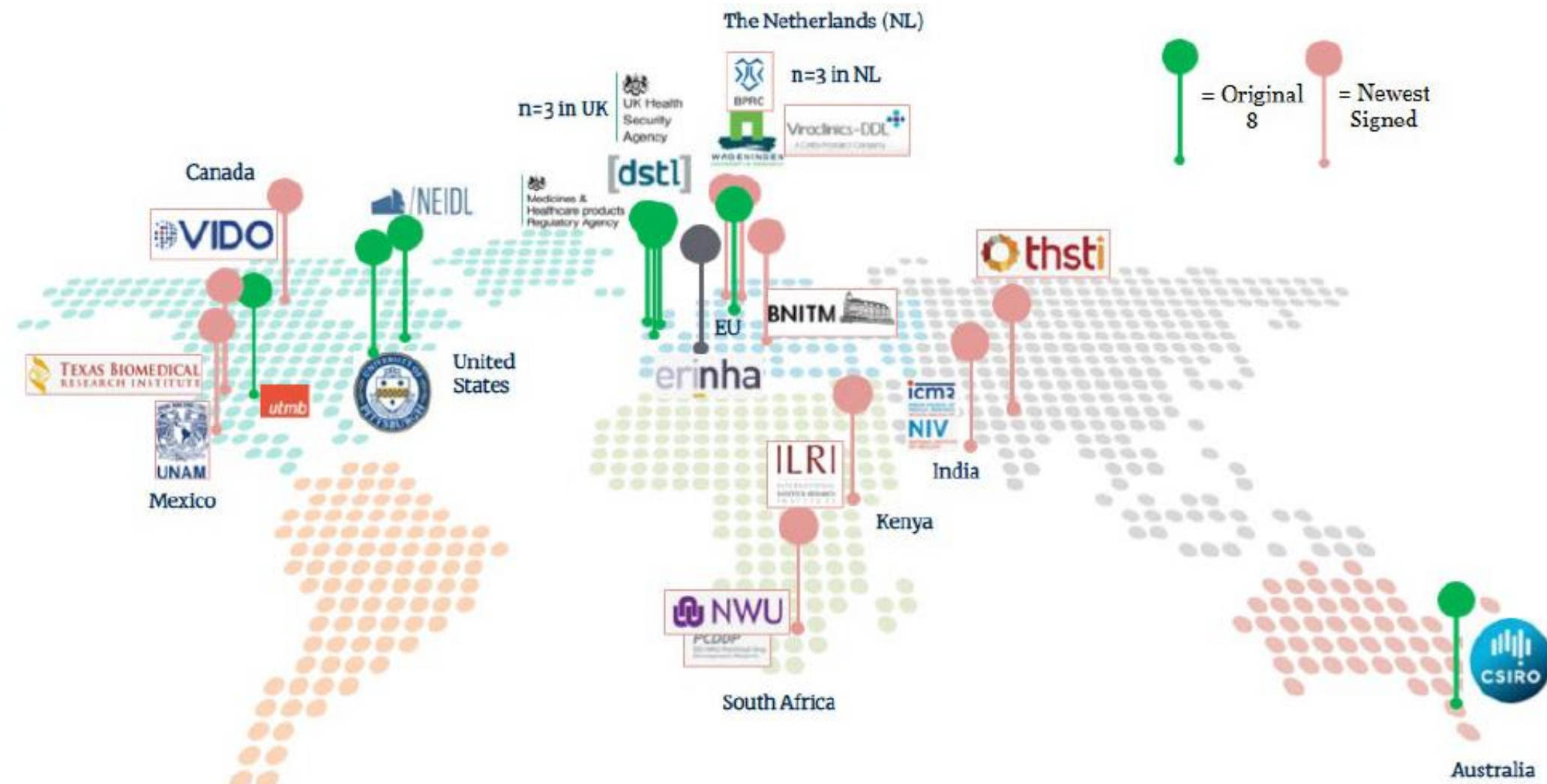
- CEPI network of clinical immunogenicity labs for performance of immunology assays in support of global clinical trials
 - Leveraging International Standards usage
 - Standardized and harmonized lab testing methods across network
 - Technology Transfer and assay validations
- Tackle new viruses and support testing for the Disease X program (virus libraries) and 100 days mission (Lassa, MERS, SARS-CoV-1, Nipah, Ebola Sudan, Marburg, Mpox, Pandemic flu)
- Capacity building and partnerships strengthening
- Implement and bring innovations to increase throughput and set up new assays
- Alignment with similar global initiatives



The CEPI Preclinical Model Network (PMN)

CEPI PM Network: Preclinical animal model development and vaccine candidate testing

- CEPI network of biocontainment labs for performance of model development studies and vaccine testing
 - BSL-3 and -4 partners to handle CEPI priority pathogens: MERS-CoV, LASV, RVFV, NiV, CHIKV, and other Disease X approaches (+ SARS-CoV and SARS-CoV-2)
 - Small and large species, including NHP
- Compliance with high animal ethics standards; partnership and reviews by <https://www.nc3rs.org.uk/>
- High-quality research supported by established quality systems or well-documented through protocol-specified methods



CEPI's Experience with UKHSA

Highly responsive contract work filling specific UK Gov and CEPI research needs and meeting 100 Days Mission Objectives

- Preclinical assay development/optimization/qualification/validation
 - Leading tech transfer and performance of SARS-CoV-2, MPOX, Influenza and other assays
 - Assay training to other recipient organizations
- Preclinical sample analysis for vaccine developers
 - Assay data collection for regulatory packages
- Proof of concept model development studies for CEPI Pathogens and for vaccine testing
 - Virus stock acquisition, production, and characterization; disease modeling
- Model refinement studies, including improved endpoints to address ethical vaccine efficacy testing
 - Incorporation of telemetry or remote monitoring strategies, defining biomarkers and correlates of immune protection, defining best immunoassays

Contact:

Vaccine Development and Evaluation Centre



VDEC@ukhsa.gov.uk

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