CEPI | Spillover to Disease X: vaccine preparedness for the next pandemic threat

Maïna L'Azou Jackson

Senior Epidemiologist - CEPI

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CEPI: a global partnership

Vision

A world in which epidemics and pandemics are no longer a threat to humanity.

Mission

To accelerate the development of vaccines and other biologic countermeasures against epidemic and pandemic threats so they can be accessible to all people in need.

CEPI

Our strategic objectives

1

Prepare

Develop vaccines and promising biologics against the most prominent known threats, building on COVID-19 achievements and CEPI 1.0

2

Transform

Harness innovations in technology and systems to significantly reduce the global vulnerability to threats of novel pathogen outbreaks

3

Connect

Connect Emerging Infectious Diseases stakeholders to enable rapid countermeasure development, effective response and equitable access for those in need

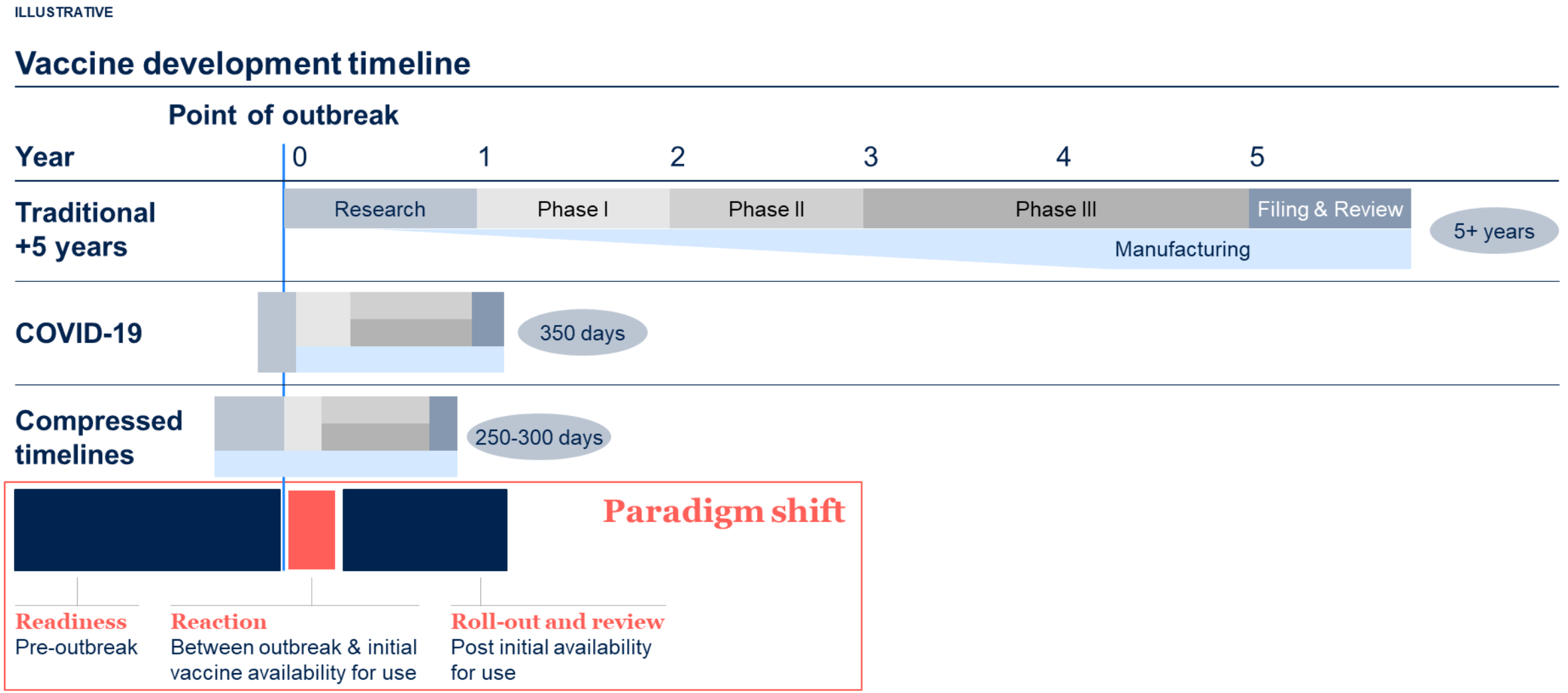
CEPI's 100 Days Mission

Coupled with improved surveillance, and swift use of non-pharmaceutical interventions, a vaccine in 100 days could defuse the threat of a new pathogen with pandemic potential.

Definition:
'Vaccines should be ready for initial authorisation and manufacturing at scale within 100 days of recognition of a pandemic pathogen, when appropriate.'

#100DaysMission

Compressing timelines further will require a fundamental shift towards preparedness



What will it take?

(1) Creating a library of prototype vaccines for representative pathogens across multiple virus families

(2) Getting clinical trials networks at the ready

(3) Speeding up identification of immune response markers

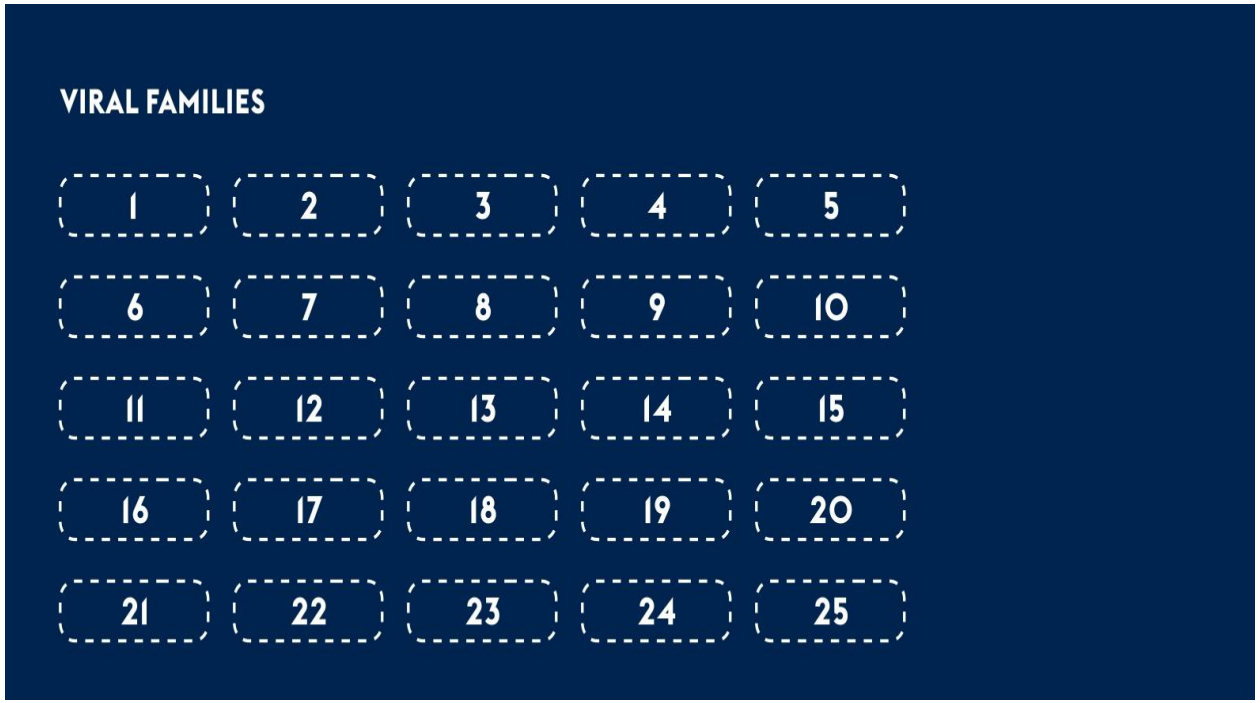
(4) Establishing global capacity to make top-quality, safe, and effective new vaccines quickly

(5) Strengthening disease surveillance and global early-warning systems

#100DaysMission

Creating a library of prototype vaccines for representative pathogens across multiple virus families

- Libraries of vaccine constructs against representative pathogens from virus families with greatest pandemic potential.
- Vaccine platforms to be rapidly adapted to develop vaccines against new threats.



#100DaysMission

What do virus family vaccine libraries look like?

Virus family prioritization and virus selection

Spillover project v2.0

Immunogen design

Optimized antigen sequences for stability, expression, antibody and T-cell responses

Extensive knowledge base

Viruses, receptors, structure-based phylogenetic analysis

Subset of designs put in cDNA plasmid and expressed as recomb. proteins

- Conformational verification
- Immunotools

Immunogen designs tested in different platforms

- e.g. mRNA, ChadOx, other
- Preclinical safety and efficacy

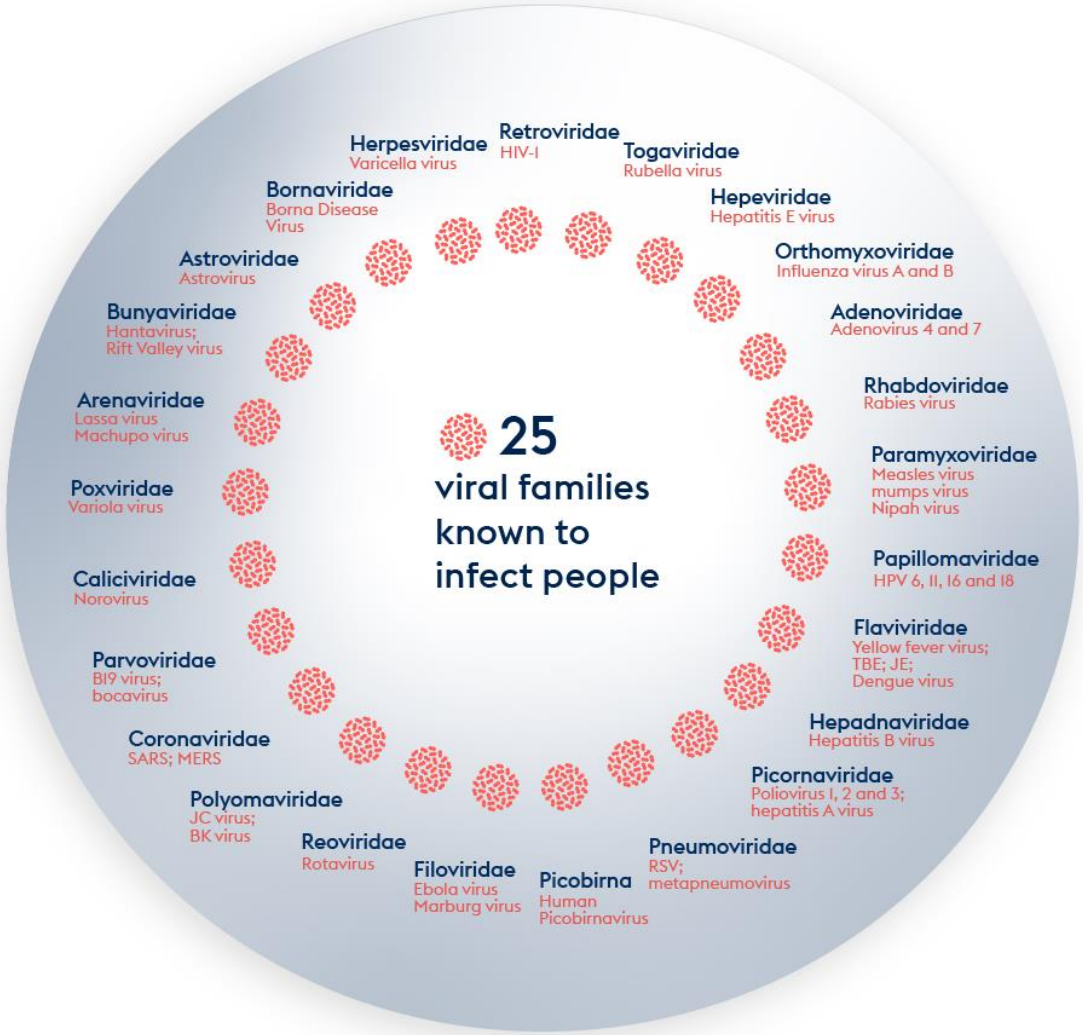
Exemplar vaccine candidates

- Clinical testing for safety and immunogenicity
- Stockpiling

Access to data, materials and vaccine candidates through our equitable access provisions

Vaccine libraries will target high-risk virus families

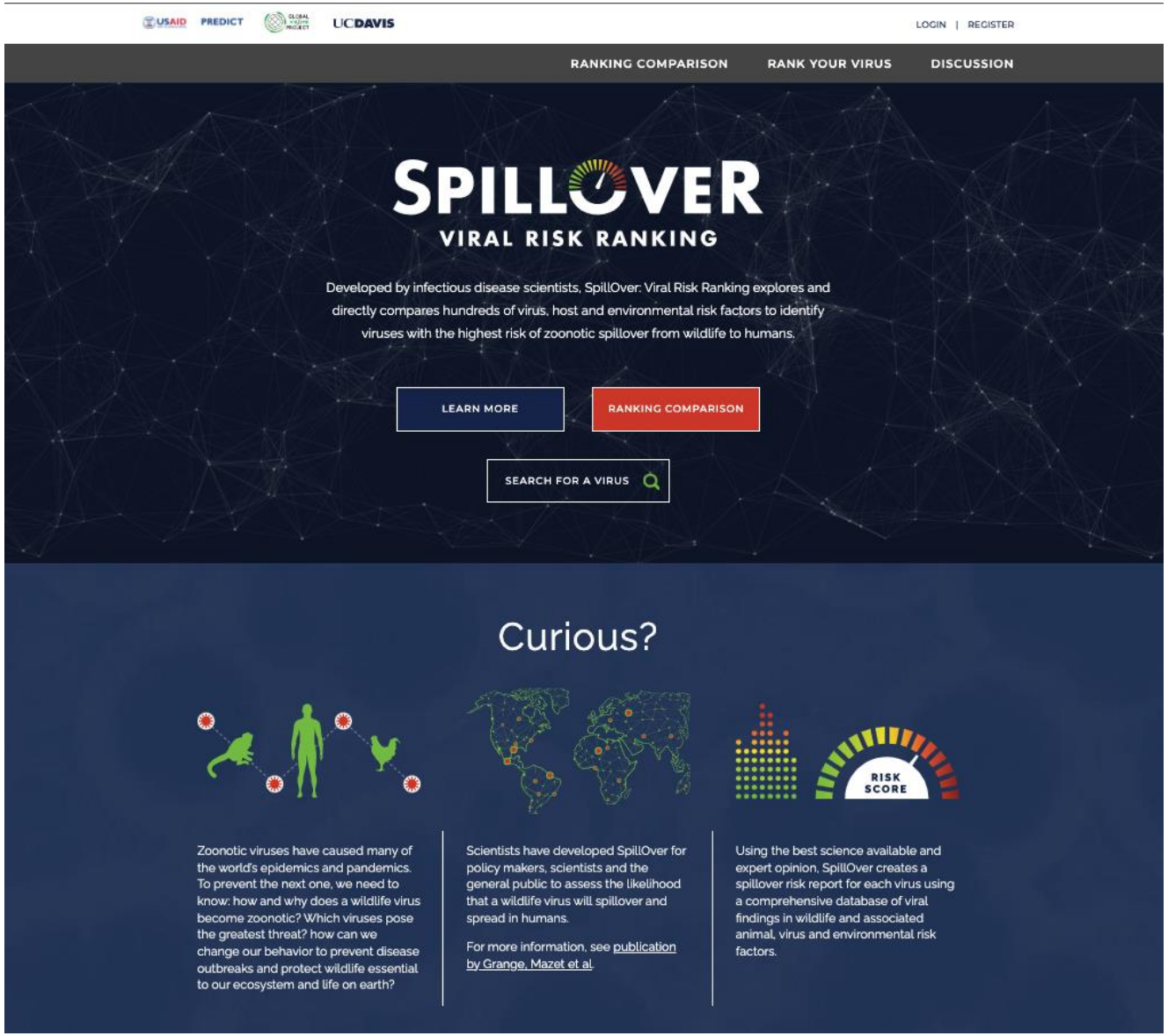
- **Virus family**: ICTV classification of viruses into families, subdivided into subfamilies and genera based on their genetic sequences and degree of divergence
- **Virus family prioritization**: Ranking of virus families for their Disease X likelihood emergence based on methodology in development
- **Virus selection:** For each virus family, 10-15 viruses are selected to have an antigen designed for the antigen sequence “vaccine” library
- Engagement with CEPI’s partners (NIAID, WHO)



Background

- Developed through the UC Davis-led PREDICT Project
- Building on the 2021 Grange et al. publication "Ranking the risk of animal-to-human spillover for newly discovered viruses" in *PNAS*
- Spillover is an online tool that compares hundreds of virus, host and environmental risk factors to identify viruses with the highest risk of zoonotic spillover from wildlife to humans.

  https://spillover.global/



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GLOBAL CONFERENCE ON EMERGENCY MANAGEMENT

World Organisation for Animal Health
Founded as OIE

Thank you

Maïna L'Azou Jackson

Senior Epidemiologist – CEPI

Maina.lazou.jackson@cepi.net

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