



Creating a world in which epidemics are no longer a threat to humanity

Background

In a world characterized by increasing population density, human mobility, and ecological change, emerging infectious diseases (EIDs) pose a real and growing threat to global health security.

Epidemic diseases affect us all. They do not respect borders. If a highly contagious and lethal airborne pathogen with the characteristics of the 1918 Spanish Flu were to emerge today, it is estimated that nearly 33 million people worldwide would die in just 6 months.¹

The costs of EIDs are vast, in both human and economic terms. A report prepared by the National Academy of Science has estimated that over 10 years the global costs of epidemics could amount to \$600bn.² Even small epidemics can cause tremendous economic disruption.

The creation of CEPI

The global need for an organisation like CEPI was recognised after the devastating West African Ebola epidemic, which killed more than 11,000 people and had an economic and social burden of over \$53 billion.³

The world's response to this crisis fell tragically short. A vaccine that had been under development for more than a decade was not deployed until over a year into the epidemic. That vaccine was shown to be 100% effective, suggesting that much of the epidemic could have been prevented. It was evident that we needed a better system to speed the development of vaccines against known epidemic threats.

CEPI was launched at Davos, in 2017, by the governments of Norway and India, the Bill & Melinda Gates Foundation, the Wellcome Trust and the World Economic Forum, as the result of a consensus that a coordinated, international, and intergovernmental plan was needed to develop and deploy new vaccines to prevent future epidemics.

CEPI's mission is to stimulate and accelerate the development of vaccines against emerging infectious diseases and enable access to these vaccines for people during outbreaks.

¹<http://www.idmod.org/news/node/296>

²<http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=21891>

³https://academic.oup.com/jid/article-abstract/218/suppl_5/S698/5129071

CEPI has three strategic objectives:

- **Preparedness** – Advance access to safe and effective vaccines against emerging infectious diseases
- **Response** – Accelerate the research, development and use of vaccines during outbreaks
- **Sustainability** – Create durable and equitable solutions for outbreak response capacity

Filling a critical gap in the vaccine ecosystem

Planning for EIDs is challenging: the R&D is complex, lengthy and expensive. The market potential for such vaccines is limited and testing such vaccines is difficult.

There are already many actors in the “end-to-end space” of vaccine funding and R&D implementation but a number of critical gaps have been identified, which CEPI was designed to fill (see *Figure 1.*):



Figure 1. CEPI’s role within the vaccine development pipeline.

- First, by advancing vaccines against known threats through proof of concept and safety testing in humans and establishing investigational stockpiles before epidemics begin — ‘just in case’.
- Second, by funding new and innovative platform technologies with the potential to accelerate the development and manufacture of vaccines against previously unknown pathogens (eg: 16 weeks from identification of antigen to product release for clinical trials)—‘just in time’.

- Third, by coordinating activities to improve our collective response to epidemics, strengthening capacity in countries at risk, and advancing the regulatory science that governs product development.

CEPI has moved quickly since launch

Moving from a start-up to an established global organisation

CEPI is headquartered in Oslo, Norway, and has offices in London, UK, and Washington DC in the United States.

A permanent Secretariat and CEO have been in place since 2017 and a new permanent governance structure has been implemented over the past year, establishing a more agile and independent Board, strengthening the Secretariat's executive role, adjusting the size and composition of the Scientific Advisory Committee, and focussing the activities of the Joint Coordination Group on CEPI's portfolio of vaccines.

Growing support from donors

CEPI was founded in Davos by the governments of Norway and India, the Bill & Melinda Gates Foundation, the Wellcome Trust, and the World Economic Forum.

As of March 2019, CEPI has secured over \$750 million toward its \$1 billion funding target, with financial support provided by the Bill & Melinda Gates Foundation, the Wellcome Trust, the European Commission, and the governments of Australia, Belgium, Canada, Germany, Japan, Norway and the UK (see *Table 1.*).

	Investment	Type of investment
European Commission	€ 200 m	Multi year
Japan	US\$ 125 m	Multi year
Norway	NOK 1.6 b	Multi year
Bill & Melinda Gates Foundation	US\$ 100 m	Multi year
Wellcome Trust	US\$ 100 m	Multi year
Germany	€90 m	Multi year
United Kingdom	£10 m	Single year

Canada	CA\$ 14 m	Multi year
Australia	AU\$ 6.5 m	Multi year
Belgium	€0.5 m	Single year

Table 1. CEPI's investors (as of March 2019)

CEPI offers a unique opportunity for our investors to lead on global health security and, in partnership with other governments and international organisations, invest in a solution that protects some of the most vulnerable people in the world while helping prevent the global spread of epidemics.

Calls for Proposals successfully announced

Since its launch, CEPI has announced three Calls for Proposals (CfP). The first CfP supports candidate vaccines against MERS-CoV and Nipah and Lassa viruses⁴. These were chosen from a priority list established by the WHO in its *R&D Blueprint for Action to Prevent Epidemics*.

The second CfP will advance rapid response platforms against unknown pathogens, known as Disease X⁵.

CEPI's third CfP, issued January 4, 2019, will support vaccines against Rift Valley fever and Chikungunya viruses⁶.

Partnership agreements launched

As of March 2019, CEPI has established eleven partnerships, reflecting a potential investment of up to \$350 million in 12 vaccine candidates (five against Lassa virus, four against MERS-CoV, three against Nipah virus) and three vaccine platforms to develop vaccines against Disease X. CEPI has a number of additional partnerships under negotiation (see *Table 2. below*).

⁴https://cepi.net/get_involved/cfps/

⁵https://cepi.net/get_involved/cfps/

⁶https://cepi.net/get_involved/cfps/

These partnership agreements represent just the start of CEPI's product development portfolio.

Themis Bioscience	Lassa & MERS vaccines	Up to \$37.5m
Inovio Pharmaceuticals	Lassa & MERS vaccines	Up to \$56.0m
International AIDS Vaccine Initiative	Lassa vaccines	Up to \$54.9m
Profectus Biosciences, Emergent Biosolutions & PATH	Nipah vaccine	Up to \$25.0m
Profectus Biosciences, Emergent Biosolutions & PATH	Lassa vaccine	Up to \$36.0m
IDT Biologika	MERS vaccine	Up to \$36.0m
Janssen Vaccines & University of Oxford	MERS, Lassa and Nipah vaccines	Up to \$19.0m
University of Tokyo	Nipah vaccine	Up to \$31.0m
Imperial College London	saRNA platform (Rabies, Marburg, 'Flu)	Up to \$8.4m
University of Queensland	Molecular clamp platform (MERS, RSV, 'Flu)	Up to \$10.6m
CureVac	mRNA platform (Rabies, Yellow Fever, Lassa Fever)	Up to \$34.0m

Table 2. CEPI's portfolio (As of March 2019).

CEPI's focus on Ebola

In addition to our priority diseases (Lassa fever, MERS, Nipah, Disease X, Chikungunya and Rift Valley fever), CEPI is also working on Ebola. Our work on Ebola is guided by the following principles:

- Aim to achieve the overall goal of attaining licensure for two or more vaccines.
- Facilitate licensure through data collection and analysis needed by advancing scientific understanding of immune response and supporting novel or flexible approaches to authorization and licensure.
- Support clinical trials in affected countries including in an outbreak situation when they aim for licensure in certain risk groups and subpopulations, and advance or simplify delivery of vaccine in the field through vaccine-related innovation.
- Support a generalizable approach to sustainable manufacturing that includes Ebola vaccines.
- Not to exclusively fund the deployment or delivery of vaccine.

Vaccine Sciences

To address the critical knowledge gaps and tools needed for rational and accelerated vaccine development, and future access to a licensed product, CEPI has set up an enabling sciences programme. Epidemiological knowledge gaps critical for vaccine development and assessment of disease burden are addressed through projects in affected countries, and through collaboration with external partners CEPI ensures diagnostics validation, training and capacity strengthening is addressed.

To facilitate comparison of vaccine candidates and appropriate assays serving future licensing, CEPI has also established partnerships to develop biological standards and assays.

CEPI is dependent on the scientific community and product developers to reach its goals, and engagement of these groups are hence core to success.