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## CEPI prepares for future pandemics and epidemics

On March 10, 2021, the Coalition for Epidemic Preparedness Innovations launched a US\$3.5 billion plan to reduce the risk of future pandemics and epidemics. Udani Samarasekera reports.



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For more on CEPI's 5-year plan see [https://cepi.net/wp-content/uploads/2021/03/CEPI\\_3\\_5\\_billion\\_investment\\_case\\_10032021.pdf](https://cepi.net/wp-content/uploads/2021/03/CEPI_3_5_billion_investment_case_10032021.pdf)

For more on CEPI's call for proposals see <https://cepi.net/wp-content/uploads/2021/03/CFP-BPCV-Call-Text-FINAL.pdf?swcfc=1>

The Coalition for Epidemic Preparedness Innovations (CEPI) has always been forward-looking. Launched in 2017, CEPI is a global partnership between public and private organisations that aims to develop vaccines to tackle future epidemics. Since its inception, it has facilitated and funded the development of vaccine candidates against known threats, as well developing rapid-response platform technologies against unknown pathogens that could cause the next Disease X. Last year, CEPI made investments in the development of COVID-19 vaccines, including the mRNA vaccine by Moderna and the chimpanzee adenovirus-vectored vaccine by Oxford-AstraZeneca.

Now CEPI is looking ahead again. On March 10, it launched an ambitious 5-year US\$3.5 billion plan to tackle existing challenges in COVID-19 and to address new priorities. "For COVID-19, we are looking at further investments in R&D, so these include things like... the next-generation vaccines, so looking at improving on the vaccines that we have today, whether that's improving manufacturing, improving deliverability, going away from ultra-cold chain, or improving to some extent the breadth of vaccines", Melanie Saville, director of vaccine research and development at CEPI, told *The Lancet Infectious Diseases*.

At the end of March, as part of its new strategy, CEPI issued a \$200 million call for proposals for development of vaccines against new emerging variants of SARS-CoV-2 and variants of concern. David Heymann, professor of infectious disease epidemiology at the London School of Hygiene & Tropical Medicine, UK, notes that addressing variants "will call for extremely close partnership with...groups that are doing the global surveillance for COVID to make sure

that there's a connect between the surveillance systems, which are looking to determine where the variants are and what they are, and also in linking that to decisions on what goes into vaccines".

The call for proposals also includes funding for new broadly protective betacoronavirus vaccines candidates, with a view to developing a vaccine that could protect against coronaviruses SARS-CoV, MERS-CoV, and SARS-CoV-2. "We would like to look with the best of researchers out there to finding a broadly protective or even a universal coronavirus vaccine", says Saville. Marion Koopmans, head of the department of viroscience at Erasmus MC, the Netherlands, thinks this is a good goal, commenting: "It's not the lowest hanging fruit. But I think it's important to just set the ambition because that will also direct some critical research elements, which I think goes beyond coronaviruses. This is, of course, what the flu field has been working on for many years".

CEPI also plans to progress its work on developing vaccines for known threats, such as chikungunya, Lassa virus, and Nipah virus. Heymann welcomes this news but thinks CEPI could have more of a One Health approach, considering both animal and human vaccines. "I think it's important that there be a One Health area in CEPI as well. In issues such as Lassa, it may be that a rodent vaccine would be more appropriate than a human vaccine", he says. Development of an animal vaccine might also be more appropriate for MERS-CoV. Koopmans agrees that with MERS-CoV "you could also look at the animal side. Studies have shown if you bring all these animals together for racing, for gatherings, that's where you find a lot of circulation, that's when you find human health risk, so you could also

think of developing vaccines at least for the racing industry".

One of the big moonshot ideas in CEPI's plan is to compress vaccine development timelines to 100 days. Saville highlights the speed of success of COVID-19 vaccine development as "really quite remarkable" but notes opportunities for improvement. She explains that by compressing different areas of the vaccine development pipeline you can reduce the timelines further. For example, "you can compress the times by having things like clinical trial networks and clinical protocols in place that people can agree on in advance", she says.

CEPI also wants to produce a library of prototype vaccines against representative pathogens from critical viral families. Saville notes that CEPI was working with AstraZeneca on a MERS-CoV vaccine before the pandemic hit "so that when the pandemic came, they already had some good idea about what the appropriate antigen to be used was and how that works in their platform". Saville calls this a classic example of the prototype vaccine idea. If you can build up prototypes "then once you get your new emerging disease, your new Disease X, you already know a lot about how to optimise a vaccine in that virus family", she explains.

Heymann thinks CEPI could also use new platforms for known threats: "I would hope that they would be able to apply technologies that have been developed for COVID-19 to influenza vaccines, the majority of which are still produced from virus grown in egg embryos. Skipping those and moving into the 21st century platforms, the COVID platforms, might be a way of speeding up influenza preparedness as well".

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