Summary of CEPI Scientific Advisory Committee (SAC) meeting

Teleconference, 20.08.2020

Committee members

Present

- Alan D. Barrett
- Alash´le Abimiku
- Christian Happi
- Connie Schmaljohn
- Daniel Brasseur
- Delese Mimi Darko
- Helen Rees (Chair)
- Inger Damon
- James Robinson (Vice chair)
- John Edmunds
- Kenji Shibuya
- Michel De Wilde
- Myron Levin
- Paula Bryant
- Penny Heaton
- Peter Smith
- Phil Krause
- Ralf Clemens
- Stanley Plotkin
- Tom Kariuki

Non-voting members

- Jean Lang
- Johan Van Hoof
- Josie Golding

Excused:

- Ali Alloueche
- Christian Bréchot
- Dong Xiaoping
- Kathleen Neuzil
- Kathrin Jansen
- Vaseeharan Sathiyamoorthy
- Yves Levy

CEPI Secretariat

- Richard Hatchett (CEO)
- Melanie Saville (Director, Vaccine R&D)
- Nick Jackson (Head of Programmes & Innovation, Vaccine R&D)
- Mike Whelan (Project Leader, Vaccine R&D)
- Jakob Cramer (Head of Clinical Development, Vaccine R&D)
- Gabrielle Breugelmans (Head Epidemiology, Vaccine R&D)
- Ingrid Kromann (Head CMC, Vaccine R&D)
- Paul Kristiansen (Head Biological Standards & Assays, Vaccine R&D)
- Stephen Mayhew (Head Strategy & Portfolio Management, People, Planning and Policy)
- Nicole Lurie (Strategic Advisor to the CEO)
- Rihana Diabo (Strategy Manager, People, Planning and Policy; note taker)
- Raimonda Viburiene (Project Manager, Vaccine R&D; note taker)
- Stig Tollefsen (Technical Lead; Vaccine R&D; note taker)

Invitees

- Peggy Hamburg

Meeting Overview

CEPI's Scientific Advisory Committee (SAC) met on 22 August 2020 to discuss options for how CEPI should be positioned when setting up CEPI's next 5-year strategy, "CEPI 2.0", (in operation from 2022 to 2026) and what priorities CEPI should consider for the upcoming years.

CEPI's SAC provides advice for CEPI's scientific programmes and strategy. The summary below will provide a guide for the development of the CEPI 2.0 strategy, due for publication in December 2020.

Meeting Summary

Key suggestions for the creation of the CEPI 2.0 strategy:

- To systematically, and periodically, review our priority pathogen list to ensure it remains current and applicable for CEPI's next five-year strategy from 2022-2026, CEPI 2.0; and to strategically define our updated priority pathogens by epidemic/pandemic potential and by disease prevention or control. Be aware of "antimicrobial resistance, climate change, and urbanisation"-related pathogens. Learnings from COVID-19 will be paramount when addressing priority pathogens in the future.
- Bring together the priority pathogen list and Disease X platforms; technology platform development should be taken to a point of validation (e.g. clinical proof of concept or licensure).
- Consider a stronger focus required on potential zoonotic diseases; and ensure One Health views are considered (e.g. engagement of veterinary experts).
- On a pathogen by pathogen basis, CEPI should assess how far it should support late stage development, including Phase III, licensure, Phase IV; in principle, the SAC supports licensure of vaccines where applicable as the optimal approach for prevention.
- Ready reserves of investigational stockpiles ready for use remains a strong recommendation where applicable for a given pathogen but this must be tied to generating safety data – important to keep in mind post-licensure studies that may be required.
- CEPI is not a manufacturer but has a catalytic role in the field. The idea of manufacturing innovations is very important (e.g. cell free systems).
- CEPI should continue to support enabling science elements:
    - support for diagnostics, but recognition that organisations exist (e.g. FIND) that are striving to address this so necessary to build on opportunities for partnerships
    - fill in gaps on standard assays, preclinical models etc.
    - epidemiology surveillance remains crucial – CEPI should support but rely on existing national and international organisations who have significant resources already dedicated to this effort.

Welcome and brief introduction of today's meeting

Helen Rees and Richard Hatchett opened the meeting.

Richard Hatchett introduced the topic for the meeting around the development of CEPI 2.0, the strategy for CEPI's next five-year period, from 2022-2026.

Renewal of SAC membership will be in process in the coming months. There may be a need for changes in expertise, likely reflecting some of the developments as part of CEPI 2.0.

The collated recommendations from this SAC meeting will be presented to the Board on September 16-18, 2020.

#1 CEPI's contribution to COVID -19 vaccine development

Setting the scene for the future

Melanie Saville
Nicholas Jackson

Melanie Saville introduced the topic by stating that COVID-19 is a Disease X impacting the field in preparing and responding to outbreaks.

Nicholas Jackson ran through the list of COVID-19 vaccine candidates supported by CEPI and gave a brief update on their development status. The COVID-19 portfolio of vaccine candidates will be actively supported as CEPI moves forward. Nicholas Jackson also indicated that there are discussions ongoing whether to support other vaccine candidates potentially filling the gaps in the current portfolio.

#2 Shaping CEPI's future strategy – Engaging the SAC for input into a range of potential future strategic options for CEPI's next 5-year business cycle

#2a Introduction to CEPI's future strategy: Objectives and progress so far - building on our COVID-19 experiences

Melanie Saville gave an introduction to the topic. She highlighted that the main goal is to align on the cornerstones of CEPI's draft 2.0 strategy which will serve as input to a final strategy by the end of 2020. A particular focus of the considerations, as per the Board's feedback, should be on strengthening engagement and programs within Low- and Middle-Income Countries.

The process needs to remain adaptive to changes in the ecosystem but should nonetheless generate outputs robust enough to enable a productive Board discussion of recommended strategic scenarios.

Member of the SAC were divided into groups to strategically discuss focus areas for CEPI 2.0.

#2b Strategic Focus Areas

1) Priority pathogens
2) Targeted Disease X investments
Q. What should be the balance of investments between priority pathogens and rapid response technologies in view of Covid-19?

Nicholas Jackson
Selected SAC Members

- Peter Smith
- Stanley Plotkin
- Penny Heaton
- Paula Bryant

Priority pathogens
Nicholas Jackson led the session. SAC members Peter Smith and Stanley Plotkin were invited to give introductory points on the selection of priority pathogens. The original thinking was to focus on diseases from the WHO R&D Blueprint list to be part of CEPI's portfolio, however it was highlighted that the COVID-19 pandemic has taught us that a more generic approach needs to be considered when it comes to the choice of pathogen. SAC Members suggested that rapid response platforms should be leveraged to tackle priority pathogens and that CEPI should clarify where it stands with regard to pandemic flu. Veterinary expertise to help address the threat of zoonotic pathogens and to pro-actively attempt to identify such agents before they become epidemic/pandemic was also highlighted. One could consider mRNA libraries for different virus families and at least demonstrate preclinical proof of concept (POC).

Main suggestions from SAC members:

- Agreement to systematically, and periodically, review our priority pathogen list to ensure it remains current and applicable for CEPI 2.0; the criteria for re-evaluation were agreed with the recommendation to consider local (LMIC) community engagement as an additional measure to understand the situation there in terms of outbreak prone diseases. There was also agreement that the priority pathogen list should be positioned in terms of epidemic / pandemic potential & disease control / prevention.

- CEPI should consider a more pro-active approach when it comes to Disease X detection.
    - Early detection of (zoonotic)s pathogen would be advantage in preparedness (as of now there is little information on what the reservoirs are and where and how does a virus jump from animals into humans). However, it was recognised that existing organisations (e.g. FIND) are striving to improve diagnostic capabilities and capacities- CEPI should strengthen partnering where applicable.
    - Take into consideration a One Health approach, introducing veterinary expertise into the CEPI team.
- CEPI was reminded that bacteria still pose significant outbreak risks (e.g. new cholera strain).
- Several new technologies were cited for potential application against priority pathogens; namely, gene-encoded MAb, rapid response platforms, cell-free production platforms.

Disease X Targeted Disease X investments
Penny Heaton introduced the topic and highlighted that we are in a transition period in which COVID-19 vaccine platforms are moving from a high-risk / unproven status to more proven platforms; and CEPI has an important role in supporting such platforms towards Disease X. It will also be important to look at new emerging technologies and reconsider the latest generation of monoclonal antibodies. However, we must also keep in mind that some of the new technologies could be out of reach for LMICs, based on cost of goods, cold chain logistics, lack of local advanced manufacturing sites etc. Finally, there are still many open questions to be answered in relation to thermostability, formulation, delivery of new vaccine technologies, and cost of goods, that would need to be addressed if these platforms were applied to Disease X. It was proposed that Disease X and priority pathogens should be linked together as a workstream, focussed around rapid response platforms.

Main suggestions from SAC members:
- CEPI should continue to work with rapid response technology platforms for known and new pathogens.
- CEPI should bring its separate portfolios 'Priority pathogens' and 'Disease X technology platforms' together strategically.
- The strategy behind CEPI 2.0 needs to consider what other entities are doing and where we can partner, in particular post-COVID-19.

#2c Strategic Focus Area

Late stage support of priority programmes and validation of platforms
Q: Should CEPI support vaccine candidates beyond Phase 2a to ensure access?

Jakob Cramer

Selected SAC Member(s)
- Christian Happi

Jakob Cramer opened the session by reminding the group of what was planned for CEPI's first five-year strategy. SAC member Christian Happi provided remarks on late stage support where he highlighted the potential for CEPI to go beyond its initial mandate (Phase IIa) with focus on diseases that are endemic locally in LMICs ensuring development of these vaccines.

Main suggestions from SAC members:
- Regarding late stage development, the SAC supports in principle the notion that such activities will improve the deployment and effectiveness of vaccines. However, CEPI should take a flexible approach towards different vaccine candidates. Some candidates could be taken through late development stages where justified, while others could be stopped earlier (PhI/PhIIa/stockpile). This would need to addressed case-by-case.
- For many of CEPI's portfolio pathogens the mission was to have ready reserves of investigational material for emergency use. For others, however, one could move towards licensure (e.g. Lassa).
- When ready reserves are generated, appropriate measures, or plans for measurement, of vaccine effectiveness should be in place.
- If efficacy is demonstrated for any of CEPI's funded vaccine candidates, it could then be taken over by commercial or governmental organisations, e.g.. Nigeria government would be receptive to support local biotech to support Lassa vaccine development.
- *Note*: The WHO R&D Blueprint list was not only created based on the epidemiology of the viruses but also considered other factors such as the risk of mutation giving a higher risk of outbreaks.

#2d Strategic Focus Area

Manufacturing

Q: How should CEPI be innovative in manufacturing?

Ingrid Kromann

Selected SAC Members

- Jim Robinson
- Jean Lang

Ingrid Kromann opened and led the session. The manufacturing team has defined guiding principles: "stay true to the role" (CEPI is not a manufacturer), fill the gaps, and "connect the dots". She highlighted that CEPI has become active in manufacturing during COVID-19. The collaboration with Developing Countries Vaccine Manufactures Network (DCVMN) should be improved.

Jean Lang introduced the three potential archetypes of manufacturing (See *Figure 1* in Appendices). Briefly:

- Archetype 1: "Current Capacity COVAX-Like" model – very ambitious – pharma companies, governments and other groups like COVAX work with CMOs as needed to secure supply for market participants.
- Archetype 2: "BARDA like- model – Large investments made in select facilities allow governments (e.g. USA) to secure priority production and lower cost access during pandemic situations.
- Archetype 3: "Modular multi-purpose" model – Proactive and dedicated investments are made in modular production technology (e.g. Sanofi, Merck, GSK) – modular model with either transportable or adaptable facilities. It is still open how to deploy this model and it brings a high technology risk.

Jim Robinson stated that the COVID-19 pandemic has changed the manufacturing landscape.
Governments are likely to invest in manufacturing capacity in response to COVID-19. CEPI should not own any assets but link the partners and fill in the gaps. In other words, CEPI should understand the global ecosystem regarding manufacturing and help it to work better.

Main suggestions from SAC members:

- Manufacturing capacity and readiness are areas of significant need and opportunity; CEPI has an important role as a catalyst. The critical part is making sure that the right people sit at the table and CEPI knows all the players.
- Strong desire by developing countries to become manufacturers. Need to think carefully how to engage such countries earlier in building capacity and move beyond tech transfer.
- A strategic partner would be the Africa CDC to develop an agenda for building capacity and buy-in from countries.
- India has a high capacity but half of what is made in India will stay in the country.
- Important to ensure proper regulatory oversight to ensure critical manufacturing quality globally.
- For innovation in manufacturing, there are very few incentives to improve the technology.
- Innovation in manufacturing would be beneficial beyond the priority pathogens.

#2e Strategic Focus Area:

Enablers

Q: What are the critical enablers to advance vaccine development? How do we ensure ownership in affected countries?

Paul Kristiansen
Gabrielle Breugelmans
Jakob Cramer

Selected SAC Member

- Tom Kariuki

Standards and assays
Paul Kristiansen led opening remarks: Enablers in CEPI 2.0 will depend on the major strategic directions that CEPI will take. Regarding biological standardisation:

- It is important to create networks (there are a lot of activities already).
- COVID-19 investments could be extended to priority pathogens to give better support and build more of a tech platform in antibody & antigen provision. This will lead to better preparedness for the next pandemic.
- Lessons learned from COVID: Look for the gaps were there are groups with advantage for collaboration.

Epidemiology
Gabrielle Breugelmans: Where we may want to move to is being less an implementer, but a service provider within CEPI.

- Need to develop projects collaboratively with our colleagues, and with the vaccine development programmes.
- Capacity strengthening and LMIC engagement needs to be integrated across all enabling activities. CEPI should support but rely on existing national and international organisations who have significant resources already dedicated to these efforts.
- Need to make sure to work together with the right partners. In addition, we need a framework for LMIC engagement.

Clinical development
Jakob Cramer:

- CEPI should not take all pathogens to licensure; only where the development, regulatory and intervention strategy support.
- The cross-cutting activities are pathogen specific. We have grouped the enabling support to vaccine operation, science and safety.

SAC member Tom Kariuki pointed out several issues such as a need to gather a better data from epidemiology and think how the information should be shared globally in real time. Data architecture and governance should be important topics to take into consideration. Kariuki also addressed the need for better visibility of clinical trial sites in Africa. For this matter, there could be a better engagement and collaboration with Africa CDC.

Main suggestions from SAC members:

- Overall - there is a common approach taken with lessons learned from COVID-19, strategic partnerships and looking at gaps.
- Surveillance is central to all activities in CEPI. CEPI needs to be closely linked to those who are working on surveillance.
- Consider a contribution that focusses on new technologies for surveillance.
- Detection/Diagnostics should be more clearly brought forward. Virus hunters need to be part of this effort to trace down the evolution of viruses.

#3 Closing Remarks

Melanie Saville thanked for the support and input during the meeting.

The input from the meeting will be taken and developed into the strategic document for the Board in September.

The CEPI Secretariat will level on the ambition and get valuable steering from the Board in September. The strategy for CEPI 2.0 will be finalised in December.

The next SAC meeting is scheduled for November 4 and 5, 1400-1700 CET.

Appendices

Ad #2d Strategic focus area: Manufacturing

Figure 1, business model for the potential archetypes of manufacturing: