



Call for concept notes:

Epidemiology and vaccine demand curve modelling for CEPI target pathogens

1. Background

CEPI (Coalition for Epidemic Preparedness Innovations) is an innovative global partnership whose mission is to stimulate and accelerate the development of vaccines against emerging infectious diseases and enable access to these vaccines for people during outbreaks. CEPI is currently investing in the development of a number of vaccine candidates and platforms, as well as undertaking planning exercises around the manufacturing and future deployment of vaccines once they are approved for use.

CEPI's Sustainable Manufacturing Steering Committee (SMSC), launched in September 2018, was tasked with the following objectives:

1. Find sustainable manufacturing solutions for CEPI projects beyond the 3–5 year time horizon.
2. Ensure a supply chain mechanism that will allow rapid response for CEPI-sponsored vaccines in full integration with our partners (i.e., develop “end-to-end” solutions).

A key need identified by the SMSC, and the corresponding recommendation to the CEPI Board for 2019, was to engage epidemiology research groups to model epidemiology and vaccination strategies of targeted diseases to better understand demand curve and stockpiling requirements. As such, one of the 5 workstreams will focus on epidemiology. The epidemiology work stream will work in close collaboration to the supply chain work stream, whose aim is to develop stockpile and supply curve models for CEPI emerging diseases vaccines.

2. Aims and objectives

Aim:

CEPI aims to engage infectious disease modelling groups from universities or non-profit organizations with experience in a) epidemiological and disease outbreak modelling and b) vaccination strategy modelling. Selected groups will undertake modelling exercises to understand the magnitude of vaccine manufacturing and stockpiling needed for CEPI target pathogen vaccines.

Objectives:

1. Use deterministic mathematical models to understand estimates for vaccine manufacturing for a) stockpile needs and b) outbreak response for CEPI target pathogens Lassa, MERS and Nipah (short-term). The estimates will be used to determine the scale of manufacturing and therefore need to be accurate within an order of magnitude (e.g. understand whether 100,000 or 1,000,000 or 10,000,000 dose stockpiles would be needed).
2. Use both deterministic and stochastic mathematical models to estimate vaccine demand curve needs across a number of different outbreak scenarios and different vaccination response

approaches (for Lassa, MERS and Nipah). This will then be matched with vaccine manufacturing and supply curve developed with Logistics supply chain modelling.

3. Develop a modelling approach that can be modified for use in estimating vaccine demand for other pathogens. The ideal approach will have clear parameters which can be easily modified by users to allow for sensitivity analyses. Use of a 'dashboard' or user interface front page will enable these types of inputs to be easily manipulated.
4. One option that we would like to see explored is whether use of Monte Carlo or other simulation approaches may help with determining potential ranges for the size of the stockpiles. Simulation approaches would also allow for modelling of best & worst case – scenarios for stockpile requirements.

3. Workplan

Deliverables:

All deliverables need to be completed by 31 August 2019.

1. High-level (order of magnitude) estimates for manufacturing and stockpiling of vaccine for Lassa, MERS, Nipah
2. Estimates for manufacturing and stockpiling needs of vaccine for Lassa, MERS, and Nipah in the context of epidemic preparedness / outbreak response (incorporating defined vaccination strategy)
3. Adaptable models for Lassa, MERS, and Nipah which can be updated as needed (e.g. with availability of new epidemiological data, changes to vaccination strategy, etc.)
4. A final project report detailing findings. Publication of results in peer-reviewer journals following project completion is also encouraged.

Tentative timeline (2019):

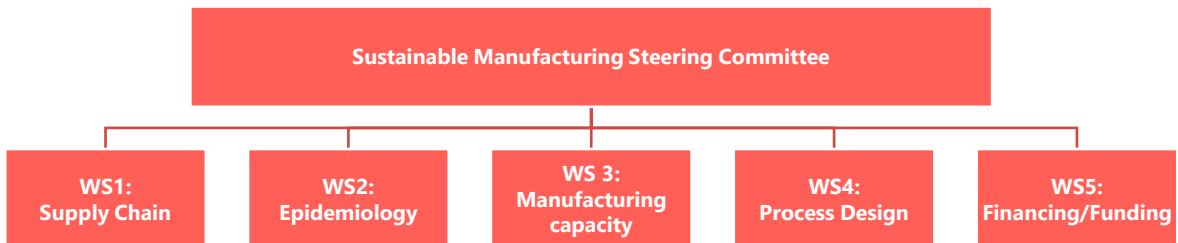
Timing of proposed activities is outlined below. While the timeline for this project is rather short, there is a strong likelihood that similar opportunities for collaboration will be available after September 2019.

Activity	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Advertisement of work, engagement of groups. Submission of concept notes, review and potential down-selection								
Project commencement, definition of assumptions and key parameters								
Order of magnitude modelling								
Vaccination strategy workshop (date TBC)								
Detailed demand curve estimations. Matching with stockpile and supply curve developed by the supply chain group								
Final estimates/results reported to SMSC								
CEPI Internal: Review of results and final preparation for Board meeting (paper, presentation) by SMSC								
CEPI Internal: SMSC presentation to CEPI Board								

4. Governance structure

Groups engaged to undertake these modelling exercises will work directly with the CEPI WS2 lead as a main point of contact (see figure below). Results from these exercises will inform the overall work of the SMSC.

Groups engaged to undertake these modelling exercises will be expected to work in collaboration with WS1 (supply chain modelling) as required. Groups will likely be asked to present their findings to the SMSC and may be required to present an overview of all findings (along with report) following project completion. Group leaders/representatives will also be asked to participate in a workshop focused on vaccination strategy in summer 2019 (date TBC).



5. How to submit a proposal

Develop a concept note (max. 3 pages) including:

1. Description of proposed plan/modelling approach that will address the four objectives described above.
2. Principle investigators and research staff background
3. Track record in epidemiological and disease outbreak modelling
4. Track record in vaccination strategy modelling
5. Experience (if any) in research/modelling of any CEPI target pathogens (Lassa, MERS Co-V, Nipah) and/or Pathogen X
6. Total cost / proposed budget

The concept notes will be evaluated based on the above criteria. Evaluation will be weighted (quality of items 1-5 weighted 90%, and cost 10%).

Fully completed CEPI tenderer declaration form and CEPI tenderer information sheet should be included in the submission.

You can find these forms by going to www.cepi.net/tenders and then filtering by category 'Supporting Documents'.

Note: Use of figures/tables and published references or reference to publicly available work is encouraged.

Concept notes are due to CEPI by **March 20, 2019 15:00 CET**. Concept notes should be submitted via email to tenders@cepi.net. We plan to notify applicants of the evaluation outcome before end of March.

Questions related to the project or the application process can be sent to epidemiology@cepi.net.