World Health Organization

WHO Research and Development Blueprint

Evaluation of ideas for potential platforms to support development and production of health technologies for priority infectious diseases with epidemic potential

August 2016

WHO/EMP/RHT/TSN/2016.02

Contents

Abbreviations & acronyms

ADEPT	Accelerated Defense against Emerging Pathogen Threats
ADP	Advanced Development Partnership
BNITM	Bernhard-Nocht-Institut für Tropenmedizin
BPO	biopreparedness organisation
BV	Bavarian Nordic A/S
CCHF	Crimean-Congo haemorrhagic fever
CE-IVD	in vitro diagnostics (CE-mark is a requirement for selling medical products and equipment in the EU)
CEPI	Coalition for Epidemic Preparedness Innovation
ChAd3	chimpanzee-based adenovirus vaccine type 3
DPP	Diagnostic Preparedness Platform
DZIF	German Centre for Infection Research
EID	epidemic-prone infectious disease
EUA	emergency use authorization
EUAL	Emergency Use Assessment and Listing Procedure
EVD	Ebola virus disease
FDA	U.S. Food and Drug Administration
GMP	good manufacturing practice
GSK	GlaxoSmithKline
INMI	Instituto Nazionale per le Malattie Infettive “Lazzaro Spallanzani”
IP	intellectual property
LICs	low-income countries
LMICs	low-middle income countries
MCMs	medical countermeasures
M&E	monitoring and evaluation
MoU	memorandum of understanding
MSF	Médecins Sans Frontières
MVA	modified vaccinia ankara
MVA-PP	modified vaccinia ankara Platform Partnership
NRAs	national regulatory authorities
PCR	polymerase chain reaction
PHE	Public Health England
POC	point-of-care
PQ	pre-qualification
RDT	rapid diagnostic test
R&D	research and development
RT-	real-time
USAMRIID	US Army Medical Research Institute of Infectious Diseases
VHF	viral haemorrhagic fever
VLP	virus like particle
WHO	World Health Organization

Executive Summary

On 21 July 2016, a 2nd Technical Workshop on R&D platform technologies was convened at the World Health Organization (WHO) headquarters in Geneva with the goal of presenting the 6 most meritorious proposals emerging from the **WHO public consultation[1] on platform technologies**, for consideration by interested WHO Member States and relevant R&D funders.

Launched by WHO in October 2015, this public consultation is one activity within the **WHO Research and Development (R&D) Blueprint[2]**, a global effort pioneered by WHO to increase R&D preparedness for future epidemics.

The focus of this 2nd technical workshop was on having concise technical presentations of the six final proposals while fostering an enabling environment for bilateral and/or multilateral discussions around potential future collaborations and/or support, between proponents and interested WHO members states and other organizations which fund R&D.

After a brief overview of the WHO R&D Blueprint, information was provided on the **Coalition for Epidemic Preparedness Innovation (CEPI)**; and following a summary of the public consultation process since its launch, the six finalists (3 vaccines, 1 diagnostics, 1 immunotherapy, 1 covering all product streams) presented their ideas in **open sessions**.

The groups presented to the Advisory Group, the WHO Secretariat, interested **member states**[3] (representatives of the Permanent Missions of Colombia, Germany, India, Korea, Norway, The Netherlands and The United Kingdom of Great Britain and Northern Ireland were present at the meeting), **potential funders** (CEPI and Wellcome Trust) and **other observers** (Médecins Sans Frontières - MSF). Each presentation was followed by a brief summary of the feedback given by the Advisory Group during their review process, and by an open discussion with participants.

The topics covered during the workshop included:

- Long term affordability, global access and intellectual property of proposed platform technologies
- Data transparency, social responsibility and the feasibility of the "no profit/ no loss" principle for the selected platforms and meaningful participation by entities in LMICs
- Linkages with other platforms technologies and availability to collaborate using technologies owned by another party
- Projected costs
- Engagement of the regulators and the role of WHO in the area of national regulatory authorities support
- Alignment of CEPI with the WHO Blueprint

The principle of "no profit/ no loss" and social responsibility and the subsequent approach of offering products at no cost to populations in need was agreed to be guiding the philosophy of the majority of the presenting groups, with the exception of those entities which, due to their structure and turnover, pointed to the fact that they needed to balance this principle with the requirement to be a sustainable and profitable business. As a follow-up to the process, WHO proactively engaged potential funders in order to advance funding for the most promising ideas.

[1] http://www.who.int/medicines/ebola-treatment/public_consult_platform-tech/en/
[2] http://www.who.int/csr/research-and-development/en/
[3] 16 Permanent Missions to the UN in Geneva were invited to the workshop: Argentina, Brazil, China, Colombia, France, Germany, India, Japan, Kingdom of Saudi Arabia, Norway, Republic of Korea, Russian Federation, South Africa, Switzerland, Thailand, The Netherlands.

Introduction: public consultation on platform technologies

Background

Current, market-driven models of medical R&D do not cater for the development of medical technologies for diseases that are sporadic or unpredictable, especially when they occur in countries with low investment in health infrastructure and delivery. The challenge becomes even greater when faced with a wholly new disease such as SARS, MERS and Nipah virus infection, which are just three examples of diseases that have emerged at the human-animal interface in the last two decades. The international community needs to invest to improve our ability to respond to new threats and to prepare itself with a novel R&D paradigm to address future epidemics.

The World Health Organization (WHO) invited ideas through a public consultation process on how to improve research and development readiness against priority infectious disease threats through establishment of a set of technology development and production platforms.

Proposals were requested for flexible development and production platform technologies to manufacture candidate products for evaluation in Phase 1 clinical trials before any confirmed epidemic threat, as well as for Phase 2 and 3 clinical evaluations during a potential epidemic. The scope of health products which was considered included vaccines, therapeutics (drugs and blood products), and diagnostics against priority pathogens, defined by WHO.

WHO stipulated that candidate products developed through this mechanism and that were found to have a favourable benefit-risk profile should be available in sufficient quantity to enable potential use in disease control efforts. Therefore the proposals were requested to go beyond preparing materials for Phase 1 clinical studies only, and to include strategies to assure readiness for production at an appropriate scale to contribute to epidemic control.

Candidate products developed through this process should be affordable for use in populations in which they are tested and/or needed. The priority pathogens may affect any country but options to address affordability in low and middle income countries (LMICs) needed to be included in each proposal.

The manufacturing process must be capable of meeting WHO norms and standards, where they exist, and WHO-requirements for emergency listing of a product or, where appropriate, prequalification. Proposals that would result in a strategic geographic distribution of platform production sites, in countries with oversight by a WHO-recognized National Regulatory Authority, were especially welcomed.

Proposals received were evaluated in a first round by a panel of experts convened by the WHO. Successful Round 1 applicants were invited to develop in Round 2 an operational and costed plan, with agreed milestones. WHO reserved the right to suggest the grouping of complementary proposals into a larger collaborative project. Round 2 plans was likewise evaluated by a panel of experts, and the best proposals were presented to potential funders and interested Member States for their consideration during the 21 July meeting.

The public consultation on platform ideas did not result in funds being awarded. Rather, it enabled a selection of appropriate proposals to be presented to potential funders for decision-making. Proposers were therefore expected to include a justified budget needed to operationalize the plans contained in the proposal. The proposals needed also to explain what internal resources would be used and what external funding would be required to implement the platform concepts being proposed.

A key goal of the process was to encourage the development of options that include meaningful participation by entities in LMICs. The strength of the collaborations included in the application was one of the evaluation parameters. The scope of the collaborations was not pre-specified by WHO, but creative ideas were welcomed.

Session 1: CONTEXT

A research and development Blueprint for action to prevent epidemics

Dr Marie-Paule Kieny, Assistant Director-General, Health Systems and Innovation, WHO HQ, Geneva Switzerland. [presentation available electronically]

At the request of its **194 Member States in May 2015**, WHO has convened a broad global coalition of experts to develop a blueprint and a platform for accelerated R&D for infectious diseases for which few medical countermeasures currently exist[4]. WHO experts teams, an international Scientific Advisory Group and partners engaged through global forums have been collaborating to formulate this novel R&D model.

The **R&D Blueprint** is a global strategy and preparedness plan that allows the rapid activation of R&D activities during epidemics. Its aim is to fast-track the availability of effective tests, vaccines and medicines that can be used to save lives and avert large scale crisis. With WHO as convener, the broad global coalition of experts who have contributed to the Blueprint come from several medical, scientific and regulatory backgrounds. WHO Member States welcomed the development of the Blueprint at the **World Health Assembly in May 2016**.

The vision the Blueprint is a world in which our R&D response to PHEIC[5] caused by emerging pathogens is faster and more effective than ever before and in which the global community is able to ensure a continuous effort aiming not only to accelerate the results of research but also to adapt to the scientific, logistical and social challenges that are specific to epidemics.

The West Africa Ebola epidemic saw the mobilization of numerous actors globally to find medical technologies to address the disease and save lives. Some of those efforts brought results, such as the VSV-EBOV vaccine, which so far has shown to be highly effective, while on the other hand large gaps were apparent in the way the global scientific and R&D community organises itself during an epidemic. The Blueprint coalition has considered those lessons gained and has developed a plan that leverages the successes and addresses the gaps so that next time the world can be prepared.

Four principles have guided the elaboration of the Blueprint plan:

1	2	3	4
An inclusive process with a clear mandate and defined milestones	Building on the efforts of others in the community	A collaborative effort with the Member States in the affected countries at its core	Driven by scientific knowledge

The Blueprint is both a convening mechanism and an instrument to articulate technical guidance for R&D preparedness, especially in the area of coordination (e.g. avoiding unnecessary duplication, addressing priorities), which can be implemented effectively through appropriate incentives and other measures.

In parallel to the Emergency Response Reform, WHO aims to develop innovative ways of promoting R&D preparedness for priority pathogens with a focus on LMICs. The R&D Blueprint seeks to create an enabling environment through which the R&D community, through increased funding, data sharing and partnerships, can drive change in the public health landscape to provide an elevated level of global impact.

[4] For further details please visit http://www.who.int/csr/research-and-development/blueprint/en/
[5] Public Health Emergency of International Concern (PHEIC)

Figure one shows the **three approaches** that are currently being used to improve preparedness under the R&D Blueprint. These 3 approaches are aligned with the lessons learned during the 2014–2016 Ebola epidemic and the recommendations of the various reviews on the Ebola epidemic conducted to date.

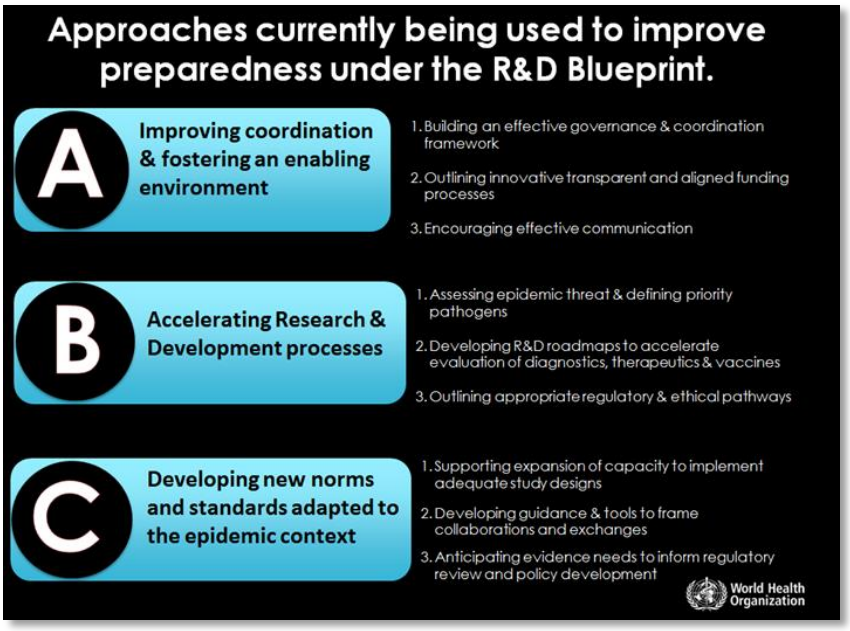

Figure 1 Approaches currently being used to improve preparedness under the R&D Blueprint

The first Blueprint **Deliverables**[6] were described in the areas of:

- Prioritization of key pathogens
- Building an effective governance and coordination framework
- Increasing investment into R&D
- Data sharing
- Development of R&D Roadmaps for priority pathogens
- Monitoring and evaluation
- Platform Technologies

A number of new initiatives have been put in place or are under discussion by international stakeholders to increase R&D preparedness for severe and emerging infectious disease threats. These could complement the efforts of the Blueprint in ensuring coordination and alignment of efforts. One example of such initiatives is the **Coalition for Epidemic Preparedness Innovation (CEPI)**.