A forum for discussion on Sarbecovirus vaccines development? What are the key issues to discuss next?

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WHO Health Emergencies programme
WHO R&D Blueprint for epidemics

At the request of its 194 Member States in May 2015, the World Health Organization convened a broad network of experts to develop an R&D Blueprint for Epidemics.

A global strategy and preparedness plan was developed to allow for the rapid activation of research before and during epidemics.
Strengthening global research capability for future pandemics

“...The benefit-cost ratio of ensuring that everybody in the world has vaccines is enormous: it would cost us a few tens of billions of dollars to ensure that everybody has the vaccines. The benefit would be in the trillions of dollars.”

Professor Joseph E. Stiglitz, Nobel Laureate. Columbia University
## WHO R&D Blueprint for action during epidemics

### Progress across key disease pathogens

<table>
<thead>
<tr>
<th>DISEASE</th>
<th>Generic methodology</th>
<th>CCHF</th>
<th>Ebola &amp; Merburg</th>
<th>Lassa fever</th>
<th>MERS-CoV &amp; SARS</th>
<th>Nipah &amp; Hendra-viruses</th>
<th>Rift valley fever</th>
<th>Zika virus</th>
<th>Plague</th>
<th>Chikungunya</th>
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- ✓: In progress
- ✓: Done
- G: Generic
- LST: Large Simple Trials

**Accumulating evidence during outbreaks and hybrid trial designs**

25th March 2022
Research centred in equitable access

The pandemic response has been a moment for research but the benefits have not been available to everyone. Equity — and access for those at highest risk — must be central in the next research phase.

This chapter assesses six key R&D areas, highlighting knowledge gaps and research priorities for the future.

“All pandemics start within communities and with people and that is where we must refocus our attention and demonstrate by our actions that we are not just going to do the science but we are going to make sure that science is available to everybody.”

Sir Jeremy Farrar, Director, Wellcome Trust

“Aside from warfare the greatest threat to the human race is pandemic disease. These last two years in vaccinology have been the best since the polio days because we have multiple strategies for developing vaccines. A universal coronavirus vaccine that will broadly protect against all beta coronaviruses ... is not simply a dream.”

Stanley Plotkin, Emeritus Professor of Paediatrics, University of Pennsylvania
COVID-19 vaccines: research priorities

Summary

Important and critical research carried out by WHO and the global research community has helped advance our understanding about safe and effective COVID-19 vaccines with a significant number of vaccines having been approved in record time. This has become possible thanks to coordinated efforts in global research and development including evaluation of candidate vaccines and their potential efficacy, effectiveness, and safety.

To date there are 33 approved vaccines and 197 countries and territories with access to these vaccines. Ten vaccines have received an Emergency Use Listing (EUL) approval by WHO, with an additional 184 candidate vaccines in development and more than 600 clinical trials conducted in over 70 countries.

Many trials are occurring in places where the Omicron variant wave has reached its peak. Animal model research played a significant role in the characterization of the pathogenesis, transmission and immunology of SARS-CoV-2 variants of concern (VOCs). Global effort has been directed to engineer animal models that would mimic these important disease drivers and research groups have shared their experiences and data on the development of immune assays, including the International Standard (IS) for neutralizing assays.

Although it is possible that additional doses of currently approved vaccines may raise antibody titres temporarily against the Omicron and other variants, it may take months to protect large numbers of unvaccinated people.

Several knowledge gaps remain

- To improve our understanding of the source of VOCs in order to be better prepared for future variants
- To better understand how the Omicron variants are transmitted
- To collect additional epidemiological data on vaccine effectiveness against Omicron and other VOCs
- To collect additional evidence on the severity of Omicron disease (and other VOCs) in different population groups (vaccinated, unvaccinated, previously infected, hybrid immunity)

Critical research priorities

- There is an urgent need for additional vaccines. Many current approaches are highly promising and feasible; however, the speed at which they are developed depends on resource availability. Novel platforms may also require support for significant manufacturing development.
- A framework that could be used for variant-specific modifications of current vaccines, new variant-specific vaccines or pan-sarbecovirus vaccines is needed. WHO is developing such a framework to contribute to increased supply of vaccines that meet WHO TPP criteria for effectiveness against severe disease. This may also help guide researchers and developers with the additional data needed for the assessment of new vaccines.
- Increased standardization of assays and readouts is essential: more information about mechanisms of protection (e.g. cell-mediated immunity - CMI, non-neutralizing responses, mucosal immunity especially against severe disease; larger sample size studies; animal studies).
- There is a need for the enhanced sharing of reagents, particularly convalescent Omicron and VOC serum.
- Assessment of Omicron-specific responses to more vaccines including variant-specific vaccines is critical.
- Generation of data that permits connecting laboratory results on variants and immune evasion to clinical outcomes is needed.
- Optimizing vaccine schedules is critical.
- Research on a range of sarbecoviruses that may protect against emerging variants and other coronaviruses must be supported.

To help deliver these research priorities WHO and its partners need to

- update the TPP for COVID-19 vaccines and continue to facilitate strategic research collaboration.
- coordinate large simple platform trials – such as the Solidarity Trial Vaccines (STV). The STV will continue to contribute to evaluating additional new candidate vaccines. The proposed framework for evaluating new vaccines will be published and novel approaches to evaluate vaccines will be explored.
- Map all pre-clinical and clinical COVID-19 vaccines candidates. This process is in development worldwide through the COVID-19 candidate vaccine tracker and landscape. This tool which provides an overview of vaccine technologies in development can potentially benefit specific populations, improve access and availability, and target specific VOCs.
Advancing the development of pan-sarbecovirus vaccines

Providing a forum to share data/progress to accelerate development and evaluation of candidate vaccines.

In addition, the principles of reduction, refinement and replacement could be addressed by international scientific coordination.
Advancing the development of pan-sarbecovirus vaccines

Regular interactions

- Review progress
- Identify bottlenecks
- Identify gaps in knowledge and promote data sharing across various groups

WHO’s aim is to contribute to accelerate the candidate vaccine assessment pathway and to contribute to highlight how global resources should be applied to their development as part of global research pandemic preparedness.
Advancing the development of pan-sarbecovirus vaccines

What are the key issues to discuss next?

- Knowledge gaps
- Coordination
- Support needed
Thank you

Download the Achievement Report

How global research can end this pandemic and tackle future ones

Download the Meeting Report

https://www.who.int/teams/blueprint/covid-19