COVID-19 research: Vaccines
Achievements, lessons learned and next steps

Global research and Innovation Forum
24th-25th February 2022
Where we are now:

**Many vaccines have been evaluated and are available in some places**

The “omicron peak” has passed in many places

<table>
<thead>
<tr>
<th><strong>By the Numbers</strong></th>
<th>33</th>
<th>197</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved Vaccines</td>
<td>184</td>
<td>Vaccine Candidates</td>
<td>633</td>
</tr>
<tr>
<td>Countries with Approved Vaccines</td>
<td>Vaccine Trials</td>
<td>Countries with Vaccine Trials</td>
<td></td>
</tr>
</tbody>
</table>

Global research and Innovation Forum
24th-25th February 2022
Where we are now:

**Substantial worldwide inequity in vaccine availability: no clear end in sight**

**Continued evolution of the virus: high transmissibility and reduced neutralizing immune responses vs. omicron**

**Concern about new variants**

**Concern about future pandemics**
Key tools and inputs:

Assays & standards (including the international standard for neutralizing assays and WHO Biohub)

Animal models

Clinical and epidemiological data
What are the vaccine-related public health needs?

More vaccines that can be deployed around the world

Vaccines that are variant-resistant (or ideally, pan-sarbecovirus vaccines)

Vaccines with greater durability of effect
Recent consultations

Developing a framework for evaluating new COVID-19 vaccines 23 February

What recent evidence do we have that omicron is evading immunity and what are the implications? 14 February

Why do we need a pan-sarbecovirus vaccine? 28 January

What evidence do we have that omicron is evading immunity and what are the implications? 16 December

How can vaccine research further contribute to achieve the control of the pandemic everywhere? 6 December
What are the research priorities?

Improved understanding of mechanisms of protection, especially against severe disease

Evaluating immune evasion, transmissibility, virulence of new variants

Immune imprinting

Improved and standardized (or at least harmonized) assays to evaluate non-neutralizing protective responses (e.g., Fc dependent humoral responses, cell mediated responses, memory B cells, mucosal)

Connection of lab results to clinical outcomes
What are the research priorities?

Clarity about the best regimens

More data on non-mRNA, non-adenovirus vectored vaccines

Finding ways to broaden immune responses to yield variant-resistant vaccines

Improved evaluation of vaccine effectiveness, severity of disease caused by variants, durability of effectiveness

Develop and implement new approaches to evaluate vaccine effectiveness
How will we achieve these priorities?

Updated TPP
Continued facilitation of research collaboration
Solidarity Vaccines Trial
Framework for evaluating new vaccines
Other novel approaches to evaluate vaccines
<table>
<thead>
<tr>
<th>Key questions</th>
<th>Status of evidence in relation to key questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. What is the effectiveness or efficacy of the comparator vs. severe disease caused by circulating VOC, relative to TPP criteria?</strong></td>
<td>Scenario 1: Meets preferred TPP criteria (90%)</td>
</tr>
<tr>
<td><strong>2. Is the predicted/likely non-neutralizing response using the new vaccine likely to be similarly proportional to the humoral response vs. the comparator vaccine?</strong></td>
<td>Scenario 1: Similar (e.g., same platform) or better</td>
</tr>
<tr>
<td><strong>3. What is the breadth of antigenic composition relative to proposed comparator that is already EUL-authorized?</strong></td>
<td>Scenario 1: Similar or better</td>
</tr>
<tr>
<td><strong>What additional data do we need to authorize the new vaccine?</strong></td>
<td>Nabs to circulating variants</td>
</tr>
</tbody>
</table>

**Comments on vaccine effectiveness**
- Duration of effectiveness may not exceed that of comparator vaccine unless CMI response is better
- Low CMI may lead to short duration of effectiveness

VACCINES THAT DON'T MEET ANY OF THESE CRITERIA WOULD NEED TO BE TESTED IN CLINICAL TRIALS
Research progress depends on:

Information sharing
Reagent sharing
Resources
As we address the current pandemic, we learn for the future

The importance of preparation

The importance of achieving both speed and rigor

The importance of collaboration

The importance of global equity

The importance of sustained effort
Thankyou