COVID-19 research: Vaccines

Achievements, lessons learned and next steps

Global research and Innovation Forum
24th-25th February 2022

World Health Organization

R&DBlueprint
Powering research
to prevent epidemics

Where we are now:

Many vaccines have been evaluated and are available in some places

The “omicron peak” has passed in many places

By the Numbers

33
Approved Vaccines

197
Countries with Approved Vaccines

10
WHO EUL Vaccines

184
Vaccine Candidates

633
Vaccine Trials

72
Countries with Vaccine Trials

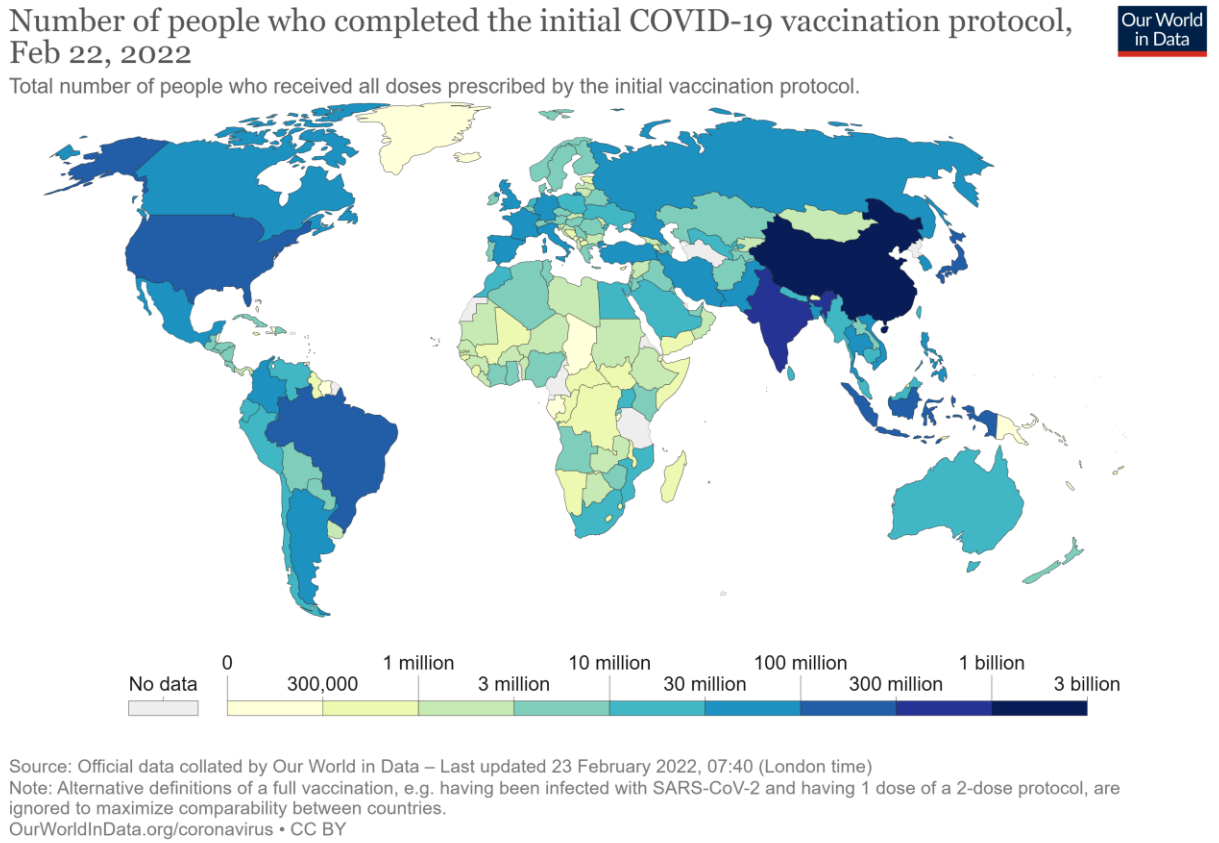
Where we are now:

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

Key questions	Status of evidence in relation to key questions				
	Scenario 1	**Scenario 2**	**Scenario 3**	**Scenario 4**	**Scenario 5**
1. What is the effectiveness or efficacy of the comparator vs. severe disease caused by circulating VOC, relative to TPP criteria?	Meets preferred TPP criteria (90%)	Meets acceptable TPP criteria (70-80%)	Comparator authorized but no longer meets TPP criteria (<70%)	As in Scenarios 1,2 or 3	Meets preferred TPP criteria (90%)
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?	Similar (e.g., same platform) or better	Similar (e.g., same platform) or better	Similar or better	Lower	Clearly better CMI or mucosal response vs circulating VOC plus supportive animal data
3. What is the breadth of antigenic composition relative to proposed comparator that is already EUL-authorized?	Similar or better	Similar or better	Similar or better	Lower	Lower
	⌄⌄⌄	⌄⌄⌄	⌄⌄⌄	⌄⌄⌄	⌄⌄⌄
What additional data do we need to authorize the new vaccine?	NI Nabs to circulating variants	Unambiguous superiority Nabs to circulating variants	Super-Superiority Nabs to circulating variants	*Results as in Scenarios 1, 2, or 3* PLUS Additional clinical data*	Additional clinical data (e.g. in deployment studies or human challenge data if feasible)
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

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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

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