Actions taken towards developing accessible vaccines

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Disclosures:

• Dr. Kim is a consultant for SK biosciences

• IVI works on the Inovio, Genexine, Cellid, Sanofi, SK bioscience, Sinopharm, and Clover vaccines in human clinical trials
Current and future COVID-19 vaccines

<table>
<thead>
<tr>
<th>Wave 1: Approved ‘prototype’</th>
<th>Wave 1a: Ph3 VE data expected</th>
<th>Wave 2: VE: Immunobridging?</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRNA</td>
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<tr>
<td>• BNT/Pfizer, Germany/USA</td>
<td>• CureVac, Germany</td>
<td>• SP/TBio, USA/France</td>
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<tr>
<td>• Moderna, USA</td>
<td></td>
<td>• Walvax, China</td>
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<tr>
<td>• AZ/Oxford, UK</td>
<td></td>
<td>• IC, UK [saRNA]</td>
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<tr>
<td>• J&amp;J, USA</td>
<td></td>
<td>• Gennova, India [saRNA]</td>
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<tr>
<td>• CanSino, China</td>
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<tr>
<td>• Gamaleya (Sputnik V), Russia</td>
<td></td>
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<tr>
<td>Viral vector</td>
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<tr>
<td>• Novavax, USA</td>
<td></td>
<td>• Altimmune, USA</td>
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<tr>
<td>Protein / adjuvant</td>
<td></td>
<td>• Grittstone, USA</td>
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<tr>
<td>• Sinovac, China</td>
<td>• Clover, China</td>
<td></td>
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<tr>
<td>• Sinopharm (BBIBP), China</td>
<td>• BioE*, India</td>
<td></td>
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<tr>
<td>• Bharat, India</td>
<td>• Medicago, Canada</td>
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<tr>
<td>Whole Inactivated virion</td>
<td>• IMB, China</td>
<td>• SK Bio*, SK</td>
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<td></td>
<td></td>
<td>• SP/GSK, France/UK</td>
</tr>
<tr>
<td>Other</td>
<td>• Valneva, Austria</td>
<td>• COVAXX, USA</td>
</tr>
</tbody>
</table>


So, lots of safe and efficacious vaccines and more on the way
And in 2022, companies project that they will make 30 billion doses.
But, in October 2021, we are here

15 Oct 2021

- 47.4% of the world has received at least 1 dose
- 6.6 billion doses given
- 21.4 million doses/day given
- ONLY 2.7% of people in LIC have received 1 dose
COVAX: A bridge to near concurrent (if partial) access?

189 countries have joined COVAX
- Organized by CEPI, GAVI, WHO
- 92 LMIC could be supported by the COVAX AMC
- 2 billion doses of WHO PQ’d vaccines by end of 2021
- 5 billion doses secured
- Roughly 20%- > 30% of need

Or was COVAX a bridge too far?
- 365M doses to 144 countries (Gavi, 17 Oct 21)

• But 85% of vaccine doses have been used by high and upper middle income countries

A FAILURE OF EQUITY AND ACCESS HAS 3 TERRIBLE CONSEQUENCES
• Humanitarian: Without equity in the first 2 billion doses global COVID-19 deaths will **double**
• Economic: Without equity, 49% of the global economic costs of the pandemic in 2021 ($4-5 trillion) are borne by the advanced economies (2021: NBER, Brookings Institute, ONI)
• Biological: Failure to control pandemic generates mutants that will undermine the efficacy of vaccines
Vaccine access isn’t fair, and it has never been fair

Decades pass before vaccination reaches those in need
Vaccine manufacturers are using other manufacturers

Contracting/licensing agreements make billions of doses: current production ~1.5 billion doses per month
As we think about building back better

- Manufacturers have contracted or licensed out hundreds of millions of doses – to other manufacturers capable of making high quality vaccines
  - Regulatory authority ML3 or “functional” – timelines?
  - Local/regional manufacturing – timelines, sustainability?
  - Technology transfer?
  - Global supply chain bottlenecks?
  - IP issues?
- Implementation of vaccination
- Vaccine adverse events reporting systems

We might in 2022 be able to count >70% globally who are fully vaccinated
- But is that enough?
- What about booster doses?
- What about the next Variant of Concern – or the next coronavirus of concern?

Have we done enough today to be ready for a long pandemic? Or have we learned enough to prevent the next pandemic?
IVI is an International Organization dedicated to Global Health

Global Vaccine Research Institute

- HQ and labs at Seoul National University
- Field programs in 28+ countries: Asia, Africa, Latin America
- 23 nationalities in workforce of 190

OECD-recognized International Organization (not for profit)

- UNDP initiative
- First international organization in Korea (1997)
- 36 countries and WHO as state parties (Madagascar, Argentina, UAE, Colombia, and Spain pending final submission to UN)

Thank you for your attention!