

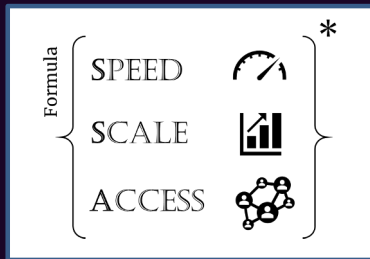
# COVID vaccines development & manufacturing

DCVMN 21<sup>st</sup> Annual General Meeting  
4th November 2020

Richard Hatchett, MD  
CEO, CEPI

# CEPI has invested >\$1.5bn in the COVAX R&D&M portfolio

- Portfolio objectives are to rapidly deliver sufficient vaccine for global use in emergency conditions at a scale, with a target to help COVAX secure 2 billion vaccine doses by end of 2021








- Current R&D portfolio has 9 candidate vaccines, with others in due diligence / negotiation
- Clear Go / No Go criteria to determine further investment
- “Wave 2” portfolio of translational candidates being established with investment from CEPI / BMGF / others
- Enabling science projects are funded to accelerate vaccine development

# COVAX: an end-to-end solution

**Bold ideas and brilliant innovation for the worst global health crisis in 100 years**




# COVID-19 Vx landscape - 44 candidates in human clinical trials

Technology platform	Phase I	Phase I/II	Phase II	Phase IIb/III and III
 <b>Viral vectors</b>	Shenzhen GIMI aAPC ReiThera GRAd-COV2 Merck / Themis TMV-083 Wantai / Xiamen DelNS1 Vaxart VXA-CoV2-1 LMU Munich MVA-SARS-2-S ImmunityBio / NantKwest nAd5-S-Fusion	Shenzhen GIMI LV-SMENP-DC		CanSino Ad5-nCoV Gamaleya Gam-COVID-Vac AstraZeneca ChAdOx1-S Janssen Ad26.COV2-S
 <b>mRNA</b>	Walvax Biotech ARCoV	Imperial LNP-nCoVsaRNA Arcturus ARCT-021	CureVac CVnCoV	Pfizer / BioNTech BNT162 Moderna mRNA-1273
 <b>DNA</b>		Genexine GX-19 Osaka / AnGes AG0301 / AG0302 Inovio INO-4800 Zydus Cadila ZyCoV-D		
 <b>Protein-based</b>	Medicago / GSK VLP CSL / Queensland West China Hospital / U. of Sichuan Covaxx UB-612 Vaxine / Medytox COVAX-19 Clover SCB-2019 Medigen MVC-COV1901	FBRI SRC EpiVacCorona Finlay FINLAY-FR-1 SpyBiotech RBD-HBsAg VLP Sanofi / GSK recombinant	Anhui Zhifei RBD-Dimer	Novavax NVX-CoV2373
 <b>Inactivated</b>	Shenzhen Kangtai	Bharat Biotech COVAXIN RIBSP QAZCOVID-IN Inst. of Medical Biology / CAMS		Sinopharm / WIBP Sinopharm / BIBP BBIBP-CorV Sinovac / Butantan CoronaVac

1. For advanced purchase agreement (APA); 2. For tech transfer, scale-out and reservation fees

Source: CEPI Vx landscape

COVAX  COVAX MoU signed<sup>1</sup>  COVAX deal signed<sup>1</sup>  CEPI agreement signed<sup>2</sup>  COVAX R&D candidate  CEPI funded candidate for R&D outside COVAX R&D portfolio

# COVAX R&D portfolio – 9 assets, 8 in clinical trials

	DNA / mRNA			Viral vectors			Protein-based		
Candidate	Inovio INO-4800	Moderna mRNA-1273	CureVac CVnCoV	Merck / Themis V591	AstraZeneca ChAdOx1-S	U. of Hong Kong	Novavax NVX- CoV2373	Clover SCB-2019	CSL / Queensland
Location	USA	USA	Germany	USA / Austria	UK	China	USA	China	Australia
Antigen / adjuvant	Full-length S protein	Full-length S protein	Full-length S protein	Full-length S protein	Full-length S protein	Receptor Binding Domain / AS03	Full-length S protein / saponin-based Matrix-M	Full-length S protein/AS03 or CPG1018	Full-length S protein / MF59 or AS03 or CPG1018
Current phase	Phase I/II	Phase III	Phase II	Phase I	Phase III	Pre-clinical	Phase III	Phase I	Phase I



## Speed



## Scale



## Access

# Building Capacity at Risk – Drug substance

The most productive platforms will be scaled-out to multiple countries/regions  
(Expression of Interest for expanding capacity)

CEPI executed a global capacity survey (EOI) and found enough capacity for >10BN doses

52 Manufacturers Reviewed

20 Groups Contacted

1 Reservation agreement signed  
with SK Bio in Korea

6 deals signed  
between manufacturers and vaccine  
developers based upon CEPI introduction

- Scale-up at risk (before clinical proof of concept)
- Scale-out at risk
- Final dose will not be known until Q3-Q4 2020(some even later)
- Bulk vaccine is stockpiled in anticipation of dose level definition
- The impact of the dose and yield information can change predicted outcome by >10-fold.

CEPI



# Building Capacity at Risk – Drug product

Drug Product capacity and vial procured in advance of knowing which products advance

CEPI executed a global capacity survey (EOI) and found capacity for >2BN doses of vaccine

89 Manufacturers Reviewed

23 Groups Contacted

7 Companies shortlisted

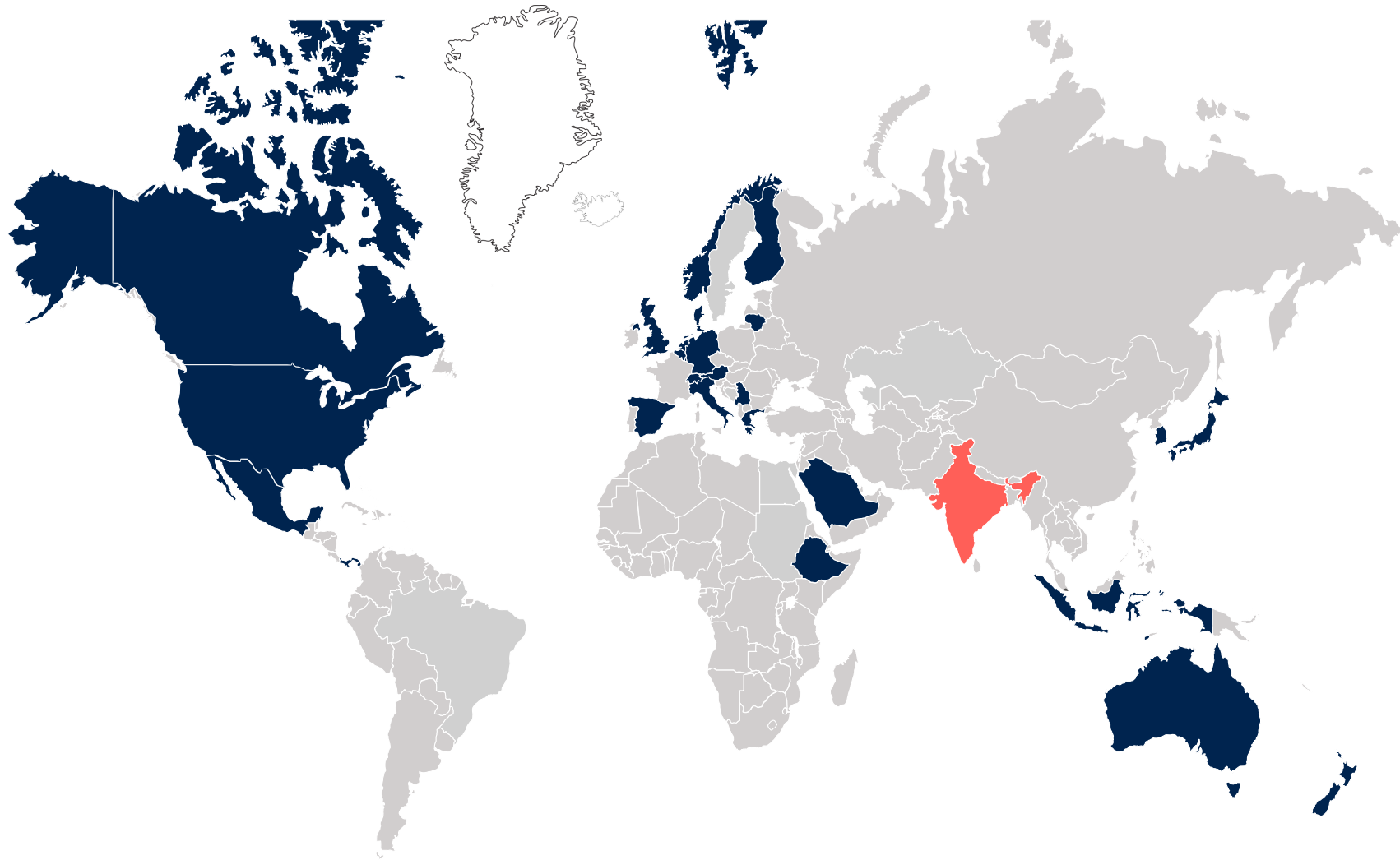
2 Reservation agreements  
signed with GC Pharma in Skorea  
and BioFabri in Spain

- Vials secured at risk
- DP strategy developed
- Scale-up at risk (before clinical proof of concept)
- Scale-out at risk
- Each product is scaled-out in different countries to expand capacity

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## PART 2 – future trends we are seeing





# Preparing for the next pandemic

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COVID-19 provides an opportunity to think about how we systematically reduce the risk of naturally occurring threats



Trends are converging in a way that could make the world better prepared for the next pandemic:

- **Political will** to invest in health security
- **Revolution in vaccinology**, with multiple new platforms approved
- **Global desire** to reduce pandemic risk



Viruses are collective, transnational threats. They should be tackled collaboratively in future

# Expanding the R&D agenda

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An **expanded R&D agenda** focused on global risk reduction.

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**Rapid response platforms** – multiple platforms will be validated for the first time during this pandemic, and ready to use

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**Candidate vaccines against every class of viral threat** – experience of developing MERS vaccines sped up work on COVID-19

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**Validating platforms across multiple pathogens** will considerably accelerate vaccine development

# Collaboration opportunities with DCVMs in COVID-19 response and beyond

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We still have major gaps in our EoI when it comes to understanding the capacity of the DCVMN and would benefit from having the individual organizations share their data for both DS (by platform – recombinant protein, LVV (adherent and suspension), RNA, DNA) and DP



Leveraging organizations that already work through WHO PQ for supplying the Gavi AMC92

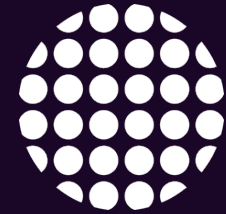
# Vision for the future



COVID-19 can inspire us to assemble a global network to combat other epidemic disease threats



COVAX can be a model for a multilateral, multisectoral collaborative approach to global risk reduction



Requires recognition that national health security and global health security are interdependent

**Act Now. Act Together. Act boldly to end Covid-19.**

CEPI

