

*WORLD BANK MENA COVID-19 VACCINATION WORKSHOP SERIES*

*Workshop 9-Deployment Of Multiple COVID-19 Vaccines*

*Practical Implications For Consideration*

Tuesday . March 23 . 2021 | 8:00 . 9:30 AM EST

## ABOUT THE WORKSHOP

Given the limited supply, countries need to deploy different COVID-19 vaccines - either simultaneously or consequently - to meet the demand. However, a diverse vaccine portfolio can have various implementation challenges which need to be considered. This workshop will help MENA countries think through the key strategic issues in the deployment of multiple vaccines.

# AGENDA

1. 8:00-8:05 am- Welcome remarks  
Rekha Menon, Practice Manager. MENA HNP, World Bank.
2. 8:05-8:20 am- Key strategic choices in deployment of multiple COVID-19 vaccines  
Emily Serazin, Managing Director and Partner, BCG.
3. 8:20-8:35 am-Logistic implications and options  
Prashant Yadav, Senior Fellow, Center for Global Development
4. 8:35-9:25 am- Panel discussion and Q&A .
  - Dr. Sami Almudarra (Epidemiologist and Public Health Consultant, MoH, KSA)
  - Paula Daza (Public Health Under-Secretary, MoH, Chile)
  - Prashant Yadav ( Senior Fellow, Center for Global Development)
  - Emily Serazin (Managing Director and Partner, BCG)



**Moderator**

Jorge Coarasa

Senior Economist, MENA HNP, World  
Bank



**Welcome Remarks**  
Rekha Menon, Practice Manager.  
MENA HNP, World Bank.



## Key strategic choices in deployment of multiple COVID-19 vaccines

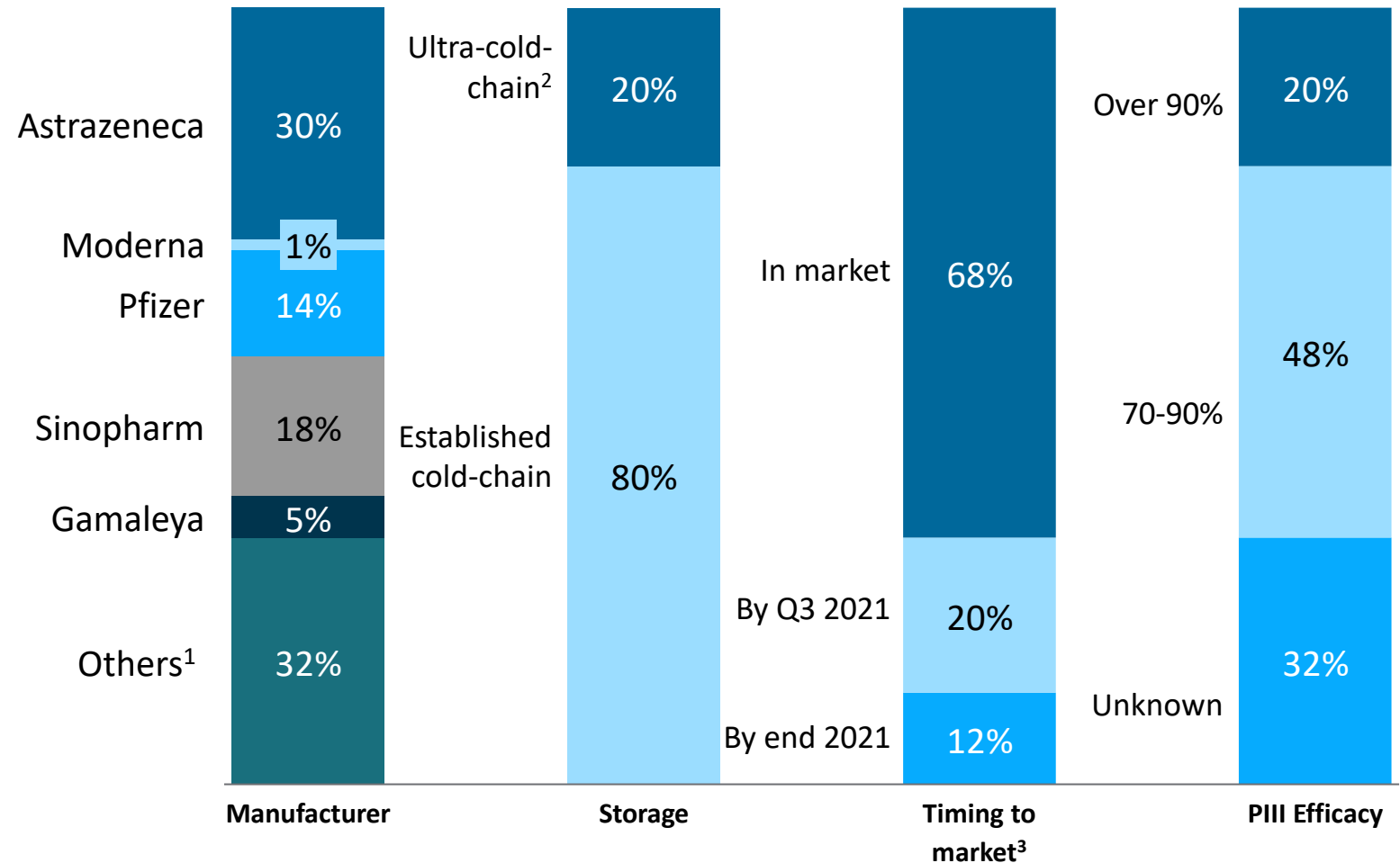
Emily Serazin, Managing Director and  
Partner, BCG.

# Profile of emerging COVID-19 Vaccines in MENA

As of February 1



MENA countries have a diverse vaccine portfolio



1. Includes phase III vaccines, pre-purchased by COVAX and AU (e.g., J&J, Sanofi/GSK, Novavax, COVAX R&D); 2. Ultra-cold-chain indicates required storage at or below -10 Celsius; 3. 66% represents the 10 approved vaccines. 21% represents Janssen & Novavax vaccines, expected to be approved by H2 2021. 13% represents Sanofi/GSK and COVAX R&D vaccines, expected to be approved by end 2021 Note: COVAX and AU vaccine portfolio was evenly distributed to relevant MENA countries  
Source: UNICEF, Reuters, BCG analysis

Portfolio  
diversification  
provides supply  
security but  
increases  
distribution  
complexity



## Procurement

Procure from multiple suppliers to increase supply availability and hedge against risk (e.g. reduced efficacy due to variants)



## Distribution

Minimize complexity where possible (e.g. fewer sites, avoid over-prioritization of sub-groups) to improve speed of distribution



# Countries must address management of diverse vaccine portfolio at multiple levels



## Regulatory approval

What are global and local regulatory requirements and policy recommendations?



## Target population

Should different vaccines be prioritized for different sub-populations?



## Supply chain

Should different vaccines be prioritized for different channels?



## Point of Administration

How to manage different vaccines at the point of administration?



## Public communication

How to communicate the similarities and differences across vaccines to general public?

# Twelve vaccines have been approved for full, emergency, or limited use with one vaccine pending approval

As of 8 March

	Earliest approval for limited or emergency use												Countries providing approval <sup>3</sup> ( <i>not comprehensive</i> )	Total no.
	2020						2021							
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May		
CanSino Biologics (China)	☆												China, Mexico, Pakistan	3
Sinovac (China)		☆											China and countries in LATAM, Middle East	12
Gamaleya "Sputnik V" (Russia)			☆										Russia and countries in Asia, Africa, LATAM	42
WIBP <sup>1</sup> Sinopharm (China)				☆									China and UAE	2
BIBP <sup>2</sup> and Sinopharm (China)				☆									China and countries in Middle East, Asia	12
Vektor (Russia)					☆								Russia	1
BioNTech (Germ.), Pfizer (US)							☆						Countries in most regions of the world	60
Moderna, NIH (US)							☆						North America and countries in Europe	34
Oxford Uni., AstraZeneca (UK)							☆						Countries in most regions of the world	44 <sup>4</sup>
Bharat Biotech (India)								☆					India and Iran	2
CoviVac (Russia)									☆				Russia	1
Janssen (J&J) (US)									☆				US, Bahrain, Canada exp. from March 11 <sup>th</sup> for EMA <sup>5</sup>	3
Novavax (US)										☆➔			<i>Pending approval in UK, rolling review in EMA</i>	0
Curevac (Germany)												☆➔	<i>Rolling review in EMA</i>	0

☆ Approved for limited or emergency use












☆➔ Estimated timeline for approval

1. Wuhan Institute of Biological Products 2. Beijing Institute of Biological Products 3. Emergency/limited use and licensure 4. Only includes vaccines manufactured by AstraZeneca 5. European Medicine Agency Source: UNICEF COVID-19 Vaccine Market Dashboard; NYT; Brokers

# 3 vaccines with WHO EUL/PQ, with assessment in progress for several others

As of 17 March

Status of COVID-19 Vaccines within WHO EUL/PQ evaluation process

	Manufacturer	Name of Vaccine	NRA of Record	Platform	EOI accepted	Pre-submission meeting held	Dossier accepted for review*	Status of assessment**	Anticipated decision date***
1.	 <b>Pfizer</b> <small>BIONTECH</small>	BNT162b2/COMIRNATY Tozinameran (INN)	EMA	Nucleoside modified mRNA	✓	✓	✓	Finalized	31/12/20
2.	 <b>AstraZeneca</b> <small>UMC SURE</small>	AZD1222	Core – EMA Non-COVAX	Recombinant ChAdOx1 adenoviral vector encoding the Spike protein antigen of the SARS-CoV-2.	✓	✓	Accepted core data of AZ – non-Covax  Data for Covax expected in March 2021	Non-Covax Core data.  Awaited	NA  April 2021
3.	 <b>SK BIO</b>  <small>UMC SURE</small>	AZD1222	MFDS KOREA	Recombinant ChAdOx1 adenoviral vector encoding the Spike protein antigen of the SARS-CoV-2.	✓	✓	✓	Finalized	15 Feb 2021
4.	<b>Serum Institute of India</b>	Covishield (ChAdOx1_nCoV-19)	DCGI	Recombinant ChAdOx1 adenoviral vector encoding the Spike protein antigen of the SARS-CoV-2.	✓	✓	✓	Finalized	15 Feb 2021
5.	 <b>Sinoopharm / BIBP</b>	SARS-CoV-2 Vaccine (Vero Cell), Inactivated (InCoV)	NMPA	Inactivated, produced in Vero cells	✓	✓	✓	In progress	Earliest April
6.	 <b>sinovac</b>	SARS-CoV-2 Vaccine (Vero Cell), Inactivated	NMPA	Inactivated, produced in Vero cells	✓	✓	✓	In progress	Earliest April
7.	 <b>moderna</b>	mRNA-1273	EMA	mRNA-based vaccine encapsulated in lipid nanoparticle (LNP)	✓	✓	✓	In progress Use abridged procedure relying on EMA	Earliest March
8.	 <b>Janssen</b> <small>Johnson &amp; Johnson</small>	Ad26.COV2.S	EMA	Recombinant, replication-incompetent adenovirus type 26 (Ad26) vectored vaccine encoding the (SARS-CoV-2) Spike (S) protein	✓	✓	Core data (US +NL sites) ✓	In progress.  Use abridged procedure relying on EMA	12 March 2021
9.	 <b>THE GANALEYA NATIONAL CENTER</b>	Sputnik V	Russian NRA	Human Adenovirus Vector-based Covid-19 vaccine	Additional information submitted	Several meetings held.	Rolling submission of clinical and CMC data has started.	Clinical and CMC review ongoing  Additional data expected.	Will be determined when all data is submitted.
10.	 <b>康希诺生物</b> <small>CanSinoBIO</small>	Ad5-nCoV	NMPA	Recombinant Novel Coronavirus Vaccine (Adenovirus Type 5 Vector)	✓	✓	Rolling data starting April 2021		
11.	 <b>NOVAVAX</b>		EMA	No pre-submission meeting yet.	Submitted EOI on 23 Feb	To be planned in April based on company request.			
12.	Vector State Research Centre of Virology and Biotechnology	EpiVacCorona	Russian NRA	Peptide antigen	Letter received not EOI. Reply sent on 15/01/2021				

# First generation vaccines are highly effective at preventing hospitalization and death

As of 1 Mar

Vaccine	Platform	No. doses	Approv. Date <sup>1</sup>	Efficacy in registration trials				Performance against variants	
				Symptomatic Reduction <sup>2,3</sup>	Hosp.	Deaths	# events in trial		Trial enroll.
CanSino Biologics (China)	Adenovirus	1	Jun '20	-	-	-	-	~40K	Unknown
Sinovac (China)	Inactivated coronavirus	2	Jul '20	51-91% <sup>4</sup>	-	-	282	~24K	<b>Trial:</b> 51% efficacy in Brazil
Gamaleya "Sputnik V" (Russia)	Adenovirus	2	Aug '20	92%	0	0	78	~22K	Unknown
WIBP/BIBP Sinopharm (China)	Inactivated coronavirus	2	Sep '20	79%	-	-	-	~69K	Unknown
Vektor (Russia)	Peptide	2	Oct '20	-	-	-	-	~33K	Unknown
BioNTech (Germ.), Pfizer (US)	mRNA	2	Dec '20	95%	0	0	170	~43K	<b>In-vitro:</b> Neutralization "slightly lower" vs. South Africa variant but still considered protective
Moderna, NIH (US)	mRNA	2	Dec '20	94%	0	0	196	~30K	<b>In-vitro:</b> Six-fold reduction in neutralization vs. South Africa variant but still considered protective; similar performance vs. UK variant
Oxford Uni., AstraZeneca (UK)	Adenovirus	2	Dec '20	70% <sup>5</sup>	0	0	131	~17K	<b>Trial:</b> Similar performance vs. UK variant
Bharat Biotech (India)	Inactivated coronavirus	2	Jan '21	-	-	-	-	~26K	Unknown
Janssen (J&J) (US)	Adenovirus	1	Mar '21	66% <sup>6</sup>	0	0	468	~44K	<b>Trial:</b> 57% efficacy in South Africa where 95% of cases were variant strain
Novavax (US)	Protein subunit	2	Pending	49-89%	0	0	106	~20K	<b>Trial:</b> 49% efficacy in South Africa where >90% of cases were variant strain; Similar performance vs. UK variant

Note: Dash reflects trial results are not yet known or unreported

1. Earliest approval date for limited or emergency use 2. Reported efficacy numbers are difficult to compare due to differences in clinical trial protocol since symptoms defined as mild, moderate, and severe may vary by clinical trial protocol 3. Range reflects differences based on geography 4. Not yet peer reviewed 5. As reported Nov '20 6. 66% efficacy for moderate cases and 85% efficacy for severe cases globally 7. Range reflects differences based on geography of clinical trial

Source: UNICEF COVID-19 Vaccine Market Dashboard, Manufacturer press releases, press search, BCG analysis

# Many unknowns remain, but data to date does not support differentiated approach based on vaccine efficacy

As of 22 Feb



## What we know

- Vaccines begin to **offer protection around 14 days** after first dose
- Vaccines are highly effective at **preventing hospitalizations & deaths**

Note: this is based on peer-reviewed Phase III trial information, which isn't available for some Chinese & Russian vaccines



## What will take time to understand

- Effectiveness to prevent **virus susceptibility or transmission**
- Effectiveness against **new mutations**
- Impact on **non-trial populations**<sup>1</sup>
- Immunity **durability**
- **Long-term safety** profile
- Additional data for some Chinese, Russian, Indian vaccines

Prioritize vaccinating health vulnerable

Do not differentiate among target populations based on vaccine efficacy

1. Including extreme elderly, lactating women, pregnant women, children under age 16, those with specific co-morbidities

Source: BCG Research, NY Times, Bloomberg

Other product characteristics (e.g. cold chain, dosing, pack size) need to inform distribution approach



## US example: supply allocation optimization suggests different distribution for vaccine types

Optimization parameters:





- Site network and throughput capacity
- Population density and demographics
- Product characteristics (i.e. pack size)
- Supply chain and logistical parameters (i.e. cold chain capabilities, storage needs)



In public communications, need to get ahead of confusion about multiple vaccines with transparency around results to date

Important for public discussion

Focus of current discussions

	People in trial	Hospitalized in trial	Fatalities in trial	Reported efficacy	Efficacy to B.1.351 <sup>1</sup>
	15 000	0	0	95%	-
	18 600	0	0	95%	-
<b>NOVAVAX</b>	13 000	0	0	89%	60% <sup>2</sup>
	5 800	0	0	62%	10% <sup>3</sup>
	22 000	0	0	72%	52% <sup>4</sup>

## Emerging best practices

- Set up national FAQ on different vaccines with transparent information
- Reach out to media to ensure they are aware of this information
- Provide information to local authorities, providers, community leaders for their COVID communication

1. "South African variant" 2. Reported company results 3. Company report; A preliminary report shows Astra Zeneca with an effectiveness of 10% against B.1.351 4. Company report

# Summary of emerging learnings for managing a diverse portfolio



## Regulatory approval

Vaccination strategy must build from global and local regulatory and policy guidance



## Target population

Do not differentiate among target populations based on vaccine efficacy



## Supply chain

[To be discussed in next presentation]



## Point of Administration

Administer one vaccine type per site where possible to simplify on-site operations



## Public communication

Emphasize urgency and strong protection all vaccines provide against hospitalization and death





Logistic implications and options  
Prashant Yadav, Senior Fellow,  
Center for Global Development

# Deploying Multiple COVID-19 Vaccines: Supply Chain and Operational Aspects

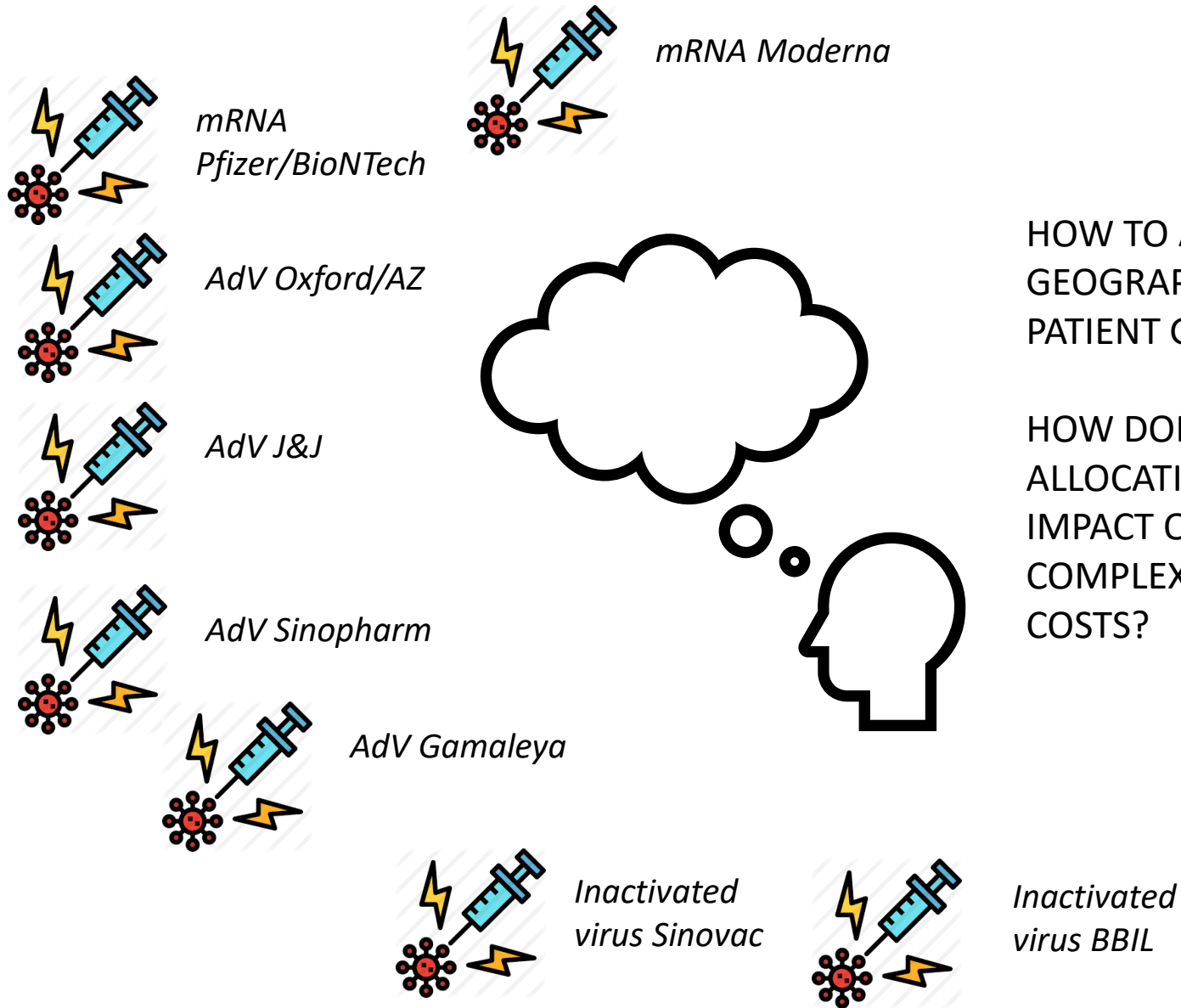
**Prashant Yadav**



Deployment of Multiple COVID-19 vaccines  
| Practical Implications for Consideration |

World Bank MENA COVID-19 Vaccination Workshop Series  
March 22, 2021

# The Operational Complexity of Deploying Multiple Vaccines



HOW TO ALLOCATE BY  
GEOGRAPHY, FACILITY,  
PATIENT GROUP?

HOW DOES AN  
ALLOCATION METHOD  
IMPACT OPERATIONAL  
COMPLEXITY AND  
COSTS?

Has the public health system dealt with geographical mosaics before?

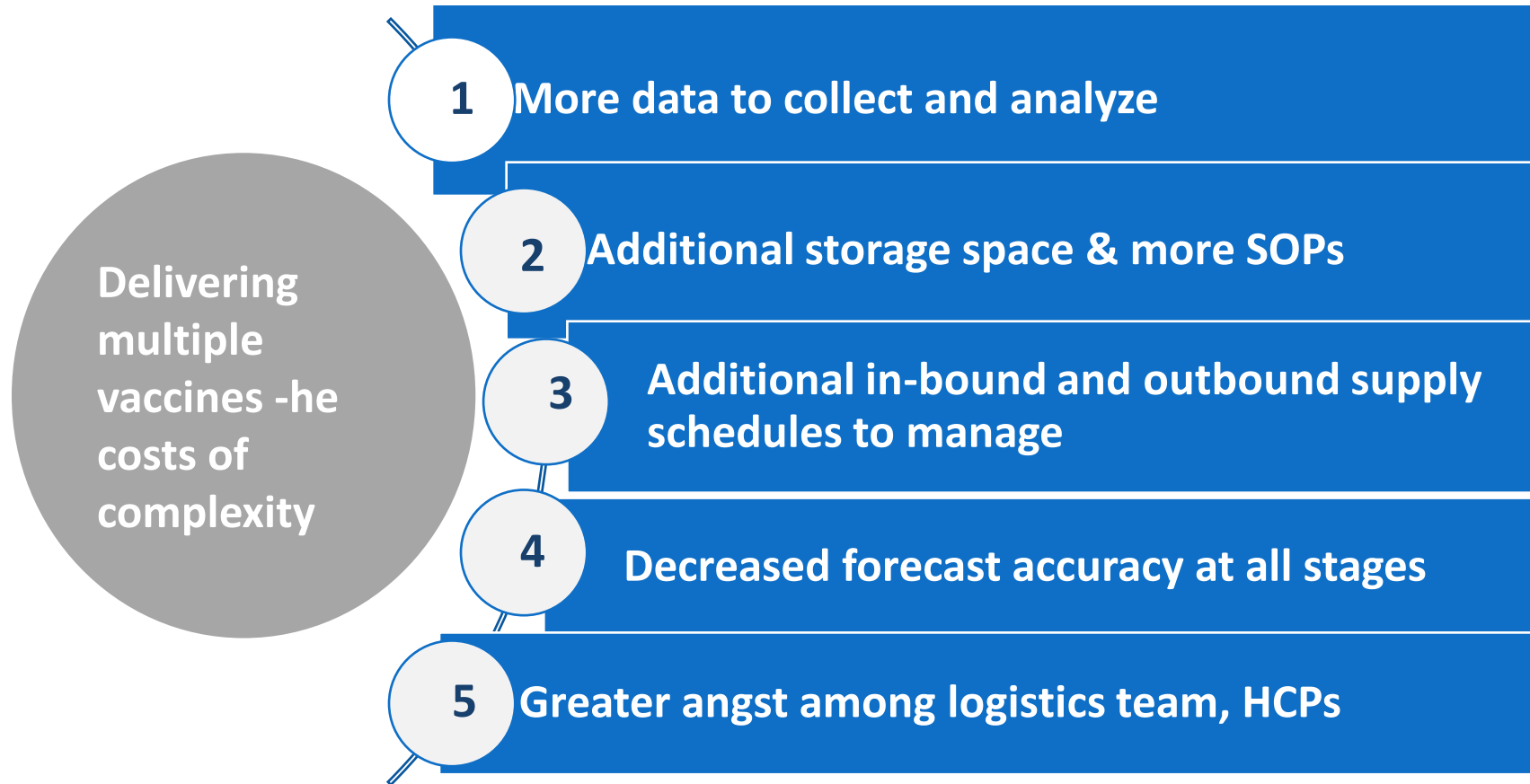
Multiple-First Line Treatments (MFT) for Malaria

Spatial Mosaic IRS ?

Mosaic measures (spatio-temporal) for managing antimicrobial resistance

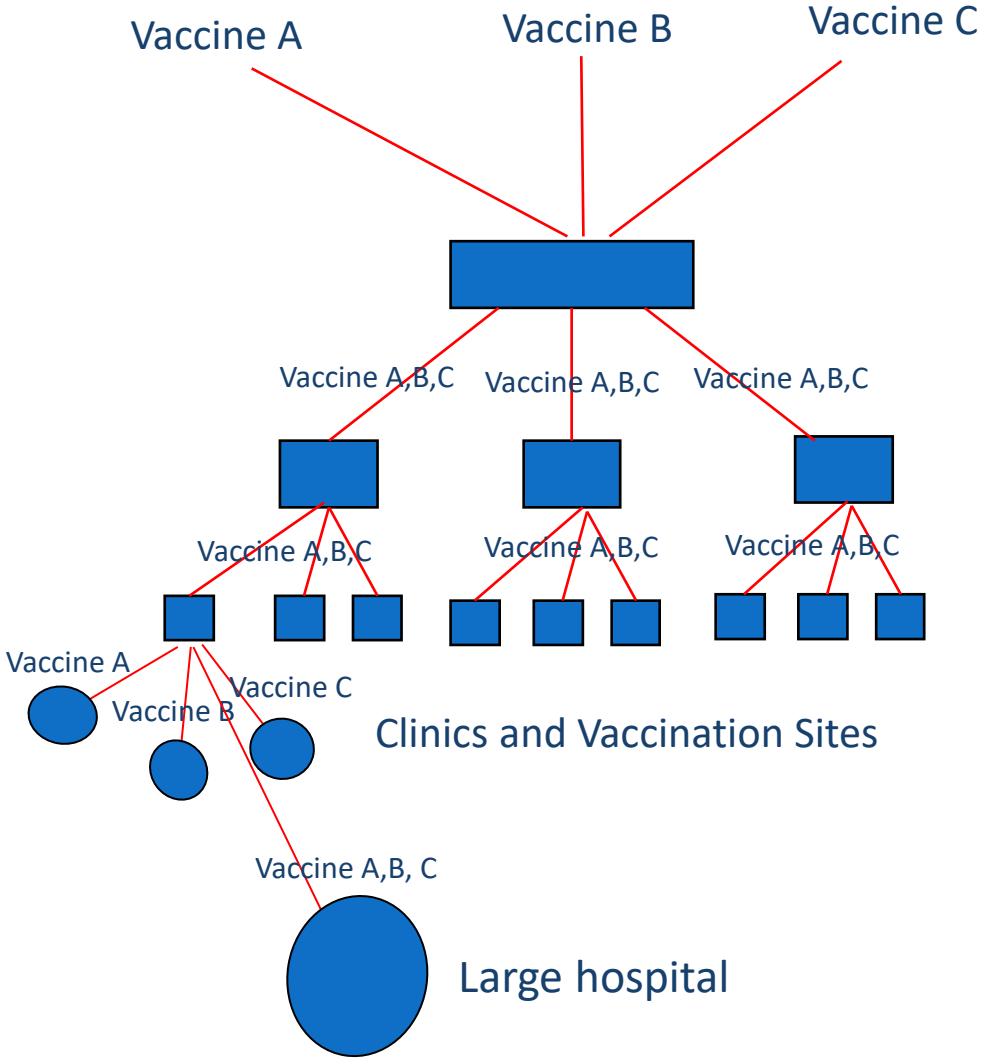
Many sub-group targeted therapies where sub-groups are geographically clustered

# Understanding the Operational Complexity of Deploying Multiple Vaccines



It is not necessarily bad, if the delivery team has the tools, experience, and dedicated resources to deal with “supply chain complexity management” & the leadership team acknowledges/internalizes the complexity

# Multi-level government and how far down into distribution does the “product fork” occur?



Vaccine Suppliers

Federal Government

State or Provincial Government

City or District

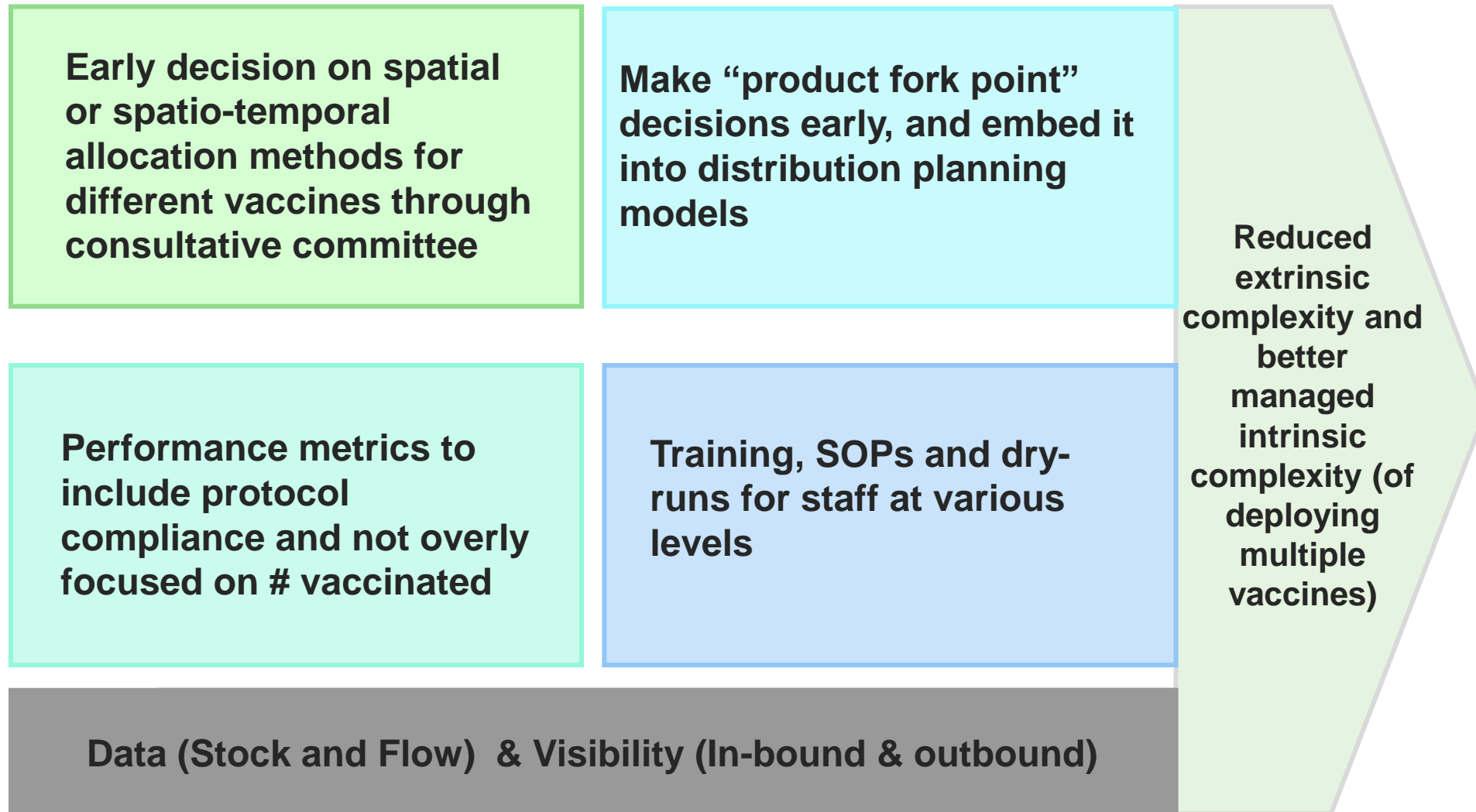
Clinics and Vaccination Sites

Large hospital

Decision depends on political economy, disease epidemiology, and type of vaccines deployed

**Deciding this early, and communicating it clearly resolves some of the extrinsic complexity**

## Preliminary thoughts on managing this





Paula Daza  
Public Health Under-  
Secretary, MoH, Chile



Dr. Sami Almudarra  
Epidemiologist and Public  
Health Consultant, MoH, KSA)



Emily Serazin  
Managing Director and Partner,  
BCG



Prashant Yadav  
Senior Fellow, Center for  
Global Development

## Panel discussion and Q&A



# Thank you

- *Notes:*

*All workshop recordings are available on the world bank events page*

<https://www.worldbank.org/en/events/2021/02/08/world-bank-mena-covid-19-vaccination-strategy-workshop-series>