Welcome to the World Bank's SAR COVID-19 vaccination strategy workshop series

We want to hear from you;
• If you have questions or comments to share during the presentation, please share your thoughts using the Zoom chat feature
• Our team will monitor the questions and share them with the presenters to address immediately or when they get to the appropriate topic

At the end, there will be a short Q&A session where you can raise outstanding questions.

Thank you for your engagement and participation!

Here are some ways to engage with us today

We will be starting shortly
Initial series of five workshops to address critical COVID-19 vaccination topics

1. Feb. 22: Intro & potential vaccination scenarios
3. Mar. 8: Demand management
5. Mar. 22: Procurement and regulatory best practices

Additional topics to be covered in future workshops
Objectives for workshop series

- Enable member countries to make informed and actionable decisions about Covid-19 vaccination based on the multiple options and guidance available

- Provide a platform for peer-to-peer learning by sharing best practices and lessons learned from existing vaccination programs

- Engage in dialogue with global and regional technical experts on critical choices and trade-offs in designing and deploying vaccination strategies
Objectives for today

- Discuss **emerging solutions to key bottlenecks for vaccine rollout** based on lessons learned from vaccination efforts
- Discuss **key uncertainties & potential scenarios** for Covid-19 and considerations for countries' **vaccination strategies**
- Engage in **peer-to-peer learning** by hearing perspectives from UAE on vaccination planning and deployment
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<thead>
<tr>
<th>Event</th>
<th>Speaker/Author</th>
<th>Duration</th>
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<td>Welcome Remarks</td>
<td>Lynne Sherburne-Benz</td>
<td>5 mins</td>
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<tr>
<td>South Asia Regional Integration Perspective</td>
<td>Cecile Fruman</td>
<td>5 mins</td>
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<tr>
<td>Keynote Speaker</td>
<td>David Wilson</td>
<td>10 mins</td>
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<tr>
<td>Part 1: Lessons from early Vx roll out globally</td>
<td>Emily Serazin, BCG</td>
<td>20 mins</td>
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<tr>
<td>Part 2: Surviving uncertainty: considerations for COVID vaccination strategies:</td>
<td>Abhishek Gopalka, BCG</td>
<td>20 mins</td>
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<td>Part 3: Country perspectives: UAE</td>
<td>Dr. Laila Hussain Al Jasmi</td>
<td>20 mins</td>
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<tr>
<td>Q&amp;A</td>
<td></td>
<td>5 mins</td>
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<tr>
<td>Closing Remarks</td>
<td>Trina Haque</td>
<td>5 mins</td>
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Welcome Remarks

Lynne Sherburne-Benz
Regional Director for Human Development,
World Bank
South Asia Regional Integration Perspective

Cecile Fruman
Director, Regional Integration and Engagement in the South Asia Region (SAR), World Bank
Keynote Speech:
From Vaccine to Vaccination

by David Wilson

David Wilson
Program Director, Health, Nutrition and Population Global Practice, World Bank
Part 1:
Lessons from early vaccine roll out globally

by Emily Serazin, Managing Director and Partner, BCG
Ten vaccines have been approved for full, emergency, or limited use

<table>
<thead>
<tr>
<th>Vaccine/Producer (Country)</th>
<th>Timeline to approval</th>
<th>Countries providing approval(^3) (not comprehensive)</th>
<th>Total no.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sinovac (China)</strong></td>
<td></td>
<td>China, Turk., Chile, Indonesia</td>
<td>9</td>
</tr>
<tr>
<td><strong>WIBP1 and Sinopharm (China)</strong></td>
<td></td>
<td>China, UAE</td>
<td>2</td>
</tr>
<tr>
<td><strong>Oxford Uni., AstraZeneca (UK)</strong></td>
<td></td>
<td>UK, UAE, India, Arg., EU, Mexico, WHO</td>
<td>48</td>
</tr>
<tr>
<td><strong>BIBP2 and Sinopharm (China)</strong></td>
<td></td>
<td>China, Iraq, Egypt, Peru, Morocco, Hungary</td>
<td>12</td>
</tr>
<tr>
<td><strong>BioNTech (Germ.), Pfizer (US)</strong></td>
<td></td>
<td>USA, UK, Can., Mex., EU, Israel, WHO</td>
<td>51</td>
</tr>
<tr>
<td><strong>Moderna, NIH (US)</strong></td>
<td></td>
<td>USA, UK, Can., EU, Israel</td>
<td>32</td>
</tr>
<tr>
<td><strong>Gamaleya (Russia)</strong></td>
<td></td>
<td>Rus., Bel., Arg., UAE, Serbia</td>
<td>25</td>
</tr>
<tr>
<td><strong>CanSino Biologics (China)</strong></td>
<td></td>
<td>China, Mex.</td>
<td>3</td>
</tr>
<tr>
<td><strong>Bharat Biotech (India)</strong></td>
<td></td>
<td>India</td>
<td>1</td>
</tr>
<tr>
<td><strong>Vektor (Russia)</strong></td>
<td></td>
<td>Rus.</td>
<td>1</td>
</tr>
</tbody>
</table>

1. Wuhan Institute of Biological Products
2. Beijing Institute of Biological Products
Source: UNICEF COVID-19 Vaccine Market Dashboard; NYT; Brokers

**SITUATION IS DYNAMIC AND CHANGING DAILY**

As of Feb 17\(^{th}\)
Supply across SAR | Secured vaccinations by country

Doses committed via formal or informal agreements

Population coverage (%)^2

<table>
<thead>
<tr>
<th>Country</th>
<th>Population (M)</th>
<th>Vaccinations Begun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>173</td>
<td>Yes (Feb 7th)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>234</td>
<td>Yes (Feb 2nd)</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>38</td>
<td>No (Est. Q1’21)</td>
</tr>
<tr>
<td>Nepal</td>
<td>29</td>
<td>Yes (Jan 27th)</td>
</tr>
<tr>
<td>India</td>
<td>1,366</td>
<td>Yes (Jan 16th)</td>
</tr>
<tr>
<td>Maldives</td>
<td>0.5</td>
<td>Yes (Feb 1st)</td>
</tr>
<tr>
<td>Bhutan</td>
<td>0.7</td>
<td>No (Est. Mar ’21)</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>22</td>
<td>Yes (Jan 29th)</td>
</tr>
</tbody>
</table>

Population:
- Bangladesh: 173 M
- Pakistan: 234 M
- Afghanistan: 38 M
- Nepal: 29 M
- India: 1,366 M
- Maldives: 0.5 M
- Bhutan: 0.7 M
- Sri Lanka: 22 M

1. Vaccine brand TBD. 2. Calculated by dividing full vaccination schedules secured by country population; does not include anticipated wastage.

Source: WB materials, press search, BCG analysis
~12.5M vaccines have been administered to date in the SAR region

SAR countries are just beginning their COVID-19 vaccination campaigns

Provisional vaccine administration data (if available)

<table>
<thead>
<tr>
<th>Country</th>
<th>No. of doses administered (k)¹</th>
<th>As % of population¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>10,190</td>
<td>0.7%</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>196</td>
<td>0.9%</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>1,850</td>
<td>1.1%</td>
</tr>
<tr>
<td>Nepal</td>
<td>184</td>
<td>0.6%</td>
</tr>
<tr>
<td>Maldives</td>
<td>64</td>
<td>12.1%</td>
</tr>
<tr>
<td>Pakistan</td>
<td>53</td>
<td>0.0%</td>
</tr>
<tr>
<td>Bhutan</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Afghanistan</td>
<td>-</td>
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</table>

1. Does not differentiate between 1st and 2nd doses; as a result, population coverage should not be understood to mean population fully vaccinated

Sources: Bloomberg, Our World in Data, Al Jazeera, Kathmandu Post, the Hindu
Key challenges | New variants impacting vaccine efficacy

Johnson & Johnson

Requires:
- Standard refrigeration (2°- 8°C)
- 1 dose per person

Phase III trial results:
- **66% efficacy** across US, Latin America, South Africa
- **85% efficacy against severe disease** and 100% efficacy against hospitalization and death

Initial results against variants:
- **57% efficacy in South Africa**, reflecting variant

NOVAVAX

Requires:
- Standard refrigeration (2°- 8°C)
- 2 doses per person (21 days apart)

Phase III trial results:
- **89.3% efficacy** in UK

Initial results against variants:
- 85.6% efficacy against UK variant
- **49.4% efficacy in South Africa**, reflecting variant (60% efficacy in HIV-negative population)

AstraZeneca

Requires:
- Standard refrigeration (2°- 8°C)
- 2 doses per person (12 weeks apart)

Phase III trial results:
- **82% after 12 week interval (UK)**

Initial results against variants:
- **Similar effectiveness vs. UK variant (b.1.1.7)**
- Ineffective vs. mild/moderate disease vs. S. African variant, causing rollout in South Africa to be halted

Source: Company press releases
The early weeks of vaccination efforts have encountered common bottlenecks across the world...

**Strategy**

**Inadequate Scenario Planning**
- Many countries yet to develop plans for vaccine roll-out beyond the 20% population coverage ensured by COVAX

**Over-prioritization of subgroups**
- Over-rigid sequencing of priority populations, coupled with lack of capacity to fully reach these groups, delayed progress to the next tier

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**Supply**

**Vaccines are distributed to providers**
- Delay in securing Vx PPAs
  - Many countries yet to secure PPAs covering their target population

**Forecasts differed from actual supply**
- US states didn’t receive the expected supply of vaccines on time

**Some doses were unallocated**
- Govts held reserve of 2nd doses to hedge against supply volatility

**Manufacturers experiencing production challenges**

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**Demand**

**People are available to be vaccinated**

**Vaccine hesitancy among prioritized groups**
- Press reports show that uptake among healthcare and LTC1 workers were lower than expected, e.g. 45-70% hesitancy in some SAR countries (India, Bangladesh)

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**Throughput & Equity**

**Providers receive & administer vaccines**

**Local healthcare delivery systems were insufficiently prepared**
- Inadequate site activation (versus plan) and training of healthcare workers

**Vaccine allocation plans to provider sites not sufficiently tested**
- Shortage of supply at sites with higher throughput and wastage of supply at site with lower throughput

**Insufficient diversity in site network**

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**Enablers**

Lack of data and delays in reporting from the ground amplifies perception of shortfall
Lack of transparency across decision makers led to uncertainties in location of bottlenecks

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1. Long-term care
Source: Press search, BCG
Emerging solutions for vaccine rollout based on lessons learned (I/III)

Emerging solutions for Supply

Maximize supply
- Secure agreements for as much vaccine as quickly as possible

Be transparent on forecasts
- Communicate supply forecasts and potential scenarios early and often

Expedite supply through system
- Push available supply to the administration site
- Re-allocate supply to sites where it will be fully utilized
- Don't hold back inventory if supply is expected to be stable or growing

Avoid unnecessary delays in 1st dosage supply
- Do not withhold the supply of 1st dose order to stock up for the 2nd dose

Lessons from other countries

Philippines
- Ongoing effort to secure adequate vaccine supplies through multiple PPAs (AZ, Sinovac, Novavax)

US
- Provide longer forecasting windows (3 week visibility vs 1 week) and hold back lesser buffer stock

UK
- 2nd dose is not set aside but rather drawn directly from new deliveries
- Dosage interval increased to 12 weeks to drive throughput and offer protection to more people

1. Long-term care 2. Key Performance Indicators
Source: Press search, BCG
Vaccine dose planning: Early results inconclusive on longevity of prime/single dose protection

First Dose Efficacy

**Johnson & Johnson**
- As on Day 28 after vaccination: 66% effective; 85% effective in preventing severe disease; 100% effective preventing hospitalization and death

**Moderna**
- Days 1-14: 50% effective
- Days 14-28: 92% effective

**Pfizer**
- Days 1-21: 52% effective
- Days 14-21: 89% effective

**Astra Zeneca**
- Days 22-90: 76% effective

Initial thoughts on booster dose

- The CDC and WHO have issued guidance that Pfizer and Moderna booster doses can be given up to 6 weeks after the prime dose
- Astra Zeneca trial showed greater efficacy with a delayed booster dose (12 weeks versus booster after <6 weeks)


J&J, Moderna and Pfizer vaccines show moderate to high efficacy till week 4. However, no data is available beyond Day 28

Astra Zeneca sets upper bound of protection at 90 days

Key Open Questions

Could delaying the second dose reduce the efficacy of the booster dose or allow room for viral mutations?

Given manufacturer supply constraints seen worldwide, would it better to delay the second dose to increase initial pop. coverage?
Emerging solutions for vaccine rollout based on lessons learned (II/III)

Emerging solutions for Demand

Proactively build demand
- Generate demand to keep it greater than supply as long as possible

Push for equity
- Prioritize high-risk groups and adapt plans to improve equity in rollout

Make it easy
- Remove barriers to uptake to make it as simple as possible to receive a vaccine

Launch communication campaigns
- Educate on vaccine safety and efficacy to address hesitancy
- Engage trusted sources such as news, HC providers, governments, and community leaders in communication efforts

Lessons from other countries

Israel
- Community leaders vaccinated with big publicity campaign to convince hesitant target groups
- Extensive public education campaign against anti-vaccination information
- Priority groups contacted through digital patient registration system of health care providers - ability to make appointments via website / phone

Saudi Arabia
- End-to-end digital journey for beneficiary with seamless integration across multiple databases - ensuring smooth registration, scheduling and tracking
- Confirmation of eligibility through SMS and appointment scheduling through App
- Customer experience captured and monitored through a dashboard
Emerging solutions for vaccine rollout based on lessons learned (III/III)

Emerging solutions for Throughput

Throughput capacity should be greater than supply
- Throughput should grow proactively as new vaccines are authorized or supply increases

Be flexible in prioritization
- Create larger prioritization tiers to avoid slowdowns, but not so large as to create bottlenecks
- Don’t wait to complete one tier before moving to the next

Pool capacity and share systems
- Manage throughput at regional vs. local level for better supply-demand matching, prioritization adherence, and equity of distribution

Focus on high throughput while supply is limited
- Maximize throughput at vaccination sites (e.g., prioritize fewer mass sites, operate 24/7, optimize scheduling)
- Supplement high throughput sites with targeted, smaller locations in areas with low access (e.g., rural or vulnerable communities)

Lessons from other countries

UK
- Efforts to reduce red tape to enlist more vaccinators such as retired medics, nurses, pharmacists, medical student, etc. leading to an increase in throughput

Israel
- 300 admin points are in operation 24/7 - mixture of hospitals and makeshift clinics
- Supplies opened to general population when supply exceeds demand of prioritized population

Texas
- Early vaccine rollout through centralized hubs - increased efficiency due to scale and ability to reallocate vaccines due to ease of tracking
- Gradual expansion to broader network to target specific locations
Part 2: Surviving uncertainty: considerations for COVID-19 vaccination strategies

by Abhishek Gopalka, Managing Director and Partner, BCG
Scenario planning addresses key questions

- What are the uncertain factors in COVID-19 vaccine planning and their best and worst case outcomes?
- How can different combinations of uncertain factors combine into plausible scenarios (i.e., "portraits of the world")?
- What are the key challenges and options that result from these scenarios?
- How should countries update their strategies/planning, to be able to better respond to these scenarios?

Scenario planning is intended to stretch our thinking and build resilience, and prepare for uncertainties that are inherently unpredictable.
Four key components to scenario planning – our primary focus today will be uncertainties, scenarios and regional implications

- **Uncertainties**: Identify a set of uncertain factors whose outcomes and interplay will determine the future scenarios.

- **Scenarios**: Build scenarios that emerge based on plausible combinations of uncertain outcomes.

- **Regional implications**: Synthesize potential timelines for achieving broad coverage & associated health, economic, social implications; identify leading indicators.

- **Country-level implications**: Distill outcomes at the country-level and identify set of specific priority areas for additional focus in vaccination strategies.

*Our focus for today*
Multiple uncertainties currently exist across three key elements

**Uncertainties**

- **Efficacy & safety**: What will be % efficacy of candidates and how will this impact our portfolio? Will existing vaccines & candidates be effective against new variants? What safety signals will emerge as trials progress and how will this impact ability to use within certain subgroups (e.g., <18)?

- **Duration of immunity**: How long will vaccine immunity last and how will this impact campaign recurrence?

- **Manufacturing capacity**: What is global manufacturing capacity, and will manufacturers be able to deliver on their maximum capacity estimates?

- **Financing**: Given fundraising uncertainty, how much of its 20% coverage target will COVAX be able to meet? What delays or constraints might countries face in procurement and delivery due to Bank financing eligibility requirements?

- **Supply pipeline**: What supply has already been secured for SAR (via domestic, bilateral, multilateral, and COVAX agreements), what additional deals might be secured, and on what timeframe?

- **Vaccine uptake**: What will be demand or uptake over time & among priority subgroups, and how will this impact prioritization, service delivery, and communications efforts?

*Note: In addition to above uncertainties, scenario analysis will also account for factors that impact anticipated time to ramp-up throughput for each SAR country*
4 potential scenarios emerge for SAR leaders to think through and plan for

**Qualitative view**

1. **Cautious Confidence**

   Strong pipeline of global supply, successful COVAX fundraising efforts, and widespread public demand result in a cautiously optimistic outlook for SAR. Moderate coverage is achievable by EOY 2021, though widely varying amongst SAR countries. In some, economic & social activity may begin to pick up pace, as restrictions are eased.

2. **Financing Setbacks**

   Strong pipeline of global supply, but fundraising challenges leave COVAX-dependent countries with little supply, and Bank eligibility requirements delay delivery of some vaccines by 1 quarter. Unless able to self-finance COVAX doses or secure significant additional PPAs, many countries only able to vaccinate select priority subgroups within 2021, with broader vaccination delayed to 2022.

3. **Supply Setbacks**

   Multiple supply shocks (e.g., inefficacy of Oxford/AstraZeneca against certain strains, slow manufacturing ramp-up) leave all SAR countries with significantly reduced supply in 2021. Most SAR countries only able to cover highest priority populations in 2021, with broader vaccination delayed to 2022. Widespread restrictions remain the norm well into 2022.

4. **Reaching the Vulnerable**

   New strains continue emerging, and many vaccines cannot prevent even severe disease – COVID becomes endemic globally, and leaders must shift their strategy away from broad coverage. In 2021, virtually no coverage across SAR, given mRNA becomes the dominant platform and SAR has little near-term supply. COVID vaccination must integrate with routine programs, prioritizing vulnerable subgroups.
4 potential scenarios emerge for SAR leaders to think through and plan for – outcomes vary widely

**Quantitative view**

**Hypothetical % Vaccinated**

**SAR Region Aggregate**

- **Scenario 1**: Cautious Confidence
- **Scenario 2**: Funding Setbacks
- **Scenario 3**: Supply Setbacks
- **Scenario 4**: Reaching the Vulnerable

**Note**: Country-specific timelines may vary significantly; dotted lines represent illustrative view of % population vaccinated beyond EOY 2021 – not a quantitative model

1. Hypothetical plausible “coverage” level varies by scenario: 60% for Scenario 1 (~80% of 14+ population in SAR), 45% for Scenario 2, 55% for Scenario 3, 20% for Scenario 4. Based on uncertainty parameters for duration of immunity (ranging from 1-5 years)

**Observations**

- Many countries are aiming for broad coverage (Scenario 1), but not all have secured adequate supply (e.g., 4 countries have secured supply for <30% of population)

- Region is highly subject to funding shocks (Scenario 2), supply shocks (Scenario 3), and efficacy shocks (Scenario 3/4)

- Maintaining coverage may require booster campaigns, even in the near-term

- For many countries, coverage may remain low well into 2022
Four key takeaways from scenarios across SAR

Without a step change in procurement & funding, achieving broad coverage will not be possible

- Health, economic, and social benefits of vaccines support push to buy supply in the near-term by any means necessary
- If step change does not occur, countries will need to shift objective towards targeted vaccination

Across scenarios, a more diversified procurement strategy is necessary

- Procurement strategy should seek diversity in vaccine portfolio as well as procurement approaches to safeguard against supply and funding shocks
  - e.g., via bilateral PPAs, COVAX, diplomacy, private sector, etc.

Emerging variants suggest planning beyond 2021+ is critical

- Begin procuring supply for 2022 and beyond; focus on “next gen” vaccines that have been updated to contend with variants
- Plan to integrate COVID vaccination into broader health infrastructure, as Booster, Repeat or Mop-up campaigns will likely be necessary

Coverage will remain low in many countries for years, meaning renewed focus on other levers is key

- Continued implementation of other PHMs/ NPIs will be key
- Further investment in therapeutics, medical consumables, and infrastructure will also be necessary
Part 3: Country highlight | Vaccine planning & deployment approach by UAE
Fireside Chat with Dr. Laila Hussain Al Jasmi

Dr. Laila Hussain Al Jasmi
Head Immunization Section,
Preventive Medicine Department,
Health Centers and Clinics Sector
Ministry of Health and Prevention, Dubai
Closing Remarks

Trina Haque
Practice Manager, Human Development, South Asia Region, World Bank
Thank you for joining the first workshop in our World Bank SAR COVID-19 Vaccine Strategy Workshop Series

The next workshop will take place on Monday Mar 1 at the same time. Key topics:
• Understanding key supply chain challenges and planning for volatility
• Optimizing distribution networks

If you have not already, please RSVP at https://www.113.vovici.net/se/13B2588B3F19B167