Regional vaccine manufacturing and mRNA
WHO regional manufacturing strategy

• There is no formal WHO strategy.....(yet)

• Support to partner’s strategies
  • GAVI – expanding sustainable manufacturing in Africa (data, procurement, finance)
  • AVMI, PAVM, AU
    -> Pull mechanism of $1Bn established ! Will this suffice to establish manufacturing ?

• Issues:
  • Need for regional manufacturing primarily driven by need for pandemic response
  • Facilities/staff cannot wait for a pandemic – need to produce routine products
  • Current supply of routine products meets global needs (approximately)
  • New production facilities for old vaccines -> product likely more expensive
  • ? How can sustainable production of vaccines be established that will also ensure sustainable capacity for pandemic vaccine production

• → New vaccines / old vaccines using new processes : needs R&D capacity
Example: Building regional capacity for pandemic flu

- 2006 - 2016 WHO established the GAP program to transfer pandemic influenza vaccine technology to LMICs
- Sustainability is major stumbling block

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Mexico:</td>
<td>Birmex</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>120*</td>
</tr>
<tr>
<td>Brazil</td>
<td>Butantan</td>
<td>0</td>
<td>136</td>
<td>216</td>
<td>432*</td>
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<tr>
<td>Romania</td>
<td>Cantacuzino</td>
<td>0</td>
<td>0</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Serbia</td>
<td>Torlak</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
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<tr>
<td>SII</td>
<td>India</td>
<td>0</td>
<td>20</td>
<td>200*</td>
<td>0!!</td>
</tr>
<tr>
<td>GPO</td>
<td>Thailand</td>
<td>0</td>
<td>1.5</td>
<td>1.5</td>
<td>31.5*</td>
</tr>
<tr>
<td>IVAC</td>
<td>Vietnam</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>BCHT</td>
<td>China</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>150</td>
</tr>
<tr>
<td>Green Cross</td>
<td>Korea</td>
<td>0</td>
<td>180</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td><strong>Total pandemic dose capacity (M)</strong></td>
<td><strong>0</strong></td>
<td><strong>338</strong></td>
<td><strong>600</strong></td>
<td><strong>&gt;&gt;900</strong></td>
<td></td>
</tr>
</tbody>
</table>

* Theoretical (access to adjuvant etc assumed)
The challenge: chickens and eggs and sustainability
Establishing a mechanism to ensure global ability to make mRNA

**2021**

- April: WHO call for EOI to contribute by providing technology or hosting a hub, or both.
- June: French President, SA president & WHO DG announcing the establishment of SA mRNA TT hub.

**2022**

- September: WHO/PAHO announce selection of Argentina & Brazil as spokes in Latin America.
- November: WHO call for EOI for additional spokes & WHO call for EOI to establish a workforce training hub.
- February: WHO announces the establishment of a global biomanufacturing training hub in the Republic of Korea.
- March: 16 companies/countries as spokes.
- April: Intro training on mRNA technology initiates at mRNA TT hub.

Call for expression of interest on contribution to the establishment of a COVID-19 mRNA vaccine competence transfer hub.
mRNA as a sustainable response option

- Hub in SA has established technology (20,000 dose/batch size) – scaling up but $$ !
  - COGs ~$6/dose ... coming down

- Covid XBB1 phase 1 for 2024
- New targets (which ?)
- New Processes
- New Compositions
- -> lower COGs, thermostability
Programme Partners Disease Targets by region

Disclaimer: notes taken during the Cape Town meeting and information on the Partner’s presentations ONLY. Pending confirmation of business interest post the Cape Town F2F meeting.
WHO/MPP mRNA meeting, April 2023
Summary of PTRS/PPDP assessment in LMICs

<table>
<thead>
<tr>
<th>Disease</th>
<th>PTRS</th>
<th>PPDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV</td>
<td>Red</td>
<td>Yellow</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>Malaria</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>RSV</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td>Influenza</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>Flaviviruses: JEV</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>Flaviviruses: others</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>EID (e.g. Ebola, Lassa)</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>Tx HPV</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>HSV</td>
<td>Yellow</td>
<td>Yellow</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>Polio</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>Leishmaniasis</td>
<td>Green</td>
<td>Green</td>
</tr>
<tr>
<td>Rabies</td>
<td>Green</td>
<td>Green</td>
</tr>
</tbody>
</table>

PTRS: Probability of Technical and Regulatory Success
PPDP: Probability of Policy Development and Procurement
SEARO/WPRO meeting on mRNA Bangkok, October 2023

- Manufacturing partners: Biofarma (Indonesia), Polyvac (Vietnam), BioE (India), Incepta (Bangladesh)

- R&D partners: IVI (Korea), Hilleman, A*Star, NUS (Singapore), Chulalongkorn (Thailand)

- Others... Philippines, Malaysia...

- Selected disease targets:
  - Dengue: preclinical data indicate high PTRS (challenge is clinical pathway in absence of COP): Consortia to be led by IVI
  - HFMD: huge regional demand. Existing vaccines no longer working (EV71c -> EV71a,b..). PTRS high. Hilleman to lead?
  - HPV Tx: strong regional demand: DNA vaccines showed efficacy – preclin data suggests mRNA superior. PTRS high. Chula to lead.
  - P. vivax:... strong regional interest – but is the market adequate for manufacture?
Known unknowns.....

- Effect of different modified nucleotides: methyl-pseudouridine NOT optimal (and causes frame-shift)
- Signal sequences: Major impact on antibody: CD4 : CD8... and other arms of immunity
- Antigen design: monomeric vs multimeric: major impact on titers, duration, etc.
- Lipid nano-particle effect on tropism, antigen expression site, adverse events etc.
- Can mRNA induce CD135 plasmacytes etc
African targets for mRNA vaccine targets

- **TB:**
  - South African SATVI identified 4 antigens where CD4 response correlates to non-progression to disease
  - Multiple mRNA candidates made (monomeric vs poly-protein, different signal sequence, etc)
  - Plan for phase 1 early 2025

- **Leishmaniasis**
  - Institut Pasteur Tunis has candidate antigens: establishing collaboration with Korea for development

- **RVF:** Senegal – South Africa: under design.

- **RSV:** Afrigen – under design

- **ALSO...** Lipid consortium – lead by South Africa based on WITS lipid chemistry group
mRNA manufacture is becoming a routine automated process
mRNA Companies and Locations: Evolving at speed.

<table>
<thead>
<tr>
<th>Country</th>
<th>Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>123</td>
</tr>
<tr>
<td>China</td>
<td>34</td>
</tr>
<tr>
<td>South Korea</td>
<td>21</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>16</td>
</tr>
<tr>
<td>Germany</td>
<td>11</td>
</tr>
<tr>
<td>Canada</td>
<td>11</td>
</tr>
<tr>
<td>Japan</td>
<td>7</td>
</tr>
<tr>
<td>India</td>
<td>6</td>
</tr>
<tr>
<td>Switzerland</td>
<td>5</td>
</tr>
<tr>
<td>Netherlands</td>
<td>5</td>
</tr>
<tr>
<td>France</td>
<td>5</td>
</tr>
</tbody>
</table>

www.beacon-intelligence.com
mRNA Disease Landscape – What’s Next?

www.beacon-intelligence.com
Biomanufacturing Workforce Training Initiative

- To address the shortage of skilled workforce with training in Biomanufacturing.
- Private commercial training entities available in industrialized countries but need one accessible to trainees from LMICs.
- Need generic training (not product-specific, hands-on).
- The Republic of Korea selected to host the Global Training hub.
  - First training courses in July and October 2022.
  - Korean Global Bio campus fully operational in 2026.
- Complemented by other training partners and regional training centres.
- Link to WHO Academy to ensure appropriate curriculum/training.
Conclusion: mRNA capacity can ensure a safe future in LMICs

- mRNA facilities can be built at low CAPEX/OPEX
- Automated machinery for mRNA and LNP reduces need for highly trained staff
- mRNA can be used to make other vaccines and therapeutics → Sustainability of facilities
- mRNA cost of goods an issue – but coming down
- Regional R&D to meet regional needs essential!
Africa CDC/PAVM R&D Priority

Abebe Genetu Bayih
December 12, 2023

Africa Centres for Disease Control and Prevention (Africa CDC)
The AU has set a goal for 60% of vaccines administered in Africa to be produced on the continent by 2040

Context

The African Union called for a **New Public Health Order** aimed at safeguarding the health and economic security of the continent.

Ambition

The first pillar of the New Public Health Order is expanded manufacturing of vaccines, diagnostics and therapeutics. The African Union has set a goal to **increase vaccine manufacturing on the African continent to meet 60% of the demand by 2040** and mandated the **Partnerships for African Vaccine Manufacturing (PAVM)** to develop a framework for action to execute this.

1. Other pillars include: Strengthened public health institutions, Strengthened public health workforce, Respectful, action-oriented partnerships

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Sensitivity: Official Use
PAVM defined 8 bold programs to support the vaccine manufacturing ecosystem and continental strategy

**Market design and demand intelligence**
Achieving sustainable and reliable economies of scale by launching mechanisms that create demand certainty for manufacturers while facilitating country procurement

**Access to finance**
Stimulating a healthy market that result in sustainable and continuous investment in local manufacturing capabilities and broader ecosystem enablers

**Technology transfer and IP**
Establishing and accelerating technology transfer and intellectual property enablement to local manufacturers

**Regulatory strengthening**
Developing best-in-class National Regulatory Authorities (NRAs), regional harmonization and World Health Organization prequalification, to enable the export of products

**R&D and talent development**
Building the continent’s workforce by investing in the development critical manufacturing skills and capabilities and local R&D capabilities to develop new and improve existing products

**Infrastructure development**
Continuing and accelerating infrastructure initiatives including investment in mega-projects, innovative technologies etc.

**Focus of today’s meeting**
22 diseases were prioritized for regional manufacturing, based on quantitative and qualitative assessments

Quantitative assessment of diseases

50+ diseases were quantitatively assessed against 3 dimensions:
- Patient need
- Manufacturing feasibility
- Attractiveness to manufacturers

Qualitative assessment of diseases

A layer of qualitative assessment was then added on, to bolster the priority list of diseases- this incorporated:
- Diseases where there is already strong demand for corresponding vaccine
- Outbreak diseases, where rapid responses are required

Validation of priority list

The diseases shortlist was cross-checked against the Gavi, WHO and CEPI key diseases lists to make the most relevant diseases selection for Africa. The diseases are also aligned with priority diseases that have been set by private manufacturing companies.
We quantitatively assessed all potential diseases along three key dimensions

**Patient need**
- Disease burden: Prevalence
- Unmet need: DALY¹

**Feasibility**
- Clinical success: Probability of success
- Manufacturing maturity: Assessment of DS and FF manufacturing

**Attractiveness**
- Volume: Projected doses (2040)
- Profitability: Current vaccine unit price
- Competition: Number of manufacturers

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1. Disability Adjusted Life Years

Sensitivity: Official Use
The initial list of 12 priority diseases from the quantitative analysis was further augmented by 10 diseases chosen by a qualitative assessment to land on the shortlist of 22 diseases.

<table>
<thead>
<tr>
<th>Category</th>
<th>Diseases</th>
<th>Rationale for including in shortlist</th>
<th>Number of diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative assessment</td>
<td>Hepatitis B, diphtheria, HIV/AIDS, malaria, measles, tetanus, tuberculosis, typhoid fever, influenza, whooping cough, yellow fever, meningitis</td>
<td>Tier 1 by quantitative assessment of patient need, vaccine feasibility and vaccine attractiveness</td>
<td>12</td>
</tr>
<tr>
<td>Qualitative assessment</td>
<td>Rotavirus, pneumococcal, human papillomavirus, COVID-19, cholera</td>
<td>Already strong demand for corresponding vaccine</td>
<td>5</td>
</tr>
<tr>
<td>Existing vaccine</td>
<td>Lassa fever, Rift Valley fever, chikungunya, Ebola, Disease X</td>
<td>Africa is subject to regular regional outbreaks mostly fueled by the same set of diseases</td>
<td>5</td>
</tr>
<tr>
<td>Outbreak diseases</td>
<td>Lassa fever, Rift Valley fever, chikungunya, Ebola, Disease X</td>
<td>Africa is subject to regular regional outbreaks mostly fueled by the same set of diseases</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Total</strong> 22</td>
</tr>
</tbody>
</table>
We identified 22 priority diseases whose vaccines could be manufactured in Africa to reach the 60% local manufacturing target set for 2040

<table>
<thead>
<tr>
<th>Archetype</th>
<th>Disease</th>
<th>Does a vaccine exist?</th>
<th>African doses volume by 2040 (Mn)</th>
<th>DALYS 2040 (Mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legacy</td>
<td>Hep B, Diphtheria, Tetanus, Whooping Cough</td>
<td>✓</td>
<td>~370</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Tuberculosis</td>
<td>✓</td>
<td>~140</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Measles</td>
<td>✓</td>
<td>~240</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Yellow Fever</td>
<td>✓</td>
<td>~50</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>Cholera</td>
<td>✓</td>
<td>~30</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Typhoid</td>
<td>✓</td>
<td>~20</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Meningococcal1</td>
<td>✓</td>
<td>~60</td>
<td>5</td>
</tr>
<tr>
<td>Expanding</td>
<td>Papillomavirus</td>
<td>✓</td>
<td>~30</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Pneumococcal</td>
<td>✓</td>
<td>~140</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Rotavirus</td>
<td>✓</td>
<td>~120</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>COVID-19</td>
<td>✓</td>
<td>~710</td>
<td>TBD</td>
</tr>
<tr>
<td></td>
<td>Malaria</td>
<td>✓</td>
<td>~120</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>HIV</td>
<td>×</td>
<td>~110</td>
<td></td>
</tr>
<tr>
<td>Outbreak</td>
<td>Ebola</td>
<td>✓</td>
<td>~1</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Influenza2</td>
<td>✓</td>
<td>~10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Chikungunya</td>
<td>✓</td>
<td>~1</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>Rift Valley fever</td>
<td>×</td>
<td>~1</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>Lassa fever</td>
<td>×</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Disease X</td>
<td>×</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>~2,200</td>
<td></td>
</tr>
</tbody>
</table>

Factors considered in prioritizing the diseases:

- Building a sustainable vaccine manufacturing industry by prioritizing high-volume products
- Addressing Africa-specific infectious disease burden
- Preparing the African continent for potential outbreaks

Additional spare capacity is needed to support manufacturing for outbreak diseases when needed

1. Including key serogroups found in Africa (A, C, W and X)
2. Considering here outbreak Influenza
CONSULTATION DOCUMENT

The African Vaccine Manufacturing Accelerator (AVMA)

November 2023
AVMA supports a resilient, secure, competitive African Vaccine Manufacturing industry

Strong momentum: Substantial policy and financial commitments

However, there are significant challenges

Higher initial costs compared with incumbent manufacturers …

+20% operating costs  + 40% labor costs  +50% capital expenditures

… resulting in unviable businesses. Example of Measles-Rubella cashflows (Cumulative, US$ mn)

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-60</td>
<td>-80</td>
<td>-100</td>
<td>-110</td>
<td>-120</td>
<td>-120</td>
<td>-110</td>
<td>-110</td>
<td>-110</td>
<td>-100</td>
</tr>
</tbody>
</table>

AVMA is a key part of Gavi’s support to the African Union’s vision:

- African manufacturers participate competitively
- Global market health is protected
- AVMA is one component within an African Union-led ecosystem
AVMA is key to Gavi’s broader 4-pillar regional manufacturing strategy which, in turn, supports the AU vision for sustainable vaccine manufacturing in Africa.

**AU’s PAVM Framework for Action**
- Market design & demand intelligence
- Access to finance
- Regulatory strengthening
- Technology transfer and IP
- Research & Development
- Talent development
- Infrastructure development
- Agenda-setting and coordination

**Leads the support for the full African vaccine ecosystem**

**Four pillar regional manufacturing strategy**

- **Pillar 1:** Aggregate and communicate market insights
- **Pillar 2:** Adapt Gavi product menu criteria to accommodate regional diversity of manufacturers
- **Pillar 3:** Build regional solidarity and predictability around demand
- **Pillar 4:** ‘African Vaccine Manufacturing Accelerator’ (AVMA) to provide early-years financial support to African vaccine manufacturers

Gavi’s market shaping and innovative financing expertise supports and incentivizes full ecosystem development.
Gavi has finetuned the design of the AVMA and its objectives and impacts

AVMA aims to achieve two main objectives …

Objective A
A sustainable, African vaccine manufacturing base that is contributory to healthy global vaccine markets

in alignment with Pillar 1

Objective B
Improved African pandemic and outbreak vaccine supply resilience

Inclusive of platform technologies that support coronaviruses response

… with four expected outcomes

At least 4
Vaccine manufacturers who secure at least one UNICEF tender with AVMA support

>0.7 billion
Drug Product capacity (in doses) of AVMA supported supply base when repurposed in a potential outbreak scenario

>0.8 billion
Cumulative doses (Drug Product and Drug Substance) supported by AVMA until 2035

3 or more
Drug Substance platform technologies supported by AVMA until 2035

>0.7 billion
Drug Product capacity (in doses) of AVMA supported supply base when repurposed in a potential outbreak scenario
How will the proposed AVMA work?

1 Could be expanded in future if there are other Gavi-recognized regulatory authorization mechanisms in place
AVMA supports a resilient, competitive African Vaccine Manufacturing with two incentive payments

AVMA provides two incentive payments to African manufacturers …

Objective A
A sustainable, African vaccine manufacturing base that is contributory to healthy global vaccine markets
in alignment with Pillar 1

Objective B
Improved African pandemic and outbreak vaccine supply resilience
Inclusive of platform technologies that support coronaviruses response

Manufacturer | WHO Prequalification | Tender application | Tender award | Tender payment
---|---|---|---|---
| | WHO PQ obtained | Application with bid factoring-in potential future AVMA payment | Successful UNICEF tender | Tender per dose payment

AVMA milestone payment
- US$ 25 million Drug substance vaccines that use Viral Vector or mRNA platforms
- US$ 20 million Drug substance priority vaccines\(^1\) only
- US$ 10 million Fill & Finish on all platforms priority vaccines\(^1\) only

AVMA accelerator payment
- US$ 0.50 per dose Drug substance: higher-priority vaccines\(^1\) and platforms\(^2\)
- US$ 0.40 per dose Drug substance: all other Gavi antigens and platforms
- US$ 0.30 per dose – Max. US$ 1 per vial Fill & Finish across all Gavi antigens

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1 Priority Vaccines constitute: OCV, Malaria, Measles-Rubella, Hexavalent (xP), Yellow Fever, Ebola (indication against at least 2 Ebola species and thermostability as from – 20C, Rotavirus (single-dose blow-fill-seal presentation), and Pneumococcal (minimum 13 valent)
2 Priority Platforms constitute: Viral Vector and mRNA platforms
AVMA technical design is structured around 6 key design elements

1. **Vaccines**
   - Scope: Vaccines
   - Procurement pathway
   - Duration

2. **Chain focus**
   - Incentives
   - Eligibility

3. **Value**
   - Scope

4. **Pathway**
   - Open to **Gavi Alliance supported vaccines** (with differences in payments)

5. **Eligibility**
   - To be launched in 2024 with a proposed duration of 10 years (payments can continue for a period beyond the 10-year mark, depending on tender length)

6. **Procurement**
   - Via successful Gavi-UNICEF tenders

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**Accelerator payment (per dose)** to African vaccine manufacturers winning Gavi-supported UNICEF tenders on competitive terms as doses are delivered

**Milestone payment** to African vaccine manufacturers successfully obtaining WHO Prequalification

**Vaccines manufactured** (drug substance and/or drug product) on the African continent

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1. A potential AU pooled procurement mechanism may be accommodated in the future
2. At this stage, the intent is to exclude from AVMA incentives for those products whose drug substance or drug product manufacturing depends on Contract Manufacturing Organisations; subject to further analysis in the first half of 2024.
3. Could be expanded in future if there are other Gavi-recognized regulatory authorization mechanisms in place
Scope: All Gavi-supported vaccines are eligible for AVMA support of which some priorities are eligible for additional incentives

<table>
<thead>
<tr>
<th>All Gavi-supported vaccines are eligible for AVMA support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholera</td>
</tr>
<tr>
<td>Malaria</td>
</tr>
<tr>
<td>Measles - Rubella</td>
</tr>
<tr>
<td>Hexavalent (wP)</td>
</tr>
<tr>
<td>Ebola</td>
</tr>
<tr>
<td>HPV</td>
</tr>
<tr>
<td>Inactivated Polio (IPV)</td>
</tr>
<tr>
<td>Japanese Encephalitis</td>
</tr>
<tr>
<td>Measles</td>
</tr>
<tr>
<td>Meningitis A</td>
</tr>
<tr>
<td>Multivalent Meningitis</td>
</tr>
<tr>
<td>Pentavalent</td>
</tr>
<tr>
<td>Pneumococcal</td>
</tr>
<tr>
<td>Rotavirus</td>
</tr>
<tr>
<td>Typhoid Conjugate</td>
</tr>
<tr>
<td>Yellow Fever</td>
</tr>
</tbody>
</table>

*Inclusive of platform technologies that support coronaviruses response

…in addition, vaccines in priority markets will receive additional incentives

<table>
<thead>
<tr>
<th>Priority vaccine markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholera</td>
</tr>
<tr>
<td>Malaria</td>
</tr>
<tr>
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</tr>
<tr>
<td>Hexavalent (wP)</td>
</tr>
<tr>
<td>Yellow Fever</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Priority platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRNA</td>
</tr>
<tr>
<td>Viral vector</td>
</tr>
</tbody>
</table>

Based on listing on the Gavi product menu
Both Drug Substance and Fill & Finish manufacturing physically on the African continent are eligible for AVMA

**Final AVMA design**

<table>
<thead>
<tr>
<th>Options</th>
<th>A</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVMA provides incentives for Fill &amp; Finish and/or Drug Substance in Africa</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Example implications**

- **A** Supports earlier F&F and long-term DS localization
- **B** More complex due to different incentive levels

**Alternatives considered**

<table>
<thead>
<tr>
<th>Drug Substance-focused</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVMA provides incentives for manufacturers producing only drug substance in Africa</td>
</tr>
<tr>
<td>DS has higher contribution to PPPR and health security compared to F&amp;F</td>
</tr>
<tr>
<td>DS localization may require more time and exceed AVMA lifetime</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>End-to-end-focused</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVMA provides incentives for African manufacturers producing vaccines end-to-end, incl. DS and F&amp;F manufacturing</td>
</tr>
<tr>
<td>End-to-end may best support PPPR and health security with full self-sufficiency</td>
</tr>
<tr>
<td>Harder to achieve and may exceed AVMA lifetime</td>
</tr>
</tbody>
</table>

**African Manufacturing projects**

1. Number of vaccine manufacturing project
2. Countries with announcements
3. Potential benefit for the AMC
4. Potential challenge for the AMC

1. African vaccine manufacturing projects expected to commence over next 10 years based on public announcements
Accelerator payments are received as a top-up to tender payments

<table>
<thead>
<tr>
<th>Potential incentive levels</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US$ 0.50</strong> -per dose</td>
<td>Drug substance: higher-priority antigens and platforms</td>
</tr>
<tr>
<td></td>
<td>Helps guide investment toward antigens offering maximum sustainability or platforms offering pandemic response capacity</td>
</tr>
<tr>
<td><strong>US$ 0.40</strong> -per dose</td>
<td>Drug substance: all other Gavi antigens and platforms</td>
</tr>
<tr>
<td></td>
<td>Supports organic market development via substantial support to all Gavi-antigens</td>
</tr>
<tr>
<td><strong>US$ 0.30</strong> -per dose</td>
<td>Fill &amp; Finish across all antigens</td>
</tr>
<tr>
<td></td>
<td>Incentivises F&amp;F investment as pathway to Drug Substance production</td>
</tr>
<tr>
<td>Max. US$ 1 -per vial cap</td>
<td></td>
</tr>
</tbody>
</table>

Post-tender accelerator payment to African vaccine manufacturers

- All Gavi antigens
- Winning Gavi/UNICEF tenders on competitive terms
- Paid as doses are supplied
- With caps per antigen and manufacturer

Supports organic market development via substantial support to all Gavi-antigens
Milestone payments are received for priority platforms and vaccines at WHO PQ

### Milestone payment: Incentive structure

**Milestone payment** to African vaccine manufacturers:
- Successfully obtaining WHO Prequalification\(^1\)
- With caps for total milestone payment and per vaccine category and per manufacturer

### Potential incentive levels

<table>
<thead>
<tr>
<th>Amount</th>
<th>Incentive Details</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>US$ 25 million</td>
<td><strong>Drug substance</strong> (can be received for multiple antigens by each manufacturer)</td>
<td>Early support guides investments toward platforms supporting pandemic response capacities</td>
</tr>
<tr>
<td></td>
<td>- <em>vaccines that use Viral Vector or mRNA platforms</em></td>
<td></td>
</tr>
<tr>
<td>US$ 20 million</td>
<td><strong>Drug substance</strong> (can be received for multiple antigens by each manufacturer)</td>
<td>Provides early support on receipt of regulatory authorisation, to bridge lead-time to full production</td>
</tr>
<tr>
<td></td>
<td>– <em>priority vaccines only</em></td>
<td></td>
</tr>
<tr>
<td>US$ 10 million</td>
<td><strong>Fill &amp; Finish on all platforms</strong> (limited to once per manufacturer)</td>
<td>Incentivises limited F&amp;F investments</td>
</tr>
<tr>
<td></td>
<td>– <em>priority vaccines only</em></td>
<td></td>
</tr>
</tbody>
</table>

---

1 Could be expanded in future if there are other Gavi-recognized regulatory authorization mechanisms in place
The incentives are capped for vaccine categories, manufacturers, value chain steps and incentive types to ensure even disbursement.

**Included**

- **Cap per vaccine category** (i.e. for a specific antigen) to promote broad antigen coverage - US$ 300 million

- **Cap per manufacturer** to limit overpayment to single manufacturer - US$ 250 million, of which maximum US$ 50 million for Fill & Finish

- **Cap for F&F** to support sufficient funding for end-to-end localization (incl. DS) – US$ 250 million

- **Cap for milestone payment** to ensure sufficient funding for manufacturers who win UNICEF tenders – US$ 250 million

**Not included**

- **Cap per platform technology**

- **Cap per country**

- **Cap for pandemic-related platforms**

**Cap design principles**

A. **Limit undesirable outcomes** (e.g., concentration to few manufacturers / antigen)

B. **Shape the AVMA to support technical outcomes** (e.g., sustainable manufacturers, localized antigens)

C. **Keep caps simple and lean** and prioritise most important caps

D. **Avoid AVMA funds** being unduly tied up
# Contract Manufacturing Organisations

The intent is to exclude from AVMA those products whose African manufacturing depends on a CMO

### NON-EXHAUSTIVE

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Benefits and risks</th>
<th>Eligible in final design</th>
<th>Not considered</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Products manufactured by an African manufacturer in Africa</td>
<td>May contribute to substantial and sustainable manufacturing base in Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Products manufactured by a non-African manufacturer in Africa</td>
<td>May be most efficient way to localize DS capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Products manufactured by an African CMO for a non-African Market Authorisation holder</td>
<td>May indirectly create more business opportunities for African CMOs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **A**: Africa-based manufacturer with Drug Substance/ F&F production in Africa
- **B**: International PharmaCo localizing F&F/DS capacity on the African continent
- **C**: CMO in Africa conducting F&F and/or DS, product sold under name of contracting manufacturer who receives incentive

1. Includes tech-transfer models

---

- **Potential benefit for the AVMA**
- **Potential risk for the AVMA**

## Benefits and risks

- **May contribute to substantial and sustainable manufacturing base in Africa**
- **May be most efficient way to localize DS capacity**
- **May not be perceived as strengthening African manufacturing long term capabilities in a sustainable manner**
- **Potentially long lead times to establish DS (potentially dependent on bulk provider until that point)**
- **Products are labelled and sold by the contracting manufacturer, potentially minimizing local capabilities**
## Incentives will be offered on vaccines procured via UNICEF tendering

### Options

<table>
<thead>
<tr>
<th>Benefits and risks</th>
<th>AVMA design</th>
<th>For future consideration</th>
<th>Not considered</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Procured through UNICEF</td>
<td>• All Gavi supported vaccines category procured through UNICEF tenders (Gavi and non-Gavi financed) will be eligible.</td>
<td>• Gavi supported vaccines procured through a future AU procurement mechanisms will be considered for eligibility.</td>
<td>• All vaccine volumes from an AVM manufacturer sold through bilateral deals outside the UNICEF tender)</td>
</tr>
<tr>
<td><strong>B</strong> AU procurement</td>
<td>• Most technically and legally feasible option.</td>
<td>• Supports future AU procurement mechanism</td>
<td>• Potentially includes domestic as well as ex-Africa volumes</td>
</tr>
<tr>
<td></td>
<td>• May exclude volumes from Gavi-transitioned /transitioning countries, if/when they self-procure</td>
<td>• May exclude domestically produced and supplied vaccines</td>
<td>• Challenges related to validating procurement outside UNICEF tenders</td>
</tr>
<tr>
<td></td>
<td>• May exclude domestically produced and supplied vaccines</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Estimated relative volume size

- **A**: 1.0x
- **B**: tbd
- **C**: 1.6x

Source: M4A, 2021 total procurement volumes globally for Gavi vaccines
AVMA is proposed to run for ten years, with a “soft” stop to accommodate tender periods

### Alternative considered

<table>
<thead>
<tr>
<th>Options</th>
<th>Hard stop mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timeline</strong></td>
<td>AVMA initial assumption limited to 10 years; no per dose payment thereafter, even for tenders won before</td>
</tr>
<tr>
<td><strong>Hypothesis</strong></td>
<td>Option deprioritised due to …</td>
</tr>
<tr>
<td></td>
<td>• higher risks of creating negative business cases for manufacturers that enter closer to the end of the AVMA</td>
</tr>
<tr>
<td></td>
<td>• potential disadvantages for platform technologies that require a longer time to build and receive PQ even though a hard stop mechanism would create incentives to invest early in local manufacturing (first mover)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B Soft stop mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AVMA design</strong></td>
</tr>
<tr>
<td><strong>Timeline</strong></td>
</tr>
<tr>
<td><strong>Hypothesis</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

### Illustration

**Soft stop mechanism**

- **Start of the AVMA**
  - Manufacturer A incentive
  - Manufacturer B incentive
  - Manufacturer C incentive

- **+5 years**
  - Manufacturer A incentive
  - Manufacturer B incentive

- **+10 years**
  - Manufacturer B incentive
  - Manufacturer C incentive

**AVMA support period**

- Disbursement until end of UNICEF tender, duration of award (LTA)

*Visualization illustratively with the assumption that a manufacturer would reach the respective manufacturer value cap roughly in two UNICEF tender periods*
## AVMA base proposal for the Board

### Size:
Funding requirement of US$ 750-1,000 million

### Duration:
Launched 2024 with a proposed 10-year duration (until final supported tenders begin)

### Procurement pathway:
Via successful Gavi-UNICEF tenders (in future any AU pooled procurement mechanism could be considered)

### Scope:
All Gavi vaccines are in scope – with higher incentives for the following priorities

- **Priority vaccines**: OCV, Malaria, MR, Hexa, YF, Ebola (min. 2 species, thermostability as from -20C), Rotavirus (single-dose BFS), PCV (min 13-valent)
- **Priority platforms**: mRNA, Viral vector

### Eligibility:
Vaccines manufactured on the African continent inc. Drug Product, and end-to-end (Substance and Product)

### Incentive structure:

#### Milestone payment at WHO PQ of:
- US$ 25 million for **priority pandemic preparedness platforms**
- US$ 20 million for **drug substance of priority vaccines**
- US$ 10 million for **fill & finish of priority vaccines**

#### Post-tender accelerator payment of:
- US$ 0.50/dose **for DS of priority vaccines and pandemic preparedness platforms** (incl. potentially C19)
- US$ 0.40/dose **for DS of non-AVMA-priority** drug substance vaccines
- US$ 0.30/dose with a cap of US$ 1.0/vial **for only fill & finish of all Gavi** vaccines

#### Disbursement caps:
- $250 mn per manufacturer of which $50 mn for F&F
- $250 mn for total milestone payments
- $250 mn for total F&F support
- $300 mn total per vaccine category

---

Note: Manufacturers doing both drug substance and fill & finish steps under a tender award will receive only the drug substance per dose accelerator payment for that tender. At this stage, the intent is to exclude from AVMA incentives, those products whose drug substance or drug product manufacturing depends on Contract Manufacturing Organisations; noting this will be subject to further analysis of these arrangements in the first half of 2024.
AVMA design process: 12 months of rigorous analysis for a targeted, effective instrument

AVMA supports African manufacturers in surviving the high-risk, high-cost early development stage, so they can sustainably compete on global terms

- Identify vaccine markets that can sustain new entrants and market health
- Model additional costs for new manufacturers in each market across a range of assumptions
- Identify optimal support model for value for money, impact and market health
- Validate model by mapping unintended consequences, risks and assumptions
- Define and stress test overall instrument scale, impact and operationalisation needs

- Extended baseline study spanning every Gavi vaccine, plus all African announcements; accounting for AU goals, leveraging existing Alliance roadmaps and factoring in analysis from CEPI and other partners
- Multidisciplinary, internal and external expert team effort for a comprehensive, bottom-up model of costs with >50 sources and >2000 line items from bioreactors down to bins, over 9 archetype vaccine production facilities
- Analysis of the additional funding required to “close the gap” for each vaccine modelled over 25 successive rounds of modelling for sensitivity analysis from cost of borrowing, to numerous offtake scenarios, and 3 additional manufacturer-specific models
- Months of continuous exchange with Alliance Market Shaping partners (BMGF, WHO, UNICEF) over >40 meetings, including a two-day simulation workshop
- Gavi-led modelling of multiple possible price impact scenarios across markets, based on best available Alliance data, forecasts and experience of market evolution
- Modelling of the required size of the AVMA and its expected impact – for a sustainable African manufacturing ecosystem

Supported by extensive consultation throughout

- The design and analysis were subject to
  - Modelling by external consultants with two decades of industry experience
  - Cross-referencing with best-in-class existing modelling, including from BDO Kroll, CHAI and GIZ
  - Biweekly consultations with Alliance Partners (BMGF, UNICEF, WHO)
  - Dedicated regular exchanges with Africa CDC, PAVM and CEPI
  - Multiple rounds: industry (AVMI, DCVMN, IFPMA), Donor, CSO consultation
  - Validation by independent Expert Reference Group
Decision 15: African Vaccine Manufacturing Accelerator (AVMA)

The Gavi Alliance Board:

a) **Approved** the establishment of the African Vaccine Manufacturing Accelerator (AVMA) as an instrument to provide time-limited financial support to accelerate the expansion of commercially viable vaccine manufacturing in Africa, in accordance with the base design criteria set out in Annex A to Doc 05b as amended in follow up to discussions at the PPC;

b) **Noted** that this approval is contingent on available funding from the COVAX Advance Market Commitment (AMC) Pandemic Vaccine Pool (PVP) as confirmed by the Gavi Audit and Finance Committee. Under the base proposal, a capitalisation of up to US$ 1 billion is required;

c) **Noted** that the investment proposals were developed with full consideration of enhanced collaboration with other pandemic recovery and PPPR initiatives and considered by the COVAX AMC Investors Group, as requested by the Board in June 2023, and were supported as options for the use of COVAX AMC PVP funds; and

d) **Requested** that the Secretariat brings back to the Board the following in the first half of 2024: further analysis of legal and regulatory risks relating to the provision of Gavi’s support; the articulation of intermediate milestones and review points; the establishment of a Treasury function; proposed governance arrangements with related legal terms and conditions established; and a high-level mapping of key dependencies related to regional demand, regulatory strengthening and prequalification functions at WHO.
AVMA governance will be important, and we need time to get it right…

... there will be a six-month process to align on the final governance and operational rules for AVMA

Principles to determine AVMA governance in Q1/Q2 2024

1. Inclusive Steering Group – membership from donors, technical experts and relevant partners (e.g. Africa CDC)
2. Regular monitoring – interim milestones tracked and updated throughout with market engagement
3. Clear links to wider ecosystem – docked into Africa CDC/AU processes (e.g., "manufacturers' marketplaces")
4. Ability to course-correct – agreed pathway to update design features (without undermining incentives to invest)
5. Alignment with the Gavi Board – final governance model and ways of reporting presented to the Gavi Board in 2024

AVMA’s operational rules to be developed into a framework agreement during Q1/Q2 2024 and presented to Gavi Board, including legal analysis and a high-level mapping of key dependencies such as regulatory strengthening

The PCV’s operational rules determined in a framework agreement signed by donors, World Bank and Gavi.

e.g. Pneumococcal AMC Advance Market Commitment (PCV AMC)
Discussion

Reactions? Questions?
Thank you
The Gavi Alliance Programme and Policy Committee recommended to the Gavi Alliance Board that it:

a) **Approve** the establishment of the African Vaccine Manufacturing Accelerator (AVMA) as an instrument to provide time-limited financial support to accelerate the expansion of commercially viable vaccine manufacturing in Africa, in accordance with the base design criteria set out in Annex A to Doc 05b as amended in follow up to discussions at the PPC;

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Appendix
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- Validate model by mapping unintended consequences, risks and assumptions
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- Cross-referencing with best-in-class existing modelling, including from BDO Kroll, CHAI and GIZ
- Biweekly consultations with Alliance Partners (BMGF, UNICEF, WHO)
- Dedicated regular exchanges with Africa CDC, PAVM and CEPI
- Multiple rounds: industry (AVMI, DCVMN, IFPMA), Donor, CSO consultation
- Validation by independent Expert Reference Group

The design and analysis were subject to

Gavi
### Alternative AVMA design scenarios for considerations

**Incentive structure**
- **Accelerator ‘per dose’ payment - 75% of AVMA**
  - Priority only
  - Priority only
  - AVMA Design: All
  - Increased focus on priorities

- **PQ Milestone payment – 25% of AVMA**
  - Priority only
  - All
  - AVMA Design: Priority only
  - Increased openness to all antigens

**Impact**
- **Accelerator ‘per dose’ payment**
  - Doses: F&F 300, DS 1,100, 1,400
  - Priority only
- **Increased focus on priorities**
  - Priority only

- **Strengthened sustainable supplier base**
- **Improved PPPR capacity**
- **Supported healthy global markets**

- **F&F DS**
  - All
  - Cumulative total disbursement, in million US$
    - 570-730
    - 630-810
    - 750-1,000
  - 810-1,050
  - 840-1,090

- **F&F DS**
  - All
  - Cumulative total disbursement, in million US$
    - 570-730
    - 630-810
    - 750-1,000
  - 810-1,050
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    - 570-730
    - 630-810
    - 750-1,000
  - 810-1,050
  - 840-1,090

### Alternative considered
In its discussion, the PPC highlighted the following

**Support for AVMA**

The PPC **highly supportive, recommended board approval**, and noted the **critical role Gavi should play** given its strength in financial innovation and vaccine market shaping.

**The consultative process**

The PPC **welcomed the extensive consultations** which had been undertaken in developing the proposal, and which will continue.

**Need for approval at the December Board**

The PPC emphasised the need to make rapid progress and to agree a specific headline terms for AVMA at the Board in December to send strong signals, both to industry and investors.

**importance of the ecosystem**

The PPC highlighted the importance of work to build the supportive African vaccine manufacturing ecosystem and AVMA’s role as an incentive for these broader conversations.
PPC recommend the Gavi Board approve the establishment of AVMA

…with optimisations to three elements of the

**Initial base proposal:**

**Priority vaccines**
- Measles-Rubella, Cholera, Malaria, Hexavalent (wP)

**F&F incentives**
- Initial F&F incentive level:
  - $0.3 per vial

**CMO eligibility**
- Eligibility criteria based on manufacturing done physically on the African continent, with CMO-models for discussion

**Final base proposal:**

**Inclusion of:**
- **Ebola:** >= two species + thermostability >= -20°C
- **Rotavirus:** 1 dose Blow Fill Seal
- **Pneumococcal:** >= 13 Valant
- **Yellow Fever:** all profiles
- **Plus the initial priority vaccines:**
  - Measles-Rubella, Cholera, Malaria, Hexavalent (wP)

**Updated F&F incentive:**
- $0.3 per dose
- Capped at $1 per vial to prevent overpayment

Assumption that **Contract Manufacturing Organizations be excluded** – subject to further analysis in Q1/2 2024
AVMA governance and operationalisation

Principles for AVMA governance, at the direction of the PPC

1. **Inclusive Steering Group** – membership from donors, technical experts and relevant partners.
2. **Regular monitoring** – interim milestones tracked and updated throughout with market engagement
3. **Clear links to wider ecosystem** – docked into Africa CDC/AU processes (e.g., manufacturers marketplaces)
4. **Ability to course-correct** – agreed pathway to update design features (without undermining incentives to invest)
5. **Alignment with the Gavi Board** – final governance model and ways of reporting presented to the Gavi Board in 2024

Specific deliverables for the Gavi Board mid 2024

- Analysis of legal and regulatory risks
- Intermediate milestones & review points
- Treasury function
- Governance arrangements
- High-level mapping of key dependencies
Impact on global market health and prices have been a core part of the risk assessment for AVMA

Potential impact on Gavi core, US$ mn

High impact case driven by
- African manufacturer entering with higher prices
- Higher risk supplier base (with production risk)
- Lower economies of scale for incumbents

Low impact case driven by
- Exit of high-priced vaccines in a specific market
- Lower prices due to increased competition

20 years of Gavi Market Shaping has consistently managed risk in dynamic markets – efforts by Gavi and the Alliance Market Shaping partners will continue with close monitoring and risk mitigation throughout the AVMA lifetime
F&F: The revised incentives were proposed based on several analyses

**Analyses**

1. COGs analysis per dose and vial
   - Larger COGS difference between different vial sizes and filling technology than previously assumed
   - The current F&F incentive (per vial) underpays for multidose vials

2. Generic F&F to tip business
   - Relationship between vial size and COGS is not a linear correlation; the same incentive per dose across all vial sizes would over-incentivize multi-dose vials
   - A maximum payment per vial prevents overpayment to multi-dose presentations

3. Split out by mfr. step
   - The proposed levels also sufficiently account for the higher COGS of more costly manufacturing steps such as lyophilisation

**Key findings**

**Design implications**

- Movement to ‘per dose’ from ‘per vial’
- Maximum incentive per vial at US$1
- No additional top ups for manufacturing steps

**AVMA implication**

- The implications on overall AVMA impact remained relatively unaffected, with potentially more manufacturers reaching their F&F manufacturer cap and slightly higher F&F payouts occurring in earlier years

**AVMA implication graph**
Updated F&F Incentive

Proposed updated F&F incentive
• $0.3 / dose
• Cap of total support of $1.0 per vial

Justification for the proposed change
• 50%+ of Gavi doses are in 5+ multidose presentations
• The previous per vial incentive seriously multidose underpaid by 100-150%
• The new proposal provides a more optimal payment of between 30-55% of COGS
• Capped at $1 per vial to avoid 150-250% overpayment for larger presentations
• This revised F&F structure offers a far more realistic incentive to ensure a sustainable F&F base as a pathway to DS, across Gavi’s programmatic concerns

Impact / considerations
• Appropriately compensates manufacturers across presentations
• Incentives for F&F remains lower than DS for all presentations
• The revised F&F incentive
  – supports a higher likelihood of manufacturers being sustained on the path to DS
  – mitigates the risk that funding is spent on manufacturers that fold
• The manufacturer F&F cap ensures that the maximum payout to F&F is unaffected

Proposed updated F&F incentive structure: Per dose incentive with a max per vial

Proposed updated F&F incentive
- $0.3 / dose
- Cap of total support of $1.0 per vial

Impact / considerations
- Appropriately compensates manufacturers across presentations
- Incentives for F&F remains lower than DS for all presentations
- The revised F&F incentive
  - supports a higher likelihood of manufacturers being sustained on the path to DS
  - mitigates the risk that funding is spent on manufacturers that fold
- The manufacturer F&F cap ensures that the maximum payout to F&F is unaffected

Model output / illustrations

- $0.3 per dose
- Max of $1.0 payout per vial
- Payout per vial (USD)

Source: Bottom-up COGS modelling – informed by PATH (2018), GIZ (2023)
## Priority vaccines: Proposal to include specific product profiles as priorities – other category B and C vaccines remain non-prioritised

### Vaccine market categorization

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Vaccines</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Market where additional supplier is expected to be contributory to global market health</td>
<td>Cholera, Malaria, Yellow Fever</td>
</tr>
<tr>
<td>B+</td>
<td>Market presenting opportunities for additional suppliers, whose product profile is at least as competitive as the current most attractive product profile</td>
<td>Ebola – indication against at least 2 Ebola species and above and thermostability at -20°C or above, Pneumococcal – min. 13 Valant, Rotavirus – single dose BFS</td>
</tr>
<tr>
<td>B</td>
<td>Market expected to present very limited opportunity for additional suppliers¹</td>
<td>Ebola – other product profiles, Meningococcal – other product profiles, Pneumococcal – other product profiles</td>
</tr>
<tr>
<td>C</td>
<td>Market expected to present very limited opportunity for additional suppliers¹</td>
<td>Meningitis A, COVID-19, Pentavalent, Inactivated Polio (IPV)</td>
</tr>
</tbody>
</table>

### Vaccines

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholera</td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td></td>
</tr>
<tr>
<td>Yellow Fever</td>
<td></td>
</tr>
<tr>
<td>Ebola – indication against at least 2 Ebola species and above and thermostability at -20°C or above</td>
<td></td>
</tr>
<tr>
<td>Pneumococcal – min. 13 Valant</td>
<td></td>
</tr>
<tr>
<td>Rotavirus – single dose BFS</td>
<td></td>
</tr>
<tr>
<td>Ebola – other product profiles</td>
<td></td>
</tr>
<tr>
<td>Meningococcal – other product profiles</td>
<td></td>
</tr>
<tr>
<td>Pneumococcal – other product profiles</td>
<td></td>
</tr>
<tr>
<td>Meningitis A</td>
<td></td>
</tr>
<tr>
<td>COVID-19</td>
<td></td>
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<tr>
<td>Pentavalent</td>
<td></td>
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<tr>
<td>Inactivated Polio (IPV)</td>
<td></td>
</tr>
<tr>
<td>Measles - Rubella</td>
<td></td>
</tr>
<tr>
<td>Hexavalent (wP)</td>
<td></td>
</tr>
<tr>
<td>Measles</td>
<td></td>
</tr>
<tr>
<td>HPV – other product profiles</td>
<td></td>
</tr>
<tr>
<td>Rotavirus – other product profiles</td>
<td></td>
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<tr>
<td>Measles</td>
<td></td>
</tr>
<tr>
<td>Typhoid Conjugate</td>
<td></td>
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<tr>
<td>Japanese Encephalitis</td>
<td></td>
</tr>
</tbody>
</table>

### Updated priority vaccines

<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>USD 10-25 mn milestone payment</td>
</tr>
<tr>
<td></td>
<td>USD 0.5 per dose accelerator payment for DS</td>
</tr>
</tbody>
</table>

### All other vaccines

<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No milestone payment</td>
</tr>
<tr>
<td></td>
<td>USD 0.4 per dose accelerator payment for DS</td>
</tr>
</tbody>
</table>

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¹ Already highly competitive and/or limited scope for product profile enhancements
Gavi is considering CMO models’ eligibility for AVMA in view of its potential to contribute to AVMA’s objectives, i.e., sustainable manufacturing capacity & improved PPPR capacity.

At this stage, the working assumption is that those products whose drug substance or drug product manufacturing steps rely on arrangements with a Contract Manufacturing Organisations; will be exclude from AVMA incentives.

This will be subject to further analysis of these arrangements in the first half of 2024.
AVMA on one slide
AVMA supports a resilient, competitive African Vaccine Manufacturing with two incentive payments

AVMA provides two incentive payments to African manufacturers ...

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>WHO Prequalification</th>
<th>Tender application</th>
<th>Tender award</th>
<th>Tender payment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>WHO PQ obtained</td>
<td>Successful UNICEF tender</td>
<td>Tender per dose payment</td>
</tr>
</tbody>
</table>

Objective A

A sustainable, African vaccine manufacturing base that is contributory to healthy global vaccine markets in alignment with Pillar 1

Objective B

Improved African pandemic and outbreak vaccine supply resilience

Inclusive of platform technologies that support coronaviruses response

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AVMA milestone payment

- **US$ 25 million** Drug substance vaccines that use Viral Vector or mRNA platforms
- **US$ 20 million** Drug substance priority vaccines\(^1\) only
- **US$ 10 million** Fill & Finish on all platforms priority vaccines\(^1\) only

AVMA accelerator payment

- **US$ 0.50 per dose** Drug substance: higher-priority vaccines\(^1\) and platforms\(^2\)
- **US$ 0.40 per dose** Drug substance: all other Gavi antigens and platforms
- **US$ 0.30 per dose** – Max. US$ 1 per vial Fill & Finish across all Gavi antigens

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1 Priority Vaccines constitute: OCV, Malaria, Measles-Rubella, Hexavalent (xP), Yellow Fever, Ebola (indication against at least 2 Ebola species and thermostability as from – 20C), Rotavirus (single-dose blow-fill-seal presentation), and Pneumococcal (minimum 13 valent)

2 Priority Platforms constitute: Viral Vector and mRNA platforms