WHO Update
Tania Cernuschi & Patrick Lydon

Session 2
UNICEF Vaccine Industry Consultation – 5-6 October 2017
The Big Picture

WHO’s Immunization Department
Supply, Technologies and Financing (STF) Team

To strive for a world where countries: have reliable and affordable supply of vaccines; can optimize their supply chains to reach coverage and equity goals with innovations; and can invest in the strengthening of their programmes with sustainable financing for vaccines and immunizations.

3x6 Strategy at a glance

- Reliable demand & supply of vaccines
- Access to innovative products & technologies
- Optimized national supply and cold chain systems
- Affordable pricing of vaccines
- Predictable financing for vaccines
- Financial sustainability of immunization programmes
### Three Strategic Objectives

<table>
<thead>
<tr>
<th>Strategic Objective</th>
<th>Strategic areas of work</th>
<th>Theory of change</th>
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<tbody>
<tr>
<td><strong>1. Reliable access to global supply of vaccines at affordable prices</strong></td>
<td><strong>1.1</strong> – Global supply and demand intelligence to secure vaccine access for all countries</td>
<td>▼ Shortages of vaccines</td>
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<td><strong>1.2</strong> – Vaccine price intelligence for improved procurement efficiency and options</td>
<td>▼ Vaccine prices</td>
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<td><strong>1.3</strong> – Improved access to affordable and timely supply of vaccine to middle income countries and in humanitarian/emergency situations</td>
<td>▲ Support to middle income countries</td>
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<td><strong>2. Innovative technologies and systems solutions to optimize supply chains</strong></td>
<td><strong>2.1</strong> – Promoting in-country adoption and scale-up of innovative delivery technologies and strategies that improve vaccine supply chain efficiency</td>
<td>▲ Adoption of new technologies</td>
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<td><strong>2.2</strong> – Strengthening supply chain and logistics systems with best practice in vaccine management</td>
<td>▲ Effective Vaccine Management (EVM)</td>
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<td><strong>2.3</strong> – Scaling-up innovative cold chain technologies and systems solutions to optimize vaccine supply chains in countries</td>
<td>▲ Cold Chain optimization</td>
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<td><strong>3. Access to sustainable financing for immunization programmes</strong></td>
<td><strong>3.1</strong> – Global immunization financing intelligence to advocate for sustainable investments in vaccines and immunizations</td>
<td>▲ Financial planning for immunization</td>
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<td><strong>3.2</strong> – Enhance national planning and financial management in order increase efficient use of existing resources</td>
<td>▲ Government funding of immunization</td>
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<td><strong>3.3</strong> – Financial sustainability planning for transitioning countries</td>
<td>▲ Health financing allocations to EPI</td>
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2. **Key Updates**

1. *Vaccine Access (GVAP stock out monitoring)*
2. *Vaccine Products (thermostability/delivery technologies)*
3. *Cold Chain Innovations*
4. *Total Systems Effectiveness (TSE)*
5. *Market Intelligence*
Vaccine Access - Stockout Monitoring

- **GVAP Indicator**: Reporting of at least 1 stockout event for at least 1 vaccine for at least 1 month at national level

- **GVAP goal**: 2/3rds reduction in the number of countries reporting stockouts (25 by 2020)

- **2016 report**: 73 countries (40%) reported 131 stockout events that lasted 51 days on average
Vaccine Access - Stockout Monitoring

- Countries of all income groups reported stockouts.
- 50% of Gavi countries & 40% of non-Gavi MICs reported stockouts in 2016.
Vaccine Access - Stockout Monitoring

- 66% of national level stockouts due to in-country challenges.

<table>
<thead>
<tr>
<th>Country Type</th>
<th>Quality issue on vaccines &amp; other causes</th>
<th>Vaccine shortages</th>
<th>Procurement delays</th>
<th>Inaccurate forecasts &amp; stock management issues</th>
<th>Funding delays</th>
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<tbody>
<tr>
<td>Gavi eligible countries (n=36)</td>
<td>7%</td>
<td>27%</td>
<td>3%</td>
<td>23%</td>
<td>7%</td>
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<td>Middle income countries (non-Gavi eligible / UN Procurement) (n=17)</td>
<td>15%</td>
<td>27%</td>
<td>61%</td>
<td>7%</td>
<td>7%</td>
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<td>Middle income countries (non-Gavi eligible / Self Procurement) (n=9)</td>
<td>29%</td>
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<td>High income countries (n=11)</td>
<td>80%</td>
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Vaccine Access - Stockout Monitoring

- Stockouts occur at sub-national level and impact on the timely delivery of immunization services.
Vaccine Products
Thermostability/CTC

- **Global Thermostability (CTC) Roadmap**
  - Four products prioritized

- **Upstream = CTC licensure**
  - Hepatitis B (birth dose) – 2 manufacturers
  - Tetanus Toxoid – 1 manufacturer

- **Downstream = accelerate uptake by countries**
  - HPV Gardasil: 42°C for 3 days (Uganda demo)
  - Oral Cholera Vaccine Shanchol: 40°C for 7 days+

- **Four products covering an interesting mix of situations**
  - Target children, adolescent, maternal health
  - Routine, campaign, and emergencies
Vaccine Products
VVMs & Delivery Technologies

INFORMATION BULLETIN – March 2017
Change in vaccine vial monitor (VVM) assignment for GlaxoSmithKline Rotarix® product

This information bulletin addresses the implications and required guidance associated with the upcoming scheduled shift in vaccine vial monitor (VVM) of the GlaxoSmithKline Biologicals SA (GSK) Rotavirus vaccine, Rotarix®, from VVM type 14 (VVM14) to VVM type 7 (VVM7). The information below is intended for WHO/UNICEF staff, as well as Expanded Program for Immunization (EPI) managers or other partner agencies which support immunization programmes.

Summary
A WHO statement on Rotarix® and VVM compliance was released in February 2017, indicating that in Quarter 3 2017, the VVM attached to the current Rotarix® product is expected to change from a VVM 14 to a VVM7. This change was deemed necessary by GSK and WHO in light of new information that the stability of the product under accelerated temperature studies is better reflected by a different VVM type, with a shorter discard point, given that some batches fall below specification following storage for more than 45 days at 25°C or higher. While such circumstances could theoretically affect vaccine potency, the safety profile of the vaccine remains the same. Furthermore, GSK has provided WHO with clinical trial data that support the conclusion that this VVM compliance concern carries no risk if the vaccine is stored in a 2–8°C cold chain as per the product’s label. Storage above these temperatures carries a very low public health risk. Even if a child received the two recommended doses from an affected batch of Rotarix, vaccine efficacy can still be expected.

Since discovering this VVM compliance issue, GSK has taken stakeholders should be aware. Should additional questions or uncertainties as to appropriate practices arise, contact points are provided for further guidance.

1. What should be done with current stock of Rotarix® with VVM14 in my programme? Can we still use it or will it be recalled?
   If you currently have stock of Rotarix® with a VVM14 or receive a shipment of this version of the vaccine, you can and should still use it. The evidence indicates that there are no concerns as to the quality of the product and therefore no product recall is required for Rotarix® with a VVM14. The vaccine is safe and can continue to be used safely as before, provided that appropriate cold chain adherence has occurred. Health workers and vaccinators should be advised to continue to administer this vaccine.

2. Why and when is it still suitable to use the Rotarix® with a VVM14?
   As indicated in the WHO statement, only temperature

- Programmatic linkages related to existing
  - Product presentations/VVMs
  - Delivery technologies

- Programmatic linkages related to upstream innovations
  - Use of the Immunization in Practice Advisory Committee to WHO (IPAC) incl. delivery technologies working group
  - Micro-Array Patches (MAP)
Vaccine Products
Revised WHO Wastage Estimates

- Updating global indicative wastage rates used since 2002 using binomial statistics
  - Improve vaccine forecast accuracy
  - Determine appropriate vaccine safety stocks
  - Inform choice of vial size and session frequency

Getting a Moon Landing on new WHO indicative vaccine wastage rate

MARS Landing
Binomial Distribution Method
The rocket to take us from EARTH to MARS.
Capturing wastage rate of each immunization service point in the world (5-10 years)

MOON Landing
Target select number and type of countries and run model estimates of open vial wastage with binomial methodology

EARTH Landing
Current WHO indicative total vaccine wastage rate (\(W_{\text{ov}} + W_{\text{v}}\)), 2005-2015

- BCG 50% (20-dose)
- DTP 25% (10-dose)
- MCV 40% (10-dose)
- OPV 30% (10-dose)
- Rotavirus 5% (1-dose)
- Measles rubella 60% (10-dose)
- Yellow Fever 40% (10-dose)
- TT 25% (10-dose)

**Problem:** These numbers have reached their limit of use as it assumes each country is the same

```
\[
\sum_{i=0}^{n} P\left(n; N_i, \frac{1}{S_i}\right) \times [m - (n \mod m)]
\]
\[
\sum_{m=1}^{\text{max}} P\left(n; N_i, \frac{1}{S_i}\right) \times [n + m - (n \mod m)]
\]
```

80%
70%
60%
50%
40%
30%
20%
10%
0%
mean session size

Open Vial Wastage (10 dose vial)

- Bangladesh
- Cambodia
- Binomial

World Health Organization
Cold Chain & Temperature Management Innovations
Many existing and future non-vaccine innovations have potential to break coverage and equity limits but have limited adoption in countries:
- Optimal dose per container (MOV/wastage)
- Thermostability/CTC (simplifying logistics)
- Needle-free injection technologies (fear, dose/sparing)
- Self administered technologies (coverage/drop-outs)

How to drive future innovations by understanding country demand and willingness to pay for innovation earlier on to better inform upstream product development and TPPs?

How to engage countries earlier in the development pipeline to ensure future adoption and scale up of novel technologies?

TSE is a component of the Health Market Framework (HMF) to address the innovation conundrum.

TSE is a multi partner initiative recently launched (Gates, Gavi, UNICEF, PATH, CHAI, WHO)
4 Total Systems Effectiveness (TSE)

- Development of a Multi-Criteria Decision Making (MCDM) and end-to-end analytical framework to:

  a) **Mitigate market failures** between supply & demand for innovations by defining the value proposition of new innovations for country and global decision makers earlier in the vaccine and technology development process

  b) **Analyze the trade-offs** of using multi-presentation and delivery technologies to determine the most suitable blend of innovations that will enable programmatic coverage and equity objective to be reached