# GAVI RV support: implementation and optimization challenges and opportunities

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14h International Rotavirus Symposium

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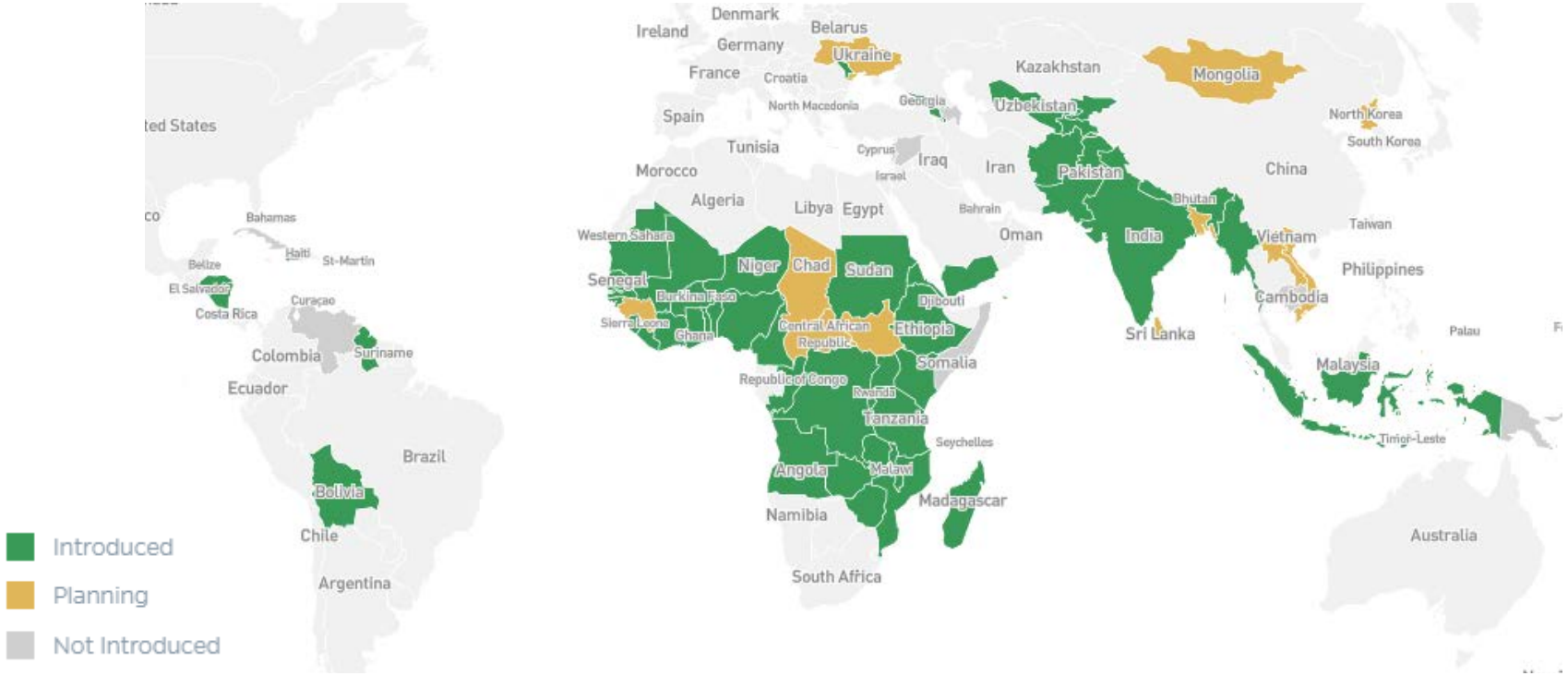
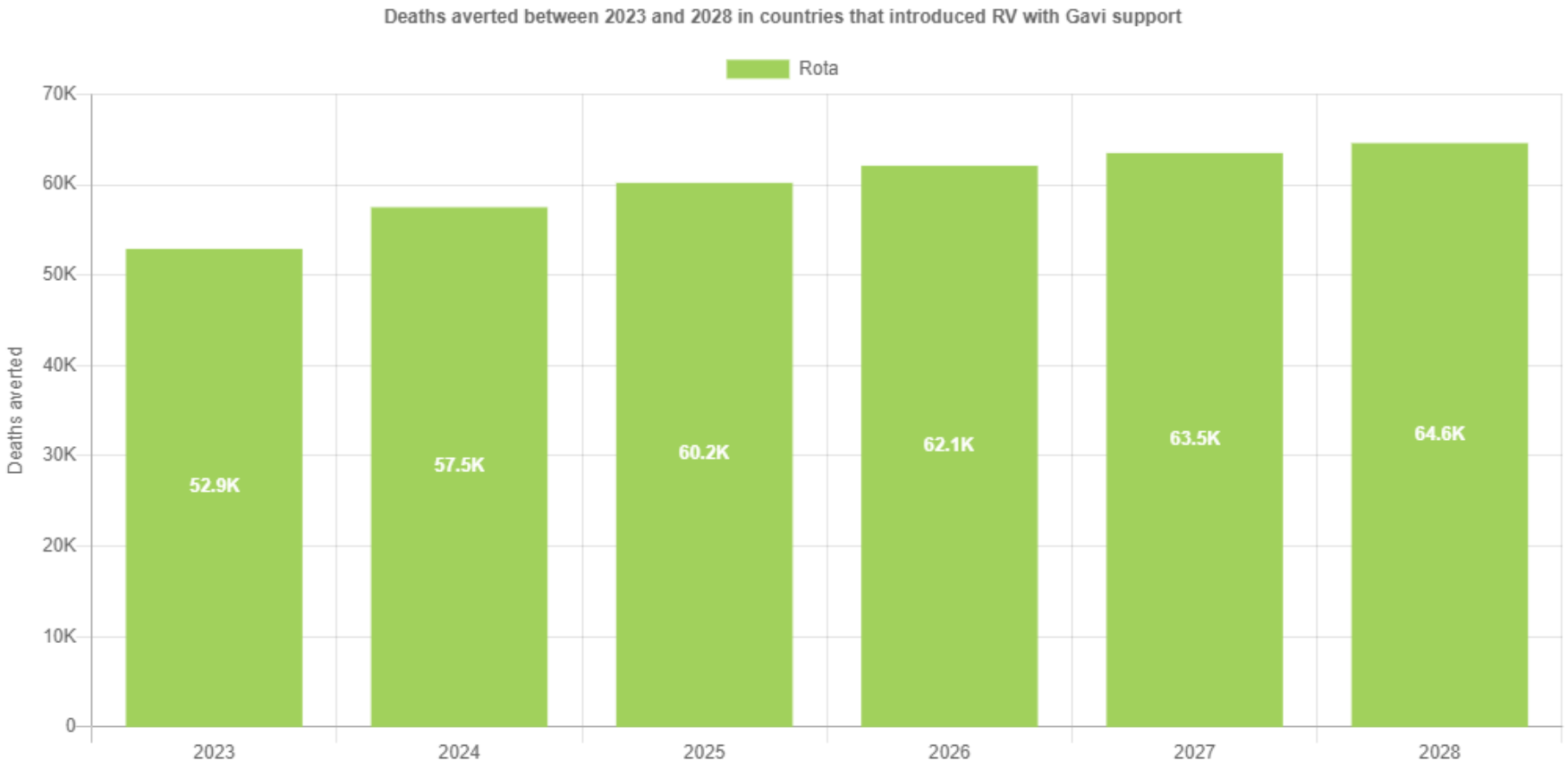
# Gavi supported RV vaccination for >200 M children

- >201m children vaccinated against rotavirus by end 2021, across 53 countries*
- Average coverage in Gavi supported countries above world average, since 2018.
- Latest introduction: Nigeria, August 2022




Source: Gavi APR 2020 and Gavi data
Map: Viewhub March 6th 2023
*Nigeria introduced in 2022

# The impact: 50-60.000 deaths averted every year (estimated)




Source: VIMC March 2023, 52 countries

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# Opportunity for Middle Income & Gavi's formerly eligible countries:
## *"MICs Approach" supports equity and sustainability by addressing backsliding and catalyzing introductions*

**Foundational building blocks**
*(addressing systematic issues across MICs, working with core and expanded partners)*

+

**Targeted & catalytic tools**
*(targeted engagement with countries)*

→

Drive the sustainable introduction of PCV, rotavirus, and HPV vaccines in former- and select never-Gavi eligible countries

Prevent and mitigate backsliding in vaccine coverage in former-Gavi eligible countries

- Providing regional and multi-country **technical assistance**
- Supporting **peer-to-peer learning** platforms (see the **Linked Immunisation Action Network**)
- Galvanising **political commitment**

Support available under the MICs Approach comprises of:

- Technical Assistance
- One-off support for vaccine introduction costs
- Vaccine catalytic financing for half of the first single-age cohort

In addition, Gavi is working with UNICEF SD to enable countries to achieve more sustainable vaccine prices

| MICs-eligible countries missing national introduction of RV vaccine | | |
|---|---|---|
| Former-Gavi eligible countries | Never-Gavi eligible countries | |
| Azerbaijan | Algeria | Maldives |
| Bhutan | Belize | Philippines |
| Cuba | Cabo Verde | Saint Lucia |
| Indonesia | Dominica | Saint Vincent and the Grenadines |
| Mongolia | Egypt | Tunisia |
| Sri Lanka | Grenada | Venezuela |
| Ukraine | Iran | |
| Viet Nam | Kosovo | |
| | Lebanon | |

Information on the Gavi MICs Approach is available online:
Gavi's approach to engaging with Middle Income Countries

# Opportunity: Optimisation of RV vaccine preferences.

*Options expanded from 2 in 2017 to 12 in 2022.*

Expanded range of options serving LMICs: 12 RV presentations (6 products) now available across three manufacturers. Characteristics and availability vary significantly by presentation, thus **the value of each option can differ depending on country context**.

| Manufacturer | GSK | | Bharat Biotech | | | | Serum Institute of India Pvt Ltd | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trade name | Rotarix[1] | | Rotavac | | Rotavac 5D | | Rotasiil | | Rotasiil - Liquid | | Rotasiil Thermo | |
| NRA | Belgium | | India | | | | India | | | | | |
| Form | Liquid | | Liquid (frozen) | | Liquid | | Lyophilised | | Liquid | | Lyophilised | |
| Presentation | Plastic tube | Strip of 5 single tubes | Vial | Vial | Vial | Vial | Two vial set | Two vial set | Strip of 5 single tubes | Vial | Two vial set | Two vial set |
| VVM Type | 7 | 7 | 2 | 2 | 7 | 7 | 30 | 30 | 7 | 7 | 250+ | 250+ |
| Doses in each presentation unit | 1 | 1 | 5 | 10 | 1 | 5 | 1 | 2 | 1 | 2 | 1 | 2 |
| WHO PQ decision | 2009 | 2019 | 2018 | | 2021 | | 2018 | | 2021 | 2021 | 2020 | |

Not available before 2024

Not available before 2024

Not available before 2024

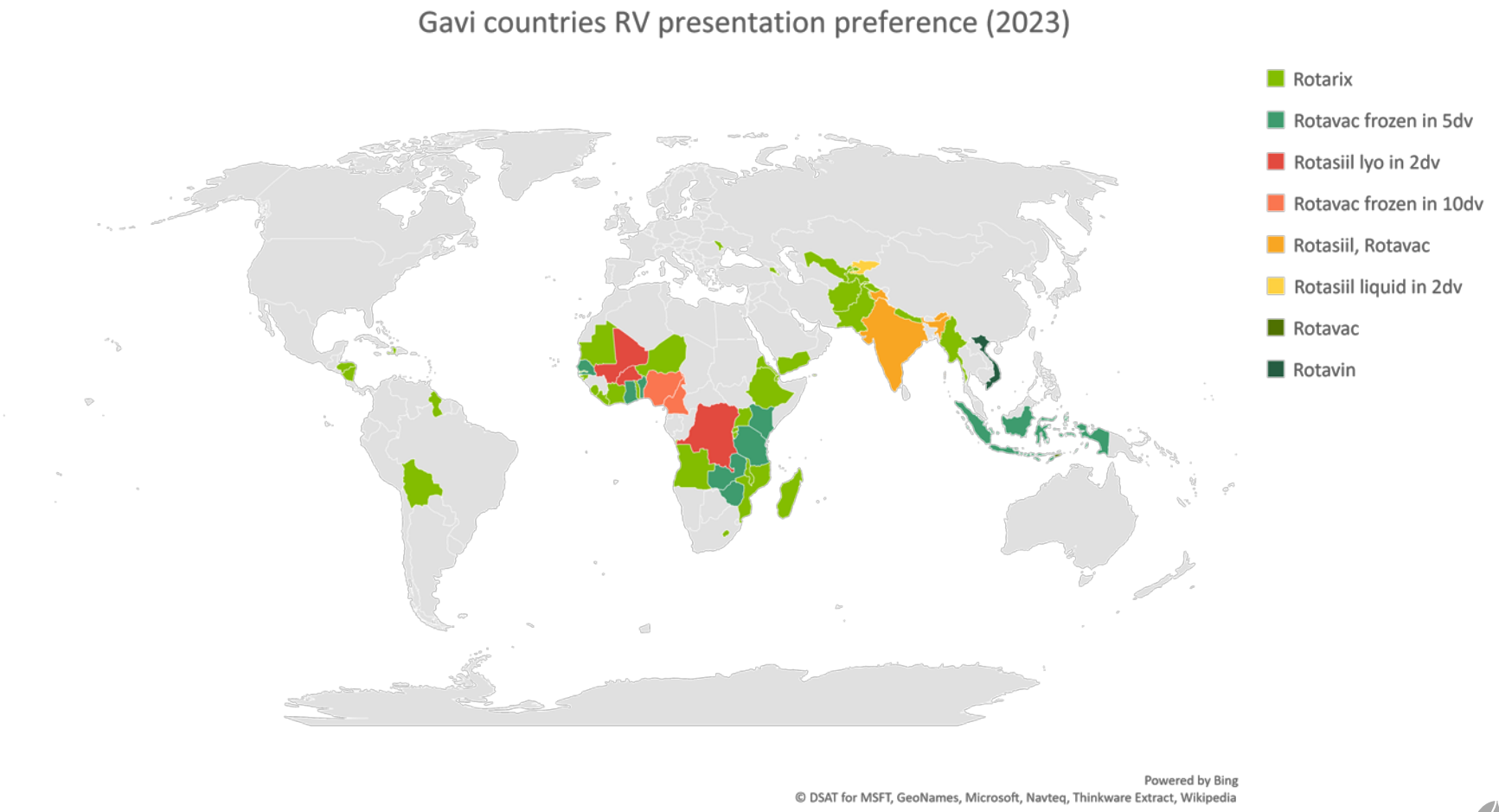
# Challenge: suboptimal supply predictability for some RV presentations

Several unrelated rotavirus vaccines supply issues affected 20+ countries in 4 years, leading to several “forced” switches with lessons learned across all stakeholders.

| Year | Vaccine presentation | Supply issue | Gavi countries affected |
|---|---|---|---|
| 2018 | Rotateq | Reduced allocation to Gavi | 4 |
| 2018 | Rotarix | Temporary manufacturing issue | 6 - 8 |
| 2021 | Rotarix BFS | Manufacturing paused | 3 |
| 2021 | Rotasiil 1-dose liquid | Temporary supply constraint due to fire damage | 2 |
| 2022 | Rotarix | Reduction in supply available to Gavi countries | 6 |
| 2022 | Rotavac 5D | Delay in supply availability | 5 |
| 2022 | Rotarix | Delay in supply availability | 1 |

# Uptake of new RV options has been hard to predict

Majority of changes in vaccine preference in Gavi-supported countries since 2018 have been “forced” by supply disruptions.




Source: Viewhub March 6th 2023

# Low awareness of new options and limited evidence-based assessment challenge demand predictability for RV vaccines

## Low Awareness

- NITAG experts in Gavi countries have lacked awareness of these new options and of tools to assess them.
- No systematic dissemination to inform technical partners, NITAGs, EPI

## Limited Assessment

- Several examples of switch requests with inaccurate assumptions and questionable benefit
- Scarcity of data and tools (no evidence from HIC)
- EPI and NITAGs have relied on suppliers more than technical partners for decision-making guidance

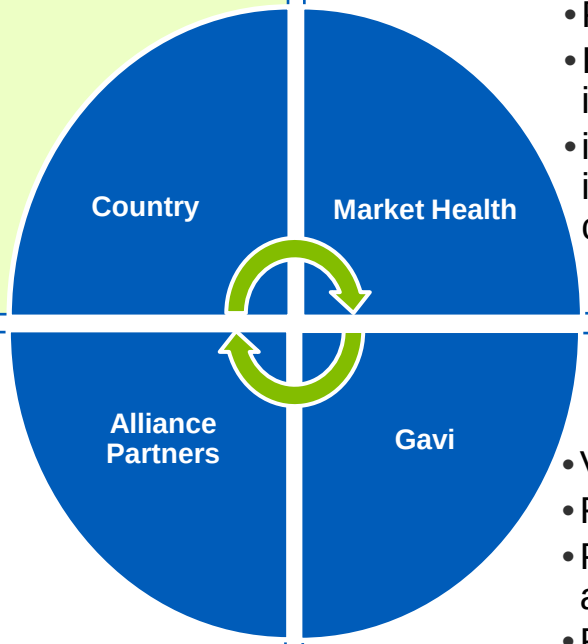
## Low Demand predictability

- The uptake of vaccine innovations in LMICs is complex to predict, especially without systematic engagement with NITAGs / EPIs
- Volatile demand forecasting, leading to inefficiencies that can reflect in a suboptimal price and vaccine supply disruptions.

# Countries switching vaccine preferences can have systemic impact

A single country's vaccine switch can impact the market and affect vaccine choices available to other countries. It is critical to ensure that switch decisions are evidence-based, well planned and coordinated, anticipating potential impacts on timing and/or product options.

- Ease of use
- Financial sustainability
- Cold chain, transport, storage
- Effectiveness, safety
- Coverage
- Supply availability, security




- Supply availability
- Prices increase/decrease
- Increase/decrease investment in new presentations
- increase/decrease investment in local manufacturing capacities

- Advocacy and fundraising
- Return on investment in Innovations for LMICs
- Pandemic readiness
- Strategic disease agendas

- Vaccine cost
- Forecast accuracy
- Penalty payments (volume agreements)
- Risk mitigation

# WHO considerations for selecting the vaccine presentation and formulation (2014)

"The price per dose of a vaccine should not be the sole driver for solid decision-making. Rather, **an analysis of all of the costs, advantages and disadvantages of introducing a specific product into the immunization programme should be conducted**.

## Safety

- least likely to result in **programmatic errors**
- correspond with the training levels and **capacities of the health workers**. For example, single component vaccines will require less training and are therefore less likely to result in programmatic errors than vaccines that require combining the contents of two or more containers, such as lyophilized vaccines or those that require the co-administration of two separate components

## Ease of use

- **time required** to prepare a vaccine is critical, such as during campaigns with long lines of waiting clients or during outreach activities.
- **Facilitates immunization delivery** by community-based health care providers.
- **similar to those already in use** to minimize the burden on health care workers.

## Wastage and missed opportunities

- costs of **wastage versus missed opportunities**.
- preferable to have **fewer doses per vial for expensive vaccines;** for vaccines that must be discarded within short time periods, such as lyophilized vaccines that have been reconstituted or unpreserved vaccines in multi-dose vials; or when **session sizes** are small.

## Cold chain, transport and storage requirements

- also look at the **auxiliary equipment needed** (e.g., injection materials),
- **sensitivities to heat and freeze damage**: if power outages are frequent or if the vaccine will be used for outreach activities, a more heat-stable vaccine will be preferable. If freeze exposure is a concern due to the use of ice packs, reliance on non-WHO pre-qualified refrigerators or cold ambient temperatures, a vaccine product that is less freeze sensitive should be selected, if available.

Adapted from: WHO's Principles and considerations for adding a vaccine to a national immunization programme (2014)

# Switch impact assessment framework for evidence-based country vaccine selection (Gavi, 2022)


Six key aspects of the immunisation programme can be impacted by a vaccine switch and should be assessed to weigh the potential benefits and trade-offs of each switch option.

## Efficacy, effectiveness or safety

- Clinical profile
- Real-world data
- Country-specific evidence
- Programmatic errors risk

## Ease of use

- Number of doses in the schedule
- Number of doses in the vial
- Time required to prepare the dose to administer
- Similarity to vaccine in use
- Means of administration
- Volume to administer

## Coverage

- Doses per schedule
- Impact on HCW hesitancy to open a vial (missed opportunities)

## Cold chain, transport, storage

- Cold chain capacity needs (incl. auxiliary equipment)
- Sensitivities to heat and freeze damage
- Type of cold chain needed
- Freeze-thaw flexibility

## Financial sustainability

- Wastage-adjusted cost to fully immunize a child
- Price per dose
- Wastage rates (doses/vial, sessions sizes, short discard period)
- Future price outlook based on tender outcomes

## Supply availability and security

- Current availability and predictability of future availability
- Made locally
- Size of supplier's capacity
- Lead time for supplier to manufacture

# Switch benefit, risk and implementation complexity can vary by option and also by country context

Assessing each variable impacted also helps planning and resourcing an effective switch implementation. For Gavi countries in "Initial Self Financing" cost per full RV schedule is fixed, but higher wastage can increase cost.

| RV Switch option (recently relevant examples) | Switch impact | | | | | | Switch implementation complexity |
|---|---|---|---|---|---|---|---|
| | Efficacy and safety [1] | Ease of use | Cold chain | Coverage | Cost (2023) | Supply (2023) | |
| **Rotarix > Rotarix in BFS** | | | ✓ | | ✓ | ! | **Low** presentation |
| **Rotavac frozen in 5dv > Rotavac 5D liquid in 5dv** | | ✓ | ! | | ! | ! | **Low** shelf life, storage |
| **Rotasiil lyo in 2dv > Rotasiil liquid in 2dv** | | ✓ | ✓ ![2] | | ✓ | | **Low** storage, preparation |
| **Rotarix > Rotavac 5D liquid in 1dv** | | ! | ! | ! | ✓ ! | | **Medium** schedule, presentation |
| **Rotarix > Rotavac 5D liquid in 5dv** | | ! | ✓ | ! | ✓ ! | ! | **Medium** schedule, dose per container, presentation |
| **Rotarix > Rotavac frozen 5dv** | | ! | ✓ | ! | ✓ ! | | **High** schedule, storage, dose per container |
| **Rotarix > Rotasiil lyo in 2dv** | | ! | ! | ! | ✓ ! | | **High** schedule, dose per container, storage preparation |

✓ Beneficial ! Risk: assess trade-offs, plan training ✓! Varies by country context or use

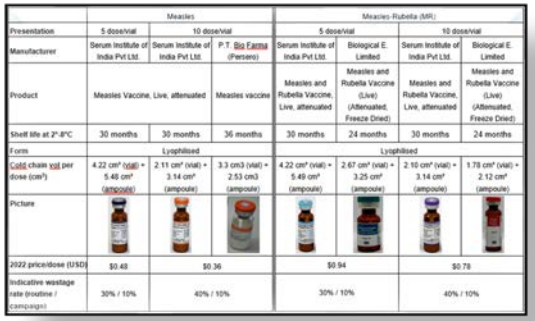


[1] *Serotype change in these vaccine products have not been shown to affect efficacy and effectiveness according to WHO position paper*

[2] *Will depends on whether diluent in stored at refrigerated temperature as well.*

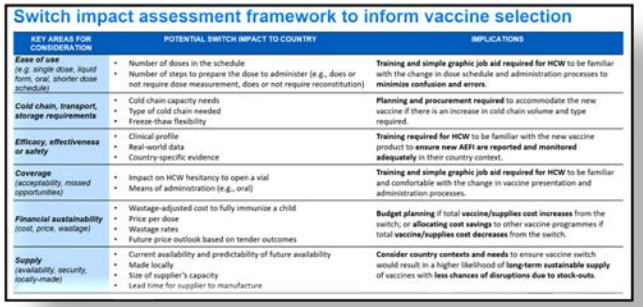
# How Gavi supports countries with vaccine optimization and switches

## Enabling awareness of the available options



| | Measles | | | Measles-Rubella (MR) | | | |
|---|---|---|---|---|---|---|---|
| Presentation | 5 dose/vial | 10 dose/vial | | 5 dose/vial | | 10 dose/vial | |
| Manufacturer | Serum Institute of India Pvt Ltd. | Serum Institute of India Pvt Ltd. | P.T. Bio Farma (Persero) | Serum Institute of India Pvt Ltd. | Biological E. Limited | Serum Institute of India Pvt Ltd. | Biological E. Limited |
| Product | Measles Vaccine, Live, attenuated | | Measles vaccine | Measles and Rubella Vaccine, Live, attenuated | Measles and Rubella Vaccine (Live) (Attenuated, Freeze Dried) | Measles and Rubella Vaccine, Live, attenuated | Measles and Rubella Vaccine (Live) (Attenuated, Freeze Dried) |
| Shelf life at 2°-8°C | 30 months | 30 months | 36 months | 30 months | 24 months | 30 months | 24 months |
| Form | Lyophilised | | | Lyophilised | | | |
| Cold chain vol per dose (cm³) | 4.22 cm³ (vial) + 5.48 cm³ (ampoule) | 2.11 cm³ (vial) + 3.14 cm³ (ampoule) | 3.3 cm3 (vial) + 2.53 cm3 (ampoule) | 4.22 cm³ (vial) + 5.49 cm³ (ampoule) | 2.67 cm³ (vial) + 3.25 cm³ (ampoule) | 2.10 cm³ (vial) + 3.14 cm³ (ampoule) | 1.78 cm³ (vial) + 2.12 cm³ (ampoule) |
| Picture | | | | | | | |
| 2022 price/dose (USD) | $0.48 | $0.36 | | $0.94 | | $0.78 | |
| Indicative wastage rate (routine / campaign) | 30% / 10% | 40% / 10% | | 30% / 10% | | 40% / 10% | |

## Facilitating an evidence-based impact assessment of the vaccine switch



**Switch impact assessment framework to inform vaccine selection**

| KEY AREAS FOR CONSIDERATION | POTENTIAL SWITCH IMPACT TO COUNTRY | IMPLICATIONS |
|---|---|---|
| ***Ease of use*** *(e.g. single dose, liquid form, oral, shorter dose schedule)* | • Number of doses in the schedule<br>• Number of steps to prepare the dose to administer (e.g., does or not require dose measurement, does or not require reconstitution) | **Training and simple graphic job aid required for HCW** to be familiar with the change in dose schedule and administration processes to **minimize confusion and errors.** |
| ***Cold chain, transport, storage requirements*** | • Cold chain capacity needs<br>• Type of cold chain needed<br>• Freeze-thaw flexibility | **Planning and procurement required** to accommodate the new vaccine if there is an increase in cold chain volume and type required. |
| ***Efficacy, effectiveness or safety*** | • Clinical profile<br>• Real-world data<br>• Country-specific evidence | **Training required for HCW** to be familiar with the new vaccine product to **ensure new AEFI are reported and monitored adequately** in their country context. |
| ***Coverage*** *(acceptability, missed opportunities)* | • Impact on HCW hesitancy to open a vial<br>• Means of administration (e.g., oral) | **Training and simple graphic job aid required for HCW** to be familiar and comfortable with the change in vaccine presentation and administration processes. |
| ***Financial sustainability*** *(cost, price, wastage)* | • Wastage-adjusted cost to fully immunize a child<br>• Price per dose<br>• Wastage rates<br>• Future price outlook based on tender outcomes | **Budget planning** if total **vaccine/supplies cost increases** from the switch; or **allocating cost savings** to other vaccine programmes if total **vaccine/supplies cost decreases** from the switch. |
| ***Supply*** *(availability, security, locally-made)* | • Current availability and predictability of future availability<br>• Made locally<br>• Size of supplier's capacity<br>• Lead time for supplier to manufacture | **Consider country contexts and needs** to ensure vaccine switch would result in a higher likelihood of **long-term sustainable supply** of vaccines with **less chances of disruptions due to stock-outs.** |

*Timely and evidence-based country decision making can mitigate risk of supply disruptions*

## Offering switch grants to cover some of the implementation costs

**0.25$ per child**

Gavi
The Vaccine Alliance

# Summary

- **>200m children vaccinated** with Gavi support
- 50-60.000 est. deaths averted every year
- Opportunity **for MICs and former Gavi eligible countries**: benefit from ad-hoc support for RV introduction or to prevent “backsliding”
- Opportunity for all countries to **optimise vaccine preference**: a dozen options are now available to optimise financial sustainability, ease of use, cold chain, supply security, coverage.
  - The **value of each vaccine option can vary by country context**
  - **Supply predictability** suffered in 2022.
  - **Demand predictability** impaired by low awareness and limited assessment
  - Timely and evidence-based country decision making can mitigate risk of supply disruptions
- Gavi’s Alliance supports to switches: enabling **awareness** of optimisation options, supporting evidence-based **assessments** with tools and technical assistance, supporting switch **implementation** through a switch grant

# With thanks to countries and technical partners