

# V3P: Key Findings for Rota



## ROTA

### Highlights

- At present, 47% of countries in the world have introduced Rota, but only 30% of non-Gavi, non-PAHO MICs;
- Rota is the fourth highest value vaccine reported to the V3P, accounting for 6% of total value reported;
- High income countries (HICs) account for 59% of the value of the Rota market whereas Gavi countries accounts for 78% of the Rota volume;
- A total of only three products from three companies were available in 2016. Single-dose presentations was the only pre-qualified presentation available;
- Despite the current oligopoly, the average price of Rota in USD has fallen over the last 3–4 years (by 18% in non-Gavi, non-PAHO MICs) to a global median of \$3.00 in 2016;
- Rota prices are tiered by income/procurement segment, but there is considerable range within each segment, particularly for higher income groups;
- In non-Gavi, non-PAHO MICs, Rota represents an important share of country vaccine immunization expenditure (14% on average).

### Analysis

Income/procurement segments are categorised as:

- HICs not procuring through the PAHO revolving fund (RF) (HICs);
- MICs not eligible or not receiving Gavi support, and not procuring through the PAHO RF (non-Gavi, non-PAHO MICs);
- PAHO countries of any income, procuring through the PAHO RF (PAHO), excluding two countries from AMRO classified as Gavi; and,
- All countries that were ever eligible to receive Gavi support, independent of transition status (Gavi).

### Vaccine Introduction Status

As of August 2017, 92 out of 194 countries (47%) had introduced or were in the process of introducing Rota<sup>1,2</sup>. In 2016, 58 countries reported use of Rota to the V3P.

By income/procurement segment, use of Rota ranges from 30% in non-Gavi, non-PAHO MICs to 58% in Gavi (see Chart 1, page 2). By region, the proportion ranges from 9% in SEARO countries to 66% in AFR.

This product fact sheet is intended for use by global and regional vaccine policy makers. The product fact sheet provides information on Rota procured by V3P reporting countries, including analyses of:

- value to the market of Rota reported globally and in each WHO region;
- the distribution of available presentations globally and in each WHO region;
- the procurement methods used globally and in each WHO region;
- prices paid globally and in each WHO region, by income segment.

The Vaccine Product Price & Procurement (V3P) initiative was launched to provide all countries with a platform for greater vaccine price & procurement transparency. The initiative collects data through the WHO and UNICEF Joint Reporting Form, analyses and distributes information to relevant stakeholders to inform policy making and procurement processes. As of July 2017, the database contained data from 144 countries.

**The fact sheet is exclusively based on the data reported through the JRF & V3P initiative,** as of July 2017.

Pool-procurement refers to vaccines procured through UNICEF SD and the PAHO Revolving Fund.

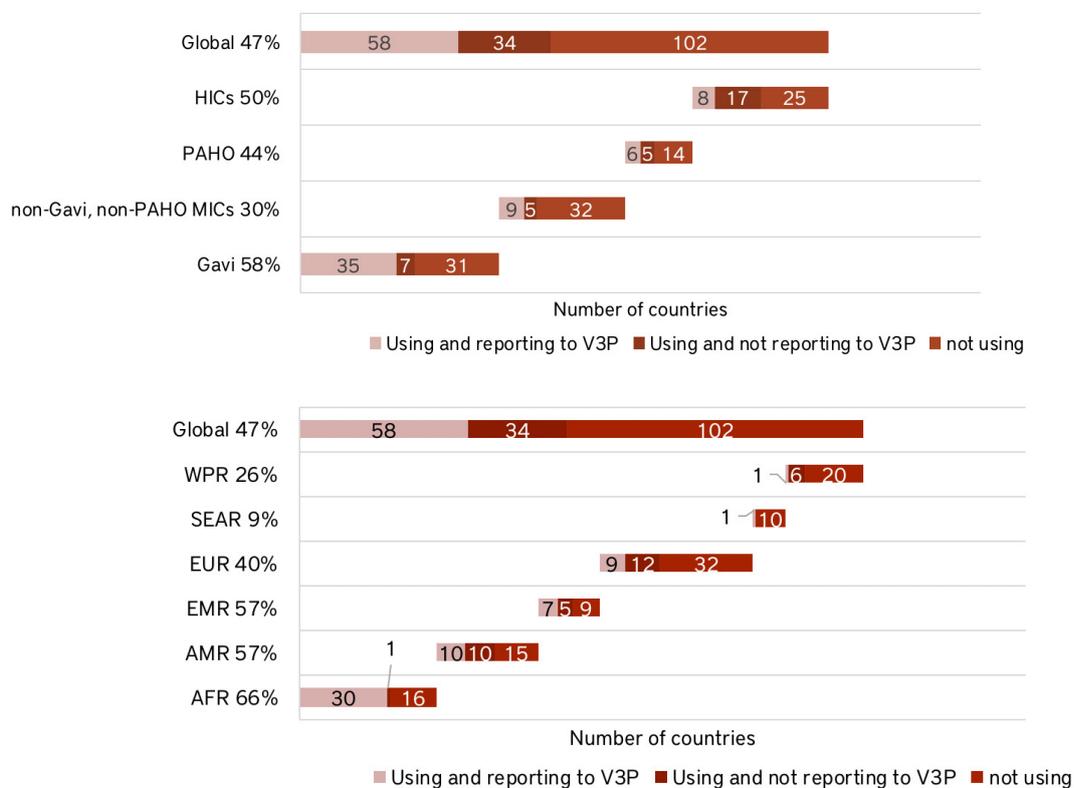
Readers may access additional vaccine price and procurement information from reporting countries and procurement agencies (UNICEF and PAHO) on the V3P website: <https://www.who.int/teams/immunization-vaccines-and-biologicals/vaccine-access/mi4a> or by contacting [MI4A@who.int](mailto:MI4A@who.int)

<sup>1</sup>WHO available at: <https://www.who.int/news/item/10-10-2019-vaccines-in-national-immunization-programme-update>

<sup>2</sup>V3P records of vaccine purchased for 2016.



**Chart 1.** The number of countries, by income/procurement segment and WHO region, using Rota in 2016, showing number of user countries reporting to V3P.

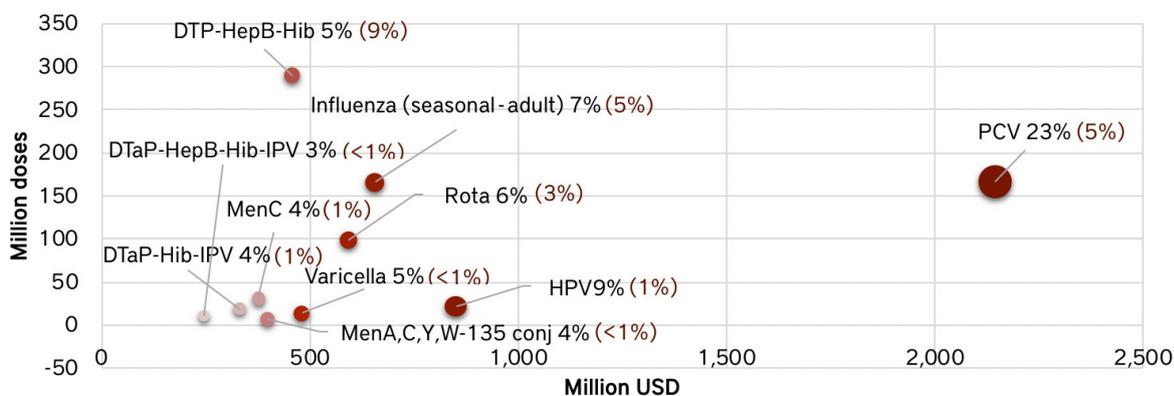


## Market Value & Volume

Rota constitutes the fourth largest vaccine market, in value, of any vaccine. Of all vaccines reported to the V3P for 2016, Rota accounted for \$591 million (6%) of the

\$9.3 billion in vaccine purchases, but about 3.6 times less value than the highest value vaccine (PCV) reported to the V3P (see chart 2).

**Chart 2.** The global top 10 vaccines, by value, reported to the V3P for 2016, with bubble size showing the % value of the global vaccine market (corresponding global proportion in volume) for each vaccine.

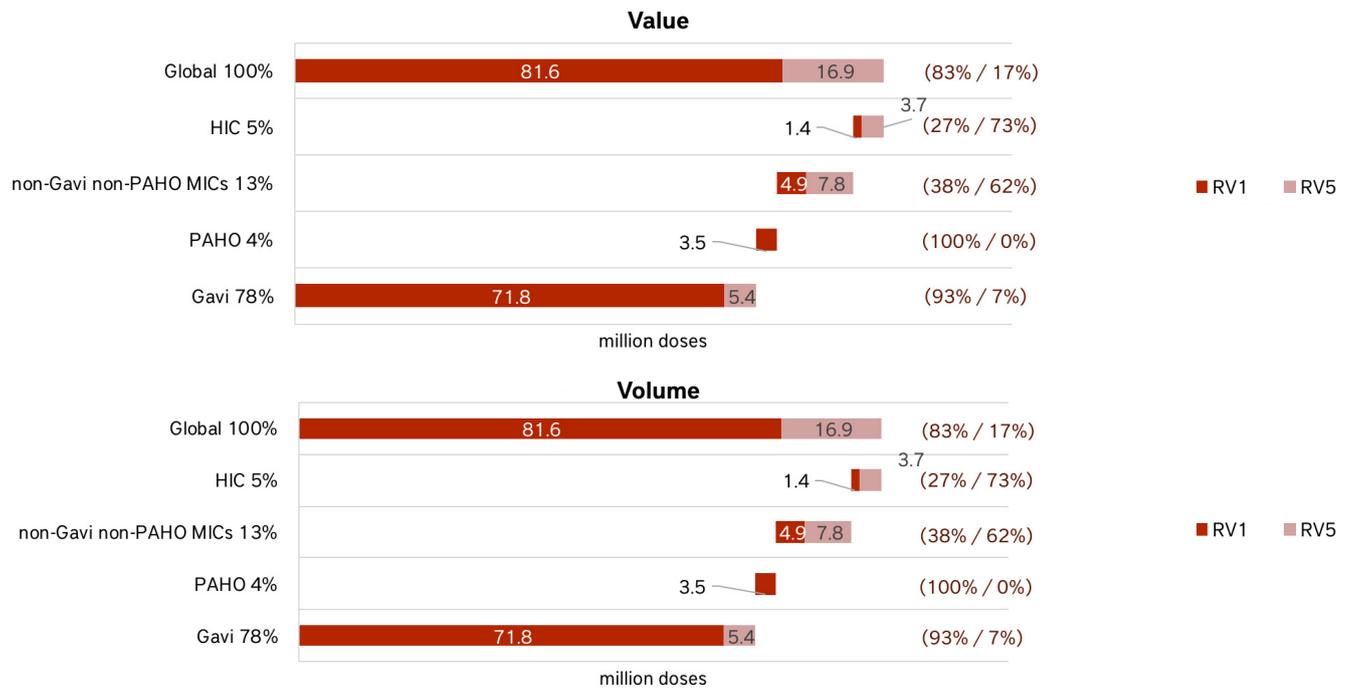




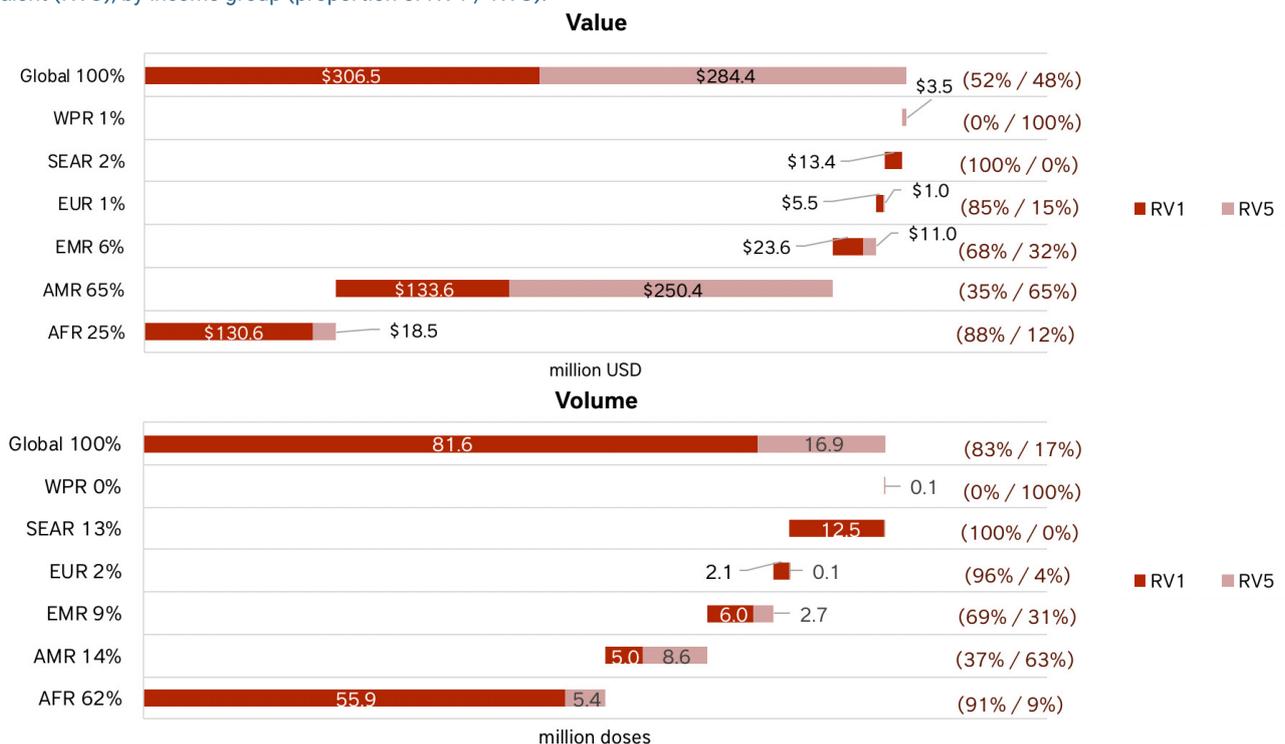
The contributions of each income segment to the global Rota market are highly heterogeneous (Chart 3). The HIC segment is by far the largest contributor to the value of the global Rota market (59%), whereas the non-Gavi, non-PAHO segment is by far the largest contributor to the total volume (78%).

Likewise, the contributions of the WHO regions to the value and volume of the global Rota market are highly varied (Chart 4). AMR alone accounts for 65% of the total value of the Rota market, and AFR for 62% of the volume.

**Chart 3.** The contributions of income/procurement segments to the global Rota market, showing the absolute value and volume of Rota monovalent (RV1) and Rota pentavalent (RV5), by income group (proportion of RV1 / RV5).



**Chart 4.** The contributions of WHO regions to the global Rota market, showing the absolute value and volume of Rota monovalent (RV1) and Rota pentavalent (RV5), by income group (proportion of RV1 / RV5).





Inherent differences in the income segments and WHO regions, and price differentiation, account for the varied contributions to the global Rota market. The AFR market is dominated by LMIC-Gavi supported and UNICEF-procuring countries, characterised by high purchase volumes and relatively low prices. The HIC market is characterised by relatively low purchase volumes but the highest prices in the market.

It is also important to note contribution of large countries to specific markets. For reporting countries to the V3P in 2016<sup>3</sup>, almost a third of the volume (35%), and 89% of the value, of the Rota market in AMR is constituted by the USA public market alone, where vaccine prices are at their highest. In other regions, large contributing countries include Iraq in EMR (28% by volume, 42% by value), India in SEAR (with 12.5 million doses), and Angola in AFR (41% by volume, 48% by value)<sup>4</sup>. EUR, due to under-reporting to the V3P by large HICs, accounts for relatively little value (1%) and volume (2%). Other factors may contribute to the variability.

### Products and Presentations

Three WHO prequalified products are available from three manufacturers:

- RV1 (GSK - Rotarix®) is available in a single-dose applicator;
- RV5 (Merck - RotaTeq®) is available in a single-dose plastic tube;
- RV1 (Bharat Biotech) is available in a 10-dose vial;

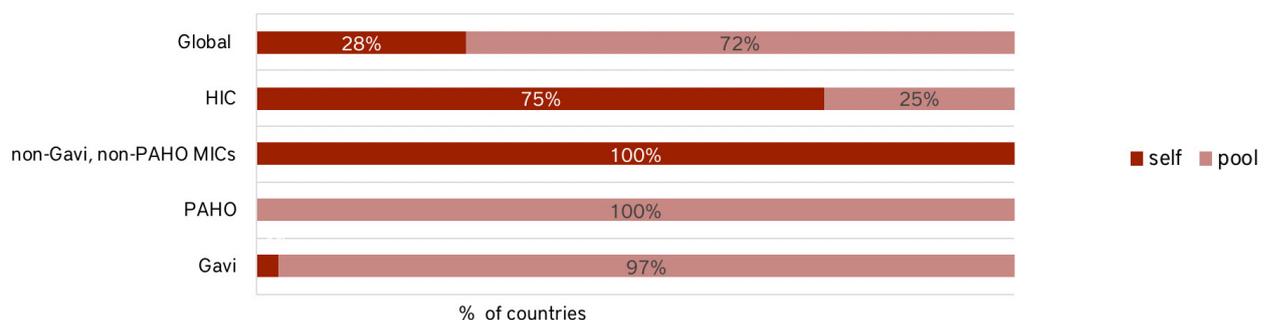
Overall, RV1 accounts for about 83% of the global volume of Rota, but only 52% of the value. This is explained by the fact that about 88% of the global volume of RV1 is accounted for by the Gavi income/procurement segment, whereas 68% of the volume of RV5 is accounted for by the non-Gavi segment.

The single dose presentation size constitutes the only product choice, with the exception of the Bharat Biotech product, which is currently used only in India.

### Procurement Method

Globally, the majority of countries pool-procure Rota, yet an important share - 28% - self-procures (chart 5). For WHO regions with more than one reporting country (AFR, AMR, EMR, EUR), self-procurement for Rota ranges from 17% in AFR to 57% in EMR. Self-procurement in the EUR region is 33%, with the majority of reporting countries procuring through UNICEF. Regional variations are primarily accounted for by differences in income levels between regions. Regions with a higher concentration of UMICs and HICs tend to have higher rates of self-procurement than regions with fewer.<sup>5</sup> At present, non-Gavi, non-PAHO MICs are exclusively self-procuring (100% of countries).

**Chart 5.** Prevalence of procurement method for Rota, for countries reporting to V3P, by global and income/procurement segments.



<sup>3</sup> Data reported to V3P is for public markets only, i.e. vaccines purchased by governments.

<sup>4</sup> These proportions are a function of the mix of the reporting and non-reporting countries to the V3P, and may not accurately represent the impact of specific countries in their respective regional markets.

<sup>5</sup> The exception is AMR, where pool procurement dominates, independent of income level, because of the Revolving Fund.



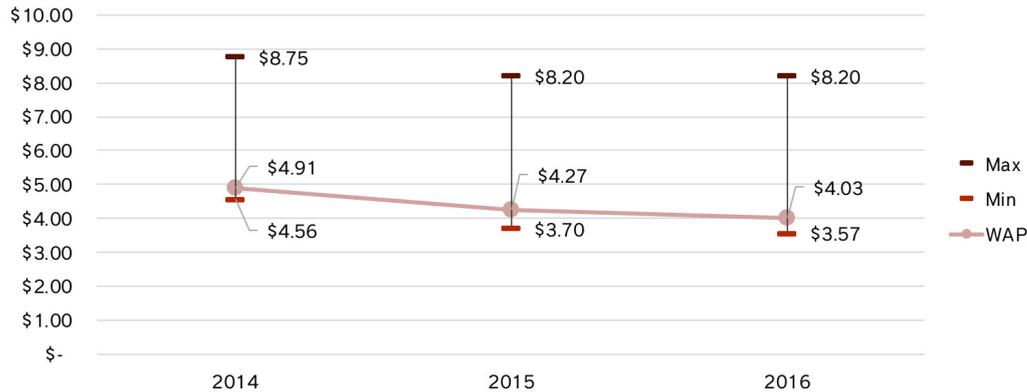
## Prices

### Price over time

For self-procuring countries, the limited historical data from V3P for the period 2014 to 2016 shows that for a total of four countries with at least 3 years of data (one HIC, two UMICs, and one LMIC), the weighted average

price (WAP) of Rota (in USD) may have declined by about 18% between 2014 and 2016<sup>6</sup> for the three non-Gavi, non-PAHO MICs (chart 6), in spite of the limited number of participants in the market.

**Chart 6.** WAP of Rota for self-procuring non-Gavi, non-PAHO MICs with three consecutive years of data, showing maximum and minimum prices.

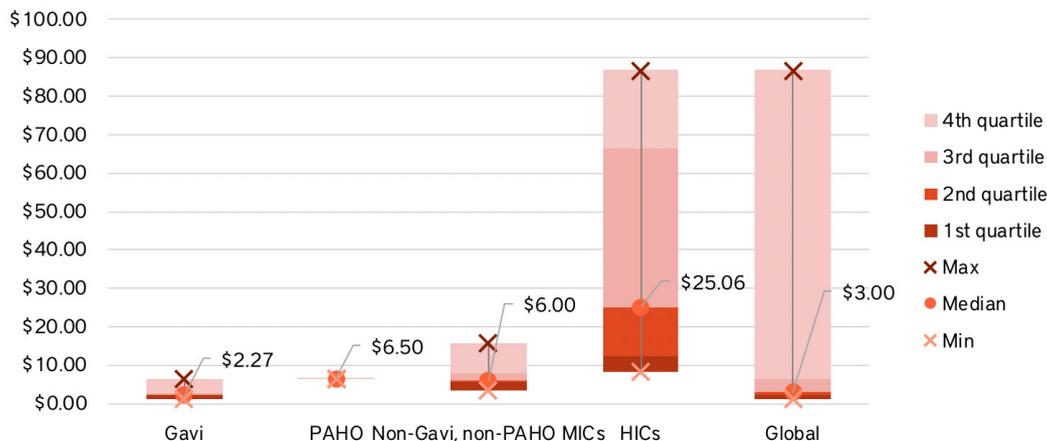


### Price by income/procurement

As noted for other vaccines reported to V3P, prices vary according to income/procurement segment. The global median price reported to V3P for 2016 is \$3.00. Median prices (chart 7) are lowest for Gavi (\$2.27) and progressively increase for non-Gavi, non-PAHO MICs (\$6.00), PAHO (\$6.50), and HICs (\$25.06), although considerable variation exists within each income/procurement group.

Price range for Rota is shown in chart 7 by quartile. Price ranges progressively increase with increasing income/procurement level, and the highest prices in non-Gavi, non-PAHO MICs are as much as 2.5 times the median and 3.5 times the median in HICs (4.7 to 10.5 times the lowest price in the same income/procurement groups, respectively).

**Chart 7.** Min, median, and max prices for Rota, by income/procurement segment, showing quartiles for price range.



<sup>6</sup>The same price trend may not be observed with all local currencies.



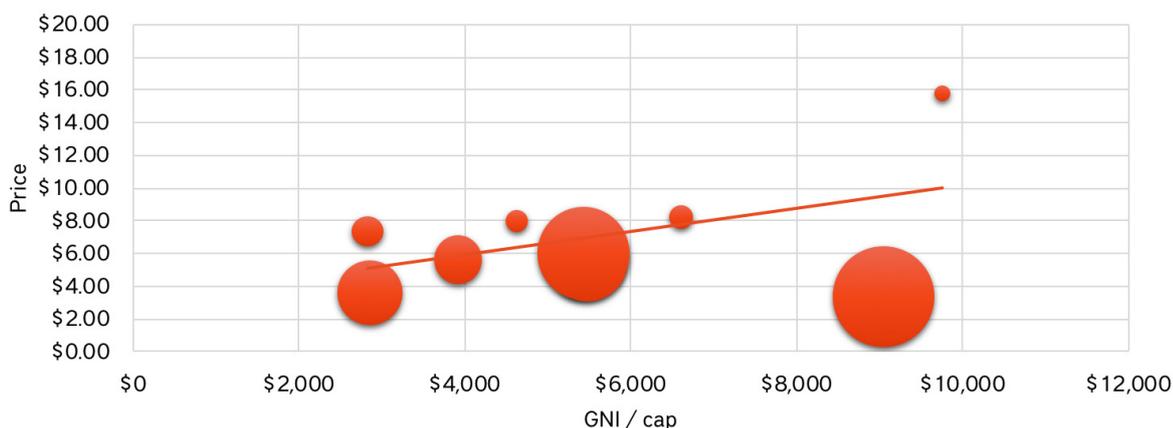
### Prices for non-Gavi, non-PAHO MICs

From chart 1 it is apparent that Rota introduction is lower in non-Gavi, non-PAHO MICs than in the PAHO and HIC market segments. Potential pricing obstacles in this income group were thus explored further.

Analysis shows that for non-Gavi, non-PAHO MICs purchasing at least a thousand doses of Rota annually there is a moderate correlation between vaccine price and GNI per capita in this market segment ( $r=0.48$ ) (chart 8). However, there is a stronger inverse correlation ( $r=-0.64$ ) between price and volume, with higher purchase volumes associated with lower pricing. Since the vast majority of countries report a single annual purchase volume, volumes are for the most part linked to country size.

The estimated value and volume of the Rota market for all 46 non-Gavi, non-PAHO countries (using and reporting, using and not reporting, and not using countries)<sup>7</sup>, under the assumption of full immunisation (average of 2.56 doses per child) of a total birth cohort of 36.3 million would amount to \$421.4 million, at the currently reported WAP, and 92.8 million doses. Assuming that the current Rota market remained constant in other income/procurement segments, the full non-Gavi, non-PAHO MIC segment would then represent as much as 44% of value and 20% of volume of the adjusted global market, up from 10% of the value and 13% of the volume.

**Chart 8.** Relationship between price of Rota and GNI/capita and annual number of doses purchased in non-Gavi, non-PAHO MICs. Bubble sizes represent annual purchase volumes of Rota.



### Price and volume

As observed above, there is some evidence that for non-Gavi, non-PAHO MICs very high and very low purchase volumes have an impact on price of Rota.

However, the evidence is weak and does not hold across all income groups.

<sup>7</sup>Analyses from the 46 countries does not include birth cohorts from Cook Islands, Marshall Islands, Niue, Palau, and Tuvalu due to lack of data from a same source.



### Proportion of vaccine expenditure on PCV

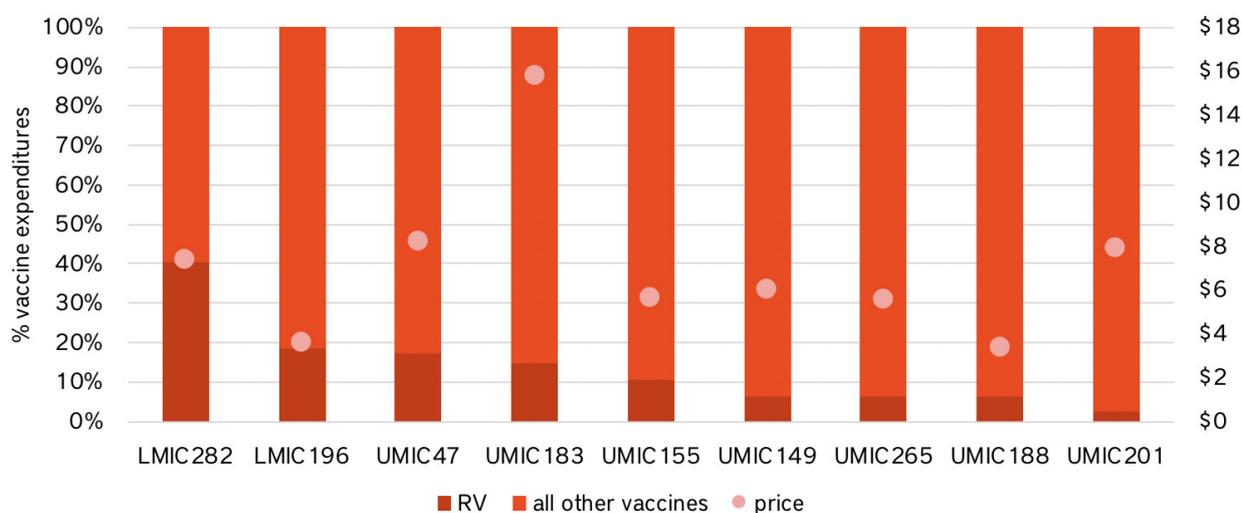
Analysis shows that non-Gavi, non-PAHO MICs' budgets increase drastically when they introduce a new vaccine. Rota represents on average 14% of non Gavi, non-PAHO MICs vaccine budget and can account for as much as 41% of vaccine spending (Chart 9).

There is no apparent relation between the share of Rota in vaccine spending and the price of Rota (range \$3.34–\$15.76), the number of doses purchased (range 26,000 doses to 5 million), and the total vaccine expenditure, as reported to the V3P (range \$2.8 to \$276.7 million).

Of note, higher prices of Rota were not associated with proportionally greater expenditure on Rota.

The proportion of Rota vaccine expenditure is instead related to the mix (mature vs new) and number of other vaccines purchased. A greater amount of other vaccines (in value and in quantity) reduces the proportion of Rota expenditure.

**Chart 9.** Share of Rota expenditure, out of all vaccine expenditure reported to V3P by non-Gavi, non-PAHO MICs, in 2016, showing prices paid in USD.



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Information contained in the V3P database is provided by participating countries and/or organizations procuring on behalf of countries that have agreed to share vaccine price and procurement data with V3P. Participating countries are solely responsible for the accuracy of the data provided.

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