V3P: Key Findings for PCV

Highlights

• At present, 73% of all countries have introduced PCV, but only 52% of non-Gavi, non-PAHO MICs;

• PCV is the highest value vaccine reported to the V3P, accounting for 23% of total value reported;

• HICs account for 59% of the value of the PCV market whereas Gavi countries accounts for 76% of the PCV volume;

• A total of five products from two companies were available in 2016. Single-dose presentation is the most used;

• Despite the current duopoly, the average price of PCV (in USD) has fallen over the last 3-4 years (by 25% in non-Gavi, non-PAHO MICs) to a global median of $8.87 in 2016;

• PCV 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, PCV represents an important share of country vaccine immunization expenditure (34% 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, 142 out of 194 countries (73%) had introduced or were in the process of introducing PCV¹. In 2016, 92 countries reported use of PCV to the V3P.

By income/procurement segment, use of PCV ranges from 52% in non-Gavi, non-PAHO MICs to 86% in HICs (chart 1, page 2). By region, the proportion ranges from 27% in SEAR to 83% in AFR.

¹WHO available at: http://www.who.int/entity/immunization/monitoring_surveillance/VaccineIntroStatus.pptx?ua=1
**Chart 1.** The number of countries, by income/procurement segment and WHO region, using PCV in 2016

<table>
<thead>
<tr>
<th>Segment</th>
<th>Using and reporting to V3P</th>
<th>Using and not reporting to V3P</th>
<th>Not using</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global 73%</td>
<td>92</td>
<td>50</td>
<td>52</td>
</tr>
<tr>
<td>HiCs 86%</td>
<td>19</td>
<td>24</td>
<td>7</td>
</tr>
<tr>
<td>PAHO 72%</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>non-Gavi, non-PAHO MICs 52%</td>
<td>10</td>
<td>6</td>
<td>22</td>
</tr>
<tr>
<td>Gavi 78%</td>
<td>45</td>
<td>12</td>
<td>16</td>
</tr>
</tbody>
</table>

**Market Value & Volume**

PCV is the single largest vaccine market, in value, of any vaccine. Of all vaccines reported to the V3P for 2016, PCV accounted for $2.1 billion (23%) of the $9.3 billion in vaccine purchases, about 2.5 times more value than the second highest value vaccine (HPV) 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.
Due to a relatively high price, and the newness of the vaccine, the contributions of each income segment to the global PCV market are highly heterogeneous (chart 3). The HIC segment is by far the largest contributor to the value of the global PCV market (59%), whereas the Gavi segment is by far the largest contributor to the total volume (76%).

Chart 3. Global PCV-10 and 13 market value and volume by income/procurement segment

<table>
<thead>
<tr>
<th>Segment</th>
<th>Value (million USD)</th>
<th>Volume (million doses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global 100%</td>
<td>$322</td>
<td>$1,821</td>
</tr>
<tr>
<td>HIC 59%</td>
<td>$33</td>
<td>$1,239</td>
</tr>
<tr>
<td>non-Gavi non-PAHO MICs 16%</td>
<td>$34</td>
<td>$312</td>
</tr>
<tr>
<td>PAHO 2%</td>
<td>$10 $41</td>
<td>1.3 11.8</td>
</tr>
<tr>
<td>Gavi 22%</td>
<td>$246</td>
<td>$229</td>
</tr>
</tbody>
</table>

PCV market value and volume by WHO region are also highly varied (chart 4). AMR accounts for 58% of the total value of the PCV market, whereas AFR accounts for 55% of the volume.

Chart 4. PCV-10 and 13 market value and volume by WHO region

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<tbody>
<tr>
<td>Global 100%</td>
<td>$322</td>
<td>$1,821</td>
</tr>
<tr>
<td>WPR 2%</td>
<td>$9 $154</td>
<td>0.2 6.1</td>
</tr>
<tr>
<td>SEAR 5%</td>
<td>$36 $0</td>
<td>8.2 0</td>
</tr>
<tr>
<td>EUR 5%</td>
<td>$22 $94</td>
<td>0.8 6.3</td>
</tr>
<tr>
<td>EMR 8%</td>
<td>$20 $78</td>
<td>17.2 15.4</td>
</tr>
<tr>
<td>AMR 58%</td>
<td>$156 $266</td>
<td>1.5 18.9</td>
</tr>
<tr>
<td>AFR 20%</td>
<td>$58.9</td>
<td>97.9</td>
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<td>AFR 55%</td>
<td>$40.4</td>
<td>51.3</td>
</tr>
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</table>
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.

It is also important to note contribution of large countries to specific markets. For countries reporting to the V3P in 2016\(^2\), almost half of the volume (45\%) and 89\% of the value of the PCV 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 Nigeria in AFR (23\% by volume, 15\% by value), Pakistan in EMR (47\% by volume, 31\% by value), and Russia in EUR (50\% by volume, 54\% by value).\(^3\) EUR reporting countries account for only 4\% of global volume and 5\% of global value because of under-reporting by large EUR HICs.

**Products and Presentations**

Five products are available from two manufacturers:

- PCV-10 (Synflorix\(^\text{TM}\) - GSK) is available in 1- and 2-dose vials (WHO pre-qualified), and a 1-dose prefilled syringe (not WHO pre-qualified);
- PCV-13 (Prevnar\(^\circ\) 13 - Pfizer) is available in a 1-dose vial (WHO pre-qualified) and a 1-dose prefilled syringe (not WHO pre-qualified).

Overall, PCV-10 accounts for about 41\% of the volume, but only 15\% of the value. This is because 76\% of the global value of PCV-10 is accounted for by the Gavi segment.

The single dose presentation constitutes the majority of product choice (88\% of countries), and this is consistent across all regions.\(^4\) The 2-dose presentation is only reported by pool-procuring countries (of note, 94\% of PCV-10 doses are procured in 2-dose presentation).

Globally, only 28\% of countries use prefilled syringes, since prefilled syringes are not currently WHO prequalified they are unavailable to countries procuring through UNICEF SD. The highest number of countries using pre-filled syringes, by income/procurement level, is in HICs (84\%) and, by region, in EUR (60\%), and in EMR (50\%).

There is a rich pipeline of new products in development but a lack of certainty on the timing of new entrants in the market. Gavi’s expectation is to have one new manufacturer supply Gavi from 2020 and at least one other by 2025.\(^5\)

**Procurement Method**

Globally, most countries pool-procure PCV, yet an important share - 36\%- uses self-procurement (chart 5). By WHO region, self-procurement for PCV ranges from 0\% in SEAR to 72\% in EUR. 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.\(^6\) At present, non-Gavi, non-PAHO MICs mainly self-procure (89\% of countries).

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\(^2\)Data reported to V3P is for public markets only, i.e. vaccines purchased by governments.

\(^3\)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.

\(^4\)100\% use of a 2-dose presentation from SEARO is most likely a function of the low number of countries reporting from the region (only 2 of 11 countries reporting PCV use), and not an indication of different practices or preferences.


\(^6\)The exception is AMR, where pool procurement dominates, independent of income level, because of the PAHO Revolving Fund.
Prices
Price over time

For self-procuring countries, the limited historical data from V3P (total of 15 countries, two thirds of which are HICs) shows that WAP of PCV in USD may have declined by about 35% between 2013 and 2016.

For non-Gavi, non-PAHO MICs with at least three years of historical data, the WAP has fallen by about 25% between 2014 and 2016 (chart 6), in spite of the limited number of participants in the market.

Chart 6. Weighted Average Price (WAP) of PCV 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 PCV global median price reported to V3P for 2016 is $8.87, which lies between the Gavi and PAHO medians, reflecting the high number of countries in the Gavi income/procurement group. This trend is consistent with prices of other vaccines reported to the V3P.

Median prices (chart 7) are lowest for Gavi ($3.30) and progressively increase for PAHO ($14.50) non-Gavi, non-PAHO MICs ($19.00) and HICs ($47.28), although considerable variation exists within each income/procurement group. The price range for PCV is shown by in chart 6 by quartile. Price ranges progressively increase with increasing income/procurement level, and the highest prices are as much as 2.5 times the median (5.1 to 7.8 times the lowest prices in non-Gavi, non-PAHO MICs, and HICs).

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

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 PCV introduction is lower in non-Gavi, non-PAHO MICs than any other market segment. Potential pricing obstacles in this income group were thus explored further.

Analysis shows that the correlation between vaccine price and GNI per capita in this market segment is very weak ($r=0.19$) (chart 8). Other factors seem to be at play such as very low purchase volumes, remoteness (island countries), and small size of countries possibly leading to higher pricing.

The estimated value and volume of the PCV market for all 46 non-Gavi, non-PAHO countries, under the assumption of full immunisation (three doses) of a total birth cohort of 36 million (including 16.8 million from China) would amount to $1.7 billion, at the currently reported WAP, and 109 million doses. Assuming the current PCV market remained constant in other income/procurement segments, the full non-Gavi, non-PAHO MIC segment would then represent as much as 48% of value and 43% of volume of the adjusted global market, up from 16% of the value and 14% of the volume.

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

Price and volume

As observed above, there is some evidence that for non-Gavi, non-PAHO MICs very high and very low purchase volumes are related to price of PCV. However, the evidence is weak and does not hold across all income groups (chart 9).

**Chart 9.** Relationship of price to purchase volume for PCV (2016)

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8Analyses 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’ vaccine budgets increase drastically when they introduce a new vaccine. This is particularly the case for PCV which on average represents 34% of non Gavi MICs’ vaccine budget and can account for as much as 66% of vaccine spending, placing a particular burden on non-Gavi LMICs (chart 10).9

Chart 10. Share of PCV expenditure, out of all vaccine expenditure reported to V3P by non-Gavi, non-PAHO MICs, in 2016, showing prices paid in USD.

There is no apparent relation between the share of PCV in vaccine spending and the price of PCV (range $9.85 – $37.16), the number of doses purchased (range 25 doses to 6.3 million doses), and the total vaccine expenditure, as reported to the V3P (range $602,000 to $359 million). Of note, higher PCV prices were not associated with proportionally greater expenditure on PCV.

The proportion of PCV vaccine expenditure is instead related to the mix (mature vs new) and number of other vaccines purchased. Greater value and volume of other vaccines reduces the proportion of PCV expenditure.

DISCLAIMER

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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9 Rota and HPV account for smaller shares of vaccine expenditure than PCV, since Rota is usually delivered in a 2-dose schedule and HPV is primarily targeted at girls.