

# WHO PRICE REPORT

## VACCINE PRODUCT, PRICE AND PROCUREMENT



WORKING DOCUMENT  
*2016 edition*



World Health  
Organization

This document has been prepared by the Expanded Programme on Immunization (EPI) of the Department of Immunization, Vaccines and Biologicals. It is a working document.

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# TABLE OF CONTENTS

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ACCRONYMS .....	4
BACKGROUND.....	5
I. ANALYSES OF V3P DATA FOR 2015 .....	7
II. KEY MESSAGES .....	13

## Disclaimer

This report is based on the ‘Vaccine Pricing’ section of the 2016 annual GVAP report (pp 148-157). There are several factors that can impact access to vaccines, and this report only intends to provide information regarding the prices of vaccines. Other sections of the GVAP Secretariat report present a review on other factors that can influence access.<sup>1</sup>

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<sup>1</sup> WHO. Global Vaccine Action Plan Secretariat Annual Report 2016. World Health Organization. Available from: [http://www.who.int/immunization/global\\_vaccine\\_action\\_plan/gvap\\_secretariat\\_report\\_2016.pdf?ua=1](http://www.who.int/immunization/global_vaccine_action_plan/gvap_secretariat_report_2016.pdf?ua=1). The price report is available on pp 148-157.

# ACRONYMS

AMC	Advanced Market Commitment
aP	acellular pertussis
BMGF	Bill & Melinda Gates Foundation
DTaP-Hib-HepB-IPV	Diphtheria-tetanus-acellular pertussis-hepatitis B- <i>Haemophilus influenzae</i> type b-inactivated polio
DTwP-HepB-Hib	Diphtheria-tetanus-whole cell pertussis-hepatitis B- <i>Haemophilus influenzae</i> type b (also called Pentavalent vaccine)
Gavi	Gavi, the Vaccine Alliance
GVAP	Global Vaccine Action Plan
HIC	High income country
HPV	Human papilloma virus
IPV	Inactivated Polio Vaccine
LIC	Low income country
LMIC	Lower middle income country = GNI/capita > \$1,025, < \$4,035.
LPC	Lowest Price Clause
LTA	Long-term agreement
MAX	Maximum
MED	Median
MIC	Middle income country
MIN	Minimum
MMR	Measles-mumps-rubella
MSF	Médecins sans frontières
PAHO RF	Pan-American Health Organisation Revolving Fund
PCV	Pneumococcal conjugate vaccine
Rota	Rotavirus vaccine
UMIC	Upper middle income country = GNI/capita > \$4,035, < \$12,476
UNICEF	United Nations Children's Fund
UNICEF SD	UNICEF Supply Division
V3P	Vaccine product, price, and procurement
WAP	Weighted average price
WHO	World Health Organisation
wP	whole cell pertussis
WHO AFRO	WHO Regional Office for Africa
WHO AMRO	WHO Regional Office for the Americas
WHO EMRO	WHO Regional Office for the Eastern Mediterranean
WHO EURO	WHO Regional Office for Europe
WHO SEARO	WHO Regional Office for South-East Asia
WHO WPRO	WHO Regional Office for the Western Pacific

# BACKGROUND

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Since 2000, low-income (LICs) and low-middle-income countries (LMICs)<sup>2</sup> have received financial support from Gavi, The Vaccine Alliance (referred to as “Gavi”), for the introduction of newer vaccines such as conjugate pneumococcal vaccine (PCV), rotavirus vaccine and human papilloma vaccine (HPV). The vast majority of these vaccines have been purchased through UNICEF Supply Division (SD), at the lowest globally available price.

However, not all countries have access to the lower prices negotiated by UNICEF tenders for Gavi countries. Countries, particularly non-Gavi middle income countries (MICs) who do not receive financial support, have raised concerns to WHO that the price of these newer vaccines may be challenging for them. To respond to these challenges, WHO has led the development of a strategy to enhance access to vaccines in MICs focusing on enhanced decision making, national sustainable financing, and access to timely and affordable supply.<sup>3</sup>

In this context, one of WHO’s key efforts in the area of access to supply is the enhancement of vaccine price transparency. WHO works in collaboration with other partners, such as UNICEF, the PAHO Revolving Fund, Médecins Sans Frontières (MSF) and the Bill & Melinda Gates Foundation (BMGF), who are also engaged in market shaping and advocacy activities to support access to affordable and timely supply of vaccines.

Most MICs not benefitting from Gavi support have limited experience in purchasing newer vaccines, which are typically available from a limited number of suppliers (often only 2 suppliers). Since available information on vaccine prices has been very limited up to present, these countries have also had little awareness about pricing to other countries of similar income level, size, and geography.

In 2014, the Vaccine Product Price & Procurement (V3P) initiative was launched to provide all countries with a platform for greater vaccine price transparency. It provides non-Gavi MICs an opportunity to learn about vaccine prices in other countries, as well as elements of procurement that are linked to the price paid, such as volumes, contract length, procurement mechanism (e.g. self-procurement or procurement through UNICEF) and other factors that can impact prices. The aim of WHO’s work in price transparency is to enhance countries’ knowledge of vaccine prices to support their decision-making regarding new vaccine introductions, product choices, and changes in procurement processes.

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<sup>2</sup> Income level groups are defined by a country GNI per capita by the World Bank. In 2016, the country groupings are as follows: LIC = GNI/capita ≤ \$1,025; LMIC = GNI/capita > \$1,025, < \$4,035; UMIC = Upper-middle-income countries GNI/capita > \$4,035, < \$12,475; High-income countries (HIC) GNI/capita > \$12,475. For more information, visit the World Bank website at: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

<sup>3</sup> WHO. The Middle Income Country Strategy. World Health Organization. Available at: [http://www.who.int/immunization/programmes\\_systems/sustainability/mic\\_strategy/en/](http://www.who.int/immunization/programmes_systems/sustainability/mic_strategy/en/)

This 2016 WHO price report highlights the most interesting analyses based on the data available in the V3P database as of August 2016 and the key messages to support policy making in this area. Table 1 shows some of the V3P data analyses available to MICs and how they can be used to make informed decisions about vaccine purchases. Further analyses are available on the WHO V3P website: [www.who.int/immunization/v3p](http://www.who.int/immunization/v3p), as well as additional documents and reports.

**Table 1. V3P Vaccine Price Data Analyses and Uses**

Data analyses	Use
1 - Number of countries sharing price information through the V3P Project by WHO region.	Identify the number of countries from a same region or income level sharing price information.
2 - Annual average or unit vaccine prices <ul style="list-style-type: none"> <li>a) annual weighted average vaccine price (WAP), weighted by volume purchased, over time in relationship to procurement mechanism;</li> <li>b) Unit prices of vaccines in relationship to country level of income and volume;</li> <li>c) Minimum–maximum price range by country level of income.</li> </ul>	<ul style="list-style-type: none"> <li>• facilitate country planning and budgeting for the introduction of new vaccines;</li> <li>• increase country awareness about factors influencing price, including procurement mechanisms, supply and price trends</li> </ul>

**All data reported has been extracted from the V3P database as of August 2016.** Caution should be exercised when comparing vaccine prices between countries as there may be multiple explanations for variability. The V3P data are sourced from voluntary reports from countries, and the country composition may vary from one year to the next. Historical data are limited to a maximum of three years in most cases and the WHO European region is currently over represented in the data set (58%). Therefore, extrapolation of price trends from one region to another may not be possible. The database collects limited information on procurement systems, which may limit any interpretation of the factors that influence vaccine prices. Fluctuation in exchange rate can also cause price variability.

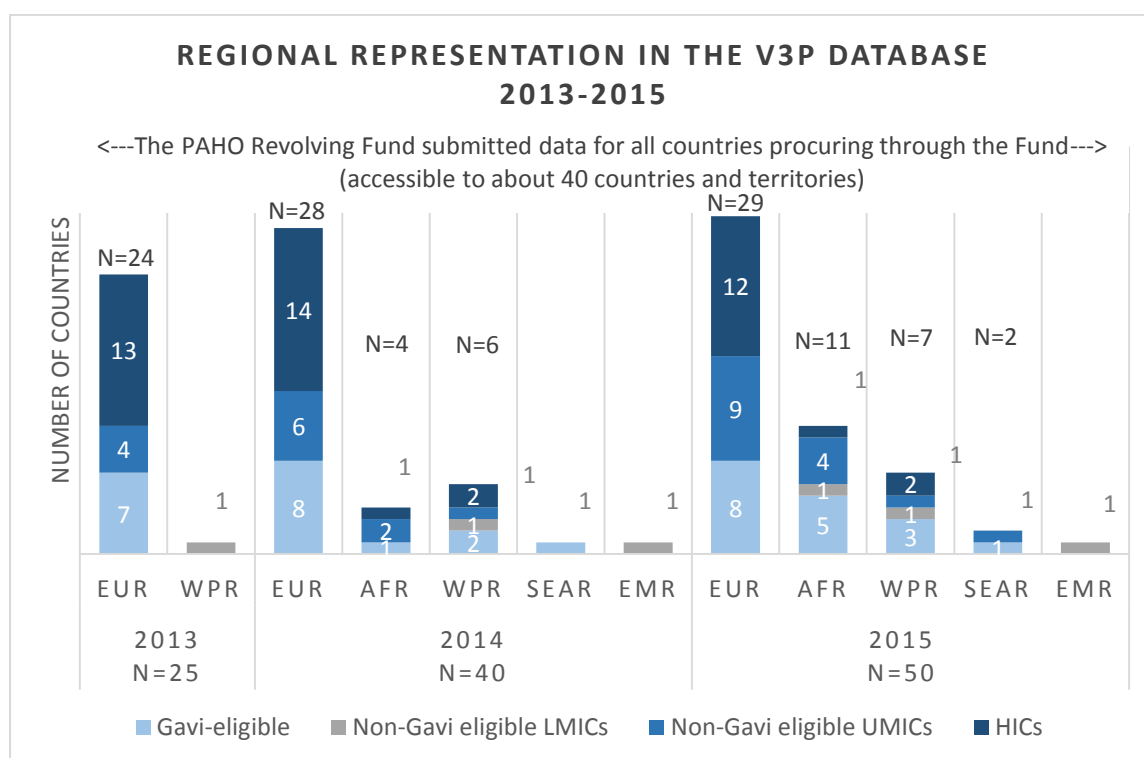
# I. ANALYSES OF V3P DATA FOR 2015

## A. Number of countries sharing price information through the V3P Project, by WHO region

As of August 2016, the database contained directly shared data from 56 countries from 5 regions<sup>4</sup> (cf. *graph 1*). Of the 50 countries that reported to the V3P in 2016, 74% were self-procuring or “mix-procuring”<sup>5</sup> countries, 68% were MICs, and 84% were non-Gavi or Gavi transitioning countries<sup>6</sup>. Of the 50 countries, 33 (66%) were non-Gavi, and of the 17 Gavi countries, 8 (47%) were non-transitioning Gavi countries.

In total, the V3P database contains vaccine price data for about 69% of the world countries and about 72% of the global birth cohort (cf. *graph 2*).

**Graph 1. Number of countries reporting vaccine price data in 2016 by WHO region over time**

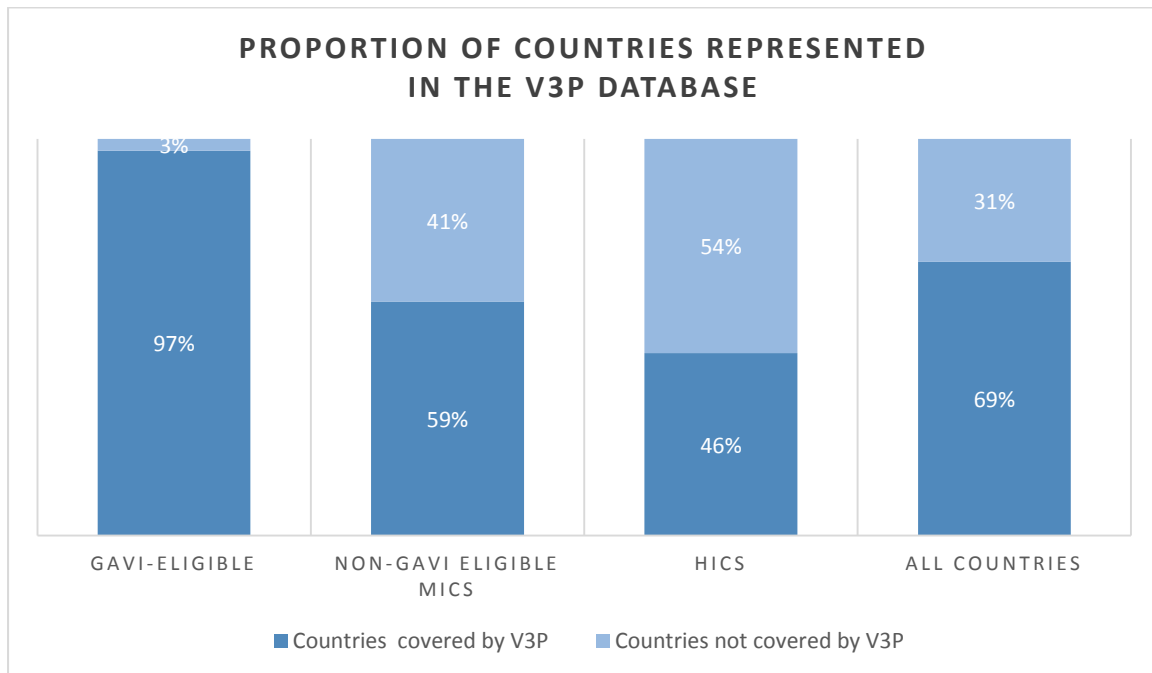


<sup>4</sup> There is no country sharing price information directly with V3P from the region of the Americas, because the PAHO Revolving Fund offers a pool procurement system available to all countries in the region. PAHO shares its price information directly with V3P.

<sup>5</sup> Mix-procuring: countries that procure some vaccines through UNICEF and some vaccines through self-procurement.

<sup>6</sup> Countries that are currently transitioning out of Gavi are countries that have passed the eligibility threshold of \$1,580 GNI per capita and are currently in the « Accelerated transition phase ».

**Graph 2. Coverage of the V3P database, including data shared by individual countries, PAHO and UNICEF**





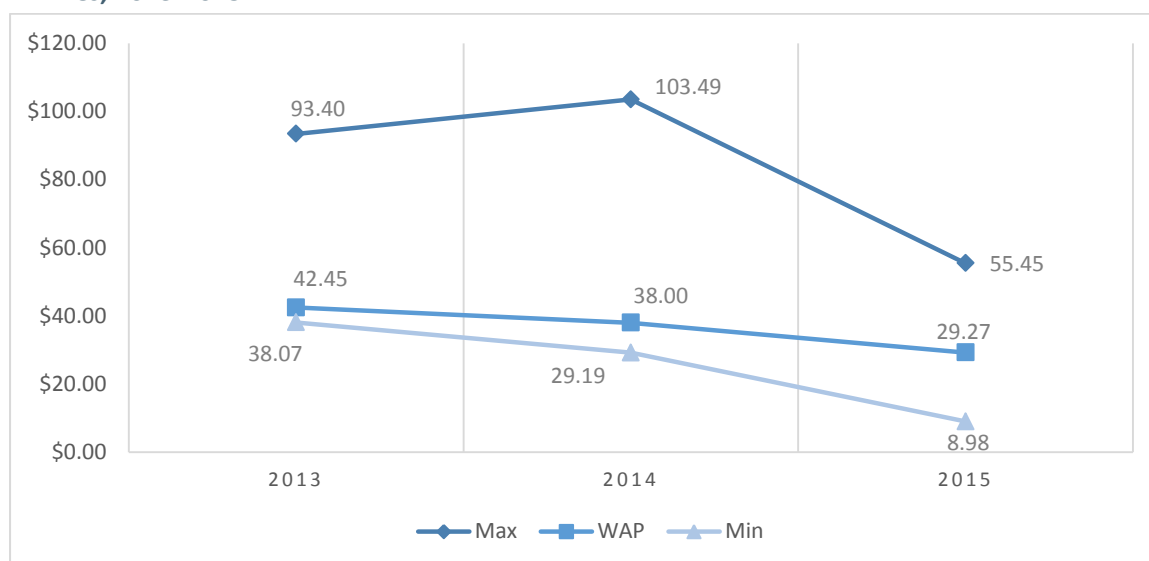
## B.Vaccine prices and price trends

The following tendencies and lessons can be extracted from an analysis of the V3P data. These analyses are strictly for the data reported and may not always reflect market trends. Differences in tendencies between regions may also exist.

### Weighted average price (WAP, by volume) may decline for some newer vaccines over time

For seven countries reporting purchase of HPV for 3 consecutive years (*cf. graph 3*), the WAP fell from \$42.45 in 2013, to \$29.27 in 2015. This tendency has been observed with previous newly introduced vaccines, where an initial high price may decline substantially over time, before the number of suppliers or the combined capacity of suppliers to the market increases. But it should be noted that the changes to prices for these countries should not be viewed in isolation from overall changes in supply and demand that may have been occurring simultaneously in the market.

**Graph 3. Minimum, maximum and Weighed Average Price (WAP)\* of the HPV single-dose vaccine in MICs, 2013-2015**

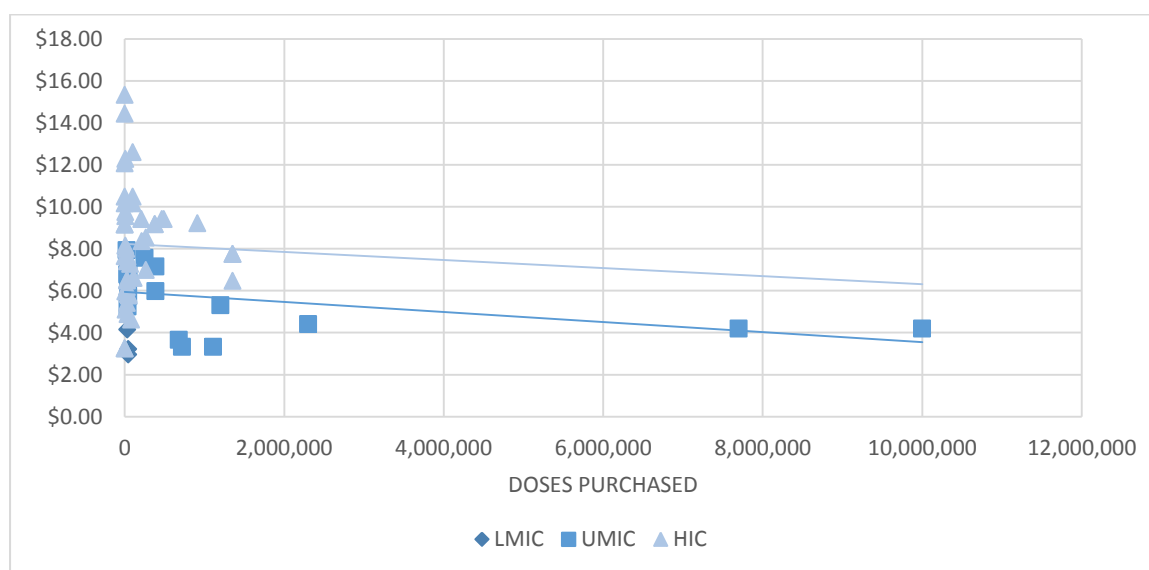


\* Price is weighed by volume procured

### Unit prices of vaccines may decline with increase in volume purchased

Prices for vaccines purchased in large quantities (several hundred thousand or even millions of doses annually), by self-procuring countries, may be marginally lower than for lesser volumes (*cf. graph 4*). Some large self-procuring country purchases may even achieve prices similar to prices obtained by procurement agencies such as the PAHO RF and UNICEF SD.

**Graph 4. Price by volume procured for the Measles-Mumps-Rubella (MMR) single dose vaccine in self-procuring countries, 2013-2015**



### Pooled procurement may achieve lower price than self-procurement

The impact of pooled procurement may be attributed to a combination of several factors, including pooling purchase volumes, multi-year contracting, special contracting (e.g. through purchase volume guarantees), on-time payments and contracting in hard currencies (e.g. euros, dollars). The effect of pooled procurement can be noted for most vaccines, and across all income groups, for the data in the V3P database. Pooled-procuring countries generally obtain lower prices for a same vaccine than self-procuring countries. This is illustrated by the comparison between pentavalent (DTwP-HepB-Hib) price ranges in non-Gavi MICs procuring through UNICEF or self-procuring in 2015 (Table 2).

However, it should be noted that not all MICs may be able to take advantage of pooled purchase mechanisms, either because of legal impediments, or because existing pooled mechanisms do not purchase their vaccines of choice.

**Table 2. Pentavalent (DTwP-HepB-Hib) single dose price ranges in non-Gavi MICs procuring through UNICEF or self-procuring in 2015**

Vaccine:			Pentavalent (DTwP-HepB-Hib)	
Presentation size			1 dose	10 dose
MIC	UNICEF-procuring	(n)	(2)	(1)
		MIN	2.35	1.55
		MED	2.73	1.55
		MAX	3.10	1.55
	Self-procuring	(n)	(3)	(1)
		MIN	2.17	2.22
		MED	4.68	2.22
		MAX	5.10	2.22

Note: NA = Not available; MIN = Minimum; MED = Median; MAX = Maximum. All prices shown are in USD per dose.

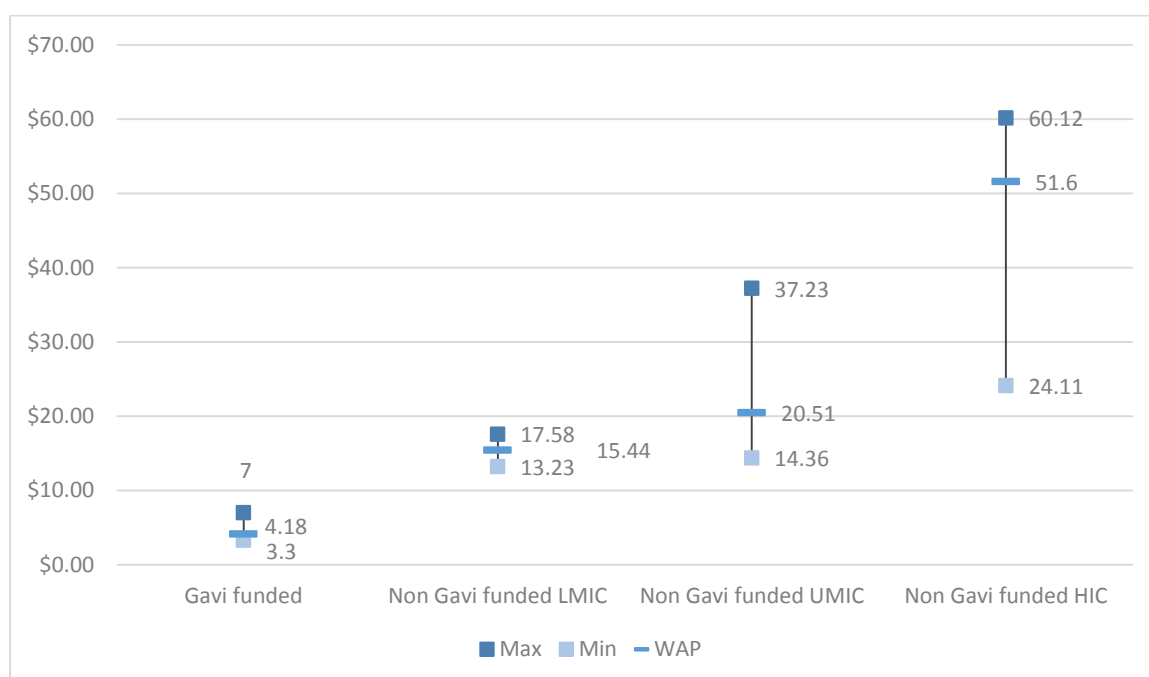
## Unit prices of vaccines may be adjusted to country income level

Table 2 also shows that prices tend to be adjusted to income level so that whether through pooled or self-procurement, median prices are lower for lower income groups. This is an illustration of tiered-pricing strategies conducted by vaccine manufacturers, where prices reflect the income level of the purchasing country.

## Price ranges may increase with increasing income level.

The data show that for most vaccines, in addition to a higher unit price, the price range is also wider for higher income groups. This is particularly visible in the newer vaccines market where the price range can be substantial within and across income groups (*cf. graph 5*).

**Graph 5. Minimum, maximum and WAP\* by income level for single dose PCV, 2015**



\* Price is weighted by volume procured

Note: all Gavi countries are procuring through UNICEF; all non-Gavi countries are self-procuring.

## Product components and presentation size preferences lead to market differentiation between income groups

Product composition and presentation sizes tend to differentiate prices of products between income groups. Higher income countries tend to use acellular pertussis (aP)-containing vaccines while lower income countries tend to use whole-cell pertussis (wP)-containing vaccines (*cf. graph 6*). As a consequence, there are a lot of wP and aP-containing vaccines available: in the V3P database, countries have reported using 8 distinct pertussis-containing vaccines (4 containing wP<sup>7</sup> and 4 containing aP<sup>8</sup>). Higher income countries also tend to use primarily single dose presentations, whereas lower income groups may more often use multi-dose presentations.

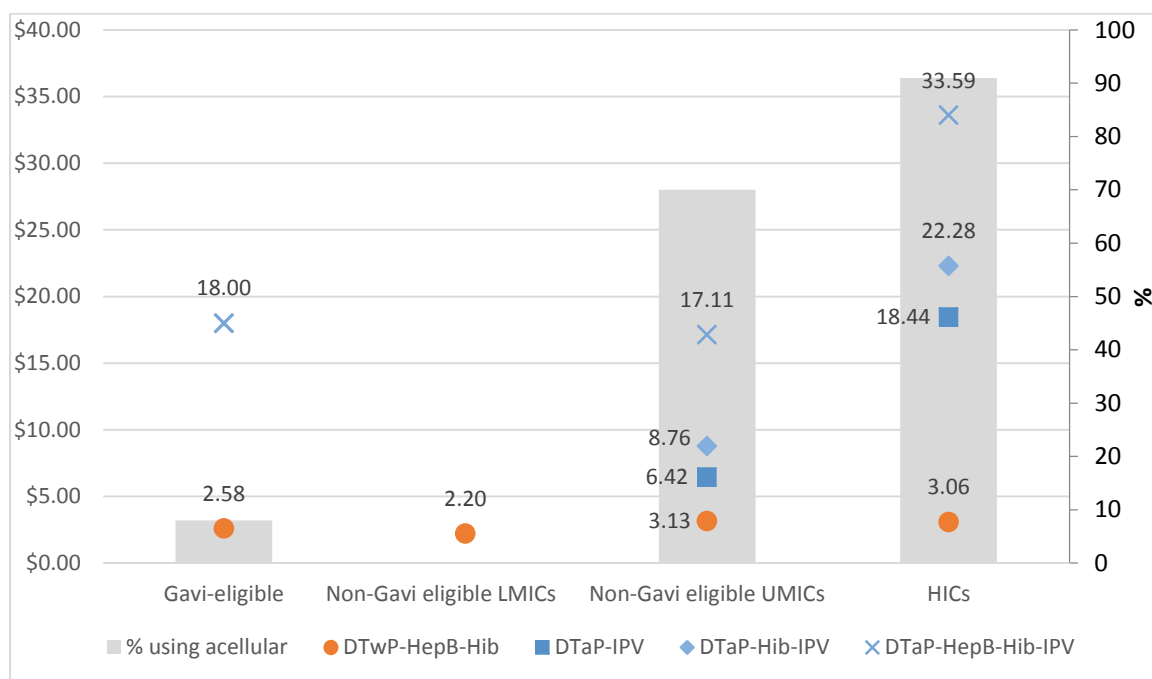
<sup>7</sup> DTwP, DTwP-Hib, DTwP-HepB and DTwP-HepB-Hib

<sup>8</sup> DTaP, DTaP-Hib, DTaP-IPV, DTaP-Hib-IPV and DTaP-HepB-Hib-IPV

With product and presentation size preferences, we observe price differentiation: with higher prices being paid for products and presentation sizes preferred in higher income countries (*cf. graph 6*).

Therefore, switching from wP-containing vaccines to aP-containing vaccines requires careful consideration of the cost implications. As illustrated in graph 6, prices for aP-containing products are at least double the price of wP-containing vaccines in non Gavi UMICs. Moreover, product choice is critical because many products and presentations are not interchangeable with other combination vaccines, in the event of a product shortage.

**Graph 6. Comparison of Weighted Average Price (WAP)\* for single dose wP- and aP-containing products, and proportion of countries using aP-containing products by income level, 2015**



\* Price is weighted by volume procured

## II. KEY MESSAGES

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### Price transparency

The V3P database was designed to improve price transparency particularly for countries planning new vaccine introductions. With the growing participation of countries in the V3P initiative, vaccine price transparency has doubled between 2014 and 2016: the V3P database now contains vaccine prices available to 131 countries, representing 70% of all countries in the world (includes all data reported to the V3P database, from individual countries, PAHO and UNICEF). The participation of in the V3P initiative has risen from just 2 WHO regions in 2013 to all WHO regions for 2015. EUR has particularly contributed to the V3P initiative, representing more than half of all countries in each year, and participation of SEAR, AFR and WPR has grown each year.

The V3P initiative has been particularly enriched by the collaboration on price transparency with UNICEF and PAHO and from the support of NGOs such as MSF.

### Data use

#### ✦ For informed decision making & procurement choices in countries

The database provides basic insights into the factors that may influence vaccine prices, and these in turn should help to inform decisions and improve price negotiations with vaccine suppliers. With vaccine price information now abundantly available, countries are able to better inform planning and budgeting for new vaccine introductions and product choices.

While the use of the V3P data is increasing every year, some countries may still be unaware of the potential benefits of the information available to them. A greater investment will be made to ensure that countries are aware of this available resource and make use of relevant information to inform purchase decisions and budget forecasts.

#### ✦ For global monitoring

At the global level, price transparency can help to monitor the effects of market shaping initiatives such as their impact on vaccine prices and country demand for specific products.

### Time trends

With the accumulation of three years of data, it is now possible to undertake time trend analyses. Weighted average price (WAP, by volume) may decline for some newer vaccines over time. Monitoring of prices over time can help countries to anticipate and forecast price changes, including those that occur with a maturing product life-cycle. However, all trend analyses should carefully consider the market context. UNICEF SD provides market updates for the specific vaccines that it purchases at: [http://www.unicef.org/supply/index\\_vaccines.html](http://www.unicef.org/supply/index_vaccines.html)

### Impact of volume purchases on price

With the accumulation of data, it is now possible to detect a correlation between large purchase volumes and vaccine prices. However, the current data show a relatively marginal correlation,

suggesting that purchase volumes may have to be substantial for prices to be meaningfully impacted.

### **Tiered pricing**

There is sufficient data in the V3P database to show that country income level does correlate with vaccine price. However, the relationship between price and country income level is complex and individual countries do not always obtain a strictly correlated tiered price, as factors other than the income level can affect pricing.<sup>9</sup>

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<sup>9</sup> Some manufacturers have provided details about their tiered-pricing strategy, showing than more than just the income may be taken into account when determining the price of a vaccine. For instance, GSK has published an update of its tiered pricing approach in 2014. Available at: <http://www.gsk.com/media/280905/tiered-pricing-for-vaccines-policy.pdf>



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