Inactivated Polio Vaccine: Supply Update

UNICEF Supply Division

August 2019
Inactivated Polio Vaccine  
Market Update - August 2019

This note provides an update on inactivated polio vaccine supply and demand through UNICEF. It provides updates on demand through UNICEF’s 2019-2022 tender period following changes in timelines for polio eradication, confirmation of supply availability for 2019, the market’s medium-term prospects and outlook, and an update on future pricing expectations through UNICEF.

Summary

- Following a period of constrained availability, the supply requirements for at least one dose of inactivated polio vaccine (IPV) for use in routine immunization can now be fully met through UNICEF. In 2018, 16 countries were able to introduce IPV into their expanded programmes on immunization (EPI), and 15 countries resumed IPV vaccination after supply interruptions in early 2016. The last two countries introduced IPV in April 2019, therefore all 126 countries that used only oral polio vaccine (OPV) in 2015 have now introduced IPV into their EPI.

- Despite the increase in supply availability, constraints remain due to the additional demand from polio endemic countries for supplementary immunization activities (SIAs) and the catch-up immunization of birth cohorts not yet vaccinated with a dose of IPV due to the supply shortages 2016-2018.

- Based on the projected increased IPV availability during the second half of 2019, five countries have been offered supply for catch up immunization based on programmatic priority.

- UNICEF expects new manufacturers of World Health Organization (WHO) prequalified IPV to enter the market from 2020, further diversifying and increasing the supplier base and product availability through UNICEF.

- The prices per dose for IPV for 2019 through to 2022 have increased compared to the previous tender period 2014 to 2018. However, UNICEF anticipates lower prices from new manufacturers entering the market and potentially, price reductions from current suppliers.

1. Background and Programme Update

The number of reported cases from wild poliovirus (WPV) has decreased by over 99 per cent from an estimated 350,000 cases in 1988 across 125 countries to just 33 in 2018 in two countries.\(^1\) WHO declared the global eradication of WPV type 2 in September 2015, 16 years after the last case in 1999. The last case of WPV type 3 was reported in 2012. Despite these encouraging achievements, it is anticipated that WPV type 1 transmission interruption in Afghanistan and Pakistan will be further delayed, expected possibly in 2020. Afghanistan and Pakistan are the two countries with continued WPV type 1 endemicity, where virus transmission has not yet been interrupted. While Nigeria continues to be categorised as an endemic country, there has been no reported WPV cases since August 2016. The country, and with it the African continent, may be declared free of WPV1 in the next 6-9 months should no cases be reported, subject to review by the appropriate committees. The delay in transmission interruption in Afghanistan and Pakistan implies that the earliest at which bOPV could be withdrawn from the market is 2024, which is three years after the last detection of the virus, and another 12 months for countries to prepare for the withdrawal, which also defines the latest by when WHO recommends all countries to have introduced at least two IPV doses into their routine immunization schedules.

WHO’s Strategic Advisory Group of Experts (SAGE) on Immunization currently recommends all countries using bOPV to have at least one dose of IPV in their routine immunization schedules. By the time of bivalent OPV (bOPV) withdrawal, all countries should have at least two doses of full or fractional IPV in their routine programmes, with the first dose being administered

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\(^2\) Children still need to be vaccinated against polio. Within a decade of stopping our current vaccination efforts, we could see a resurgence of polio that could paralyze more than 200,000 children worldwide every year.
at fourteen weeks and the second dose at an interval of at least four months after the first dose.\textsuperscript{3} Since June 2018, SAGE also recommends that countries with poliovirus essential facilities (PEFs) should provide two doses of IPV at the time of OPV withdrawal to align schedules.\textsuperscript{4, 5}

Due to the global shortage of IPV, the Global Polio Eradication Initiative’s (GPEI) Polio Oversight Board made the decision in March 2016 to prioritise available supply through UNICEF to those countries at highest risk for outbreak and importations of polio.\textsuperscript{6} In order to secure the sustainable IPV supply for those priority countries, thirty-five lower risk countries of the more than 80 countries procuring through UNICEF, experienced interruptions in planned or ongoing IPV supply from UNICEF. Two of the 35 countries did not stop IPV immunization. In 2018, the availability of IPV increased, enabling UNICEF to offer the 35 countries that had experienced interruptions supply from first quarter 2018, allowing IPV immunization activities to resume. In April 2019, the last two countries out of the 35 introduced IPV. Therefore, all 126 countries that did not have IPV in their schedule in 2015, but relied on OPV only, have now introduced at least one dose of IPV in their EPI schedule.

Six manufacturers have 10 product presentations prequalified by WHO, of which three manufacturers are currently supplying to UNICEF. Four manufacturers are based in Europe and produce their own bulk, while two manufacturers are based in India and source bulk from Europe through either their parent company or subsidiary.

Table 1 WHQ Prequalified Inactivated Polio Vaccines

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>WHO PQ</th>
<th>Presentation</th>
<th>Form.</th>
<th>Shelf life</th>
<th>VVM</th>
<th>Cold Chain Vol / Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJ Vaccines (Denmark)\textsuperscript{*}</td>
<td>2010</td>
<td>1-dose vial</td>
<td>Liquid</td>
<td>36 months</td>
<td>7</td>
<td>12.90 cm(^2)</td>
</tr>
<tr>
<td>Bilthoven Biologicals (Netherlands)</td>
<td>2010</td>
<td>1-dose vial</td>
<td>Liquid</td>
<td>36 months</td>
<td>7</td>
<td>15.70 cm(^2)</td>
</tr>
<tr>
<td></td>
<td>2014</td>
<td>5-dose vial</td>
<td>Liquid</td>
<td>36 months</td>
<td>7</td>
<td>4.00 cm(^2)</td>
</tr>
<tr>
<td>GlaxoSmithKline (Belgium)</td>
<td>2010</td>
<td>1-dose vial</td>
<td>Liquid</td>
<td>36 months</td>
<td>14</td>
<td>11.50 cm(^2)</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>2-dose vial</td>
<td>Liquid</td>
<td>36 months</td>
<td>14</td>
<td>5.70 cm(^2)</td>
</tr>
<tr>
<td>Sanofi Pasteur (France)</td>
<td>2005</td>
<td>10-dose vial</td>
<td>Liquid</td>
<td>36 months</td>
<td>7</td>
<td>2.44 cm(^2)</td>
</tr>
<tr>
<td>Shantha Biotechnics (India)</td>
<td>2018</td>
<td>5-dose vial</td>
<td>Liquid</td>
<td>24 months</td>
<td>7</td>
<td>6.08 cm(^2)</td>
</tr>
<tr>
<td>Serum Institute of India</td>
<td>2016</td>
<td>1-dose vial</td>
<td>Liquid</td>
<td>36 months</td>
<td>7</td>
<td>17.57 cm(^2)</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>2-dose vial</td>
<td>Liquid</td>
<td>36 months</td>
<td>7</td>
<td>8.78 cm(^2)</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>5-dose vial</td>
<td>Liquid</td>
<td>36 months</td>
<td>7</td>
<td>3.51 cm(^2)</td>
</tr>
</tbody>
</table>

Source: World Health Organization

Note \textsuperscript{*}: Formerly Statens Serum Institut of Denmark

In addition, five other manufacturers in four countries produce non-WHO prequalified IPV licensed by their respective national regulatory authorities (NRA) and supply mainly their domestic markets (Table 2 – next page).

2. Innovation and Pipeline Products

There are several manufacturers with IPV products at various stages of clinical development,\textsuperscript{7, 8} of which many are developing vaccines from a Sabin strain, (Sabin IPV - sIPV) through technology transfers from WHO and Intravacc.\textsuperscript{9} Sabin IPVs use an attenuated (weakened) poliovirus strain which significantly reduces the risk of outbreaks caused by containment breaches.

\textsuperscript{4} Poliovirus essential facilities (PEFs) are facilities designated by national ministries of health to handle, store, and manage necessary polio materials post-eradication, including vaccine testing and virologic research and diagnostics.
\textsuperscript{7} World Health Organization, 17\textsuperscript{th} WHO/UNICEF Consultation on OPV/IPV Manufacturers and National Authorities for Containment of Polio Vaccine Producing Countries, WHO, Geneva, October 2018, p. 18.
\textsuperscript{9} Intravacc is a research and development organization with over 100 years of experience in vaccinology.
during vaccine production when compared with Salk based IPV products, which use WPV for production (Table 2). In addition to the innovative development of sIPV vaccines, one manufacturer, AJ Vaccines (Denmark) has developed an adjuvanted IPV vaccine that requires less antigen per dose.11

Table 2 Nationally licensed IPV Vaccines and New Pipeline Products

<table>
<thead>
<tr>
<th>Nationally Licensed IPV Supplying Domestic Markets</th>
<th>New IPV Pipeline Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing Institute of Biological Products (China)12</td>
<td>AJ Vaccines (Denmark)12</td>
</tr>
<tr>
<td>Biken (Japan)13</td>
<td>Beijing Minhai (China)13</td>
</tr>
<tr>
<td>Bio Farma (Indonesia)14</td>
<td>Bharat Biotech (India)15</td>
</tr>
<tr>
<td>IMBCAMS (China)16</td>
<td>Biological E (India)16</td>
</tr>
<tr>
<td>Nanolek (Russian Federation)17</td>
<td>LG Chem (South Korea)18</td>
</tr>
<tr>
<td></td>
<td>Panacea Biotec (India)19</td>
</tr>
<tr>
<td></td>
<td>Sinovac Biotec (China)20</td>
</tr>
</tbody>
</table>

Note 11: Sabin polio strains.

UNICEF dosed its IPV tender for supply over 2019-2022 in September 2017, for which it received proposals from 11 manufacturers, all offering to supply WHO prequalified IPV to UNICEF during the tender period. From the information in the proposals UNICEF received, manufacturers expect 12 new products to acquire WHO prequalification based on national licensure in countries of production (Table 3).

Table 3 Number and Timeline Assessment by Manufacturers of New Products by Presentation for WHO Prequalification

<table>
<thead>
<tr>
<th>Presentation</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-dose</td>
<td></td>
<td>1</td>
<td></td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5-dose</td>
<td>1</td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10-dose</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Source. UNICEF Supply Division

A critical objective for UNICEF for the 2019-2022 tender period is to expand the supplier base and to improve the health of the IPV market. Based on the lessons learnt from its previous tender cycle 2014-2018, and the challenges experienced IPV manufacturers had in scaling up production, UNICEF continues to closely monitor the progress with manufacturers against critical milestones towards i) having their new products WHO prequalified, and ii) the expansion of current and new production capacity where relevant.

Table 4 (next page) reflects UNICEF’s current assessment based on the updates on progress provided by manufacturers as well as UNICEF’s experience with individual manufacturers as illustrated by the arrows of when WHO prequalification can reasonably be expected for the new products. It anticipates possibly eight vaccines acquiring WHO prequalification before the end of 2022. It also takes into account the discontinuation by one manufacturer of the IPV in development.

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10 Intravacc, Development of Inactivated Polio Vaccine Derived from Attenuated Sabin Strains, Intravacc, Bilthoven, July 2016.
16 Biological E, Vaccines, Biological E, Hyderabad, 2017.
18 Clinical Trials, A Clinical Study to Evaluate the Safety and Immunogenicity of Inactivated Poliomyelitis Vaccine in Healthy Infants, US National Library of Medicine, Bethesda, January 2018.
22 Nanolek, Vaccines, Nanolek, Moscow, 2019.
Table 4 UNICEF’s Assessment of Anticipated Number and Timeline of New WHO Prequalified IPV Products per Presentation 2018-2022

<table>
<thead>
<tr>
<th>Presentation</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-dose</td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5-dose</td>
<td>1</td>
<td></td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>10-dose</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source. UNICEF Supply Division

3. Current Global Demand

The global demand for standalone IPV in 2019 is estimated to reach 120.9 million doses to meet the needs of 111 countries. UNICEF procurement during this period is projected to reach 91.3 million doses representing 76 percent of the global demand. This includes Gavi, The Vaccine Alliance (Gavi), funded routine requirements, as well as catch-up immunization in Gavi supported countries and supplementary activities with IPV in polio endemic countries, Afghanistan, Nigeria and Pakistan. Figure 1 shows the breakdown of demand for 2019.

Figure 1. Global Demand for Standalone IPV - 2019

Source. UNICEF Supply Division

4. Demand through UNICEF

Since UNICEF issued initial awards to manufacturers in January 2018 under the current tender, there have been changes to the demand for IPV through UNICEF due to several factors. The key drivers of change are:

- Wild poliovirus eradication. Now expected earliest 2020, and consequently, UNICEF anticipates bOPV withdrawal in 2024 at this earliest. This implies a period of three years between the last case and the declaration of eradication, and subsequently a 12 months period for countries to prepare for the global withdrawal of OPV. Prior to bOPV withdrawal, WHO recommends all countries to have at least two doses of IPV in their routine immunization schedule.
- Introduction of second dose of IPV. UNICEF had previously assumed in its demand forecasts that all countries would introduce a two-dose schedule from January 2021.23 UNICEF has adjusted the timing of when all countries are assumed to have introduced two doses of IPV to reflect a phased approach across 2021-2023, based on revised supply availability and country readiness. UNICEF and partners will be advocating with countries to phase in the introduction of their second dose.

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IPV dose as soon as supply availability allows and based on each countries’ timing of when they are ready to implement the new schedule. This is to achieve a smooth transition and avoid a doubling of demand over a short period of time.

- **Catch-up immunization timing:** At the time UNICEF issued the tender, UNICEF had anticipated catch-up immunization activities would have taken place in 2019, assuming supply was available. As manufacturers did not offer UNICEF sufficient supply to meet these requirements, UNICEF, WHO, Gavi, and the Bill and Melinda Gates Foundation (BMGF), continue to work with countries to confirm the size of the unimmunized cohorts. Available supply is being allocated starting with the countries at highest-risk of reintroduction of polio in case of importation. The first five countries, Angola, Liberia, the Sudan, Tanzania, and Zambia, have been allocated doses for the catch-up immunization. UNICEF, in collaboration with partners, is working with the next group of countries to benefit from supply availability for catch-up immunization in 2020.

- **Demand projections:** From polio-endemic countries and from populations in areas affected by circulating vaccine-derived polio (cVDPV), demand projections have increased from two million doses to six million doses in 2019. Based on 2019 requests from GPEI, UNICEF has assumed a similar requirement in 2020. UNICEF and partners are currently discussing the need to secure supply to immunize high at-risk refugee populations against the relative risks of other strategies, for example the allocation of additional doses for countries at high risk and catch up immunization in the context of limited supply.

UNICEF communicated the changes that were known at its Vaccine Industry Consultation in October 2018.\(^2\)\(^4\) Figure 2 incorporates these changes as well as updates since and shows expected demand through UNICEF from 2019 through to 2023.

**Figure 2 IPV Demand Forecast Through UNICEF 2019-2023**

![IPV Demand Forecast Through UNICEF 2019-2023](image)

Source: UNICEF Supply Division

**Note 1:** Demand through UNICEF for 2019 is suppressed by limited supply availability. UNICEF further assumes that some catch-up campaigns will be carried forward to 2021 on account of country readiness.

**Note 2:** SIA: Supplementary immunization activities.

**Note 3:** RI: Routine immunization.

5. **Supply**

Since 2013 to date (end of May 2019), UNICEF has procured a total of 279.7 million doses of standalone IPV for a total of USD 389.6 million. In 2018, even though supply was constrained, UNICEF procured 66 million doses, which was an increase

\(^2\)\(^4\) UNICEF, [Market Updates: Routine Vaccine Introductions IPV](link), (PowerPoint Slides), UNICEF, Copenhagen, October 2018.
of 28 per cent over 2017. UNICEF expects the availability of standalone IPV to remain constrained through 2020. However, UNICEF also anticipates that supply will be sufficient to fully meet country routine demand through UNICEF (for one-dose schedules) and to cover catch-up immunizations for countries that will be able to do this activity with allocation being done in accordance to their level of risk.

Over the tender period 2019-2022, UNICEF estimates demand through UNICEF for IPV to reach 396 million doses (Table 5). To date, UNICEF has awarded 294.5 million doses to three manufacturers: Bithoven Biologicals, Sanofi Pasteur, and Shantha Biotech. UNICEF currently forecasts that the majority of catch-up requirements after 2019 will be implemented in 2020, but some activities may be delayed to 2021 due to the readiness of countries. The final distribution will be determined by the supply availability and the country readiness to undertake catch-up immunization. In addition, for 2021 as more supply becomes available, and countries progress towards introducing a second dose of IPV into the EPI schedule, UNICEF expects country demand to gradually increase up to around 140 million doses a year by 2023 (Figure 2).

For the current tender, UNICEF left 101.6 million doses (25 per cent) of forecast demand unawarded for pipeline manufacturers to provide them with an incentive to continue, and if possible, accelerate efforts to have products prequalified by WHO as soon as possible. At the same time, it was critical for the GPEI not to jeopardise any supply for routine immunization programmes, as there is a need to secure supply from manufacturers well in advance and in accordance with their production timelines.

Table 5 IPV Supply Suppressed Demand Forecast through UNICEF Supply Awards, and Unawarded Demand 2019-2022

<table>
<thead>
<tr>
<th>Purpose</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gavi</td>
<td>57,145,500</td>
<td>58,019,200</td>
<td>68,826,300</td>
<td>87,837,600</td>
<td>271,828,600</td>
</tr>
<tr>
<td>Middle-income Countries</td>
<td>9,303,700</td>
<td>9,255,100</td>
<td>9,211,400</td>
<td>16,964,300</td>
<td>44,734,500</td>
</tr>
<tr>
<td>India</td>
<td>9,000,000</td>
<td>7,500,000</td>
<td>-</td>
<td>-</td>
<td>16,500,000</td>
</tr>
<tr>
<td>SIA / Emergency Outbreaks</td>
<td>6,000,000</td>
<td>6,000,000</td>
<td>3,000,000</td>
<td>2,000,000</td>
<td>17,000,000</td>
</tr>
<tr>
<td>Catch-up</td>
<td>6,000,000</td>
<td>30,000,000</td>
<td>10,000,000</td>
<td>-</td>
<td>46,000,000</td>
</tr>
<tr>
<td>Total Demand</td>
<td>87,449,200</td>
<td>110,774,300</td>
<td>91,037,700</td>
<td>106,801,900</td>
<td>396,063,100</td>
</tr>
<tr>
<td>Awards</td>
<td>91,500,000</td>
<td>79,000,000</td>
<td>71,500,000</td>
<td>52,500,000</td>
<td>294,500,000</td>
</tr>
<tr>
<td>Unawarded</td>
<td>-</td>
<td>31,774,300</td>
<td>19,537,700</td>
<td>54,301,900</td>
<td>101,613,900</td>
</tr>
</tbody>
</table>

Source: UNICEF Supply Division

In providing the overview of unawarded quantities for 2020 through 2022, UNICEF assumes that the majority of doses needed for catch-up immunization campaigns after 2019 are needed in 2020 with some of the demand spilling over to 2021. Furthermore, 50 per cent of the new birth cohorts are assumed to be provided a two-dose schedule in 2022 and the remaining by 2023 assuming funding is available.

6. Pricing

Table 6 IPV Awarded Price per Dose through UNICEF per Presentation 2018-2022

<table>
<thead>
<tr>
<th>Presentation</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-dose USD</td>
<td>USD 2.80</td>
<td>USD 3.50</td>
<td>USD 2.80</td>
<td>USD 2.80</td>
<td>USD 2.80</td>
</tr>
<tr>
<td>5-dose USD</td>
<td>USD 1.90</td>
<td>USD 2.95</td>
<td>EUR 3.10</td>
<td>USD 3.10</td>
<td>USD 2.50</td>
</tr>
<tr>
<td>5-dose EUR†</td>
<td>EUR 0.96</td>
<td>EUR 2.06</td>
<td>EUR 2.06</td>
<td>EUR 2.06</td>
<td>EUR 2.06</td>
</tr>
<tr>
<td>USD Equivalent†</td>
<td>USD 1.09</td>
<td>USD 2.34</td>
<td>USD 2.34</td>
<td>USD 2.34</td>
<td>USD 2.34</td>
</tr>
<tr>
<td>10-dose EUR*</td>
<td>EUR 0.75</td>
<td>EUR 1.81</td>
<td>EUR 1.81</td>
<td>EUR 1.81</td>
<td>EUR 1.81</td>
</tr>
<tr>
<td>USD Equivalent*</td>
<td>USD 0.85</td>
<td>USD 2.06</td>
<td>USD 2.06</td>
<td>USD 2.06</td>
<td>USD 2.06</td>
</tr>
</tbody>
</table>

Source: UNICEF Supply Division

Note*: Prices apply only to Gavi supported countries. Prices for other countries are published on UNICEF’s website.

Note†: USD equivalent based on UN exchange rate of July 2019 of 0.88.²⁶

Manufacturers’ proposals and UNICEF’s awards for 2019 to 2022 resulted in an increase in IPV price per dose for multi-dose vial presentations compared to the prices UNICEF secured under its previous 2014-2018 IPV tender (Table 6). The price increases from current manufacturers were explained to UNICEF as necessary to offset the considerable investments manufacturers made over the past four years to scale up their production capacity, and to address unforeseen challenges during this process. UNICEF expects that as WHO prequalifies new products, and manufacturers make these supplies available through UNICEF, the prices will be lower from 2020.

Since 2011, UNICEF has been publishing vaccine prices, as part of its strategy of influencing markets and broader commitments to information and price transparency. UNICEF pricing data by supplier and presentation can be accessed here:  
https://www.unicef.org/supply/files/2018_10_23_IPV.pdf as well as here:  
https://www.unicef.org/supply/index_102934.html

Table 7 Prices Offered by Presentation from Manufacturers with a Product in Development for Gavi-Supported Countries

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Price Range per Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-dose vial</td>
<td>USD 1.50 to USD 2.50</td>
</tr>
<tr>
<td>5-dose vial</td>
<td>USD 0.999 to USD 2.528</td>
</tr>
<tr>
<td>10-dose vial</td>
<td>USD 1.99 to USD 2.50</td>
</tr>
</tbody>
</table>

Table 7 shows the range of prices that have been offered to UNICEF under the current tender by presentation from manufacturers that do not have products prequalified by WHO and are therefore not eligible for awards.

Source: UNICEF Supply Division

Some manufacturers offer different prices for Gavi supported countries and countries that are not supported by Gavi (tiered pricing).

7. Issues and Challenges

- Despite increased supply availability, constraints remain due to the additional demand from the polio endemic countries for SIAs, in addition to catch up immunization for birth cohorts that did not receive IPV since the switch from trivalent OPV to bOPV in April 2016 due to supply shortages.
- UNICEF anticipates WHO to prequalify new IPV products over the course of the next few years, with one new product anticipated in the market in 2020. This will improve the health of the IPV market by expanding the supplier base and increasing supply security.
- UNICEF, WHO, Gavi, and BMGF are currently reviewing the supply availability for 2020 for missed birth cohorts. Once the review is completed, countries will be prioritised based on the risk assessment and their readiness to undertake these activities in 2020.
- Based on current supply projections, a gradual introduction of a second dose of IPV from 2021 is assumed. This is intended to avoid the issues encountered when all 126 OPV only using countries introduced one-dose of IPV over a short period. This smooth transition should start as soon as supply becomes available, and countries are ready.
- The increase in IPV prices is causing budget concerns for self-financing countries. UNICEF will continue to work with these countries, global partners and manufacturers to achieve affordable, sustainable prices to ensure cost is not a barrier to improved IPV coverage.
- Gavi approved in June 2019 the continued support of IPV under the same conditions until bOPV is withdrawn, at which time countries will be expected to undertake some co-financing contribution.

8. Steps Forward

- UNICEF will continue to work with current and new manufacturers to improve IPV supply availability for 2020 and 2021 and to improve the health of the market by expanding the supplier base.
- It will continue to work with current and new manufacturers to improve prices of IPV.
- UNICEF and partners will continue to work with countries to plan their catch-up immunization activities as supply becomes available.
• UNICEF will also continue to closely monitor manufacturers with new products in the development as well as their progress towards acquiring WHO prequalification, and the expected timing of when they can make supply available through UNICEF.
• UNICEF anticipates issuing its next market update by the end of 2019.

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