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The Market Shaping Goal

Ensure healthy markets for vaccines and related products

Gavi Alliance Market Shaping Roadmap for *Pneumococcal Vaccines*

Public Summary
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Purpose and scope

The roadmap is a foundational tool of Gavi's market shaping strategy with the purpose to articulate a mid- and long-term market strategy designed to align market-shaping objectives and target outcomes across the Alliance partners, define a set of interventions to reach these objectives and target outcomes, and inform procurement strategies and decisions. The objectives, target outcomes and interventions articulated in this roadmap focus on:

- The Gavi74¹ market while including global market considerations to highlight interdependencies and their impact on overall market health.
- The next UNICEF pneumococcal vaccine tender period starting in Q3 2022, covering a nine-year period from 2022 until 2030.

Current epidemiological context of Pneumococcal and Gavi engagement

Pneumococcal disease caused by *Streptococcus pneumoniae* is the leading cause of pneumonia, which results in the greatest number of deaths in children under 5 years of age worldwide, the vast majority in developing countries. WHO recommends that pneumococcal vaccines be introduced into all national immunisation programmes. Pneumococcal conjugate vaccines (PCVs) are currently the only vaccines for childhood protection since polysaccharide vaccines are not effective for paediatric use.

Gavi's pneumococcal programme aims to facilitate the rapid uptake and coverage of pneumococcal vaccination. As part of its commitment to the WHO/UNICEF Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPD), Gavi requests that the use of pneumococcal vaccines be part of a comprehensive and integrated strategy alongside other related interventions. As of the end of 2021, 61 countries have introduced PCV into their routine immunisation programmes. It is estimated that >255 million children were immunised with Gavi-supported PCV since 2009 under the Advance Market Commitment (AMC) – an innovative funding mechanism launched in 2010 and finished in 2020. The AMC has proven to be an effective market shaping intervention, incentivizing vaccine makers to build manufacturing capacity and improve PCV access in Gavi73 countries. From 2021 to 2030, based on current forecasts², 471 million children are expected to be immunised, preventing over 1.3 million deaths.

Market evolution over the next 10 years

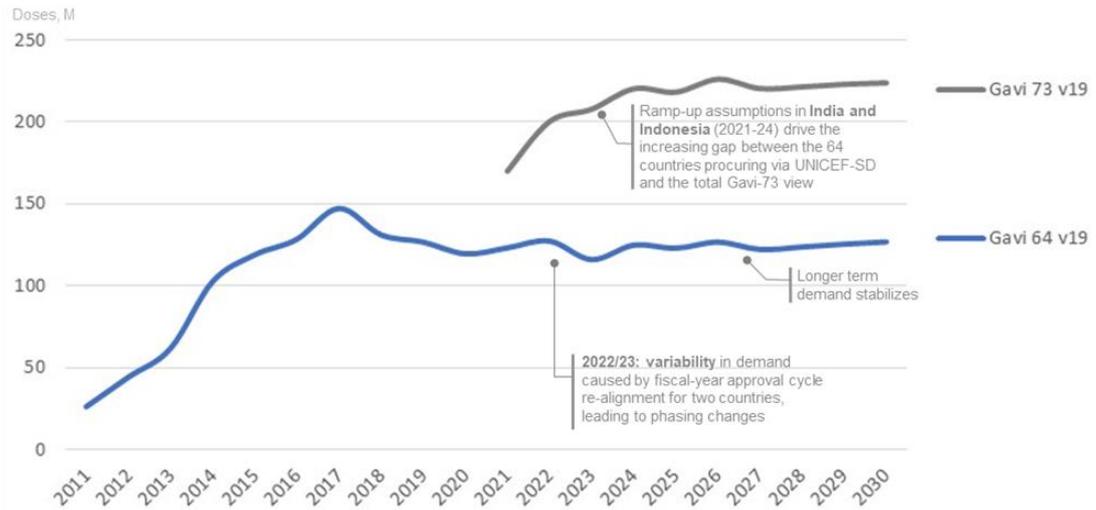
By July 2020, over 150 countries had introduced PCV into national routine immunisation programmes for infants. WHO global market analysis assumes all remains countries will have introduced by 2030, driving global demand from just below 300m doses in 2021 to just over 400m doses by 2030. 61 of the 74 Gavi countries have introduced PCV for infants and all are forecast to introduce by 2026. Gavi74 demand for this vaccine is expected to increase from 170m doses in 2021 to 224m doses in 2030, largely driven by national PCV programme expansion in India and Indonesia (see Figure 1). More than half of non-Gavi non-PAHO middle-income countries have introduced PCV nationally and demand from this group is estimated to double by 2030, largely driven by national introduction of (publicly procured) PCV in China that would require 40 million doses annually. Most high-income countries have introduced PCV, and some use it for both children and adults and schedules vary between 2 and 4 doses. If more countries adopt a two-dose schedule, future volume requirements could decrease³. The use of PCV for people >50 years old could increase if SAGE (Strategic Advisory Group of Experts on Immunization) and/or National Immunization Technical Advisory Groups recommend this use.

¹ 74 Gavi-supported countries including currently eligible, transitioning, and transitioned countries

² Figures are based on the Gavi operational forecast OP18 generated in Q1 2021. Gavi forecasts are updated annually.

³ A 2 dose schedule is currently not recommended by SAGE WHO for Gavi countries. If recommended in the future it is likely this would be applicable to only a few Gavi countries with very high coverage.

Figure 1: Gavi PCV base demand forecast v.19 (Jan 2021)



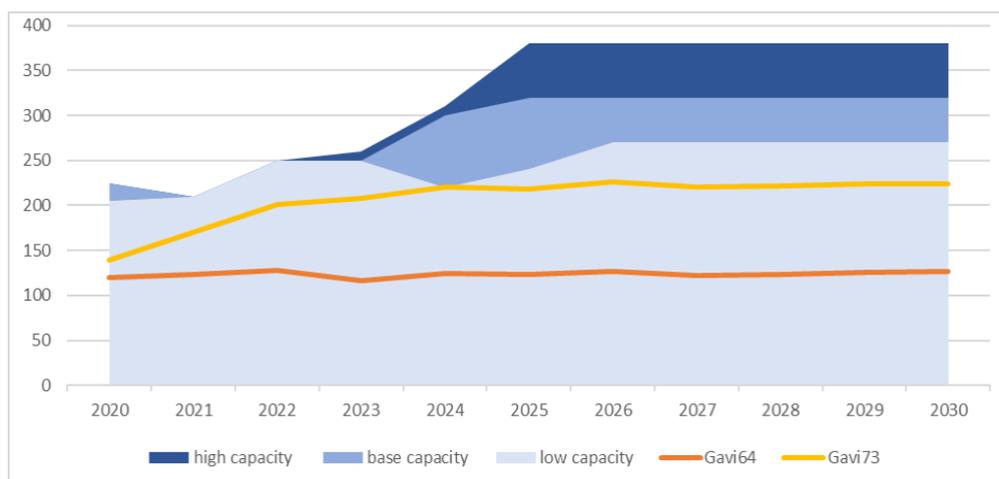
Gavi 64 represents all Gavi 73 except India, Indonesia, Ukraine and six PAHO countries

The magnitude and the duration of the Covid-19 pandemic impact on immunization programmes and PCV demand is still uncertain. Impact on immunisation has varied across Gavi countries, but disruptions were less severe in 2021 compared to 2020, and generally no more than 5% variability in monthly vaccination rates was experienced versus pre-pandemic levels. From 2023 onwards the forecast assumption is for a return to 'normal' activity levels for routine immunisation. However, the emergence of new Covid strains, national lockdown measures, export restrictions, and cold chain capacity constraints have potential to disrupt demand and supply further.

The global supply base for PCV is sufficient to meet global demand and the number of suppliers has recently increased with two market entrants in 2019, Serum Institute of India (SII) and Walvax Biotechnology, and one in 2020, Beijing Minhai Biotechnology. Until this point, the global PCV market was a duopoly, served by GSK and Pfizer since 2010. GSK and SII's PCV10 contain the same number of serotypes, though they differ in the replacement of one of the PCV serotypes (serotype 4 in GSK's vaccine and serotype 19A in SII's vaccine). The 13 serotypes contained in Pfizer's vaccine include all the serotypes in GSK and SII vaccines plus serotypes 3 and 6A and may have an additional benefit in settings where disease attributable these serotypes is significant. The 2019 WHO position paper states that PCV10 (GSK) and PCV13 (Pfizer) have substantial impacts against pneumonia, vaccine-type IPD and nasopharyngeal carriage, and there is insufficient evidence of a difference between these vaccines in the net impact on overall disease burden. A total of seven different product presentations from Pfizer, GSK and SII are WHO prequalified, whilst the PCV13 from both Walvax and Beijing Minhai are currently licensed in China and not widely used. Pfizer dominates global market shares in terms of revenue (90%) and volumes, as well as in Gavi73 countries. Going forward new entrants are expected to increase their share of the global market.

Between 2022 and 2025, at least four additional manufacturers are expected to license PCVs (including a PCV14, 15 and 20) with additional serotypes, and at least two are anticipated to seek WHO prequalification. From 2026-2030, several other producers of pneumococcal have potential to enter the market. Protein-based vaccines and other broad-spectrum coverage vaccines that may provide protection against a broader range of pneumococcal disease and may lower manufacturing costs are early in development and time to market remains uncertain. Innovations in vaccine delivery device are also in early-stage development, such as micro-array patch (MAP), and could make a difference in the reach of unimmunised populations.

Figure 3: Gavi73 supply-demand balance scenarios (units in doses, millions)



Gavi73 healthy market dynamics and challenges over the next 10-years

By analysing the above market evolution, Alliance partners have identified three phases of growth over the next 10-years characterised by changing market dynamics. The Alliance’s Healthy Market Framework (see Figure 2) illustrates several risks that are considered today based on the expected evolution of market dynamics described below.

Figure 2: Assessment of healthy market attributes for PCV (2021), based on the Gavi Alliance Healthy Market Framework

Market attributes assessed by impact on market health (Low, Medium, High)

And by level of unmet need

- Low
- Medium
- High

Low	Geopolitical & regulatory risk	Predictability of demand	Materialisation of demand
Medium	Incentivising & scaling up innovations	Supplier base risk	Meeting country product preference
High	Supply meets demand	Market sustainability & attractiveness	Balanced demand of appropriate products & timely uptake of new innovative products

- **Phase 1 (2022 – 2025):** To date, Gavi country product switching has been limited and **demand is expected to remain relatively concentrated** towards PCV13 across this period. The third supplier of a lower cost prequalified PCV (SII’s PCV10 with a low price of \$2.00/dose in 2022 versus \$2.90/dose for Pfizer’s PCV13 and \$3.05/dose for GSK’s PCV10) will scale up supply during this phase, largely driven by expansion in India, and as a result Gavi73 market shares will shift. Additional India-based PCV manufacturers are expected to join the supplier base with PCV14/15 products, increasing the choice of product options for countries. In the context of Covid-19 and broader immunisation program decisions, it could be a challenge for countries to make timely evidence-based decisions concerning product choice/switch (considering programmatic characteristics, vaccine supply, vaccine price and the local prevalence of vaccine serotypes and antimicrobial patterns). Whilst overall Gavi73 demand is relatively predictable, the **uncertainty around future country preferences** and potential changes in **product-specific demand** could lead to risk of **supply-demand imbalances, supplier sustainability issues** and premature market exits, and challenges for pipeline manufacturers in **assessing market opportunity**.

- **Phase 2 (2026 – 2030):** By 2026, peak demand will be reached and remain stable, and drivers of country product preferences should be better understood, making product-specific demand more predictable. **Market competition will likely increase** as new installed capacity becomes ‘tested’ and the **supplier base is expected to diversify**. However, certain market risks might prevail into this phase depending on supply and demand-side scenarios:
 - In a scenario of high supply (i.e. successful market entry of pipeline candidates) and low demand (i.e. including switch of high-performing countries to a 1+1 schedule), there could be significantly more available supply capacity than demand thereby increasing competitive pressure and supplier sustainability and market attractiveness may become an issue.
 - In a low supply scenario (i.e. medium-term market exit of a large manufacturer, and unsuccessful entry of new manufacturers), supply security risks may prevail into this phase and market competition may be more limited.
 - Market competition will also depend on evolution of country product preferences (including their price sensitivity) and country decision making capacity. For example, there could be a scenario where demand across appropriate products is skewed towards higher-valency vaccines.
- **Phase 3 (2031+):** By this phase, natural market competition should have driven significant diversification of the supply base and **Gavi73 market shares by product should begin to stabilize**. However, this could also be the point at which **innovations potentially disrupt the market** (such as next-generation broad spectrum pneumococcal vaccines), which could create mismatches between specific country preferences and supply availability, as well as vaccine security issues if products are not interchangeable. Alternatively, **innovations might find market niches** (such as MAPs) and have an important impact on disease outcomes without triggering major changes in market dynamics.

Strategy to sustainably improve market health

Gavi Partners defined a long-term strategy for the pneumococcal vaccine market to address these challenges, which translates into the following strategic market objectives and target outcomes:

Objective 1: Maintain a secure supplier base

Supply currently meets demand and is expected to exceed demand over the long term; however, several risks are identified that could impact supplier sustainability, market attractiveness and thus overall supply security over the long term. Mitigating these risks and maintaining a secure supplier base is considered a market priority over the long-term.

- **Target Outcome 1:** A minimum of three pneumococcal vaccine suppliers serve the Gavi73 market over the longer term, each with viable market shares

A concerted action plan ensures the coordination between Gavi market shaping partners and facilitates the achievement of the above strategic market objectives. Actions include the following:

- Support to and monitoring of pipeline candidates
- Initiate parallel processes alongside regulatory pathways for new products to facilitate country readiness and reduce time to market
- Ad-hoc evaluation +/- mitigation of issues impacting overall supply security, related to supplier sustainability, market competition, and unbalanced demand (considering expectations regarding future vaccine candidates, their eventual consideration by SAGE, and “preferential

recommendation” scenarios), and whether this should trigger a roadmap strategy re-evaluation

Objective 2: Healthy demand drives meaningful supply-side competition

Healthy demand will be key to the overall evolution of the market, both to ensure diversification of the supplier base (to achieve Objective 1), but also to drive meaningful competition. To facilitate future healthy demand, the following target outcomes aim to foster sustainable market competition, mitigate against skewed and unbalanced demand across appropriate products, and improve predictability.

- Target Outcome 2: Gavi policy environment supports vaccine price sensitivity among all Gavi countries, sufficient to stimulate competition among pneumococcal vaccine suppliers and thus influence their tender bidding behaviour
- Target Outcome 3: Gavi countries make timely, rational, and evidence-based switch and introduction evaluations for pneumococcal vaccine products supporting an environment for fluid market competition
- Target Outcome 4: A credible pneumococcal vaccine demand outlook underpinned by sharing of accurate short- and long-term forecasting
- Target Outcome 5: Long-term steady state pricing is sustainable for both the supplier base (i.e. TO1 is not at risk) and Gavi supported countries under any new co-financing paradigm (i.e. no Gavi country pneumococcal programme experiences persistent regression in performance or discontinues citing vaccine price as the driver)

A concerted action plan ensures the coordination between Gavi market shaping partners and facilitates the achievement of the above strategic market objectives. Actions include the following:

- Bring to bear market shaping consideration in Gavi’s “Co-financing Policy review” with a critical view on the need for greater price sensitivity across all Gavi countries
- Develop and implement Alliance-wide processes to support “timely” country switch and portfolio optimization decision-making (“timely” corresponding to meaningful changes in short-term supply landscape such as price, changes in the transition status of countries, or shifts in circulating strains)
- Regular exchange of demand forecasts and methodologies with manufacturers, including updates on expectations regarding drivers of country preferences and introduction/switch decisions (including price sensitivity of countries)
- Collect market intelligence enhancing the understanding of country preferences for current and future program alternatives and drivers for introductions and switches enabling accurate presentation-specific forecasting and the anticipation of demand and supply side issues and to inform TO1 and TO4
- Enhance Alliance processes and country data quality to reduce year-on-year volatility of renewal volumes
- Monitor country intelligence regarding possible future schedule change (1+1) to inform demand forecasting scenarios

Objective 3: Accommodate future waves of innovation in Pneumococcal disease control

Vaccine innovations that could make an important difference in pneumococcal disease control, such as broad-spectrum pneumococcal vaccines or new presentations or formulations that could improve coverage and equity, are of interest to Gavi market shaping partners. Candidates are being monitored

closely (and some are actively supported), and an aligned strategic picture on the benefits and challenges/bottlenecks needs to be maintained.

- Target Outcome 6: Manufacturers with new pneumococcal vaccines in pipeline are in an informed position to evaluate their future participation in the Gavi market
- Target Outcome 7: A strategic and aligned picture is maintained among Gavi market shaping partners of broader serotype coverage vaccines and other next generation innovations

A concerted action plan ensures the coordination between Gavi market shaping partners and facilitates the achievement of the above strategic market objectives. Actions include the following:

- Allow adequate strategic lead-time for accommodation of innovation by supporting early SAGE (or Working Group) consideration of novel pneumococcal vaccines that accounts for market health implications and up-to-date epidemiological data
- Evaluate the need for Alliance partners to develop a value-based assessment of vaccines offering higher serotype coverage
- Evaluate the need for Alliance partners to develop a public strategic alignment paper on potential next generation innovations to support industry and future roadmap strategies