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The Market Shaping Goal

Shape vaccine markets to ensure adequate supply of appropriate, quality vaccines at low and sustainable prices for developing countries.

Market shaping Roadmap

Covid-19

PUBLIC SUMMARY
October 2022

Coronavirus disease 2019 (Covid-19) is a contagious disease caused by the Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2). The first known case was identified in Wuhan, China, in December 2019. The disease has since spread worldwide, leading to the ongoing pandemic. Globally, as of 16 May 2022, there have been 519,105,112 confirmed cases of COVID-19, including 6,266,324 deaths, reported to WHO. Estimated deaths based on excess mortality are considerably higher.

COVAX, the vaccines pillar of the Access to COVID-19 Tools (ACT) Accelerator, is co-led by the Coalition for Epidemic Preparedness Innovations (CEPI), Gavi and the World Health Organization (WHO), alongside key delivery partner UNICEF. In the Americas, the PAHO Revolving Fund is the recognized procurement agent for COVAX. It aims to accelerate the development and manufacture of COVID-19 vaccines and to guarantee fair and equitable access for every country in the world, offering doses for at least 20% of countries' populations. As of September 2022, 1.72 billion doses have been shipped through COVAX to 146 countries.

Gavi is starting to explore how COVID-19 vaccination and COVID-19 learnings will come together with Gavi's core 5.1 strategy and operating model. The design of a potential Gavi-supported COVID-19 programme for 2024 onwards will be informed by the latest scenarios on the future evolution of the pandemic and the recommendation provided by the SAGE. The Secretariat will return to the Board in 2024 as part of the Gavi 6.0 strategy development process to assess the case for the continuation of the programme informed by the experience of the first phase and real time epidemiological considerations for a longer-term programme.

Purpose, scope and roadmap timelines

Purpose

The vaccine Market Shaping roadmap is a foundational tool of Gavi's market shaping strategy. The purpose of the Covid-19 market shaping roadmap is to articulate a 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.

Scope

The Covid-19 vaccine roadmap was co-developed by the Gavi Market Shaping team and the following Alliance partners: UNICEF SD, WHO, PAHO, the Bill & Melinda Gates Foundation (BMGF), and the Coalition for Epidemic Preparedness Innovations (CEPI). Other stakeholders within the Global Market Assessment (GMA) group, were consulted during the Roadmap development process.

There are several key questions that cannot be answered through the Roadmap process and for which Partners had to make assumptions and work on scenarios:

1. 'The predominant vaccine strategy(ies) for the eventual "endemic phase"'
2. 'Future steady-state donor funding support and country scope of support'
3. 'Gavi's future programmatic role'

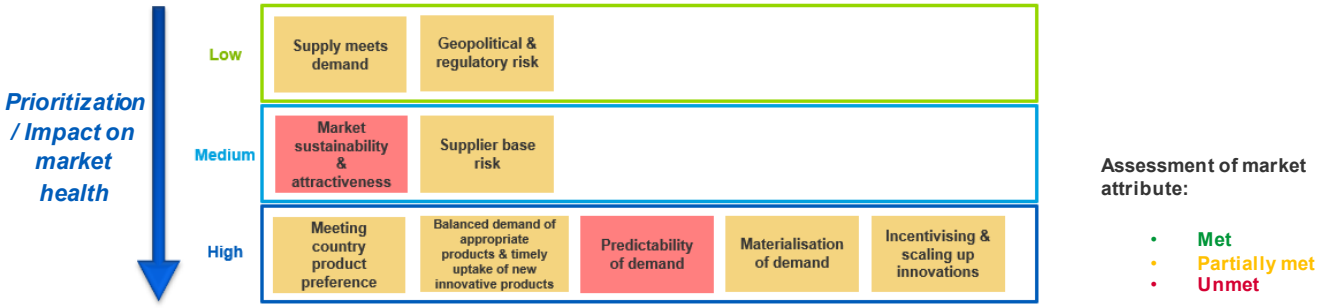
Against this background, strategy development was based on an analysis of the market and expected future supply and demand scenarios, accounting for product preferences, mapping of current and future products and their profiles. .The objectives and action plan in this roadmap take a long-term view, starting from a post-pandemic phase (potentially from 2023/24) through the next 10 years, and focus on lower middle income countries (LMICs) and low income countries (LICs). The demand forecast is based on AMC92 and Gavi54 countries.

This roadmap was written at an early and uncertain point in the evolution of the Covid-19 vaccine market, and a review/update will likely be needed in early 2023 or once we are in a position to further narrow down the demand scenarios.

Market health and strategic market objectives

In 2015, the Gavi Secretariat, UNICEF and the Bill & Melinda Gates Foundation jointly developed a "healthy markets framework". The framework helps us to develop common strategies for vaccine markets across the Vaccine Alliance through the development of a clear and consistent definition of market health. For the 2021-2025 period, the Healthy Markets Framework assesses overall market health by taking demand health directly into account, in addition to doing so through supply dynamics and innovation perspectives. Additionally, the new iteration of the HMF is designed to reflect a greater emphasis on long-term market views, in alignment with the Gavi's overall objectives for this period.

Healthy Market Framework for Covid-19: The Covid-19 market health is expected to be low post-pandemic with no healthy market attributes met.



The challenges currently facing the Covid-19 market include:

- Demand is hard to predict, with several factors impacting countries' abilities to develop and execute comprehensive immunization plans, thus currently developed 'steady-date' demand scenarios are wide-ranging.
- Country product preferences have so far been shaped by data and experience from HICs causing a concentration of demand and perceived preference for mRNA vaccines for the moment, though other vaccine platforms are also gaining market share. Expectations around future LMIC product preferences are not yet well understood, thus there is uncertainty over whether the future supplier base will be able to meet country product preferences.
- The Covid-19 vaccine supplier base is currently large and diverse, but it is expected that some manufacturers will substantially scale down or exit completely in the future, thus the long-term balance of supply and demand for the Covid-19 market is uncertain. Due to a crowded supply landscape and high demand uncertainty, the market's attractiveness and sustainability is a concern in the long term.
- Innovations are in the pipeline, but the current outlook makes it unclear whether support would be necessary or appropriate to advance or accelerate them to market.

Covid-19 strategic market objectives

The long-term strategy presented in this roadmap aims to ensure the best outcome for the Covid-19 vaccine market, which was defined by reviewing different supply and demand scenarios and

implications on market health over the long-term. This translates into the following strategic market objectives that are aligned with the Gavi 5.0 goal: 'to ensure healthy markets for vaccines and related products'. Each objective is underpinned by target outcomes that the Alliance aims to achieve by implementing a set of interventions to tackle risks and challenges.

Objective 1 – Ensure timely and equitable access for LMICs and LICs through a diverse, distributed and sustainable supplier base that meets expected demand, existing and emerging product preferences, and public health needs (e.g. new variants)

TARGET OUTCOMES

1.a Diversity of suppliers of appropriate C-19 vaccines by platform, target age group and geography to meet demand in LMICs and LICs.

Proposed sub-targets as of August 2022 (to be revised as needed):

- A minimum of 3-4* suppliers (low-mid demand scenario) or 5-6* suppliers (high demand scenario) to LMICs and LICs, with products appropriate for LMICs and LICs settings, based in at least 2-3* different countries of NRA release and several geographical regions; including at least 2 suppliers in platform segments representing greater than 50% demand by country preference
- All 3-4* (or 5-6*) suppliers offer vaccines suitable for relevant population groups and schedules, as needed
- At least 2 suppliers operate a platform with potential to rapidly scale up to meet unexpected demand surges and adapt to meet new variant vaccine needs

**The number of suppliers targeted here is dependent on the demand forecast scenarios and expected volumes.*

Future demand scenarios for AMC92/Gavi54 range between 43M-1.4B doses (see Figure 2), while global demand may range between 489M-3.16B doses (see Figure 3). Note: the demand scenarios are estimates only for the development of the Roadmap. Any of these parameters are subject to modification and/or confirmation.

Figure 2 – AMC92/Gavi54 annual demand

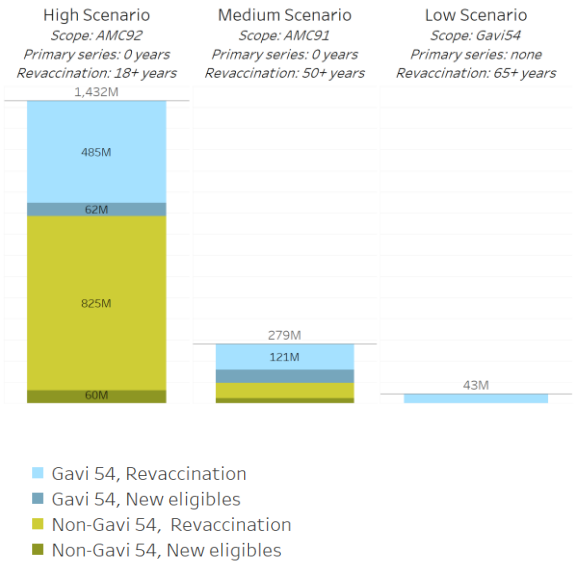
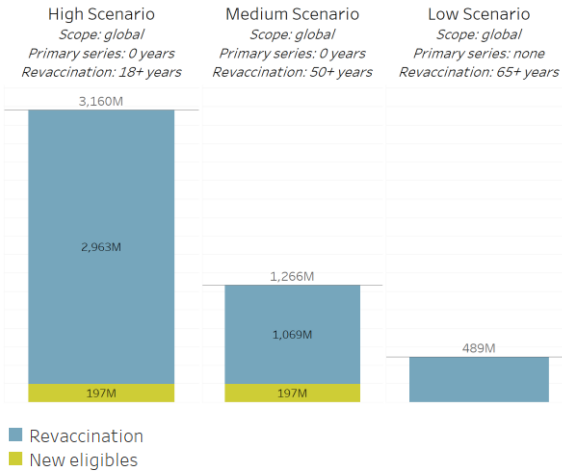


Figure 3 – Global annual demand



The current Covid-19 vaccine supply base is large and diverse; installed production capacity (although not necessarily actual supply availability) for 2022 is estimated to be up to 16Bn doses, including vaccines that have not yet received WHO EUL (see Table 2). Note that actual supply available in 2022 via COVAX portfolio including agreements and donations (as of August 2022) represent less than 10% of this expected capacity.

The 2022 production capacity is higher than the anticipated demand scenarios in the 'steady state'. As such, the market will be 'demand led': manufacturers will align their production volumes to demand signals, and the market should contract towards a steady state where production and supply capacity balance (at least in aggregate terms) with demand.

In the future, it is expected that the supplier base will likely shrink as some manufacturers will substantially scale down or exit completely. However, a diverse supply base is likely to continue in the near term based on the number of current suppliers with plausible reasons to remain in the market. Based on tentative assumptions as of May 2022, future 'steady-state' level of production capacity could be only 20-30% of the 2022 capacity (see Table 2).

Table 2. Long-term production capacity estimates (global)

	2022 capacity estimate	Future potential capacity	Assumptions
mRNA	4.2B	0.9 - 1.5B	Assume major protein subunit vaccines and mRNA vaccines that are HIC-preferred will maintain presencese
Protein subunit	3.5B	0.5 - 1.2B	

Viral vector	3.1B	0.1 – 0.8B	Most inactivated vaccines and non-replicating viral vector vaccines would exit the market except for major domestic producers
Inactivated	5.2B	0.6 - 1.7B	
Total	**16.0B**	**2.1B - 5.2B**	Low scenario assumes some key players with other vaccines in the pipeline will exit the COVID-19 market High scenario incorporates claimed capacities from second-gen novel vaccines still in the pipeline, as well as African-produced vaccines from tech transfers

INTERVENTIONS

Against the background of demand uncertainty, ensure a diverse supplier base and supply security by:

- Annually developing and sharing with manufacturers steady state demand forecasts, by platform/profile and presentation
- Regular collection, analysis and review of market data and track Target Outcome progress with core Roadmap partners, including:
  - Review demand forecast developments, including evolving information of product preferences
  - Review supplier landscape in terms of capacity, supply/sales, medium-long-term plans, scale up flexibilities and prices
  - Review this sub-target, update as needed, and track progress
- Aligned with existing procurement processes between UNICEF and Gavi, UNICEF and PAHO to establish a comprehensive procurement approach ensuring that long-term tenders are published by an agreed date, in coordination with long-term funding timelines, and aligned with the roadmap objectives. UNICEF and PAHO tender strategies should be coordinated/aligned with other regional procurement activities.

TARGET OUTCOMES

2.a Country product choices are evidence-based and value-based; and drivers of country decision-making and choices are understood

2.b Demand across appropriate C-19 vaccines is suitably balanced; no one supplier has greater than 50% market share by volume.

So far, global product choices have been largely shaped by data and programmatic experience in HICs, and there is a perceived preference for mRNA vaccines for the moment, while other vaccine platforms are also gaining market share. Analysis and feedback so far show a preference for current mRNA vaccines, however, when a non-UCC mRNA vaccine becomes available, it is expected to rank higher in terms of countries product preferences.

As of early 2022, many LMICs and LICs had received multiple products (due to supply constraints) and so signals on product preferences are highly confounded. Some LMICs and LICs may not be able to access relevant, high quality information on products, and capacity to evaluate them may be limited.

Political influences have an important role in shaping product preferences (e.g. governments supporting/funding domestic manufacturers, e.g. US, Chinese, Latin American and African manufacturers).

As multivalent or new variant vaccines come to market, there is a risk of supply shortages for LMICs and LICs vs HICs. Manufacturers may be less willing to commit to supply LMICs and LICs without significant demand de-risks or firm commitments in place. Additionally, differences in regulatory timelines between LMICs and LICs and HICs may be a structural barrier to equitable variant adapted vaccines access.

Skewed product preferences may lead to competition/price and supply security issues.

Uncertainty around future country product preferences may lead to risks of underproduction or overproduction and/or unfavorable market exits.

INTERVENTIONS

Improve understanding of product preferences and ensure balanced demand across vaccine by:

- Developing demand-shaping strategy to ensure uptake of certain products that come later to market, if needed
- As needed[1]: Conducting survey to understand the drivers for decision-making, materials available to countries and capacities in county to evaluate the material, potential changes in product preferences and reasons why. Based on needs identified from survey, secure resources for technical partner support to countries.
- Briefing regional TAGs and countries NITAGs systematically on evolving vaccination strategy advice and product options

TARGET OUTCOMES

3. Genuine competition between C-19 manufacturers is achieved in UNICEF and PAHO tenders, resulting in prices that are not prohibitive to future country adoption

The market's attractiveness & sustainability is reduced with uncertainty on the demand side and a crowded supply landscape, and there is a risk of increasing pricing trends in the future as demand coalesces around preferred products.

As of July 2022, there are 11 vaccines granted Emergency Use Listing (EUL) by WHO, over 100 further products in Phase 1-3 trials, and another 200+ in pre-clinical development. (https://covid19.trackvaccines.org/agency/who/)

With expected reduction in demand post-pandemic (1.4B to 40m doses, based on the scenarios run for the Roadmap) and the crowded supply side, this market's attractiveness and sustainability is at risk. Market exits and/or scale downs are expected. There will be a wide diversity in manufacturer profiles each with a different ability to compete on price.

INTERVENTIONS

Ensure that price is not prohibitive to future country adoption:

[1] Potential situations that might require such surveys (non-exhaustive): in anticipation of new products launching, after publication of new WHO guidance

- Aligned with existing procurement processes between UNICEF and Gavi, through UNICEF and PAHO tender(s) designed to elicit explicit price competition between suppliers, monitor price dynamics and understanding impact on preferences to ensure price trends do not become prohibitive to Gavi/countries, to inform Target Outcome 6 and Target Outcome 2

Objective 2 – Overall buffer capacity to be able to respond to future outbreaks and demand fluctuations

TARGET OUTCOMES

4a. If final programme design calls for a buffer capacity element, evaluate optimal approach, depending on epidemiology and needs (finished product vs bulk antigen vs buffer capacity). Note: existing/excess supply as we exit the acute pandemic phase could constitute the initial stockpile.

4b. Appropriate vaccines have optimized shelf-life, ideally of 2-3 years

Responsiveness of vaccine supply must remain steadfast with a buffer capacity that can respond to outbreaks and demand fluctuations. Under-production or over-production must therefore be carefully controlled in order to avoid a market failure in case of unexpected changes in disease epidemiology. In the event of a demand surge, supply response times may not meet demand due to the lead times needed for future commercial production.

Tactics may include negotiation of long-term contracts that allow for stockpiling or buffer capacity based on Purchase Orders against Long-term Arrangements, though this may only make sense in an endemic state.

INTERVENTIONS

- Further refine the potential buffer capacity needs for expected demand spikes
- Determine whether the capacity should be rapid production scale up capacity and/or in bulk (drug substance) or labelled/finished products
- Confirm how stockpiles will be funded and whether rotating stock ensuring maximum remaining shelf life could be feasible. Explore stock/shelf life optimization.

Objective 3 – Optimize predictability and materialization of steady state demand to minimize impacts on supply-side market health

TARGET OUTCOMES

5a. From mid-2023, clarity on global recommendations on post-pandemic programme policies

5b. By end 2022, clarity on pathway to donor funding for LMICs and LICs post-pandemic

6. Co-financing policy is consistent with programme sustainability as countries move under Gavi policies

7. Ensure quality of country applications, planning, decision-making and country readiness to minimize introduction delays

Demand for AMC92 or Gavi54 countries will highly depend on programmatic recommendations from WHO and subsequent donor funding/country co-financing, which is not yet secured. If/when Gavi core financing is secured, countries will likely have to co-finance and thus will have to evaluate prioritization of C-19 vaccine introductions/campaigns among other vaccine programmes.

Other factors that may contribute to decreased demand materialization: declining political and public attention, competing health priorities, changing epidemiology / reduced severity of disease, and improvements in therapeutics.

Linked to uncertainties around antigenic drift and funding, the future vaccination strategy for LMICs and LICs is uncertain (e.g. booster target population, frequency of boosters).

Volumes from year to year may be influenced by emergence (or not) of variants, future outbreaks, changes in funding, and political priorities.

All of the above factors may impact countries' abilities to develop and execute comprehensive immunization plans.

Future demand materialization and low demand predictability can in turn have important consequences on market health:

- Risk of underproduction or overproduction and unfavorable market exits
    - Manufacturers may face difficulties adjusting and planning their capacities against an unpredictable demand (potential impact on higher prices and/or contracting terms)
    - In an event of a pandemic surge, supply response times may not meet demand due to lead times needed for future commercial production
    - Manufacturers with flexible production facilities & short lead times may be at an advantage
- Risk of higher prices and/or need for special contracting with implied financial risk
- Possible disincentivizing of future innovations

INTERVENTIONS

Optimize future demand materialization and predictability through:

- In the short-term, defining & communicating process and timelines for WHO position on post-pandemic programme policies, as well as
- Ensuring that market shaping input is provided in the process of the funding policy reviewin order to consider the impact of cofinancing on country vaccine uptake
- In the medium term, defining and analysing country readiness and application processes, timelines, resources needed and potential barriers and ensuring resources/support to countries to help with timeliness and readiness

Objective 4 – Targeted innovations and preferred product characteristics enter the market and are scaled up to meet public health needs, across both routine and new outbreak scenarios

TARGET OUTCOMES

8. A strategic and aligned picture is maintained among Gavi market shaping partners on next-generation innovations.

9. Innovation pipeline & candidates time to market are aligned with WHO innovation priorities and expected country needs (as per WHO 8 March 2022 interim statement: mucosal vaccines, variant-specific, broad spectrum). Products have appropriate presentation for LMICs and LICs, ensuring final proposition from manufacturers is in line with Gavi's value-based pricing.

As the virus continues to mutate, WHO guidance on R&D priorities will continue to be critical in steering innovation efforts. In addition, early engagement with suppliers of next-generation products will be important to ensure, to the extent possible, the availability of products with appropriate presentation and pricing for LMICs and LICs.

WHO has provided guidance on innovation priorities, which include:

- Development of variant-adapted vaccines, in mono- or multi-valent formulation, to boost immune responses against specific variants.
- Development of vaccines which induce mucosal and systemic immunity, to more effectively reduce risk of transmission.
- Development of broad-spectrum vaccines such as pan-sarbecovirus vaccines that may prevent a future pandemic caused by a spillover of new coronavirus.

Informed by these priorities, over 100 products are currently in Phase 1-3 trials, and another 200+ in pre-clinical development. However, it is not clear how many of these will come to market, and more broadly, whether this market is sufficiently attractive over the long term to incentivize and support scaling of innovations.

INTERVENTIONS

Ensure alignment on priority innovations and successful market entry of priority candidates through:

- Regular update of R&D priorities based on epidemiology & product performance by WHO
- Regular progress briefings from developers to identify potential needs for support to reach WHO PQ and availability for procurement by UNICEF and PAHO. Ensure resources/support is provided, as needed.
- Manufacturers interactions to explicitly focus on presentation and pricing strategies to ensure expectations for LMICs and LICs are understood and accounted for to the fullest extent possible.
- Focus on transparency and documentation of fair and equal treatment in the selection of possible manufacturers against clear requirements, and agreements on how support is to be reflected in price of products in subsequent supply agreements.

TARGET OUTCOME

10: Products with desirable innovations used in countries

Countries rely on information about the efficacy and product characteristics of WHO EUL vaccines to make informed decisions about their vaccination programs, including decisions around target populations, coverage targets, administration strategies (e.g. mass vaccination campaigns, outbreak response), and product selection.

In light of declining demand for current Covid-19 vaccines, the evidence and guidance around new products will be particularly important to help countries determine the degree to which Covid-19 vaccination should be re-prioritized in the evolving epidemiological context.

INTERVENTIONS

Linked to demand-side interventions under objective 1 and 3, brief countries on future innovations, and ensure support/resources are provided to help with decision-making and readiness for uptake.