PROSUR

A study on governance frameworks for regional vaccine production cooperation for PROSUR Member States

Scaling up of Immunization Capacities in the PROSUR countries.

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FINAL REPORT

Scaling up of Immunization
Capacities in the PROSUR countries

Immunization Subgroup
· Health Group ·

IDB

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Acronyms

AU	African Union
ACT-A	Access to Covid Tools Accelerator
ACTO	Amazon Cooperation Treaty Organization
AMSP	Africa Medicines Supply Platform
AVAT	Africa Vaccine Acquisition Trust
AVATT	Africa Vaccine Acquisition Task Team
CDC	Centers for Disease Control and Prevention
CELAC	Community of Latin American and Caribbean States
CEPAL	United Nations Economic Commission for Latin America and the Caribbean
CEPI	Coalition for Epidemic Preparedness Innovations
CERN	Conseil Européen pour la Recherche Nucléaire / European Council for Nuclear Research
COVID-19	Coronavirus disease 2019
EAC	East African Community
EMRO	WHO Regional Office for the Eastern Mediterranean
ESS	European Spallation Source
EU	European Union
EUL	Emergency use listing
FDA	U.S. Food and Drug Administration
FMAM	Global Environment Facility
GCC	Gulf Cooperation Council
HERA	European Health Emergency Preparedness and Response Authority
IADB	Inter-American Development Bank
LAC	Latin America and Caribbean region

LMIC	Lower-Middle Income Countries
LIC	Low Income Countries
MMGH	MMGH Consulting
MRC	Mekong River Commission
NRA	National Regulatory Authority
OAS	Organization of American States
OECS	Organization of Easter Caribbean States
PAHO	Pan American Health Organization
PAHO RF	PAHO Revolving Fund
PQ	WHO pre-qualification
PROSUR	Forum for the Progress and Development of South America
SRA	Stringent Regulatory Authority
TYH	The Yellow House
UMIC	Upper Middle-Income Country
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNICEF	United Nations Children’s Fund
WHO	World Health Organization

Executive Summary

The COVID-19 pandemic has highlighted the central role played by the timely and continued access to vaccines for minimizing mortality and morbidity impact of infectious diseases. Such central role is not limited to pandemic and epidemic events but extend to many endemic diseases for which vaccines exist. While at global level, supply of vaccines eventually became generally sufficient to fulfil the ongoing demand from countries, several factors can affect access at regional and country level. Even under normal circumstances, different epidemiological needs, specific policy decisions, country product preferences, registration constraints, procurement constraints can all lead individual countries or even regions to face access constraints irrespective of the global health of the market. During period of crisis additional factors enter into play, making access to vaccines more difficult: vaccine nationalism, interruption of supply chains, competition for access to input materials, pricing competition and product hoarding being some of the most prominent ones. An effective pandemic/outbreak preparedness strategy as well as a resilient routine immunization strategy must secure timely and uninterrupted access to vaccines.

Vaccine manufacturing has been traditionally very concentrated in few large players, mostly located on the North or in India and China. This is primarily the result of economies of scale and knowhow barriers to entry in vaccine production. This situation can further worsen the impact of the above factors especially in condition of stress. To overcome those problems, the need for a more distributed vaccine production system is emerging as the appropriate way forward. In this spirit, the PROSUR members states are exploring options to expand vaccine manufacturing in the Latin American and Caribbean region (LAC).

The 'Diagnostics' study provided a set of recommended actions to address the fundamental shortcomings in access to vaccines including the establishment of bulk vaccine production, negotiating commercialization rights, and expanding existing production capacity. In addition, the study recommended action around the ecosystem including licensing, regulatory, clinical development, manufacturing, and manufacturing inputs.

The goal of pandemic vaccine manufacturing is complex and ambitious. Doing so in cooperation between several countries has many benefits, but it also adds some layers of complexity. It represents disruptive change, costs, and risks — in exchange for health, societal and economic gains, some of which may only be realized in the long-term.

In this "Governance" study, we set out a set of considerations that aim to help PROSUR develop the design and operation of a mechanism (or platform) for cooperation around capacity expansion of pandemic vaccine manufacturing in the PROSUR region. The design and operation elements, such as benefits, costs, mutual obligations, and how to organize — which we also refer to under the general description of "governance" — would also be applicable to pursue cooperation around non-pandemic vaccines.

These elements have been developed by taking key learnings from examples of successful cooperation among countries in LAC for the creation and sharing of public goods across borders. They also draw on any relevant lessons from pandemic vaccine and vaccine initiatives from other regions. In total, eighteen examples of cooperation were studied in order to gain insight into success factors and challenges related to collaborative governance below to be made into a graphic:

- Pandemic vaccine cooperation: COVAX Facility, EU Vaccines Strategy and HERA, AVAT, CEPAL/CELAC, PAHO/CEPI
- Cooperative infrastructure and other: ITAIPU, ACTO, MRC, CERN, ESS
- Pooled procurement: AVAT, AMSP, EAC, EU, GCC, OECS, PAHO Revolving Fund, UNICEF Procurement Services

The analysis of the case studies was presented and discussed with PROSUR Member States over two workshops as well as some bilateral calls. Of the multiple takeaways, below is a summary of the key factors driving successful collaboration – with an emphasis on learnings around vaccine production and equitable access.

- **Momentum and set-up.** Inter-state collaboration can be complex and even more so in the management of a public good. Political will and political leadership were consistently a critical factor in initiatives being launched. Moreover, the more successful initiatives were launched with clear objectives around a long-term goal, on which all other decisions were based, including around governance and operation. Designing the early part of collaboration in a way that drew on the strengths and expertise of the collaborators as well as establishing an initial budget were important for garnering buy-in and momentum of an initiative.

- **Securing vaccines.** A critical success factor that was specific to pandemic vaccines included non-traditional procurement with at-risk and co-investment contractual terms. In other words, contracting with manufacturers before their pandemic vaccine had been developed or licensed. Doing so incentivized rapid action by developers, but also secured access to doses in case the vaccine development was successful. The other critical success factor was establishing a portfolio of contracts with different manufacturers and for more doses than needed. Given the likeliness that not all the development efforts would result in successful candidate vaccines, this better assured access to a pandemic vaccine. Timeliness and rapid contracting of such terms impacted earlier supply. The cost of access to pandemic vaccines necessarily included a portfolio, knowing that some parts of the portfolio would not likely materialize.

- **Manufacturer engagement.** Negotiations that were conducted by a central authority yielded the best output – especially when the central authority brought together expertise from across collaborators to inform decisions on which vaccines to secure and the content of the portfolio. In some cases, legislation around delegated or collaborative procurement and

harmonized regulation needed to be rapidly put in place.

- **Budget and finance.** Having money rapidly available early in the pandemic was key to securing contracts. Multiple financing streams financed by a combination of upfront/ guarantee and top-up for doses purchased were effectively utilized.

- **Ownership in a facility.** An investment decision funded by multiple countries was considered fair and effective when made via an open tender and with bidding countries contributing more to the investment. The outcome had buy-in from all collaborators. This was key since the benefits of a facility include employment, prestige, etc. and therefore go beyond the specific output of the cooperation.

- **Nationalism.** It was difficult to mitigate the risk of vaccine nationalism at the time of a pandemic or other scarcity situation. But the impact of nationalization could be minimized by manufacturing in a country whose national demand can more quickly be fulfilled – a country without a large population. This is somewhat contrary to the more common economies-of-scale basis used for investment decision-making.

- **End-to-end vaccine value-chain.** Establishment of end-to-end vaccine development and manufacturing was the most comprehensive approach to achieve timely access. This included, for example, research and development (R&D), intellectual property (IP), clinical trials, and distribution.

- **Communication.** A pandemic or scarcity situation causes uncertainty, stress, and disruption. The pace of change is so rapid that misinformation spreads easily, including among collaborators. Effective and frequent communication is needed to build trust in organizations and their efforts to deliver on the challenges being faced.

- **Preparation and response.** Collaboration that agreed on actions to be taken during the preparation phase and emergency phase was more agile and responsive.

Based on the analysis of the case studies, feedback from PROSUR Member States. and TYH expertise, the study puts forth ideas for PROSUR to consider when thinking through how activities and work could be organized when creating a mechanism to increase vaccine production and achieve equitable access. The ideas are organized around five key questions that help think through the change, costs, risks, and gains associated with a cooperation mechanism or platform:

- *How could the benefit of regional vaccine production be shared between PROSUR Member States?*

- *What are the costs and obligations that should be considered?*

- *How could cooperation be organized?*

- *Are there existing legal or policy frameworks that could enable or hinder cooperation?*

- *What are the options for memorializing the Member States' cooperation?*

These considerations essentially lay out the decisions that will need to be made for the mechanism or platform to operate (allocation decisions, funding decisions, public policy

decisions, and the like) and deliver equitable access. By identifying the nature of the decisions to be made — political, technical, or administrative, for example — it becomes easier to task those decisions to particular stakeholders or stakeholder groups (political decisions at the political level, and so on). Finally, we should note that our study was primarily focused on the manufacturing of vaccines for the next pandemic. However, pandemic vaccine production needs to be seen in the context of:

- Related functions, such as research and development (R&D), procurement, stockpiling, distribution, and regulatory oversight; and
- Vaccine production during non-pandemic (inter-pandemic) periods.

A schematic showing the focus of the study in the context of those other functions and epidemiological phases is shown in Annex C.[1]

This study recommends six primary strategic areas of focus for consideration by PROSUR Member States when considering governance framework.

1. **Distribution of benefits from the initiative**
2. **Sharing of costs and obligations**
3. **Organization and structure of the initiative**
4. **Policy and legal landscape**
5. **Formal agreements**
6. **Engagement with complementary regional initiatives**

The governance study is necessarily preliminary, and the considerations can be further refined once PROSUR Member States decide on how they wish to proceed. Considering these aspects can help clarify stakeholders' understandings and expectations on this initiative. Thinking through the set-up of an initiative at this early stage may inform the decision on if and how to proceed.

Read in combination with the report of the diagnostic study, this report can provide a foundation for any subsequent pre-feasibility analysis. It provides high-level direction and points out to the critical factors that will need to be considered in the subsequent steps aimed at the refinement of a vaccine self-reliance strategy for the PROSUR Member States.

[1] At times, including based on learnings from the case studies, we refer to other functions given the inter-dependency of the various functions. For example, a production facility may have the capabilities and resources to manufacture pandemic vaccine, but it may not have access to the R&D or IP and therefore may be idle. Hence, a link to R&D is key to achieving the goal of pandemic vaccine manufacturing. Similarly, a production facility that is dormant except when there is a pandemic, may not be able to produce as quickly as the capabilities (know-how, raw materials, vials, etc.) would need to be brought in. Therefore, while the focus of the study is governance of pandemic vaccine production, other aspects are mentioned given the influence they may have on achieving a goal of timely access to pandemic vaccines.

Context & introduction

Starting in January 2020 a global pandemic caused by a new viral pathogen, SARS-CoV-2, has caused severe health and economic impact on a fully immunologically naive world population. In absence of preventive or curative measures for COVID-19, mortality, and morbidity rapidly increased. In the last 6 months of 2020, as result of unprecedented research and development efforts and investments across many countries, the first vaccines to prevent COVID-19 were approved by regulators [2] and ad- ministered. Since then, more than 30 vaccines have achieved marketing authorization or emergency listing[3] and more than 9 .7 billion doses of COVID-19 vaccines have been distributed globally.[4] Disappointingly, the distribution of these vaccines has been uneven across the different regions and countries - only 9.6% of people in low-income countries have received at least one dose[5] -reflecting not only a significant difference in the purchasing power of different countries but also an uneven distribution of the vaccine research, development, and manufacturing capabilities. Most of these capabilities are concentrated in a handful of countries located in Europe, North America, Japan, China, and India, with few other players from the rest of the world. The concentration of these capabilities is even more stark when focusing specifically on the small number of companies that have the in-house development and manufacturing expertise required to take a vaccine from the discovery phase to the commercialization on global scale (i.e., not accounting for all the entities that can perform only a sub- set of the development or manufacturing processes).

Due to the potential for prolonged constraints in access to COVID-19 vaccines, currently the most important health tool needed to control the pandemic, the need for a swifter access to vaccines has become critical from a political and public health standpoint. As result, many countries have started looking with renewed interest at strategies to establish or strengthen domestic and regional vaccine manufacturing capacity.[6] While such a strategy can be difficult to implement and even more difficult to sustain, the appetite to control the sources of critical health products

[2] In August 2020, Sputnik V was the first COVID-19 vaccine to receive authorization from an NRA. In the same month Comirnaty (Pfizer-BioNTech) was the first COVID-19 vaccine to receive authorization from an NRA capable of supporting the UN prequalification.
[3] https://en.wikipedia.org/wiki/List_of_COVID-19_vaccine_authorizations accessed January 18, 2022.
[4] Mathieu, E., Ritchie, H., Ortiz-Ospina, E. et al. A global database of COVID-19 vaccinations. Nat Hum Behav (2021) – One World in Data - https://ourworldindata.org/covid-vaccinations accessed on January 18, 2022.
[5] Mathieu, E. et al. – cit.
[6] https://www.reuters.com/business/healthcare-pharmaceuticals/africa-needs-make-own-vaccines-hurdles-are-high-experts-say-2021-12-07/ accessed on January 16, 2022.

is growing, particularly for those products required in the event of a pandemic.

In this context, the government of Colombia, in its capacity as Pro Tempore Presidency in 2021 of the Forum for the Progress and Integration of South America (PROSUR) through the Presidential Agency for International Cooperation (APC-Colombia), contributed funding for the implementation of the project "Scaling up of Immunization Capacities in the PROSUR countries". The project was developed within the Immunization Subgroup[7] of PROSUR's Health Group, with the objective of identifying approaches for sustainable production of vaccines in the region in order to generate equitable and timely access for PROSUR countries, both for vaccines used in routine immunization and preparedness for future pandemics. The Inter-American Development Bank (IDB) supported the project by administering and executing the project budgets.

The project consists of two phases. The first phase (July-December 2021) focused on a diagnostic study of existing production capacities and facilities in the region and of the demand for routine and pandemic vaccines and a study analyzing potential regional governance mechanisms to guarantee equitable access to vaccines produced by the PROSUR countries. In the second phase (January-July 2022), a pre-feasibility analysis is expected to be carried out, which will result in a strategic roadmap with the necessary steps to increase vaccine production capacities in the region.

With the objective of providing a body of evidence that can informed PROSUR discussion and preliminary decisions, the Yellow House has been commissioned to develop options for a governance framework for collaboration around pandemic vaccine production.

- The first part of the study includes eighteen case-studies of governance models used by countries to access pandemic vaccines, conduct joint procurement, manage joint infrastructure projects, and manage other shared assets. Each case was analyzed to identify good practices and learnings that could inform governance frameworks for cooperation around increasing pandemic vaccine manufacturing capacity.

- The second part of the report is based on the analysis of the case studies, feedback from PROSUR Member States and TYH expertise, and puts forth ideas for PROSUR to consider when thinking through governance frameworks, including how activities and work could be organized. The second part is necessarily preliminary, and the considerations can be further refined once PROSUR Member States decide on how they wish to proceed. Though preliminary, it can in fact help clarify the stakeholders' understandings and expectations on this initiative. Thinking through the set-up of an initiative at this early stage may inform the decision on if and *how* to proceed.

Based on the outcome of the analyses and of the discussions with the PROSUR countries, a set of pathway points detailing a potential way forward has been formulated by the TYH team. This report provides a detailed overview of the analyses, of the methodologies employed and of the emerging recommendations. Read in combination with the diagnostics study, it provides the foundation for the subsequent pre-feasibility analysis scheduled for 2022.

[7] The participating countries of the Immunization Subgroup are Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay and Peru.

Study of existing governance models

The first phase of the governance framework study assessed and characterized other existing regional cooperation agreements both within PROSUR Member States and elsewhere, which could serve as models for a PROSUR vaccine manufacturing cooperation and capacity expansion initiative.

The initial plan was to review three models, but in consultation with the IADB and PROSUR Member States, this increased to nineteen governance models for review. These included six multilateral pandemic vaccine cooperation mechanisms, six cooperative infrastructure frameworks and seven pooled procurement mechanisms for vaccine and health products.

Most of the models studied were led by public cooperation, some included private partnership, and most engaged with private sector businesses. The cooperative models studied are as follows.stabilizes unless supply constraints occur limiting the capacity of the program to reach the target population. An exception is represented by vaccines for diseases with outbreak potential where supplementary immunization activities (SIAs) aimed at reducing the number of susceptible individuals and/or for immediate outbreak response can cause significant variability in the overall demand.

- Pandemic vaccine cooperation: COVAX Facility, EU Vaccines Strategy and HERA, AVAT, CEPAL/CELAC, PAHO/CEPI.

- Cooperative infrastructure and other: ITAIPU, ACTO, MRC, CERN, ESS.

- Pooled procurement: AVAT, AMSP, EAC, EU, GCC, OECS, PAHO Revolving Fund, UNICEF Procurement Services.

The methodology used to study each cooperation consisted of 1) a literature review of publicly available information, 2) an analysis of the results, and an assessment of key aspects of the cooperation, 3) interviews and first-hand accounts, when possible, and 4) conclusions on key learnings and take-away messages relevant to the PROSUR pandemic vaccine production governance framework. Some of the models (e.g., ITAIPÚ, COVAX) had been studied or reviewed by other sources and some of these findings were incorporated in the review.

The aspects assessed for each case study included:

- The purpose and/or objective of the cooperation and the parties involved.
- How the cooperation and outputs were governed, including the legal and financial set up of the cooperation.
- How the cooperation model could be relevant to PROSUR regional cooperation on pandemic vaccine production.
- The achievements and challenges of the cooperation, including the governance set-up.
- Learning and take-aways for a potential PROSUR vaccine manufacturing cooperation and capacity expansion initiative.

2.1 Pandemic vaccine governance cooperation models

With vaccine considered to be the best way out of the pandemic, several cooperative frameworks were put in place to achieve efficient development and access to safe and effective COVID-19 vaccines. Some were built on existing Member State frameworks and others emerged as a new cooperation. Below is a summary of each model studied.

2.1.1 COVAX Facility[8]

Purpose and objective. The COVAX Facility ("COVAX") is the vaccines pillar of the Access to COVID-19 Tools Accelerator (ACT-A) initiative. It has two purposes: to accelerate the development and manufacture of COVID-19 vaccines; and to guarantee fair and equitable access to vaccines for every country in the world. Each country choosing to opt-into COVAX tells COVAX how many vaccines it wishes to secure through the Facility; the Facility negotiates purchase contracts with a range of vaccine manufacturers for the cumulative total requested volume of vaccines; it then allocates to each participating country a particular number of vaccines, assigned among participating manufacturers; and the participating country in question then receives vaccines through the Facility under the negotiated contracts (with funding provided either by the country itself or by Gavi, the Vaccine Alliance (Gavi) through the Advance Market Commitment, AMC).

How it is governed. COVAX is a coordination mechanism but not a formal legal entity in itself. COVAX is co-led by the Coalition for Epidemic Preparedness Innovations (CEPI), Gavi and the World Health Organization (WHO); UNICEF and PAHO are procurement agencies for the purchase of vaccines. COVAX is legally administered by and housed within the Gavi Secretariat; staff working full-time on the initiative are employed by Gavi and provide secretariat functions for the mechanism, and Gavi enters into contracts with countries, manufacturers and partners. The Gavi Board has oversight on the role of the Gavi Secretariat and the Alliance in the COVAX Facility. A COVAX Shareholders Council represents the interests of self-financing participants. There is also a self-organized AMC Engagement Group, which includes implementing participants, donors and other partners engaged with financing and operations. Decisions are made by technical personnel on the basis of technical information. COVAX has a number of working groups (allocation, delivery, etc.) and advisory bodies (procurement, products). The Governing layer at COVAX/Gavi is comprised of Ministers of Health, Ministers of Development of

[8] https://www.gavi.org/covax-facility.

donor countries, Executive Heads of partners organisations (WHO, UNICEF, etc.), and representatives of other donors and technical agencies and civil society organisation. Gavi has three Working Groups: Programme & Policy, Financial & Audit, and Market Sensitive Decisions. The Working Groups are comprised of representatives of member organisations.

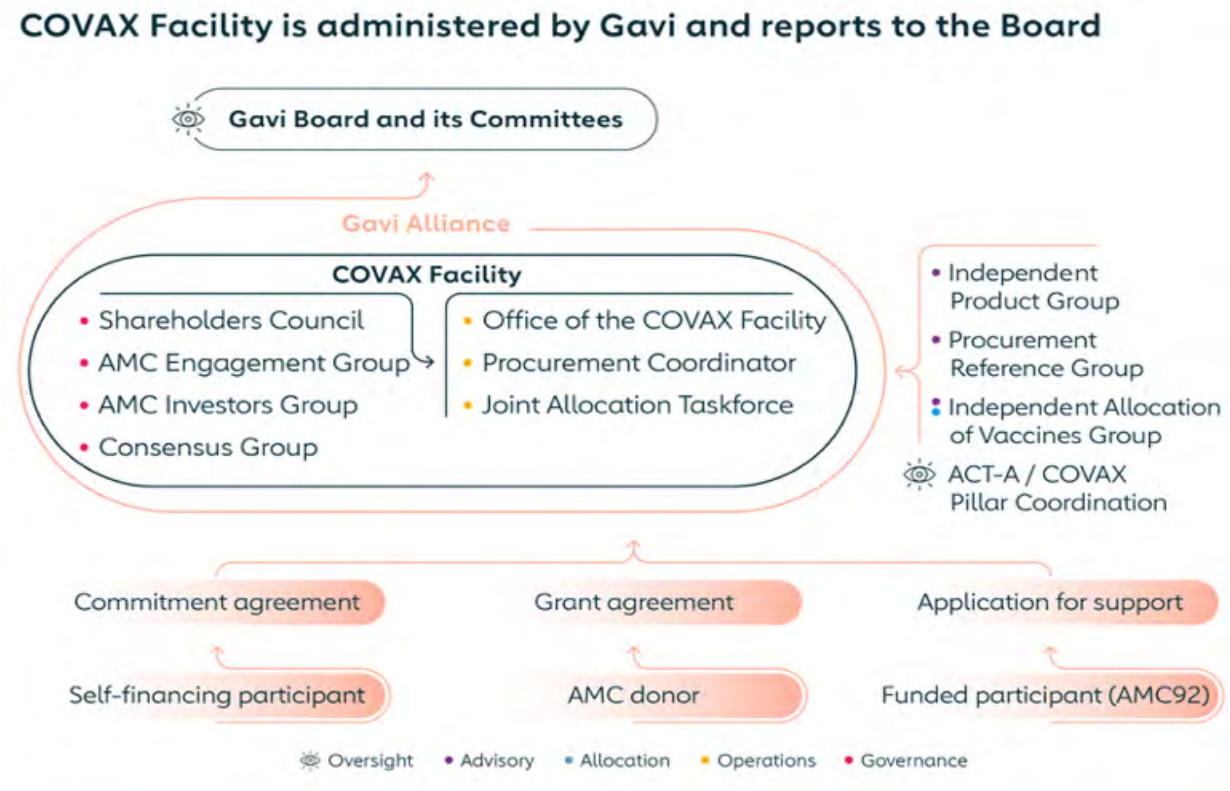


Figure 1: COVAX Facility set-up and governance.[9]

Why it could help inform the PROSUR Study. COVAX and the PROSUR initiative are aiming to do similar things — that is increase manufacturing capacity and ensure access to pandemic response vaccines. COVAX is focused on pull contracts (Gavi Advance Purchase Agreements, APA) to secure pricing and quantities from manufacturers and push funding (CEPI) to accelerate vaccine production and scale up and is trying to do this in a short period of time and on a global scale in the midst of the pandemic. The various participants in the COVAX ecosystem already have well-formulated views on the strengths and weaknesses of the COVAX design and implementation; this includes sovereign Governments, vaccine manufacturers and partner organizations. Vaccines are already being delivered under COVAX and so it will be possible to identify practical implications (positive and negative) of the design and implementation. In contrast, PROSUR has the benefit of advance planning (in preparation for the next pandemic event) and more focused scope, e.g., a smaller group of countries, although the overall objective and roles and responsibilities of the actors involved still need to be defined.

In September 2021, WHO published the Strategic Review of the ACT-A.[10] Several aspects of the assessment and recommendations for COVAX should be considered in the context of the PROSUR vaccine manufacturing cooperation and capacity expansion initiative. A summary is provided in Annex 1.

[9] https://www.gavi.org/covax-facility (COVAX Facility Governance)
[10] https://www.who.int/publications/m/item/act-accelerator-strategic-review

Analysis. Considering the literature review, the ACT-A Strategic Review and interviews, as well as TYH first-hand experience, below is a summary of how COVAX thus far helped achieve its goal of improving access as well as its challenges.

How COVAX helped access to COVID-19 vaccines	Challenges and shortcomings of COVAX
Pooled donor resources.	Did not meet the 2 billion dose target by end 2021, perhaps by 1Q22.
195 countries engaged.	"Built the ship while it was sailing".
Used long-standing experience in the market to pool demand and negotiate supply with manufacturers.	Timing of funding and timing of contracts – most contracts issued in 2021 (later than most HICs, notably US and EU).
Push funding (via CEPI) with COVID-19 vaccine manufacturers to support vaccine development. Large portfolio of push investments.	Limited country visibility on when doses would be available.
Pull contracts – via Gavi APAs (with delivery organized by PAHO, UNICEF and self-financing countries).	Designed around goal of vaccinating 20% by end 2021; however, this was 30-50% was lower than country goals. The perceived "capping" of demand to be filled via COVAX meant countries needed to buy directly as well (parallel channels).
Established an allocation that would provide equitable deliveries to countries: 3%, 20%, etc..	
Created a humanitarian buffer with the aim of leaving no one behind for access by non-state actors (e.g., NGOs).	
Linked with Gavi funding and capacities – which provided doses and operations funding for 92 'AMC' countries.	Vaccine nationalism & de facto nationalism delayed COVAX deliveries.
Global supplier based on WHO EUL/PQ.	Earlier and larger contracts issued by others put COVAX late in queue.

How COVAX helped access to COVID-19 vaccines	Challenges and shortcomings of COVAX
COVAX conducted over 140 country readiness assessments.	Governance was light touch but also complex with limited agility. Limited country engagement in governance.
COVAX had a goal of 2 billion doses. Contracted for 3 billion with options for up to 5 billion.	CEPI had a large portfolio but few products have yet to be approved.

Key take-aways for PROSUR

Take a non-traditional procurement exercise – at-risk, co-investment contracts. Some 'investments' will be a loss.

Issue contracts rapidly with rewarding terms.

Link push investments and purchase quantities together in same contract.

Establish provision to have money rapidly available in case of an emerging pandemic.

Establish clear and agile governance (to respond to a rapidly evolving pandemic). Acknowledge that a current design may not be precisely designed for a next outbreak/pandemic; therefore, the design may need to be adapted at the early stage of a pandemic.

Communicate to countries frequently, including on availability of vaccines.

Key take-aways for PROSUR

It is difficult to mitigate the risk of vaccine nationalism (& de facto nationalism) but minimizing impact could be done via:

Manufacturing in a country with a relatively smaller population so any domestic prioritization can be achieved more quickly, allowing excess vaccines to be available or export to other countries earlier.

Establishing a cooperative agreement upfront that includes plans for equitable allocation.

Decide scope of the mechanism upfront: does it aim to provide a country with all its pandemic vaccines or only part of the needs?

2.1.2 European Union (EU) Vaccines Strategy[11] and Health Emergencies Preparedness & Response Authority (HERA)[12]

Purpose and objective. The EU has had two initiatives to secure pandemic vaccines: the EU Vaccines Strategy and, moving forward, the Health Emergencies Preparedness & Response Authority (HERA). HERA emerged from the learnings of the pandemic and is forward looking, building on the EU Vaccines Strategy.

The EU Vaccines Strategy was launched in June 2020 to ensure the quality, safety and efficacy of vaccines; secure swift access to vaccines for all EU nationals; and ensure equitable access to an affordable vaccine as early as possible.

The EU strategy rested on two pillars:

- Securing the production of vaccines in the EU and sufficient supplies for its Member States through Advance Purchase Agreements with vaccine producers via an Emergency Support Instrument and an upfront financing amount of €2.7 billion.

- Adapting the EU's regulatory framework to the current urgency and making use of existing regulatory flexibility to accelerate the development, authorisation and availability of vaccines while maintaining the standards for vaccine quality, safety and efficacy.

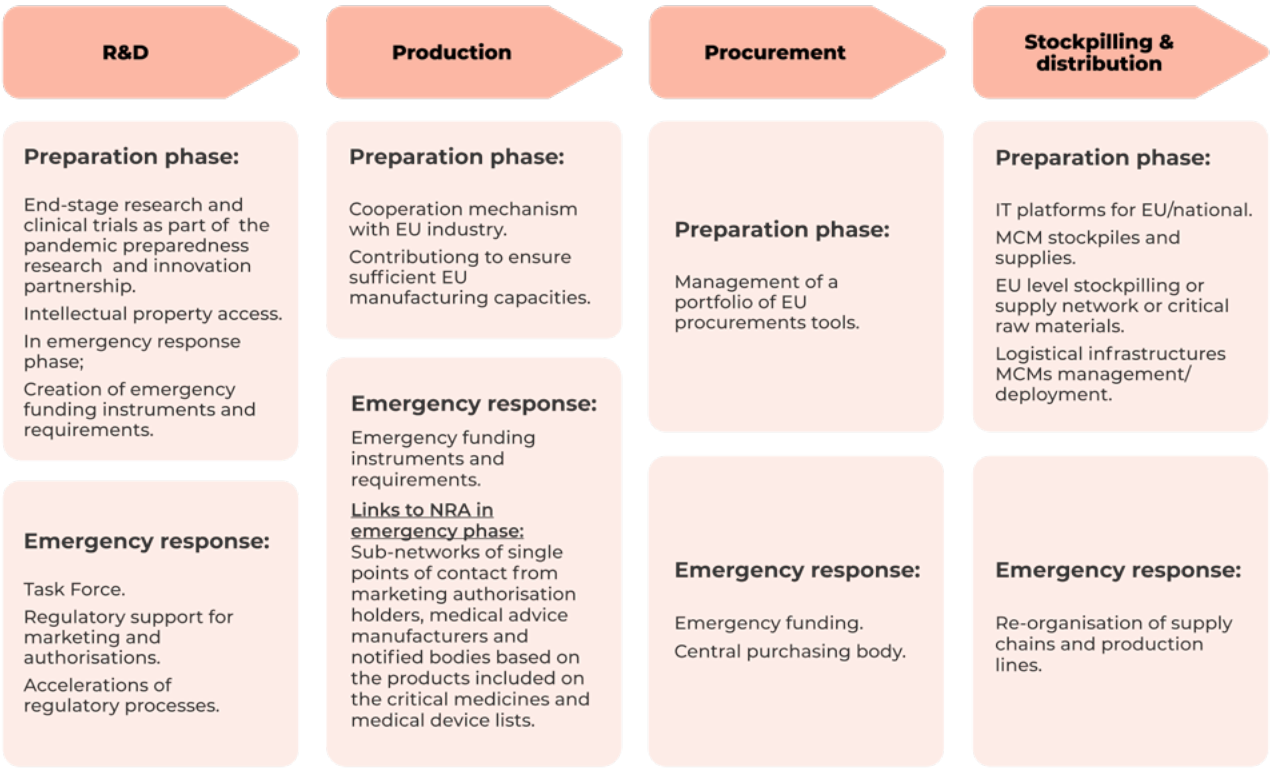
The European Commission (EC) entered into agreements with individual vaccine manufacturers under which the EU financed part of the costs associated with the development of a vaccine,

[11] https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/public-health/eu-vaccines-strategy_en
[12] https://ec.europa.eu/health/health-emergency-preparedness-and-response-hera_en

including some margin of risk financing for vaccine development. In return for this, the EU had the right to buy a specified number of vaccine doses in a given timeframe through an advance agreement. The funding provided was a down-payment on the vaccines that were eventually purchased by EU Member States. The initiative pooled the resources of EU countries, and 4.2 billion doses of COVID-19 vaccines were put on contract through 2023.

Building on the Vaccines Strategy, in September 2021 the EU announced an expanded approach to Health Emergencies preparedness, HERA, to strengthen Europe's ability to prevent, detect, and rapidly respond to cross-border health emergencies by making sure medical countermeasures, including medicines, vaccines and other medical products, such as gloves and masks, are available, helping reduce dependencies in the health industrial ecosystem through innovative flexible and modular production capacities, and contributing to the global health security infrastructure. It has "preparedness" and "emergency" phases – the emergency phase is triggered by declaration of a public health emergency at the EU level and where appropriate to the economic situation. Financing provided included €6 billion in direct funding for 2022-2027 plus an additional €24 billion from other EU programmes.

HERA sets out key functions during preparation and emergency



How the EU Vaccines Strategy and HERA are governed. The Vaccines Strategy was coordinated by the EC with a steer from Member States.

HERA has a multi-level set-up for governance, decision-making and technical expertise under the auspices of the EC is currently being established.

- Established and operated by the EC as a Common Service.
- HERA Board shapes strategic direction of EU and national health preparedness and response (member states, EC).

- HERA network collaborates with national or regional authorities.
- HERA Advisory Forum with external stakeholders (e.g., industry, academia, civil society).
- Health Crisis Board to coordinate action in response to a crisis (Member States, EC with involvement from other institutions).

Why they could help inform the PROSUR study. The EU initiatives and the PROSUR initiative have similar objectives in terms of regional production capacity of vaccines (and other medical countermeasures) in case of public health emergencies, although HERA also focuses on end-to-end value-chain segments needed for preparation and emergency response. In September 2021, HERA received approval to proceed by the EU and is currently in the early phase of design and set-up. As such, it can be highly relevant to the study. The EU Vaccines Strategy provides insight in acquiring vaccines and equitable distribution. However, overall, the initiatives are built on the existing governance, financing, and cross-border cooperation mechanisms of the EU, which do not yet exist to the same extent across the PROSUR Member States.

Analysis. Taking into account the literature review, below is a summary of how the EU Vaccines Strategy and HERA thus far helped achieve its goal of improving access as well as the challenges.

How the EU Vaccines Strategy & HERA helped access to COVID-19 vaccines	Challenges and shortcomings
Existing governance, financing and cooperation mechanisms within the EU – strong legal framework and existing cooperation	Some contractual delays initially due to disagreement on which manufacturers to contract – including level of risk to take (solidarity vs. speed).
Negotiation group of first movers: France, Germany, Italy, Netherlands. Then expansion to full EU	
Pooled procurement to avoid competition between EU countries, established APAs with manufacturers	
Commission provided part of pre-finance – 2.7B Euro	
Contracted 5-6 times their shared vaccination goal (80% of adults by summer 2021)	
Empowered countries to draw down volumes based on national needs & preferences.	
Collaborative procurement – shared know-how.	

How the EU Vaccines Strategy & HERA helped access to COVID-19 vaccines	Challenges and shortcomings
Excess vaccines moved to 2022 & 2023 deliveries and donated to countries & COVAX.	Governance is still being considered. Per the EU treaty, member countries hold primary responsibility for organizing and delivering health services and medical care so governance is being designed in this context.
HERA – high level political leadership - Led by Commission President with high level of support by EU Member States.	

Key take-aways from EU Vaccines Strategy & HERA for PROSUR

APAs negotiated by a central authority. EU countries drew down from the APAs once product was approved.

Doses were financed by a combination of centralized upfront guarantee provided by the EU via the APA plus top-up payments by countries for doses purchased.

Expertise from across member countries was brought together to inform decision on which vaccines to secure, which platforms, etc..

Supply contracted was greater than needed – sufficient fail-safes were built in (paid for redundancy).

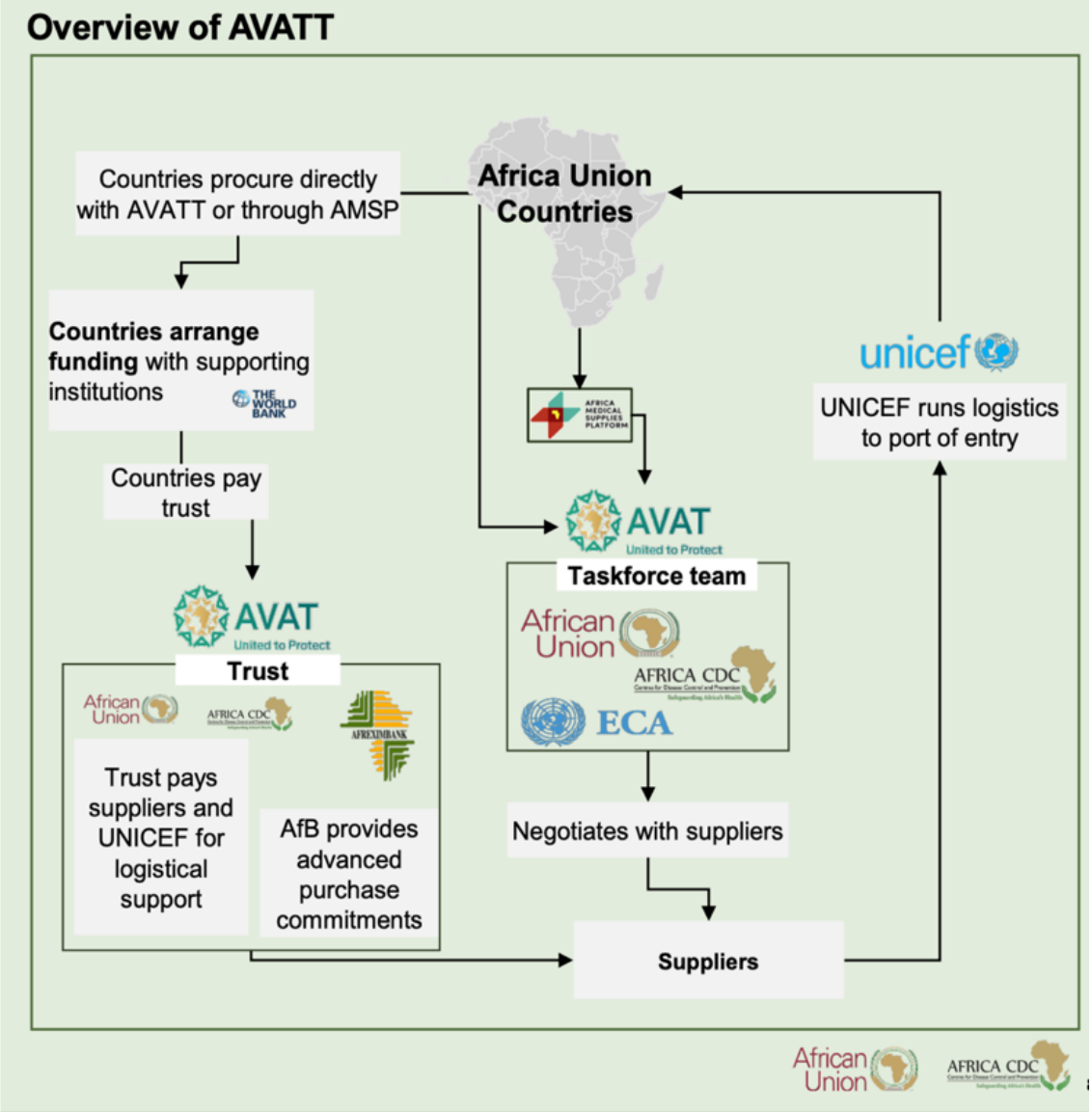
Focus on brvoader value-chain segments needed for pandemic vaccine to be available:

- Includes Research and Development (R&D), Intellectual Property (IP), Clinical trials.
- Defines actions during preparation phase and emergency phase.

2.1.3 African Vaccine Acquisition Trust (AVAT)[13]

Objective and purpose. The African Vaccine Acquisition Trust (AVAT) is a stand-alone entity that purchases COVID-19 vaccines for Member States of the African Union (AU), using a $2 billion facility provided by the African Export-Import Bank (Afreximbank)[14]. AVAT is a political response to a political crisis.

In order to secure enough COVID-19 vaccines to respond to the pandemic in their countries, African governments opted into the COVAX mechanism but then experienced (a) vaccine nationalism on the part of countries where vaccines were manufactured, and (b) no transparency from COVAX on the volume of vaccines it would make available to African countries or timing. This created a political crisis for Government leaders across Africa. The then-head of the African Union established the Africa Vaccines Acquisition Task Team ("AVATT"), comprised of senior political, technical, and private sector leaders, to decide on the right response. This led to the creation of AVAT, which runs in parallel to COVAX. AVAT works in partnership with the African Union's Africa Centre for Disease Control and Prevention[15], Afreximbank, and the United Nations Economic Commission for Africa (UNECA).



[15] https://africacdc.org/

How it is governed. It was established by the COVID-19 African Vaccine Acquisition Task Team (set up in November 2020 by then Chairperson of the African Union to support implementation of the AU's August 2020 COVID-19 Immunization Strategy). AVAT is a special purpose vehicle, incorporated in Mauritius. The Afreximbank serves as Financial and Transaction Advisers, Guarantors, Installment Payment Advisers, Contracting Authority and Payment Agent. Image source: AfrExImBank presentation to PROSUR.

The AVAT legal structure and operation is as follows:

- AVAT is a Mauritius-registered trust.
- The beneficiaries are the Member States of the AU.
- Afreximbank, on behalf of AVAT, negotiates bilateral purchase contracts between AVAT and individual vaccine manufacturers.
- Afreximbank engaged with Member States seek country-specific demand projections. provide their demand projections through completion of an on-line Pre-Order Form. It made use of the on-line Africa Medical Supplies Platform.
- AU Member States draw down on the volumes set out in the contracts by notifying AVAT of the amount.
- Overall, AVAT operates as a conduit between vaccine manufacturers and AU Member States. Manufacturers have no direct engagement with AU Member Countries; they deal only with AVAT/Afreximbank and with AVAT's logistics partner, UNICEF.

Why it might help inform the PROSUR study. AVAT started as a centralized purchasing agent for COVID-19 vaccines and in the second half of 2021 shifted to a market-shaping entity that fosters local production and possibly local R&D. It has the goal of producing in Africa 70% of the vaccines needed in Africa. As such, it can be highly relevant to the study. It is also noted that AVAT was started from political leadership and momentum from the AU.

Analysis. Taking into account the literature review, below is a summary of how AVAT thus far helped achieve its goal of improving access as well as the challenges.

How AVAT helped access to COVID-19 vaccines	Challenges and shortcomings
AVAT was established and operational in less than 12 weeks. Initial conversations occurred January 2021, and first purchase contract signed by 30 March 2021.	The creation of and contracting by AVAT alone has not yet been able to get COVID-19 vaccines prioritized to Africa. Africa remains as the lowest served region in the world with less than 5% vaccination coverage by the end of 2021.
It was driven by high-level political leadership. The political level made clear that it wanted a working solution as soon as possible and would not accept a lengthy process to develop a structure or response.	
AVAT opted for a solution that was (i) in complement with COVAX; (ii) to be anchored in a private sector approach; and (iii) to be implemented by an existing, quasi-private sector, entity based in Africa, which would negotiate vaccine purchase contracts on behalf of all AU members.	
The political leadership appointed a high-profile business leader to champion the initiative. His interventions maintained political will for a fast effective solution, kept all stakeholders focused on moving quickly to implementation and contract-signing. In addition, his stature enabled quick access to the most-senior levels at vaccine manufacturers.	
At present, AVAT outsources key functions, including contract negotiation to Afreximbank; it engages UNICEF to provide logistics services for delivery of the purchased vaccines.	
The stakeholders have decided to expand the mandate of AVAT to a broader range of vaccines, and to re-frame AVAT as a stand-alone operational entity with, for example, its own chief executive officer and staff.	

How AVAT helped access to COVID-19 vaccines	Challenges and shortcomings
Pooling of volumes have increased purchasing power.	Africa is still dependent on other mechanisms, manufacturer decisions and vaccine nationalism by other countries.
There are at least 5 African countries with Memorandums of Understanding (MOUs) signed or technology transfer underway for production of COVID-19 vaccines procurement. Due, at least in part, to the momentum created by AVAT.	

Key take-aways from AVAT for PROSUR

High level political leadership is key to moving quickly.

Used a private sector envoy and political force which brought attention to the initiative.

Brought together regional bodies for political and institutional buy-in and strengthened institutions (Africa CDC, African Medicines Authority, etc.)

Mechanism was set up to move quickly and leveraged existing expertise to move quickly.

Focus on continent decision-making and capacities and bold statements are garnering attention and action by Africa countries and the private sector.

A solution for on-continent vaccine production is still ongoing.

2.1.4 Strengthening productive and distribution capabilities for vaccines and medicines in CELAC countries[16]

Objective and purpose. The United Nations Economic Commission for Latin America and the Caribbean (CEPAL/ECLAC) and the Community of Latin American and Caribbean States (CELAC)[17] have jointly performed an assessment of regional vaccine supply in the Latin American region (LAC) and in the second half of 2021, developed a plan to ensure future regional vaccine supply self-sufficiency.

The initiative identified several critical areas for action which may be aligned with PROSUR goals and potential activities to improve vaccine self-sufficiency in the region:

- Strengthening of regional pooled vaccine procurement mechanisms.
- Creation of regional markets via pooled procurement strategies.
- Formation of vaccine development and manufacturing consortiums.
- Development of regional clinical trial infrastructure.
- Securing access to key vaccine intellectual property.
- National medical regulatory agency strengthening and capacity building.

How it is structured. The plan was created by of a group of 20 experts coordinated by CEPAL. CELAC and CEPAL have planned a series of workshops in late 2021 and early 2022 focusing on three initial areas: regulatory strengthening, establishment of a regional clinical trial platforms, and vaccine procurement. The engagement is a collaboration with, as of yet, no formal structure or budget.

Why it might help inform the PROSUR study. Each of the areas is relevant and complementary to PROSUR's vaccine self-sufficiency objectives. As this is an initiative in progress, there is therefore an important opportunity for PROSUR collaboration with CELAC/CEPAL.

2.1.5 PAHO/CEPI - Regional Platform to Advance the Manufacturing of COVID-19 Vaccines and other Health Technologies in the Americas[18]

Objective and purpose. In the second part of 2021, PAHO announced that it would support the establishment of regional vaccine manufacturing hubs in the Americas with a focus on manufacturing vaccines that are messenger Ribonucleic Acid (mRNA) types. The manufacturing platform will "coordinate across sectors – health, science and technology and industry - to strengthen their capacity to produce new technologies" and will support collaboration across

[16] https://celacinternational.org;
https://www.cepal.org/sites/default/files/presentation/files/ing_ppt_celac_short_version_1809.pdf
[17] CELAC, launched in 2011, is a regional intergovernmental mechanism for dialogue and political agreement. It includes thirty-three permanent member countries in Latin America and the Caribbean.
[18] https://www.paho.org/en/news/1-9-2021-paho-launches-new-collaborative-platform-produce-covid-19 vaccines-latin-america-and;
https://www.paho.org/en;
https://cepi.net; https://cepi.net.

countries and cooperation agencies, applying existing regional biomanufacturing capacity to production of COVID-19 vaccines as well as other medical technologies. The principle is that manufacturing should benefit the entire region, with regional pharmaceutical production and distribution of the vaccines by PAHO's Revolving Fund to all countries.

How it is structured. PAHO, working with CEPI, issued a tender to support the development of mRNA production hubs in Latin America and the Caribbean (LAC). Upon the review of bids from interested pharmaceutical companies based in the LAC region, PAHO announced that two manufacturers in LAC countries were selected as the regional hubs: Biomanguinhos-Fiocruz based in Brazil and Sinergium Biotech in collaboration with mAbxience, both based in Argentina. PAHO is now focused on convening a regional consortium to support technology transfer of mRNA vaccine technology to each of the manufacturers.

Why it might help inform the PROSUR study. To ensure that the regional hubs are developed in a manner that guarantees support to all PROSUR countries and the broader LAC region, it will be important to collaborate with PAHO in the definition of the goals of the initiative and its mode of operation.

2.1.6 Other examples of pandemic preparation and response

Zika Plan[19]

Objective and purpose. Zika Plan brings together 25 research and public health organizations in Latin America, North America, Africa, Asia, and Europe to address the Zika virus outbreak and the many research and public health challenges it poses. Its objective is to build a sustainable response capacity in Latin America for Zika and other emerging infectious diseases.

How it is structured. ZikaPLAN works closely with two other EU consortia networks - ZIKAction and ZIKAlliance. The three consortia have common bodies for the global management of scientific programs, communication, and ethical, regulatory and legal issues.

Why it might help inform the PROSUR study. It may help inform the market study as well as be a key network for R&D of infectious disease threats.

> **Review:** *A review of ZIKAPlan was not undertaken as agreed with IADB, but it is noted that should the scope of PROSUR engagement on pandemic vaccine include R&D and access to IP, it could be reviewed for lessons learned and potential collaboration.*

[19] https://zikaction.org/partners/other-eu-consortia/zikaplan/

US BARDA – Operation Warp Speed[20] (OWS)

Objective and purpose. The US government Biomedical Advance Research and Development Authority (BARDA) was created in 2009 with the objective to develop biomedical tools, including vaccines, medicines and diagnostics, for pandemic response (e.g., Influenza, Zika, Anthrax, and most recently COVID-19, etc.). Operation Warp Speed was launched in May 2020 as a coordination between different parts of the US Government with the purpose of accelerating the development, manufacturing and distribution of COVID-19 vaccines, therapeutics and diagnostics, with the original goal of beginning delivery of 300 million doses of COVID-19 vaccine by January 2021. It had an initial budget of USD 10 billion, which increased to USD 18 billion by the end of 2020. OWS provided push funding directly to six vaccine manufacturers (Pfizer/BioNTech, Moderna, AstraZeneca/Oxford University, Janssen Pharmaceuticals, Novavax, and Sanofi/GSK), of which 2 received FDA approval, and an advance purchase contract to an additional manufacturer, which also received FDA approval.

How it is structured. Part of the US government Health & Human Services (Ministry of Health). Specific budget approval from Congress.

Why it might help inform the PROSUR study. It may help inform the study with respect to scope of work along the full vaccine value-chain and different types of intervention.

> **Review:** *It was agreed that a review of OWS was not undertaken, given that it was not a multi-country cooperative model but under the auspices of the government in a single country. It is widely considered a success in terms of early access to COVID-19 vaccines for a single country to consider. There could be direct discussion with BARDA in terms of development of a portfolio, risk-assessment and funding or accessing R&D and IP of pandemic vaccines.*

MERCOSUR[21]

During the second consultation with PROSUR Member States, Brazil advised of the work underway within the MERCOSUR group, comprised of Argentina, Brazil, Paraguay, and Uruguay.

On 19 November 2021 on the occasion of the XLIX Meeting of Ministers, a Declaration of the Ministers of Health of MERCOSUR on the need for the Expansion of Regional Production Capacities for Medicines, Vaccines and Technologies in Health. The Declaration included the creation of an Ad Hoc Committee to promote the expansion of the regional production capacity of medicines, immunizations and health technologies, aiming: to analyze and outline production capacities, research and development in MERCOSUR, and evaluate initiatives to improve access to medicines, immunizations and health technologies; and identify possible complementarities between MERCOSUR Member States and cooperation possibilities, especially from the Regional Centers for the development and production of mRNA vaccines and other technologies.

MERCOSUR member countries have been meeting on a regular basis with this pursuit.

[20] https://public3.pagefreezer.com/browse/HHS%20%E2%80%93%C2%A0About%20News/20-01-2021T12:29 https://www.hhs.gov/about/news/2020/05/15/trump-administration-announces-framework-and-leadership-for-operation-warp-speed.html

[21] https://www.mercosur.int/en/

2.1.7 Other examples of pandemic preparation and response

A summary of the objective, set-up and key obligations of each coordination model is as follows. Note that AVAT, COVAX and EU/HERA have all been established during the current pandemic and are active in the marketplace with budget, binding obligations and a formal set-up. The CEPAL/CELAC and PAHO/CEPI initiatives have also been created in response to the current pandemic but are informal in terms of mutual obligations and set-up.

We note that several of the models on pandemic vaccines we studied had an existing legal structure to build from: COVAX is housed by Gavi and supported by WHO, CEPI, UNICEF and PAHO; AVAT is housed by the Africa Export Import Bank and supported by the Africa Union and Africa CDC; the EU Vaccines Strategy and HERA are housed in the European Commission and supported by the European Medicines Agency. The other pandemic vaccine models studied were more informal collaborations and notably, did not have time-bound or quantitative targets, or budget.

	AVAT	COVAX	EU/HERA
Objective	To secure enough COVID-19 vaccines to reach the AU target of 67% by end 2022. In late 2021, the goal was expanded to source 60% of all vaccines needed for Africa from African sources by 2040.	To accelerate the development & manufacture of COVID-19 vaccines; and guarantee fair & equitable access for every country in the world.	To accelerate the development & manufacture of COVID-19 vaccines for EU countries and to support other countries.
Obligation			
Decision on distribution of output	How equitable allocation is determined is unclear at this stage.	Allocation principles and algorithm and run set by WHO for equitable distribution of available supply based on % population.	Equitable allocation was achieved by countries placing purchase deliveries for the doses needed based on agreed EU targets on progression of coverage.
Obligations between the facility and Member States (& means of formalizing obligations)	AU Resolution – followed by transactional forms from countries (demand, delivery, invoice).	Gavi MOUs with countries – committed or optional.	The EC issued APA for volumes that well exceeded these needs. EU Resolution resulting in the Vaccines Strategy and HERA.
Obligations between the facility & suppliers	Afreximbank designated to negotiate and contract with suppliers based on projected demand from countries.	Gavi issued APA with suppliers. Self-financing countries, PAHO & UNICEF took delivery against the APA per WHO allocation. Push funding to support vaccine development provided by CEPI for some manufacturers in the COVAX portfolio)	EC has relationship with suppliers – established APA based on demand targets and countries draw down on them for deliveries and co-pay. Relations with R&D networks and means to build capacities is unclear.
Structure			
Legal entity, trustee, 'secretariat' country	A Trust was established with Afrieximbank as the Secretariat and countries as the beneficiary	The COVAX Facility is hosted by Gavi (a Swiss foundation). Gavi Board oversight of Gavi Secretariat and Alliance engagement.	EC is Secretariat (which is a legal entity) with oversight by Member States.
Organization Structure (high-level, management, network, secretariat)	AVAT Task Force – comprised of AU Pres, Private Sector lead, Ministers of Health, Head of Africa CDC. No other structure.	ACT-A Facilitation Council / COVAX lead – Gavi, WHO, CEPI, UNICEF / Working Groups. No formalization of the roles except via Terms of Reference.	Structure still being developed.
Procedures / rules of operation / decision-making. **Strategy and principles**	Strategy is expanding to include local manufacturing and all vaccine procurement. Principle of regionalization is overriding.	MOU with countries and buyers. Process maps for operations. Advisory and technical groups for decision on products and contracts (decision taken by Gavi) and for allocation (decision taken by WHO).	Full scoping of functions but rules of operation still being developed.
Public transparency (& which aspects)	The aims of the initiative, organization structure and strategy have been made publicly available.	Public transparency: periodic updates on Gavi website but UNICEF & PAHO did not provide usual disclosure of contract pricing, etc.	Public transparency: Strategy & principles are decided by EU Member States and made public.
Key issues			
Special financing	Afreximbank provided guarantee to manufacturers.	Gavi budget for the 92 countries included in the advances market commitment for Covid-19 vaccines. Self-financing countries. Donations – Cash and Vaccines from High Income Countries, China.	Special budget allotment made for pandemic vaccine procurement – via an emergency financing mechanism. Dedicated 5-year budget was established to put HERA in place. Plus links were made to funding that would come from other EU programmes. Final costs/ budget under review.
Regulatory	Moving toward an empowered Africa Medicines Authority (per AU resolution in 2021) but until then WHO Prequalification (PQ), WHO deemed Stringent Regulatory Authority (SRA), and agreed National Regulatory Authorities.	WHO Emergency Use Listing / PQ & country registration.	European Medicines Agency is the regulator. Delegation of procurement decision to EC.

Objective	AVAT	COVAX	EU/HERA
Regulatory	Moving toward an empowered Africa Medicines Authority (per AU resolution in 2021) but until then WHO Prequalification (PQ), WHO deemed Stringent Regulatory Authority (SRA), and agreed National Regulatory Authorities.	WHO Emergency Use Listing / PQ & country registration.	European Medicines Agency is the regulator. Delegation of procurement decision to EC.
Policy & legislative			Healthcare as a part of Member States responsibility is a part of the EU Treaty so a provision may be needed for EU mandated collaboration in the case of health emergencies.

At the time of this analysis, the other models did not have formal governance frameworks in place per se but worked collaboratively to identify and pursue a shared objective. The key take-aways for these include:

- Reduce external dependence on production of health products, especially vaccines.
- Each of the areas is relevant and complementary to PROSUR's vaccine self-sufficiency objectives. There is therefore an important opportunity for PROSUR collaboration with CEPAL/CELAC,
- To ensure that the regional hubs are developed in a manner that guarantees support to all PROSUR countries and the broader LAC region, it will be important to collaborate with PAHO/CEPI in the definition of the goals of the initiative and its mode of operation.

Following is a consolidated summary of key take-aways from the pandemic vaccine cooperation mechanisms examined in the context of the objective and set-up for Regional Pandemic Vaccine Manufacturing Cooperation.

Key Take-aways for PROSUR		
Momentum and Set-up	**Securing vaccines and manufacturers engagement**	**Other**
High level political leadership is key.	A non-traditional procurement exercise – at-risk, co-investment contracts – delivers best results. Even though some investments may not materialize.	Communication to countries on availability is critical.
Private sector envoy and political force behind the initiative that can demand attention could be key additive.	Issue contracts early/rapidly with rewarding terms maximizes access.	Consider including additional aspects that impact timely access to vaccines: research & development, intellectual property, clinical trials, equitable distribution. By doing so, take an end-to-end approach to accessing timely pandemic vaccines.
Establish clear and agile governance & procedures – in order to respond to a rapidly evolving pandemic. Schedule a moment to adapt design - at early stage of a pandemic and some months in.	Link push investments and purchase quantities together (as was done by CEPI and Gavi) or in the same contract (as was done by the EU and US).	
Bring together regional/sub-regional bodies to work cooperatively and facilitate political and institutional buy-in and strengthened institutions.	Establish provision in advance (during preparation) to have money rapidly available.	
Leverage others´ expertise to move quickly or during different phases.	Negotiate Advance Procurement Agreements (APA) by a central authority.	

Key Take-aways for PROSUR

Momentum and Set-up	Securing vaccines and manufacturers engagement	Other
Scope needs to be well defined (e.g., all or a part of pandemic vaccine needs)	Consider multiple financing streams financed by a combination of upfront/ guarantee and top-up for doses purchased.	
Scope of vaccine supply chain in focus needs to be well defined (e.g., production only, or also R&D, IP, distribution, etc.)	Bring together technical expertise from across countries to inform decision on which vaccines to secure, which platforms, etc.	
Budgetary needs and mutual obligations between actors involved need to be well defined.	Contract supply for an "x-factor" more than needed to build in redundancy.	
	Difficult to mitigate risk of vaccine nationalism (& de facto nationalism) but consider looking at minimizing impact via: Manufacture doses in a small country, relative to the size of the region country Establish cooperative agreement upfront	
	Design within or resolve legislative matters around delegated or collaborative procurement; at-risk investments/contracts.	

2.2 Cooperative infrastructure and other models

The above-described methodology was also applied to a study of various cooperative infrastructure projects and management of shared natural and other resources between countries:

- **Itaipú[22]:** A large public-private owned hydroelectric dam on the Paraná River between Brazil and Paraguay.
- **The Amazon Cooperation Treaty Organization[23]:** an international organization aimed at the promotion of sustainable development of the Amazon Basin. Its Member States are Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela.
- **The Mekong River Commission[24]:** The governments of Cambodia, Laos, Thailand, and Vietnam jointly manage the sustainable development of the Mekong River.
- **The European Council for Nuclear Research (CERN)[25]:** A center for scientific research established by 23 European countries.

[22] https://www.itaipu.gov.br/en
[23] http://otca.org/en/
[24] https://www.mrcmekong.org
[25] https://home.cern

- **The European Spallation Source (ESS)[26]:** A multi-disciplinary research facility established and operated by 13 European countries based on the world's most powerful pulsed neutron source, currently being built.

The full analysis is in Annex 2 and below is a summary of the key take-aways related to that could inform the set-up and governance of a PROSUR initiative.

Key Take-aways for PROSUR	
ITAPÚ	The output required an initial investment and then generated resources from a shared natural resource. Much of the cooperation focused on distribution of the output and allocation of revenues generated from the output. The learnings could be relevant if PROSUR Member States jointly invest in production capacity and not only purchase contracts of doses. There are benefits and costs to sovereigns around the table that could go beyond the specific output of the cooperation. Benefits and costs could be, for example human resources, knowledge and expertise development, job creation, local infrastructure investments, maintenance. Overall, the benefits could be seen as a package together with the specific output of the cooperation. Agility in design – an automatic reset mechanism after some time agreed up front.
ACTO	Inter-governmental collaboration and high-level political commitment were key enablers and were memorialized via a treaty. Initial seed capital came from international organizations and not only member countries.
MRC	IA collaborative mindset and high-level political commitment were key to get the MRC established. Well-documented and transparent information on objectives, structure and procedures that were agile to evolve over time.
CERN	A major regional/global event inspired Heads of State to push/support an initiative. Collaboration was a must to create a public good that many countries wanted but no one country could afford. The notion of a "fair return" related to contribution provided is a key aspect of running the organization.

[26] https://europeanspallationsource.se

Key Take-aways for PROSUR	
ESS	Shared vision within the region was key. A public good that many countries wanted but no one country could afford – cooperation was a must. A competitive process was used as the means to select which country "hosts" the mechanism. The output is a public good that can be accessed by more than the Member States.

2.3 Pooled procurement of vaccine and medicines

Pooling resources and demand and securing vaccines for a group of countries is a core part of utilising and accessing any increased vaccine production in PROSUR countries as envisioned by the initiative. There are several pooled procurement mechanisms that access health products for a group of countries and given the link to the initiative, learning from their experience was important. Nine such mechanisms were: AVAT, AMSP, EAC, EU, GCC, OECS, PAHO Revolving Fund, UNICEF Procurement Services. A summary and comparison of each is below, followed by key take-aways.

Africa Medical Supplies Platform (AMSP): From 2020, an Africa-led, online centralized digital platform established in response to the COVID-19 pandemic to improve access to medical supplies, starting with personal protective equipment (PPE) and expanding to other products including vaccines with preference for suppliers in Africa.

Africa Vaccine Acquisition Trust (AVAT): From 2021, an AU-led initiative to procure COVID19 vaccines for Member States and bridge the gap with COVAX and the AU 67% objective. 280M doses secured as of December 2021.

East Africa Countries Pooled Procurement (EAC): Started in 2008 with HIV/AIDS medicines, the pooled procurement mechanism includes centrally negotiated contracts that countries can decide to use at their discretion for health products.

EU COVID-19 Vaccines Strategy: From 2020, a mechanism set up during the COVID-19 pandemic to jointly procure vaccines for all EU countries, to reduce cost and ensure fair distribution and access.

WHO Eastern Mediterranean Regional Office (EMRO) Pooled Vaccine Procurement initiative: Initiative to create a pooled procurement mechanism to reduce cost and improve the introduction of new and underutilized vaccines. The initiative was stopped after a failure to mobilize seed funds.

Gulf Cooperation Council Group Purchasing (GCC): Established in 1978 by 6 countries to reduce the price paid for medicines and other pharmaceutical products; has achieved 30% cost savings.

Organization of the Eastern Caribbean States (OECS): Established in 1986, nine-member group centralized tendering and procurement system based on a drug revolving fund for its nine member countries; has achieved 37% cost savings for 25 items over a 5-year period.

PAHO Revolving Fund: Created to improve access, affordability, and quality of vaccines for member countries by pooling demand and centralizing negotiations and contracting as well as supporting on demand forecasting.

UNICEF Procurement Services: Procures vaccines and other health products. Approximately 100 countries get some or all of their vaccines via this mechanism. Gavi-supported countries access the COVAX APAs through this mechanism. The mechanism also procures other vaccines for both Gavi-supported and non-Gavi countries.

Key take-aways from pooled procurement mechanisms

	AVAT	AMSP	CAO	UE	GCC	OECS	PAHO RF	UNICEF
Governance	AU, Africa CDC, Afriexim Bank, UNECA.	Task Force: AU, Africa CDC, Afriexim Bank, UNECA. Afriexim taking decisions w/ AU.	EAC Council of Ministers approved pooled procurement.	EU Council; procurement run by the Commission.	GCC Charter signed by countries.	ECS Treaty. Authority - political level; Commission – provides services (out of 6 countries).	WHO and Directing Council of PAHO Member States.	Governed by UNICEF.
Country engagement	For 55 AU Member States.	For 55 AU Member States.	5 countries.	All 27 EU Member States. They participate in process by providing info.	6 Gulf countries (Bahrain, Oman, Kuwait, Qatar, Saudi Arabia, United Arab Emirates) 35 million people.	Currently 9 countries, 570,000 people. Process for new members.	Open to all LAC countries that have a 5-yr plan of action, national budget for vaccines, a national EPI Manager. 42 countries & territories are members.	Open to all countries where UNICEF has programme. 99 countries/yr for part or all of vaccines and some health supplies.
Product Scope	Covid-19 vaccines. Expanding to regional production and procurement of other vaccines.	PPE and IPC, Diagnostics, Medicines, Medical Equipment.	Essential medicines and technologies unless donors have specific requirement.	COVID-19 vaccines.	Vaccines and biomedicines.	700 items; 70% pharma.	Vaccines and immunization devices.	Vaccines, medicines and health technologies.
Supplier engagement	Direct negotiation by Afreximbank on behalf of AU member, based on their projected demand.	A marketplace platform. Prioritization of products made-in-Africa.	EAC issues tender. Global suppliers with some preference for Africa.	EU support to vaccine development and production in EU; single procurement.	Central tender, bid process and vendor selection for countries. Countries contract with and pay suppliers on their own.	Via the OECS Commission.	Pooled demand; PAHO issues tenders/contracts and plans deliveries with suppliers.	Pooled demand; UNICEF issues tenders/contracts & plans deliveries with suppliers.
Regulatory standard	WHO Pre Qualification (PQ) until the Africa Medicines Authority is established and functioning.	Stringent Regulatory Authority (SRA), WHO PQ, and International Organization for Standardization (ISO).	An issue – but goal is EAC Regulatory Harmonization.	European Medicines Authority & NRAs.	Saudi Arabia is standard, but countries need to provide no objection letter or a preferred supplier.	Harmonized/agreed between 9 members.	WHO PQ or SRA (US, EU, Canada, Australia, S. Korea).	WHO PQ.
Financing	Afreximbank provides guarantee; countries repay Afreximbank.	Countries place orders via platform and pay.		Countries place orders against an APA.	Delivery and payment made by countries.	Revolving drug fund; centralized payment, common currency.	PAHO pays supplier, countries must reimburse w/in 60 days.	Countries (incl. Gavi, WB) pay UNICEF in advance, UNICEF pays suppliers. Some capacity for country reimbursement.
Pricing	Single price.	Single price.	Single price.	Single price.	Single pricing across all countries. Saved "millions of dollars over the period".	Single price. Cost savings for 25 products, 37%. 13% fee.	Single price product. Handling fee is 3.5% of procurement.	Tiered pricing – manufacturers can tier. Handling fee is 1.5-6.5% depending on product
Challenge	*New*	*New*	Lack of common currency, regulation.	*New*	Role of independent NRA.	Sufficient volumes – some products.	Contract durations of one year don't reflect the lead-time for vaccine production of capacity increase.	

There are important learnings from these pooled procurement mechanisms related to procurement set-up, engagement with manufacturers and governance in the context of the objective and set-up for Regional Pandemic Vaccine Manufacturing Cooperation since contracts with manufactures and procurement will play a key role in such a mechanism.

Key success aspects of procurement	Key learnings for governance options
Political solidarity	Regulatory options.
Appropriate procurement legislation, including that allowing for collaboration or delegated procurement or contract negotiations to another country or institution.	Pricing & fees.
Harmonized regulatory aspects, such as aligned technical requirements, mutual recognition agreements, etc.	Engagement with manufacturers.
Adequate and predictable financial resources.	Participation of Member States in procurement decisions, such as volumes, technical/quality requirements, price ceilings, etc.
Shared objectives/advantages e.g.,	
Local production preference	
Pricing	
Strengthened supply chain capacities	
Demand predictability, including quantities and duration – pooled demand leverages better terms (including pricing)	
Increased transparency and information sharing	
Fees or budget to cover costs of secretariat/operating platform.	

2.4 Consolidated review of studied governance models

A consolidated summary of key takeaways from all governance models studied – pandemic vaccine cooperation, cooperative infrastructure, and pooled procurement – is as follows. The summary is divided into Moment and Set-up, securing vaccines and manufacturers engagement and other aspects.

Momentum and Set-up

Political will

High level political leadership & solidarity is critical.

Private sector envoy and political force behind the initiative that can demand attention could be key additive.

Clear and agile governance & procedures are needed to respond to a rapidly evolving pandemic.

Objectives

Pandemic manufacturing is a public good that everyone wants but no one government can afford (except very large countries)

The scope of the cooperation (e.g., if part or all of pandemic vaccine needs) needs to be decided.

There needs to be long term commitment and shared objectives from governments.

Set-up

Adequate and predictable financial resources, including fees or budget to cover costs of secretariat/operating platform are needed.

Transparent administrative structures and procedures should be established.

Build an alliance

The mechanism should leverage others´ expertise to move quickly or during different phases.

Regional/sub-regional initiatives with similar objectives should work together.

Securing vaccines and manufacturers engagement

Contractual terms

A non-traditional procurement exercise, including at-risk and co-investment contracts may be needed.

Contracts should be issued early and rapidly with rewarding terms.

Push investments and purchasequantities should be linked together or included in same contract.

Legislative matters around delegated or collaborative procurement should be designed within or resolved as part of the governance model.

Budget and finance

A provision to have money rapidly available at the time of pandemic should be established. Multiple financing streams financed by a combination of upfront/guarantee and top-up for doses purchased should be considered.

Negotiate with maximize influence to achieve best output

Negotiations should be conducted by a central authority to maximize influence.

Expertise from across countries should be brought together to inform decision on which vaccines to secure, which platforms, etc.

Ownership in a facility

-There should be a decision on joint investment – via an open tender and with bidding country contribution.

Difficult to mitigate risk of vaccine nationalism (& de facto nationalism) but consider looking at minimizing impact.

Other aspects

Communication is critical.

Consider including other value-chain segments that impact timely access to vaccines, e.g., research and development (R&D), intellectual property (IP), clinical trials, distribution.

Actions during preparation phase and emergency phase should be defined.

Harmonize regulatory aspects.

Benefits and costs to member countries could go beyond the specific output of the cooperation (e.g., vaccine availability).

Draft Aspects of a Governance Framework

Definition on the objectives of cooperation and scope are critical in considering a governance framework. At the same time, thinking through the set-up of an initiative may also inform the decision on if and how to proceed.

The goal of pandemic vaccine manufacturing is complex and ambitious. Doing so in cooperation between several countries has many benefits but it also adds some layers of complexity. It represents disruptive change, costs, and risks in exchange for health, societal and economic gains some of which may only be realised in the long-term. This section provides analysis around five key questions to help think through the change, costs, risks, and gains associated with a regional cooperation mechanism or platform:

- *How could the benefit of regional vaccine production be shared between PROSUR Member States?*
- *What are the costs and other obligations that should be considered?*
- *How could cooperation be organized?*
- *Are there existing legal or policy frameworks that could enable or hinder cooperation?*
- *What are the options for memorializing the Member States' cooperation?*

These considerations essentially lay out the decisions that will need to be made in order for the mechanism or platform to operate (allocation decisions, funding decisions, public policy decisions, and the like). By identifying the nature of the decisions to be made — political, technical, or administrative, for example — it becomes easier to task those decisions to particular stakeholders or stakeholder group (political decisions at the political level, and so on).

3.1 How could the benefit of regional vaccine production be shared between Member States?

Primary Benefits: Pandemic Vaccine Doses; Research & Development

A primary benefit, or output, from regional vaccine manufacturing cooperation, is doses of qualified pandemic vaccine. There are many ways in which doses could be distributed to Member States including:

- Equally to all Member States
- Proportionate to the need of Member State with need determined by the size of the at-risk population, the rate and level of disease transmission, among others
- Proportionate to a Member State's contribution of resources to the mechanism
- Special allocation to the Member State(s) that conducted clinical trials
- A criterion including all the above

The allocation of doses for each criterion could be done in sequence. For example, doses could be first allocated to meet the needs of at-risk persons in Member States and once all Member States have the number of doses needed, a next allocation could be made for the next criteria.

As the needed vaccine will not all be produced at once, an additional important consideration needs to be given to the time when countries will receive their benefit.

Depending on the scope of the cooperation, a further primary benefit could be research and development of pandemic vaccines, and this output benefit would also need to be shared. The R&D would be shared with the vaccine manufacturers that are part of the PROSUR mechanism. In addition, the R&D output could also be shared with others, including other manufacturers in PROSUR member countries and beyond.

If cooperation with regard to production of routine vaccines during inter-pandemic periods is included in the mechanism, the output would be doses and could be R&D. Except that the distribution criteria for routine vaccine production would likely be done more frequently, such as agreed on a quarterly or annual basis, per planned forecasts and financing.

Other Benefits

The location of the manufacturing facility within PROSUR Member States could also be considered a benefit of the cooperation, including because of the employment it would provide as well as the prestige of hosting such a facility. A decision on the location(s) could be taken based on Member State decision to invest. However, if the investment in a manufacturing facility (and R&D) is made jointly by Member States, the decision on location could be informed by a set of agreed criteria (for example, regulatory capacity/plans, size of country in comparison with need, etc.) and taken based on inter-country negotiation, pre-feasibility analysis, or the outcome of a competitive proposal process.

If Member States pool resources to cover the costs of operating a mechanism – so, not the manufacturing of vaccines (or conducting R&D), but coordination, communication, facilitation, etc. – an additional benefit could be the staff (the expertise and knowhow) needed to perform those functions. The location of the mechanisms could be a benefit decided similarly to the location of the manufacturing facility. Or instead, the benefit could be hiring of staff from Member States proportionate to the amount of the budget provided by Member States or provide secondment of staff to the mechanism per terms agreed between Member States.

Once the scope and objectives of the initiative are defined, thinking through the principles and basis distributing the benefits of the mechanism will be clearer.

3.2 What are the costs and other obligations that should be considered?

Achieving the goal of pandemic vaccine manufacturing in cooperation between several countries has many benefits but it also means sharing costs, risks and other obligations.

The major cost categories that could be shared include:

- Creation and maintenance of a mechanism.
- Investment in a new facility or production expansion.
- Contracting of a vaccine portfolio for supply during pandemic and inter-pandemic phases.
- Depending on the scope of the initiative, funding could also be needed for R&D during the pandemic and inter-pandemic phases as well.

The major cost categories that could be shared include:

Creation and maintenance of a mechanism

The set-up and scope of work being undertaken will drive the cost of creating and maintaining a mechanism. By mechanism we mean a secretariat function and not the production of doses, R&D or any other costs related to the output. The cost of the mechanism could range significantly based on the activities, workload and the number of staff needed to deliver on the work. Example activities that could drive the cost are outlined in section 3.3 and depend on the approach to the set-up.[27]

Contracting of a vaccine portfolio for supply during pandemic and inter-pandemic phases

To mitigate technical, scaling, and political risks, we anticipate the mechanism could need to draw from a portfolio of manufacturers to ensure sufficient access to pandemic and epidemic vaccines. A portfolio means that no single manufacturer bears the full responsibility of having sufficient pandemic vaccine because the effort and risk is spread across multiple manufacturers. A portfolio could include portions of the contract at-risk, meaning, uncertainty whether the doses will fully be needed but secured on a no-regrets basis. In doing so, the likelihood of having enough of the right vaccine when it is needed increases. It also increases the cost.

In addition to the pandemic period, since production facilities will need to keep warm, the portfolio could include manufacturing incentives during the inter-pandemic period. These aspects are important due to the nature of vaccine production, costs could include the purchase price of doses, or maintaining know-how and regulatory capacity.

[27] It is useful to note that several of the models on pandemic vaccines studied have established their secretariat function within an existing legal structure. COVAX is housed by Gavi and supported by WHO, CEPI, UNICEF and PAHO. AVAT is housed by the Africa Export Import Bank and supported by the Africa Union and Africa CDC. The EU Vaccine Strategy and HERA are housed in the European Commission and supported by the European Medicines Agency. Pooled vaccine procurement mechanisms were also generally housed by an existing organization (GCC, PAHO, UNICEF, etc). Other pandemic vaccine models studied were more informal collaborations and notably, did not have time-bound or quantitative targets, or budget. *As such and depending on how the PROSUR Member States chose to proceed with regional vaccine manufacturing, it could be a benefit to house the future secretariat of a cooperative mechanism within an existing regional body.*

Public sector investment in a new facility or production expansion

The diagnostic study concluded there is insufficient pandemic vaccine production capacity in PROSUR Member States currently – one option to increase capacity is for a joint investment — a decision that could be informed by the pre-feasibility studies. If investment and ownership is included in the objective, below is a decision-tree to help think through the options and costs involved. Some key points to be considered include: (a) the amount of the investment and objectives; and (b) whether the decision on who to contract would be selected based on direct negotiation informed by the diagnostic or an open process for proposals. A version of a "decision tree" for considering possible public sector investment in a vaccine production facility is shown in the diagram at Annex C.

A more formal governance set-up would be critical to oversee the effectiveness of such investment and to ensure mutual obligations are established and met.

Other obligations

When considering the scope of an initiative, below are some example questions that could help PROSUR think through costs and obligations:

- Should the mechanism include multi-year purchases of routine vaccines to keep vaccine production capabilities active, so they are available when needed during a pandemic?
- Should pre-financed investments be an option?
- Should funding be provided for R&D during the pandemic phase? What about inter-pandemic phase as well?
- Could in-kind resources be provided, such as vaccine production from a Member State owned facility or personnel?

3.3 How could cooperation be organized?

There are several ways cooperation could be organized, and two approaches emerged for PROSUR Member States to consider.

- **Aligned-coordinated approach:** Member States align on a shared goal but act independently while coordinating activities and sharing information
- **Integrated approach:** Member States align on a goal and implement via a single strategy with shared resources.

How cooperation is organized could evolve over time and PROSUR Member States may wish to start with an aligned-coordinated approach and move to an integrated approach once there is clear political will, momentum, and/or decisions on more specific objectives of cooperation. In any case, the operating model should be based on the objectives of goals of cooperation and target achievement date as well as budget and political will, among other factors.

An *aligned-coordinated approach* (option A) is a lighter touch and therefore could be initiated more quickly but it would likely be slower in achieving shared results. An *integrated approach*

(option B) is a more formal option and therefore may take longer to operationalize but would likely be faster and more efficient in delivering value. A look at examples of key operating components and some pros/cons of each option are below.

Examples of key operating components of different approaches to organizing collaboration:

OPTION A Aligned-coordinated: "Progress over time"	OPTION B Integrated: "More commitment more benefit"
Key activities	**Key activities**
Harness political will.	Harness political will.
Use existing modalities for working together such as sharing of workplans, coordination and monitoring.	Develop an integrated plan of action to achieve the objectives.
Establish a joint, non-binding statement of intent to increase pandemic vaccine production (or whatever the objective is).	Develop a budget and allocation of resources to achieve objectives.
Focus on transparency, collaboration & coordination of action developed based on good will.	Establish a dedicated team to perform key coordination functions such as budget management, communication, reporting, policy matters (such as criteria and allocation of benefits).
National, rather than joint, investment, policy, and legislation to drive increases in production and other vaccine capabilities.	Contract with manufacturers (including via PAHO RF).
During interpandemic period, countries could prioritize procurement from PROSUR Member State facilities via PAHO RF or self-procurement.	Invest in a new facility, as relevant.
In time of pandemic, countries could create a mechanism to 'pool' their capabilities and production capacities and establish an opt-in allocation to ensure equitable distribution of vaccines.	Convene expert groups, or decision-making fora.
	Memorialize obligations and benefits with Member States.
	Conduct financial management including payments.

OPTION A Aligned-coordinated: "Progress over time"	OPTION B Integrated: "More commitment more benefit"
Pros More informal and lower costs to set-up and more quickly set-up.	**Pros** - More specific benefits and obligations - Clearly defined roles and responsibilities - Pooling of resources/budget - Higher level of commitment to action and objectives - Integrated working together - Joint decision-making and jointly operated
Cons - Does not guarantee the production capacity in the region will be available to the region and negotiating influence with the market. - Less certainty on outcome - Less visibility on gaps	**Cons** - More expensive way of working than coordinated action - Some Member States may not want to delegate decision-making

In either model, PROSUR Member States would need to agree on the "rules of engagement" up front, including accepting and implementing the decision-making process, including allocation of the benefit, noting that these may be different during inter-pandemic and pandemic phases. Agreement on a "trigger" for pandemic operations would be needed.

An example Option B type of organization is found in Annex C.

3.4 Are there legal or policy frameworks that could enable or hinder cooperation?

As a part of the study, TYH assessed how a policy and legal landscape within and between PROSUR Member States could aid or hinder cooperation on regional vaccine production and the degree to which new policy or law is required to enact the desired cooperative framework agreement. The assessment included a desk review of public documents and information provided by IADB and PROSUR Member States. The landscape assessment included:

- Vaccine procurement
- Regulatory aspects
- Domestic industrial policy
- Trade
- The enabling environment and connecting with other regional actions

Vaccine procurement

Procurement and production of pharmaceutical products involves complex trade norms and interests, risk regulation and therefore should be more closely reviewed with Member States as a part of the pre-feasibility study, once the objectives and scope of the cooperation are agreed. In any case, there are several issues identified related to vaccine procurement that should be taken into account.

Delegation of vaccine procurement: PROSUR Member States currently procure their routine vaccines via a combination of self-procurement from foreign manufacturers, national supply, and via the PAHO Revolving Fund. The PROSUR Member State procurement via PAHO is more than 70% of the PAHO annual procurement amount. One Member State indicated that they do not procure their vaccines via PAHO and one indicated that their current legislation mandates vaccine procurement be via PAHO, although an exception was made for pandemic vaccines.

In the case of pandemic vaccines, PROSUR Member States primarily procured COVID-19 vaccines via COVAX (with PAHO RF as the procurement agency) as well as via self-procurement. In addition, some countries received donations of vaccines bilaterally from countries (notably China, Russia, and the U.S.), including as a part of technology transfer or undertaking clinical trials. As countries already procure via a mix of modalities, and as procurement is a key interface with production and securing quantities, this is an important aspect of a collaborative framework. Economies of scale achieved via bulk procurement and commitments to industry will be key determinants of success for pandemic vaccine production cooperation.

Note that the contracting of doses could be done separately from purchase deliveries. This model is how COVAX and the EU managed central contracting of pandemic vaccines and de-centralized purchasing. COVAX and the European Commission issued APAs to manufacturers and then UNICEF/PAHO and EU Member States, respectively, issued purchase orders against the contracts for their needs.

A decision to delegate vaccine procurement (e.g., to PAHO RF or a new mechanism) is a matter of policy or legislation in many of the PROSUR Member States. It should be anticipated that changes to the status quo would need to be substantiated to enact a cooperative framework.

Preferential procurement: PAHO RF and countries may achieve lower prices for vaccines due to open, international, and competitive tenders. The viability of PROSUR Member State vaccine production may be compromised unless preferences can be granted to local suppliers, as is the case in several of the pooled procurement mechanism noted above. This could be a matter of legislation and policy – including industrial policy and should be considered.

At-risk contracting: There are several factors related to procuring pandemic vaccines that result in contracting to be more at-risk than routine vaccine procurement. The drivers of the uncertainties are around demand and the vaccine candidates:

- Contracting more doses than may be needed given the risk of production scale-up and the uncertainty of demand given emerging and evolving epidemiology.

- Contracting for vaccines that have not yet been approved for use including to incentivize development and rapid access upon approval.

Waiting for certainty on either of these factors results in delayed access or reduced availability – in terms of the number of vaccines developed and/or production capacity increases. Based on public information available on contracts, it appears that several PROSUR Member States were able to issue at-risk contracts within this definition. For example, four countries have bilateral vaccine contracts to cover significantly more than 70% of population. However, one Member State advised that they were not able to use their budget for at-risk contracts. Therefore, if at-risk or risk-sharing is a taken forward as a tool of the facility, then exception would need to be given to the country or a review of national legislation and/or practices.

Regulatory aspects

There are two aspects of regulation of vaccines that are important to consider. The first is the need for harmonization on regulatory aspects and agreement on the regulatory pathway. Multiple regulatory reviews and processes can be a challenge to the development, production, and procurement of vaccines, resulting in delays and reduced access. Harmonized regulatory aspects and agreement between PROSUR Member States will be a key enabler, including for emergency use authorization processes. Currently, regulatory pathways and standards are not harmonized among PROSUR Member States and doing so would simplify the reviews manufacturers must undergo to achieve marketing authorisation and provide mutual assurance. Secondly, a well-functioning national regulatory authority is a precondition for successful vaccine production. Investments in regulatory capacity building may be needed to attain the higher maturity levels required to provide stringent oversight on the manufacturing processes for vaccines.

Domestic Industrial Policy

The viability of domestic production is positively impacted by industrial policy that supports national production with financial support, incentives (such as tax exemptions, support to R&D, investment in NRAs, etc.) and preferential treatment in procurement. On the other hand, industrial policy that prioritizes meeting domestic needs before exporting or limits investment in production capacity to that of national needs may be counter to the objectives of a cooperative mechanism such as PROSUR is exploring.

From a review of publicly available information and from information shared by Member States via the workshops, it appears that few PROSUR Member States have an industrial policy that prioritizes national production of vaccines.

Establishing an industrial policy for domestic or regional vaccine production could be an important enabler of increasing vaccine production. The policy should consider NRA strengthening, preferential treatment in procurement, delegation of procurement and at-risk contracting.

Trade

There are numerous free trade agreements (e.g,, MERCOSUR free trade regime among its Member States and between other Latin America countries such as Bolivia, Chile, Colombia, Ecuador, Peru[28]) that reduce or eliminate certain barriers to trade and investment and facilitate stronger trade and commercial ties between PROSUR Member States.

[28] https://scioteca.caf.com/bitstream/handle/123456789/365/caf_tomo_7_.pdf?sequence=1

To achieve the goals of a possible PROSUR-wide arrangement for the joint development, manufacturing, and distribution of vaccines for the next pandemic disease, PROSUR Member States would need to suspend any regulatory requirements that would slow the transfer of such vaccines (whether in bulk or in ready-to-use presentations) or the related devices and supplies (such as syringes or, if needed, cold chain equipment) among the PROSUR Member States. This includes whatever import and export requirements would inhibit the quick and tariff-free flow of such vaccines and goods. The PROSUR Member States would do so by expressly exempting such vaccines and goods from the relevant requirements. This exemption would apply whether or not a pandemic had been declared or had shifted in scope.

Enabling environment and connecting with other regional actions

In addition to the above considerations and obligations, there are policy and legislative matters that could contribute to success. Such as industrial policies that provide financial support and incentives for local vaccine production. Moreover, harmonized regulatory aspects and agreement between PROSUR Member States will be a key enabler, including for emergency use authorization processes.

Two initiatives with complementary work underway in Latin America – CELAC and PAHO – offer important opportunities for collaboration to multiply efforts on areas of synergy. Including topics such as connect to IP access, clinical trial platforms, regulatory standards, mRNA production hubs, and procurement.

3.5 What are the options for memorializing cooperation?

Once the PROSUR Member States have settled on the structure of their initiative, including the roles each Member State will play in realizing the initiative and the possible establishing of a new entity to administer any commonly held assets and obligations associated with the initiative, all these need to be memorialized in writing. This section sets out several considerations that need to be addressed when this phase is reached.

The idealized scenario is for the Member States to establish the initiative through a binding multi-lateral treaty. Such a treaty would set out the Member States' respective roles and responsibilities — including with regard to such matters as the payment of monies; the holding of property rights including intellectual property; the frictionless flow of funding, inputs, personnel, and outputs; the establishment and operation of a secretariat for the initiative including its immunity from suit; and other relevant matters. The binding nature of such a treaty makes it the most effective way to ensure the achievement of the goals of this initiative once the instrument is in place. However, the time required to negotiate and execute such an instrument — including the time taken for any necessary legislative approval in some or all PROSUR Member States — should be considered. The timing may be such that the initiative is not ready and in place, in time to achieve its goals.

It could therefore be wise to consider a two-track approach: while working towards a binding multi-lateral treaty, the PROSUR Member States could establish interim arrangements by way of a multi-party Memorandum of Understanding. Such a Memorandum of Understanding would set out all those commitments agreed on by the Member States which are within the authority of the executive branch of the Government (that is, those which do not require legislative authorization). This may vary from Member State to Member State and therefore to promote parity among the Member States it would be wise to ensure that such a Memorandum of Understanding addressed only those issues which are within the authority of all executive

branches across the Member States. Such a Memorandum of Understanding should be acknowledged as an interim arrangement.

This two-track approach could, as noted, be triggered once the Member States have agreed on their respective roles and responsibilities in this initiative, and the overall architecture of the initiative. However, even before that phase is reached, the Member States may wish to consider creating a written instrument to memorialize the basic goals of the initiative, and parameters for their negotiation of more detailed points. Such an instrument could be in the form of a Joint Declaration or similar instrument. It could serve as a useful guide for the Member State delegations charged with pursuing this initiative. It could be reviewed on a regular basis considering reports from each delegation.

Summary recommendations

A range of potential approaches can be conceived to organize the collaboration of PROSUR Member States' ambition of increasing vaccine production in their countries with the goal of securing reliable access to vaccines for COVID-19, vaccines against future pandemics as well as vaccine to serve routine vaccination programmes. As highlighted in the diagnostic study the development and manufacture of vaccines is a long-term, high-risk effort which requires substantial capital investment and technical expertise.

This study recommends six primary strategic areas of focus for consideration by PROSUR Member States when considering a governance framework.

1. **Distribution of benefits from the initiative:** It is important that Member States agree on how benefits of the collaboration will be distributed. For example:

Equitable allocation of vaccine produced: Different models can be considered for achieving equitable allocation of vaccines – for example, pandemic vaccine may be distributed equally to all Member States; or proportionately to the need of Member State with need determined by the size of the at-risk population, the rate and level of disease transmission, among others; or proportionate to a Member State's contribution of resources to the mechanism; or special allocation to the Member State(s) that conducted clinical trials; or a criterion including all the above. The criterion may be simpler for routine vaccine needs and could be based on annual and multi-year forecasts and financing and then updated quarterly in the year of production, for example.

R&D output: Successful R&D output could also be shared with others, including other manufacturers in PROSUR member countries and beyond.

Production facility: The location of the manufacturing facility within PROSUR Member States could also be considered a benefit of the cooperation, including because of the employment it would provide, staff (the expertise and knowhow). as well as the prestige of hosting such a facility. A decision on the location(s) could be taken based on Member State decision to invest. However, if the investment is made jointly by Member States, the decision on location could be informed by a set of agreed criteria (for example, regulatory capacity/plans, size of country

in comparison with need, etc.) and taken based on inter-country negotiation, pre-feasibility analysis, or the outcome of a competitive proposal process.

Once the scope and objectives of the initiative are defined, thinking through the principles and basis for distributing the benefits of the mechanism will be clearer.

2. **Sharing of costs and obligations:** It is important that Member States agree on how costs and obligations will be shared.

Costs may relate to the creation and maintenance of a mechanism, investment in a new facility or production expansion in an existing facility, and contracting of a vaccine portfolio for supply during pandemic and inter-pandemic phases. Depending on the scope of the initiative, funding could also be needed for R&D during the pandemic and inter-pandemic phases as well.

Other cost and obligations related to the mechanism should also be agreed. These may include multi-year purchases of routine vaccines to keep vaccine production capabilities active, so they are available when needed during a pandemic; pre-financed investments; funding for R&D during the pandemic phase and potentially for the inter-pandemic phase as well; and, provision of in-kind resources, such as vaccine production from a Member State owned facility or personnel.

The costs could be distributed based on size of the at-risk population, the size of anticipated benefits to be received, or equally. Once the scope, objectives and estimated costs of the initiative are defined, thinking through the principles and basis for distributing costs and obligations of the mechanism will be clearer.

3. **Organization and structure of the initiative.** There are several ways cooperation could be organized. Two types of approaches emerged for PROSUR Member States to consider.

Aligned-coordinated approach: In this approach, Member States would align on a shared goal but act independently while coordinating activities and sharing information. This approach is easier to initiate as it is less formal and non-binding. It can deliver progress but may be less able to drive sustained action and therefore may be more suitable for less ambitious goals. An information approach may also help alignment of separate but ambitious national goals around increasing vaccine production.

Integrated approach: In this approach Member States alignment on an ambitious goal drives implementation via a single strategy with shared resources. This approach draws from higher level of commitment and obligation to drive quicker and sustained results. It would likely need higher political support and may take longer to get established. It represents a material change in the status quo.

4. **Policy and legal landscape.** The policy and legal landscape within and between PROSUR Member States could aid or hinder cooperation on regional vaccine production and the degree to which new policy or law is required to enact the desired cooperative framework agreement. These include:

Vaccine procurement. National policies around vaccine procurement are important to consider. There is likely a need for appropriate policies around delegation of procurement (e.g., to the PAHO Revolving Fund, a PROSUR Member State, or another third party), and changes to legislation that prevents at-risk procurement, as well procurement policies that give preference to locally or regionally produced vaccine, including potentially paying a price premium for such.

Regulatory. Harmonization of regulatory aspects and regulatory pathways of PROSUR Member States is important to avoid multiple regulatory reviews – which often result in delays and reduced access. For novel pandemic vaccines, this would also mean agreement on emergency use authorization processes.

Domestic industrial policies. Domestic industrial policies that provide financial support and incentives for local or regional vaccine production could help with investment decisions.

Trade policies. Trade policies that enable freedom of movement of goods between Member States are important.

5. **Formal agreements.** Once the PROSUR Member States have settled on the structure of their initiative, including the roles each Member State will play in realizing the initiative and the possible establishing of a new entity to administer any commonly held assets and obligations associated with the initiative, the structure of the initiative and all associated aspects need to be memorialized in writing. It could be wise to consider a two-track approach: while working towards a binding multi-lateral treaty, the PROSUR Member States could establish interim arrangements by way of a multi-party Memorandum of Understanding.

6. **Engagement with complementary regional initiatives.** Engaging with other regional initiatives that have complementary work underway in LAC – such as CELAC and PAHO. These offer important opportunities for collaboration to multiply efforts on areas of synergy, including on topics such as IP access, clinical trial platforms, regulatory standards, mRNA production hubs, and procurement.

The governance study is necessarily preliminary, and the considerations can be further refined once PROSUR Member States decide on how they wish to proceed. Considering these aspects can help clarify stakeholders' understandings and expectations on this initiative. Thinking through the set-up of an initiative at this early stage may inform the decision on if and how to proceed.

Read in combination with the report of the diagnostic study, this report can provide a foundation for any subsequent pre-feasibility analysis. It provides high-level direction and points out to the critical factors that will need to be considered in the subsequent steps aimed at the refinement of a vaccine self-reliance strategy for the PROSUR Member States.

Annex A: Achievements and challenges per the WHO ACT-A Strategic Review to be considered in the context of the PROSUR vaccine manufacturing cooperation and capacity expansion initiative

In September 2021, WHO published the Strategic Review of the ACT-A [29]. Following is a summary of key aspects of the assessment and recommendations for COVAX that should be considered in the context of the PROSUR vaccine manufacturing cooperation and capacity expansion initiative.

Assessment

- The Vaccines Pillar, or COVAX, took a global lens, aiming to accelerate progress across the full vaccine value chain to achieve equitable global access and uptake.
- COVAX contributed to the global push for vaccine development through broad investments into vaccine candidates and trials, and supported manufacturing scale-up.
- For procurement, COVAX took on a unique global scope aimed to maximise collective buying power for its participants while reducing the lag between low and lower-middle income countries (LMICs) and high-income countries (HICs) receiving vaccines.
- COVAX set the first-step target of reaching at least 20% coverage in participating countries, to protect frontline health workers, people above 65, and those with underlying risk factors.
- Challenges in the vaccine market have constrained COVAX's ability to meet early targets.
- As a result, the COVAX Facility has adapted its focus to better serve countries in this new environment.
- By the end of September 2021, COVAX has delivered over 319 million vaccines, with a forecast of meeting its two-billion target in the first quarter of 2022.
- To support rapid vaccine uptake at the country level, the Vaccines Pillar has set up a Country Readiness and Delivery (CRD) workstream which works closely with countries and is aligned with national Strategic Preparedness and Response Plans (SPRPs).

Key recommendations linked to COVAX

- Given the ongoing transmission and pervasive vaccine access inequity COVAX should continue operations through 2022.
- Product procurement and delivery are the most pressing priorities for countries today.
- Strengthening uptake capacity now will also support future outcomes.
- Increase and enhance L/MIC, CSO, and Community representation and involvement in ACT-A.

[29] https://www.who.int/publications/m/item/act-accelerator-strategic-review

- Re-affirm the mandate of the Facilitation Council and set up a regular communication channel with the Principals Group.

- Align around ACT-A's collective brand to support stronger and more consistent messaging to external audiences.

Annex B: Review of cooperative infrastructure and other models – full analysis

ITAPÚ

Objective and purpose. Itaipú is the world's second-largest operational hydroelectric power plant in terms of installed power. Itaipú generated 79.44 million MWh of energy in 2019, while the plant achieved a milestone in 2016 by setting a new world record for annual power generation with a production of 103.1 million MWh Itaipú Dam supplies 17% and 90% of annual electricity needs of Brazil and Paraguay, respectively.

How it is governed. Itaipú is a Binational Entity created and ruled, with equality of rights and obligations, by the Treaty signed on April 26th, 1973, between the Federative Republic of Brazil and the Republic of Paraguay. Some key points of the governance structure include:

- The Treaty stipulates that each country is entitled to half of the electricity generation capacity and electricity produced by the dam.
- Itaipú revenues from electricity sales to Paraguay and Brazil are used for three main purposes: (i) to service the debt incurred for building the dam, (ii) to pay for operations, administration, and maintenance, and (iii) to make payments to the two countries.
- Annex C of the Treaty stipulates the two main types of payments to Brazil and Paraguay, royalty payments and compensation payments.
- There is no link between both the price structure and the compensation payments. Its strategic plan has 10 objectives around energy production and use as well as social and environment issues.
- The treaty expires in 2023.
- Paraguay plans to renegotiate the terms of the treaty including in terms of royalty and compensation payments.

Why it might help inform the PROSUR study. ITAIPÚ has cooperative ownership and execution of a facility. It has long-standing, functioning, governance, and financing. Being the 2nd largest hydroelectric dam in the world, it has been well studied (ref: IMF published a paper on the "Macroeconomic impact of the Itaipú treaty review for Paraguay"). There may be lessons from the renegotiation of the treaty.

Key take-aways from ITAIPÚ for PROSUR

- The output required an initial investment and then generated resources from a shared natural resource. Much of the cooperation focused on distribution of the output and allocation of revenues generated from the output. The learnings could be relevant if PROSUR Member States jointly invest in production capacity and not only purchase contracts of doses.
- There are benefits and costs to sovereigns around the table that could go beyond the specific output of the cooperation (e.g., vaccine availability). Benefits and costs could be, for example, human resources, knowledge and expertise development, job creation, local infrastructure investments, maintenance. Overall, the benefits could be seen as a package together with the specific output of the cooperation.
- Agility in design – an automatic reset mechanism after some time agreed up front.

Amazon Cooperation Treaty Organisation (ACTO)

Objective and purpose. In the 1978 Amazon Cooperation Treaty, the eight Amazonian countries — Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela — agreed "to undertake joint actions and efforts to promote the harmonious development of their respective Amazonian territories in such a way that these joint actions produce equitable and mutually beneficial results and achieve also the preservation of the environment, and the conservation and rational utilization of the natural resources of those territories" and did so, "inspired by the common aim of pooling the efforts being made, both within their respective territories as well as among themselves, to promote the harmonious development of the Amazon region, to permit an equitable distribution of the benefits of said development among the [eight countries] so as to raise the standard of living of their peoples and so as to achieve total incorporation of their Amazonian territories into their respective national economies".

The eight countries would meet annually to discuss implementation of the treaty, with the meetings rotating among the eight and the relevant host country serving as secretariat pro-tempore for the meeting it hosted. In 2003 a permanent secretariat and organization — the Amazon Cooperation Treaty Organization — was established in Brazil "to be a permanent cooperation, exchange and information forum guided by the principle of reducing regional asymmetries among the [eight countries] through its actions, cooperating in national processes for socioeconomic progress and enabling a gradual incorporation of these vast territories into the national economies, promoting regional cooperation actions to improve the quality of life of Amazonian inhabitants, and working under the principle of sustainable development and sustainable livelihoods in harmony with nature and the environment and considering the internal laws of the [eight countries]".

In 2005, after the approval of a US$ 700,000 grant by the Global Environment Fund (GEF), ACTO, the Organization of American States (OAE) and the United Nations Environment Programme (UNEP) agreed to sign a project brief to carry out the preparatory phase of the "Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin Considering Climate Variability and Change" Project, called the GEF Amazonas Project. After the preparatory phase (2005- 2007), the proposed project was divided into three four-year phases: the first for planning and development of institutional capacity, the second for implementation of jointly identified strategic activities, and the third for strengthening sustainable and integrated water resources management in the Basin.

In 2009 the member countries issued a Declaration on ACTO with the mandate to endow the Organization with "a new and modern role as a cooperation, exchange, knowledge and joint projection forum to face the new international challenges that lie ahead". Consequently, the member countries approved in 2010 the present new Amazonian Strategic Cooperation Agenda with an 8-year implementation horizon. The New Strategic Agenda includes the vision, mission and strategic objectives of ACTO based on two axes: (i) conservation and sustainable use of renewable natural resources and (ii) sustainable development (ACTO, 2010). Phase 1 to strengthen the institutional framework for planning and executing, in a coordinated and coherent manner, e.g., decision-making, vision, institutional capacity and structure.

How it is governed. ACTO is a formally-established intergovernmental organization created under international law by the Amazon Cooperation Treaty (1978). The signatories to the Treaty were the eight Amazonian countries: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela. It has permanent headquarters and staff, and program of work. It is accountable to its Member States. In 2010, the GEF Amazonas Project was signed, prepared by the 8 ACTO members countries to formulate a consensual Strategic Action Programme based on the needs and objectives of Amazonian stakeholders (ACTO/GEF/UNEP, 2015).

- Countries: Bolivia, Brasil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela.
- Implementing Agency: United Nations Environment Programme (UNEP).
- Executing Agency: Organization of American States/ Office for Sustainable Development and Environment.

Why it might help inform the PROSUR study. ACTO positions itself as "an Organization that is internationally recognized within the eight member countries and in the international environment as a reference in regional cooperation, discussions and positions on topics of the international agenda related to the Amazon, and sharing experiences, guided by the principles of full sovereignty, respect and harmony with nature, integral sustainable development and reducing asymmetries between the nations of the region". As such, although it is not directly addressing vaccine-related international public health issues, it has created one model of a structure for regional cooperation and coordination to pursue defined public policy goals.

ACTO is a well-studied cooperation. The ambitions of ACTO were limited for a long time, then there was realization that it needed to more formalization – after 25 years, a Permanent Secretariat (in Brazil) and budget were established.

Key take-aways from ACTO for PROSUR

Inter-governmental collaboration and the importance of high-level political commitment via formal treaties in establishing a mechanism is a priority.

Initial seed money came from international organizations.

The mechanism does not govern an output per say but rather, harmonious development of the Amazon region; however, it provides an example of cross-border collaboration and cooperation.

Mekong River Cooperation (MRC)

Objective and purpose. A 4-country (Cambodia, Laos Peoples Democratic Republic, Thailand, Viet Nam) commission established in 1995 to coordinate sustainable management and development of water and related resources of the Mekong River Basin (e.g., irrigation, hydro-power, navigation, flood control, fisheries, timber floating, recreation, tourism). Cooperation is on the basis of sovereign equality and territorial integrity. Financing and utilization are determined based on the principle of equity. It defines activities and procedures for dry and wet seasons. Overall, it is well established and documented – vision, mission, agreements, structure, procedure rules, etc.

How it is governed.

- Commissioned agreements signed by Heads of State.
- Council of Ministers (at level no lower than Vice-Minister) is a decision-making body.
- Joint Committee (at level no lower than Head of Dept) recommends policy and financing decisions.
- A Secretariat drives implementation of the policy and financing decisions with a dedicated CEO appointed by the Council of Ministers.
- Rotating Secretariat location – but de facto in Lao PDR.

Why it might help inform the PROSUR study. The Commission is long-standing and acknowledged as well-performing. It defines different sets of activities and procedures for periods, e.g., dry and wet seasons. This could be relevant if PROSUR established pandemic and inter-pandemic activities.

Key take-aways from MRC for PROSUR

The importance of high-level political commitment via formal treaties in establishing a mechanism as a priority and engagement of senior political leadership.

Well-documented and transparent information on structure, procedures, etc., which have evolved over time.

A collaborative mindset is the necessary first step.

Well-organized but not distributing a specific outcome, more about use and management of a shared, natural resource.

European Council for Nuclear Research (CERN)

Objective and purpose. CERN was founded post World War II in 1954 with the ambition to unite people from all over the world to push the frontiers of science and technology for the benefit of all.

It was established as an international organization via the CERN Convention (1953). CERN has 23 Member States, with other nations from around the globe contributing to and participating in its research programmes, with the mission to provide a unique range of particle accelerator facilities that enable research at the forefront of human knowledge and perform world-class research in fundamental physics.

How it is governed. The CERN Council is the highest authority of the organization and has responsibility for all important decisions. It controls CERN's activities in scientific, technical and administrative matters. Member States have special duties and privileges. They make a contribution to the capital and operating costs of CERN's programmes, and are represented in the Council, responsible for all important decisions about the Organization and its activities. It also has Observers and cooperation agreements with a number of other countries. Under the Director-General, CERN has 4 directorates and 11 departments and employs approximately 2,500 staff. 2020 expenses were 1,157 million Swiss Francs (approx. 1.25 billion USD).

Why it might help inform the PROSUR study. CERN was established by multiple countries and is located in one country while serving many.

Analysis:

- Post World War II – it reflects a vision to unite Europe via science.
- It was considered to be a public good that, due to the expense and size, that would benefit from collaboration between many countries.
- The outputs of the entity (research) are available to everybody equally, including non-participating countries.
- The indication of success is the number of scientists that conduct research at CERN and the number of publications or references to CERN research.

- CERN has a policy of "fair return" to its Member States. Employment & procurement contracts notionally proportion to contributions. For example, it aims to award procurement contracts in proportion to member contributions.

Key take-aways from CERN for PROSUR

A public good that everyone wants but no one government can afford (except very large countries). Collaboration is a must. Triggered by major regional/global event and led by leadership at heads of state level.

The notion of "fair return" related to contributions for running the mechanism.

European Spallation Source (ESS) ERIC

Objective and purpose. ESS is a neutron science research facility under construction and in initial operations in southern Sweden. It is hosted by Sweden and Denmark and established under the EU framework as a European Research Infrastructure Consortium (ERIC) in 2015. (The facility itself is located in Sweden and the data center is hosted in Denmark.) ESS has the vision to build and operate the most powerful neutron source in the world to enable scientific breakthroughs in materials research in order to address some of the most pressing societal challenges. It is expected the most users of ESS will come from European universities and institutes and others from industry. It currently has approximately 500 employees from 50 countries.

How it is governed. ESS is organized as a European Research Infrastructure Consortium (ERIC). It is a legal entity of the EU and considered to be of European importance on a non-economic basis. The output (scientific research) will be made public and is considered to be an important aspect of society. It has 13 founding member countries who contribute to its budget and participate in the ESS ERIC Council and related committees. Member countries also contribute to the construction of ESS through in-kind contributions (through collaborating institutes /universities who, on behalf of their national governments, supply equipment, design documentation, personnel, or other services to support the construction of ESS). The user access policy is still under development. While access will be open beyond members only, there may be some element of proportionality to member contributions (see ESS ERIC Statutes, Articles 17 & 18).

Analysis. European Union had a strategy and legislative framework in place for ESS to be created. ESS was a regional and national priority. Sweden won the bid to host the ESS (over Hungary and Spain). The ESS is estimated to cost ~1.8 billion EURO to build and the host government has promised to cover 15-20 percent of the running costs.

Key take-aways from ESS for PROSUR

- Shared vision within the region.
- Cooperative model but the output is a public good with a benefit beyond the Member States only.
- Competitive process for "hosting" the mechanism.
- A public good that everyone wants but no one government can afford (except very large countries). Collaboration is a must.
- Notional return to access based on contributions to running the mechanism.

2.2.6 Consolidated key take-aways from cooperative infrastructure models

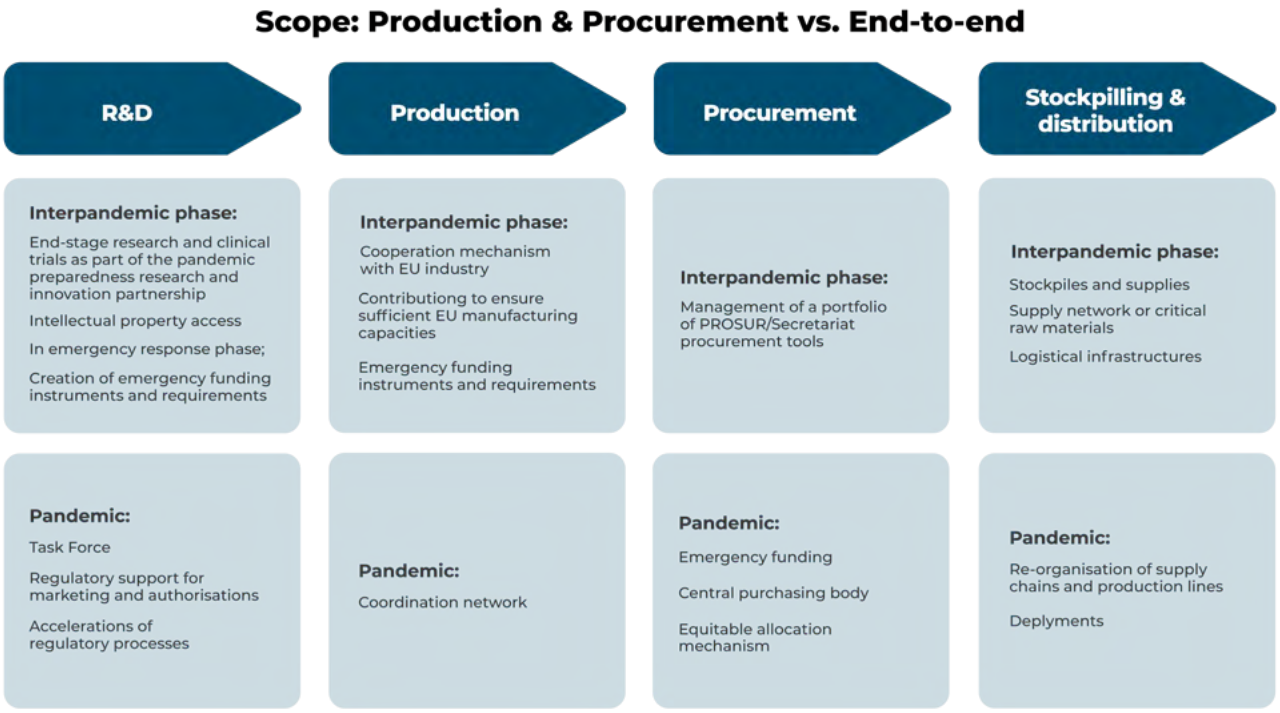
A summary of the objective, agreement type (set-up) and key take-aways of each cooperative infrastructure model is as follows.

	ITAPÚ	MRC	ACTO	ESS	CERN
Objective	Generate energy and resources for Brazil and Paraguay.	Promote and coordinate sustainable management and development of the Mekong River basin.	Promote the preservation of the Amazon basin and regulate Amazonian development through international cooperation.	Establish the brightest neutron source in the world, as a powerful tool for materials research. Enable scientists to see and understand basic atomic structures and forces at length and time scales unachievable at other neutron sources.	"Science for peace" Provide a unique range of particle accelerator facilities that enable research at the forefront of human knowledge. Perform world-class research in fundamental physics. Unite people from all over the world to push the frontiers of science and technology, for the benefit of all.
Agreement type	Treaty.	Treaty.	Treaty.	Agreements. Open science. User time somehow proportional to member contributions.	MOUs between all participating States and CERN. Open science. Employment and procurement notionally proportional to member contributions.
Structure	Legal entity. Public-private ownership. Governed via treaty between Brazil & Paraguay.	Legal entity. Cooperation between Member States.	Cooperation between Member States.	European Research Infrastructure Consortium (ERIC) Member States contributions. Host governments covering 50% of construction cost & contributing 15-20% of annual op cost. Regulated by Swedish Radiation Safety Authority.	International organization. Member States contributions.
Key take-aways	Benefits and costs to sovereigns around the table could go beyond the specific output of the cooperation – benefits could be seen as a package. Agility in design – an automatic reset mechanism after some time agreed up front.	A collaborative mindset is the necessary first step. Transparent information on structure, procedures, etc.	The importance of high-level political commitment via formal treaties in establishing a mechanism as a priority.	Cooperative model but the output is a public good with a benefit beyond the Member States only. Competitive process for "hosting" the mechanism. A public good that everyone wants but no one government can afford (except very large countries). Collaboration is a must.	A public good that everyone wants but no government can afford (except very large countries). Collaboration is a must.

Annex C: Supplementary diagrams

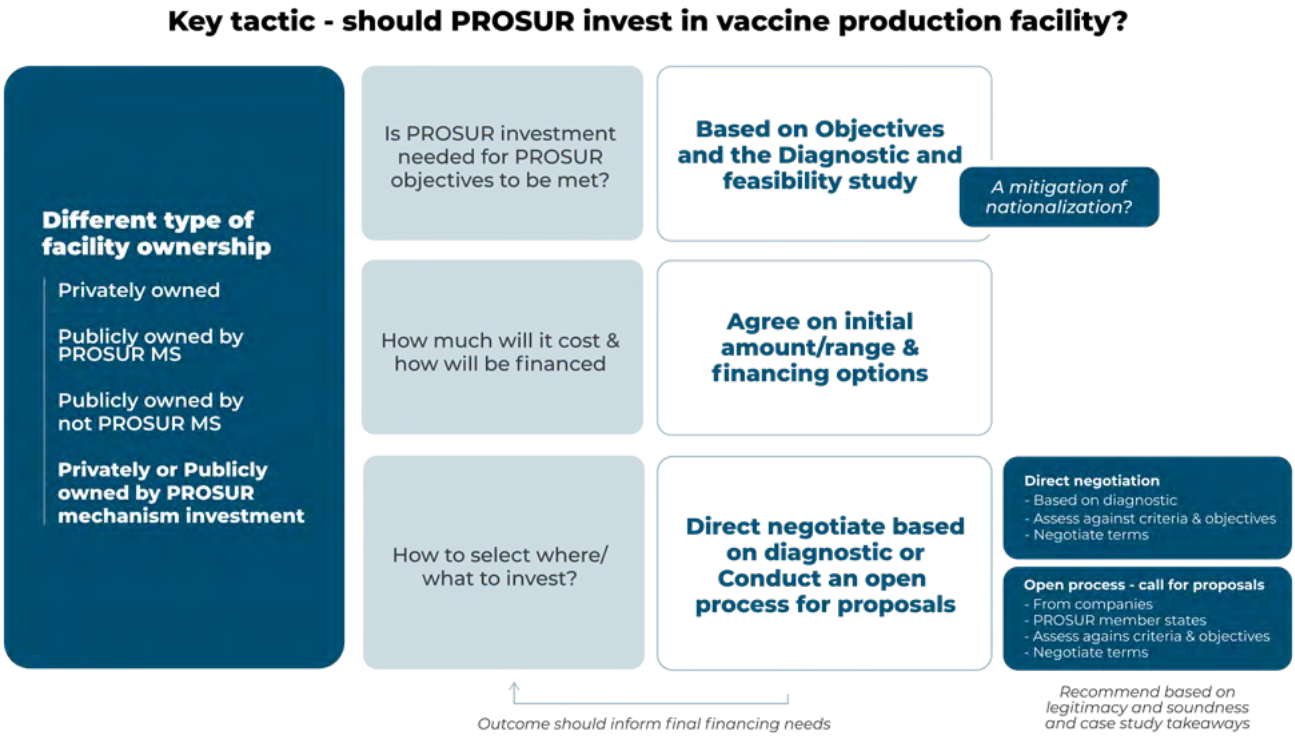
The end-to-end value-chain of pandemic vaccine production

At times, including based on learnings from the case studies, we refer to other functions given the inter-dependency of the various functions. For example, a production facility may have the capabilities and resources to manufacture pandemic vaccine, but it may not have access to the R&D or IP and therefore may be idle. Hence, a link to R&D is key to achieving the goal of pandemic vaccine manufacturing. Similarly, a production facility that is dormant except when there is a pandemic, may not be able to produce as quickly as the capabilities (know-how, raw materials, vials, etc.) would need to be brought in. Therefore, while the focus of the study is governance of pandemic vaccine production, other aspects are mentioned given the influence they may have on achieving a goal of timely access to pandemic vaccines.



Example decision tree for considering public sector investment in vaccine production facility

If there is insufficient pandemic vaccine production capacity in PROSUR Member States currently, one option to increase capacity is for a joint investment — a decision that could be informed by the diagnostic and pre-feasibility studies. If investment and ownership is included in the objective, below is a decision-tree to help think through the options and costs involved. Some key points to be considered include: (a) the amount of the investment and objectives; and (b) whether the decision on who to contract would be selected based on direct negotiation informed by the diagnostic or an open process for proposals. A version of a “decision tree” for considering possible public sector investment in a vaccine production facility is as follows.



Example of an Option B organization: Integrated, "More commitment more benefit"

The following is an example structure for a more formal governing mechanism that oversees objectives, strategy, finances, and operational aspects of a cooperation. It is a multi-layered structure to separate political, strategic, operational, and technical decisions. It is designed with a Minister-level Steering Council (as is the case with the COVAX, EU, AVAT models) as the highest-level decision-making body. Decisions on membership, strategy, budget, and critical execution matters, such as equitable allocation criteria, would reside with the Steering Council (that the Council may choose to delegate). Reporting into the Steering Council is a Working Group comprised of Heads of Departments. The Working Group reviews analyses and drafts decisions that proceed to the governing level. A Secretariat also reports to the Steering Council, it has an executive head and supports the work of the Steering Council and Working Group. The Secretariat is also responsible for communication and reporting. A Trust (or the Secretariat as the Trustee) is needed to oversee and manages a budget to fund the work and any investments to increase regional vaccine production. The Secretariat/Trustee can make purchase and commitments with the budget, based on the principles and criteria established by the Steering Council. The set-up should operate under the principles of inclusion, transparency and good management.

This set-up is similar to the COVAX/Gavi set-up: The Governing layer at COVAX/Gavi is comprised of Ministers of Health, Ministers of Development of donor countries, Executive Heads of partner organisations (WHO, UNICEF, etc.), and representatives of other donors and technical agencies and civil society organisation. Gavi has three governance committees ("Working Groups" in the above schematic): Programme & Policy, Financial & Audit, and Market Sensitive Decisions. These committees are comprised of representatives of member organisations and make recommendations to the Gavi Board ("Steering Council" in the above schematic). Gavi has a Secretariat (of approximately 200 people); however, additional staff were brought on to manage and operationalise COVAX. Agreements with members (countries and partner) are put in place bilaterally via the Secretariat.

Annex D: Feedback from PROSUR Member States

Feedback was received from PROSUR Member States via a survey, during the four workshops and individual country consultations.

Survey feedback

A survey was sent to PROSUR Member States by the IADB to gather feedback on the Diagnostic and Governance studies. The questions related to the governance study focused on three areas: (i) examples of cooperative frameworks to be included in the study, (ii) initial views on what aspects should be considered in governance framework – or excluded, and (iii) what good cooperation looks like.

Four of the eight PROSUR Member States provided feedback per the below (as translated). The feedback showed a range of priority issues – from ensuring equity in access to support to investment and harmonization in regional vaccine production.

- "It is considered that there should be a committee that is responsible for coordinating and representing all participating countries in the framework of cooperation for the production of vaccines, in order to ensure equity in access to the technologies that are produced." – Colombia.

- "Equity and access to health technologies for all nations participating in the mechanism" – Colombia.

- "Strengthen communication actions regarding the importance of vaccination and its benefits, with a view to improving vaccination coverage; Strengthen and maintain information systems to promote the qualification of vaccination data and dissemination of secure information; Preparation and Implementation of timely responses in dealing with emergency situations in public health." – Brazil.

- "Once Brazil and Argentina have already been approved as HUBs by PAHO/WHO as platforms for the technology transfer of messenger RNA, the other countries can also develop. Search for the Harmonization of the regulatory system and quality assurance to make technology transfer-viable." – Peru.

- "Generation of innovative legal frameworks for public-private partnership. Generate an ecosystem with synergy at the regional level that allows to improve the capacity of all countries according to their individual strengths and strengthen their weaknesses." – Peru.

- "Regional cooperation in the manufacture of vaccines is a process of extreme relevance in that it enables the provision of vaccines in a timely manner to the population. This process, however, must be well articulated and properly aligned among those involved, in order to ensure the resources necessary for the sustainability of this offer." – Brazil.

Feedback via consultations on draft governance options

Calls were held with Brazil, Colombia, Paraguay and Peru to get feedback on the first draft proposal of options for a governance framework for cooperation on pandemic vaccine production. Representatives from Ministry of Health and Ministry of Foreign Affairs were most commonly on the calls and the feedback between countries varies in terms of topic covered and

points of view. Below is a summary.aspects should be considered in governance framework – or excluded, and (iii) what good cooperation looks like.

Timing: It is too early to discuss governance before the objectives have been decided. Take a step-by-step approach.

- Without **agreement on the WHAT** and understanding the diagnostic, it's **premature to talk about governance** and issues like rules and obligations.
- We should take things in stages – **a step-by-step approach**. To see what engagement countries want, to build trust and compromise.
- Keep **different options** on the table in discussion with countries. Identify the concrete **benefits of working together** and what countries can bring to the project.

Set-up: Lean, work cooperatively

- Find a way to have a lean set-up. Perhaps IADB can be Secretariat as they support PROSUR.
- Maybe we can think about a **structure without legally establishing it. Create space for decision-making committee under the umbrella** of PROSUR.
- A governance framework needs to include **goals, strategic mandates, financial incentives and be established with structures and processes and could cooperate with other organizations and international partnerships**.

Working together: Build on existing mechanisms, non-exclusive, create new alliances

- There are **cooperation mechanisms in place that can be strengthened** - and that can create new alliances that may facilitate the demand expectations so we can meet the expectations.
- We may need to **adapt and take a phased approach** – during the early phase of working together, working groups and shared workplans may be the right approach - and then move toward something more binding.
- It should be **open to all LAC countries** – there isn't any reason to exclude countries. We should also consider working with countries outside of the region if they want to help.
- We should see how this differs from the **MERCOSUR** Ad Hoc Committee to Promote the Expansion of Regional Production Capacity of Medicines, Immunizations and Health Technologies **(CAHECPR)**.

Mutual obligations: From collaboration via working groups to binding obligations

- **Sustainability** is important – if we want something to work, we need to use it throughout - and therefore mutual obligations and binding governance will be important.
- If production is built and meets the quality level, countries **need policies that prioritize procurement from the facilities**.
- This must be linked to something on the way of a binding agreement – for countries to **take**

on responsibilities and honor their commitments and give stability moving forward.

- Considering the type of work – we need agreements at country level.
- The best option is probably a binding agreement but if there isn't a real possibility of reaching agreement, we should move on something more realistic.
- We don't want it to be a temporary situation. It should deliver clear benefits.
- **Perhaps adapt during different phases, progress. In any case, reflect the objective**.

Scope: Consider from R&D to production to regulatory

- If production is not l**inked to scientific capacities**, it will fall short. We should also invest in appropriate regulations.
- We need it to be **from R&D to production**.
- It will need **innovation in regulatory authorities and financing**.
- Work with CELAC and PAHO – combine with their efforts to **find synergies on health self-sufficiency and vaccine production**. There seems to be a major focus on procurement more so than production.

Financing: Different finance for interpandemic and pandemic phases. Innovative financing

- Explore ideas on financing including with Ministries of Commerce on how to blend finance - from countries, investments and corporation.
- Be clear on **how financing could work for interpandemic phase and pandemic phase. Including procurement**.
- Our public goods initiative within the trade framework could also be a window to give this cooperation focus and example or link to funding.

Impact of feedback on timming of the governance study

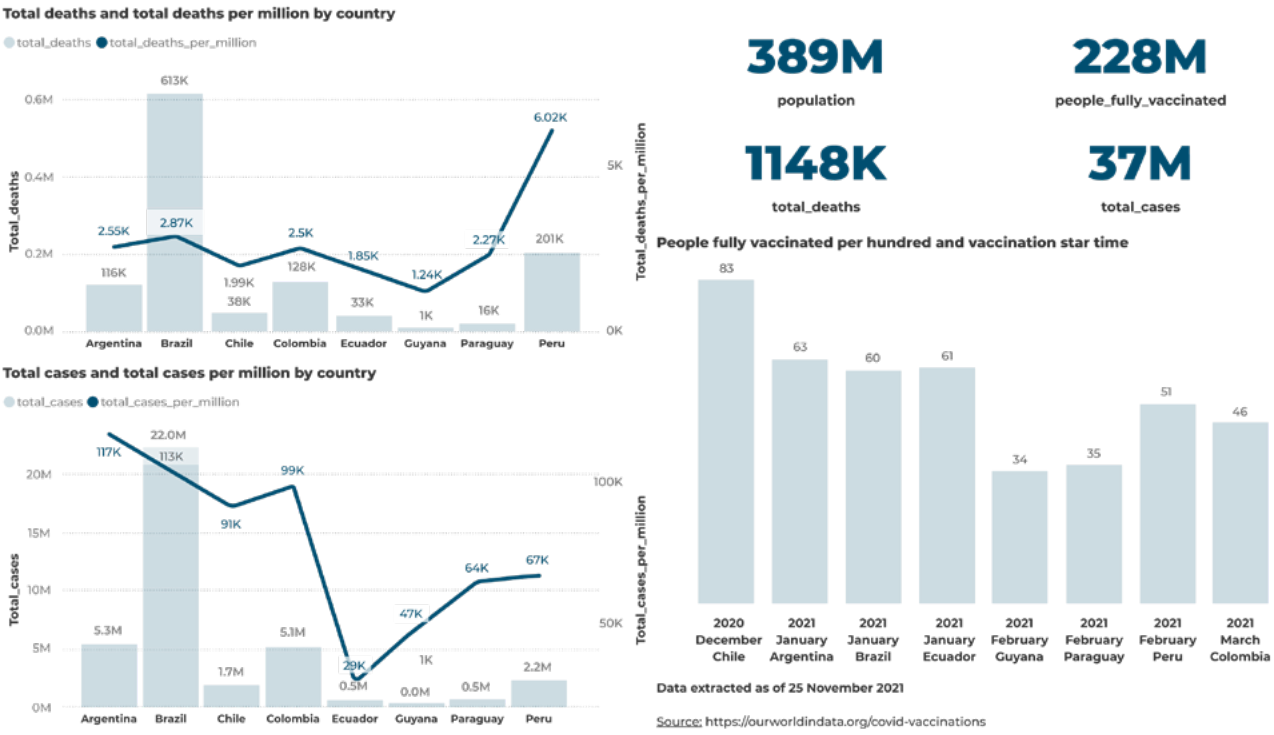
The feedback was incorporated into the drafting of the governance frameworks. A key adjustment was around the set-up and the inclusion of a non-binding way of working (e.g., sharing of workplans, working via existing working groups, etc.) as an option.

The most impactful feedback was by one Member State that asked for the discussion on governance to be put on hold until the results of the Diagnostic study had been shared and until there was agreement on whether Member States should work together on a shared agenda for increasing pandemic vaccine production – the WHAT.

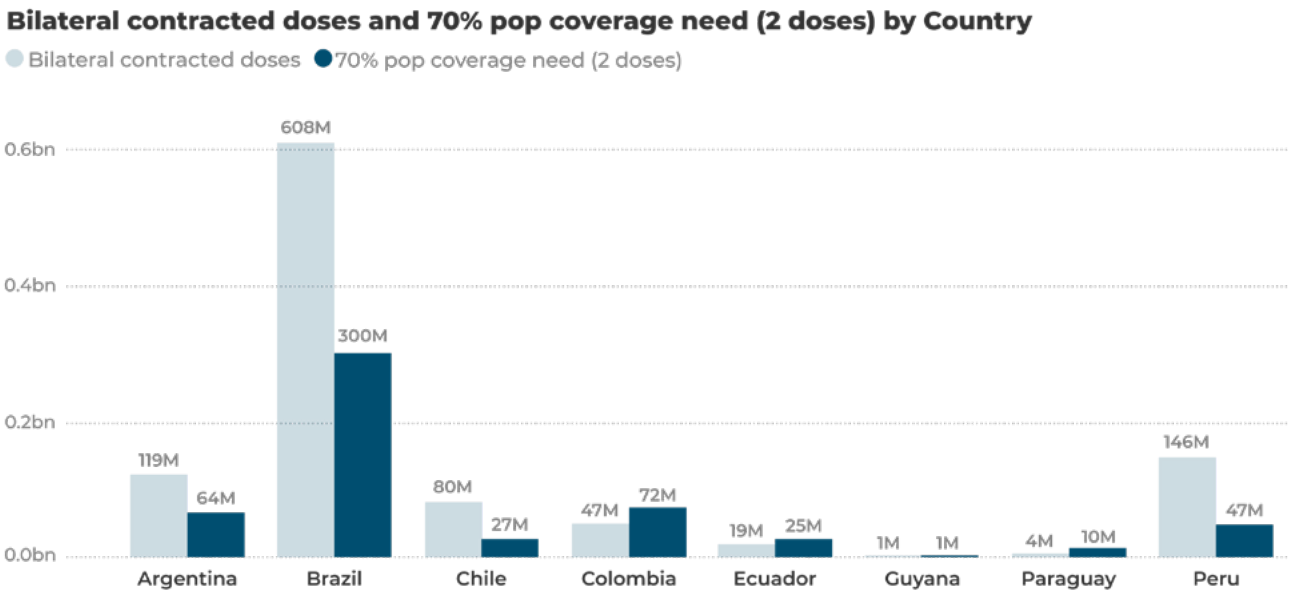
As a result, it was agreed with IADB and PROSUR Member States to move any further consultations on governance to 2022, after the conclusion of the Diagnostic and following the Public-Private Forum.

Annex E: Snapshot of COVID-19 and vaccination in PROSUR Member States

The following section provides analysis on the impact of COVID-19 on PROSUR Member States, vaccination status and vaccine procurement / contracting, such as channel for securing COVID-19 vaccines, manufacturers and platforms, as of November 2021. Overall, there is a mix of vaccines by different manufacturers and different platforms in use in the region and within countries.

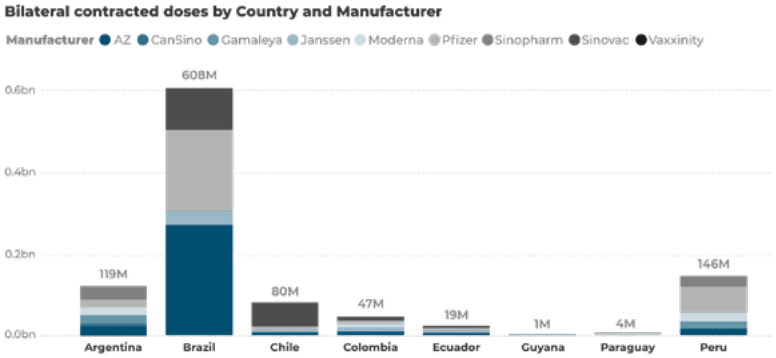


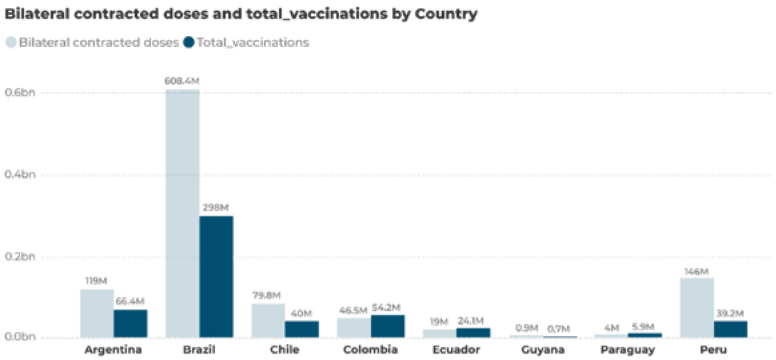
- Brazil has the highest COVID-19 death toll in the region due to a combination of population size (55% of PROSUR) and relatively high death rate per capita.
- Peru has the highest death rate in the region of 6 thousand per million people – this is twice as high as the next highest which is Brazil.
- Brazil has the highest caseload in the region due to a combination of population size (55% of PROSUR) and relatively high caseload per capita.
- Argentina has the second largest number of cases driven by a combination of population size and the highest case incident per capita in the region.
- Chile started vaccination the earliest in the region (December 2020) and now has the highest full coverage rate at 83% of population.
- There may be a correlation between starting to vaccinate early and current coverage.

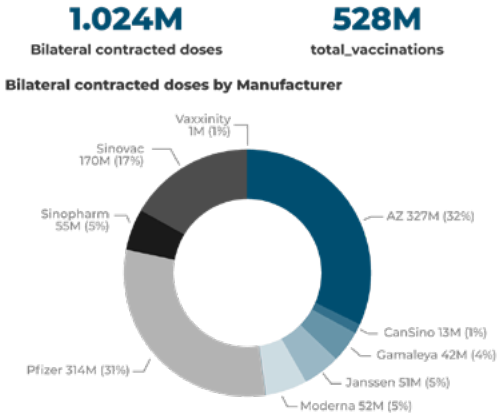


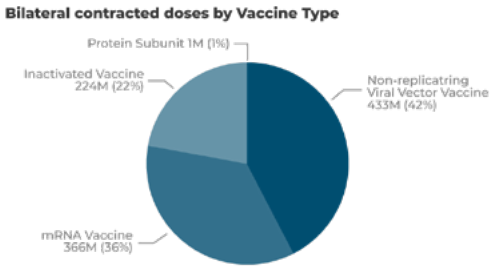
- Brazil, Peru, Argentina and Chile have bilateral vaccine contracts to cover significantly more than 70% of population.

- Columbia, Ecuador, and Paraguay do not have bilateral contracts in place to cover 70% of population however seem to draw the balance from COVAX, regional contracts, and donations.







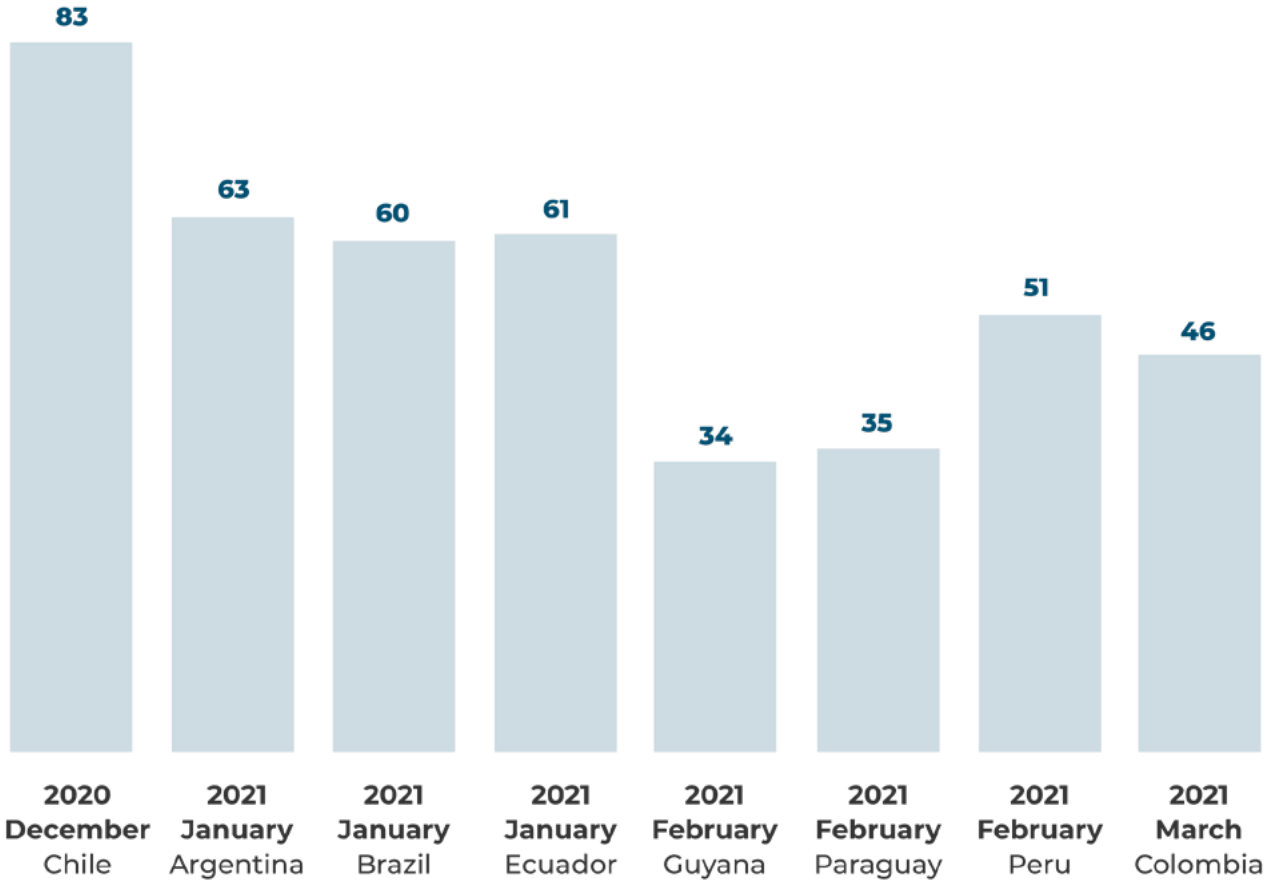


- PROSUR Member States sources from multiple manufacturers (up to 7) across a mix of platforms.

- The ‘portfolio’ is fairly evenly spread across Viral Vector (42%), mRNA (36%), and Inactivated Vaccines (22%).

- AZ, Pfizer, and Sinovac (3 out of 9 manufacturers) cover 80% of contracted doses.

People fully vaccinated per hundred and vaccination start time



Data extracted as of 25 November 2021

Source: https://ourworldindata.org/covid-vaccinations


PROSUR