ECONOMIST IMPACT

The vaccine ecosystem

The Vaccine Ecosystem policy briefing paper: distribution, logistics, and supply chain management

Resiliency throughout distribution networks, logistics and supply chain management must be improved to ensure equitable and rapid worldwide protection from vaccine-preventable diseases.

We have conceptualised the ecosystem as five inter-related pillars, as outlined in our framework report *Towards a stronger Vaccine Ecosystem: building resilience beyond covid-19*. Based on our report and a roundtable discussion with experts in the field, this briefing paper presents the key actions needed to improve the fourth pillar: distribution, logistics, and supply chain management. This document is a broad overview of a complex topic, and more work is needed to address these and other issues in greater detail.

Key policy takeaways

More effective and better coordinated vaccine distribution, logistics, and supply chain management requires action from:

- **National and sub-national leaders:** Streamlining data sharing and simplifying export and import of vaccines, raw materials for R&D and manufacturing as well as ancillary supplies.
- **International, national, sub-national leaders, and public health bodies:** Identifying trusted third-party entities to provide dynamic vaccination and logistical data and incentivise development of infrastructure to maintain flexible vaccine manufacturing capabilities.
- **Private sector companies:** Coordinating efforts relating to vaccine development early in the process to improve synchronisation of vaccines with delivery systems and minimise wastage while increasing sustainability and encouraging data sharing.
- **Health ministries and public health bodies:** Implementing policies to promote sharing of vaccination data and leading efforts to educate the public on the importance of supply chains in vaccine development and delivery.

Data systems and inventory management

Vaccination data systems are chronically underinvested, lacking coordination and transparency across governmental jurisdictions and between public and private entities.[1] Improved governance can enhance data systems, data sharing, data transparency, and inventory management and can promote equitable distribution through the sharing of best practices. This can be achieved by the following actions:

- Updating data systems for government agencies and public institutions to bring them on par with the data systems of medical supply and pharmaceutical firms.

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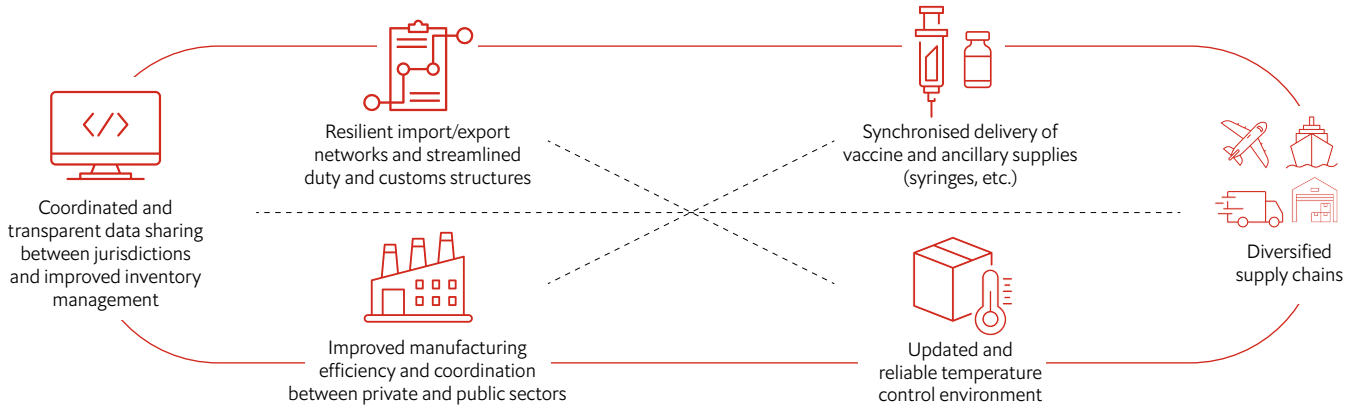
The Vaccine Ecosystem: Vaccine Distribution, Logistics, and Supply Chain Management



- Adjusting confidentiality, regulatory and antitrust standards/ regulations to encourage data sharing between companies and with the public sector through a trusted third party entity.
- Increasing research and development on data sharing techniques, inventory management, and the creation of a framework for implementation of new technologies.
- Implementing the International Organization for Standardization's (ISO) recently developed models for supply chain data sharing to promote collaboration between and within the private and public sectors.[2]

Strengthening supply chains and emergency management plans

Countries, sub-national jurisdictions, and private companies have neither clear nor coordinated mechanisms to share vaccine supply chain data and they lack adaptive emergency preparedness plans. This can be achieved by the following actions:

- Adapting and designing emergency preparedness plans in coordination with other ecosystem partners. These plans should be systematically tested to ensure they are robust and can adapt to the changing demands of logistics, distributions and suply chain needs during a public health emergency or extreme weather event.
- Strengthening the infrastructure and building strategic public-private partnerships to address unmet needs.
- Prioritising supply chains for vaccines and ancillary components and equipment during a pandemic.

Synchronisation of manufacturing

Manufacturing facilities should be built to support the wider distribution network needed to ensure vaccines and ancillary supplies are produced and made available to all who can benefit from them.[1] Actions to support this include:

- Coordination across manufacturing in development of vaccines and ancillary supplies (e.g. needles and syringes), and delivery logistics to simplify distribution while maintaining independent innovation.
- Identifying a mutually agreed upon sychronisation agency with the goal of fostering agile production able to adapt to satisfy demand and produce "just in time" vaccine products more quickly.
- During a public health emergency use existing manufacturing capacity data (and predictive software) to anticipate manufacturing demand.
- Increasing investment in forecasting technologies to reduce oversupply and the number of products wasted due to spoilage or expiration. Better forecasting can also alleviate problems stemming from undersupply by getting products where they are most needed.

Adapting import and export networks

Outdated trade policies, protectionism, human error, and poor trade integration can delay export and import of vaccines and ancillary supplies.[1] Import and export networks can be more resilient to respond to large scale vaccine needs if the following actions are taken:

- Streamlining tariff and duty structures across countries for vaccine related supplies help importers and exporters better anticipate associated costs and timing.
- Identifying an internationally recognised body to maintain a dynamic list of scannable Stock Keeping Units (SKUs) for vaccines, syringes, and associated medical products to ease transport across borders.

Infrastructure and environmental impact, including temperature control systems

Current inefficiencies in vaccine delivery infrastructure lead to unnecessary waste and negative environmental impacts, such as landfill contribution. A more efficient and sustainable vaccination ecosystem, that reduces waste, can be achieved by these actions:

- Coordinating shipping and storage temperatures (cold chain) between companies to simplify the logistics processes and reduce vaccine spoilage and cost burdens for different storage temperature requirements.
- Providing incentives to develop sustainable vaccine packaging, increase reuse, and encourage suppliers and distributors to promote a more sustainable vaccine ecosystem.

Building a better Vaccine Ecosystem

Maximising the many opportunities to strengthen distribution, logistics and supply chain management requires collaboration and consensus building. This policy briefing paper is a step towards building a better Vaccine Ecosystem.

[1] The Economist Group. Towards a stronger Vaccine Ecosystem: building resilience beyond covid-19. The Economist Group; 7 October 2021. Available from: vaccineecosystem.economist.com/the-vaccine-ecosystem--framework-report/.

[2] Oclarino R. Keeping up with logistics. ISO, 30 November 2021. https://www.iso.org/news/ref2767.html. Accessed on 25 March 2022.