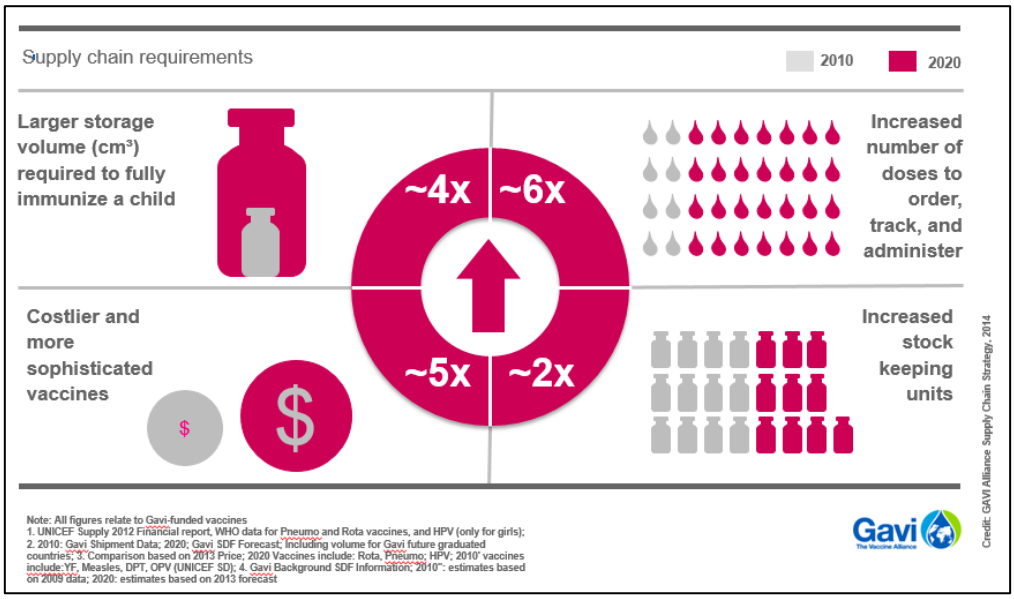
Supply Chain System Design

An Evidence-based, Continuous Improvement Approach toward Supply Chain Performance

Is it possible to introduce a new vaccine next year with the existing immunization supply chain? What needs to change? ***What happens*** to the planned availability of vaccines if there is an earthquake? ***Can the health system support*** greater outreach efforts, or do other areas of the supply chain need to be more efficient to support reaching the last mile? These kinds of decisions require data, analysis, and a clear picture of the end-to-end supply chain, including the inherent relationships between storage, distribution, inventory, and presentation. Behind of each of these questions is whether the current supply chain system is "fit for purpose" and answering these questions is the subject of Supply Chain System Design.

BACKGROUND

Since vaccines were first introduced at scale in low-income countries more than 35 years ago, conditions, capabilities, and circumstances have evolved. Population and birth rates have changed, new vaccines have been and will continue to be introduced, currency and politics fluctuate, and new technologies and supply chain practices are constantly being developed.



All of the inputs are different, yet the supply chains that support the programmes are mostly the same – the same physical network and infrastructure, same distribution plans, same inventory policies, and same reporting mechanisms. Inefficient and poorly performing supply chains have been linked with delayed new vaccine introductions, excessive waste of expensive vaccines, and reduced availability of vaccines at the point of immunization. ***The supply chain is becoming a barrier to coverage and children's health when it should be an enabler***; ensuring the efficient movement of immunization products from arrival in country to vaccine administration that is supported by infrastructure, tools, people, and processes, and resulting in a transparent, adaptable, and sustainable solution to disruptions.

THE CHALLENGE

Supply chain systems must adapt to changing circumstances to remain relevant and to support better immunization access and coverage. Using a System Design approach to analyze the immunization supply chain (iSC) can bring those needed transformative changes. System Design is a process which creates the plan, or blueprint, for how the iSC should run, including how all of the components of the supply chain system (financial requirements, programme requirements, physical network, transport routes, storage, human resources, asset management, planning, monitoring, data, etc.) fit together and interact. System design is critical for the required transition to and sustainment of new supply chain models which can better meet the rapidly changing needs of current immunization programmes.

Supply chain systems must adapt to changing requirements, challenges, technologies, opportunities

SYSTEM DESIGN CONCEPT

WHAT

(Noun) A continuous improvement approach that is evidence-based, measuring KPI's that are both quantitative (e.g., product availability) and qualitative (e.g., risk, community will);

*...Encompassing a holistic, **system** approach that incorporates people (stakeholders, decision-makers, and other contributors), activities, processes, products, infrastructure, money, incentives, and other related systems in their unique contexts.*

*...Informing decisions in the **design** or blueprint of a supply chain plan, recognizing the as-is and to-be state by illustrating trade-offs, using local knowledge, best-practice, and curiosity to outline, prioritize, and implement supply chain alternatives;*

HOW

A system design approach can help answer these questions using the following steps:

1. *ANALYSIS and RECOMMENDATIONS*
   a. ***Advocate and Introduce** the concepts to stakeholders and decision-makers to clarify scope, interest, and opportunities*
   b. ***Model, Validate, and Optimize** the existing supply chain, potential future needs, and analyze scenarios to highlight improvements*
   c. ***Prepare an action plan** that reflects known barriers, stakeholders, funding and risks*

2. *PHASED IMPLEMENTATION*
   a. ***Implement** the recommendations of the plan using a targeted, phased approach*
   b. ***Evaluate** the project and decide how to expand the implementation*
   c. ***Expand** the implementation, model and optimize a new set of questions*

It can be a cyclical process. Each stage can redirect analysis back to an earlier stage. For example, while validating an optimal supply chain design, the need to procure additional cold chain equipment may not align with procurement funding cycles, requiring further rounds of analysis in Modeling and Optimizing.

THE WAY FORWARD

The next-generation iSC would be more responsive, stable, and efficient, which in turn elevates the programme performance and improves health outcomes. This fundamentally shifts the way vaccines are managed and delivered to communities. The implemented plans can look different from country to country, and even within a country, to include strategies such as informed push, integration, segmentation, outsourcing, and distribution loops, to name a few. System Design is an approach towards creating and maintaining a next-generation iSC.

So…Is it possible to introduce a new vaccine next year with the existing immunization supply chain? This question does not go away under a transformed, next-generation iSC. Nor does a single supply chain redesign project make questions like these irrelevant. Instead, a system design approach, employed on a routine basis, delivers more confident, evidence-based answers in support of a robust and flexible supply chain.

To learn more, email sd.iscSystemDesign@unicef.org.