



Review

Seizing market shaping opportunities for vaccine cold chain equipment [☆]Tara Azimi ^a, Lauren Franzel ^{b,*}, Nina Probst ^c^a McKinsey & Company, 55 East 52nd Street, 21st Floor, New York, NY 10022, United States¹^b Gavi, the Vaccine Alliance, Chemin des Mines 2, Geneva 1202, Switzerland^c McKinsey & Company, Place de Cornavin 7, Geneva 1201, Switzerland

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ABSTRACT

Gavi, the Vaccine Alliance, supports immunisation programmes in eligible countries to reach children with lifesaving vaccines. Dramatic improvement in the scale and performance of current cold chain systems is required to extend the reach of immunisation services - especially for children living in remote locations - to advance progress towards full vaccine coverage. Achieving these improvements will require a healthier market for cold chain equipment where the products meet user needs, are sustainably priced, and are available in sufficient quantities to meet demand. Yet evidence suggests that the cold chain market has suffered from several failures including limited demand visibility, fragmented procurement, and insufficient information exchange between manufacturers and buyers on needs and equipment performance. One of Gavi's strategic goals is to shape markets for vaccines and other immunisation products, including cold chain equipment and in 2015, Gavi created a new mechanism - the Cold Chain Equipment (CCE) Optimisation Platform - to strengthen country cold chain systems by offering financial support and incentives for higher performing CCE. The main objective of the CCE Platform is to get more equipment that is efficient, sustainable, and better performing deployed to every health facility where it is required at an affordable price. To achieve these objectives, Gavi is putting in place tested market shaping approaches and tools adapted for the CCE market: the development of market strategies or 'roadmaps'; improvement of product performance through the development of target product profiles (TPPs); strategic engagement with CCE manufacturers and countries to enhance information sharing; and tailoring procurement tactics to the CCE market. These approaches and tools will allow for increased demand and supply of higher-performing, cost-effective and quality products. By strengthening immunisation systems with improved cold chain equipment, Gavi countries can begin to address the underlying problems limiting vaccine availability and improve the coverage and equity of vaccines.

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Abbreviations: CCE, cold chain equipment; EPI, expanded programme on immunisation; PIS, product information sheets; PQS, performance quality and safety department of world health organization; SDD, solar direct drive; TCO, total cost of ownership; TPP, target product profile; UIFP, user-independent freeze protection; UNICEF, united nations children's fund; WHO, world health organization.

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¹ McKinsey & Company worked with Gavi on the design and the preparation to launch the Cold Chain Equipment Optimisation Platform.

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1. Introduction

Strong and efficient supply chains – equipped with reliable cold chain equipment (CCE) – are vital to reach children with lifesaving vaccines that protect them against deadly diseases, such as tetanus, hepatitis B, polio, and measles. To ensure that vaccines are widely available to children and potent throughout the entire supply chain, each country's immunisation programme needs access to high-performing and well-maintained cold chain equipment, such as refrigerators and cold boxes. The reality today is that cold chain quality and reach is limited. This is driven by, among other factors, funding constraints, issues in installation and maintenance, and market failures, such as insufficient demand visibility, fragmented procurement, and insufficient information exchange between manufacturers and purchasers. Gavi, the Vaccine Alliance, with analytical support from McKinsey & Company, has estimated the effectiveness of vaccine supply chains across countries eligible for Gavi support.² It has found that 20% of targeted health facilities in Gavi-supported countries still lack cold chain devices, and therefore immunisation services may not be offered regularly or on a predictable schedule. Where cold chain does exist, it is often unreliable in performance and expensive to operate. Moreover, as illustrated in Fig. 1, across facilities with cold chain equipment, up to 20% of installed devices are broken and over 50% of the equipment is poor-performing or older generation,³ which increases the risk of exposing vaccines to temperature excursions and often imposes higher operating and wastage costs.

Dramatic improvements in the scale and performance of current cold chain systems is required to extend the reach of immunisation services, especially for children living in remote locations, and to advance progress towards full vaccine coverage. Achieving these improvements will require a healthier market for cold chain equipment – where the products meet user needs, are sustainably priced, and are available in sufficient quantities to meet demand. In 2015, the Cold Chain Equipment Optimisation Platform was designed and launched to provide an opportunity for countries and manufacturers to work together to improve the vaccine cold chain. The aspiration of the Platform is to equip up to 90,000 facilities with upgraded CCE and extend CCE to 45,000 currently unequipped facilities over the next 5–7 years.⁴ This strengthening of the cold chain in Gavi countries will contribute to increasing vaccine coverage for some of the world's hardest to reach populations.

2. Market shaping for cold chain equipment

One of Gavi's four strategic goals is to shape markets for vaccines and other immunisation products, including cold chain equipment. Over the past several years, Gavi⁵ has analysed the CCE market⁶ and

² Estimation for the fifty-five countries supported by the CCE Optimisation Platform (excluding India)

³ Poor-performing or older generation equipment includes, for example, absorption refrigerators and solar refrigerators with battery. This categorisation also includes domestic refrigerators and equipment that is not user-independent ("Grade A") freeze protected to prevent freezing of vaccines.

⁴ Estimations for 55 countries eligible for Platform funding (excluding India)

⁵ With support from McKinsey & Company

⁶ Including interviews with country decision makers, manufacturers and implementation partners

its assessment to date suggests that the cold chain market has suffered from several failures. These include very limited demand visibility, fragmented procurement, and insufficient information exchange between manufacturers and buyers on needs and performance feedback. These market conditions can make production planning and inventory management unpredictable resulting in higher costs and prices. From the perspective of a buyer, i.e., a country, new innovation and improvements in pricing might not be visible or well understood. As a result, buyers often have to make decisions with insufficient and/or outdated information.

3. Setting market shaping goals

The Cold Chain Equipment (CCE) Optimisation Platform is intended to strengthen country cold chain systems by offering financial support and incentives for adopting and maintaining higher-performing CCE. The main objective of the CCE Platform is for every vaccination facility to be equipped with efficient, sustainable, reliable, and affordable equipment. The Vaccine Alliance will achieve this by:

- Incentivising manufacturers to accelerate innovation, by aligning technology requirements in line with the World Health Organisation (WHO) Performance Quality Safety (PQS) target product profiles (TPPs)
- Stimulating demand by increasing and pooling resources for CCE procurement
- Providing greater visibility on supply and demand to allow suppliers to plan production and give country decision-makers better information so that they can make more informed equipment choices.

To address the unique needs of the CCE market Gavi aims to:

- **Stimulate demand and supply of higher-performing, cost-effective and quality products** that meet specific technology requirements of Gavi-supported countries by increasing demand visibility, improving information exchange between manufacturers and buyers, financially supporting equipment that meets Gavi's requirements, and including focus on the total cost of ownership, which considers the costs over the lifetime of the device, including capital expenses (e.g. procurement price) plus operating expenses including maintenance and energy costs.
- **Minimise costs of devices and services** by implementing tailored procurement approaches, using financing levers to de-risk manufacturer production planning, improving price transparency and strengthening the installation and maintenance procedures.
- **Promote continuous innovation** by leveraging country and partner (e.g. UNICEF, WHO, PATH, CHAI) feedback mechanisms to share user needs with manufacturers and WHO Performance Quality Safety (PQS) through a continuous 'feedback loop'.

4. Market shaping approaches and tools

To achieve these objectives and improve the efficiency and sustainability of supply chains, the Vaccine Alliance is putting in place five key market shaping approaches and tools for CCE. While these

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