



PATH/Doune Porter

KEY MESSAGES FOR  
POLICY- AND DECISION-MAKERS

## Next-generation immunization supply chains are needed to improve health outcomes



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Starting at the Last Mile

*The following key messages were developed with input from colleagues at the WHO/UNICEF Supply Chain Hub, John Snow, Inc., VillageReach, the Bill & Melinda Gates Foundation, the Clinton Health Access Initiative, and Gavi, the Vaccine Alliance and coordinated by PATH. They are intended to unite partners and stakeholders in a common language around immunization and health supply chain strengthening and may be used freely by all partners when communicating about immunization supply chains issues and solutions.*

# Next-generation immunization supply chains are needed to improve health outcomes

## EXAMPLE

By 2030, the use of both pneumococcal and rotavirus vaccines could avert more than 11 million child deaths in Gavi-eligible countries.<sup>1</sup>

## 1. Supply chains play a critical role in improving health, saving lives, and reducing under-five mortality.

- Enormous investments have been made to ensure that low- and middle-income countries have access to safe and effective vaccines—protecting communities against highly prevalent infectious diseases, including pneumonia, diarrhea, meningitis, and cervical cancer. These vaccines are dependent on the people, equipment, and systems in place to get them from the manufacturer to the most remote communities.
- Until immunization supply chains can safely and reliably manage, store, transport, and deliver vaccines to all people, immunization and child and maternal health services will fall short of their full potential.

Of the 75 countries that have completed at least one World Health Organization (WHO) Effective Vaccine Management (EVM) assessment since 2000, only 14\* are meeting the globally accepted WHO EVM standards (composite score above 80%).<sup>2</sup>

\*The 14 countries with an EVM composite score above 80% include: Afghanistan, Armenia, Moldova, Rwanda, Albania, Burkina Faso, Malawi, Sri Lanka, Tanzania, Uzbekistan, Vietnam, Zimbabwe, Yemen, and Sudan.

Photo: Lori Sweningson



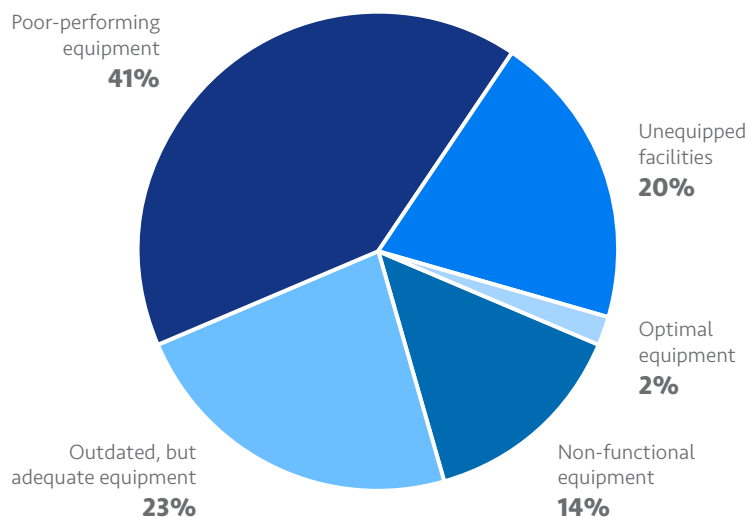
## EXAMPLE

In 2014 and 2015, the EPI program in Pakistan was forced to discard 1.3 million doses of pentavalent vaccine—worth US\$3.4 million—when vaccine vial monitors indicated exposure to excessively high temperatures.<sup>3</sup>

## 2. Ambitious global health efforts are transforming immunization services and placing new demands on immunization supply chains.

- Immunization supply chains—the system of people, infrastructure, and equipment required to deliver vaccines from manufacturer to child—were first developed 30 to 40 years ago when immunization programs were much smaller and vaccines much less costly.
- Over the past 30 years, vaccination costs have risen six-fold per person,<sup>1</sup> yet investments in supply chain systems have remained stagnant and narrowly focused on cold chain equipment. Gavi, the Vaccine Alliance, estimates that US\$280 million is needed per year to address the supply chain needs in low-income countries.<sup>4</sup>
- Between 2010 and 2020, immunization services will require twice the storage and transport capacity to manage four times the vaccine

Cold chain equipment status at 134,000 immunization points in 57 Gavi-eligible countries, 2014<sup>5</sup>



volume per fully immunized person. Health workers—already in short supply—will need to administer six times as many doses per person, to older children, adolescents, and adults, and in more places, including health centers, schools, pharmacies, and hospitals.<sup>1</sup>

- Researchers estimate that, of the approximately 134,000 immunization points in Gavi-eligible countries, approximately one-fifth have no cold chain equipment (e.g., refrigerators, freezers, cold rooms); one-fifth have equipment that does not work; and more than two-fifths have equipment with significant limitations, such as a high freezing risk and/or the need for expensive gas or kerosene.<sup>5</sup>
- Poor supply chain performance can delay new vaccine introductions,<sup>6</sup> waste expensive vaccines, and reduce availability of all vaccines at the point of immunization.<sup>7</sup>

#### EXAMPLE

Modeling is an effective way to evaluate options for increasing availability and efficiency of supply chains. HERMES computer modeling and simulation helped the Benin Ministry of Health evaluate different options for streamlining the vaccine supply chain. The analysis demonstrated that new delivery routes would save Benin over \$500,000 in total costs over five years, while improving vaccination rates.

### 3. Transformative changes in supply chains are required to achieve better immunization access and coverage.

- EPI programs have implemented incremental, and often necessary, supply chain improvements, such as investing in additional storage capacity or outsourcing transportation. However, coping mechanisms such as these do not solve underlying structural problems. New approaches must reconsider the complete supply chain system, from distribution and inventory policies to the changing role of information systems and supply chain managers.<sup>8</sup>
- It's time to build next-generation immunization supply chains that are thoughtfully designed and continuously re-evaluated to keep pace with changing circumstances, such as the introduction of new vaccines, disease outbreaks and emergencies, and updated EPI requirements.
- Designing new supply chains requires a careful analysis of options. Many supply chains can be consolidated or streamlined into fewer levels, and some functions, like storage or transportation, can be consolidated with other health product supply chains or outsourced to the private sector. A recent study of supply chains in 57 Gavi-eligible countries suggested that simplified systems may provide countries substantial cost savings.<sup>9</sup>



#### 4. Next-generation immunization supply chains fundamentally shift the way vaccines are managed and delivered to communities.

- Next-generation immunization supply chains can look different from country to country, but they all share certain fundamental characteristics:
  - ◇ **Holistic design:** They are designed to optimize the safety, reliability, and efficiency of immunization and health services.
  - ◇ **Management:** They are led by competent, professionally trained supply chain managers who can consolidate logistics tasks and direct resources toward activities that improve the effectiveness or efficiency of the supply chain.
  - ◇ **Data:** They use data from all levels of the supply chain to monitor day-to-day performance and support evidence-based decision-making.
  - ◇ **Equipment:** They use well-maintained, WHO-prequalified cooling equipment and temperature monitoring devices and systems to sustain proper temperatures along the supply chain.
  - ◇ **Continuous improvement:** They are continuously improved based on regular, system-wide assessments (e.g., cEVM approach) and improvement strategies are supported in comprehensive multi-year plans.

To further support countries, Gavi is launching a Cold Chain Equipment Optimization Platform, a financing facility that will enable innovation and adoption of larger, more cost-effective cold chain equipment in Gavi-eligible countries.

Photo: PATH/Sang



#### 5. More leadership and support is required to build next-generation supply chains.

- Recognizing the critical role that supply chains play in saving lives, improving health, and reducing under-five mortality, the WHO Strategic Advisory Group of Experts (SAGE) endorsed a Call to Action in 2014 asking national governments, implementing partners, and civil society organizations (CSOs) to increase ongoing investments in immunization supply chains.
- The WHO/UNICEF Supply Chain Hub is coordinating support to Member States and providing updated guidance materials, tools, and technical assistance.

- Gavi partners, including WHO and UNICEF, are also implementing an immunization supply chain strategy to help Gavi-eligible countries develop stronger immunization and health systems.
- National and global leaders can show their support by investing in supply chains and engaging partners in designing and implementing next-generation supply chains with the fundamental characteristics needed for optimal performance.

## Notes

<sup>1</sup> World Health Organization. *Immunization Supply Chain and Logistics: A Neglected but Essential System for National Immunization Programmes. Call to Action*. 2014: Geneva. WHO/IVB/14.05.

<sup>2</sup> UNICEF and World Health Organization. *EVM Global Data Analysis 2010-2013*. 2014: Geneva.

<sup>3</sup> Imaduddin. "Rs 124.7 paid to heirs of 84 martyred polio workers, Senate told." *Business Recorder*. July 8, 2015.

<sup>4</sup> Gavi, the Vaccine Alliance. BCG Analysis of Gavi Alliance taskforce preliminary estimates and projections based on 53 Gavi-eligible countries. 2014. **N.B.** Costs include: transportation (vehicle depreciation, fuel, insurance, maintenance, labor), storage (infrastructure, equipment, energy, maintenance, labor).

<sup>5</sup> Bill & Melinda Gates Foundation. Analysis based on data from 57 Gavi-eligible countries. 2014.

<sup>6</sup> **N.B.** Gavi Independent Review Committee (IRC) reports on New and Underused Vaccine Introduction applications (between 2011 and 2013) show that 50 countries (44%) received clarifications or conditions relating to the performance and readiness of their supply chains.

<sup>7</sup> World Health Organization and PATH. *Optimize: Senegal Report*. Modeling of the costs of Senegal's vaccine supply chain. 2013: Seattle.

<sup>8</sup> Zaffran M, Vandelaer, Kristensen D, Melgaard B, Yadav P, Antwi-Agyei KO, Lasher H. The imperative for stronger immunization supply and logistics systems. *Vaccine*. 2013;31(2):B73-B80.

<sup>9</sup> Lee B. Landscaping the structures of GAVI country vaccine supply chains and testing the effects of radical redesign. *Vaccine*. 2015;33(26):4451-4458.