# Investing in stronger vaccine supply chains

## Reaching children with immunization, saving lives

PATH/Gabe Bienczycki

**Millions of people are alive today because of immunization programs.** Major global investments in the development and introduction of new vaccines in the past decade have contributed to tremendous improvements in people's health around the world. Current immunization programs save more than 2.5 million lives each year by protecting children, families, and communities from diarrhea, pneumonia, polio, measles, tetanus, and other life-threatening illnesses. Today, countries have access to powerful new vaccines that can protect millions more.

EACH YEAR, 24 MILLION CHILDREN ARE NOT BEING REACHED WITH VACCINES

Improved vaccine supply chains offer a solution

Despite tremendous progress, 24 million children still do not get the complete routine immunizations scheduled for their first year of life. Weak health systems and difficulties with delivering vaccines to remote locations are two of the challenges that hinder progress.

Improved vaccine supply chains offer a solution. With advances such as more efficient tracking systems, new technologies, and updated national policies, countries can deliver lifesaving vaccines to more people who need them.

## Building more effective supply chain systems

Many children in need of vaccines are difficult to reach—living in remote rural locations and facing disadvantages that make them even more vulnerable to disease and death. Immunizing these children requires far more than producing critical vials of safe and effective vaccines. Once a vaccine is available, it needs to be delivered to the right place, at the right time, in the right condition. For instance, vaccines must be transported and stored within a very narrow temperature range—an extreme challenge in remote areas. High temperatures, unreliable electricity, long distances between health care facilities, and other obstacles often impede delivery to low-resource settings.

Often, countries still rely on outdated supply and logistics systems that are inadequate for today's newer vaccines. Many of these systems were developed 30 years ago, before sophisticated tracking and management tools were widely available. Now, many vaccines cost more than traditional ones, making it even more critical to avoid stock outs, minimize waste, and improve vaccine management. Meanwhile, innovations that deliver vaccines and reduce waste—such as single-dose vials and prefilled syringes—require more space on trucks and in refrigerators, putting even more pressure on the system. And as new vaccines become available over the next decade, countries will be able to offer even more vaccines—in some cases doubling the volume of vaccines that need to be safely and efficiently stored, transported, and delivered.

With the rising cost of vaccines and growing storage requirements, strengthened supply chain systems are urgently needed. Systems must be advanced enough to deliver today's vaccines and ready for vaccines that will be available tomorrow.

IMPROVING VACCINE SUPPLY CHAINS

The following steps are critical to achieving strong immunization logistics and supply systems:

1. Introduce innovative vaccine products and packaging tailored to meet the needs and constraints of developing countries.
2. Facilitate efficient and effective vaccine delivery and leverage proven methods from other sectors.
3. Assess and minimize the environmental impact of energy, materials, and processes used.
4. Design information systems to help plan and manage immunization activities and resources while ensuring that adequate quantities of vaccines are always available to meet demand.
5. Include human resources policies that provide adequate numbers of trained, motivated, and empowered personnel at all levels of the system.

## Delivering the right vaccine, to the right place, at the right time

Cost-effective solutions are available now and can be scaled up to provide countries with stronger, more adaptable, and efficient vaccine delivery systems. PATH and the World Health Organization are working with a wide range of partners—including governments, the United Nations Children's Fund, GAVI Alliance partners, and nongovernmental organizations—to identify, develop, and test solutions to help supply chains keep up with rapidly advancing vaccine and delivery device technologies. The goal is to build immunization programs that safely, affordably, and

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reliably deliver lifesaving health technologies to people at the right time, to the right place, in the right condition, in the right amount, no matter where they live.

To achieve this goal, international and national partners are collaborating to identify problems and test solutions that could have global applications. Evidence from countries around the world is helping to identify the characteristics of an ideal supply chain and develop a globally accepted roadmap that will make it possible to implement similar improvements around the world. These critical lessons are informing global strategies and commitments, such as the Global Vaccine Action Plan, in which stakeholders are working together to achieve a world where all individuals and communities enjoy life free from vaccine-preventable diseases.

### SAVING LIVES THROUGH IMPROVED VACCINE DELIVERY IN GHANA

In May 2012, the Government of Ghana and the GAVI Alliance introduced both pneumococcal and rotavirus vaccines across the country—a momentous achievement that will save lives and reduce disease. Improvements in the country's logistical systems made it possible to launch the immunizations nationwide. For instance, the government replaced refrigerators at the regional level with walk-in cold rooms. These cold rooms are more reliable than the old refrigerators and will provide needed cool space for many years to come.

## Lifesaving results

Improved supply chain systems will result in:

- **More lifesaving vaccines reaching families and communities around the world.** With stronger, more adaptable, and efficient logistics systems, countries and communities will reach more children with vaccines, enabling healthier and more productive futures. GAVI estimates that rolling out critical childhood immunizations against *Haemophilus influenzae* type b, pneumococcal, and rotavirus diseases in the world's 73 poorest countries over the next decade would result in an estimated $63 billion in treatment and productivity savings.
- **Maximized investments in vaccines and global health programs.** Improvements in supply chain systems will safeguard major global investments in new vaccines by mitigating the waste, loss, breakage, and exposure to excessive heat or cold that often occurs when supply chain systems are out of date. As a result, countries will be able to deliver the correct amounts of vital vaccines safely and efficiently in addition to scaling up a range of complementary global health interventions aiming to prevent diarrhea, pneumonia, and other illnesses.
- **Enhanced support for the health workforce.** Training logistics managers, cold chain mechanics, health personnel, and other workers to efficiently manage supply chain systems will enable them to maintain lower stock levels, reduce wastage, accurately forecast vaccine demand, and prevent equipment breakdowns and malfunctions. As a result, the health workforce will have the tools and support needed to meet the demand for immunizations and prevent disease.

## THE VACCINE SUPPLY CHAIN

Ultimately, all immunization programs aim to safely, affordably, and reliably deliver lifesaving health technologies to people at the right time, to the right place, in the right condition, in the right amount, no matter where they live.


## Support for supply chain systems is urgently needed

Addressing the urgent logistical challenges of delivering lifesaving vaccines to the millions of children who still need them will require that policymakers:

- **Prioritize supply chain systems as part of vaccine strategies and investments.** When investing in and planning vaccine programs, considering supply chain issues early on will lead to more efficient delivery of critical vaccines. For example, it is important to examine the costs of developing vaccines as well as the space, storage, and transportation needed to deliver them.
- **Build advanced supply chain systems that are ready for the future.** Resources are urgently needed to bridge the gap between current supply chain systems and the vaccines that are ready to be delivered to individuals who need them. There is a need to improve storage and transport, refrigeration equipment, human resources, program management, training and capacity-building, social mobilization, surveillance, research and development for new supply chain technologies, and operations research. Strengthening these essential supply chain components will assist countries in building new systems that are up to par with existing vaccines in addition to meeting the demand for new vaccines that become available over the coming decades.

PATH/Hai Le

### SPURRING THE DEVELOPMENT OF INNOVATIVE PRODUCTS

Global and national partners are investing in research and development of innovations that will address gaps in cold chain equipment and advance immunization programs in low-resource settings. For example, PATH is challenging manufacturers to develop new low-cost solar refrigerators that eliminate the need for batteries. After selecting the most promising designs, PATH is now working with partners to evaluate and refine the models for vaccine storage in Vietnam and Senegal.

World Health Organization

unicef

The World Health Organization and the United Nations Children's Fund recognize the importance of investing in stronger supply chains. Their work has helped to generate the evidence base highlighted in this brochure.

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455 Massachusetts Ave NW, Suite 1000
Washington, DC 20001

info@path.org
www.path.org

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