Medical Devices and Health Technologies

Technology Updates

May 2025

PATH

Contents

Innovations for women and children

Vaccine and pharmaceutical formulation innovations

Vaccine and pharmaceutical packaging and delivery innovations

Supply systems and equipment innovations

MEDICAL DEVICES AND HEALTH TECHNOLOGIES

BABE (Boosting Availability of bCPAP kit and Blenders Everywhere) device

A very low-cost, nonelectric bubble continuous positive airway pressure (bCPAP) and oxygen blending device that provides a stable and reliable source of pressurized, blended gas for treating small and sick newborns (SSN) with respiratory distress syndrome (RDS) to reduce the risk of brain, eye, and lung damage, and death.

Need

Premature babies suffering from respiratory distress require a means of respiratory support to assist with breathing.

PATH's role

PATH identified the need, designed prototypes and validated and verified the bCPAP and oxygen blender device in Uganda. PATH is currently seeking a commercialization partner for technology transfer and funding to support implementation research around delivery of a comprehensive SSN package of services that includes bCPAP and oxygen blending.

Partners

Adara Development, Kiwoko Hospital, Seattle Children's Hospital, University of Washington Department of Neonatology.

Country

Uganda.

RESEARCH ▷ DEVELOP ▷ APPROVE ▷ INTRODUCE ▷ SCALE

Donors

Innovation Fund (PATH), Saving Lives at Birth.

Product manager

Mike Ruffo, mruffo@path.org.

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Caya™ Diaphragm

A single-size contraceptive barrier that expands women's options for nonhormonal contraception. Easy to use, comfortable for both partners, easy to supply and provide. Developed through human-centered design process involving women and providers in multiple countries. Marketed as the Caya™ contoured diaphragm.

Need

Existing contraceptives don't meet the needs of all women. Some want or need a nonhormonal option that is user-controlled and discreet.

PATH's role

PATH and our partners developed and evaluated the single-sized diaphragm. We assisted in manufacture scale-up, regulatory submissions, and introduction. PATH provides assistance to expand Caya introduction to low- and middle-income countries.

Manufacturer

Kessel Medintim GmbH.

Partners

Medintim and Caya distribution partners.

Countries

Approved or registered in more than 35 countries.

Donors

Medintim, Bill & Melinda Gates Foundation, USAID (previous).

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Product manager

Maggie Kilbourne-Brook, mkilbou@path.org.

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.7: By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Ellavi uterine balloon tamponade

A fully assembled, quick to deploy, cost-effective uterine balloon tamponade (UBT) to address postpartum hemorrhage in low-resource settings.

Need

Uncontrolled postpartum hemorrhage (PPH) is a life-threatening emergency and the most common cause of maternal death and disability worldwide. Women in resource-poor settings are at greatest risk of dying from PPH.

PATH's role

PATH defined the need and product requirements and established a strong partnership with Sinapi Biomedical to develop, commercialize, and manufacture the Ellavi UBT (www.ellavi.com). PATH conducted implementation research in Ghana and Kenya to inform introduction and scale, and serve as a model for wide-scale implementation in low- and middle-income countries.

Partners

South African Medical Research Council, University of Stellenbosch, University of Nairobi, Kenyan Ministry of Health, Ghana Health Services.

Countries

Registered in 16 countries and more than 30,000 devices have been sold.

Donors

FCDO, Anonymous Swiss Foundation, Janine Luk Foundation.

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Product manager

Scott Knackstedt, sknackstedt@path.org.

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.1: By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

STREAM Disinfection Generator

PATH

Enabling health care facilities to produce chlorine at the push of a button using salt, water, and a power source.

Need

Inadequate water, sanitation, and hygiene services in health care facilities directly contributes to the spread of preventable health care–associated infections. Chlorine is widely recommended by national infection prevention and control guidelines for disinfection. However, an estimated 36 percent of health care facilities globally lack access to chlorine.

PATH's role

PATH partners with national government leaders and subnational actors to introduce and scale-up the use of STREAM into health care systems. Using a systems-based approach, we support the alignment of the STREAM to national health policies and regulatory requirements, develop financing strategies for national deployment of the device, and support a multitude of evidence generation activities to strengthen the value proposition for the device.

Partners

Aqua Research, Inc., Uganda Ministry of Health, Ethiopia Ministry of Health, Ghana Health Service, Millenium Water Alliance, Global Water Center, Cova Agua.

Countries

Ethiopia, Ghana, Kenya, Mozambique, and Uganda.

RESEARCH ▷ DEVELOP ▷ APPROVE ▷ INTRODUCE ▷ SCALE

Donor

Conrad N. Hilton Foundation.

Product manager

Adam Drolet, adrolet@path.org.

6 CLEAN WATER AND SANITATION

Addresses United Nations Sustainable Development Goal 6: Ensure access to water and sanitation for all.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Buccal naloxone for treatment of opioid overdose

Buccal naloxone, designed for rapid dissolution between the gums and inner cheek, provides a convenient method for quick delivery of naloxone for the reversal of fatal opioid overdose.

Need

According to World Health Organization estimates, approximately 115,000 deaths annually are attributable to opioid drug use. Current approaches for treating opioid overdose involve syringe and needle injection or nasal spray of a rescue drug, naloxone. These methods also require training and are prohibitively expensive for single use.

PATH's role

PATH is developing a low-cost and self-contained buccal formulation of naloxone to address the limitations of currently available products, improving acceptability and usability as well as increasing the efficiency of distribution and refills.

Partners

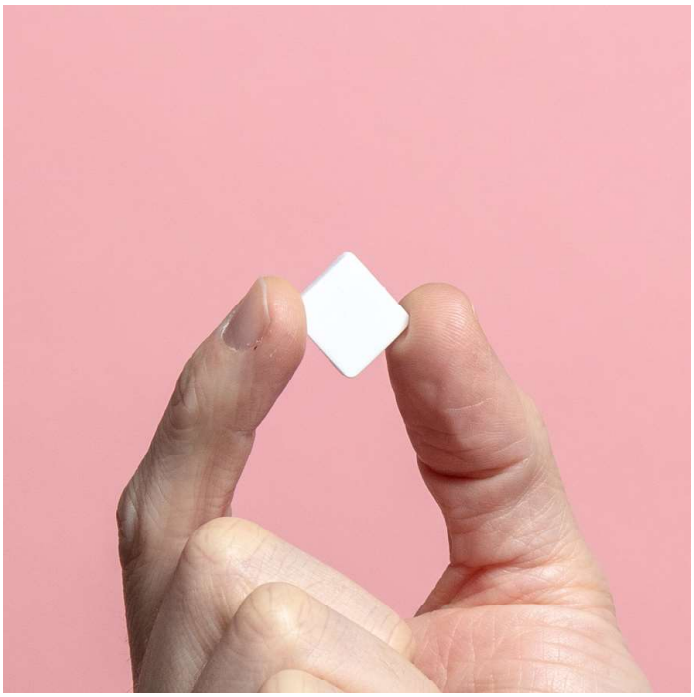
University of Washington, Oregon Freeze Dry.

Country

United States.

Product manager

Dr. Manjari Lal, mlal@path.org.



RESEARCH DEVELOP APPROVE INTRODUCE SCALE

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.5: Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Comparative evaluation of mRNA-LNP manufacturing platforms

Evaluating various lipid nanoparticle (LNP) manufacturing platforms' ability to produce consistent, reproducible, and efficient mRNA-LNP vaccines.

Need

Recently, mRNA-LNP vaccines have revolutionized the global immunization landscape by offering a more efficient method of production and delivery. Several methods have been documented for the preparation of LNPs using microfluidic mixing. However, there are significant gaps in the existing literature about how the mRNA-LNPs produced using these various methods differ in terms of yield, encapsulation efficiency, and thermostability.

PATH's role

PATH is conducting a technical assessment of various LNP platforms for producing mRNA-LNP vaccines by comparing the product attributes through structural characterization and in vitro and in vivo testing.

Country

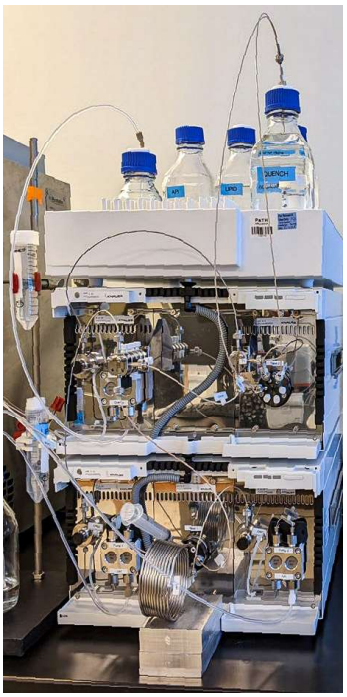
United States.

Donor

Bill & Melinda Gates Foundation.

Product manager

Dr. Manjari Lal, mlal@path.org.



RESEARCH DEVELOP APPROVE INTRODUCE SCALE

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.B: Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

mRNA potency assay development

PATH

A globally accessible mRNA potency assay.

Need

Existing mRNA potency assays require complex quantification methods such as flow cytometry that are not widely adaptable for routine use by low- and middle-income country manufacturers or National Regulatory Agency laboratories.

PATH's role

PATH is using existing reagents and experience to develop methods for global use to optimize mRNA vaccine potency methods for both monovalent and multivalent SARS-CoV-2 vaccines as model targets.

Country

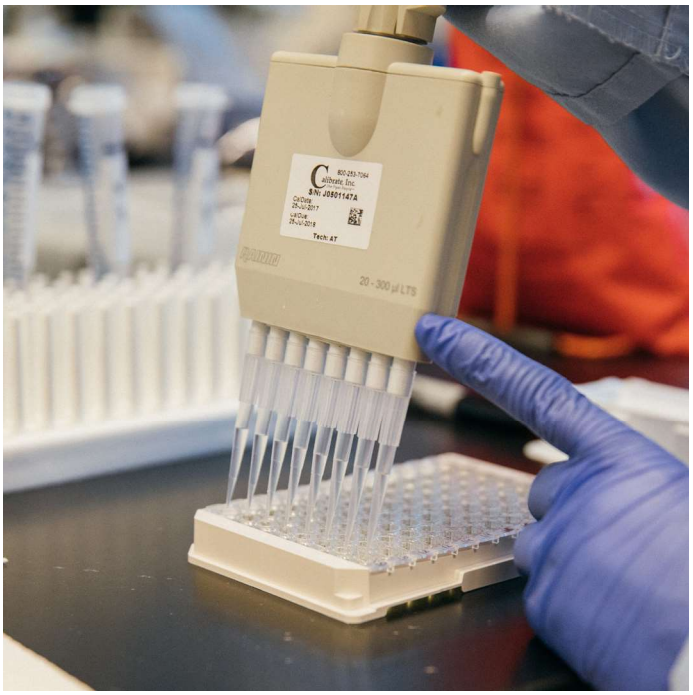
United States.

Donor

NIIMBL.

Product manager

Dr. Jessica White, jawhite@path.org.



RESEARCH DEVELOP APPROVE INTRODUCE SCALE

3 GOOD HEALTH AND WELL-BEING

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Sensitive immunoassay to support development of COVID vaccines

PATH

Quantitative and stability-indicating assays to monitor antigen and adjuvant content in the vaccine product.

Need

Development of sensitive, stability-indicating analytical methods to measure the antigen and adjuvant content in the final vaccine formulation are required for vaccine release and stability studies.

PATH's role

PATH is conducting initial method development for, and transfer of, the bioanalytical method to manufacturing partners in low- and middle-income countries. PATH is also harmonizing assay results across manufacturing sites.

Partners

Butantan, The Government Pharmaceutical Organization, Institute for Vaccines and Medical Biologicals, Mt. Sinai.

Countries

Brazil, Thailand, and Vietnam.

Product manager

Dr. Jessica White, jwhite@path.org.

Photo: Pixabay/WiR_Pixs

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.B: Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Thermostable formulation platforms for mRNA-LNP based vaccines

Development of thermostable formulations of messenger RNA lipid nanoparticle (mRNA-LNP) based vaccines.

Need

Leading mRNA-LNP based vaccines rely on complex cold chain infrastructure for delivery. These specific storage and transportation requirements are often not only expensive and logistically complex, but also limit equitable distribution to underserved populations and hard-to-reach communities.

PATH's role

PATH is applying freeze-drying and spray-drying stabilization technologies to develop thermostable lyophilized and spray-dried formulations of an mRNA-LNP vaccine.

Country

United States.

Donors

University of Delaware/NIIMBL.

Product manager

Dr. Manjari Lal, mlal@path.org.

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.B: Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

mRNA work at PATH

A full suite of activities supporting formulation development of messenger RNA based vaccines and therapeutics.

Need

mRNA-based vaccines have revolutionized the immunization landscape by offering a more efficient method of production and delivery. This presents an exciting opportunity to leverage research and development in this rapidly evolving sphere to advance global health equity.

PATH's role

PATH is conducting several activities to support mRNA formulation development including:

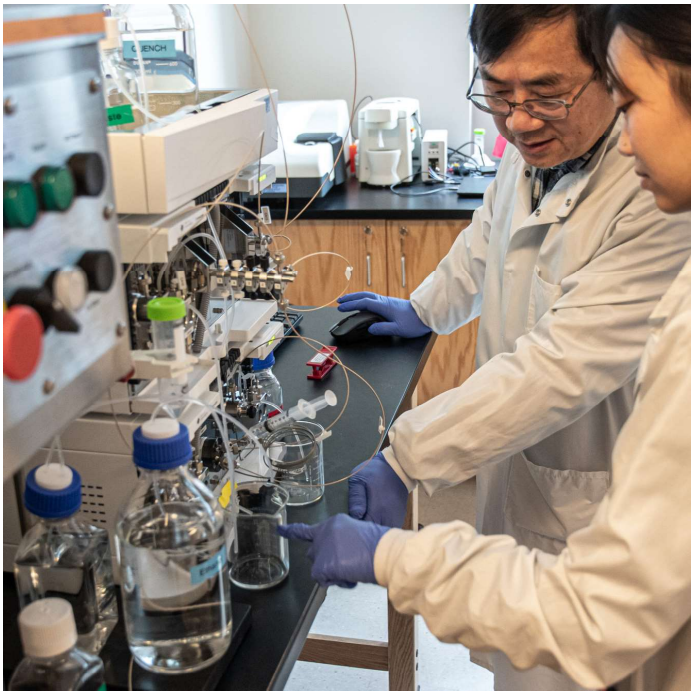
- Analytical method development.
- Sequence-to-vial mRNA production.
- Mapping innovations in LNP and non-LNP technologies, including cost assessment of mRNA-based solutions for low-resource environments.
- Technical advisory support to vaccine developers in low- and middle-income countries (LMICs).
- Development of thermostable mRNA-based vaccine formulations to increase immunization program distribution and allow for pandemic preparedness.

Country

United States.

Donors

Gates Foundation, University of Delaware/NIIMBL.



RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Product manager

Dr. Manjari Lal, mlal@path.org.

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.B: Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Thermostable insulin for diabetes management

PATH

Thermostable formulations of for treatment and management of diabetes.

Need

The World Health Organizations estimates that more than 400 million people worldwide are living with diabetes, with the majority living in low- and middle-income countries (LMIC). Both Type 1 and Type 2 diabetics need insulin to manage their diabetes, but many are unable to access it, largely due to short supply and high costs. Additionally, the stability of commercial insulin products is compromised when exposed to elevated temperatures and sunlight. Other factors contributing to the poor availability and affordability of insulin include lack of adequate infrastructure for local manufacturing or storage.

PATH's role

PATH is the technology developer of encapsulated, gastric-resistant oral tablets for easy and convenient packaging, delivery, storage, and use in any setting.

Country

United States.

Product manager

Dr. Manjari Lal, mlal@path.org.

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.4: By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Autodisable syringes

PATH

Fixed-dose syringe that locks after injection, preventing reuse and potential transmission of bloodborne pathogens.

Need

Autodisable (AD) syringes are already widely adopted, and accessible at low-cost. But continued market and product support help to address new issues and increase use and impact. During the peaks of COVID-19 supply chain disruptions threatened adequate and timely supply at acceptable prices to meet global immunization needs, sharps injury prevention (SIP) features that can prevent needlestick injuries are commonly used in high-income countries, but are not yet widely accessible on AD syringes, and some regions do not routinely access these safe devices.

PATH's role

PATH was instrumental in the development and introduction of AD syringes, and now routinely provides market intelligence to manufacturers and global health stakeholders to ensure a stable supply is available. PATH is also assessing environmental sustainability, working to advance the accessibility of SIP features, and supporting regional manufacturing and market expansion efforts.

Manufacturers

Multiple.

Partners

Gavi, the Vaccine Alliance, PAHO, UNICEF, WHO.

Countries

Global.

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Donor

Bill & Melinda Gates Foundation.

Product manager

Courtney Jarrahian, cjarrahian@path.org.

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.B: Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Blow-Fill-Seal device for oral delivery of novel oral polio vaccine

A novel fill/finish process and primary container technology that can be used for oral delivery of novel oral polio vaccine (nOPV). Blow-Fill-Seal (BFS) containers have the potential to simplify delivery and reduce costs.

Need

Low-cost primary packaging that decreases supply chain requirements and environmental impact while improving usability in low resource settings.

PATH's role

PATH is facilitating the development and stability testing of a novel BFS oral delivery system for nOPV.

Manufacturer

BioFarma.

Partners

Rommelag, New Horizons.

Countries

Germany, Indonesia, Switzerland, and Zambia.

Donor

Bill & Melinda Gates Foundation.

Product manager

Ben Creelman, bcreelman@path.org.

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.B: Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

CPAD-neo: compact, prefilled, autodisable devices

PATH

Exploring the feasibility of novel compact, prefilled, autodisable devices (CPADs) as a lower-cost alternative to Uniject™.

Need

Lower-cost, improved CPAD devices to simplify delivery of vaccines and essential medicines.

PATH's role

PATH is partnering with developers to evaluate whether novel CPAD devices can meet technical, cost, and programmatic suitability requirements for delivery of priority vaccines and injectable contraception. The two devices currently under consideration are Injecto's "easyject™" prefilled syringe and 3CK's novel Blow-Fill-Seal CPAD design.

Partners

3CK, Injecto.

Countries

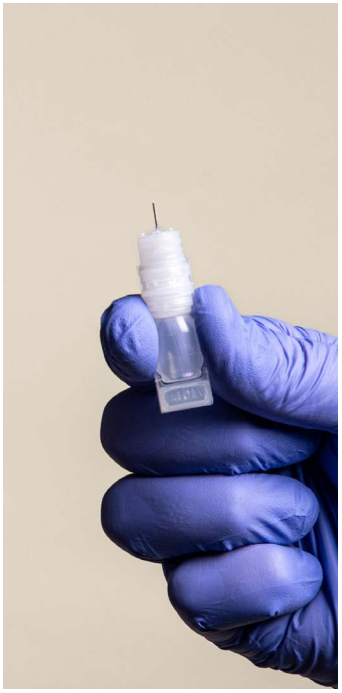
Denmark, Italy, Uganda, and Zambia.

Donor

Bill & Melinda Gates Foundation.

Product manager

Ben Creelman, bcreelman@path.org.



Images: easyject, PATH

3 GOOD HEALTH AND WELL-BEING

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Delivery of long-acting monoclonal antibodies (mAbs) to prevent respiratory syncytial virus (RSV) infection in infants

Passive immunization (lab-made antibodies that block the virus) to protect infants from severe respiratory infections and death.

Need

RSV is the world's top cause of severe respiratory infections and hospitalizations in infants and young children, with most deaths occurring in low- and middle-income countries (LMICs). The mAbs bind to the virus and block it, preventing severe disease. They come in single-dose, non-standard volume presentation and are administered intramuscularly soon after birth to confer protection for six months, when infants are most at risk.

PATH's role

PATH assessed the programmatic fit of delivery device options for LMIC immunization programs to inform manufacturers on the best container option for this new product. PATH also assessed acceptability of maternal versus infant immunization and gathered recommendations on the most feasible infant RSV prevention strategy for LMICs.

Partners

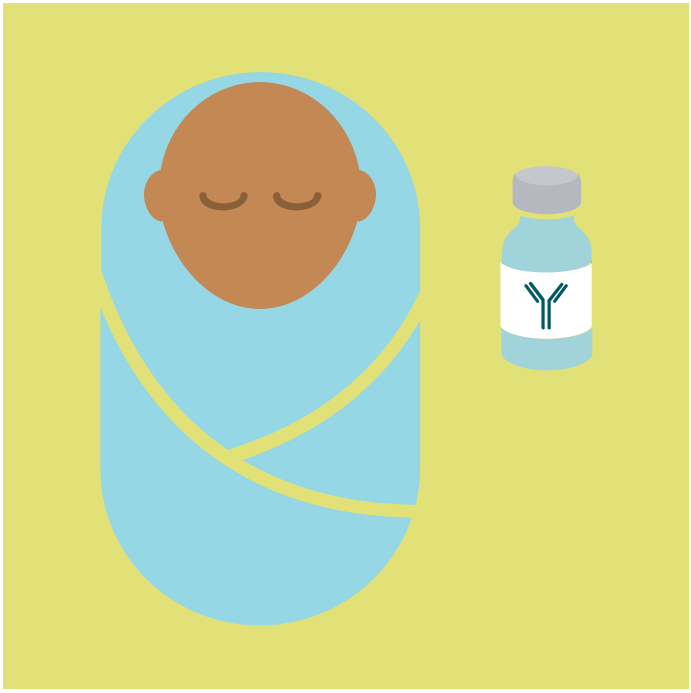
Merck.

Countries

Ethiopia, Kenya, Lebanon, Nepal, Peru, Senegal, South Africa, Vietnam, and Zambia.

Donor

Merck.



Product manager

Dr. Manjari Quintanar-Solares, mquintanar@path.org.

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Dualject

A dual-chamber reconstitution injection device.

Need

Simpler reconstitution of vaccines and essential medicines.

PATH's role

PATH has developed a design for a novel dual-chamber device that enables mixing of dry and liquid components within the device itself, reducing the risk of errors in preparation and delivery of vaccines and essential medicines.

Country

United States.

Donor

Bill & Melinda Gates Foundation.

Product manager

Dan Myers, dmyers@path.org.

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.B: Support the research and development of vaccines and medicines for the communicable and noncommunicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Microarray patches

Microarray patches (MAPs) consist of microscopic projections that are applied to the body like a small bandage, penetrating the skin's outermost layer to deliver a drug or vaccine to the top layers of the skin.

Need

The global health community needs highly effective, well-tolerated, low-cost, and easy to administer delivery systems to enable new scenarios of administration and expand access to vaccines and medicines.

PATH's role

PATH and various partners are collaborating on multiple projects to advance the development of MAPs for delivery of priority vaccines and essential medicines, including antiretrovirals and contraceptives.

Partners

Micron, Vaxxas, Cardiff University, Queen's University Belfast, CDC, MRC Gambia, Gilead, WHO, UNICEF, Gavi, the Vaccine Alliance, ViiV, Pharmetheus.

Countries

Kenya, Nepal, DRC, UK, Australia, Uganda, Gambia, India, , Thailand, China, Ethiopia, South Africa, and Sweden.

Donors

Bill & Melinda Gates Foundation, Gavi, the Vaccine Alliance, National Institutes of Health.

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Product manager

Jessica Mistilis, jmistilis@path.org.

3 GOOD HEALTH AND WELL-BEING

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

PharmaJet® Tropis®

PATH

The PharmaJet Tropis is a needle-free, disposable syringe jet injector which provides intradermal injections with no sharps waste.

Need

Intradermal delivery of fractional doses of vaccines—such as the polio and COVID vaccine—can improve efficacy, reduce costs, and address supply shortages. However, the conventional injection technique is difficult to perform, particularly in campaign settings, and requires sharps waste disposal.

PATH's role

PATH collaborated on a study comparing the current standard of intramuscular delivery of full-dose IPV using needle and syringe to the demonstrated improved coverage rates, acceptability and feasibility, and the potential for reduced costs associated with using Tropis for fractional-dose inactivated polio vaccine (IPV) delivery in routine immunization.

Manufacturer

PharmaJet.

Partners

PharmaJet, National Primary Health Care Development Agency (NPHCDA), Jhpiego, and the Sydani Group.

Countries

Nigeria, Pakistan, and Somalia.

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Product manager

Courtney Jarrahian, cjarrahian@path.org.

3 GOOD HEALTH AND WELL-BEING

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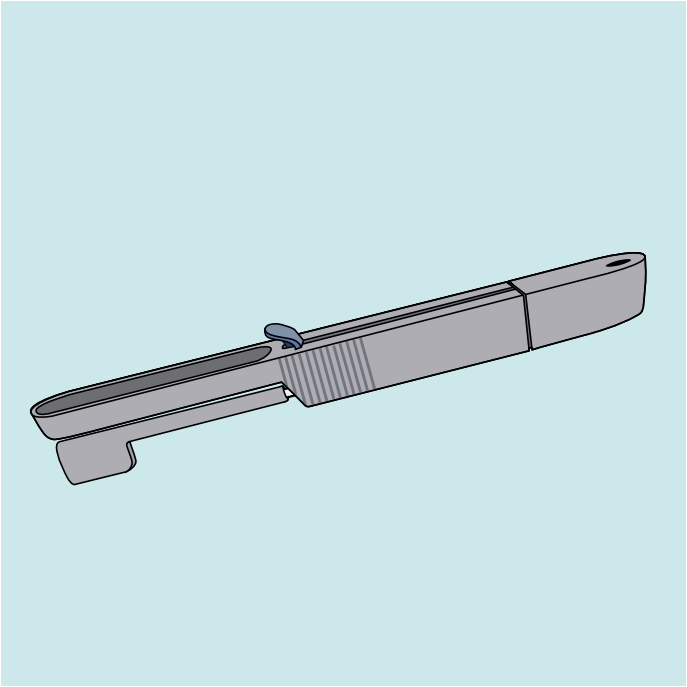
MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Universal implant inserter

The device is designed to insert next-generation biodegradable contraceptive implants currently in development. The inserter could potentially work with implants for other use cases as well, such as HIV prophylaxis implants.



RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Need

A universal inserter that works with implants from multiple manufacturers could:

- Simplify implant development by allowing developers to concentrate specifically on the implant.
- Reduce the training burden on health care workers.
- Reduce inserter costs through economies of scale.

PATH's role

Research and develop.

Partners

CONRAD

Country

United States.

Donor

Bill & Melinda Gates Foundation.

Product manager

Dan Myers, dmyers@path.org.

3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.7: By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Better data for managing vaccine refrigerators

The World Health Organization (WHO) has specified new requirements to help generate standardized performance data for refrigerators that are used to store vaccines in the immunization supply chain. UNICEF alone purchases about 20,000 refrigerators per year that are prequalified under the WHO standards. From 2026, all new vaccine refrigerators prequalified by WHO will be equipped with Equipment Monitoring System (EMS) loggers and data ports enabling better data for action by health workers and technicians looking after the equipment that keeps life-saving vaccines at the right temperature.

Need

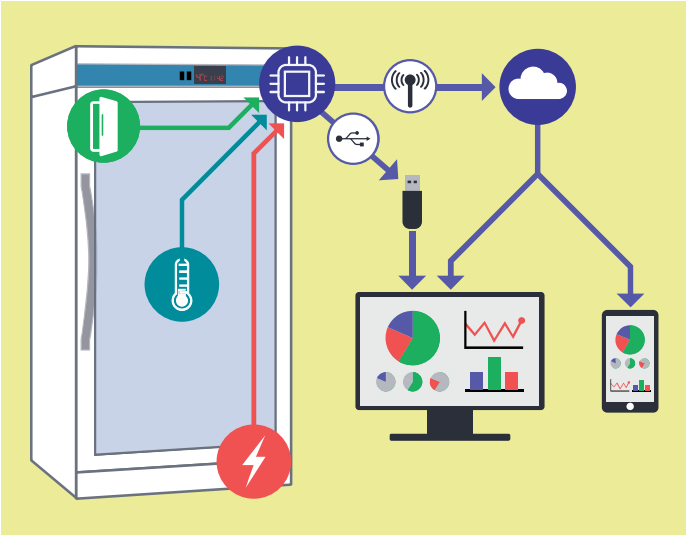
Currently there are multiple modes for collecting data from refrigerators, but performance data is not standardized across vendors making it difficult for countries to manage the data from the thousands of refrigerators in their immunization system.

PATH's role

PATH has contributed to the development of EMS standards and communicating and coordinating among global agencies. PATH is preparing the market for EMS introduction through market shaping strategies, strengthening data use in immunization programs, and building awareness of this new technology.

Partners

Ministries of Health in Senegal and Uganda, WHO, Gavi, UNICEF, Global Health Labs/New Horizons.



RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Countries

Senegal, Uganda.

Donors

Gavi, the Vaccine Alliance, Bill & Melinda Gates Foundation, WHO.

Product manager

Matt Morio, mmorio@path.org.

7 AFFORDABLE AND CLEAN ENERGY

Addresses United Nations Sustainable Development Goal 7.B: By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Freeze-preventive cold box

A vaccine cold box used for transporting large volumes of vaccines between health facilities with an engineered barrier that prevents exposing vaccines to freezing temperatures.

Need

Many vaccines are freeze-sensitive and can lose potency when exposed to freezing during transport.

PATH's role

PATH engineered a solution that allows users to place frozen ice packs in the cold box without risk of vaccine exposure to freezing temperatures. PATH transferred the technology of this freeze-prevention barrier to multiple manufacturing partners to bring the first product to market. PATH evaluated a cold box from one manufacturer in Nepal.

Manufacturer

Leff Trade.

Partners

B.P. Koirala Institute of Health Sciences, Nepal Ministry of Health, the United Nations Children's Fund, the World Health Organization.

Countries

Globally available.

Donor

Bill & Melinda Gates Foundation.

RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Product manager

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3 GOOD HEALTH AND WELL-BEING

Addresses United Nations Sustainable Development Goal 3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.

Address
437 N 34th Street
Seattle, WA 98103 USA

Date Published
May 2025

MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Freeze-preventive vaccine carrier

A vaccine carrier with an engineered barrier that prevents accidental freezing of vaccines.

Need

Many vaccines are freeze-sensitive and can lose potency when exposed to freezing during transport and outreach.

PATH's role

PATH engineers pioneered a novel solution that allows users to place deeply frozen, or solid frozen ice packs in the carrier while protecting vaccines in a separate compartment, virtually eliminating exposure to freezing temperatures. PATH's design was adopted by multiple manufacturers who have in turn gone on to make additional innovations, accelerating the introduction and adoption of this breakthrough innovation.

Manufacturers

Multiple.

Partners

B.P. Koirala Institute of Health Sciences, Nepal Ministry of Health, the United Nations Children's Fund, the World Health Organization, and manufacturers.

Countries

Globally available.

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RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Product manager

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

National cold chain information system for improved vaccine management

The Cold Chain Information System (CCIS) is a digital asset management tool built upon the Open Data Kit X platform. The app allows user-friendly digital data reporting and monitoring of cold chain equipment and other assets using Android-based mobile phones and tablets.

Need

Countries need a robust system for collecting, managing, and reporting on the large data sets involved with supply system asset management. Updating these data for effective decision-making has traditionally been slow and costly and, as a result, they are often out-of-date. Tracking the functional status of equipment and spare parts has been problematic for many countries.

PATH's role

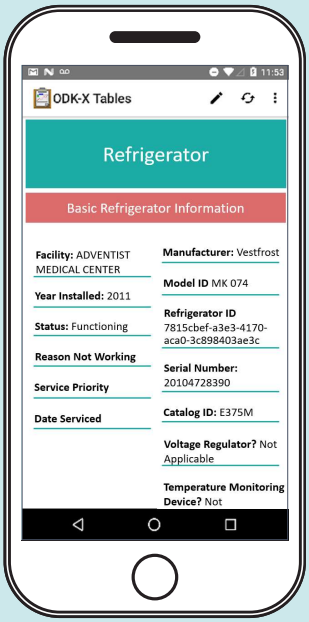
PATH helped Uganda's national immunization program pilot and scale the technology for a Cold Chain Equipment (CCE) inventory application. Within one year, 6,095 CCE across 160 districts were entered into the national inventory, 5,990 CCE maintenance records were logged, and 29,119 temperature records were collected. Uganda immunization and cold chain officers now rely on CCIS for holistic cold chain inventory management, procurement strategizing, and prioritizing CCE repair and maintenance activities.

Partners

Uganda National Expanded Programme on Immunization, Uganda National Medical Store, University of Washington.

Countries

Globally available.



RESEARCH DEVELOP APPROVE INTRODUCE SCALE

Donors

Bill & Melinda Gates Foundation, Gavi, the Vaccine Alliance.

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MEDICAL DEVICES AND HEALTH TECHNOLOGIES

Solar direct drive vaccine cold rooms

Solar direct-drive walk-in cold rooms (SDD WICR) use solar energy without batteries to provide safe continuous cold storage for vaccines where refrigerators are too small for the storage need.

Need

Before prequalifying this new and innovative technology for broad purchase through UNICEF, the World Health Organization's cold chain technology regulation team needs to know if SDD WICR performs as promised to protect significant vaccine investments which can be stored inside—a cold room fully stocked with typical childhood vaccines holds more than $600,000 worth of product.

PATH's role

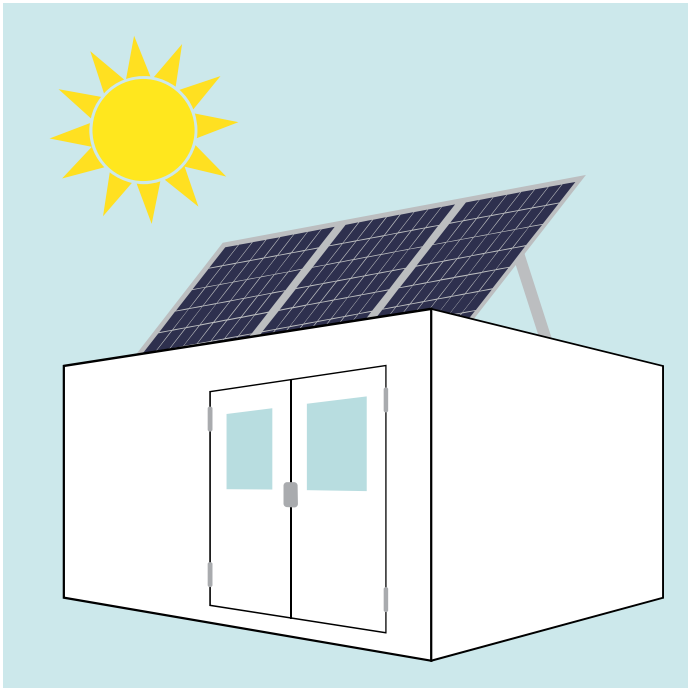
PATH is leading a pilot study of SDD WICR installations in Senegal. The team will continuously monitor important technical indicators including temperature, power utilization, and solar power generation; as well as qualitative information about users' experience with the equipment. Similar technologies are used in other sectors, but in order to provide the assured protection of the vaccines, PATH continues work with global bodies and manufacturers to adapt and validate the technology to improve reliability, resilience, and environmental sustainability of the vaccine cold chain.

Partners

Senegal Ministry of Health and Social Action, Sunny Day LLC, the World Health Organization, and manufacturers.

Countries

Globally available.



Donors

Gavi, the Vaccine Alliance

Product manager

Steven Diesburg, sdiesburg@path.org.

7 AFFORDABLE AND CLEAN ENERGY

Addresses United Nations Sustainable Development Goal 7.B: By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries.

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