**Translating innovative ideas into breakthrough medical devices and health technologies**

All too often in low- and middle-income countries, medical devices and health technologies are inaccessible because they are too expensive or impractical for use in under-resourced health care settings. PATH’s Medical Devices and Health Technologies Program responds to these challenges and health system gaps by collaborating with partners and stakeholders to design, test, refine, introduce, and scale devices and tools with the potential to achieve unprecedented wins for health.

Together with our public- and private-sector partners, we have investigated hundreds of innovations and advanced the most promising and appropriate technologies into affordable products for use in country health programs and global health campaigns for the women and children who face the greatest health inequities.

**Innovations by the numbers**

- **7 billion** SoloShot™ syringes
  - PATH designed the first commercially available autodisable syringes for immunizations: a fixed needle that locks after a single injection to prevent reuse. It catalyzed a global policy shift in safe injection, and since 1990 more than 7 billion have been produced by BD, lowering the risk of bloodborne disease transmission.

- **8.5 billion** HEATmarker® vaccine vial monitors
  - To help health workers know in a glance if a temperature-sensitive vaccine can be used, PATH advanced a small sticker on a vaccine vial that changes color when exposed to heat over time. All vaccines purchased through the United Nations Children’s Fund use vaccine vial monitors (VVMs). Since 1996, more than 8.5 billion VVMs have helped ensure that undamaged vaccine is used to immunize children and improved vaccine distribution.

- **155 million** Uniject™ injection systems
  - PATH developed a compact prefilled autodisable injection system that combines a needle, a syringe, and a single dose of vaccine or pharmaceutical. Millions of babies have received their hepatitis B birth dose, and more than 1 million units of injectable contraceptive DMPA-SC have been given via Uniject injection system.

- **20+ million** doses of chlorhexidine for infant umbilical cord care
  - PATH led a global coalition to advance 7.1% chlorhexidine digluconate (CHX) for use as an essential newborn care intervention to help prevent umbilical cord infection and neonatal sepsis. CHX has been introduced or scaled in more than 25 countries.

- **240,000** Caya® contoured diaphragms
  - PATH designed and developed the first new diaphragm design in 50 years to address women’s unmet need for a nonhormonal family planning method that they can control. Introduced in 2013 by KESSEL medintim GmbH, Caya is now available in more than 44 countries, with more than 240,000 units sold.

- **80,000** Nifty Feeding Cups
  - PATH and partners designed a cup for infants who are unable to breastfeed. Mothers can express breast milk into the cup and use it to effectively feed their infants. In 2016, PATH and Laerdal Global Health announced a collaborative effort to bring the Nifty Feeding Cup to market, and now it has been distributed to more than 40 countries.
Helping global immunization campaigns

Polio eradication: For years, PATH has generating data to support fractional dose delivery regimens to help support polio eradication efforts. More than 4 million PATH-developed intradermal adapters—manufactured by West Pharmaceutical Services, Inc. and supplied with Helm autodisabling syringes—have been procured by the World Health Organization (WHO), and 1.3 million were used in 2018 in Nigeria for fractional dose inactivated poliovirus vaccine delivery. Also, WHO procured 5 million needle-free syringes with 5,000 reusable PharmaJet Tropis® jet injectors, and hundreds of thousands have been used in polio vaccine campaigns in Pakistan. Now 9 countries have adopted fractional dose inactivated poliovirus vaccine regimens—stretching limited vaccine supplies to protect more children.

Protecting infants from Rotavirus: With the aim of developing a more compact container that could enable more children to be reached with this lifesaving vaccine, researchers at PATH developed a multi-monodose Blow-Fill-Seal (BFS) container design compatible with oral rotavirus vaccine. Now, the first immunization program against rotavirus in Myanmar is using GSK's Rotarix vaccine in a multi-monodose squeezable tube via BFS technology.

Protecting vaccine potency

PATH developed a vaccine carrier freeze-prevention barrier innovation that protects vaccine potency and reduces health worker burden. We made the design open source and transferred the technology to multiple manufacturing partners to help bring the first freeze-preventive vaccine carriers approved by WHO to market in 2018. As of 2020, two of the three PQS prequalified products that are now available on the market were based on PATH's solution.

Bringing safe water to households and communities

C1 Common Interface: PATH designed an open-source common-connection point and platform solution to promote water filter interchangeability, standardization, and market efficiency. Commercial products from Ningbo Clean (2012), PureEasy (2012), Kohler (2015), and Imerys (2016) are in use in households around the world.

The MSR SE200™ Community Chlorine Maker: PATH and MSR Global Health codeveloped an innovative, on-site chlorine generator for treating drinking water and as a disinfectant for infection prevention in communities. Commercialized in 2015, the product has been used in more than 40 countries.

Saving the lives of women with severe post-partum hemorrhage (PPH)

Ellavi Uterine Balloon Tamponade: PATH in collaboration with Sinapi Biomedical (Pty) Ltd are advancing the use of the Ellavi uterine balloon tamponade, a low-cost, preassembled medical device that manages PPH in minutes. In 2019, the Ellavi received a CE Mark and in 2020 the product is being introduced into existing national PPH-control programs in sub-Saharan Africa, starting with Kenya and Ghana. The device has been used in hospitals across South Africa since 2019.

LifeWrap non-pneumatic antishock garment: This neoprene compression garment can be used to control bleeding and stabilize vital signs. To increase availability of this lifesaving innovation in low-resource settings, PATH focused on lowering production costs while maintaining quality by building the capacity of a new manufacturer to produce high-quality garments. More than 15,000 reusable LifeWraps have been sold by Blue Fuzion Group in 11 countries since 2014.

For more information about the Medical Devices and Health Technologies Program’s portfolio of technologies, please contact innovation@path.org. All photos: PATH, where not otherwise indicated.