

Echelon: Improving Health Outcomes through Locally Made Devices

Neonatal asphyxia, when a baby has inadequate oxygen before, during, or just after birth, is a devastating emergency for too many families. Globally, neonatal asphyxia accounts for 29 percent of neonatal deaths. This problem is particularly pronounced in Ethiopia, where a recent study determined that 47 percent of newborn complications were due to neonatal asphyxia. When asphyxia leads to disability, the resulting impact can have significant financial and social consequences for the child, their family, and community.

A simple, yet critical, handheld device used for resuscitation called a “bag valve mask” can prevent these outcomes. When health care providers resuscitate infants experiencing asphyxia, they can prevent 20 to 30 percent of neonatal deaths, and save 5 to 10 percent of preterm babies. In Ethiopia, bag masks are often costly or unavailable, due to shortages or lack of access for people in rural areas, who comprise 80 percent of the population. With the support of the HANSHEP Health Enterprise Fund, implemented by the SHOPS project, Echelon, a local company, is now producing bag masks. The company is the first medical device manufacturer in Ethiopia.

The Business Model

Echelon aims to benefit Ethiopians across the health system: the child, who receives treatment at birth; the family, for whom the burden of care is reduced; the health worker, who saves more lives; the facility, which no longer encounters stockouts; and the government, which better meets the needs of its citizens. Before Echelon’s production, all bag masks were imported and sold for \$100 for a package of three. In addition to one infant device, the three-pack contained an adult and child device, which are needed less frequently and often wasted. Echelon’s bag mask is sold for \$10 per device, and better aligns with medical needs and usage patterns in Ethiopia as it is only for infants. The bag mask is also reusable, and in rural health facilities will typically be used 10 to 20 times, or less than \$1 per use.

The financial barrier to providing a life-saving service is reduced by Echelon’s local operations, while at the same time creating a comparative labor advantage in an underdeveloped country. Echelon contributes to the local economy by providing jobs, and building a more marketable, skilled labor force through the assembly-line training of employees. This effort was made possible by U.S. partners, which teamed with Echelon to design a mask that is less complicated and requires fewer components. The new



Tiffani Diage and a health worker inspect a bag valve mask.

Grantee at a Glance

- Vision: Create capacity for local medical device manufacturing, ensuring consistent access for providers and improving health outcomes
- Innovation type: Low-cost, locally manufactured neonatal bag valve masks
- Health focus: Maternal, newborn, and child health
- Target population: Neonates receiving care in public and private facilities
- Country: Ethiopia

design is simple to produce and practical for clinicians, as it is easily disassembled for cleaning and reuse.

Start-up Support for Manufacturing

Through the HANSHEP Health Enterprise Fund, SHOPS provided support for Echelon to open its manufacturing facility and secure equipment and supplies for the first round of bag mask production. Echelon hired local assembly workers and trained them in good manufacturing practices, equipment maintenance, and product quality testing. The grant allowed Echelon to produce a small number of prototype bag masks for piloting at health facilities for safety and clinical validation.

The Health Enterprise Fund also supported Echelon in their commitment to quality by facilitating certification through the World Medical Device Organization, and assisting with the process of patenting technology in Ethiopia. The grant ensured that Echelon could demonstrate foreign investment, which helped meet requirements to obtain a trade license from the Investment Bureau in Ethiopia.

SHOPS is supporting a program to supply the devices and train clinicians in maintenance and cleaning. Through these clinical evaluation sites, Echelon is tracking product use and collecting feedback to continue to improve the product. The company also plans to test devices with health extension workers at rural health posts outside of Addis Ababa.

The Impact

“ I founded Echelon to create the capacity for Ethiopia to move towards independence in health care by establishing a local medical device industry that can provide essential, life-saving devices.” — Tiffini Diage, Founder and CEO

The Echelon bag mask has been used to resuscitate over 100 newborns. Echelon received an order of 500 bag masks and anticipates a bid from the Ministry of Health. The company intends to scale up production by purchasing materials in bulk and increasing the number of skilled assemblers. As sales increase, Echelon intends to expand clinical training to accompany its sales, with the goal of reaching more rural populations in Ethiopia.

Creating local medical device manufacturing establishes a new industry in Ethiopia. As a pioneer, Echelon is committed to setting a precedent of excellence in quality and compliance in a country where there are few regulations and standards. Echelon is innovating through its product, and its approach, and ultimately saving lives.

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For more information about the SHOPS project, visit: www.shopsproject.org



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