How can better-designed products address critical needs for wheelchair users?

Challenge: Wheelchair products are necessary, but are complex and prohibitively expensive

Global guidelines for the provision of wheelchairs in low-resource settings have been in place since 2008, and many individuals receive their wheelchairs free of cost through a variety of wheelchair distribution programs. Still, many wheelchair users report receiving but not using their chair. When a necessary mobility-enhancing device is available and free, what else can be done to improve its use?

Accelovate is a five-year, United States Agency for International Development (USAID)-funded program charged to increase availability of and access to lifesaving technologies and commodities in low-resource settings. In keeping with its mission, Accelovate addressed the challenge of ensuring the greatest possible independence for persons with disabilities by increasing the availability and uptake of appropriate wheelchair technologies in low- and middle-income countries.

Challenge Background: Wheelchair programs address both distribution and service delivery

According to World Health Organization estimates, 65 million people worldwide need a wheelchair. Yet less than 5% have a properly fitted wheelchair, and, in one study, 57.4% of distributed wheelchairs went unused.

For wheelchair users with poor trunk control (intermediate-level wheelchair users), good fit includes postural support to sit upright. Without support, these wheelchair users face diminished quality of life, injury, and even death; equipment is abandoned and underutilized.

Postural Support Devices (PSDs) mitigate risks that further complicate the health of wheelchair users, help prevent secondary disabilities, increase functional movement, boost communication, and enhance overall quality of life.
ability, and reduce aspiration that can lead to death. Examples of PSDs include cushions, straps, supports, and trays. However, most available PSDs are cost-prohibitive. Existing devices cannot be interchanged to multiple chairs or to users with differing postural needs. For users in low-resource settings, this poses a critical problem. In keeping with its mission to improve access to lifesaving technologies, Accelovate aims to increase the availability of PSDs that meet the needs of this subset of wheelchair users.

Accelovate’s Solution: A call to innovators

Accelovate launched a Design Challenge in September 2014. The Design Challenge issued an open call to innovators to develop PSDs for wheelchair users in low-resource settings. Competitors were spurred to create devices adhering to Accelovate principles, including:

- Extreme affordability so that technology is widely accessible and scalable;
- Simplicity so that technology can be deployed and maintained closest to communities and people in need;
- Robustness to withstand use outside of hospitals and health facilities and in diverse and adverse conditions;
- Ability to be rapidly developed using re-engineering principles or be repurposed for use at peripheral levels of health care systems; and
- Demonstrable application of frugal engineering concepts.

Furthermore, solutions should utilize a universal interface compatible with a variety of wheelchair types and models, all without reducing or diminishing wheelchair functions.

Accelovate assembled an expert panel representing expertise in wheelchair service provision and design, engineering, and product innovation for the developing world. This panel was tasked to award funding to up to 10 concepts for the creation of initial prototypes. Three winning prototypes were provided additional funding and mentorship to develop final prototypes and collect data establishing proof of concept.

Results Achieved

Developers of the three winning initial prototypes were brought together as a community of collaborators to work through challenges with the support of mentors. Final prototypes were presented to stakeholders representing the USAID Global Development Lab; the International Society of Wheelchair Professionals; the Nova Scotia Health Authority; Google; and USAID’s Consolidating Logistics for Assistive Technology Supply and Provision (CLASP) project. Notably, two winners are in discussion to combine elements of their products. A report is available at [http://www.jhpiego.org/accelovate](http://www.jhpiego.org/accelovate)
Accelovate—a Partnership in Accelerated Global Health Innovation

Accelovate is a global program dedicated to increasing the availability and use of lifesaving innovations for low-resource settings. Led by Jhpiego, the Accelovate program began in 2011 as a five-year, United States Agency for International Development (USAID)-funded program under the Technologies for Health (T4H) grant.

Also available from Accelovate:

- **Design Challenges** promote the development of innovative solutions where appropriate technology is lacking
- **Solution Landscapes** assess what solutions exist
- **Value Propositions** assess the benefits and drawbacks of an array of solutions for our context
- **Business Cases** assess manufacturability and commercial potential
- **Market Readiness Assessments** evaluate a selected technology/solution for market-level readiness factors
- **Briefs** describe technology access and utilization challenges in a topical area and outline Accelovate’s approach
- **Excel Tools** present raw data that implementers may develop for programming and advocacy purposes
- **Literature Reviews** review secondary data, usually to understand a bottleneck

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Accelovate invites innovators, advocates, funders, and programmers addressing the procurement and use of maternal health drugs and technologies in low-resource settings to share our tools and develop appropriate models to promote wheelchair availability and use. To discuss **partnership opportunities around new solutions**, contact us at accelovate@jhpiego.org.

detailing the lessons emerging from the Design Challenge to inspire innovators and draw attention to help winning designs find their way to market.

**Next Steps: Building on Accelovate’s achievements**

Accelovate continues to **work with strategic partners**; these partners include but are not limited to: USAID, national governments, universities, wheelchair service providers, nongovernmental organizations, organizations of disabled persons, innovators, and implementing partners.

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4. Ibid.