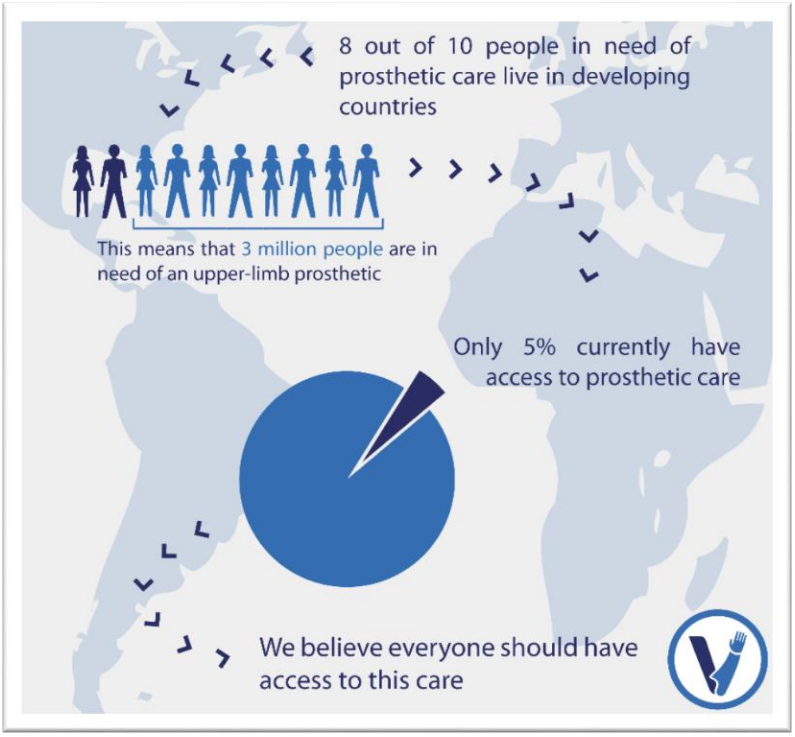
## The Need for Prosthetic Care

For people missing an upper-limb, the lack of prosthesis may be a major disability that can negatively affect their quality of life. Many developing countries lack the proper resources to help disabled citizens. Prosthetic care is expensive and requires trained individuals (prosthetists) to provide proper care to the people in need. According to the World Health Organization (WHO), 80% of amputees live in low-income countries yet only 5% of them have access to prosthetic care [1].



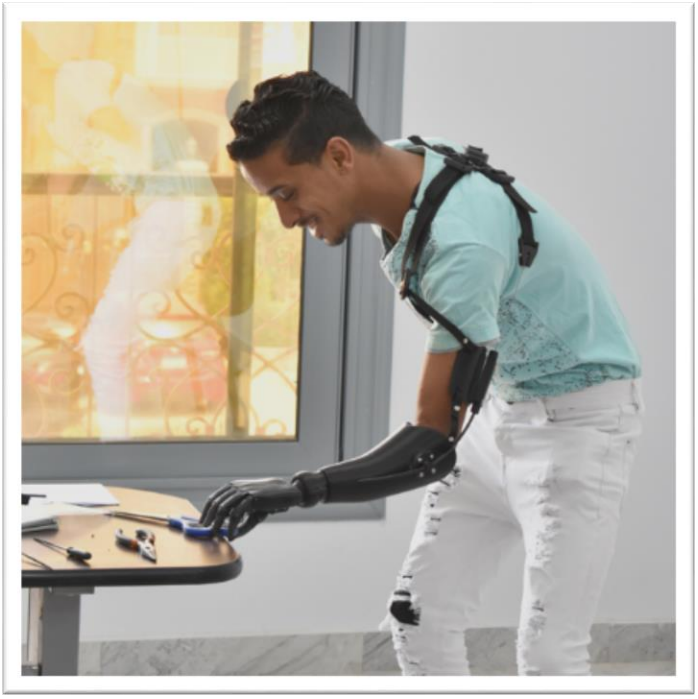



*Figure 1: Bilateral Amputee Mostafa Using a Victoria Hand (Egypt, 2019)*

Missing limbs can lead to low self-esteem, social exclusion from the community, and can be a burden to the supporting family. Further, it can make it difficult to gain and keep employment. Everyday tasks such as eating, cooking, dressing, and washing may become challenging to complete. Conventional upper-limb prosthetic devices can cost between $2,000 [2] and $5,000 [3] USD for parts alone. This is too expensive for many people in the developing world, especially those who cannot find work.

Victoria Hand Project

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## The Victoria Hand Project Solution

*Just $300 USD provides a prosthetic arm to an amputee in-need*

The Victoria Hand Project (VHP) is a Canadian non-profit organization founded in July 2015, with a mission to provide upper-limb prosthesis to amputees in developing countries with limited or no access to prosthetic care. VHP has created the Victoria Hand System: a series of body-powered prostheses that allow amputees to do home and work-related tasks, and to improve their quality of life.

VHP's approach has three key features:

(1) Setup of a production/fabrication center and assembly training to make the 3D printed prostheses on-site within developing countries;

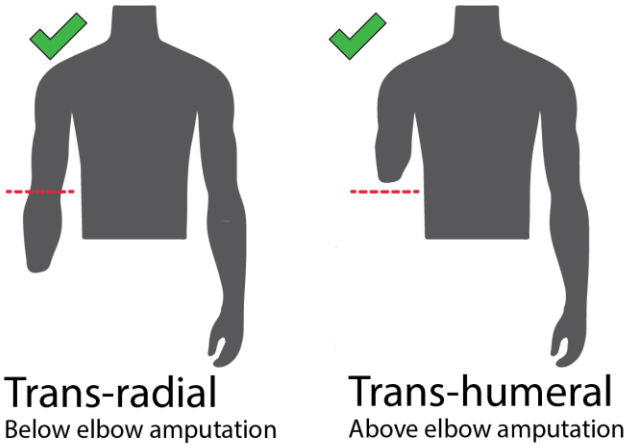
(2) Training and working with clinical and medical practitioners to provide professional care for amputees;

(3) On-going operations support for both the production center and the clinical provision network.


Just $300 USD provides a prosthetic arm to an amputee in a developing country. This includes the cost of materials to build the hand, and the cost to pay our clinical partners in-country to assemble and properly fit the hand. The Victoria Hand Project is currently working in 8 developing countries - Nepal, Cambodia, Guatemala, Ecuador, Haiti, Egypt, Uganda, and Kenya – and with recent funding is looking to expand to underserved areas of Canada and the USA. VHP has fit over 170 amputees around the world, empowering them to live more independent, fulfilling lives.

## Victoria Hand Project Technology

3D printing allows the devices to be printed on-demand, on-site in the country. 3D scanning is used to capture the unique shape of the individual's limb, to 3D-print a limb-socket that is completely customized for that user. The Victoria Hand is a complete prosthetic system, which includes the hand, the wrist unit, the custom forearm socket, and a harness to actuate the device. VHP has the capabilities to fit amputees who are trans-radial (below elbow loss), trans-humeral (above elbow loss), and children with trans-radial loss. VHP has also adopted a US non-profit named LimbForge Technologies, who make 3D-printed cosmetic arms.



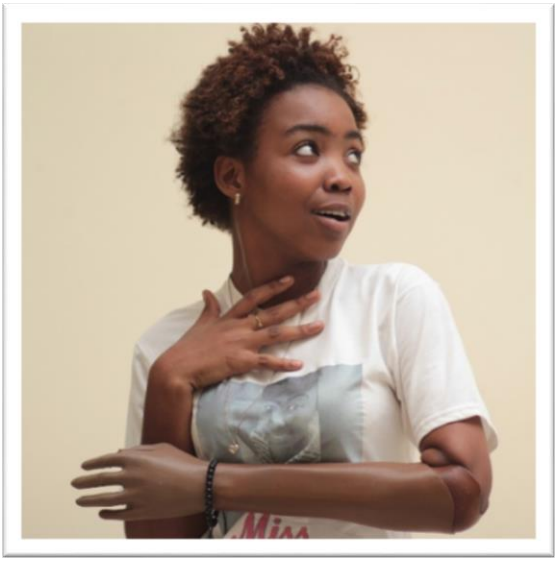



*Figure 2: The LimbForge Arm is also 3D-Printed and is made to look very aesthetically appealing*

*Figure 4: Palpasha was fit with a Child's Hand in June 2019*

## Victoria Hand Project History

The Victoria Hand is based off the TBM Hand, which was designed by VHP's Executive Director, Nick Dechev, during his Master's at the University of Toronto in 2001. This hand was very expensive to produce since it used traditional manufacturing techniques, such as milling. The hand was re-designed for 3D printing and was tested in Guatemala in 2014 as part of University of Victoria research. The need for accessible prosthetic technology in developing countries was discovered at this time and the idea of the Victoria Hand Project was devised. The Victoria Hand Project became incorporated as a not-for-profit in 2016. In Summer 2016, VHP expanded to Nepal and Cambodia after receiving funding from Grand Challenges Canada, and to Haiti with help from LimbForge (Enable Community Foundation at this time). In 2017, VHP received $250,000 CAD from the Google Impact Challenge Canada. This has allowed VHP to expand operations to both Egypt and Uganda, as well as continue operations in the 5 other countries. In January 2019, VHP adopted Limbforge technologies and started offering the cosmetically realistic hands alongside the functional Victoria Hands. In December 2019, VHP received funding from TD Bank Group via the TD Ready Challenge to expand services to underserved areas of Canada and the United States. In 2020, thanks to a very generous anonymous donation, VHP opened it's eighth international clinic in Kenya.

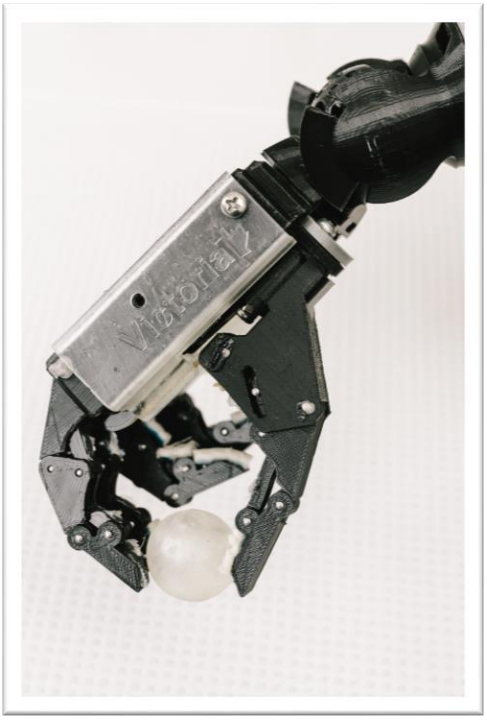



*Figure 5: One of the first versions of the Victoria Hand (2016)*

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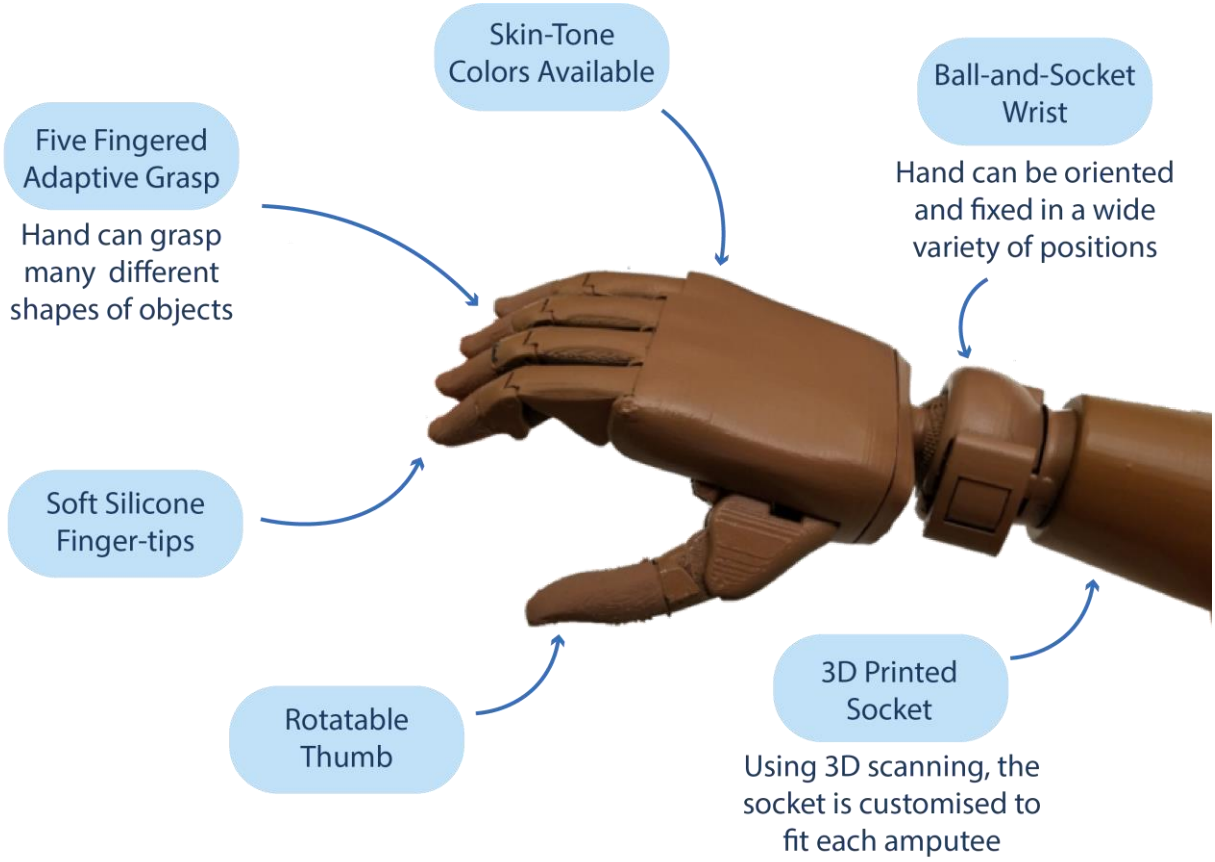
## Victoria Hand Features




For more information on the Victoria Hand Project, visit our website at:

www.victoriahandproject.com

References

[1] M. Marino, S. Pattni, M. Greenberg and A. Miller, "Access to prosthetic devices in developing countries: Pathways and challenges", 2015. Available: https://www.researchgate.net/publication/285591611_Access_to_prosthetic_devices_in_developing_countries_Pathways_and_challenges. [Accessed 28 June 2019].

[2] “AOPA Statement on 3-D Printing in Prosthetics and Frequent Errant Estimates of the Average Cost of Upper and Lower Limb Custom-Fabricated Prosthetic Devices”, American Prosthetic and Orthotic Association, Online, Feb 2015, http://www.aopanet.org/2015/02/aopa-statement-on-3-d-printing-in-prosthetics-and-frequent-errant-estimates-of-the-average-cost-of-upper-and-lower-limb-custom-fabricated-prosthetic-devices/

[3] "How Much Does a Prosthetic Arm Cost?", CostHelper, 2017. [Online]. Available: https://health.costhelper.com/prosthetic-arms.html. [Accessed: 28- Jun- 2019].