

## Students build wiki of medical devices designed for low-income countries

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A human powered nebulizer could provide breathing treatments to asthma patients in parts of the world without reliable electricity. The device, developed at Marquette University, is one of the more than 100 technologies University of Michigan students have cataloged in a new wiki of medical devices for resource-limited settings. Credit: courtesy of Marquette University.

(Medical Xpress) -- In parts of the world without reliable electricity, a pedal-powered nebulizer could provide life-saving asthma treatments. Small wax-filled sleeping bags could keep premature infants warm. A salad spinner centrifuge for blood samples could help clinicians diagnose anemia.

University of Michigan researchers have cataloged more than 100 such technologies in a new wiki of medical devices designed for resource-limited settings. The [Global Health Medical Device](#) Compendium, an

open-source inventory, is hosted by the popular appropriate technology wiki Appropedia. It is expected to serve as an important communication vehicle for end users, non-governmental organizations, researchers and others to help advance such technologies.

[Developing nations](#) import roughly 90 percent of their medical technologies from higher-income countries. But systems tested in controlled settings in high tech hospitals often don't work as intended in places where continuous electricity, replacement parts, clean water, and appropriate training aren't always accessible.

In the new database, each device's entry outlines the problem the technology aims to solve and includes links to related peer-reviewed studies. Visitors can search by disease, device status, and the region where the device has been tested or targeted. They can comment on a device's usefulness. And, because the database is a wiki, they can update information and add technologies.

"We've created an active, dynamic compendium of devices specifically designed for resource-limited settings. It will help people see what is possible and what is in the pipeline," said Kathleen Sienko, an assistant professor of mechanical and biomedical engineering who spearheaded the project.



Rachel Strauss (left) and Megan Bland, master's students in biomedical engineering developed an inexpensive, low-tech child car seat for use in developing nations where car seats are not mandated or even commonly used. The car seat one of the more than 100 technologies University of Michigan students have cataloged in a new wiki of medical devices for resource-limited settings. Credit: Marcin Szczepanski

The endeavor began in 2010 in Sienko's Design for Global Health engineering course. When she found that a suitable textbook for the course did not exist, she turned the students into global health researchers. Over the course of the semester, they examined 600 health-related technologies and even traveled to Nicaragua to observe medical care there. During the past two years, other students have whittled down this information and cataloged it. Design science doctoral student Amir Sabet, who took Sienko's class, led the Appropedia project.

"I'm from a part of the world that isn't very developed" said Sabet, who was born in Iran and spent time in Turkey. "When I came to the U.S., the promise I made to myself was to give back to places like where I came from, where not many people tend focus with their education and knowledge."

Sabet believes the database will make a big impact, and he's not alone. It could become the first place that clinicians, non-governmental organizations, social entrepreneurs, and policymakers go to find global health solutions, says Sofia Merajver, M.D., director of the U-M Center for Global Health and a professor of internal medicine at the U-M Health System. The students met weekly at the center to do this work.

"Let's say you're setting up a healthcare facility in the developing world and you know you're only going to be able to rely on a limited amount of

electricity and there could be 10 mothers delivering at once. You could go to this database to see what your options are for fetal heart rate monitors or infant warming devices," Merajver said.

U-M students will continue to expand the compendium in future semesters, but its growth isn't limited to their efforts.

"The incredible beauty of this project is that it's alive. It's updatable by anyone in real time. I believe it can really help advance new knowledge in a way that's never been done before," Merajver said.

Several technologies developed at U-M are already in the database, including a male circumcision device that can be incorporated into traditional ceremonies to reduce the risk of complications, an inexpensive infant car seat, and a filtering syringe called Hemafuse that make autologous blood transfusion (salvage and reuse of a patient's own blood) safer and easier for medical professionals to accomplish during surgery. Hemafuse is being commercialized through the student startup DIIME, which is traveling to Ghana in May for market research.

"For this exemplary case of collaboration and service learning to address global issues, Professor Sienko and her teams leveraged and augmented the tools and community of Appropedia. This type of collaborative effort is critical to moving quickly on our global challenges and creates immediate and lasting impact through the thousands of daily Appropedia visitors from all around the world," said Lonny Grafman, Appropedia founder and Humboldt State University engineering instructor.

**More information:** The new database can be found at [www.appropedia.org/Global Health Compendium](http://www.appropedia.org/Global_Health_Compendium)

Provided by University of Michigan

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