IMPACT Journalism Day by Sparknews

Brian Turyabagye and Besufekad Shifferaw show off their innovation, the mamaope jacket to be used to detect pneumonia in children. Below, the mamaope jacket.
PHOTOS BY HALIMA ATHUMANI

The jacket that detects pneumonia

Wrong diagnosis leads to death which is why tools that help tell the occurrence of a disease are essential.

BY BEATRICE NAKIBUUKA
The Daily Monitor, Uganda

Six months of coughing and a debilitating fever was too much for Olivia Koburongo's 86-year-old grandmother, whose body had been weakened by other age-related conditions. My grandmother, the 26-year-old says, died of pneumonia that could not easily be diagnosed because of a lack of proper diagnostic equipment. "For six months she kept taking wrong medicine. Several health workers in different health facilities had diagnosed her with malaria. Pneumonia was discovered after a postmortem was conducted when she died," Koburongo reveals.

Killer ailment

Children and the elderly are especially vulnerable to pneumonia. According to Unicef, pneumonia accounts for almost one million child deaths worldwide every year; 922,000 in 2015 which is 16% of total deaths among children under five years of age. In Uganda, Unicef estimates that the disease kills up to 24,000 children under-five every year, many of whom were misdiagnosed with malaria.

Uganda, like its neighbouring countries, lacks proper diagnostic equipment for many diseases such as pneumonia, therefore health workers rely on basic clinical examinations. It is in this context that in 2014, Koburongo and four others invented "Mama-Ope" (Mother's Hope): a biomedical smart jacket that detects and analyses pneumonia symptoms among children, with the aim of providing more accurate diagnosis. Koburongo, a graduate of Telecom Engineering from Makerere University, says the team has developed a prototype that is three times faster than the standard diagnostic process in Uganda.

According to co-founder Brian Turyabagye, also a telecom engineer: "The jacket diagnoses, measures the extent to which the disease has affected the lungs and also tracks the progress of the disease since diagnostic information is sharable."

Milestone

Mama-Ope won runner-up prize in the Big Ideas Innovation competition run by the University of California Berkeley in 2015. The $6,500 (about Shs 22.7m) prize provided seed money that the team used to develop a prototype.

The team is currently in the process of getting certification from Uganda's Ministry of Health.

According to Dr Flavia Mpanga Kaggwa, a Health Specialist at Unicef Uganda: "The jacket needs to be approved by a regulatory authority to have the possibility of commercial viability. Otherwise I think it would be a great addition to the tools used in diagnosing pneumonia."

Once certification is secured, the team intends to do mass production and supply the jacket to countries in East Africa at a cost of about $80 (Shs280,000).

In the meantime, Mama-Ope has been gaining supporters around the world – in March this year, Brian Turyabagye won the Pitch@Palace Africa event hosted by HRH The Duke of York in London, England.

"We plan to have the jacket also operate on solar energy which is more reliable for most East African countries," Turyabage says.

Mama-Ope's founders hope the smart jacket will help in saving diagnosis time and reduce the number of deaths due to pneumonia, which would be a great contribution to the country's Sustainable Development Goals (SDGs) and save the government on wastage of drugs.

HOW IT WORKS

Traditionally, doctors use a stethoscope to check for abnormal crackling sounds in the lungs. However, if medics suspect malaria or tuberculosis which also cause respiratory distress, they may end up misdiagnosing the patient.

Currently at prototype stage, the Mama-Ope kit is designed to work as follows: health workers slip the jacket onto the child, and its sensors pick up sound patterns from the lungs, temperature and breathing rate. Each sensor is aligned to a particular symptom and in four minutes, data is computed and sent to a mobile phone application which does the diagnosis.

"The processed information is sent to a mobile phone app (via Bluetooth) which analyses the information in comparison to known data so as to get an estimate of the strength of the disease," explains Turyabagye.

According to studies carried out by its inventors, the jacket can diagnose pneumonia up to three times faster than a doctor, and reduces human error. The Mama-Ope team has also hired private medical researchers from Makerere University's Infectious Disease Institute to test their prototype, and sought guidance from Unicef. Dr Namwase, a paeditrician at Mulago National Referral Hospital, said the device is "easy to use because there are not so many processes involved but also does not require special training to the health workers."

After displaying the result on the app, the technology goes on to advise on the appropriate action, e.g. if the disease is severe, it advises the user to reach out to the nearest referral hospitals. The beauty of this is that the doctor can gauge the severity of the disease from the point it was first diagnosed by using the information stored on the cloud.