

Makerere graduates develop pneumonia diagnosis device

By Gloria Nakajubi

Currently, it takes over 20 minutes to carry out a pneumonia diagnosis. However, a new device (app) developed by fresh graduates from Makerere University, might drastically bring that time span down to just three minutes, with over 90% accuracy.

Codenamed *Mama-ope* the device shortlisted for the 2017 Royal Academy of Engineering Africa Prize is a biomedical smart jacket that helps doctors identify pneumonia faster and more accurately.

How it works

Brian Turyabagye, a graduate of telecommunications engineering and a member of the team, yesterday said the device is fitted onto the patient to measure their temperature and breathing rate. This data is compared to the parameters in the inbuilt database.

"The jacket, currently a prototype, can diagnose

pneumonia three times faster than a doctor and reduce human errors," he says.

According to Olivia Koburongo, another telecommunications engineering graduate on the team on whose unfortunate experience the app was born, this should solve the misdiagnosis that happens in most health facilities, resulting in death.

In 2014, Kaburongo lost her 86-year-old grandmother after she was wrongfully diagnosed with malaria, yet she had pneumonia. It was after they visited a different hospital that pneumonia was discovered, but it was too late to save her.

The health worker to population ratio in Uganda is 1:1,298 compared to the World Health Organisation (WHO) guidelines of 1:439. This leaves many patients at risk of misdiagnosis and lack of appropriate care.

The *Human Resources for Health Audit Report 2011*

BETWEEN THE LINES:

■ The app also provides a smart way of storing and accessing client records.

showed that up to 42% of all health worker positions were vacant at the time, with majority of the gaps at the lower health facilities.

A graduate medical doctor on the team from Makerere College of Health Sciences, Rodney Sekate, said Uganda being a malaria endemic country, some health workers including parents mistake pneumonia for malaria. The two share close signs and symptoms such as fever and difficulty in breathing.

About pneumonia

Pneumonia as explained by the World Health Organisation, is a form of acute respiratory infection that affects the lungs. When an individual has



Shifferaw (left) and Sekate diagnosing Allison Nabitosi using the app. Photo courtesy of Brett Eloff for the Royal Academy of Engineering

pneumonia, the alveoli (small sacs filled with air) are filled with pus and fluid, which makes breathing painful and limits oxygen intake. Managing pneumonia gets quite challenging if not diagnosed early, which explains a high rate of mortality. According to UNICEF, pneumonia kills up to 24,000 children annually in Uganda.

"It is quite easy for a doctor to differentiate between these two, but how many patients have access to medical doctors? Most people, especially in rural areas, are in the hands of lower cadres," Sekate says.

Besufekad Shifferaw, a

computer engineering graduate on the research team, said the technology can offer up to 75% accuracy on diagnosis but since technology development is an ongoing process, it might be at 90% by the time it hits the market.

Mama-ope according to the team, also provides a smart way of storing and accessing client records. This helps to inform interventions when they next visit the health facility.

"You do not have to carry along a booklet every time you visit a health facility, the system attaches a code to every patient's data entered and that becomes their user

identification number," says Koburongo.

Paediatrician's take

According to Dr Terry Piloya, a consultant paediatrician at Mulago Hospital, pneumonia diagnosis remains a major challenge, especially for the less skilled health workers in rural areas.

"I have read about the kit and I think if it is well-developed and certified, it will help the health worker challenges we face," she says.

Pneumonia, she says, is still a leading cause of death among the under five in not just Africa, but globally.