

FRONTLINE: a new treatment facility for Ebola virus disease



ALIMA/Anne-Gaëlle Borg

A doctor working with ALIMA changes the bandage of a patient being treated for the Ebola virus disease

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The second-worst outbreak in the history of Ebola is afflicting the volatile region of eastern DR Congo, said the country's health ministry on Nov 29. At least 426 people have been affected and 245 people have died since August.

The latest outbreak poses several challenges, not least of which is security. North Kivu province hosts dozens of armed groups and in November, WHO temporarily evacuated 16 staff from the town of Beni in the north of the province after fighting between armed groups.

In most Ebola treatment centres with isolation areas, which can take up to a couple of weeks to set up, civilians cannot enter to visit their loved ones. Patients who survive confirmed Ebola virus disease spend on average 16.1 days in isolation, separate from family and friends. Doctors must don protective clothing, which can take up to 15 mins to put on, and they can only treat patients in pairs.

However, a Senegal-based medical charity Alliance for International Medical Action (ALIMA) has pioneered a new type of treatment facility called the CUBE or the Biosecure Emergency Care Unit.

The contraption creates a chamber for an individual patient and is made up of four plastic, see-through walls. One of the walls is fitted with plastic glove-like inserts, meaning the health workers no longer have to put on and take off the cumbersome protective clothing for routine operations, substantially cutting the risk of exposure and contamination and reducing the need for more staff to treat patients. A single doctor can treat several patients in CUBEs, which can be deployed in 48 hours and be more easily moved.

Richard Kojan is president of ALIMA and an anaesthesiologist. He spoke with the *The Lancet* from the organisation's medical centre in Beni.

How did ALIMA develop the CUBE?

The story of the creation of the CUBE goes back to the operation against Ebola in west Africa in 2014–16.

At that time, ALIMA was taking action in Guinea using the classic Ebola treatment unit [ETU]. It was difficult for us. We were frustrated to work in those conditions because, for reasons of biosecurity, we could not, using these traditional methods, spend much time with the patients.

It also meant that, with the traditional ETU, relatives could not stay with patients. When the epidemic was over, we told ourselves we must improve the situation.

We had internal discussions and...we met specialists in patient isolation. We came up with a design and consulted a specialist nuclear company that built the CUBE, which today guarantees laboratory-level bio-security.

We didn't build the CUBEs just for Ebola, they can be used for other haemorrhagic illnesses such as Rift Valley fever. CUBEs can be used for air-borne diseases as there is negative pressure within them.

The overall cost per CUBE is € 16 000. Compared with the cost of traditional ETUs, the CUBEs are cheaper. We have 12 CUBEs at the moment and four CUBEs in reserve in Goma.

How have patients reacted to the CUBE?

The advantage of the CUBE is that, even on the level of maintaining biosecurity, it's more convenient than in the traditional ETU, where you're obliged to keep your distance from the patients. You don't see them and they don't see you.

Right now, I'm in Beni in front of the CUBEs and I can see all the patients.

Here, relatives of the sick are much closer to the patients and can talk

to them...the patients are with their families. That makes a big difference. That supports their lives.

We also receive pregnant women suffering from Ebola ...we can carry out lifesaving interventions in case of spontaneous miscarriage or we can deliver a child in the CUBE.

This is definitely a step towards humanising patient care. This helps the patient, the carers, and the community.

What are the security conditions?

Security is another challenge. There are armed groups that from time to time enter the outskirts of the town and there are some areas where surveillance teams cannot go to follow up suspected cases. It's a real challenge because there are clashes every week.

It also means patients cannot reach us quickly if they are experiencing symptoms.

When we first thought of the CUBEs, we said to ourselves we must improve the standards of care with a view to reducing mortality.

We think that with the CUBEs and with patients arriving as early as possible we could lower the mortality even further.

In principle, we've improved standards and mortality should be falling, but with all the challenges we face, mortality is taking time to reduce. We are around 45% and if you take away those who die in the first 24 hs, you are down to 30%, but it should be less.

Might other organisations use the CUBE?

It's possible. We have [access to] the patent with the makers and we can ask them to make additional CUBEs for Médecins Sans Frontières, for US International Medical Corps, or other players.

Sharmila Devi