



**A NEW INNOVATION  
IN THE TREATMENT OF  
EBOLA AND MARBURG**



Yvonne Etinosa / ALIMA



**THE ALLIANCE FOR INTERNATIONAL MEDICAL ACTION**

# THE CONTEXT

Between 2013 and 2016, more than 11,000 people in West Africa died during the worst-ever Ebola epidemic, including more than 500 health workers. Tragically, the Ebola epidemic demonstrated the urgent need to rethink medical interventions and develop innovative technologies for treating highly-infectious diseases.

The Ebola epidemic was both a humanitarian and a scientific crisis; providing further evidence that whenever possible, direct medical care should be done while pursuing public health and research objectives.

The CUBE (Biosecure Emergency Room) was designed in response to the inadaptability of Ebola Treatment Centers (ETCs).



**ALIMA's Ebola Emergency Team identified several challenges related to the Ebola response in Guinea:**

- Insufficient patient security from cross contamination
- Insufficient equipment to monitor the patient's condition
- People unwilling to come to the center due, in part, to patient isolation
- High construction costs of the Ebola treatment center (\$1.2 million) & high monthly running costs
- Complicated and dangerous waste management for health workers in personal protective equipment (PPE)
- Lengthy, constrictive and risky PPE removal procedures for health workers
- Slow deployment, often far from the affected communities.

Photo: Sylvain Cherkaoui / ALIMA



# THE CONCEPT

BRING INNOVATION TO THE TREATMENT OF INFECTIOUS DISEASE

**Business as usual wasn't working.** During the Ebola crisis, ALIMA's emergency medical team brought together a group of researchers, doctors, technicians, and logistical experts working in the fight against the Ebola virus to rethink how to care for patients with infectious diseases more safely, effectively and cost efficiently.

Following the seminal meeting, a concept was developed to turn the traditional paradigm protocol for treating highly-contagious patients on its head:

*Isolating the health worker in specialized protection suits, inhibited their ability to effectively treat patients, who themselves suffered from a lack of human contact. Instead, why not create an individual isolation unit for the patient?*

The aim is to allow the health worker to monitor the patient, check their vitals, administer medicine and adapt the treatment from outside the treatment unit without having to wear individual protective equipment.

In this way, **both patient and health worker are protected.**



Photos: Yvonne Etinosa / ALIMA



# THE RESULT

AN INNOVATIVE WAY TO CARE FOR PATIENTS WITH HIGHLY INFECTIOUS DISEASES

ALIMA, in collaboration with Securitec, has developed an individual treatment unit, called **the Biosecure Emergency Room (Chambre d'Urgence Biosécurisée)** or **CUBE**, allowing for quality care with minimal contamination risks.

Securitec, a company specializing in nuclear, chemical and bacteriological risk (NRBC) is responsible for the management of the CUBE's technical development, including its security aspects.

The primary objective of the CUBE is to confine the start of an outbreak by creating a first line of treatment close to the patient's home.

To do this, all the functions of the CUBE have been designed to address an efficient and quality response suited to the needs of the health workers, as well as patients in the field.

## ALIMA AND RESEARCH

Since its founding in 2009, ALIMA has supported collaboration among researchers, doctors, academic centers and NGOs to create innovative solutions that improve how humanitarian medicine is delivered to the most vulnerable, particularly in fragile states.

ALIMA's scientific research projects are conducted in health emergency situations in the field with the goal of discovering new treatments, studying new practices and new therapeutic models that will lead to improved quality of care for patients.

To date, ALIMA has conducted 10 operational research projects in 5 countries. For ALIMA, the pooling of expertise, resources and knowledge from varied stakeholders leads to greater impact and quality programs to assist families in the greatest need.

# ETC vs CUBE



Ebola Treatment Centers (ETCs) are often poorly perceived, where patients are reticent to come and once arrived, are cut off from the surrounding communities.



In a standard ETC health workers must wear Personal Protective Equipment (PPEs) to interact with patients



PPEs are cumbersome and inhibit interactions with patients, who themselves suffer from the quarantine's lack of human contact



The CUBE can be deployed to the heart of the communities affected by outbreak. The transparent walls allow for patients to be in contact with the outside

Health workers do not need to wear Personal Protective Equipment for 80% of medical actions.



With the CUBE, health workers and patients are more comfortable and the transparent walls make the patient feel less isolated



## SPECIFICATIONS:

### TECHNICAL INNOVATION

- Individualized medical care area: 9m<sup>2</sup>
- Modular: 9, 18, 27 and 36m<sup>2</sup> possible areas
- Transportable : 290kg
- Reusable : can be assembled/disassembled up to 10 times
- Priced less than \$20,000
- Walls available for order by catalog

### OPERATIONAL INNOVATION

- Deployable 72 hours after initial alert close to the outbreak's epicenter
- Assembles in 90 minutes, inside or outside
- Health worker security ( Biosafety Level-4 )
- Intervention cost reduced by 75%
- Modular (interchangeable walls)

### MEDICAL INNOVATION

- 80% medical actions in low-risk areas
- Treatment administered from low-risk areas
- Continuous patient monitoring
- Patient/Health Worker/Family in close proximity
- Air conditioned

The CUBE also allows for other options including:

- A mobile Biosafety Level-4 Laboratory capable of accompanying research projects
- A protection for an immunosuppressed patient, the CUBE can be placed in positive pressure
- A 36m<sup>2</sup> operating theater configuration

## ACKNOWLEDGEMENTS

ALIMA thanks everyone who contributed to the CUBE's development :

The Guinean National Agency for Public Health Security (ANSS)  
The Royal Free Hospital (London)  
The Jean Mérieux P4 Laboratory (INSERM, Lyon)  
Bichat Hospital(Paris)  
Bégin Hospital (Paris)  
Pellegrin Hospital (Bordeaux)  
Doctors Without Borders (MSF)  
International Committee of the Red Cross (ICRC)  
The World Health Organization (WHO)

## CONTACTS

For more information on CUBE :

[cube@alima.ngo](mailto:cube@alima.ngo)

For more information about ALIMA:

[www.alima.ngo](http://www.alima.ngo)

Follow ALIMA on social media:

Facebook: [alima.org](https://www.facebook.com/alima.org)

Twitter: [alima\\_org](https://twitter.com/alima_org)

Instagram: [alima.ngo](https://www.instagram.com/alima.ngo)



THE ALLIANCE FOR INTERNATIONAL MEDICAL ACTION