MEDECINS SANS FRONTIERES

OPERATIONAL RESEARCH SNAPSHOT

A Mobile Laboratory to Diagnose and Monitor Ebola Patients

BACKGROUND

Sufficient and reliable laboratory services are essential to respond to outbreaks of infectious diseases and monitor patients. But when outbreaks affect developing countries, the necessary infrastructure is often missing or difficult to access.

During the Ebola virus disease epidemic in West Africa from 2014 to 2016, Médecins Sans Frontières (MSF) established and operated several Ebola Treatment Centers (ETCs) to help contain the outbreak and provide care for patients.

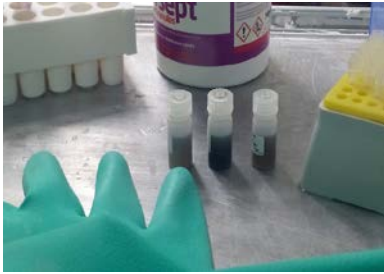
At first, to diagnose patients with Ebola, blood samples needed to be prepared and transported to off-site laboratories. This caused severe delays in reliably identifying and treating patients.

To streamline the process, MSF developed a laboratory inside a transportable shipping container, which was integrated into two Ebola Treatment Centers in Guinea. This operational research study describes and evaluates the feasibility and benefits of this mobile setup.

RESULTS

MSF's innovative laboratory consisted of an airtight metal shipping container spanning the High-Risk Zone (for patients and staff) and Low-Risk Zone (for services like the pharmacy). The container had a plexiglass partition between the zones and could be safely accessed from both sides.

Handling samples through the plexiglass, healthcare workers could rapidly and safely conduct tests to diagnose Ebola and malaria, check for pregnancy, and analyze urine samples. Diagnosing time for Ebola is estimated to be twice as fast using the on-site laboratory.



The two Ebola Treatment Centers in Guinea where the mobile lab was tested admitted more than 2,500 patients over 16 months. Protocols for safe decontamination and infection prevention and control were closely followed. No capacity problems were observed for tests run in both ETC laboratories.

IMPLEMENTATION

Allowing on-site diagnosis of Ebola, as well as continuous blood and urine tests for improved patient management, these innovative container laboratories can be used in other high-lethality, high-infectivity disease outbreaks requiring patient isolation.

Building on the experience from West Africa, a similar mobile laboratory prototype using a tent instead of a container was deployed by MSF during the 2018 Ebola outbreak in the Democratic Republic of the Congo.

Original Study: Williams, A; Amand, M; Van den Bergh, R; De Clerck, H; Antierens, A; Chaillet, P (2019) Ensuring on-site Ebola patient monitoring and follow-up: development of a laboratory structure embedded in an Ebola Treatment Centre. Disaster Medicine and Public Health Preparedness.
Pictures: Sylvain Cherkaoui/Cosmos; Carl Theunis/MSF; Pascale Chaillet/MSF.

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