

Lessons Learned from the 13th Ebola Virus Disease Outbreak in the Drc: Experience from Beni During Response Interventions with Support from the Usaid Infectious Disease Detection, Diagnosis, and Surveillance Project

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ABSTRACT

Background: The Democratic Republic of Congo (DRC) reported its 13th Ebola virus disease (EVD) outbreak on October 8, 2021, in the Beni Health Zone, North Kivu Province. Occurring five months after the 12th outbreak, it emerged amid security instability, healthcare worker strikes, and prolonged humanitarian crises. Supervision and technical support missions were deployed to strengthen the response and resilience of the health system.

Methods:

Interventions focused on three main areas:

- Logistical support: secure sample transport and distribution of waste bins and bags to laboratories in Beni, Mangina, and Butembo;
- Safe waste management: collection and incineration in Goma of 5,450 GeneXpert cartridges (3,700 used, 1,750 expired) in a high-capacity incinerator (>1200 °C);
- Technical support: field supervision visits, harmonization of biological data, reinforcement of biosafety practices, and discussions on patient and sample flow at the Beni Ebola Treatment Center (ETC).

Results: Between October and November 2021, 620 samples were tested by RT-PCR, of which 18 were positive (8 new confirmed cases). Supervision improved biomedical waste management, ensured secure incineration of GeneXpert cartridges, and strengthened biosafety, reducing environmental and health risks.

Conclusion: Laboratory supervision, combined with targeted logistical support and secure waste management, is essential for an effective Ebola response. Security instability limited intervention effectiveness, emphasizing the need to integrate adapted logistical and security measures into future outbreak planning to reinforce health system resilience.

Keywords: Ebola Virus Disease, Democratic Republic of Congo, Lessons Learned

interventions conducted and highlights lessons for improving future outbreak responses [1,2].

Introduction

The 13th EVD outbreak in DRC was declared on October 8, 2021, in the Beni Health Zone, North Kivu Province. It occurred five months after the 12th outbreak in a context marked by security instability, healthcare worker strikes, and ongoing humanitarian crises. Laboratories, key pillars of surveillance and diagnosis, received targeted supervision to strengthen biosafety and biomedical waste management. This study describes

Methods

Interventions focused on three main components:

- Logistical support: secure transport of samples and distribution of 41 bins and 13,120 trash bags to laboratories in Beni, Mangina, and Butembo.
- Safe waste management: collection and incineration in Goma of 5,450 GeneXpert cartridges (3,700 used, 1,750 expired) in a high-capacity incinerator (>1200 °C) [3].

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- Technical support: field supervision visits, harmonization of biological data, reinforcement of biosafety practices, and discussions on patient and sample flow at the Beni ETC.

Results

Table 1: Logistical and Technical Activities (Oct–Nov 2021)

Main Activities	Achievements
Equipment provision	bins and bags distributed (Beni, Mangina, Butembo)
Biomedical waste management	5,450 GeneXpert cartridges collected and incinerated
Technical supervision and training	Data harmonization, biosafety reinforcement
Support to ETC Beni	Discussions on patient/sample flow, safety strengthening

Comment: Activities strengthened logistics and waste management, reduced environmental risks, and improved biosafety in strategic laboratories.

Table 2: Biological Surveillance Results (Oct–Nov 2021)

Parameter	Value
Total samples tested	620
Total positive	18
New confirmed cases	8
Positivity rate (%)	2.9%

Comment: Surveillance allowed rapid detection of 8 new confirmed cases (2.9% positivity), highlighting the importance of maintaining active and secure diagnostic capacity.

Discussion

Technical and logistical support enabled rapid and effective outbreak response while minimizing environmental and health risks. Secure incineration of GeneXpert cartridges reduced contamination risks. Security instability limited continuity of interventions, highlighting the need to integrate reinforced logistical and security mechanisms into future outbreak planning, particularly in fragile settings [4,5].

Conclusion and Recommendations

Laboratory supervision, combined with logistical support (sample transport and waste management), is a critical component of Ebola response. Lessons learned emphasize the importance of sustainable technical and logistical support and integrating adapted security mechanisms to strengthen health system resilience against future epidemic crises [6,7].

X. ANNEXES



Photo A & B: Reception and Verification of Garbage from Goma



Photo C & D: Handling of Genexpert Cartridges for Shipment to Goma



Photos E & F: Genexpert Cartridges Ready for Shipment to Goma



Photos G & H: Symbolic Handover of Large 120-litre bins



Photos I & J: Symbolic Handover of a Large 100L Wheelie Bin and a Small Pedal Bin



Photos K & L: Symbolic Handover of a Large Open-Format Bin and a Small Metal Pedal Bin



Photos M & N: Reception of All the Garbage by the Beni Laboratory



Photos O & P: Visit to CTE BENI

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