Guinea's five-year progress in Lassa fever surveillance: Strengthening diagnostic and genomic surveillance capabilities

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Introduction

Viral hemorrhagic fevers (VHFs) remain a persistent public health concern, especially in resource limited settings. The 2014–2016 Ebola outbreak highlighted the need to strengthen laboratory preparedness and diagnostic capacity in endemic areas. In response, a long-term laboratory capacity building program was initiated in Guinea to enhance the country's ability to timely detect and respond to VHF outbreaks, including Lassa fever.

Methods

Since 2016, our program has focused on improving infrastructure, training local laboratory personnel, and providing VHF diagnostics support, including Lassa fever. This enabled the setup (Gueckédou), and strengthening of existing capacities (Conakry and N'Zérékoré), creating a network of three VHF diagnostic laboratories in Guinea, two in the Forest region. Molecular testing by RT-PCR (altona Diagnostics), serological assays, and nanopore sequencing (Oxford Nanopore Technologies), were set up.

Results

Systematic testing enabled the detection of VHFs in Guinea, particularly in Forest Guinea. Over 20 laboratory staff were trained in advanced diagnostic procedures across the three laboratories. A total of 34 Lassa fever cases have been identified across the three laboratories, all between 2020 and 2024. In country genomic surveillance capacity permitted the characterization of Lassa viruses as subclusters of lineage IV. Case fatality rate was 59%, with

approximately one third of patients receiving ribavirin treatment. Notably, 82% of Lassa fever cases were detected in the Forest region, although a nosocomial outbreak was identified in Conakry in 2022. The two new serology units in Gueckédou and N'Zérékoré allowed seroprevalence research in Forest Guinea, revealing widespread Lassa virus circulation in the region.

Conclusion

This study presents a comprehensive overview of the Lassa fever cases detected within the network of the three VHFs labs in Guinea since 2017. The strengthened diagnostic infrastructure and local workforce has improved outbreak detection, providing valuable insights into Lassa fever epidemiology and guiding future prevention strategies.