Sierra Leone: Surveillance, ongoing research

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Lassa fever program
Acting District Medical Officer MoHS
LASSA FEVER UNIT

• L. Fever unit is part of KGH MoHS,
  – Kenema 300km east of Freetown, an area known to have the greatest burden of Lassa fever (L. Fever) in the world.

• Activities include **Prevention**, **Diagnosis**, **Isolation & Treatment**, and **Research** on L. Fever that has made significant contribution to knowledge about this disease in the world.
The Lassa Fever program

- Clinical
- Laboratory
- Ecology
- Data Management
- Outreach
- Supportive, Eg. Drivers, Cleaners, IT, Power
- Administration
**Mission**

- Provide outstanding clinical, epidemiologic and laboratory services for viral hemorrhagic fevers in SL.

- Develop an environment of life-long learning and professional development in viral hemorrhagic fever.

- Maintain a site of national and international education in the diagnosis, treatment and prevention of viral hemorrhagic fevers.

- Develop a strong foundation in the principles and practice of scientific research and quality assessment and improvement.

- Maintain the site as a center of preparedness for emerging diseases

**Vision**

- To provide cutting edge research and evidenced based optimal care for Lassa fever and other viral hemorrhagic fever cases.
Lassa fever program at Kenema Government Hospital

- Important site for Lassa fever research by CDC and others
- Blood Diamonds civil conflict forces suspension of Lassa program
- International team refurbishes Lassa Laboratory
- Establishment of recombinant Lassa ELISA diagnostics
- Introduction of ReLASV lateral flow immunoassays
New VHF Ward
Kenema Government Hospital

Khan Center of Excellence
KGH – New Viral Hemorrhagic Fever Ward
KGH Viral Hemorrhagic Fever Laboratory

Augustine Goba
Mombu Mamoh

John Dembi Sandi
KGH Viral Hemorrhagic Fever Ecology Team
Key highlights

• Support referral of both suspected, confirmed cases and or samples to the isolation unit for diagnosis and further management

• Support affected districts in the investigation of all lab confirmed cases and trapping of rodents at case and control houses

• Continued community education in confirmed case communities

• Continued sensitization meetings with health workers

• Active case surveillance
Kenema Government Hospital Lassa Ward patient presentation by month and serostatus

A. Ag+/IgM±

B. Ag-/IgM+

C. Ag-/IgM-
Bilateral hearing loss in Lassa fever and Ebola survivors

<table>
<thead>
<tr>
<th>Hearing Loss Severity</th>
<th>Ebola Survivors (%)</th>
<th>Ebola Contacts (%)</th>
<th>Lassa Survivors (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>222 (64.9)</td>
<td>685 (80.6)</td>
<td>35 (61.4)</td>
</tr>
<tr>
<td>Mild</td>
<td>105 (30.7)</td>
<td>149 (17.5)</td>
<td>5 (8.8)</td>
</tr>
<tr>
<td>Moderate</td>
<td>11 (3.2)</td>
<td>14 (1.7)</td>
<td>4 (5.3)</td>
</tr>
<tr>
<td>Severe</td>
<td>3 (0.9)</td>
<td>2 (0.2)</td>
<td>2 (3.5)</td>
</tr>
<tr>
<td>Profound</td>
<td>1 (0.3)</td>
<td>0 (0.0)</td>
<td>12 (21.1)</td>
</tr>
</tbody>
</table>
Ongoing antiLASV seroprevalence study in Sierra Leone

28 endemic communities KENEMA
25 emerging communities TONKOLILI
25 non-endemic communities PORT LOKO

Enumerate all households in community
Randomize households

20+ households 20+ households 20+ households

1 each in 5 age groups 1 each in 5 age groups 1 each in 5 age groups

Collection of blood spots for IgG testing
Demographic questionnaire

Screening of blood spots by ELISA

Statistical analysis and reporting
Demographic, GPS, history data and dried blood spots collected for >11,000 subjects
LASV seroprevalence/incidence studies for vaccine trials

Prevalence (%)
- 0.00 - 6.02
- 6.02 - 15.25
- 15.25 - 34.87
- 34.87 - 75.61

Donald Grant
Lansana Kanneh
Jeff Shaffer
John Schieffelin
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>01. Distance to bushes:</td>
<td>less than 5m, 5-20m, more than 20m</td>
</tr>
<tr>
<td>02. Distance to vegetable gardens:</td>
<td>less than 5m, 5-20m, more than 20m</td>
</tr>
<tr>
<td>03. Distance to refuse:</td>
<td>less than 5m, 5-20m, more than 20m</td>
</tr>
<tr>
<td>04. Distance to toilet:</td>
<td>less than 5m, 5-20m, more than 20m</td>
</tr>
<tr>
<td>05. Condition of toilet:</td>
<td>blank</td>
</tr>
<tr>
<td>06. Distance to water source:</td>
<td>less than 5m, 5-20m, more than 20m</td>
</tr>
<tr>
<td>07. Water source type:</td>
<td>tap, open well, hand pump well, stream, other: blank</td>
</tr>
<tr>
<td>08. Rodent holes observed on exterior of house:</td>
<td>yes, no</td>
</tr>
<tr>
<td>09. Roof construction:</td>
<td>thatch, corrugated iron sheets, other: blank</td>
</tr>
</tbody>
</table>
LASV seroprevalence by house
LASV seroprevalence by age

<1  1-4  5-14  15-44 >45
LASV seroprevalence by sex

Graphs showing seroprevalence for different locations with data on male and female populations.
ADVANCES

• Development of diagnostics in country (RDTs)

• MoHS setting up of RRT with a data base of those being trained at National and district level

• Construction of a new VHF ward in Kenema that will serve as part of a clinical trial site in future.

• Linking researches to Academic institutions in Sierra Leone

• MoHS currently working on a LF Road map for SL
Recommendations for CEPI EPI studies

- Standardize methodology for sample collection (dried blood spots vs phlebotomy)
- Collect village and household demographic data including GPS
- Utilize common diagnostic tests
- Base collections on Lassa fever seasonality
Recent Collaborations
- Stanford University
- University of Connecticut
- University of Nebraska
- US Department of Defence
- Oxford University
- University of Cambridge
- University of Glasgow
- University of Edinburgh

International Partners
- BROAD Institute
- Tulane University
- MASS
- iCARE Consortium
• THANK YOU