THE NEED FOR RAPID ACCESS TO PATHOGEN SAMPLES AND FAIR AND EQUITABLE ACCESS TO MEDICAL COUNTER MEASURES FOR PUBLIC HEALTH SURVEILLANCE, PREPAREDNESS AND RESPONSE, EXPERIENCE FROM LABORATORIES
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GLOBAL EMERGING PATHOGENS
TREATMENT CONSORTIUM (GET)
There was a paucity of laboratories capable of diagnosing Ebola virus disease in West Africa before the outbreak.

The first case of Ebola in Guinea West Africa was diagnosed by a European mobile laboratory located in France on 23rd of March 2014.

In Sierra Leone the first case was diagnosed on 25th May, 2014 in the Lassa fever laboratory which was established by Tulane University, USA about a decade prior to the EVD epidemic.
LABORATORIES DEPLOYED IN SIERRA LEONE DURING EBOLA OUTBREAK
<table>
<thead>
<tr>
<th>Country</th>
<th>Cases</th>
<th>Deaths</th>
<th>Last update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberia</td>
<td>10,672</td>
<td>4,808</td>
<td>On 16 September 2015 by WHO</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>13,756</td>
<td>3,953</td>
<td>as of 13 September 2015</td>
</tr>
<tr>
<td>Guinea</td>
<td>3,792</td>
<td>2,530</td>
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</tr>
<tr>
<td>Nigeria</td>
<td>20</td>
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<td>Mali</td>
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<td>6</td>
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<td>United States</td>
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<td>Italy</td>
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<tr>
<td>United Kingdom</td>
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<td>Senegal</td>
<td>1</td>
<td>0</td>
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</tr>
<tr>
<td>Spain</td>
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<td>0</td>
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<tr>
<td>Total</td>
<td>28,196</td>
<td>11,306</td>
<td>as of 13 September 2015</td>
</tr>
</tbody>
</table>
HSS: Increase in EVD Labs in Sierra Leone

- 16 international labs
  - Western area = 9 labs
  - East = 1 lab
  - North = 4 labs
  - South = 2 labs

10 countries
- South Africa - 1
- USA - 2
- Canada - 2
- Italy - 2
- Germany - 1
- China - 2
- Netherlands - 2
- Nigeria - 1
- United Kingdom - 3
LABORATORY RESPONSE CYCLE

CONTACT TRACING NOTIFICATION
(facility/family/DPC)

SPECIMEN COLLECTION

COMMUNICATIONS OF RESULT

TEST QA- QA/PT

Specimen Transportation and DISTRIBUTION
Specimen reception and validation
Total Number of Specimens Tested

No. Labs: 15
No. of Samples: 92,698
Total of Positive: 13,488
Percentage Positive: 14.6%

Sample Count by Ebola Interpretation by Testing Week

Updated as of 26 July 2015

For last five weeks:
Average number of samples tested per week: 1992

Number of samples tested and the percent of positive EVD results
USE OF SAMPLES DURING AND AFTER OUTBREAK

1. INITIAL DIAGNOSIS
2. MONITORING OF DISEASE PROGRESSION AND RESPONSE TO TREATMENT
3. SURVEILLANCE
4. RESEARCH
   * SEQUENCING TO DETERMINE ORIGIN AND TYPE OF VIRUS, VIRAL STRAINS, CHANGES IN TRANSMISSION PATTERNS
   * NEW AND RAPID DIAGNOSTIC METHODS
   * NEW TREATMENT MODELS
     Eg. Drugs and Vaccines
Early sequencing was done by Gire et al at Harvard university in collaboration with the Ministry of Health and Sanitation (MoHS), Sierra Leone.

99 virus genomes from 78 patents diagnosed within the first three weeks of the outbreak were sequenced.

Elucidation of the origin and the determination of patterns of viral transmission in the initial weeks of outbreak in Sierra Leone.

The West African variant (Makona) diverged from a central African strain a decade ago, with zoonotic transmission in Guinea and crossing into Sierra Leone at a funeral of a traditional healer who was infected in Guinea.

Explained the difference in clinical presentation observed.
Rapid diagnostics tests for point of care testing for the Ebola were developed towards the end of the epidemic. These include:

1. **THE LATERAL FLOW ANTIGEN-CAPTURE LATERAL FLOW ANTIGEN —CAPTURE ASSAY**
   (Corgenix, Inc Broomfield, Colorado, USA)

2. **THE ORAQUICK EBOLA ANTIGEN TEST** (Orasure Technologies, Inc, Bethlehem, Pennsylvania)

Validation of the cogenix test in Sierra Leone revealed that it is as sensitive as gold standard, RT-PCR in diagnosing Ebola (Broadhurst et al, 2015).
The samples posed serious biosafety and biosecurity challenges.

A Bio Bank Project was designed to mitigate the challenges and also serve as a source for much needed research.

spear headed by the Global Emerging Pathogens Treatment Consortium (GET) in collaboration with the Government of Sierra Leone.

samples catalogued and stored in three temporary repositories awaiting transfer to the main Bio Bank in mid 2018.
* GET AND MOHS embarked on a data management and LIMS strategy that will match the research vision for the national asset of Ebola bio specimens.

* Access will be equitable through the access committee of governing council involving all stakeholders.

* PROJECTS FUNDED BY GPP, CANADA AND MSF
CHALLENGES

* Approval from regulatory bodies, security and other government Agencies
* Training of personnel in the sample transport chain
* Limited quantity of samples for distribution,
* Adherence to material transfer agreements,
* Intellectual property rights etc.
* Ethical issues, eg Third party use,
* Biosafety and biosecurity.