AFTER EBOLA
The future of pandemic risk management

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African Union – Addis Ababa, Ethiopia
AFTER EBOLA: THE FUTURE OF PANDEMIC RISK MANAGEMENT

MARGARET LAMUNU
Epidemiologist, Ebola Response Lead in Sierra Leone, World Health Organization

ESTHER BAUR
Head, Global Partnerships, Swiss Re

SUNKARIE KAMARA
Mayor, Makeni, Sierra Leone

OB SISAY
Director, Situation Room, National Ebola Response Centre, Sierra Leone

M. MOHAMED BEAVOGUI
Director General, African Risk Capacity (ARC)

MADS OYEN
Regional Emergency Advisor for West Africa, UNICEF
Understanding the Risk from Pandemics
Case Study: Sierra Leone’s Ebola Virus Disease Outbreak
OB SISAY
Director, National Ebola Response Centre, Sierra Leone
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18 November 2015

OB SISAY

DIRECTOR – SITUATION ROOM & SECRETARIAT
ACTING DIRECTOR - PLANS
NATIONAL EBOLA RESPONSE CENTRE (NERC)
SIERRA LEONE
Contents

• Epi trend
• Ebola Epidemiology Status
• Response Structures
• Key Response Interventions
• SOP’s developed
• Partners’ support to the response
• Getting to Resilient Zero Strategy
• Transitioning out of Response mode
• Economic impacts
• What next?
BACKGROUND

SIERRA LEONE’S HEALTH SECTOR PRE-EBOLA

• Damaged physical infrastructure due to the country’s 10 years civil war – rebuilding process continues

• Reduction in the real resources available to the health sector

• Low number of skilled professionals – LESS THAN 200 DOCTORS IN A POPULATION OF NEARLY 7 MILLION PEOPLE

• Limited access to health by everyone – PREVALENCE OF TRADITIONAL HEALERS
EPI Trend
Sierra Leone Ebola Outbreak 2014/2015 (ongoing)

Case Statistics
- Cases Reported in all 14 Districts
- 8,704 Confirmed
- 3,589 Deaths
- 4,051 Survivors

20 October 2014
Formation of NERC
Response Structures:
New, temporary structures created to support the Response

The National Ebola Response Centre and 14 District Ebola Response Centres were appointed the leadership of the response by HE The President in October 2014.

MOHS, MSWGCA, ONS and Partners provide the critical technical/medical guidance to the response.
Response Structures:
National, District, Technical & Operational

- Leads Sierra Leone Ebola Response
- Sets the National Strategy
- Manages national resources
- Prioritizes districts & provides resources
- Unblocks obstacles

Operational

- Leads the district Ebola response (command, control and coordination)
- Operational response, inc: Surveillance, Case Management, Quarantine, Social Mobilisation, Psycho-Social, Burials
- IM and reporting

Technical

- Leads the implementation of SOPs and technical advice
- Guides strategic priorities at district level
- Medical response
- Addresses technical questions & develops recommendations

National

- Develops evidence-based SOPs
- Guides strategic priorities
- Addresses technical questions and develops recommendations

District

NERC

iPACT

Pillars
WHO/CDC/MoHS

DERCs

Pillars
DHMTs

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District

NERC

iPACT

Pillars
WHO/CDC/MoHS

DERCs

Pillars
DHMTs
The NERC, DERCs and Partners have launched a series of national/district interventions to influence the epi trend.
## SOP’s Developed

Over 16 SOP’s have been developed by our technical partners in WHO/ MoHS and others to provide the technical guidance for the response activities at District Level.

<table>
<thead>
<tr>
<th>SOP</th>
<th>Pillar Responsible</th>
<th>SOP</th>
<th>Pillar Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ebola Virus Disease Contact Tracing</td>
<td>Surveillance</td>
<td>Home Decontamination after Collection of Corpses or Transfer of Suspect/Probable Ebola Cases</td>
<td>Burial Pillar</td>
</tr>
<tr>
<td>Entry and Exit Screening Freetown Airport</td>
<td>Surveillance</td>
<td>Interim Home Protection and Support</td>
<td>Case Management</td>
</tr>
<tr>
<td>Quarantine</td>
<td>Surveillance/Security</td>
<td>Screening and Infection Control of Ebola Virus at PHUs and other Non-Ebola Healthcare Facilities</td>
<td>Case Management</td>
</tr>
<tr>
<td>Reintegrating Ebola Survivors in Communities</td>
<td>Psychosocial</td>
<td>Rapid Response Team (Draft)</td>
<td>Surveillance</td>
</tr>
<tr>
<td>Management of Check points</td>
<td>Surveillance/Security</td>
<td>Community Based Surveillance (Draft)</td>
<td>Surveillance</td>
</tr>
<tr>
<td>Social Mobilisation and Community Engagement</td>
<td>Social Mobilisation</td>
<td>Swabbing of Corpses</td>
<td>Laboratory</td>
</tr>
<tr>
<td>Decontaminating Ebola Facilities</td>
<td>Case Management</td>
<td>Nutrition Response to Ebola</td>
<td>Nutrition</td>
</tr>
<tr>
<td>Safe and Dignified Burials</td>
<td>Burial Pillar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decontaminating Ebola Care Centres</td>
<td>Case Management</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## SOP’s Developed

Two of the most important SOP’s are:

<table>
<thead>
<tr>
<th>Safe and Dignified Burials</th>
<th>Quarantines</th>
</tr>
</thead>
</table>

### Key principles:

- All corpses must be buried within 24 hours
- All corpses must be buried in a safe dignified medical burial by the GoSL and authorised partners
- All corpses must be swabbed and tested for Ebola
- Burial does not wait for the results of the swab
- Families are allowed to attend to the graveside, pay last respects with a religious figure and incorporate a coffin or shroud

### Key principles:

- All positive lab results (live or dead body swab) result in the quarantine of all contacts of the index case
- Quarantine is either conducted in the home or an off-site quarantine facility
- Contacts are quarantined by risk category with high separated from low and from each other
- Food, non-food items, education materials, psychosocial support and medical care are provided
Partners Support to the Response

Our local and foreign partners have provided financial, technical and operational support in our EVD fight. Below is a list – not comprehensive - of some of them.

Donors and Key Partners
- World Bank, AfDB
- UNMEER, WHO and other UN Agencies
- CJIATF (Government of United Kingdom)
- US CDC, China CDC

Key International NGO’s
- IFRC
- Concern Worldwide
- CRS, CAFOD, World Vision Consortium
- GOAL
- WHH

Support from Africa has also been significant – for the response and to shore up the wider healthcare system
- AU – doctors, nurses and Epidemiologists
- South African Laboratory, PLUS EVD sample storage
- Mano River Union
NERC Strategy for Resilient Zero
Revised Strategy published in July 2015
Specific Strategies required for the Silent Districts

**Silent District components relevant to all districts but especially those with no recent transmissions**

**Core Elements of the Strategy**
- Focus on Community Ownership
- Operational Excellence in Critical Interventions
- Robust and Efficient Event Management

**District Differentiation**
- **Silent Districts**
  - Vigilance in alerts and responses must be maintained
  - District Rapid Response Capability
  - Preparedness, incl. simulations
  - Reinforcement of Community Ownership in all aspects of the response

- **Active Transmission Districts**
  - EVD Event Management
  - Increased focus on Community Ownership in all aspects of the response

**4 key outcomes of the response in the silent districts**

1. **Rapid Response in the event of an EVD EVENT**
   - Ability to plan, stand up and deploy rapid response teams
   - Ready access to technical expertise and logistics
   - Isolation space
   - Simulations

2. **Maintain vigilance (sustained alerts and Rapid verification processes)**
   - Active surveillance
   - High levels of alerts (sick and death)
   - Real time verification
   - Implement community based surveillance systems

3. **Reinforce Community Ownership**
   - High levels of alerts (sick and death)
   - Community owned local responses given accountability for finding contacts, supporting quarantined hh’s and target active surveillance

4. **Improve Survivor Engagement**
   - Enhanced capacity to support medical and non-medical needs of survivors
Strategy is designed to address risks to a resilient zero

Components of Getting to Resilient Zero

1. Rapid Response in the event of an EVD Event
2. Maintain Vigilance
3. Reinforce Community Ownership
4. Improve Survivor Engagement

On-going Risks

1. Unknown chains of transmission
2. Cross border transmission
3. Re-emergence from Survivors
Component 1-
Rapid Response in the event of an EVD Event

1. EVD Event Management Preparedness
   Document issued as District Planning Guidance
   • EVD Event Management Protocols: 12hrs; 24hrs; 72 hrs
   • Missing Contacts; Enhanced Quarantine; Livelihood Support etc.
   • Centralisation of locations and contact information

2. Preparedness Testing Team
   • Simulation Exercises in Districts
   • In-district support to District Teams
**Component 2 – Maintaining Vigilance (examples)**

1. **Maintain alerts and ability to respond**
   - Live alerts and Death alerts – Best Practice promoted to all districts
   - Promotion of lessons learned from events where vigilance contributed to the event.

2. **Burials**
   - Swabbing remains critical as confirmed by recent cases
   - Maintaining ability to swab impacted by current challenges with burial vehicles
Component 4 – Improving Survivor Engagement

1. Managing Re-emergence Risk
   • On-going interventions through existing survivor programmes targeting psychosocial support, sex education and issue of condom
   • Project Shield to build on this with comprehensive survivor registration, sex education and counselling, semen testing and vaccinating survivor partners

2. Comprehensive Package for Ebola Survivors
   • Holistic assessment and delivery of medical and non-medical assistance to survivors
Transitioning out of Response Mode

Ebola Response

Transition Period

In progress....

1. Preparedness Assessments
2. Live Simulations
3. Skills Transfer
4. Development/Enhancement of Structures

Zero+90 and after

Office of National Security
MOHS National EOC and District EOC’s
MSWGCA
KEY CHALLENGES FACED IN FIGHT AGAINST THE EVD OUTBREAK

1. **Late Intervention of Partners**

2. **Resources**: Throughout the campaign, there was a challenge to attain and properly allocate resources
   - Human Resources – Situation Room Academy
   - Financial resources to fund projects – speed, national ownership, financial rules
   - Physical equipment, facilities to aid response – Three Phases of the Response

3. **Coordination with partners**: Due to the rapidly changing-response it was difficult to maintain alignment with partners on all key decisions, actions. – Introduction of Command & Coordination Groups

4. **Behavioral Changes**: Influencing the behavior of people to reduce overall caseload was very difficult

5. **Transition**: Transitioning form response to longer term recovery has proved tricky
   - Government of Sierra Leone was eager to restore services while focusing on getting to 0
   - Partners have had to develop long-term strategy and continue day-to-day operations

6. **Quarantine**: Was difficult to build public confidence in quarantines and establish stable security to prevent escapes and potential spread of EVD
IMPACTS OF SIERRA LEONE’S EBOLA PANDEMIC

**HEALTH**
- 221 healthcare workers died
- 8,704 Confirmed EVD Cases
- 3,589 Confirmed EVD Deaths
- 1,760,000 children out of school
- 19% Increase in under 5 mortality
- 20% Increase in maternal deaths

**SOCIAL**
- >8,000 orphans
- 280,000 made food insecure from the crisis

**ECONOMIC**
- -12.8% estimated 2015 GDP growth
- 30% decline in agricultural output
- 170,000 non-farmers lost employment

**EDUCATION**
- 221 healthcare workers died
- 8,704 Confirmed EVD Cases
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**OTHER**
- >8,000 orphans
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# Impacts of Sierra Leone’s Ebola Pandemic on Trade and Economic Development

<table>
<thead>
<tr>
<th>Category</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014 Growth (GDP)</td>
<td>6.0% down from an expected 11.3% pre crisis</td>
</tr>
<tr>
<td>Projected 2015 growth (GDP)</td>
<td>-12.8% (-2% excluding iron ore)</td>
</tr>
<tr>
<td>Projected agricultural output growth</td>
<td>Cut from 4.8% to 2.6%</td>
</tr>
<tr>
<td>Tourism - Hotel occupancy</td>
<td>Below 25% (down from 70 - 80% in July)</td>
</tr>
<tr>
<td>Estimated no of people who have been made food insecure as a result of the crisis</td>
<td>Estimated 280,000 (4% of population)</td>
</tr>
<tr>
<td>People who have experienced loss of livelihoods due to the state of emergency, curfews and business opening restrictions</td>
<td>24,000 people (0.4% of population)</td>
</tr>
<tr>
<td>No of wage workers no longer working since start of crisis (excluding agricultural sector)</td>
<td>9,000 wageworkers (0.2% of population)</td>
</tr>
<tr>
<td>No of self-employed people no longer working since start of crisis (excluding agricultural sector)</td>
<td>170,000 (2.9% of population)</td>
</tr>
<tr>
<td>Number of Farming families having suffering considerable adverse impact on farming</td>
<td>197,000 families</td>
</tr>
</tbody>
</table>
WHAT CAN WE DO TO MITIGATE THESE SHOCKS IN THE FUTURE?

- World Bank estimates this outbreak could cost West Africa up to $15bn in the next 3 yrs – in trade, investment and tourism.
- Between 1997-2009, 6 major outbreaks - Ebola, SARS, avian and H1N1 flu—caused est $80bn losses
- Estimates of the cost of a severe outbreak could be 5% of global GDP – or USD $4 trillion.

Pandemic insurance can be used to fund:
- Rapid deployment of healthcare workers;
- Medical equipment, pharmaceuticals and diagnostic supplies
- Logistics, food and non food supplies
- Coordination and communication.

Pandemic risks may be insurable but the markets have a number of issues to deal with
- Understanding the real level of risk – data
- How do you have a facility that responds to low levels i.e. before an outbreak explodes into a pandemic, whilst keeping premiums affordable?
- Can vulnerable countries create a pandemic pool - supported by multilateral and bilateral donors and INGOs? These pools could work like insurance firms or captives with risk mgmt and an investment strategy for funds. This could also allow the re-insurance market to play a significant role in risk diversification.
- Data from the pool would allow further fine tuning of the coverage.
THANK YOU

18 November 2015

OB SISAY

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ACTING DIRECTOR - PLANS
NATIONAL EBOLA RESPONSE CENTRE (NERC)
SIERRA LEONE
The Future of Pandemic Risk Management

MARGARET LAMUNU
Technical Lead for Ebola Response for Sierra Leone
World Health Organization
Presentation Outline

- Examples of Previous Pandemics and lessons
- A review of Previous Ebola Outbreaks, & Lessons from the Ugandan outbreaks
- A review of the 2014 West African Ebola outbreak
  - Achievements
  - Challenges and Systems Failure
  - Lessons learnt & implications for future Epidemic/pandemic risk management
- Key Recommendations
Previous Pandemics

- Black death – from Plagues in the 14th Century (between 75 – 200 M people worldwide died)
- 1918 Pandemic Spanish Flue – H1N1 (over 50 Million)
- 1957 -58 Pandemic Asian Flue H2N2 (>70 M deaths in the USA alone)
- 1968 – 1969 Hong Kong Flue –H3N2 (>34 M deaths in USA,
- Small Pox eradication
- 2003 – SARs (estimated economic loss for Asian sub-region estimated between $18 – 60 Billion; case identification estimated at $2M/case
- 1980 to date; HIV/AIDs pandemic
REVIEW OF PREVIOUS EBOLA OUTBREAKS & LESSONS
Recorded Ebola Outbreaks in Africa: 1976 - date

Date of onset

Onset date unavailable

Arrival of International Team

1st report of outbreak

Number of cases

Not tested
Lab confirmed

Outbreaks of Ebola in Uganda (2000 to date)
Classical Framework for Ebola Control

- Behavioural and social interventions
- Anthropological evaluation
- Triage In/out
- Barrier nursing
- Isolation & case Management
- Research & Development
- Epidemiological investigation, surveillance and laboratory
- Database analysis
- Search the source
- Specimens Laboratory testing
- Active case-finding
- Follow-up of contacts
- Duty of care Research
- Ethical aspects
- Leadership & Coordination
- Medias
- Logistics
- Finances Salaries
- Transport Vehicles
- Security Police
- Lodging Food
- Social and Epidemiological mobile teams
- Formal and informal modes of communication
- Clinical trials Ethics committee
- Organize funerals
- Women, associations Traditional healers Opinion leaders
- Social and Cultural practices
- Communication Press Journalists
- Anthropological evaluation

Psycho-social support

World Health Organization
THE 2014 WEST AFRICAN EBOLA OUTBREAK & LESSONS
### Confirmed, probable, & suspected EVD cases worldwide (as of Nov. 01, 2015)

<table>
<thead>
<tr>
<th>Country</th>
<th>Confirmed</th>
<th>Probable</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guinea</td>
<td>3810</td>
<td>2536</td>
<td>11314</td>
</tr>
<tr>
<td>Liberia</td>
<td>10672</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>14089</td>
<td>3955</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mali</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td>4808</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senegal</td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States of America</td>
<td>41</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28607</strong></td>
<td></td>
<td><strong>11314</strong></td>
</tr>
</tbody>
</table>

Source: WHO
EVD infections in health workers in Guinea, Liberia, and Sierra Leone

<table>
<thead>
<tr>
<th>Country</th>
<th>Cases</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guinea</td>
<td>196</td>
<td>100</td>
</tr>
<tr>
<td>Liberia*</td>
<td>378</td>
<td>192</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>307</td>
<td>221‡</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>881</strong></td>
<td><strong>513</strong></td>
</tr>
</tbody>
</table>

*: Liberia includes the capital region and 14 counties. Other counties are considered low risk.
‡: Includes one health worker death in Conacry, Guinea.
The West African EVD response, Critical timelines & Lessons

- **Phase 0**: Behaviors, Beds, Burials
- **Phase I**: Event management, Enhanced surveillance, Survivor support & screening
- **Phase II**: Transition, resilience & early recovery
- **Phase III**: Community Ownership, Case finding

Graph showing timelines from 2014-W01 to 2015-W42 for Guinea.
## Ebola Response Roadmap

<table>
<thead>
<tr>
<th>PHASE 1</th>
<th>PHASE 2</th>
<th>PHASE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCALING RESPONSE</td>
<td>GETTING TO ZERO</td>
<td>RESILIENT ZERO</td>
</tr>
</tbody>
</table>

### PHASE 1: SCALING RESPONSE
- Achieve full coverage with complementary activities
- Achieve immediate comprehensive Ebola response to new outbreaks
- Strengthen preparedness in high-risk countries

### PHASE 2: GETTING TO ZERO
- Stop transmission
- Prevent new outbreaks
- Reactivate essential health services & increase resilience
- Fast-track research & development
- Coordinate national/international response

### PHASE 3: RESILIENT ZERO
- Interrupt all chains of Ebola transmission
- Manage consequences of residual risks

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UNMEER September 2014 – July 2015

WHO –ICE /OCHA
Challenges and Systems Failure in Response and Containment -1

- Delayed detection, reporting, & Requesting for help (Countries with intense transmission vs. limited transmission)

- Delayed /slowed understanding of the scale, magnitude and implication of the outbreak, as well as late acknowledgement of the problems

- In-country public health infra-structures to support response had collapsed & non existent

- Poor / or no compliance with IHR 2005

- Very high population movements, porous borders & international travels
Challenges and Systems Failure in Response and Containment - 2

- Slow /delayed response from WHO, sub-regional bodies & from the International communities
  - WHO declared PH emergency in August
  - UNMEER operational in October

- Initial response lacked resources, not comprehensive, and interventions had to be phased out versus comprehensive response to stop transmission chains
  - No capacity for isolation, no capacity for burial, Infection control, surveillance & contact tracing, etc,

- Poor messaging, & not true & targeted community mobilization & engagement
Challenges and Systems Failure in Response and Containment - 3

- At the peak of the outbreak, multiple actors with no or varied experience with Ebola control, people had to learn by doing.

- Delayed establishment/strengthening of coordination structures to coordinate multiple partners with varied experiences and skill sets, & to provide direction.

- Socio-cultural factors coupled with inadequate community engagement that required targeted messaging & mobilisation came late.
Positive achievements -1

- Following declaration of the Public health emergency, the international communities and other Governments demonstrated unprecedented level of solidarity in support of the affected countries.

- WHO re-organized and made significant strides in supporting and mobilizing support for the affected countries.

- Advances in vaccine trials with promising prospects for the future (VsV-EBOV).
Positive achievements -2

- Advances in diagnostics for Ebola (Gene sequencing, Gene Xpert machines, RDTs in various phases of developments)
- Not much advances in drug trials, more needs to be done
- New knowledge related to the disease that needs to be considered in strategy development
  - Viral persistence in body fluids
Review of the EVD Preparedness checklist and development of a generic version before end 2015
### Checklist implementation by component

<table>
<thead>
<tr>
<th>Component</th>
<th>Baseline</th>
<th>21-Sep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination</td>
<td>22%</td>
<td>58%</td>
</tr>
<tr>
<td>Rapid Response Teams</td>
<td>23%</td>
<td>62%</td>
</tr>
<tr>
<td>Public Awareness</td>
<td>41%</td>
<td>59%</td>
</tr>
<tr>
<td>Infection Prevention Control</td>
<td>29%</td>
<td>41%</td>
</tr>
<tr>
<td>Case Management</td>
<td>24%</td>
<td>66%</td>
</tr>
<tr>
<td>Safe and Dignified Burials</td>
<td>17%</td>
<td>66%</td>
</tr>
<tr>
<td>Epidemiological Surveillance</td>
<td>17%</td>
<td>53%</td>
</tr>
<tr>
<td>Contract Tracing</td>
<td>11%</td>
<td>38%</td>
</tr>
<tr>
<td>Laboratory</td>
<td>11%</td>
<td>54%</td>
</tr>
<tr>
<td>Points of Entry</td>
<td>25%</td>
<td>48%</td>
</tr>
<tr>
<td>Budget</td>
<td>17%</td>
<td>33%</td>
</tr>
<tr>
<td>Logistics</td>
<td>6%</td>
<td>29%</td>
</tr>
</tbody>
</table>

*Baseline vs. 21-Sep*
Key Lessons Moving forward -1

- Preparedness capabilities is key for early detection, verification, response and mitigation of potential pandemic risks

- Strong Leadership & effective coordination framework is crucial & central to effective response – need to strengthened at all levels

- The outbreak exposed;
  - substantial weaknesses in health systems,
  - health governance at all levels,
  - Regional & global emergency response capacities,
  - WHO capacities for outbreak & emergency response
Key Lessons & Recommendations
Moving forward -2

- Without a proper framework & adequate financing mechanisms for systematic monitoring of pandemic risks, systematic risk verification, & assessments, structured, technically & evidence driven response, looming and potential pandemic threats can not be mitigated.

- Future response needs to be fast, comprehensive & well resourced.

- Need for greater investments & efforts to strengthen health systems in a manner that helps to prevent, detect & respond to potential infectious disease threats.
Acknowledgments

- Affected communities
- National Governments, affected and non-affected
- Sub-Regional bodies (MRU, ECOWAS, AU, etc.)
- All Ebola responders
- Bilateral and Multilateral bodies
- UN partners and UNMEER
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Epidemiologist, Ebola Response Lead in Sierra Leone, World Health Organization

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Director, Situation Room, National Ebola Response Centre, Sierra Leone

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