Cholera Epidemic 2012: Lessons Learned

Vibrio cholerae: a flagellate bacterium

Integrating lessons learned from the 2012 cholera response into a national strategy for risk reduction, preparedness and response
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December 2012

This 'lessons learned' paper on the 2012 cholera epidemic in The Republic of Sierra Leone is the product of an inclusive and participatory process conducted by the Ministry of Health and Sanitation (MoHS) over the period October-December 2012.

Its preparation was informed by a series of background discussions, workshops, and interviews with all those stakeholders who played such a prominent role in preventing this epidemic from becoming so much bigger than it could have been. These include government staff at both national and District level, WHO, UNICEF and other UN Agencies, IFRC and the Sierra Leonian Red Cross, and more than twenty national and international non-governmental partners. On behalf of the Government of the Republic of Sierra Leone, the Ministry of Health and Sanitation would like to extend its appreciation and thanks to all of those involved.

Special thanks must go to Dr. Amara Jambai, Director of the MoHS Directorate for Disease Prevention and Control, for his leadership and guidance in coordinating the national cholera response, and for his vision in helping to prioritise those realistic and achievable actions outlined in this report that will serve to enhance efficiency and effectiveness when managing future such responses. Special thanks are due, too, to James Shepherd-Barron, a disaster risk management consultant seconded from the UK’s Department for International Development, for managing the overall process and drafting the final report.

The challenge now is to ensure that these lessons do not remain un-learned but inform development of a national strategy for risk reduction, preparedness and response for cholera and all diseases of epidemic potential.

Dr. K.S. Daoh
Chief Medical Officer
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<tr>
<th>Acronym</th>
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<td>3W</td>
<td>Who, What, Where</td>
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<tr>
<td>ADB</td>
<td>African Development Bank</td>
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<td>ALNAP</td>
<td>Active Learning Network for Accountability and Performance in Humanitarian Action</td>
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<td>AWD</td>
<td>Acute Watery Diarrhoea</td>
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<td>C4</td>
<td>Cholera Command and Control Centre</td>
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<td>CDC</td>
<td>US Centers for Disease Control and Prevention</td>
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<td>CERF</td>
<td>UN Central Emergency Response Fund</td>
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<td>CFR</td>
<td>Case Fatality Rate</td>
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<td>CHC</td>
<td>Community Health Centre</td>
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<td>CLTS</td>
<td>Community-led Total Sanitation</td>
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<td>CMS</td>
<td>Central Medical Stores</td>
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<td>CPHRL</td>
<td>Central Public Health Reference Laboratory</td>
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<td>CTC</td>
<td>Cholera Treatment Centre</td>
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<td>CTU</td>
<td>Cholera Treatment Unit</td>
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<td>DDPC</td>
<td>Directorate of Disease Prevention and Control</td>
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<td>DFID</td>
<td>UK Government Department for International Development</td>
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<td>DHMT</td>
<td>District Health Management Team</td>
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<td>DMD</td>
<td>Disaster Management Department</td>
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<td>DRR</td>
<td>Disaster Risk Reduction</td>
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<td>DSO</td>
<td>District Surveillance Officer</td>
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<td>ECHO</td>
<td>The European Commission Humanitarian Aid and Civil Protection Department</td>
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<td>ERF</td>
<td>Emergency Response Fund</td>
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<td>FRC</td>
<td>Free Residual Chlorine</td>
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<td>GIS</td>
<td>Geographic Information Systems</td>
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<td>GoSL</td>
<td>Government of Sierra Leone</td>
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<td>GUMA</td>
<td>Guma Valley Water Company</td>
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<td>HMIS</td>
<td>Health Management Information System</td>
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<td>HPA</td>
<td>UK Health Protection Agency</td>
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<td>HTH</td>
<td>High Test Hypochlorite (chlorine)</td>
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<td>IASC</td>
<td>Inter-Agency Standing Committee</td>
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<td>ICDDR,B</td>
<td>International Centre for Diarrhoeal Diseases Research in Bangladesh</td>
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<td>IEC</td>
<td>Information, Education and Communications</td>
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<td>IFRC</td>
<td>International Federation of Red Cross and Red Crescent Societies</td>
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<td>JMP</td>
<td>Joint Monitoring Programme for Water and Sanitation</td>
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<td>UNCT</td>
<td>United Nations Country Team</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>MICS</td>
<td>Multi-Indicator Cluster Survey</td>
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<td>MLGRD</td>
<td>Ministry of Local Government and Rural Development</td>
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<td>Ministry of Energy and Water Resources</td>
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<td>National Cholera Task Force</td>
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<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<td>NTU</td>
<td>Nephelometric Turbidity Units</td>
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<td>OCHA</td>
<td>UN Office for Coordination of Humanitarian Affairs</td>
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<td>ORP</td>
<td>Oral Rehydration Point</td>
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<td>Oral Rehydration Salts</td>
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<td>Oral Rehydration Therapy</td>
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<td>PHU</td>
<td>Peripheral Health Unit</td>
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<td>PTF</td>
<td>Presidential Task Force</td>
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<td>RDT</td>
<td>Rapid Diagnostic Test</td>
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<td>SSS</td>
<td>Salt Sugar Solution</td>
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<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<td>Water, Sanitation and Hygiene</td>
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EXECUTIVE SUMMARY

1. The cholera epidemic of 2012 was the worst to affect Sierra Leone in fifteen years. It was also the largest outbreak in the West African region for ten years. An upsurge in the weekly number of cases of acute diarrhoea and vomiting (D & V) was reported in November 2011 in Western Area. Initial investigations conducted at the regional laboratory in Dakar, Senegal indicated *E.coli* as the causative agent. Some three months later, on 16 February 2012, *Vibrio cholerae* was confirmed by Freetown’s Connaught Hospital laboratory, and an outbreak was declared in the coastal District of Kambia on 27 February.

2. Cases continued to be reported in at least four Districts through until mid-June, at which point the incidence of cholera began to rise. By mid-July (Week 28) it became clear that not only were the numbers of cases beginning to rise exponentially in these affected Districts, but that the disease was spreading, eventually affecting 12 of the 13 Districts across the country. Although some UN agencies and NGOs started to scale up response activities in Freetown in late June, it was not until the President’s declaration of an emergency on 17 August that response efforts began to reach scale, with critical mass not being achieved until some weeks later once funds had been secured.

3. In a country already experiencing some of the worst health indices in the world – although the figures are slowly improving, 174 of every 1,000 children born fail to live long enough to celebrate their 5th birthday – the effects were extremely serious. By late November, some 22,629 cases had been reported and 294 lives lost, although under-reporting suggests that the actual number of cases may have been somewhat higher. This has to be balanced against over-reporting, however, as, towards the end of the epidemic, the number of laboratory-confirmed cholera cases had dropped to approximately 10% of suspected cases, with the remainder being mostly D & V or malaria.

4. The cholera outbreak, while apparently under control, cannot yet be considered over. Cases continue to be reported in at least four Districts across the country, and, although overall attack rate trends are down, sporadic outbreaks continue. National public health capacities to respond, although strengthened over the past five months, remain under-resourced, and it is likely that subsequent epidemics of this scale will continue to need external international support.

5. Response to the 2012 cholera epidemic in Sierra Leone has been described as “remarkable” by the World Health Organisation (WHO)\(^1\). This statement is based on the fact that ‘worst case’ scenario projections made in mid-August (Week 32) on the assumption that the outbreak had not peaked – when, in fact, it had – did not occur. The extent to which this was the result of national and international response measures is therefore difficult to quantify, especially as many interventions had not yet come to scale by that time.

6. That the number of reported cases and the case fatality rates were both below the initial ‘most likely’ projections is, however, clear testament to the efficiency with which social mobilisation efforts changed prevention and care-seeking behaviours at household level, and the quality of treatment provided, for the better. Weekly case fatality rates dropped to 1% or below at the end of August (Week 34)\(^2\), and few international responses to cholera outbreaks achieve this benchmark\(^3\). It is quite probable, therefore, that hundreds of lives were saved by the combined efforts of the Ministry of Health and Sanitation, the UN – particularly UNICEF and WHO – the international and national non-governmental community, the Red Cross, and the private sector.

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\(^1\) WHO Update, 8 October 2012
\(^2\) Crude CFR for the whole response to date (5 December 2012) is 1.29%
\(^3\) Harris et al. ‘Cholera’s western front.’ The Lancet, Vol.376, Issue 9757, December 2010
7. That said, the limited availability of funds and fragmented coordination at the onset of the outbreak hampered the ability of relevant agencies to embark on a swift and rapid response. A six-week delay between the first signs that an epidemic was underway and disbursement of funds meant that the response was slow to gather momentum, and it is probable that more deaths could have been averted had outbreak control measures been quicker to galvanise. Coordination improved as the epidemic progressed but, despite terms of reference, suffered from a lack of predictability in leadership and initial confusion over who was supposed to do what. There are aspects to the response, therefore, which could be improved, and from which ‘lessons learned’ would be useful when responding to future such epidemics. And, “without serious medium and long-term investment in health systems, and water and sanitation infrastructure, such outbreaks are a matter of when, not if.”

8. A response strategy was formulated to guide the response, but the absence of a multi-sectoral plan of action with targets and indicators made it difficult to monitor achievements. Consequently, response measures were initially ad-hoc and reactive, and driven largely by where NGOs were already working or on the simple assumption that Freetown, being the most densely populated part of the country, would be home to the largest caseload. The opportunity to strengthen Sierra Leone’s disaster management capacity, supply chain and disease surveillance systems with additional funding was partially missed as a result.

9. In terms of strengths and weaknesses observed during the response overall, the following are highlighted:

**Key successes:**
- Weekly case fatality rates dropped to 1% at the end of August (Week 34), and have remained at or below this threshold ever since (see footnote 2)
- A total of 294 deaths, although tragic, is 219 less than ‘worst case scenario’ predictions
- Access to safe water at community and household level was greatly improved
- The campaign of social mobilisation was highly effective, with the majority of the population reached with clear, coherent, and consistent messaging about how to prevent and treat cholera in the home, and when to seek medical care
- Government commitment, especially from MoHS, became high once an emergency was declared
- Establishment of weekly meetings of the National Cholera Task Force, and a dedicated ‘Cholera Command and Control Centre’ (C4) improved clarity in leadership (although also see ‘challenges’ section below)
- Early warning and disease surveillance, including use of Rapid Diagnostic Tests (RDTs) allowed trends to be picked up relatively quickly
- Collaboration when responding to the outbreak, preparing for transition, and engaging in preparedness planning was good among implementing agencies and with government-led coordination mechanisms
- The waiver of import duties and temporary suspension of import controls for humanitarian supplies led to a speedier response
- Beneficiaries and communities were included in programme design and implementation, and feedback mechanisms were established, including provision of a ‘hotline’
- Daily cholera reporting and identification of hotspots enabled timely intervention
- Setting up of functional Cholera Treatment Centres/Units (CTC/CTU), and formal and on-the-job training of health workers in case management led to a reduction in case fatality rates
- Infection control measures were effective
- A functional bacteriology laboratory was established
- Monitoring and supervision of interventions increased overall performance

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4 As at 5 December 2012
5 Worst Case Scenario predictions, however, were made in mid-August (Week 33) on the assumption the epidemic had not peaked, when in fact it had.
Key constraints and challenges:
- Logistics management systems made timely and equitable distribution, as well as tracking of health inputs (drugs, medical supplies, and non-food items) at, and between national and District levels, difficult
- Inadequate material and financial resources (vehicles, fuel, funds) for secondary distribution of supplies from District medical stores to peripheral health facilities, and inadequate human resources in terms of the number of surveillance, environmental health, and social mobilisation officers at District (DHMT) and Chiefdom level constrained timely intervention
- Clear, efficient, and effective coordination and information management systems took time to emerge, with information management remaining a challenge
- Engagement by donors was generally slow owing to delays in declaring a national emergency, and late disbursement by some left their NGO partners financially exposed
- The number of cases tended to be under-reported owing to a bias towards data collection from government health facilities
- The lack of laboratory diagnostic capacity and functioning sample collection during the early phase of response made it difficult to verify the scale of the epidemic, and therefore difficult to target proportionate response measures
- Capacity for District-level data capture, collation and analysis at national level, and feedback between the two, was limited
- Vulnerability and capacity mapping was limited, which lead to ad-hoc gap analysis and inequitable response measures in under-served Districts

10. As one of the major natural hazards facing Sierra Leone, cholera continues to pose a significant threat to the country’s development. Reducing risk of cholera transmission must therefore be seen as an integral part of a wider Disaster Risk Reduction (DRR) strategy aimed at preventing outbreaks of all diseases of epidemic potential, rather than as the one-off response measure it appeared to be. The aim now is to protect gains made in improved health outcomes throughout the response, and ensure that resilience is strengthened as emergency response transitions into longer-term development.

11. With these challenges in mind, a series of operational recommendations are intended to help inform development of an updated national cholera preparedness and response plan. Strategic ‘systems’ recommendations can be distilled into five main areas:

**RECOMMENDATION 1: Rationalise coordination architecture at National and District levels**

- i. Agree and implement a streamlined ‘Cholera Control & Command Centre’ (C4) coordination architecture
- ii. Update the National Cholera Preparedness and Response Strategy (NCPRS) to include national standards and guidelines
- iii. Develop a multi sectorial risk reduction strategy for cholera and other diseases of epidemic potential.
- iv. Conduct Tri-Cluster coordination training for National and District C4 coordinators
- v. Establish thresholds for declaration of an epidemic emergency
- vi. Capacitate a National Information Management Unit

**RECOMMENDATION 2: Upgrade disease surveillance systems**

- i. Apply EpiSurveyor® and Epi-Info® (or similar)
- ii. Build capacity for early case detection and response
iii. Ensure support for microbiological diagnostics in the National Public Health Reference Laboratory

**RECOMMENDATION 3: Strengthen supply chain management**

i. Establish buffer stocks of chlorine (HTH), cholera kits, drugs, and consumables in ‘at risk’ Districts, with a national reserve held in the MoHS Central Medical Stores (CMS)

ii. Review supply chain management procedures for reporting, ordering of stocks by health facilities, and distribution

iii. Require imported medical and cholera-related non-medical supplies to be inventoried and quality controlled (at least for time expiry and labelling) at MoHS-CMS prior to secondary distribution to Districts

iv. Consider use of military logistics assets for short-term distribution of cholera supplies

v. Include a logistician in the C4

**RECOMMENDATION 4: Capitalise on investment gains in case management, environmental sanitation, and health and hygiene promotion**

i. Continue training in case management

ii. Continue participatory behaviour and social change efforts in environmental sanitation, and health and hygiene promotion

iii. Fully integrate WASH aspects in all levels of response planning and implementation

**RECOMMENDATION 5: Ensure timely and predictable funding for emergency responses**

i. Establish a national emergency response (revolving) contingency fund

ii. Specify to donors that disbursement is not dependent on a formal declaration of emergency
INTRODUCTION

OBJECTIVES

12. Learning lessons from humanitarian action is an integral part of the disaster management cycle. Ideally it is an iterative process involving all those involved, as this improves ownership of the ensuing recommendations and makes implementation more likely going forward. This was the approach applied in this case, with a single consultant lead-managing a participatory and inclusive process that captured inputs and feedback from all stakeholder groups at all levels.

13. The overall objective is to strengthen GoSL-owned and MoHS-led preparedness for potential outbreaks of cholera and other diseases of epidemic potential in Sierra Leone through multi-sectorial response systems by which subsequent epidemics\(^\text{6}\) can be more efficiently and effectively managed.

14. Specific objectives are to:
   - Identify lessons learned from the ongoing cholera response, and make recommendations on how to capitalise on investment gains made thus far, and mitigate gaps in response, both in the short term (until end 2012) and medium term (until end 2013)
   - Provide inputs to a joint operational action plan that will inform partner exit strategies and feed into a revised National Cholera Preparedness and Response Plan, and ultimately the National Disaster Risk Management Plan
   - Strengthen coordination at national and district levels

15. This assessment therefore takes a critical look at what worked and what worked less well throughout the cholera response in terms of the efficiency and effectiveness of national coordination and response mechanisms. It does not look specifically at the technical approaches adopted, nor does it analyse the results of response measures taken in terms of health outcomes, although both aspects are mentioned indirectly. It is anticipated that these will be the subject of a more detailed technical evaluation to be conducted by WHO and MoHS in the first quarter of 2013.

16. Emphasis is placed on those recommendations coming out of the lessons learning process that are practical and do-able in the short and medium term i.e through 2013. Longer-term recommendations – such as the further development of a national sanitation strategy – are considered to be more about national disaster risk reduction, and are therefore not covered in any detail here. Neither are components already within the National Health Sector Strategic Plan 2010-2015 or National WASH Policy Implementation Strategy elaborated upon.

TERMS OF REFERENCE

17. Terms of reference for this assessment of lessons learned are derived from the 1999 OECD guidelines for evaluations and the 2006 ALNAP guidance for humanitarian agencies when evaluating humanitarian action, and include:

   Coherence of response within and between agencies
   - National: Were relevant national stakeholders consistently engaged through coherent management structures?
   - International: Was the international humanitarian community fully integrated into the government-led response?
   - Good Humanitarian Donorship: Were funding decisions made transparently, and did such decisions follow the response strategy agreed?

\(^{6}\) An ‘outbreak’ is the occurrence of more cases of disease than normally expected within a specific place or group of people over a given period of time. Use of the term ‘epidemic’ implies a number of outbreaks occurring either in sequence or over a wider area.
Integration of Health and WASH: Were water, sanitation, and hygiene components fully integrated into the health response?

Timeliness: Were decisions made, and actions agreed carried out in a timely manner?

Appropriateness

Response strategy: Did the cholera response strategy meet defined needs at the individual, community and household level?

Targeting: Were vulnerable groups identified and prioritised e.g by age, urban vs rural, gender, nutritional status?

Environment: Were aspects of environmental health and environmental sanitation properly considered?

Inclusivity: Was the population potentially exposed to cholera included in planning and carrying out the response? Was feedback sought, and was a complaints mechanism established?

Technical inputs: Was technical advice appropriate, and was the advice followed?

Financial resources: Were funds forthcoming in the right amount, to the right partners, and in time?

Efficiency and Effectiveness

Coordination: Did the structures put in place contribute to improved health outcomes?

De-duplication of effort: Was it clear to partners who was supposed to be doing what, where?

Procurement and distribution: Was local procurement encouraged? Was quality assured? And were inputs distributed equitably according to need?

Capacities: Were delivery capacities sufficient?

Outcomes achieved: To what extent was avoidable death averted as a result of this response?

Sustainability

Skills transfer: Were skills and equipment transferred to the appropriate partners? If so, were costs for operation and maintenance included?

Behaviour change: Were knowledge, attitudes, and practices at individual and household level enhanced by this intervention?

Preparedness: Is Sierra Leone better placed now to cope with a recurrence?

METHODOLOGY

18. The assessment was conducted by a single international consultant from 24 September - 10 November 2012, with oversight provided by a ‘Review Panel’ consisting of representatives from all stakeholder groups, namely: GoSL (Ministry of Health and Sanitation and Ministry of Energy and Water Supply), the United Nations (UNICEF and WHO), Red Cross (IFRC), and NGOs (via the WASH Consortium). From its inception, it was agreed that this assessment was being conducted on behalf of the Government of Sierra Leone. Accordingly, the final draft was presented to the MoHS’s Directorate of Disease Prevention and Control on 7 December.

19. This paper is the product of an interactive and participatory process, involving medical and public health professionals and volunteers at all levels. The methodology involved soliciting feedback on what worked, what worked less well, main achievements, and recommendations for future preparedness and response from members of all stakeholder groups according to a self-assessment tool adopted by MoHS, and circulated on 11 October (see Annex A). Non-attributable feedback was gathered via:

- One-to-One semi-structured interviews with key informants
- Focus Group discussions at District level
- WASH satisfaction survey
- Real Time Evaluations and After Action Reviews conducted by individual operational agencies
- Desk review of lessons learned from Chad Basin (2010), Zimbabwe (2008), and Haiti (2011)
- C4 field mission reports
- A workshop with District Medical Officers, line Ministries, donors and operational partners held on 6 November

**Constraints**

20. Direct inclusion of beneficiaries and community-based organisations was limited to Freetown and two districts. However, it draws on ‘real time evaluations’ conducted by NGOs and others which included bottom-up inputs from the general population – all of whom were potentially exposed to cholera infection – community-based organisations, and volunteers

21. Many key informants had already left the country by the time the assessment was begun. Attempts were made to conduct telephone interviews with limited success.
BACKGROUND & CONTEXT

GLOBAL

22. Cholera control in populations living at risk of recurrent cholera outbreaks is based on timely treatment and prevention strategies, mainly promoting supply of safe water in sufficient quantities, improved sanitation, and health education. Despite development programmes addressing these issues, cholera remains a global public health concern with the World Health Organization (WHO) estimating morbidity and mortality in excess of 3 million cases and 100,000 deaths worldwide in 2011. And the threat is growing as cholera re-emerges. Cholera therefore remains a global threat to public health and a key indicator of lack of social development.

23. Recently, the re-emergence of cholera has been noted in parallel with the increasing size of vulnerable populations living in unsanitary conditions – as is the case with Sierra Leone’s capital, Freetown.

REGIONAL

24. New variant strains have also been detected in several parts of Africa. Observations suggest that these strains cause more severe cholera with higher case fatality rates. Careful epidemiological monitoring of circulating strains is recommended, and is ongoing via the University of Marseilles in France and the Centres for Disease Control and Prevention in the US.

25. Cholera has been declared as endemic among the neighbouring countries of Liberia and Guinea. Sierra Leone is, however, the worst affected country in the West Africa region, with most other countries experiencing lower prevalence. While cholera persists in West Africa, industrialised countries have not experienced epidemics of cholera since the late 1800’s. This is a direct result of sustained investments made in their water and sanitation systems.

26. In an effort to strengthen collaboration and coordination through development of joint plans for cholera and other epidemic prone diseases control in cross-border areas, the first formal inter-governmental meeting between Sierra Leone and Guinea took place on 1-3 November 2012.

NATIONAL

27. Sierra Leone is experiencing a cholera outbreak which has been preceded by, and is likely to be followed by, subsequent outbreaks that assume a persistent seasonal pattern. This suggests an endemic, rather than epidemic, pattern but, while endemcity is suspected in the riverine areas of Kambia, and Port Loko in the north, this remains to be qualified, verified and confirmed. Outbreaks are periodic – the last major outbreak was in 2008 – with one or two peaks per year. Seasonal floods and droughts cause periodic variations in contact and contamination rates, which probably explains why the number of people infected began to climb rapidly at the onset of the rainy season.

28. Initial caseload projections made by CDC in mid-August (Week 32) based on the epidemiological data from previous outbreaks in Sierra Leone, current trends, and similar trends elsewhere, notably in Zimbabwe, Chad, and Haiti, suggested that more than 32,000 would show symptoms of disease, of

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7 For 2011, a total of 589,854 cases were notified from 58 countries, including 7,816 deaths. Many more cases were unaccounted for due to limitations in surveillance systems and fear of trade and travel sanctions. The true burden of the disease is estimated to be 3–5 million cases and 100,000–120,000 deaths annually.
8 Cutler & Miller. ‘The role of public health improvements in health advances.’ Demography Vol.42, 2005
which 513 would be likely to die before the end of 2012. It is important to note, however, that this estimate was made on the assumption that the epidemic had not peaked, when in fact it had.

RISK FACTORS

29. Several risk factors can be identified in this outbreak, though, which are common to all, including lack of access to safe water and improved sanitation, and poor personal hygiene in both urban and rural areas.

30. A retrospective study of cholera incidence in the Chad Basin highlighted that, while local routes of transmission are not well known, unprotected water sources, late access to care, and funeral traditions are factors influencing spread of the disease. An assessment by CDC in Freetown conducted during this outbreak went further to suggest that food vendors were likely to be another risk factor. These findings point to the need for a focus on early warning systems involving community surveillance and cross border cooperation.

31. Many ecological, sociological, and seasonal factors are involved in the emergence of \textit{V. cholerae}, and, although these factors rarely converge\textsuperscript{10}, they seem to have done so in Sierra Leone. Although routes of transmission have not been identified, more than one respondent noted that “with rare exceptions, you never see clusters of cholera cases around individual water points.” This suggests that other factors, particularly the sale of contaminated fish and shellfish in markets well away from the coast, played a more prominent role than it might otherwise. It should be noted, however, that initial cases originated in this and previous outbreaks in the Kambia, Yeliboya, and Moribaya areas from identified water points.

32. The epidemic affects the rural and urban population in different ways. Indeed, data from the first phase of response shows that mortality rates in rural areas were at one point three times higher than those in urban areas. The identification of new cases and the operation of an effective mechanism for referral of patients to health facilities as well as an adequate stock of medical and WASH supplies in both urban and rural health facilities are thus essential\textsuperscript{11}.

33. Studies suggest that the number of susceptible people, exposure to untreated water and sewage, and the presence of an aquatic reservoir of \textit{V. cholerae} are important risk factors\textsuperscript{12}. How important they are, and how they interact with each other and with other variables to drive cholera epidemiology, are, however, open questions. In endemic regions, cholera outbreaks are usually associated with climatic events. Flooding and drought affects cholera dynamics in complex and not yet fully understood ways. Floods, water shortages, temperature and biotic interactions have potentially quite different impacts on cholera seasonality.

34. Flooding of streets and cities washes faeces and sewage into the rivers. It may also disrupt water distribution service and aggravate hygiene conditions. The limited availability of safe water in the dry season increases the number of people sharing the same water supply, which results in increased per capita water contamination, especially in urban areas of high population density. In an urban context, especially a hilly urban context such as Freetown, this is exacerbated still further by siting of water courses due to erosion caused by de-forestation, and poor enforcement of urban planning and construction standards.

\textsuperscript{10} Sack \textit{et al.} Four-year study of the epidemiology of \textit{Vibrio cholerae} in four rural areas of Bangladesh. \textit{Journal of Infectious Diseases}, 187 (96–101), 2003

\textsuperscript{11} Haiti Ministry of Public Health & Sanitation, 20th September 2012

\textsuperscript{12} As a water-borne disease, any outbreak of cholera indicates systemic failure in the supply of safe drinking water. What makes this water unsafe, though, is the presence of faecal matter – organisms such as \textit{E.coli}, \textit{shigella}, and \textit{rotaviruses} as well as \textit{cholera vibrio}, all of which are present in Sierra Leone – which simultaneously indicates a failure in sanitation and hygiene. This is why curative approaches to treatment need to be combined with preventive sanitation measures aimed at interrupting the routes of faecal-oral transmission.
35. Cholera transmission is therefore closely linked to inadequate environmental management. Typical at-risk areas include peri-urban slums, coastal areas such as Forecariah, and islands and villages lacking access to safe water where basic infrastructure is not available and minimum requirements of clean water and sanitation are not met.

36. Most response measures involve raising awareness of the risk factors involved and consequent changing of human behaviour. Knowing that faeces should be buried, water disinfected at point of use, hands washed with soap after defecating and before eating, and how to make ‘sugar-salt-solution’ (SSS), for example, are all actions that result once families and communities are made aware that failing to take such action results in people dying unnecessarily. But, such knowledge also requires the means to effect behaviour change in the form of commodities such as chlorine, soap, sugar, and salt.

37. People with low immunity – such as malnourished children or people living with HIV – are at a greater risk of death if infected.

Urbanisation

38. The Republic of Sierra Leone has an estimated population of 5.9 million people, of which roughly 37% reside in urban areas. However, it should be noted that denominator populations within Districts are not considered very accurate, making the calculation of rates and ratios difficult.

39. The population of Freetown has doubled or even tripled over the past decade – i.e since the war – to stand at over 1.2 million inhabitants, or more than one fifth of the total population. Reticulated water distribution systems built in colonial times for one quarter of the population, are decades beyond their design life, and, according to the African Development Bank (ADB) will cost over $175 million to upgrade. The semi-privatised GUMA does what it can to maintain this infrastructure, but can do little more than respond to reported leakages. With lack of tax revenue, and illegal tapping of those networks that are rehabilitated, it remains difficult to get ahead of the challenge of providing safe water for all.

Poverty and Health Status

40. While some improvements have been made in recent years, Sierra Leone has some of the poorest health indices in the world, with only seven countries ranking worse in the UN’s Human Development Index. Life expectancy at birth is 47 years, compared to 61 in Haiti – which suffered the worst cholera outbreak in over a century in 2010 – and 57 for Africa as a whole. Its infant mortality ratio (IMR) is estimated at 114 per 1,000 live births – almost the highest in Africa – while 174 of every 1,000 children born fail to live long enough to celebrate their fifth birthday. The maternal mortality rate is also one of the world’s worst, at 857 per 100,000 live births.

41. Before the cholera outbreak, only half the population of Sierra Leone has access to health care because of poverty, poor infrastructure, lack of essential drugs, and shortage of health care professionals – there are only 0.2 physicians and 0.18 nurses per 10,000 population. Similarly, nearly half (45%) of Sierra Leone’s population use either surface water or collect it from an unimproved source – i.e a source unprotected from external contamination, particularly from faecal matter – and 87% use unimproved or shared toilets which fail to separate excreta from human contact. Open defecation is practiced by over a quarter (28%) of the population, and defecating in a plastic bag and flinging it into the night sky – so called, “flying toilets” – is still practiced in many urban areas.

13 MoHS National Health Sector Strategic Plan 2010-2015
14 Interview with DMO, Western Area, 6 November 2012
42. In practice, JMP and MICS data for access to improved sanitation are considered to be overestimates for the simple reason that de-sludging of pit latrines even in schools and health facilities is observed to be sporadic, resulting in there being little other option but to practice open defecation. This probably explains the high prevalence of all forms of diarrhoeal disease, with action and alert thresholds\(^\text{18}\) consistently exceeded as shown below.

![Weekly diarrhoea Alert and Action threshold in Sierra Leone](image)

Source: MoHS and C4

Health Services

43. Health services are delivered through a network of primary health facilities consisting of 1,040 Peripheral Health Units (PHUs) – which are made up of Community Health Centres (CHCs), Community Health Posts (CHPs), and Maternal and Child Health Posts (MCHPs) – and 40 secondary (District) and tertiary (Referral) hospitals, of which 23 are government owned and the rest owned and operated by private, non-governmental, and faith-based organisations\(^\text{19}\).

44. The Health Management Information System (HMIS) reported 83% completeness in 2010. However, strengthening of the HMIS still suffers from the absence of necessary human resources. Furthermore, according the National Health Sector Strategic Plan 2010-2015, the use of information for problem-solving and decision-making has not seen widespread take-up within the health sector.

DISASTER RISK REDUCTION

45. As one of the major natural hazards facing Sierra Leone, cholera continues to pose a significant threat to the country’s development. Reducing risk of cholera transmission must therefore be seen as an integral part of a wider Disaster Risk Reduction (DRR) strategy\(^\text{20}\). Currently, this is managed by

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\(^\text{18}\) Source: MoHS  
\(^\text{19}\) MoHS National Health Sector Strategic Plan 2010-2015  
\(^\text{20}\) According to the UN-ISDR, ‘Toolkit for National Platforms for Disaster Risk Reduction in Africa.’ September 2010, emergencies are threatening conditions that require urgent action to stop them completely overwhelming individuals and communities. Emergency management focuses on an adverse event, whether it is concerned with early warning and preparedness before the event takes place, provision of relief during and immediately following the event, or early recovery after the event. Disaster Risk Reduction, on the other hand, is the concept and practice of reducing vulnerability and exposure to a given hazard, and building resilience through systematic efforts to
the Office of National Security’s Disaster Management Department. The multi-disciplinary and participatory approach used in this ‘lessons learning’ process therefore provides recommendations on coordination and risk management for cholera that supports this wider national effort as emergency response phases into transition and longer-term development. The aim is to protect gains made in improved health outcomes throughout the response, and ensure that resilience is strengthened going forward.

46. Disaster Risk Reduction requires the knowledge, capacities, and inputs of a wide range of sectors and organisations, including multiple government line ministries, UN agencies, donors, NGOs, civil society, the Red Cross, and the private sector. As the cholera epidemic accelerated in July and August 2012, the Strategic Planning Unit within the State House played a proactive role in convening a Presidential Task Force on Cholera (PTF) which included all these stakeholders.

THE CLUSTER APPROACH

47. The Cluster Approach is the international humanitarian system’s way of organising coordination and cooperation among humanitarian actors to facilitate joint strategic planning. At country level, it establishes a clear system of leadership and accountability, and provides a framework for effective partnerships among international and national humanitarian actors in each sector. It is supposed to strengthen, rather than replace, existing sector coordination mechanisms. The aim of the approach is to ensure that international responses are appropriately aligned with national structures and to facilitate strong linkages among international organisations, national authorities, national civil society and other stakeholders. It is expected to be used in any country faced with a sudden major new emergency requiring a multi-sectoral response with the participation of a wide range of international humanitarian actors.

48. With the UN Country Team choosing not to activate the Cluster Approach – unlike during the Zimbabwe outbreak in 2008, and the Haiti outbreak in 2010, both of which were pre-existing and on a larger scale – those sectors normally associated with cholera responses, namely: Health, WASH, Logistics, Education, and Nutrition (and sometimes Camp Coordination Camp Management) were limited for the most part to Health and WASH only, with health education and hygiene promotion being a cross-cutting strategy.

49. In theory, as long as the inclusive and consensual approach that the Cluster Approach implies is adopted, this should not have mattered. After all, as the UN’s Transformative Agenda 21 makes clear, Clusters are not supposed to be superimposed over already functional national systems. But, apart from the National Cholera Task Force established at the end of 2011, there was no national system.

50. An early decision to apply the inclusive and consensual approaches that partners now expect of Clusters when responding to humanitarian crises would arguably have speeded up response times, been better at analysing and filling gaps, engaged more stakeholders, provided consistent information management, clarified provider-of-last-resort responsibilities, allowed for integration of early recovery strategies, and generally rendered the overall response more efficient and more effective. It would certainly have demanded engagement by the Global Logistics Cluster 22 in support of logistics and telecommunications, two of the main barriers to effective response in Sierra Leone.

51. A two-person team from the UN’s regional Office for Coordination of Humanitarian Affairs (OCHA) arrived in country in second half of August on the invitation of the UN-ERSG. Overall, although OCHA analyse and manage the causal factors, including improved preparedness. Disaster Risk Management is concerned with putting the institutional and management mechanisms in place to avoid, lessen, or transfer the adverse effects of hazards through activities and measures for prevention, mitigation, and preparedness.

21 The ‘Transformative Agenda’ is an attempt by the UN’s Emergency Response Coordinator and OCHA in 2012 to tackle issues outstanding from the Humanitarian Reform agenda of 2005.

22 Although a smaller entity in Sierra Leone, the UN World Food Programme played a major role in coordinating logistics in the Zimbabwe and Haiti cholera responses.
offered GIS mapping support from its regional office in Senegal, OCHA’s engagement was considered “too little, too late.” Some frustration was also expressed about the short duration of their mission; one person for ten days, the other for sixteen. These remarks were later put into context by a staff member of the UN with considerable humanitarian experience, who acknowledged the minimal knowledge of humanitarian affairs in the country at the time.

52. OCHA continued to support the C4 from its regional office following the departure of its two-person team in mid-September. This support took the form of weekly briefing notes and updated maps of cholera cases at Chiefdom level based on information supplied weekly by WHO and UNICEF.

53. The Cluster Approach calls for a two-tier management model when the number of partners becomes too large and therefore too unwieldy for rapid decision-making. Essentially, this two-tier mechanism calls for a small team that represents all stakeholder groups to take decisions and pass these back to the wider membership for approval. The number of partners in Sierra Leone – at the height of the outbreak, there were a total of 15 International NGOs actively engaged in coordination, of which 4 were dedicated solely to emergency medical response – was never thought enough to warrant such a two-tier mechanism.
OUTBREAK RESPONSE

TIMELINE

<table>
<thead>
<tr>
<th>DATE (2012)</th>
<th>ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 November 2011</td>
<td>Outbreak of suspected cholera (acute watery diarrhoea) in Freetown and diarrhoea &amp; vomiting (D&amp;V) in Western Area</td>
</tr>
<tr>
<td>26 November 2011</td>
<td>National Cholera Task Force starts meeting on a weekly basis</td>
</tr>
<tr>
<td>16 February</td>
<td>First confirmed cholera case in Kambia</td>
</tr>
<tr>
<td>27 February</td>
<td>Outbreak declaration by MoHS in Kambia, Port Loko and Pujehun</td>
</tr>
<tr>
<td>23 June</td>
<td>First RDT-positive case in Western Area</td>
</tr>
<tr>
<td>28 June</td>
<td>NGOs initiate response measures in Freetown with limited funds</td>
</tr>
<tr>
<td>7 July</td>
<td>WASH Consortium advocates for coordination, initiates ‘dropout’, and produces 3W map</td>
</tr>
<tr>
<td>16 July</td>
<td>First laboratory-confirmed cholera case in Western Area (Freetown)</td>
</tr>
<tr>
<td>18 July</td>
<td>UNCT meets to consider response</td>
</tr>
<tr>
<td>31 July</td>
<td>CERF application made</td>
</tr>
<tr>
<td>1 August</td>
<td>NGOs scale up response activities</td>
</tr>
<tr>
<td>9 August</td>
<td>Revised CERF application</td>
</tr>
<tr>
<td>12 August</td>
<td>IFRC FACT arrives</td>
</tr>
<tr>
<td>14 August</td>
<td>CERF funding approved</td>
</tr>
<tr>
<td>15 August</td>
<td>Donor meeting with UN</td>
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<tr>
<td>16 August</td>
<td>Presidential declaration of a national emergency</td>
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<tr>
<td>23 August</td>
<td>Presidential Task Force on Cholera convenes</td>
</tr>
<tr>
<td>24 August</td>
<td>Outbreak peaks</td>
</tr>
<tr>
<td>24 August</td>
<td>CERF funds disbursed via UNICEF and WHO</td>
</tr>
<tr>
<td>25 August</td>
<td>WHO convenes first meeting with NGOs</td>
</tr>
<tr>
<td>27 August</td>
<td>DFID RRF funds disbursed</td>
</tr>
<tr>
<td>27 August</td>
<td>National Cholera Task Force convenes daily (previously, was meeting weekly since 1 Dec 2011)</td>
</tr>
<tr>
<td>30 August</td>
<td>Cholera Command &amp; Control Centre (C4) established</td>
</tr>
<tr>
<td>1 September</td>
<td>Crude CFR falls below 1%</td>
</tr>
<tr>
<td>3 October</td>
<td>Last recorded death</td>
</tr>
<tr>
<td>10 October</td>
<td>Number of reported cases falls below 500 per week</td>
</tr>
</tbody>
</table>

CONTROL MEASURES

54. An upsurge in the weekly number of cases of acute diarrhoea and vomiting (D & V) was reported in November 2011 in Western Area. Initially the country had no capacity to confirm cholera cases because of lack of laboratory capacity to confirm cases at local level. Investigations conducted at the regional laboratory in Dakar, Senegal indicated *E.coli* as the causative agent. Immediate measures were taken to strengthen surveillance and case management. However, the increase in cases of D & V in Port Loko and Kambia prompted further investigations by joint team from MoHS and WHO in the two districts. *Vibrio cholerae* was laboratory confirmed on 16 February 2012 at Connaught hospital, Freetown, and an outbreak was declared in the coastal District of Kambia on 27 February.

55. A multidisciplinary intervention strategy based on prevention, early warning, preparedness and response – along with an efficient surveillance system – is key for mitigating cholera outbreaks,
controlling cholera in endemic areas and reducing death rates. Accordingly, initial emphasis was placed on early detection of cases and ensuring prompt access to treatment at District level where suspected cholera cases were managed in cholera treatment centres (CTCs), or, where there were no established CTCs, designated isolation areas within health facilities. This is the so-called ‘Sword Strategy’ (with Chiefdoms experiencing a high number of cases marked in red on the map below).

56. Simultaneously, measures to control the spread of the disease by providing safe water, proper sanitation, health education, and hygiene promotion for improved hygiene and safe food and water handling practices by households are scaled up in known ‘hotspot’ areas and their surroundings. The provision of safe water and sanitation is a formidable challenge but remains the critical factor in reducing the impact of cholera. This is the so-called ‘Shield Strategy’ (marked in blue).

57. When surveillance and modelling suggested that the spread of cholera across Sierra Leone was outpacing the public health response, MoHS reached out to donors and existing NGO partners already in the field to expand preventive services and treatment capacity.

58. A coherent and collective response strategy inclusive of all levels (National and District), all sectors, and all actors was developed, but without full consultation. This, it was felt, undermined the quality of response overall and the consistency of actions by different partners. A first attempt was made towards the end of August but with very limited time available (one day), with output being of limited quality. The rush with which this process was conducted – mostly, it was felt at the time, due to pressure from donors – limited the ownership felt by many partners, with the result that several of them did not consider it relevant. Despite these limitations, the strategy was agreed by partners and endorsed by MoHS. However, it appears that “donors did not require those partners they funded to follow this strategy”, further reducing coherence of the response. It should also be noted that only the WASH-Social Mobilisation Sub-Group formally developed such a response strategy.

59. District level responses were considered much less intense than in Freetown, with fewer actors covering larger areas. Initially, there was much talk of the ‘sword and shield’ strategy outlined above in the region, but, with the majority of early response efforts focussing on Freetown, the outbreak spread rapidly from known ‘point sources’ along borders, on the northern coast, and from Freetown itself to all but one District which, although the strategy “was never really implemented”, suggests that neither element was very effective (see below).

60. The epidemic accelerated through August, with the number of cases increasing 148% during the month from 6,184 across eight districts to more than 15,000 cases across twelve districts. The number of fatalities also more than doubled from 115 on 1 August to 249 by 27 August. In mid-August (Week 32, the actual peak of the outbreak), worst-case-scenario projections made by CDC on behalf
of MoHS, and assuming the outbreak had not already peaked, suggested as many as 32,000 cases would be reported of which 513 might die\textsuperscript{23}. By mid-November, as the outbreak had more or less run its course, the figures were roughly two-thirds of these predictions, at 22,487 and 294 respectively as shown in the graph below.

\textbf{Prediction of weekly cholera cases for week 33 onwards (blue) assuming worst case scenario (32,000 cases and 530 deaths) versus actual epidemic curve (red)}

Source: MoHS and C4

61. On a week-by-week basis, the figures show an even more positive picture, with the weekly crude case fatality rate (CFR) falling below 1%\textsuperscript{24} in mid-September (Week 34), and reducing more or less every week since. However, this still means that people are dying unnecessarily every week, mostly because caseloads remain stubbornly high in four health districts\textsuperscript{25}. Although Western Area remains the largest zone affected\textsuperscript{26} with approximately 60% of all reported cases, ‘only’ one death has been reported since 3 October.

62. Response activities focused on health protection in collaboration with District Health Management Teams (DHMTs) and consisted mostly on distribution of cholera kits and social mobilisation to ensure beneficiaries had the means and the knowledge to protect themselves against cholera. Overall, it can be confidently asserted that patient treatments and prevention activities significantly contributed to reducing the risk of cholera transmission.

\textbf{“Prevention activities significantly contributed to reducing the risk of cholera transmission.”}

\textsuperscript{23} Noting the assumptions on which this prediction was based, outlined in paragraph 28
\textsuperscript{24} 1% Case Fatality Ratio is the WHO indicator for quality of care, above which an outbreak is considered an emergency. Note that a single laboratory-confirmed case of cholera constitutes an outbreak.
\textsuperscript{25} Kambia, Bo, Moyamba, and Bonthe.
\textsuperscript{26} The population of Freetown has doubled if not tripled in the past decade and now stands at 1.2 million, over one fifth of the country’s total population.
Risky behaviours by coastal communities in defined locations are thought highly likely to be the point source of the outbreak, as brackish, vibrio-rich estuarine water contaminates surface water as it is being collected and when seafood is being cooked. The mobility of populations from these rural areas to Sierra Leone’s major towns, as well as those across the Guinean and Liberian borders, then become major factors in the spread of the disease; a situation exacerbated by a shortage of community health workers and environmental health technicians, dilapidated infrastructure, and poor knowledge of how the disease is transmitted. Understanding of these route vectors is not well understood, however, and closer inspection of how the disease spread across the country is required so that containment efforts can be targeted on emerging hotspots.

One of the main methods for controlling the outbreak is the treatment of cases, which the MoHS effected with support of health partners, particularly MSF. This was enhanced by setting up of treatment centres in the affected areas as well as through training of health workers to give the correct diagnosis and ensure rapid care seeking behavior as appropriate.

Timeliness

The increase in the number of diarrhoea and vomiting cases in November 2011 prompted MoHS and WHO to conduct epidemiological investigations in the affected areas. Initial samples collected and analysed in the regional laboratory in Dakar, Senegal revealed *E.Coli*. The persistent increase in the number of acute diarrhoea and vomiting cases led to joint further investigation by MoHS and WHO in Port Loko and Kambia districts during February 2012. WHO supported the provision of reagents for the confirmation of vibrio cholera at Connaught National Referral Hospital in Freetown on 16 February 2012. An outbreak was declared eleven days later on 27 February. With sporadic cases continuing for the next four months, disease surveillance systems provided early warning of potential for further spread, with the first laboratory-confirmed case in the densely populated Western Area on 16 July. This outbreak was publicly announced on 17 July.

A number of International NGOs who had already been participating in National Cholera Task Force meetings since November 2011, and who had been engaged in cholera response since February 2012, scaled up their operations, with MSF arriving to establish its first CTC in early July. Oxfam and Concern began their cholera responses on 1 August, and IFRC’s Field Assessment and Coordination Team (FACT) arrived in-country on 12 August. Yet it was not until 16 August that a national humanitarian crisis was formally declared by the President. In future, a quicker declaration by the Government of Sierra Leone that an epidemic is underway based on pre-designated thresholds would ensure that response measures are brought to scale more rapidly.

Meanwhile, the UN Country Team requested funding from the Central Emergency Response Fund (CERF), submitting a proposal for US$ 5.7 million on 31 July. A few days later, the CERF Secretariat requested the proposal be reviewed and the sum requested reduced. A revised proposal was resubmitted on 9 August. After strong lobbying by UN agencies, the eventual request was made for US$ 2.5 million.

That governments are reluctant to declare national emergencies for cholera is not in itself unusual, as the possibility of detrimental effects on tourism, inward investment and trade exists. But that debate was then allowed to ensue over such things as the reliability of data, comparisons with previous outbreaks, the regional context, and what thresholds and triggers are relevant for a country that may or may not be endemic for cholera, should not be allowed to stall the scaling up of response measures.

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Following the President's declaration, a high-level Presidential Task Force (PTF) was established a week later on 23 August, chaired by the Chief-of-Staff's Office in the State House to oversee coordination, mobilise resources and guide the response. A multi-sectoral approach was adopted under leadership of the Ministry of Health and Sanitation (MoHS), with the support of other line ministries such as Energy & Water Supply, Education, Finance, Information & Communication, and Local Government, together with the Red Cross, NGO partners, UN agencies and private sector stakeholders. The PTF met weekly with all stakeholders for a few weeks, and then reduced the frequency of meetings and limited participation to national authorities only.

At the national level, a National Cholera Task Force was established at the end of 2011 which met weekly, and to which a Cholera Command and Control Centre (C4) – a model tried and tested during the 2008 Zimbabwe cholera response – was added in the last week of August 2012 to coordinate provision of technical guidance, disease surveillance, case management, water and sanitation, logistics and social mobilisation, and provide information to guide decision-making of the national task force.

Overall, it is clear that the process between the first declaration of an outbreak in Western Area – i.e. the cholera noticed to the north in Kambia back in February had now reached the Capital – and establishment of coordination mechanisms, including resource mobilisation from donors, took overly long in the face of what was an exponential rise in the number of suspected cholera cases almost one month earlier. In the event, and with the exception of ECHO's initial diversion of regional funding to two of their partners in May/June, funding was released after the outbreak had peaked.

By WHO definition, as soon as a single case is confirmed by laboratory diagnosis, an outbreak must be declared. But declaration of an epidemic, especially in a country with an already high prevalence of diarrhoeal disease, depends on the setting of more sophisticated alert thresholds and action triggers. Although such threshold calculations exist for diarrhoeal diseases, those specific for cholera were missing in this response, and need to be clarified.

Cholera outbreaks in Sierra Leone apparently always start in the same place, a coastal fishing community in Kambia to the north of the country. It then spreads down the coastal route by boat and by road to Freetown, where coastal slums are particularly vulnerable. If this is true, then more robust control measures need to be put in place in these locations in advance of the 'cholera season' to limit disease spread.
Appropriateness and Proportionality

73. Despite this being the largest cholera outbreak in Sierra Leone for fifteen years, the impact was not large in global and regional terms. The 2008-2009 epidemic in Zimbabwe – a country with a similar epidemiological and poverty profile, but with more than twice the population – experienced over 100,000 cases and more than 4,000 deaths. The 2010 outbreak in Haiti – a similar sized country with similar health indicators, yet one that was highly susceptible to introduced cholera as it had not seen an outbreak in more than 100 years – experienced over 7,000 deaths.

74. In unit cost terms, the Sierra Leone outbreak generated external emergency funding amounting to US$ 2.32 per capita, approximately 80% of the figure for Zimbabwe four years earlier.

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Population potentially exposed</th>
<th>Cases</th>
<th>Deaths</th>
<th>Crude Case Fatality Rate</th>
<th>Response Budget (US$)</th>
<th>Per capita cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zimbabwe</td>
<td>2008-2009</td>
<td>12.6 million</td>
<td>100,000</td>
<td>4,300</td>
<td>4.1</td>
<td>36 million</td>
<td>2.85</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>2012</td>
<td>5.6 million</td>
<td>30,000</td>
<td>300</td>
<td>1.3</td>
<td>13 million</td>
<td>2.32</td>
</tr>
</tbody>
</table>

75. At least half of the urban population potentially exposed (PPE) live in Western Area, including in the urban and peri-urban slums of Freetown. A range of risk factors, including population density, undernutrition, and poor access to safe water or improved sanitation, make this urban population particularly vulnerable. It is therefore considered appropriate that more than 50% of the control effort was targeted there.

Targeting

76. Given the dynamic and constantly evolving spread of the outbreak, with the population of the entire country potentially exposed and susceptible to cholera, NGO response programmes initially focused on those localities where they already had ongoing programmes prior to the emergency. Some agencies – such as Oxfam who established a new office in Tonkolili District after initially working through Concern, who were already established in the District – established new offices in response to the outbreak. For those newly arriving, the choice of where to set up operations was based mainly on whether another partner was present in the area or not. With only a partial grasp of who was doing what where (3W mapping), and even less information on capacities of the partners involved, many NGOs based their decisions on where to work on information provided by the National and District Cholera Task Forces.

77. The Red Cross was one of the few organisations to establish operations based on needs independently established by a combination of the IFRC’s in-coming Field Assessment and Coordination Team (FACT) and the extensive local knowledge of the Sierra Leonian Red Cross National Society; knowledge later refined by more detailed risk analysis that took into consideration data down to Chiefdom level on vulnerability (age and poverty), number of cases (attack rates, incidence), case fatality rates, population density, availability of safe water, access to healthcare, and bed capacity at Cholera Treatment Centres (CTCs).

78. ACF was another agency to use a targeted approach by identifying areas of operation based on the highest caseload – attack rate data was not available in late June, when they started operations – in city sections of urban Freetown and selected rural Chiefdoms.

28 US$ 9.8 from CERF and other bilateral donors, plus CHF 3.2 million from the Red Cross
79. The cost-recovery policy was waived for those suspected of having contracted cholera, with all treatment, including ORS for home-based treatment and chlorine for prevention, provided for free. There are only very limited anecdotal reports of charges having been levied. On the contrary, as the outbreak continued, the concept of free treatment attracted patients with other, less severe forms of diarrhoea to arrive at health facilities of all types.

80. Access to CTCs and CTUs may have been difficult in some areas for those who could not afford transport, or those prevented from attending by inaccessible roads. It is here that the Sierra Leone Red Cross volunteers supported by IFRC came with case management, hygiene promotion and water treatment, especially in the remote rural areas. They were able to establish 393 Oral Rehydration Posts at community level in close cooperation with their MoHS community health worker counterparts, which allowed for early identification of those cases requiring referral as well as targeting health education and hygiene promotion efforts locally. In urban areas, Blue Flag Volunteers, trained by relevant NGOs prior to and during the outbreak, also proved to be highly effective in establishing ORPs and enabling referral of suspected cholera cases to the nearest functional health facility.

### Sustainability

81. Transition from emergency cholera activities to longer-term health protection programmes, particularly in the area of mother and child health, depends on a strategy that builds on and reinforces hygiene promotion and social mobilisation efforts made within communities as part of this cholera response. Those organisations already present in the country prior to the cholera epidemic are already transitioning to such strategies.

82. Support given to the Health Education Division (HED) and district surveillance mechanisms in the form of motorbikes, laptops, mobile phones and phone bills by partner agencies now allows DHMTs to monitor cases reported by PHUs which were previously neglected, allowing them to assess and provide further support (e.g. supplies and training). This has served to strengthen district health management information systems beyond those required for the immediate cholera emergency response. Support was also given to the MoHS-HED in the form of laptops and printers, as well as limited budget support for MEWR. HED also received limited budget support.

83. The real legacy of the 2012 emergency cholera response, however, is measured not just in lives saved, but in the improved levels of knowledge within households about what cholera is, and how it can be prevented and treated. Along with MoHS staff at peripheral, secondary, and tertiary level, volunteers, especially Red Cross and Blue Flag Volunteers have been, and will continue to be, instrumental in building such knowledge, attitudes, and practices, particularly when these are combined with complementary distributions of cholera kits.
LESONS LEARNED

84. The tables that follow are based on feedback obtained through the lessons learned review process by partners who were active throughout the response. Bullet points are arranged in no particular order of priority. Recommendations stemming from these observations are outlined in the ‘options and recommendations’ chapter.

COORDINATION

<table>
<thead>
<tr>
<th>What worked well</th>
<th>What could be improved / Challenges remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Establishment of a technical coordination mechanism Cholera Control and Command Centre (C4) and thematic working groups, Co-chair arrangements in C4 (MoHS / WHO)</td>
<td>• Delayed activation of Rapid Response Teams and coordination mechanisms at national and District level (not all Districts)</td>
</tr>
<tr>
<td>• Establishment of Cholera Task Force multi-sectoral weekly meetings at District level in February 2012, comprising DHMT, District Councils, and partners</td>
<td>• Terms of Reference for coordination management, where they existed, were not ratified and applied, so what could be expected was unclear to partners</td>
</tr>
<tr>
<td>• District based response planning</td>
<td>• Some WASH partners implemented directly without always consulting the respective DHMT</td>
</tr>
<tr>
<td>• Definition of Terms of Reference for various coordination mechanisms</td>
<td>• Weak engagement in sanitation services by local water authorities</td>
</tr>
<tr>
<td>• Standards and guidelines (case definition, case management, infection control, laboratory protocols)</td>
<td>• Deeper, disaggregated data required e.g. Chiefdom-level attack rates, weekly incidence rates, CTC/CTU bed capacity, weekly CFRs, gender, pregnancy, nutritional status, PHU reporting rates</td>
</tr>
<tr>
<td>• Reporting</td>
<td>• No GIS maps of Attack Rates at Chiefdom level until 23 October (although these were supplied regularly thereafter by OCHA)</td>
</tr>
<tr>
<td>• Resource Mobilisation (Human resources, Funds, medicines and materials)</td>
<td>• Initial who, what, where (3W) confused (except for WASH Consortium)</td>
</tr>
<tr>
<td>• Sharing of information on a daily basis through meetings and distribution of daily epidemiological updates</td>
<td>• Limited mission of OCHA</td>
</tr>
<tr>
<td>• Identification of operational gaps through assessment by C4 teams using quantitative data</td>
<td>• Lack of integration between Ministries of Health, Education, and Energy &amp; Water Supply</td>
</tr>
<tr>
<td>• Engagement and commitment of government institutions, especially Office of the President and various line ministries</td>
<td>• Not all NGOs engage which undermines district ownership.</td>
</tr>
<tr>
<td>• Engagement of civil society and private sector: cell phone companies (text messages free of charge, jingles); banks; vehicles and other logistics support provided by private sector companies</td>
<td>• Disseminate information to districts</td>
</tr>
<tr>
<td>• UNICEF deployed 3 field coordinators to support coordination at District level, which the DMOs concerned found helpful.</td>
<td>• Incomplete National Cholera Preparedness and Response strategy, with no action plan and little reference to what existed</td>
</tr>
<tr>
<td>• WHO deployed 27 experts (8 for coordination, 4 case management, 5 Epidemiologists, 4 laboratory, 3 Social mob/WASH, 1 programme operations and 2 logisticians)</td>
<td>• Predictable leadership</td>
</tr>
<tr>
<td>• Technical coordination of partners through C4</td>
<td>• Prevent funding gaps</td>
</tr>
<tr>
<td>• Identification of hotpots and sharing with partners</td>
<td>• Leadership from District Councils is crucial, especially for sanitation, but was lacking</td>
</tr>
<tr>
<td>• District to National Feedback mechanism through the C4</td>
<td>• Links with development partners</td>
</tr>
<tr>
<td></td>
<td>• Dropbox was a useful interim measure but is no substitute for managed information; access for some partners was difficult and, as contents grew, finding what was needed became more and more difficult which limited its effectiveness as an information-sharing tool</td>
</tr>
<tr>
<td></td>
<td>• Absence of nutritional advice in the C4 (including for hospital feeding of cholera)</td>
</tr>
</tbody>
</table>


Overall achievements

- Contributed to overall reduction in crude mortality due to cholera
- Production of regular epidemiological bulletins to guide and monitor national and District level response
- Provision of timely technical advisories
- Production of technical guidelines

National Coordination Structure

85. Sierra Leone instituted a national system for disaster risk management in 2008 managed by a Disaster Management Department within the Office for National Security. It chairs a departmental committee comprising police, military, civil protection, and local government, including Freetown City Council, and the Western Area District Health Management Team (DHMT).

86. Following the government’s declaration of a national public health emergency, a Presidential Task Force was established on 23 August under leadership of the Chief-of-Staff with participation of relevant line ministries (Health and Sanitation (MoHS), Energy and Water Resources (EWR), Education, Finance and Economic Development, Agriculture and Food Security, Local Government and Rural Development, and Information and Communications), donors, UN agencies (WHO and UNICEF), the Red Cross (IFRC), and selected International NGOs. Its role was to provide strategic oversight, ensure adequate resource mobilisation, and coordinate the engagement of the multiple line ministries involved. In this it was successful, although, as a strategic oversight body, it was considered by many partners to have become overly enmeshed in operational decision-making which was felt to be the role of the National Cholera Task Force (NCTF).

87. A National Cholera Task Force, chaired by the MoHS Department of Disease Prevention & Control (DDPC) provided operational coordination of the overall response. This group’s membership comprised the same stakeholder groups, but included all International NGOs. Most of these NGOs were in the country at the time of the outbreak and were already members of Working Groups such as the WASH Consortium – a group of 5 NGOs dedicated to Urban WASH in Freetown – and a WASH & Social Mobilisation sub-group led by MoHS’s Health Education Division which involved almost all partners.

88. A Cholera Control and Command Centre (C4) was established on 27th August, staffed at various times with specialists from MoHS, WHO, the US Centres for Disease Control & Prevention (CDC), the International Centre for Diarrhoeal Diseases Research in Bangladesh (ICDDR,B), the UK’s National Health Protection Agency (HPA), the Global Outbreak Alert and Response Network (GOARN), and, temporarily OCHA. UN agencies and NGOs representing thematic groups were also members of the C4. Attendance was however not restricted to representatives of the thematic groups as some members of the working groups also attended as they wished. The principle of establishing the C4 was to provide a mechanism to coordinate technical support from the 5 thematic working groups as well as to facilitate the scaling up of interventions to fight the cholera outbreak, including development of comprehensive technical guidelines. At inception, the C4 recommended 5 thematic areas namely; case management; epidemiology, surveillance and laboratory, logistics, social Mobilisation.

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29 Sierra Leone Cholera Control and Command guideline, August 2012 MoHS
and WASH. However some of the thematic groups were already merged and functional before the C4 was established.

89. From 30 August (Week 34) when it held its first meeting until 1 October (Week 39), the C4 held a daily review meeting which was meant for at least two representatives from the 5 thematic areas as
well as members who were permanently located within command centre. These meetings reduced to three per week at the beginning of October (Week 40), and to once per week at the beginning of November (Week 44). Its purpose was to provide technical guidance to the different health care providers in the country; epidemiological updates; review available data on current trends of the outbreak; identify hotspots; make recommendations (to the National Cholera Task Force); and strengthen coordination of the response at all levels.

90. The National Cholera Task Force (NCTF) exists in order to strengthen coordination amongst the various partners. The establishment of a Cholera Command and Control Centre (C4) under the NCTF was meant to offer technical support as well as coordinated technical aspects which required the inputs from the 5 thematic areas. Presentations were made during NCTF to introduce the operations and mandate of the C4. Terms of reference of C4 as well as operational structure was presented and discussed. Representatives from the various thematic areas – namely WASH, Case Management and Logistics, Epidemiology and Surveillance – were supposed to table issues raised from the C4 to the working groups before final decisions were made in C4.

91. However, during the early stages of the response, partners felt that coordination mechanisms were not well defined. There were too many working groups with overlapping roles, which made decision making harder than it needed to be and hindered the streamlining of information flow. With the National Cholera Task Force (NCTF) working “relatively well” – especially when it set up the three working groups at the beginning of August – superimposing the Cholera Control and Command Centre (C4) saw duplication of effort and resultant meeting overload. With the Presidential Task Force involving itself – as it has the right to do – in operational coordination, this created “a tripling of effort”. It is clear that only one ‘coordination centre’ was required, and that the ideal way to achieve this at the time would have been to empower the NCTF and enable it with the technical support services it needed.

92. On 27 August, the NGO community active in WASH – which, in Freetown, is a small but cohesive group of five NGOs that knew each other well through their collaboration as the Freetown Urban WASH Consortium – wrote a joint letter to the UN Representative requesting clarification on the respective roles of UNICEF and WHO, and recommending that UNICEF be given the formal mandate to lead the WASH response.

93. Between the beginning of the response and the end of September, the representatives of WHO and UNICEF used to meet bilaterally every week with their respective programme managers to discuss integration of WASH and Health components of the response. Not only were the results of these meetings never shared, but a conflict of interest then arose within the WASH – Social Mobilisation Group and the C4 which made autonomous decision-making of the type envisaged by the Cluster Approach impossible as it effectively meant that UN staff could not counter the NCTF and its working groups or the C4 as decisions had already been made.

94. With the arrival of a full-time coordinator on 8 August, WASH and Social Mobilisation planning and coordination gathered momentum and was considered as “very useful” by its members – the bulk of the NGO community.

95. Management of cholera control programmes requires robust coordination measures to be put in place, where operational decision-making and oversight roles and responsibilities are clear. This is usually only feasible where government-led entities take an early and proactive lead, as was the case in Sierra Leone where the MoHS Director of Disease Prevention and Control was the chairperson of the National Cholera Task Force (NCTF).

96. The Cholera Control and Command Centre (C4) – a model first used during the Zimbabwe cholera epidemic in 2008 alongside the UN’s Cluster Approach – facilitated the identification of hotspots and gave specific tasks to be undertaken by the working groups to improve the response. Following
identification of hotspots areas with high CFR and operational challenges, the C4 became involved in technical field assessments and provided on the job support to districts. The findings were helpful in improving district operations as well as monitoring of cases. C4 provided direction to thematic working groups following identification of hotspots. Teams were also dispatched to ascertain situation on the ground and provide technical advice.

“Coordination arrangements appeared to be duplicated, and were hugely blurred.”

97. The National Disaster Management Agency (NDMA) or equivalent is usually in charge of ensuring inter-sectoral strategic coordination and cooperation 30. Line ministries are then involved in sectoral operational coordination, with local authorities responsible for local level implementation. In Sierra Leone, the NDMA function is vested in a department within the Office of National Security. This does not give it the necessary authority to ‘direct’ the various Line Ministries which need to be engaged in a cholera response. Instead, this function was taken on by the State House, with a Presidential Task Force commissioned by His Excellency The President under chairmanship of the Chief-of-Staff, with support of the Strategic Planning Unit within his office.

98. Formalisation of these roles and responsibilities is necessary so that each stakeholder knows what to expect of the other.

Information Management

99. Historically, health-led responses to disaster tend to see epidemiology and data management as the same thing as information management. But, information management in disaster response settings is a much broader concept, covering not just the one-way distribution of epidemiological data and promulgation of technical advisories, but two-way approaches to planning, monitoring, evaluation, and analysis. It is expected by humanitarian partners to be an interactive service provider where raw data-sets can be interrogated by anyone at any time. Such a system is crucial to providing evidence bases by which decisions can be made as situations evolve. It also requires full-time moderation and dedicated capacity to work well.

“It’s a constant struggle to get the information and analysis we need.”

100. While disease surveillance efforts eventually became effective at monitoring the outbreak and providing early warning of outbreaks, and regular bulletins/press releases and meeting notes were issued, wider aspects of ‘information management’ such vulnerability, risk, and capacity mapping, tracking of commodity pipeline data, and use of web-based applications for the dissemination of coordination outputs, contact information, and technical advisories, were inconsistently applied throughout this response despite support from OCHA, both while in-country and from its regional office.

101. Information management was rendered less inclusive and transparent by the use of ‘dropbox’, a central, static, and password protected repository of information which was only accessible to those actively engaged in the response – and, even then, some partners could not access it for technical reasons. The WASH Consortium was using ‘dropbox’ as their information-sharing tool prior to onset of the cholera epidemic. This was then absorbed into a larger ‘dropbox’ account on OCHA’s advice in late August. Neither the Government as a whole, nor the MoHS within it, ever established a website with a page dedicated to the cholera response. Not only does such a site allow for better

30 As per UN Security Council Resolution 46/182, ‘Affected States have the sovereign right to coordinate, regulate, and monitor disaster relief and recovery assistance provided by (internal and external) actors on their territory, consistent with international law.’


management of information – assuming the proper firewalls are erected to prevent malware intrusion – but it allows the tools, guidelines and experiences of one response to be accessed when planning the next. Recognising connectivity challenges in Sierra Leone, establishment of such a site by GoSL in close cooperation with OCHA and the Global Health Cluster should nevertheless be considered.

102. Use of GIS maps for planning was inconsistent, and they were rarely used for decision making. The WASH Consortium produced street level caseload maps for Freetown early in the response, and the WASH Group produced attack rate maps at the District level on a weekly basis from Week 33 to 42. SHAPE files delineating administrative boundaries down to Chiefdom level were passed to OCHA’s regional office, but the requested maps outlining which organisation was present where, locations of unprotected water sources, and what areas were not accessible by road during the rainy season never materialised.

Resource Mobilisation

103. According to OCHA’s Financial Tracking Service (FTS), a total of $US 5,606,000 was committed to the cholera response in Sierra Leone (Switzerland, Sweden, Ireland, Finland, ECHO, CERF).31 To this can be added known disbursements of US$ 3,200,000 under DFID’s Rapid Response Facility, US$ 750,000 in aid from the African Development Bank, and US$ 250,000 from UNICEF’s own funds. Total commitments as at the end of October 2012 therefore amounted to US$ 9.8 million leaving a funding shortfall of US$ 2.7 million; a sum which just happens to amount to that committed by the Red Cross movement.

104. The UN Country Team requested funding from the Central Emergency Response Fund (CERF), submitting a proposal for US$ 5.7 million on 31 July. In the event, US$ 3.5 was allocated by the CERF, but these funds were not disbursed until 20 August. It was soon realised that the initial CERF application had under-estimated the scale of response required, and an additional appeal was made, requesting a total of US$ 12.5 million – later scaled back to US$10.79 million – for enhanced prevention and control activities.

105. Some bilateral funding – for example, from the US – was dependent on an emergency being formally declared. US$ 3.2 of DFID funds were disbursed on 27 August through its new Rapid Response Facility, and those from ECHO on 5 September. The one month delay between first confirmation that an outbreak was underway and disbursement of funds, resulted in a lead-lag such that operational response measures based on local and international procurement from many WASH partners did not reach scale until early September i.e some weeks after the outbreak had peaked. Those that were able to respond earlier than this, did so with their own funds on verbal assurances from UNICEF and WHO – who were managing the CERF grant – and ECHO, each of whom made verbal commitments to their chosen implementing partners during the first week of August. ECHO was also able to temporarily ‘divert’ funds from its ongoing cross-border programme with ACF at the first sign of the outbreak, which was considered critical to scaling up control measures.

106. Separate to the UN and other bilateral donors, the Red Cross committed a total of CHF 3.2 (US$ 3 million) to the cholera response, although this sum includes nominal costs associated with mobilising Emergency Response Units (ERUs) for Mass Sanitation, Community Health, and Basic Health Care, which were ‘donated’ by national societies. THE BHC ERU was not primarily involved in treatment of patients, but provided system support for clinical case management, infrastructural water and sanitation support in targeted health facilities, and hygiene promotion.

107. According to the NGOs interviewed, most donors preferred to focus on those Districts with higher reported caseloads at the time of the President’s emergency declaration – ECHO, for example, funded partners only in Freetown – leaving it difficult for some NGOs to mobilise the funds necessary to carry out prevention activities in those Districts less affected at the time, such as Kenema and Kono.

108. A number of NGOs interviewed felt that “there was not a lot of clarity from donors, including the CERF, on eligibility criteria for funding through the period 21 June – 27 August” and that conformity to the Government’s preparedness and response strategy was not in itself enough of a criteria, when the (incomplete) strategy in question was not widely shared and remained in draft form.

109. MoHS staff at national and District levels also complained of lack of transparency in donor funding, and requested all donors to inform them in advance of who they were intending to fund, to do what, and where. This is indeed a principle under ‘Good Humanitarian Donorship’ so is to be encouraged. Equally important is for donors to engage when as soon as an outbreak turns into an epidemic without waiting for a formal announcement declaring a national emergency. Either way, any such support should be given according to the agreed response strategy.

### DISEASE SURVEILLANCE

<table>
<thead>
<tr>
<th>What worked well</th>
<th>What could be improved / Challenges remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>• WHO support for bacteriology in Central Public Health Reference Laboratory (CPHRL)</td>
<td>• Sustaining active surveillance including daily reporting</td>
</tr>
<tr>
<td>• Early identification of index cases</td>
<td>• Regularly monitoring of disease trend for early detection of outbreaks in districts</td>
</tr>
<tr>
<td>• Consistent data management and reporting</td>
<td>• Laboratory sustainability and quality control</td>
</tr>
<tr>
<td>• Commitment of DSOs</td>
<td>• HMIS should be capable of providing datasets for vulnerability (age, gender, and poverty), number of cases (attack rates, incidence), case fatality ratios, population density, availability of safe water, and access to healthcare</td>
</tr>
<tr>
<td>• Collaboration and cooperation from all partners</td>
<td>• Remoteness of some Chiefdoms and communities + lack of cellphone coverage makes data collection and reporting difficult</td>
</tr>
<tr>
<td>• Regular feedback of District level analysis</td>
<td>• Data was reported retrospectively, thereby distorting the person, place, and time (PPT)</td>
</tr>
<tr>
<td>• Epidemiological teams mobilised through WHO came at the required time</td>
<td>• Surveillance data often wasn’t communicated to the WASH and Social Mobilisation Sub-Group which meant that targeting of messages was not as efficient as it might have been, although this improved in September</td>
</tr>
<tr>
<td>• Collaboration between WHO and MOHS</td>
<td>• Policy needed for use of RDTs as first line early warning pending later laboratory confirmation of suspected cases. Also need to train health staff on use of RDTs</td>
</tr>
<tr>
<td>• Identification of hotspots</td>
<td>• At the beginning of the outbreak there was limited diagnostic facilities (RDT and Lab) resulting in some D&amp;V cases were suspected as cholera.</td>
</tr>
<tr>
<td>• Support for Fields assessments</td>
<td>• Inadequate supervision</td>
</tr>
<tr>
<td>• Follow up of cases and sample collection and analysis</td>
<td>• Community surveillance and notification of disease is limited</td>
</tr>
<tr>
<td>• Monitoring cholera disease trend</td>
<td></td>
</tr>
<tr>
<td>• Daily report and weekly bulletins</td>
<td></td>
</tr>
<tr>
<td>• Mapping of hotspots and attack rates</td>
<td></td>
</tr>
<tr>
<td>• Printing of case definition, standards and protocols</td>
<td></td>
</tr>
<tr>
<td>• Strengthening capacity of health workers in case management, surveillance and laboratory confirmation of cases</td>
<td></td>
</tr>
<tr>
<td>• Training of Red Cross volunteers on epidemic control</td>
<td></td>
</tr>
<tr>
<td>• Setting up of a pilot community surveillance system and referral</td>
<td></td>
</tr>
<tr>
<td>• Field investigations were conducted by MoHS and partners to identify the possible causes of the outbreak and to guide response activities</td>
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**Overall achievements**

- Improved mobile communications with health facility staff enabled more regular and timely reporting
- Regular and consistent dissemination of epi-data informed decision making at national and District

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32 Meeting with WASH Consortium, 7 November
levels
- Use of surveillance data as evidence improved decision making and prioritisation when coordinating response, as well as case identification and management

110. Sierra Leone has an established disease surveillance system in place with weekly, monthly, and quarterly reporting according to the country’s IDSR technical guideline. Immediate reporting is done for all notifiable diseases conditions and events. Data analysis is regularly conducted with weekly epidemiological bulletins and quarterly bulletins produced.

111. Daily reports to monitor the spread of the epidemic and thereby to know where to focus limited prevention and treatment resources are required in the country. Apart from surveillance being syndromic – laboratory confirmation was not available from the CPHRL until August; prior to this Laboratory confirmation was done by the microbiology laboratory in the Connaught hospital laboratory – the ability of Disease Surveillance Officers did not always have the means to communicate what data they had. Over 1,400 mobile telephones were eventually procured to enable daily reporting.

112. In the initial phase of the outbreak, District Health Authorities collected data from up to 120 health centres in each of their areas by phoning around. For weeks, 'no reply' was recorded as 'no cases' which resulted in under-reporting of the spread of the outbreak once collated statistics were passed every evening to the newly-convened national C4. Despite national mobile phone penetration of over 55%, the lack of communications technology in the form of mobile telephones and modem-enabled laptops was also considered a serious constraint to data collection. But, there again, many rural areas had no network coverage. It was only on 24 October, some two months after the outbreak declaration, that it became clear that the percentage of PHUs reporting was 73% overall (range 12% - 103%)

113. The collection of epidemiological data in general was noted to be unreliable throughout the first phase of response, with both under- and over-reporting, especially by smaller village and town health facilities. Partly, this can be put down to the lack of clear case definitions, the high prevalence of other endemic diarrhoeal diseases, and co-diagnosis with malaria. Inconsistency in reporting across time and space may also have distorted trends observed, and may have limited the usefulness of the data at the time. Some Districts, such as Kenema, found it difficult to identify trends in the response as they lacked data from their PHUs until the end of September.

114. The surveillance system is also biased towards reporting only those suspected cases admitted to District hospitals, with the assumption being that all suspect cases are referred, and that there are no outbreaks in non-reporting Chiefdoms. Later review of PHU and hospital records did not support this assumption.

115. Anecdotal evidence from MSF’s CTCs suggested that by the end of August (Week 34) cholera contributed approximately one third of all cases presenting with D&V. By the time a sample survey capable of being diagnosed by laboratory testing was conducted in mid-October (Week42), this figure appeared to have fallen to 13% and by late November to 8%.

116. Under-reporting is also suggested as it remains unclear how many health facilities run by the private sector or faith-based charities reported to their respective district health authorities.

117. Disaggregated data was provided in part by the surveillance system, but lacked gender-specific information. When such data was available via NGO and CDC surveys, the number of reported cases

33 Save the Children figures show no more than 70 of the 104 PHUs in their area of operation reported regularly. This despite the donation of two motorbikes.
34 British Red Cross proposal to DFID, September 2012
35 C4 mission report to Kenema, October 2012
36 CPHRL report to C4, 18 October 2012. Note, however, the small sample size of 30.
showed the epidemic affected more women than men – probably owing to their role as care-givers – whereas direct observation showed more men than women. This sort of data could usefully influence future messaging targeting women. However, the data also demonstrates that age and gender are not the overriding factors in cholera transmission. Instead, socio-economic status and access to health and sanitation services are most important and will remain the guiding factors in future responses.

118. Calculation of thresholds, crude attack rates and crude case-fatality-ratios (CFRs) disaggregated by age (under or over five years of age) as a proportion of numbers affected per District were published daily by the C4 until the end of October (Week 43) after which they became weekly. Inputs continued daily however in order to provide continued early warning of (re-)emerging hotspots. These daily outputs were much appreciated by all respondents at national level, “although weekly incidence and attack rates and GIS mapping would have been useful.”

Field investigation and laboratory confirmation

119. WHO and partners are supporting the government in the response to the outbreak. Through the Global Outbreak Alert and Response Network (GOARN), experienced case management and laboratory experts from the International Center for Diarrheal Disease Research, Bangladesh (ICDDB), CDC and HPA were deployed to build capacity among health-care workers and laboratory technicians in case management and laboratory diagnostics. WHO continues to support Sierra Leone in the areas of epidemiology, social mobilisation, and disease surveillance and mobilised experts from the AFRO Regional Office and WHO headquarters.

Sample Chain

120. There is a network for collection and transportation of samples existing in the integrated disease surveillance system. There are 32 Disease Surveillance Officers (DSOs), including 4 at national level, whose responsibilities are to investigate, collect and transport samples to DPC offices for onward transmission to the Reference Laboratory.

121. For prompt action, Rapid Diagnostic Test (RDT) kits were used for preliminary confirmation of cases. RDT positive samples were transported to the Reference Laboratory in Freetown for further analysis.

122. A series of capacity building workshops for laboratory personal on bacteriology were conducted by different specialist agencies/Institutions such as ICDDR,B, CDC, HPA and WHO IST/West Africa.

123. While laboratory results were immediately communicated to the MoHS and partners, some district medical officers (DMOs) reported that feedback to their districts was somewhat ad-hoc. Rapid feedback of results is considered essential for effective outbreak control and for understanding the dynamics of how the disease is spreading. It also provides an overview of background prevalence, without which the risk of over-reacting to seasonal incidence of diarrhoeal disease, or under-reacting to a resurgence of cholera is highly likely. It is therefore suggested that every aspect of the sample chain be strengthened and the reference microbiology laboratory made functional.

124. There are no bacteriologists, basic training was given in emergency response to cholera but at the time there was nobody available to carry this out. Staff is still and issue and even though limited training was carried out by specialists seconded to WHO from the UK’s Health Protection Agency (HPA), dedicated staff are still needed for this section.

125. There were no reagents available for microbiological testing, and it was only in late October (Week 42) that supplies for cholera surveillance and outbreak response became available with a donation from HPA. In addition, there were no rectal swabs or Carie Blair transport medium available to take samples for testing. A large stock and continue supplied needs to be organised.
126. There was no system in place or transport to CPHRL for cholera testing, people were not trained in taking samples. This is now being addressed but a long term surveillance strategy is required.

CASE MANAGEMENT

<table>
<thead>
<tr>
<th>What worked well</th>
<th>What could be improved / Challenges remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Case definitions were developed and distributed to health facilities</td>
<td>• Preventive activities should not be limited to Districts where outbreaks have been confirmed</td>
</tr>
<tr>
<td>• Training of Trainers (TOT) on case management conducted at national level and in 13 districts</td>
<td>• Huge differences in diarrhoeal disease prevalence within and between Districts; hence the difference in attack and case fatality rates</td>
</tr>
<tr>
<td>• Training of Sierra Leone Red Cross volunteers (1534) on case management</td>
<td>• Need to improve infection control in all facilities.</td>
</tr>
<tr>
<td>• Patient management was guided by standard guidelines</td>
<td>• Orientation of health workers at PHU level prior to outbreaks</td>
</tr>
<tr>
<td>• Limited referral of patients was done</td>
<td>• Provision of IPC materials at government run facilities</td>
</tr>
<tr>
<td>• Infection control guidelines were developed and distributed</td>
<td>• Identification of focal persons to deal with IPC at treatment centres</td>
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<tr>
<td>• Regular meetings were held to monitor response activities including quality of care</td>
<td>• Orientation of health workers on waste management</td>
</tr>
<tr>
<td>• In some areas dead bodies were managed under supervision</td>
<td>• Staffing levels for clinical and environmental health</td>
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<tr>
<td>• Guidelines updated during outbreak</td>
<td>• Information about handling of dead bodies</td>
</tr>
<tr>
<td>• Monitoring and supervision of patients</td>
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Overall achievements

- Minimised excess deaths due to D&V / Cholera by extending case management training to PHU level which improved treatment outcomes and timeliness of referral
- Despite the challenges with case management at the beginning of the outbreak there was an improvement in treatment outcomes, thus attaining an overall CFR of 1.3%.
- Mitigated the spread of the disease

127. MoHS conducted a Diarrhoeal Diseases and Cholera Case Management Training-of-Trainees (ToT) workshop in Freetown from 25-28 September 2012 as part of scaling up response to the cholera outbreak. The purpose of the training was to build capacity of district supervisors and trainers from all the districts to serve as trainers of health facility staff in their respective districts. This served to strengthen national capacity for clinical management of cholera and other diarrhoeal diseases thus contributing to sustainability. The training was facilitated by physicians and epidemiologists from the International Centre for Diarrheal Disease Research, Bangladesh (ICDDR,B), Health Protection Agency UK and WHO. The course focused primarily on the epidemiology and etiology of Diarrhoeal Diseases, clinical features and management of cholera, shigellosis and typhoid, as well as sample collection.

128. WHO recommends that immunisation with currently available oral cholera vaccines be used in conjunction with the usually recommended control measures in areas where cholera is endemic as well as in areas at risk of outbreaks. When used, vaccination should therefore target vulnerable populations living in high risk areas and should not disrupt the provision of other interventions to control or prevent cholera epidemics. Health professionals in contact with cholera cases and samples should receive vaccination.
### SUPPLY CHAIN MANAGEMENT AND LOGISTICS

#### SUPPLIES AND LOGISTICS

<table>
<thead>
<tr>
<th>What worked well</th>
<th>What could be improved / Challenges remaining</th>
</tr>
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<tbody>
<tr>
<td>● Customs clearance</td>
<td>● Leadership (and capacity) at district level on management of supplies and logistics, including rational forecasting, distribution and reporting/accountability</td>
</tr>
<tr>
<td>● Re-positioning of cholera drugs to hard-to-reach community health facilities closer to affected communities</td>
<td>● Unavailability of Logistician within the MoHS to coordinate cholera logistics.</td>
</tr>
<tr>
<td>● Logistics/supplies support provided by partners to CTCs/CTUs and DHMTs</td>
<td>● Inadequate stocks of RDTs and, initially, of Aquatabs</td>
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<tr>
<td>● DLOs and field coordinators were kept informed about quantities to be supplied and dates of distribution.</td>
<td>● Weak oversight for equitable distribution at national level</td>
</tr>
<tr>
<td>● Good division of roles among partners in supporting treatment centres and districts: MSF supported CTCs in Western Area, the IFRC supported CTC and CTUs in the districts, while UNICEF provided medical supplies to DHMTs for further distribution to PHUs</td>
<td>● Increase the quantities of cholera drugs (IV and antibiotics) and consumables</td>
</tr>
<tr>
<td>● Regular distribution plans developed and implement from the central level (CMS) to the Districts (DMS)</td>
<td>● There is neither budget nor vehicles for secondary distribution from District medical stores to PHUs</td>
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</table>

#### Overall achievements

- Collaboration with NGOs and C4 at District level to ensure timely and de-duplicated tertiary distribution of drugs and supplies
- Pre-positioning of supplies in hard-to-reach PHUs

Logistics presented a formidable challenge. Limitations in the stock management system, number of serviceable trucks available, and road conditions were among the main factors to render the supply chain fragile at best. Sudden, unexpected surges in cases would quickly deplete stocks of intravenous fluids (mostly Ringers’ Lactate) and ORS sachets in DHMT stores, and resupplying them usually took days. Meanwhile, relevant supplies such as IV fluid and chlorine would languish elsewhere in District Medical Stores “because they had been earmarked for another programme” and could not therefore be diverted to the cholera response. It seems that health facilities lacked the proper authorisation to use these earmarked stocks for unrelated interventions, although responding to the cholera outbreak should have been a priority.

"Some NGOs distribute directly, without reference to us.”

(District Medical Officer, 25 October 2012)
Incoming supplies were supposed to be registered and stored at Central Medical Stores, and physically handed over to District stores or direct to point of use once released from customs. There was an agreement between MoHS, MSF and IFRC on supplies for CTC/CTUs. At least two NGOs donated directly to the districts without passing by the central level as agreed.

Importing agencies report, at worst, only a few days delay in clearing customs, with most goods cleared quickly and efficiently.

A Logistics Management Information System (LMIS) has been developed under the National Health Sector Strategic Plan 2010-2015 to track distribution of drugs and medical supplies. In addition, the MoHS will be establishing a National Pharmaceutical Procurement Unit (NPPU) as a central body to procure drugs, medical consumables, and health equipment. With incoming supplies for the cholera response being sometimes directed straight to point of use or to District medical stores, this system was not capable of tracking all the inputs through the supply chain. As a result, inputs are likely to be far higher than official figures suggest. Likewise, ad-hoc and partial information on who was supplying what, where, and when meant that oversight could not be exercised by either the NCTF or Central Medical Stores, with the result that medical and consumable supplies “piled up in one place while others were ignored.”

There were many difficulties in managing and reporting on a demand-led supply chain in Sierra Leone, among other reasons for lack of coordination between health and wash authorities at district level. On occasions WASH supplies were distributed to WASH authorities but DHMTs were not aware of it or vice versa. There were some delays on WASH supplies but the Logistics group reported no delays in delivery of health / medical supplies from central to District level, although delays were experienced in tertiary distribution between Districts and the periphery, mostly due to challenges of accessibility and lack of transport and resources.

Districts often failed to request drugs in a timely and rational manner; and limited utilisation reports were made available which posed problems for forecasting of supplies and distribution planning at national level. There was not enough communication between central authorities and the implementing health facilities in the districts. This may warrant improvement in the procedures of reporting, ordering of stocks by health facilities, and verification of needs by central authorities.

### WATER, SANITATION AND HYGIENE

<table>
<thead>
<tr>
<th>What worked well</th>
<th>What could be improved / Challenges remaining</th>
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<tbody>
<tr>
<td>• Disinfection of community toilets</td>
<td>• Enhance Total Sanitation in schools</td>
</tr>
<tr>
<td>• Chlorination of unprotected water sources</td>
<td>• De-sludging of toilets in schools and health facilities</td>
</tr>
<tr>
<td>• Local capacity mapping</td>
<td>• Regular supply of chlorine</td>
</tr>
<tr>
<td>• Rapid establishment of bucket chlorination points</td>
<td>• Local Councils could be more proactive</td>
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<td></td>
<td>• Presence and activities of NGOs need to be known to all partners</td>
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<tr>
<td></td>
<td>• Include standards and indicators in the NCPRP</td>
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<tr>
<td>Overall achievements</td>
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<tr>
<td>• Improved access to safe water at community and household level</td>
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<tr>
<td>• Effective social mobilisation, with the majority of the population reached with clear and consistent messaging about how to prevent and treat cholera</td>
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<tr>
<td>• Involvement of community sanitation / village water committees</td>
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<tr>
<td>• Growing awareness among health workers and medical staff of importance of integrating WASH into response planning and operations</td>
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The WASH Group is organised under the Health Education Division and is supported by the (Urban) WASH Consortium. It consists of more than 25 partners from the WASH and Health sectors, and continues to meet regularly to coordinate transitional planning. Its main successes can be summarised as follows:

- Consistent ‘who, what, where’ (3W) mapping with weekly updating
- Early agreement on standards and procedures (e.g., technical best practices, beneficiary feedback mechanisms, the use of chlorine products, allowance for volunteers) were agreed by the group in July.
- Rapid and coherent development of IEC materials, and consistent employment of relevant media
- More than 75,000 households (490,000 individuals) received ‘cholera kits’ for water treatment and personal hygiene
- More than 460 community water points have been rehabilitated, providing safe water to more than 780,000 people (120,000 households) in urban and rural areas.
- Approximately 3,000 chlorinators have been trained, and 278,000 household visits conducted.
- More than 200 PHUs and all CTCs and districts hospitals were supported in accessing safe water and improved sanitation, and in enhanced contamination control

Even though the Cluster Approach was not formally activated, “UNICEF’s leadership from earlier on in the response – it is the global cluster lead for WASH, after all – would have been very welcome, but was absent.” In general, respondents thought that UNICEF’s lack of early and proactive engagement undermined the overall effectiveness of the response, although it was acknowledged that leadership and engagement improved as the control programme progressed. A general feeling was also expressed that WHO’s “engagement and leadership was limited during the majority of the response.”

The establishment of WASH sub-group was deemed very useful by all respondents as it allowed specific discussions on standards and technical approaches “to be more informed, evidence based, and inclusive of the expertise needed.” The avoidance of duplication and timely sharing of relevant information once the group came up to speed was considered highly successful. Some respondents, however, suggested that physical separation from the C4 created an artificial barrier between Health and WASH components of the response when it came to planning those areas of response that had the potential to overlap, and would have preferred to see the WASH Coordinator co-located in the C4 with his MoHS, MEWR and WHO counterparts.

The lack of enforcement of the national water and sanitation policy, as well as the absence of nationally defined standards for WASH, means that water quality standards and accountabilities are unclear. Too many shallow wells are dug and too many boreholes drilled without prior permission and without recording their locations with the District authorities. This also means that no one is held accountable when they fail or run dry.

Although individual agencies rehabilitated incinerators and organised the de-sludging of pit latrines, environmental sanitation, including all aspects of solid, liquid, hospital, and hazardous waste management – especially where CTC’s/CTU’s are concerned – needs to more consistently and coherently integrated into future cholera response planning.

**SOCIAL MOBILISATION**

<table>
<thead>
<tr>
<th>What worked well</th>
<th>What could be improved / Challenges remaining</th>
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<tbody>
<tr>
<td>• Existence of a Communications Plan (developed in September 2011)</td>
<td>• Piloting the use of mobile cash payments</td>
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<tr>
<td>• Timely distribution of funds to Western Area, Kambia, and Port Loko</td>
<td>• Health Education and Hygiene Promotion are two distinct approaches.</td>
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<tr>
<td>• Key messages were quickly available, coherent, regularly updated, and consistently</td>
<td>• ORS should only be used for cholera and other DDs</td>
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<td></td>
<td>• Social mobilisation activities should be</td>
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</table>
- Community mobilisation, especially by Blue Flag volunteers and SLRC volunteers
- Involvement of DHMTs in local radio discussions, feedback, and messaging
- Engagement of DHMTs in schools
- Complaints handling and feedback in some Districts, but not well coordinated
- Operationalisation of a toll-free number for cholera-related information
- Working with local partners
- Building on existing programmes, using the same communities and networks
- Sharing of information started early, even before the declaration of emergency
- Good use of diverse means of communication – inter-personal, mass media (radio and TV), social networks, posters
- Common understanding of what messages needed to go out, communities were able to receive the right messages at the right time; good quality control of messaging through coordination efforts
- Communities were receptive to the messages, willing to listen and practice behavior change
- Feedback from communities was listened to, taken seriously, and responded to (i.e. issues around burial of the dead)
- Use of Inter-Religious Council to sensitize their own communities, especially as the outbreak corresponded with Ramadan
- Social Mobilization response began very early
- Early hygiene promotion and social mobilisation response, with reviewed and updated key messages
- Use of ‘Story of Cholera’ video translated into local languages and regularly aired on national TV

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<tr>
<th>Overall achievements</th>
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<tbody>
<tr>
<td>Despite the lack of baselines, Knowledge, Attitudes and Practices (KAP) at individual, household and community levels as well as in schools were thought to have improved markedly during this response</td>
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<tr>
<td>Reduction in transmission rates</td>
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<tr>
<td>Improved reporting time to health facilities</td>
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140. Key messages developed during the AWD outbreak in Freetown were quickly adapted for cholera in February 2012 (Week 5) and were used as the basis for social mobilisation. Existing materials from WHO for cholera jingles on the radio were reproduced, and a cholera prevention flipchart/storyboard from UNICEF was used for training community volunteers in hygiene promotion.

141. The CHW materials discussed the treatment of drinking water using several alternative disinfection products as well as boiling; how to differentiate between everyday D&V and cholera among those arriving at primary health units (PHUs); making and administering ORS; and disinfecting homes, clothing, and dead bodies with chlorine bleach solutions.
142. Health authorities quickly advised the affected communities to boil their drinking water and bury human faeces, especially those of infants under one year of age – whose faeces are subject to particularly high concentrations of vibrio. Because the outbreak appeared to be spreading rapidly, and the initial case fatality rate was climbing, MoHS initially focused on five immediate priorities:

i. prevent deaths in health facilities by distributing treatment supplies – cholera kits consisting of water purification tablets, oral rehydration salts (ORS), and antibiotics – and provision of case management guidelines;

ii. prevent deaths in communities by supplying ORS sachets to homes, and urging people with ‘rice water diarrhoea’ to seek care promptly;

iii. prevent the spread of disease by promoting point-of-use water treatment with ‘aquatabs’, safe storage in the home, hand washing, and the burying of excreta;

iv. conduct field investigations to define risk factors with which to guide intervention strategies; and

v. establish a national cholera surveillance system to monitor the spread of the disease.

143. Beginning in mid-July, MoHS, with the support of key WASH NGOs, broadcast mass media messages by radio and TV, displayed banners, and sent text messages encouraging the population to boil drinking water and seek care quickly if they became ill. Early qualitative feedback from the NGOs and local health workers affirmed the level of confusion amongst the public about how to respond. As a result, priority messages were distilled down to five: 1) Drink only treated water; 2) Cook food thoroughly, especially seafood; 3) Wash hands, especially before eating, after defecating, and after handling infant faeces; 4) Seek care immediately for any diarrhoeal illness; and 5) Give ORS to anyone with diarrhoea. Posters and theatre groups provided graphic messages for those who could not read, and a TV spot using generic footage produced in Haiti and dubbed into Sierra Leone’s four main languages underlined these key messages.

“The people don’t think cholera is a disease.”

(District Medical Officer, 25 October 2012)

144. Volunteers, such as the Blue Flag Volunteers\(^{37}\) had their skills upgraded in subjects such as case detection, ORS preparation and distribution, referral mechanisms, and prevention measures, and went on to conduct sensitisation at household level, making sure that at risk households knew what to do to prevent and respond to cholera. Cholera kits consisting of a 4 gallon jerrycan or lidded bucket, ORS, soap, and aquatabs for bucket chlorination were distributed during these visits as were pictorial leaflets. These community volunteers were paid a daily stipend (“incentive”) of US$ 2 per day. They also re-visited the ten most immediate neighbours to remind them of key messages once a patient had been referred to a CTU.

145. Vulnerability assessment based on criteria set by local councillors – typically, poverty, disability, age, female-headed households, and number of children – identified households to which early sensitisation efforts were targeted.

146. It is not known to what extent real and lasting gains have been made in changing knowledge, attitudes, and practices at household level as pre-outbreak baselines are not available. However, the following is from a meta-analysis of NGO KAP surveys carried out by WASH Sub-Group partners in late October and is worth highlighting [see Annex B for fuller analysis]:

- Cholera knowledge is quite high – most HH know at least 2 key messages

\(^{37}\) These are volunteers living with the community trained to assist in dissemination of key hygiene messages, support national immunisation campaigns, and to mobilise communities in times of emergency.
- The biggest barriers to information were ability to read (39%) and lack of equipment (29%) or access to electricity (33%)
- People are knowledgeable on the signs, symptoms and results and consequences of cholera
- Most people have heard of ORS and SSS but only one third know the correct recipe for the latter
- Knowledge around cholera transmission via dead bodies and funerals is low
- The majority of people (80%) think they are drinking safe water but around only half of people are treating their water
- High levels of open defecation
OPTIONS & RECOMMENDATIONS

The recommendations that follow are in two parts: Operational recommendations to inform micro-planning of short-term transitional activities relevant to an 'inter-epidemic' period – increasing supplies of Rapid Diagnostic Tests, for example; and those that are more 'systems-based' and therefore designed to focus on national priorities for enhancing disease prevention and control measures over the longer term.

OPERATIONAL RECOMMENDATIONS

<table>
<thead>
<tr>
<th>COORDINATION</th>
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<tbody>
<tr>
<td>i. Identify specific areas for collaboration between Ministries of Health and Energy &amp; Water Supply</td>
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<tr>
<td>ii. Strengthen emergency response structures and teams within Districts</td>
</tr>
<tr>
<td>iii. Districts to hold monthly meetings with all WASH and Health partners together</td>
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<tr>
<td>iv. Partners should share their workplans with DHMTs and update them regularly depending on health outcomes and operational bottlenecks</td>
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<tr>
<td>v. Factor Cholera EPRP and costs into District annual planning cycle</td>
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<tr>
<td>vi. Donors should align their funding with GoSL priorities and then inform MoHS, and thence Districts, on who they have funded, to do what, where, and when</td>
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<tr>
<td>vii. Include technical guidance notes in NCPRP</td>
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<td>viii. DHMTs and WASH partners to develop joint operational plans</td>
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<th>DISEASE SURVEILLANCE</th>
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<tbody>
<tr>
<td>i. Print, and distribute check list on surveillance tools, methodologies, and protocols to DSOs</td>
</tr>
<tr>
<td>ii. Update the epidemiological profile of areas, considered at risk for cholera by mapping and monitoring of disease trends for early detection and response for outbreak</td>
</tr>
<tr>
<td>iii. Provide and maintain toll-free communication line (CUG) for PHU-level surveillance in all districts, and include community based disease surveillance</td>
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<tr>
<td>iv. Increase availability and utilisation of ORS at community level</td>
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<tr>
<td>v. Build capacity of health workers to be able to predict, detect and respond to epidemics</td>
</tr>
<tr>
<td>vi. Map capacities for surveillance (staffing levels, transportation/communication, maintenance facilities) and strengthen surveillance units in all Districts</td>
</tr>
<tr>
<td>vii. Provide epidemiological data disaggregated by age, gender, and location capable of providing raw datasets for vulnerability, number of cases, attack rates, incidence, case fatality ratios, population density, availability of safe water, access to healthcare, and bed availability</td>
</tr>
<tr>
<td>viii. Provide robust attack rate predictions no later than one week after any future localised outbreak</td>
</tr>
<tr>
<td>ix. Establish, train, and support District Rapid Response Teams (RRT), with initial focus on 'at risk' Districts (Pu Jehun, Kambia, Port Loko, and Western Area)</td>
</tr>
<tr>
<td>x. Maintain heightened disease surveillance capacity in most-at-risk Districts (Kambia, Port Loko, Pu Jehun, and Western Area) in order to provide timely early warning of new outbreaks</td>
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<tr>
<td>xi. Develop a long term surveillance strategy</td>
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<th>CASE MANAGEMENT</th>
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<tbody>
<tr>
<td>i. Offer periodic training to physicians and paramedical personnel for the clinical management of patients with acute watery diarrhoea</td>
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</table>
**SUPPLIES AND LOGISTICS**

- Distribute / share national guidelines for importation of drug and in-kind donations with all partners
- Define and share with all partners essential supplies (capital items as well as consumables) lists for CTCs, CTUs and ORPs
- Work with the private sector on local production of ORS and chlorine products
- Ensure linkages with Central Medical Stores monitoring systems
- Conduct quality assurance of imported health supplies
- Identify pre-qualified local suppliers for non-medical items
- Improve (secondary) delivery systems from CMS to DMSs, and onwards (tertiary) to staffed PHUs
- Pre-position supplies in ‘at-risk’ and hard-to-reach areas such as Bonthe and coastal areas of Kambia based on outbreak history (attack rate), population potentially exposed, and PHU capacity
- Map capacities for tertiary distribution
- Procure and distribute bulk chlorine (HTH) to District hospitals and PHUs
- Build capacity of DMOs and DHMTs in forecasting of required supplies, supply chain management, accountability and reporting, including thresholds for restocking
- Determine distribution plans (including necessary means and resources, routes and alternative routes and arrangements) as part of preparedness planning taking into account geographic characteristics and access.
- Integrate the distribution guidelines produced to the preparedness plan and the logistics plan

**WATER, SANITATION & HYGIENE (WASH)**

- Integrate activities with WASH in schools
- Include social marketing of chlorine (e.g chlorox and aquatabs) and ORS in transition strategies
- Focus Community-Led Total Sanitation efforts in known hotspots where access to safe water is limited (the so-called “WatSan Revolution”)
- Provide national policy on phasing out Sugar-Salt-Solution (SSS) in favour of Oral Rehydration Salts (ORS)
- Provide guidelines on water treatment at community (whether or not to conduct well chlorination, for example) and household level (specification of aquatabs and/or chlorox)
- Enhance environmental health and food safety by registration and licencing of food vendors, establishing hand washing stations in markets, making better provision for solid waste collection and disposal, regulating water sellers (with water quality testing)
- Provide hand washing facilities in targeted PHUs
- Train MoHS staff, including DSOs, on water quality monitoring using defined protocols for residual chlorine and biological contamination, and supply Pool Testers and Delagua kits (or equivalent) as appropriate
SOCIAL MOBILISATION

i. Engage youth groups for social mobilisation and sensitisation irrespective of outbreak occurrence
ii. Develop a social marketing strategy for ORS and chlorine
iii. Ensure key messages and the mechanisms by which they are promoted are saved for future use
iv. IEC messages to be used in video centres
v. Provide safe water and sanitation facilities to enhance behaviour change by communities
vi. Advocate for the introduction of hygiene promotion messages into the national school curriculum
vii. Increase sensitisation activities in all Districts, not just neighbouring Districts, as soon as a localised outbreak is declared
viii. Revise IEC materials to include reasons behind public health messaging (e.g. cause of cholera)
ix. Focus messaging on women and food vendors
x. Establish targets for behaviour change, including establishment of baselines and setting of indicators (for example on knowledge, attitudes and practices around hand washing with soap and household water treatment) against which progress can be measured, and ensure appropriate institutionalisation with the Health Education Division and UNICEF
xi. Train MoHS staff at District level on risk communications and health and hygiene promotion
xii. Establish ‘communication for development’ (C4D) within coordination structures at the national level, replicated at District level, for effective planning and implementation of behaviour change strategies

SYSTEMS RECOMMENDATIONS

148. A roadmap outlining the phasing of each of these recommendations, together with suggestions as to who is responsible, by when, with indicative budgets, is attached at Annex D.

RECOMMENDATION 1: Rationalise coordination architecture at National and District levels

i. Agree and implement a streamlined ‘Cholera Control & Command Centre’ (C4) coordination architecture
ii. Update the National Cholera Preparedness and Response Strategy (NCPRS) to include national standards and guidelines
iii. Develop a multi sectorial risk reduction strategy for cholera and other diseases of epidemic potential.
iv. Conduct Tri-Cluster coordination training for National and District C4 coordinators
v. Establish thresholds for declaration of an epidemic emergency
vi. Capacitate a National Information Management Unit

Recommendation 1.1
Agree and implement a streamlined ‘Cholera Control & Command Centre’ (C4) coordination architecture

149. The three levels of coordination instituted for the 2012 cholera response led to overlapping roles and a diffusion of accountability. For natural disasters such as disease epidemics, strategic and policy oversight would normally be exercised by the National Disaster Management Authority. Since no such authority yet exists in Sierra Leone – there is a Disaster Management Department within the Office of National Security – it is felt necessary to maintain the concept of a Presidential Task Force (PTF). This task force would meet quarterly to maintain oversight of all hazards risk reduction in the
country, and convene weekly specifically for cholera when and if another epidemic was to be declared. It is recommended that the PTF (Cholera) be chaired by the Minister of Health, with the Chief-of-Staff acting as Co-Chair. Its primary roles would be to ensure appropriate engagement of line ministries, provide policy guidance, maintain strategic oversight, and ensure coherent advocacy with donors and other stakeholders.

150. Only one level of coordination is required under the PTF’s executive authority to manage operational coordination of all aspects of the response, not two as was the case in this response. Accordingly, it is proposed that when an epidemic is declared the National Cholera Task Force – which continues to meet quarterly during inter-epidemic periods in order to monitor the situation – be absorbed into a single entity, the Cholera Control and Command Centre (C4). Preferably, this coordination body would be given a name that differentiates its new role from the old C4 model that preceded it.

151. Lessons learned from the 2010 cholera epidemic in Haiti demonstrate that a public health expert familiar with coordinating multi-sectoral responses is required to coordinate the response at national level. The same lesson applies to Sierra Leone. In epidemic situations, this position should be considered to be full-time for three months, commencing as soon as the pre-determined emergency threshold is exceeded [see Recommendation 1.v], with a further three months added, perhaps part-time, to coordinate the transition phase. It is recommended that the MoHS Chief Medical Officer chair the C4, with the Global Health Cluster supplying a coordinator at the request of WHO as soon as emergency thresholds are reached to act co-chair and to ensure that decisions made are carried out, and that operational responses are adapted according to evolving circumstances in line with the national response plan. The CMO may choose to delegate his or her role to the Director of the Directorate of Disease Prevention and Control. The CMO is accountable to the Minister of Health as Co-Chair of the Presidential Task Force, and would report weekly to him or her.

152. The C4 should comprise all relevant technical specialisms, including WASH components, as outlined in the organigram below. Its suggested roles and membership are outlined at Annex E. Ways of working and terms-of-reference for each position should be clarified and shared with all partners. Ideally, technical advisers and sub-group coordinators should be co-located, preferably within MoHS. Meetings are likely to be daily at first. It is important that C4 participation be limited to keep the process of decision-making manageable.

153. External epidemiological support via the C4 will continue to be necessary in time of crisis, but, ideally, oversight and analysis should be exercised by a staff member within MoHS-DDPC. It is suggested that MoHS consider the establishment of such a full-time position.

154. All organisations active in the response can, and should, engage in C4 technical working groups according to their particular capacities and competencies. All stakeholders should be invited to attend the C4 at least once per week in order to share information, and discuss and resolve issues of mutual concern.

155. The C4 also requires a dedicated information management resource [see next recommendation], of which disease surveillance data management is an integral part. This service could be built within the existing National Disaster Management Department, within Statistics Sierra Leone, or within MoHS, but would, in the event of the C4 being mobilised, be co-located within the C4. Such a unit is likely to require additional surge capacity in the form of GIS mappers, data entry staff, and a webmaster.
Coordination at District level mirrors that at national level, but requires less technical input in the form of case definitions and standardisation of supplies and messages as these are decided at national level for the sake of coherence. But it is at District level that micro-planning takes place and operations are de-duplicated, gaps filled, and case investigations launched, which is reflected in the organigram below. It is important that all actors involved in the response engage with this structure, and, at a minimum, provide information about their planned and ongoing activities.
Recommendation 1.2
Update the National Cholera Preparedness and Response Strategy (NCPRS) to include national standards and guidelines

157. The NCPRS needs to be updated in line with those recommendations made in this paper that are approved by GoSL, and taking into account the need to remain vigilant for sporadic outbreaks in the near term, and the need to transition to longer term development. The NCPRS should be drafted by a ‘technical oversight committee’ under terms of reference given by National Cholera Task Force (NCTF) as soon as possible, and then passed to Districts for adaptation based on local knowledge and known risk factors. This should be reviewed annually. The oversight committee should represent all those with a stake in improving health outcomes for all diseases of epidemic potential, including cholera, and, at a minimum, should include:

- MoHS (DDPC, CMS, Environmental Sanitation, Health Education, DPI, Directorate of Lab Services)
- MEWR
- WHO
- UNICEF
- Health and WASH INGOs x 2
- Red Cross (IFRC and SLRC)

158. A key component of these guidelines would set out the minimum standards of coordination and quality in cholera response operations, and outline the coordination and information management architecture to be employed. Application of lessons learned from the IASC’s Cluster Approach will be helpful in this endeavour.

159. One of the limitations of the C4 in the 2012 cholera response was the lack of a clear action plan to complement the national response strategy. This made it difficult to monitor what was going on in anything other than epidemiological terms, and identify constraints and challenges in a systematic way. The C4 should agree on a limited set of common indicators to enable such monitoring.

160. MoHS / WHO and the WASH-National Cholera Task Force (NCTF) have developed several guidance notes over the course of this outbreak. A collated document, updated annually, would be useful to guide health professionals and volunteers in all levels of response at national, District, Chiefdom, and Village level. It would also capture ‘best practices’ from the 2012 response in hard and soft formats so that templates don’t need to be reinvented.

161. Contents should cover:

- Introduction to Cholera in Sierra Leone and the region
- Worst case planning scenario and assumptions, including risk factors and likely transmission routes
- Phases of preparedness, response, and transition
- Triggers and Thresholds
- Intervention Strategy
  - Identification of High Risk Areas
  - Investigation and Confirmation
  - Prevention
  - Access to safe water
  - Access to improved sanitation
  - Community based approaches
  - Dealing with dead bodies
  - Standards and Indicators
  - Cross-cutting Issues
- Needs Assessment
- Response Actions
  - Coordination structures, roles, and responsibilities
- Case Management
- Disease Surveillance
- Laboratory Diagnostics
- Water
- Environmental Sanitation
- Social Mobilisation and Hygiene Promotion
- Food Safety
- Supplies
- Logistics
- Monitoring, Evaluation and Learning
- Guidelines and Tools
- Action Plan

Recommendation 1.3

Develop a multi-sectorial risk reduction strategy for cholera and other diarrheal diseases.

162. There is a need to invest in a consistent, comprehensive, and multi-sectorial approach on risk reduction and preparedness. The NCPRP is itself founded in the principles of disaster risk reduction, and should be integrated within the wider national disaster risk management plan as part of the transition to longer term development. However, in order to capitalise on investment gains made during the 2012 cholera response, and in order not to lose momentum while funds and partners remain operationally active, it is recommended that both it and a wider risk reduction strategy are developed in parallel. As with the NCPRS, initial drafting can be carried out by an ‘oversight committee’ mandated by the NCTF, and later adapted by District DHMTs on a District by District basis.

Recommendation 1.4

Conduct a Tri-Cluster coordination training for National and District C4 coordinators.

163. Although the Cluster Approach was not activated for the 2012 cholera response – nor, given the scale of the disaster and the views of those involved, did it need to be – it is clear that those involved in coordinating the response and national and District level would benefit from greater awareness of the principles and practices of coordination implicit in the approach. It is therefore recommended that the Global Health Cluster be requested to implement a form of Tri-Cluster (Health, WASH and Nutrition) training adapted for cholera responses no later than June 2013 as an integral part of national capacity building for disaster risk management. Participants would include staff from MoHS at national and District level, and national level staff from related line ministries such as Education, Energy & Water Resources, and the Office of National Security.

164. Normal functions of coordination by a multi-sectoral thematic group are:
- Ensure adequate contingency planning and preparedness
- Lead strategy development and planning
- Establish appropriate coordination mechanisms at National and District level
- Ensure rapid, effective, and coherent needs assessment and analysis
- Advocate for proportionate mobilisation of resources, and advise donors (and pooled funds such as CERF) on allocations according to defined funding criteria
- Ensure mainstreaming of priority cross-cutting issues such as age, gender, diversity, environment, and HIV-AIDS
- Ensure formulation and adherence to appropriate technical standards and policy guidelines
- Ensure adequate monitoring, reporting, and information management
- Lead training and capacity building of national partners, and ensure ‘best practices’, skills, and knowledge are transferred at the appropriate level, including to civil society
- Maintain links with relevant national and local authorities
Recommendation 1.5
Establish thresholds for declaration of an epidemic emergency

165. Whether or not cholera is endemic in Sierra Leone – a statement that needs to be clarified by GoSL – outbreaks occur at regular intervals against a backdrop of high prevalence of other diarrhoeal diseases. This makes it difficult to isolate cholera as the cause of an outbreak, especially when diagnosis relies on clinical observation and use of rapid diagnostic tests (RDTs) in the initial phase when access to a functioning national reference laboratory is limited. It also suggests that the WHO standard of one laboratory-confirmed case in a child over five years of age may not be the correct trigger for an outbreak declaration. MoHS should therefore work with WHO to establish the threshold above which an outbreak is to be confirmed on a District-by-District basis, and for an epidemic on a national basis. The same applies for declaring an outbreak over, as the standard of no cases reported for three times the incubation period (i.e. approximately one month) may not apply.

166. Oxfam’s guidelines for cholera outbreaks suggests that a case fatality rate of 1.0 or over, or an attack rate of 0.6 should prompt public health activities to move from awareness-raising mode to outbreak implementation. Since the average number of expected cases per month and per week for any given period and in any given District is now known in Sierra Leone, Oxfam also suggests that a doubling of this average indicates the risk of an outbreak.

167. Similarly, establishment of such thresholds in border regions of neighbouring countries should be enough to trigger proactive control measures in those Districts that border Guinea to the North and Liberia to the South.

168. Establishment of such thresholds should trigger an accelerated response, with external stakeholders such as donors and implementing partners not having to wait for a declaration of an emergency from the Presidential Task Force before diverting resources from ongoing programmes or mobilising additional resources. The normal impediments to announcement of a cholera epidemic – adverse effects on trade, investment and tourism – are not thought to apply to Sierra Leone.

Recommendation 1.6
Capacitate a National Information Management Unit

169. Disaster risk reduction efforts across multiple hazards requires management of information in real time, both for preparation of response measures in identified ‘at-risk’ areas, and to aid monitoring as the situation unfolds. With outbreaks of communicable diseases, especially diarrhoeal diseases, constituting one of the principal hazard risks in Sierra Leone – along with flash floods, riverine floods, and landslide – such a unit would prove invaluable in helping national and international stakeholders respond and adapt their responses more efficiently. It is therefore recommended that a dedicated full-time unit be established.

170. This unit would provide analysis and technical support for GIS mapping and web services to line ministries, and, for cholera responses, to the MoHS C4 as requested, and would be the repository of record for all disaster-related data management, including, for example, waterpoint maps produced by MEWR. It would also work in close cooperation with the National Statistical Office.

171. Epidemiological data on caseloads (disaggregated by gender and age), attack rates, and case fatality rates is only one part of the story when it comes to managing the types of information required for multi-sectoral responses to disease outbreaks. Crude (cumulative) figures also need to be supplied as rates on a weekly basis. Information is also needed on such aspects as:
- Who is doing what where, including capacity to cover needs
- Access to health services and safe water
- Population denominators and numerators, including density

38 Lamond and Kinyanjui. ‘Cholera Outbreak Guidelines: Preparedness, Prevention and Control.’ Oxfam, June 2012
- Administrative boundaries
- Commodity tracking of medical and non-medical supplies, and
- Humanitarian dashboard that measures fulfilment of the national cholera response action plan

172. For this and general coordination information to be available to stakeholders requires more than a ‘dropbox’ or ‘googlemail’ account which, as it expands, becomes progressively more difficult to navigate. It requires a dedicated web portal – preferably situated within the existing GoSL web architecture – which is moderated full-time while responses are ongoing. Such a site needs to provide the following in English and Krio, and at low bandwidth:
- Meeting schedules (including agenda’s and past meeting notes)
- Contact details (of coordination team members and partners at all levels)
- Library of relevant guidelines, technical best practices, and legal instruments
- Map atlas
- Bulletins and Updates
- Cholera Response Strategy
- Latest Situation Report (and history)
- Latest statistical analysis
- Bulletin Board for commercial suppliers (with a warning that this does not act as any sort of endorsement)
- Interactive discussion forum (including links to other social media)

173. Apart from the human resources needed to staff such a unit – information manager, data manager, GIS mapper, and webmaster – the unit would need to capacitated with the requisite hardware and software, including widescreen computers and plotters for volume map production up to A0 size. Skills transfer and management training in all these aspects is available from the IASC Inter-Cluster Working Group on Information Management, accessible via UN-OCHA.

**RECOMMENDATION 2: Upgrade disease surveillance systems**

i. Apply EpiSurveyor® and Epi-Info® (or similar)
ii. Build capacity for early case detection and response
iii. Ensure support for microbiological diagnostics in the National Public Health Reference Laboratory

Recommendation 2.1

**Apply EpiSurveyor and Epi-Info (or similar)**

174. Although considerable investment has been made during the 2012 response in use of mobile phone technology to report suspected cholera cases, an opportunity exists to apply ‘leapfrog’ technology to the comprehensive disease surveillance system. This technology allows captured line-list data to be geo-referenced, dated, and sent automatically (as soon as a connection becomes available) to a central node (in MoHS-DDPC) where it is automatically collated using a freeware application called Episurveyor. This information can be fed directly into Epi-Info software.

175. It is recognised that such an upgrade will require considerable investment in technology and skills upgrading, and will therefore take some time. In the meantime, it is recommended that Closed User Groups (CUGs) be maintained, paid for, and include District Medical Officers (DMOs).

176. Countries neighbouring cholera-affected areas are encouraged to strengthen disease surveillance and national preparedness to rapidly detect and respond to outbreaks should cholera spread across borders. Further, information should be provided to travellers and the border communities on the
potential risks and symptoms of cholera, together with precautions to avoid cholera, and what to do should it appear.

177. Accelerate implementation of the integrated disease surveillance strategy outlined in the National Health Sector Strategic Plan 2010-2015

**Recommendation 2.2**
**Build capacity for early case detection and response**

178. The cost-benefit relationship of primary prevention is optimal at the start of an epidemic. This means early detection of sporadic cases occurring during the inter-epidemic period is a high priority for stopping circulation of the vibrio, and preventing the start of a new epidemic.

179. Capacity to conduct field investigations of suspected outbreaks rapidly should be strengthened through training and mentoring of multi-disciplinary Rapid Response Teams in all districts, including in case management, community sensitisation, and water quality testing.

**Recommendation 2.3**
**Ensure support for microbiological diagnostics in the Central Public Health Reference Laboratory**

180. Following extensive training in diagnostics and specimen collection in September (Weeks 35-38) by the ‘Bangladeshi Doctors’ (ICDDR,B), WHO’s Global Outbreak Alert Response Network (GOARN) put out a second international request for assistance to further develop capacity in the Central Public Health Reference Laboratory (CPHRL). This was provided jointly by the US Centres for Disease Control and Prevention (CDC) and the UK’s Health Protection Agency (HPA). Reinforcing and sustaining laboratory activities still requires external support for technical follow-up, quality assurance, and supplies so that laboratory results are accurate and reliable.

181. It is recommended that the conclusions of the joint ‘Final Bacteriology Report’ published by WHO, MoHS, CDC and HPA be implemented in full as soon as possible, with particular emphasis on:
   - Improving frequency and quality of sample collection and transport between districts and CPHRL
   - Continuation of reporting of results
   - Establishment of a more reliable electrical supply, especially maintenance of constant refrigeration (4 – 8°C) and incubation (36 – 38°C) temperatures
   - Implementation of procurement process and stock supply system
   - Dedication of at least one additional full-time staff member to bacteriology
   - Vaccination of exposed laboratory staff
   - Maintenance of linkages, including monthly conference calls, between WHO, MoHS, CPHRL, CDC, and HPA for mentoring and problem-solving

**RECOMMENDATION 3: Strengthen supply chain management**

vi. Establish buffer stocks of chlorine (HTH), cholera kits, drugs, and consumables in ‘at risk’ Districts, with a national reserve held in the MoHS Central Medical Stores (CMS)
vii. Review supply chain management procedures for reporting, ordering of stocks by health facilities, and distribution
viii. Require imported medical and cholera-related non-medical supplies to be inventoried and quality controlled (at least for time expiry and labelling) at MoHS-CMS prior to secondary distribution to Districts
ix. Consider use of military logistics assets for short-term distribution of cholera supplies
x. Include a logistician in the C4
Recommendation 3.1
Establish buffer stocks of chlorine (HTH and Aquatabs), cholera kits, drugs, and consumables in ‘at risk’ Districts, with a national reserve held in the MoHS Central Medical Stores (CMS)

182. Moving cholera-related supplies at the scale and speed required to control an outbreak is expensive. It is more efficient and cost-effective to invest in preparedness by investing in pre-positioning essential medical and WASH supplies in those areas deemed most at risk of future outbreaks. It is recommended that consideration be given to specifying standard modules for use at PHUs, ORPs, CTUs, and CTCs based on known risk factors, population profiles, and historical attack rates, and these supplies are procured and pre-positioned in District Medical Stores, with a national reserve capable of responding to excess needs for 4,000 cases.

183. Define medical supply needs for cholera per District per month (for three months) and define, create and pre-position a buffer stock of essential emergency supplies, especially oral rehydration salts (ORS), IV fluids, RDTs, and appropriate antibiotics at central and District levels

Recommendation 3.2
Review supply chain management procedures for reporting, ordering of stocks by health facilities, and distribution

184. The current supply system both responds to demand (pull) and proactively forecasts and organises regular distributions based on pre-determined needs (push), but lacks accountability in as much that systematic tracking of commodities through the pipeline to end-user facilities does not happen. Focusing on supply chain management is critical to ensuring maintenance of tenuous stocks of ORS, drugs and consumables at central and district level. It is suggested that a supply chain system similar to that put in place in Haiti for the cholera response is supported. This system is called PROMESS (Programme on Essential Medicine and Supplies) and ensures distribution of supplies in terms of quality, quantity and timeliness. Such a system not only expedites the distribution of medicines and equipment for CTC’s in clinics and hospitals, and to PHUs, but also assures distribution according to need rather than just where partners are located and builds local capacity to effectively manage the supply chain for the health system in the future.

185. A regular and comprehensive supply-driven system is based on forecast needs according to known risk factors and previous caseload history. For this to happen, the revised NCPRP will need to define a standard supplies list per population of 10,000 based on optimal rates of consumption. The present supply chain management system needs to be reviewed so that secondary and tertiary distribution is rendered efficient, accountable, and appropriate to need.

186. It may be timely to revisit the supply management system (for emergencies) and the appropriateness of the software involved. Certainly, central coordination of the supplies management system, including non-medical supplies (i.e. WASH) is required including the building of capacity of DMOs and DHMTs in forecasting of required supplies, supply chain management, accountability and reporting, including thresholds for restocking. It is therefore recommended that a logistician – perhaps from the WFP-led logistics cluster – coordinate the entire logistic chain management of the cholera response, and identify a person responsible for logistics and secondary distribution at district level.

187. Set up a logistics working group within the Cholera Task Force

Recommendation 3.3
Require imported medical and cholera-related non-medical supplies to be inventoried and quality controlled (at least for time expiry and labelling) at MoHS-CMS prior to secondary distribution to Districts

188. The success of the PROMESS supply chain management system used for the cholera response in Haiti mentioned above relied on all donated and government-procured supplies being inventoried and quality controlled centrally prior to their secondary distribution. This applied to all imports from the
private sector, including from NGOs, who were then free to complete distributions according to their own work plans. Given that it was not possible in the 2012 Sierra Leone response to track who had distributed what, where, and when because direct distribution to beneficiaries was allowed, and many organisations failed to properly inform national and District health authorities of their distributions, it is recommended that such a system be considered in Sierra Leone.

189. Local procurement will necessitate the signing of MoUs with pre-qualified suppliers, and unit costs reviewed and mutually agreed at least annually.

Recommendation 3.4
Consider use of military logistics assets for short-term distribution of cholera supplies

190. Limitations on the availability of 4x4 vehicles for tertiary distribution to peripheral health units – mostly on account of lack of fuel and maintenance – was a major constraint on effective and timely delivery. As experience in Niger, Chad, Liberia and Zimbabwe has shown, it is not unusual in such circumstances to use domestic military assets to make up the shortfall for limited periods of time, and this option should be considered within national plans for (cholera) risk reduction. However, as the experience of Haiti’s 2010 cholera response makes clear, use of military assets should only be considered when all other ‘civilian’ options have been exhausted.

Recommendation 3.5
Include a logistician in the C4

191. In the absence of an equivalent to the Logistics Cluster, the C4 would benefit from having a dedicated logistician to coordinate the entire logistic supply chain, including oversight of secondary and tertiary distribution at District level in close cooperation with the Central Medical Stores.

RECOMMENDATION 4: Capitalise on investment gains in case management, environmental sanitation, and health and hygiene promotion

i. Continue training in case management
ii. Continue participatory behaviour and social change efforts in environmental sanitation, and health and hygiene promotion
iii. Fully integrate WASH aspects in all levels of response planning and implementation

Recommendation 4.1
Continue training in case management

192. Perhaps the biggest continuing challenge facing health authorities in Sierra Leone is how to sustain cholera treatment and prevention activities with limited resources. Cholera training for doctors, nurses, and CHWs should be added to the clinical curricula.

Recommendation 4.2
Continue participatory behaviour and social change efforts in environmental sanitation, and health and hygiene promotion

193. Encouraging and empowering urban and rural household across the country to disinfect and protect water supplies in the home, as well as in schools and health centres, by using chlorine products has
been effective in many African countries\textsuperscript{39}, and is a practical interim solution for Sierra Leone pending construction and rehabilitation of piped water systems.

194. Cholera messaging needs to be focussed on signs and symptoms and that rapid re-hydration and care seeking saves lives. And as far as prevention goes, cholera needs to be treated as part of a long term Health - WASH / communications strategy. In the interim, safe water and hand washing practices should be integrated into household and community settings\textsuperscript{40}.

195. Develop and pursue strategies to ensure that all populations have access to improved sanitation and the provision of safe drinking water; construct sanitary systems for human and hazardous waste disposal suitable to the local conditions; and emphasise safe disposal of human excreta through health education\textsuperscript{41}.

196. Strengthen national and District level capacity in planning and implementing behaviour change strategies for health and hygiene promotion, especially as it requires active coordination and engagement between Health and WASH.

197. Promote community distribution and utilization of Oral Rehydration Salts

**Recommendation 4.3**

**Fully integrate WASH aspects in all levels of response planning**

198. The Ministries of Health and Sanitation (MoHS), Energy and Water Resources (MEWR) and Ministry of Local Government should facilitate provision of safe water supply and sanitation in the districts.

199. The Ministries of Energy and Water resources (MEWR) and Ministry of Local Government should designate a focal point for the National Cholera Task Force. It is therefore recommended that MEWR and Ministry of Local Government embed a senior representative in the National C4, that District Councils co-chair coordination meetings at District level, and that the Sierra Leone Red Cross be fully involved in community mobilisation efforts.

200. Environmental sanitation, including all aspects of solid, liquid, hospital, and hazardous waste management – especially where CTC’s/CTU’s are concerned – needs to more consistently and coherently integrated into future cholera response planning.

**RECOMMENDATION 5: Ensure timely and predictable funding for emergency responses**

i. Establish a national emergency response (revolving) contingency fund

ii. Specify to donors that disbursement is not dependent on a formal declaration of emergency


\textsuperscript{40}Cravioto \textit{et al}. ‘Final report of the independent panel of experts on the cholera outbreak in Haiti.’ 4\textsuperscript{th} May 2011 [http://www.un.org/News/dh/infocus/haiti/UN-cholera-report-final.pdf]

Recommendation 5.1
Establish a national emergency response (revolving) contingency fund

201. The cost of the 2012 cholera response was approximately US$ 12.3 million. It is recommended that the GoSL now set aside 10% of this amount as a central contingency reserve to be called forward in tranches as appropriate on the signature of the Minister of Health for expediting local procurement of cholera-related supplies as soon as an outbreak is confirmed. Following the earthquake of 2005 in Pakistan, just such a fund was established called the ‘President’s Relief Fund’. Such a fund is at the disposal of the Presidential Task Force, and may be requested by the Minister of Health and/or Chief of Staff as co-chairs for any cholera preparedness and response actions recommended by the C4. It may be possible to persuade donors to match this fund on a 50:50 basis. This fund could also be used for the procurement and pre-positioning of cholera drugs, consumables, and cholera kits for household level water treatment and hygiene.

Recommendation 5.2
Specify to donors that disbursement is not dependent on a formal declaration of emergency

202. Most definitions of what constitutes a disaster include a clause to the effect that events are on such a scale that local capacities have been overwhelmed. For example, UN-OCHA defines a disaster as “A serious disruption to the functioning of society, causing widespread human, material, or environmental losses which exceed the ability of society to cope using its own resources.”

203. But, how do aid agencies know when government capacity has been overwhelmed? And how can a government judge whether its capacity is sufficient in a given crisis, or whether it needs to declare an emergency or appeal for international assistance, especially when there is a debate about whether a cholera outbreak constitutes a ‘disaster’ or not?

204. The other half of the equation concerns international donors. International relief can only be activated in response to a formal request for assistance from the affected government. But governments, while quick to declare an ‘outbreak’, often hesitate to declare an emergency, far less issue an appeal for external assistance. This is especially the case for cholera epidemics, where government reluctance is based on concerns over the potential negative effects on trade, investment and tourism, and the possible political implications, not least because cholera evokes such fear in the general population, all of whom may be potentially exposed.

205. There needs to be a more sensitive way for governments to be able to request international assistance without raising such spectres. Donors need triggers for providing assistance – whether via national or international channels – in the absence of a formal declaration of emergency by the government. When it comes to diseases of epidemic potential, formulation of such thresholds in epidemiological terms of, say, attack rates, case fatality rates, or numbers of laboratory-confirmed cases is perfectly feasible. Obfuscation over this issue delayed the scaling up of humanitarian response to Sierra Leone’s 2012 cholera epidemic for too long.

206. IFRC has suggested a more flexible model, whereby governments make a general statement about welcoming international assistance without formally declaring an emergency, while retaining the right to decide on what terms such assistance is made. This is the approach most commonly found in the disaster-affected countries of the Asia-Pacific region. These terms – which would likely include deciding which organisations should participate in the response, and where, and possibly linking legal arrangements to registration, visa issuance, quality control (qualifications of staff, and sample testing of incoming relief items), temporary suspension of duties for imported in-kind donations, requirements to share programme information, and insisting that donors disburse only to those conforming to the
national (cholera preparedness and response) strategy – can be found in the IFRC’s IDRL guidelines\(^{42}\).

**CONCLUSION**

207. Lessons learned invariably end up as being lessons un-learned unless they are realistic and doable in the context of capacity in Sierra Leone; owned by all stakeholders who have been given the opportunity to engage in formulation of preparedness and response planning; supported at the highest level within government; and transitioned into longer-term risk reduction activities.

208. The risk exists that gains must thus far in promoting behaviour change in communities and increasing quality of care in health facilities will lose momentum and, over time, will even reverse.

209. It is therefore recommended that MoHS incorporate those lessons learned outlined here into a revised National Cholera Preparedness and Response Plan which guides both technical and management staff on their roles and responsibilities, including actions to be taken before the outbreak season occurs.

210. At the same time, if GoSL is serious about eliminating the risk posed to the public’s health by cholera and other diseases of epidemic potential, then water and sanitation development issues need to be taken seriously as a - or even the - priority development issue\(^{43}\). Global experience with cholera suggests that the epidemic in Sierra Leone could cycle every other year or so at similar levels to that seen in 2012. Conditions that permit water-borne transmission, especially during the rainy season (July-November), persist. Improving knowledge, attitudes and practices can only go so far when improving Sierra Leone’s water and sanitation infrastructure is critical to achieving the same profound health gains brought by improving water and sanitation infrastructure elsewhere in the world\(^{44}\).

211. The World Health Organization (WHO) meanwhile estimates that meeting the global Millenium Development Goals (MDGs) for improving access to safe water and improved sanitation demonstrates a huge return on investment worldwide. For each $1 invested, the economic rate of return in regained time at work, school, and at home by not hauling water, increased productivity, and reduced health costs would be as much as $8, in addition to the direct health benefits in terms of death or disability-adjusted-life-years (DALYs) averted\(^{45}\).

212. International agencies should more systematically assess state capacities, invest more in joint contingency, preparedness and response planning with government, and link better with the disaster risk reduction agenda. Over the medium term, the trend will be to move from delivering aid in ways that substitute for the state, to supporting the government to meet its own responsibilities while filling gaps in response until such time as the state has the capacity to do so.

213. The onus for change, however, is not just on the international aid agencies. In order to meet their responsibilities to assist and protect their citizens in times of disaster, and fulfill their commitments made under the Hyogo framework and embodied in international humanitarian and human rights law, the government needs to invest more in their capacity to manage disaster risk. This is not only economic good sense, but can also be politically popular.

\(^{42}\) ‘Guidelines for the domestic facilitation and regulation of international disaster relief and recovery assistance.’ International Federation of Red Cross and Red Crescent Societies, Geneva, 2011 [www.ifrc.org/idrl]

\(^{43}\) Such investment would also help in controlling outbreaks, not just water-borne diseases, but of other communicable diseases such as haemorrhagic fevers and H1N1 / H5N1 influenzas

\(^{44}\) Sepulveda et al. ‘Improvement of child survival in Mexico.’ The Lancet Vol.368, 2006

\(^{45}\) UNDP. ‘Human Development Report, 2011’
214. Bearing in mind that over-regulation can lead to unnecessary bureaucratic bottlenecks which slow the entry and distribution of relief, while under-regulation allows for poor quality and uncoordinated relief efforts, governments are encouraged to adopt the comprehensive legal, policy, and institutional frameworks and planning guidelines for disaster prevention, mitigation, preparedness, relief, and recovery efforts laid out in the Red Cross/Red Crescent’s IDRL guidelines.

215. For the government of Sierra Leone, where disease epidemics rank alongside the other natural hazards of flood and landslide, the first essential step is to produce and ratify National Guidelines for Cholera Preparedness and Response. A key component of these guidelines would set out the minimum standards of coordination and quality in cholera response operations, and outline the coordination and information management architecture to be employed.

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46 The International Federation of Red Cross and Red Crescent Societies’ (IFRC) International Disaster Response Laws, Rules, and Principles Programme (IDRL) seeks to reduce human vulnerability by promoting legal preparedness for disasters through advocacy, technical assistance, training, and research. IDRL guidelines can be found at www.ifrc.org/idrl
ANNEX A

Ministry of Health and Sanitation
Directorate of Disease Prevention and Control

Cholera Response: Real Time Review of Lessons Learned
Terms of Reference, Analytic Framework, Self-Assessment Tool

Introduction
Under The Ministry of Health and Sanitation (MOHS), the National Cholera Task Force intends to update the National Strategic Cholera Preparedness and Response Plan in light of lessons learned from the ongoing response.

At the same time, national and international partners who have been active in the response will also benefit from these ‘lessons learned’ as they revise and adjust their response – and, in some cases, exit – strategies.

These TORs outline how the process of ‘lessons learning’ is to be managed and made coherent using a self-assessment tool that reflects a common analytic framework. To this end, the process is outlined below.

The ‘lessons learning’ process will take the form of a ‘real-time’ review pending a wider and more comprehensive ‘Cholera Response Evaluation’ (including impact), likely to be conducted under the auspices of WHO and MOHS in the 1st Quarter of 2013.

It is important to emphasise that such a review in no way implies that the outbreak is over, hence use of the term ‘real time’.

Purpose
To strengthen the MOHS-led preparedness and response planning for potential outbreaks of cholera and other diarrhoeal diseases of epidemic potential in Sierra Leone.

Objectives
1. To identify lessons learned from the ongoing cholera response, and make recommendations on how to capitalise on investment gains made thus far and mitigate gaps in response, both in the short term (until end 2012), and medium term (until end 2013)
2. To provide inputs to a joint operational action plan that will inform partner exit strategies and feed into the National Cholera Response and Preparedness Plan, and ultimately the National Disaster Risk Management Plan

3. To strengthen coordination of the preparedness and response to cholera (and other diarrhoeal diseases of epidemic potential) at national and district levels

**Process**

Workshops are planned for the month of October by designated Thematic Working Groups, with the larger national level lessons learning discussion to be led by DDPC during the first week November. This will be followed by revising the national cholera preparedness plan in mid-November (continuing through December), and then the roll-out to District level in January-February 2013.

The process will be led by MOHS-Directorate of Disease Prevention and Control (DDPC), with oversight provided by a review team consisting of:

- Director DDPC
- Humanitarian Adviser, Presidential Task Force
- WHO
- UNICEF
- 1 x International NGO (to cover Health, and WASH aspects, to be selected by the NGO community)
- Red Cross Red Crescent Movement
- Ministry of Energy and Water Resources

Each technical sector of response will lead its own review process, under guidance of the relevant Thematic Working Group coordinators at the national level

- Water, Sanitation, Health & Hygiene Promotion
- Social Mobilisation
- Urban WASH
- Epidemiology & Information Management
- Case Management & Logistics
- Coordination & Leadership

Each District will lead its own review of all sectors at the District level

A national plenary workshop is provisionally scheduled for 6th November in Freetown, to be facilitated by MOHS with support of WHO and Unicef. At this workshop, each Technical and District Review Team will present a summary of their findings and recommendations for further discussion in plenary. Working groups will then translate these recommendations into priorities for action in two phases: 1) Until end 2012, and 2) For 2013

**Outputs**

DDPC will provide a collated draft lessons learned document based on outputs of the plenary workshop for editing by the Review Panel outlining the adequacy of the response as a whole, outcomes for the affected population, and recommendations for post-cholera transition planning, specifically:

- What worked well (process)
- What worked less well (process)
- Achievements & Outcomes
- Outstanding challenges
- Recommendations for future national cholera response planning, including identification of priority areas that capitalise on investment gains already made

**Methodology**

- Key informant interviews to be conducted by the Humanitarian Adviser
- Technical ‘lessons learned’ workshops/focus group discussions (as above)
- Plenary workshop (one day)
**Timeline**

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>WEEK (2012)</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree deliverables and approach with GoSL (CoS)</td>
<td>1 Oct</td>
<td>Election Period</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Define and agree analytic framework</td>
<td>8 Oct</td>
<td>Discuss internally first, then inform BHC</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conduct Key Informant interviews</td>
<td>15 Oct</td>
<td>Agree TORs, Tools &amp; Guidelines</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sectors conduct technical reviews</td>
<td>22 Oct</td>
<td>Coincides with RRF Review</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lessons Learned Workshop</td>
<td>29 Oct</td>
<td>One Day</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Draft Lessons Learned Doc</td>
<td>5 Nov</td>
<td>With review panel</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revise National Cholera Emergency Preparedness &amp; Response Plan</td>
<td>12 Nov</td>
<td>In close cooperation with Nat Disaster Management Dept.</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support District level response planning</td>
<td>19 Nov</td>
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</tr>
</tbody>
</table>

**Analytic Framework**

<table>
<thead>
<tr>
<th>COORDINATION, LEADERSHIP AND RESPONSE</th>
<th>Question Areas (If so, why? If not, why not?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topics to be covered</td>
<td></td>
</tr>
<tr>
<td>Mechanism</td>
<td>Was the coordination architecture logical, clear, appropriate, and established in a timely manner?</td>
</tr>
<tr>
<td>GoSL ownership</td>
<td>Was the (national and international) humanitarian community slow to respond?</td>
</tr>
<tr>
<td>Cross-border</td>
<td>Was coordination among stakeholders effective in identifying gaps, and enhancing strategic prioritisation and timeliness?</td>
</tr>
<tr>
<td>International engagement (including UN)</td>
<td>Were treatment centres located in the right places? Were they adequately staffed and equipped? Was safe water available?</td>
</tr>
<tr>
<td>Good Humanitarian Donorship</td>
<td>Were vulnerability and risk maps available?</td>
</tr>
<tr>
<td>Timeliness</td>
<td>Was the coordination system supported by an efficient communications and information management system (at District level and below, and between Districts and the Capital)?</td>
</tr>
<tr>
<td>Prioritisation</td>
<td>Was data and information used to inform decision-making?</td>
</tr>
<tr>
<td>Multi-sectoral integration</td>
<td>Which systems were put in place to monitor, report, and evaluate the efficiency and effectiveness of the overall response?</td>
</tr>
<tr>
<td>Information Management</td>
<td></td>
</tr>
<tr>
<td>Needs Assessment</td>
<td></td>
</tr>
<tr>
<td>Vulnerability &amp; Gap Analysis</td>
<td></td>
</tr>
<tr>
<td>Resource Mobilisation</td>
<td></td>
</tr>
<tr>
<td>Decentralisation</td>
<td></td>
</tr>
<tr>
<td>Relevance</td>
<td></td>
</tr>
<tr>
<td>Advocacy</td>
<td></td>
</tr>
<tr>
<td>Flexibility of response</td>
<td></td>
</tr>
<tr>
<td>Preparedness</td>
<td></td>
</tr>
<tr>
<td>Strategic and Operational Planning</td>
<td></td>
</tr>
</tbody>
</table>
Were cross-cutting issues (HIV-AIDS, Age, Disability, Environment) appropriately integrated into the response?
- Did donors respond quickly and appropriately?
- Were external scientific experts and institutions contacted? If so, how did they respond?
- Were contingency plans available, were they applied, and were the scenarios valid?
- Was the ‘surge’ of incoming international staff appropriate?
- Were relevant, inclusive and appropriate strategic and response plans developed based on assessed needs?
- Was the response appropriately targeted? Did interventions take account of the needs of different vulnerable groups. Did it meet the needs of beneficiaries?
- Were activities and resources prioritised according to the most urgent needs?

<table>
<thead>
<tr>
<th>What worked well</th>
<th>What could be improved / Challenges remaining</th>
</tr>
</thead>
</table>

**Overall achievements**

**General recommendations for improved preparedness and response**

<table>
<thead>
<tr>
<th>Priority Actions</th>
<th>By who</th>
<th>By when</th>
<th>Additional resources required</th>
</tr>
</thead>
</table>

**CASE MANAGEMENT & LOGISTICS**

**Topics to be covered**
- Standards, Protocols and Guidelines
- Training and Strengthening of national capacity
- Patient Management
- Referral
- Confirmation and Sample Chain
- Hygiene in CTCs
- Logistics
- Management of dead bodies

**Question Areas (If so, why? If not, why not?)**
- Was the supply chain (item tracking, cool chain, vehicles, warehousing etc) function well? Did it respond to requests quickly and accurately?
- Were medical supplies and non-food items pre-positioned?
- Were clinical resources (skill-sets of health professionals and treatment resources) adequate?
- Were customs procedures known, transparent and used properly?
- Was local and international procurement efficient?
- Were guidelines for donations available and respected?

<table>
<thead>
<tr>
<th>What worked well</th>
<th>What could be improved / Challenges remaining</th>
</tr>
</thead>
</table>

**Overall achievements**

**General Recommendations for improved response**
### DISEASE SURVEILLANCE

<table>
<thead>
<tr>
<th>Topics to be covered</th>
<th>Question Areas (If so, why? If not, why not?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outbreak Detection &amp; Early Warning</td>
<td>Were national and regional early warning linkages made beforehand?</td>
</tr>
<tr>
<td>Appropriate targeting</td>
<td>Was ‘early warning’ heeded in an appropriate and timely manner?</td>
</tr>
<tr>
<td>Epidemiology</td>
<td>Were triggers and thresholds appropriate, and were they heeded?</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Was there under-reporting? If so, why?</td>
</tr>
<tr>
<td>Data management</td>
<td>Was the national reference laboratory able to provide timely confirmation?</td>
</tr>
<tr>
<td>Laboratory services</td>
<td>Was the sample chain robust?</td>
</tr>
<tr>
<td></td>
<td>Was data collected rapidly, and did it reflect the true picture?</td>
</tr>
<tr>
<td></td>
<td>Were ‘hotspots’ identified, and was appropriate action taken if they were?</td>
</tr>
<tr>
<td></td>
<td>Were initial caseload projections based on previous incidence? Was this data reliable?</td>
</tr>
</tbody>
</table>

**What worked well**

**What could be improved / Challenges remaining**

**Overall achievements**

**General recommendations for improved preparedness and response**

<table>
<thead>
<tr>
<th>Priority Actions</th>
<th>By who</th>
<th>By when</th>
<th>Additional resources required</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### WATER, SANITATION & HYGIENE (WASH)

<table>
<thead>
<tr>
<th>Topics to be covered</th>
<th>Question Areas (If so, why? If not, why not?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe water supply</td>
<td>Were WASH interventions integrated into the overall response appropriately and proportionately?</td>
</tr>
<tr>
<td>Water quality control</td>
<td>Were all technical areas covered, and were they guided by a clear set of standards and tools?</td>
</tr>
<tr>
<td>Food safety</td>
<td>To what extent were WASH partners able to transfer skills and build local capacities</td>
</tr>
<tr>
<td>Environmental Sanitation</td>
<td></td>
</tr>
<tr>
<td>Urban aspects</td>
<td></td>
</tr>
</tbody>
</table>

**What worked well**

**What could be improved / Challenges remaining**

**Overall achievements**

**General recommendations for improved preparedness and response**

<table>
<thead>
<tr>
<th>Priority Actions</th>
<th>By who</th>
<th>By when</th>
<th>Additional resources required</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## SOCIAL MOBILISATION & HEALTH EDUCATION

<table>
<thead>
<tr>
<th>Topics to be covered</th>
<th>Question Areas (If so, why? If not, why not?)</th>
</tr>
</thead>
</table>
| - Community Volunteers  
- Inclusivity  
- Risk communication  
- Health and Hygiene promotion | - Were education materials appropriate, timely, and diffused through the correct media?  
- Did outreach and education programmes build on existing programmes e.g in schools?  
- Did such programmes improve awareness and result in better practices at household level?  
- Were those potentially exposed included in the design of the local response?  
- Was a mechanism in place by which communities or individuals could feedback their praise and/or frustrations?  
- Have national and local capacities been strengthened, and partnerships with civil society organisations been built. |

What worked well  
What could be improved / Challenges remaining

### Overall achievements

### General recommendations for improved preparedness and response

<table>
<thead>
<tr>
<th>Priority Actions</th>
<th>By who</th>
<th>By when</th>
<th>Additional resources required</th>
</tr>
</thead>
</table>

**Guidance on how to undertake the self-assessment**

The analytic framework outlined above is incorporated into a self-assessment tool. This provides a checklist of topics/issues to be covered and indicative questions based on common international standards for disaster preparedness and response (Guidance Note of the Inter-Agency Standing Committee47 Task Force on Natural Disasters) and made relevant for the cholera response in Sierra Leone.

Each District – either through the C4 or the DHMT – is asked to convene all stakeholders who played an active role in the response (International NGOs and their national NGO and community based partners, the private sector, the Red Cross as well as MOHS health professionals) to discuss the areas outlined in the tool above. It is strongly suggested that the self-assessment is conducted in a collective and constructive manner – perhaps following a regular weekly coordination meeting – in order to ensure ownership and continuation of the process under MOHS leadership going forward. Such a discussion group is likely to take no more than 4 hours.

The sequence and number of questions implies no particular priority, and issues are likely to emerge which may result in more emphasis being given to one area than another.

It is expected that each thematic and district group will appoint a reporter to fill in the boxes above. Lengthy texts are not required; what is required is a bullet point summary of the key points arising. A few paragraphs may, however, be needed to explain the extent to which the response thus far has been

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47 The IASC provides a broad representation of today’s composite humanitarian world, and is made up of UN Agencies, the three main International NGO groups (ICVA, InterAction, SCHR), The World Bank, IOM, and The Red Cross (ICRC and IFRC)
effective in delivering against its targets (as measured by outputs) and to what extent these outputs have resulted in outcomes or achievements.

These completed text boxes are to be forwarded electronically to the Director DDPC (amarajambai@yahoo.com) with copy to the humanitarian adviser (james@shepherd-barron.com) no later than 3rd November 2012.

Those DMOs/CMOs attending the plenary workshop on 6th November (date to be confirmed) will be expected to make a 15 minute (maximum) presentation on their group’s findings and recommendations.
ANNEX B
WASH AND SOCIAL MOBILIZATION SUB-COMMITTEE MEETING

Sub-group on shared KAP findings and recommendations

23/10/2012 – Health Education Division

Attendees
Amie Koroma, Save the Children
Sammy Chagar, Oxfam
Sharon Reader, British Red Cross
Raymond Alpha, Sierra Leone Red Cross Society
Prof. Misse Misse, Unicef
Erwin Kamara, Ministry of Health

Overview
This sub group was tasked with drawing conclusions from the various KAP, baseline and rapid assessment surveys conducted by the different partners working on the cholera response in Sierra Leone, identifying shared findings and any key differences. Based on these conclusions, the sub group will provide recommendations on the way forward for social mobilisation and behaviour change communications activities in Sierra Leone.

Available Data
The conclusions below have been drawn from the results of the following KAP, baseline and monitoring surveys:

<table>
<thead>
<tr>
<th>ORGANISATION</th>
<th>SURVEY TYPE</th>
<th>LOCATION</th>
<th>NUMBER OF HH/PEOPLE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFRC</td>
<td>KAP</td>
<td>Bombali and Tonkolili</td>
<td>405 HH</td>
<td>Sept</td>
</tr>
<tr>
<td>British Red Cross</td>
<td>Ongoing monitoring (mobile cinema)</td>
<td>Bombali, Tonkolili, Port Loko, Kambia, Western Area rural</td>
<td>120 people</td>
<td>Aug-Oct</td>
</tr>
<tr>
<td>Oxfam</td>
<td>KAP</td>
<td>Tonkolili</td>
<td>303 HH</td>
<td>Sept</td>
</tr>
<tr>
<td>Concern</td>
<td>Baseline</td>
<td>Freetown</td>
<td>415 HH</td>
<td>Sept</td>
</tr>
<tr>
<td>CDC</td>
<td>Case control study</td>
<td>Freetown</td>
<td>144 people</td>
<td>Sept</td>
</tr>
<tr>
<td>ACF</td>
<td>Minimal KAP</td>
<td>Freetown</td>
<td>106 HH</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

Water
- The majority of people (80%) think they are drinking safe water but around only half of people are treating their water. Concern’s data showed that 40% of respondents believe their water was safe because it looks clean and 45% don’t think you have to treat water. In addition many were observed to take water from unprotected sources or are not cleaning their containers regularly.
- The CDC study also found that drinking untreated or unsafe water led to a significant increased risk of cholera.
- We conclude that the population may not fully understand what makes water ‘safe’ to drink – they may be drinking water they think is safe, but is not.
- Confusion was caused over the different sizes of aquatabs.

Sanitation
- High numbers (av. 90%) of people report using a latrine. However, there was high evidence of open defecation and not all families had access to a latrine. The Concern and CDC data from Freetown indicated higher access to latrines and less open defecation.
- The mobile cinema report illustrated that when people are asked where is a safe place to go to the toilet when there is no latrine, the common answers were river, open and the bush indicating people don’t fully understand why a latrine is safe – i.e. to keep faeces away from people.
- We conclude that people know they should be using a latrine, and social pressure ensures that they report that they are using a latrine – it would be shameful to say otherwise, in reality this is not always the case.

Handwashing
- Most people (>75%) know you should wash your hands before eating and after the toilet.
- Knowledge of hand washing before preparing food or feeding children and after cleaning a baby is much lower – less than 40% in most cases.
- Observationally though, the use and availability of soap was much lower. Both IFRC and Oxfam observed that in the rural areas people may have soap but weren’t using it; only 17% of HH viewed by IFRC had hand washing facilities near the latrines and Oxfam observed that while HH in Tonkolili had received soap they weren’t using it. The results in Freetown were better with ACF noting that 86% of HH had soap available after using the latrine, while CDC saw soap in 98% of the homes they visited.

Health
More women than children and men are reporting with cholera. More research is needed into why this is. However one hypothesis is because they are caring for children and more likely to care for cholera patients.

People are knowledgeable on the signs, symptoms and results and consequences of cholera.

Most people have also heard of ORS and SSS but much less know the correct recipe (either of them) at only around 30% of people.

Knowledge of the causes of cholera is high – most people can list dirty food, dirty water and dirty hands. However the corresponding knowledge of how to prevent cholera is much lower with less people being able to give answers like wash fruits and vegetables and treat water.

There are still those who believe cholera is caused by evil spirits, the breeze or sugar – around 1 in 10.

The results for cooking food fully as a prevention method are very varied, ranging from 25% in ACF’s study through 40-50% for Red Cross and CDC to 62% for Concern and Oxfam?

Never the less, the CDC study found that consumption of food or beverages from a street vendor was associated with an increased risk of cholera. While eating leftover rice and shellfish did not show a significant risk increase, both of these are known as vehicles of transmission and need to be addressed.

ACF also found in their KAP results that knowledge around cholera transmission via dead bodies and funerals was low. This was not researched in other surveys. However CDC did not in this case identify this as an increased risk factor.

Information

- The Red Cross and CDC surveyed how people get information – by the far the most common and preferred method was radio. Health facilities and word of mouth were the other key ways people get information, but when asked the best way to reach them the top answers were health facilities and volunteers (27 and 29%), mobile phone (15%) and public address systems (19%)
- Cholera knowledge is quite high – less than 20% of HH not able to give any key messages and most HH know at least 2 key messages.
- The most commonly known are; you need to wash your hands (66%), you can die from cholera (57%), you should go to a clinic if you have cholera (46%) and cholera treatment is free (44%).
- Least well known were; wash fruits and vegetables (24%), cook your food well (28%) and store drinking water in clean, covered containers (35%)
- The biggest barriers to information were ability to read (39%) and lack of equipment (29%) or access to electricity (33%)
- 77% of people own a radio and 53% own a mobile phone
- Airtel and Africell were the most commonly used networks (60 and 64% respectively).
- Around 50% of HH said someone in the family could read and write.
Recommendations

1. KAP surveys and methodologies should be harmonized across agencies to allow for better data comparison. This should be led by the Ministry of Health.

2. Overall cholera knowledge is high; most people know about cholera and its symptoms and can name key causes, key messages and the most common prevention methods. However, cholera understanding is much lower - people don’t understand what is meant by safe water, why open defecation is a problem, or the reasons behind key hand washing times and preventative measures like cooking food fully and this clearly has a major impact on people’s ability to protect themselves. Therefore more effort needs to be put into explaining the ‘why’ of cholera as well as sharing key messages. We need to go beyond just sharing key messages and think about how we can help people develop a deeper understanding. Specific areas to focus on are;
   o explaining what is meant by safe water and how to do this
   o hand washing before touching food, feeding children and after cleaning a baby and why you need to use soap for hand washing to be effective
   o why we need to use a latrine
   o Proper treatment of food

3. Key audiences to focus on are;
   o Women, as they have higher infection rates (although this probably needs further investigation)
   o Mothers, with a focus on washing hands before feeding children and after cleaning a baby and ensuring children don’t defecate in the open
   o Food vendors on proper treatment of food.

4. Activities should include;
   o Participatory activities should be given priority as these allow people to develop a deeper knowledge and understanding, for example; radio discussion shows; community social mobilisation etc
   o Advocacy for key regulatory changes, for example around registration of food vendors with Environmental Health to ensure they meet certain standards; hand washing stations established in food markets; better provision for rubbish collection and disposal.
   o Obviously these actions take time, so in the short term more effort needs to be given to educating and encouraging market vendor associations to take the lead on keeping markets clean and setting up hand washing stations through community mobilisation activities.

5. We recommend that only one size of aquatab is used so communications on use can be clear.

6. The Ministry of Health needs to decide on which SSS recipe they wish to promote and ensure all agencies follow this. Sachets should be promoted as a better option than home-made SSS due to issues with people getting the measurements confused. However the SSS recipe must still be communicated much more effectively.
ANNEX C

WHAT IS CHOLERA?

Cholera is a severe form of diarrheal disease caused by the bacterium *Vibrio cholerae*. In its extreme manifestation, it is one of the most virulent and rapidly fatal illnesses known. Over 80% of people infected with *V.cholerae* do not develop any symptoms, although the bacteria are present in their faeces for weeks and sometimes months after infection and are thus shed back into the environment, potentially infecting other people. The short incubation period of two hours to five days, enhances the potentially explosive pattern of outbreaks. Among people who develop symptoms, between 80-90% have mild or moderate symptoms, while around 10% develop acute watery diarrhoea with severe dehydration. When these averages are applied to the 2012 Sierra Leone outbreak (where over 22,000 acute cases were observed) this suggests that roughly 200,000 people experienced sub-acute cholera, and approximately one million more were infected but showed no symptoms. If correct, this would mean that four fifths of the country’s population has not yet been exposed.

Left untreated, cholera can be fatal in up to 50% of those with severe symptoms. But with proper treatment and case management – aggressive and early rehydration and electrolyte replacement, and, in some cases, administration of antibiotics to diminish duration of the diarrhoeal episode, reduce the volume of rehydration fluids needed, and shorten the duration of *V. cholerae* excretion – the case fatality rate (CFR) can be limited to less than 1%, the level above which the World Health Organisation (WHO) determines an outbreak to be considered as an emergency. According to the International Centre for Diarrhoeal Disease Research in Bangladesh (ICDDRB), there is no reason why complete and integrated control measures cannot reduce the CFR to zero.

There are over 200 strains of *Vibrio cholerae*, with almost all being non-virulent and therefore posing no threat to humans. A single serotype, designated O1, is responsible for epidemic cholera. However, there are three distinct O1 biotypes, and each biotype may display the classical or *El Tor* phenotype. The disease is caused by toxigenic *Vibrio cholerae* O-group 1 or O-group 139. Only these two toxigenic strains have caused widespread epidemics and are reportable to the World Health Organization as "cholera". Sierra Leone suffers from the latter.

There appears to be no typical model of a cholera outbreak, and no one really knows what sparks one off, or for how long immunity is conferred. Much depends on environmental factors. Seasonal outbreaks might occur because cholera simply "spreads until there's essentially no one left to spread to." At that point, cholera fades away because there are not enough susceptible hosts remaining. The disease then remains in the reservoir – in Sierra Leone, thought to be brackish coastal estuaries until waning immunity over the next 3 months to 3 years creates the conditions for a new outbreak.

Cholera vibrio do not survive for more than a few hours in dry, sunlit conditions but corpses of cholera patients are highly infectious as the bacterium can survive in bodily fluids for days after death. The handling of bodies – it is the practice in Sierra Leone to touch the body before burial – and the location of

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48 Todar.‘Online Textbook of Bacteriology’ [http://textbookofbacteriology.net/cholera_4.html retrieved 9 October 2012]
49 Tappero & Tauxe. ‘Lessons Learned during Public Health Response to Cholera Epidemic in Haiti and Dominican Republic.’ Journal of Emerging Infectious Diseases Vol.17, No.11, November 2011
50 C4 meeting Freetown, 18th September 2012
51 The main reservoirs of *V. cholerae* are people and aquatic sources such as brackish water and estuaries, often associated with algal blooms. Recent studies indicate that global warming creates an environment favourable for the bacteria.
52 Natural infection confers effective immunity against cholera for anywhere between a few months and a few years, depending on individual and environmental risk factors. This is why epidemics recur in endemic regions.
53 Lamond and Kinyanjui. ‘Cholera Outbreak Guidelines.’ Oxfam, June 2012
the burial site therefore requires particular attention during social mobilisation campaigns, especially if the bottom of the grave is 1.5 metres or less above the water table.
## ANNEX D PROPOSED ROADMAP FOR ENHANCING CHOLERA PREPAREDNESS & RESPONSE

<table>
<thead>
<tr>
<th>OUTPUTS / ACTIVITIES</th>
<th>2013</th>
<th>By Whom</th>
<th>Indicative Cost (US$)</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RESULT 1: Enhanced preparedness and response for disease control</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree national coordination architecture for outbreak response</td>
<td></td>
<td>ONS-DMD/MoHS</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Conduct technical evaluation of 2012 cholera response</td>
<td></td>
<td>MoHS/WHO</td>
<td>45,000</td>
<td>Consultancy</td>
</tr>
<tr>
<td>Donor Conference</td>
<td></td>
<td>GoSL / Donors / Partners</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Prepare and conduct multi-sectoral (Cluster) coordination training</td>
<td></td>
<td>MoHS/WHO</td>
<td>75,000</td>
<td>Consultancy</td>
</tr>
<tr>
<td>Revise the National Cholera Preparedness &amp; Response Strategy</td>
<td></td>
<td>MoHS</td>
<td>-</td>
<td>To Districts</td>
</tr>
<tr>
<td>Establish outbreak response activation thresholds</td>
<td></td>
<td>MoHS/WHO</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Build District-level capacity for case investigation and rapid response</td>
<td></td>
<td>MoHS/WHO</td>
<td>-</td>
<td>Included in JPWF</td>
</tr>
<tr>
<td>Create contingency fund</td>
<td></td>
<td>GoSL</td>
<td>600,000</td>
<td>Including legal framework</td>
</tr>
<tr>
<td>Conduct refresher trainings for clinical case management</td>
<td></td>
<td>MoHS/WHO</td>
<td>-</td>
<td>Included in JPWF</td>
</tr>
<tr>
<td>Carry out prevention measures in known hotspots</td>
<td></td>
<td>MoHS/UNICEF/Partners</td>
<td>20,000</td>
<td>4 Districts</td>
</tr>
<tr>
<td>Contingency planning workshop and simulation exercise</td>
<td></td>
<td>WHO/UNICEF/MoHS/ OCHA</td>
<td>With support of OCHA</td>
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<tr>
<td>Monitor implementation</td>
<td></td>
<td>SPU</td>
<td>25,000</td>
<td>Consultancy</td>
</tr>
<tr>
<td>RESULT 2: Improved Information Management services</td>
<td></td>
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<td>--------------------------------------------------</td>
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<tr>
<td>Create an Information Management Unit</td>
<td>ONS-DMD/MoHS/Stats 200,000</td>
<td></td>
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<tr>
<td>Train IM officers</td>
<td>MoHS/OCHA 10,000 Included in JPWF</td>
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<tr>
<td>Build and maintain website</td>
<td>OCHA - Included in JPWF</td>
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</table>

<table>
<thead>
<tr>
<th>RESULT 3: Enhance Disease Surveillance</th>
<th></th>
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<tbody>
<tr>
<td>Automate data collation</td>
<td>MoHS/WHO 300,000 Episurveyor</td>
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<tr>
<td>Build capacity of Central Public Health Reference Laboratory</td>
<td>MoHS - Included in JPWF</td>
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<tr>
<th>RESULT 4: Strengthened supply chain management</th>
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<tbody>
<tr>
<td>Conduct systems review</td>
<td>- Included in JPWF</td>
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<tr>
<td>Procure and establish buffer stocks</td>
<td>MoHS/WHO/UNICEF 200,000</td>
</tr>
<tr>
<td>Identify and pre-qualify selected suppliers</td>
<td>MoHS/WHO/UNICEF -</td>
</tr>
</tbody>
</table>
# ANNEX E: Coordination Roles and Responsibilities

## PRESIDENTIAL TASK FORCE (PTF)
- **CHAIR**
  - Minister of Health
  - Chief of Staff (Co-Chair)
- **MEMBERSHIP**
  - State House Strategic Planning Unit
  - Minister of Health and Sanitation
  - Minister of Energy & Water Resources
  - Minister of Local Government & Rural Development
  - Minister of Education, Youth & Sports
  - Minister of Information & Communication
  - Donors
  - President of Red Cross National Society
  - Private Sector (Water and Telecomms)

## NATIONAL CHOLERA CONTROL & COMMAND CENTRE (C4)
- **CHAIR**
  - Chief Medical Officer
  - WHO / NGO Coordinator (Co-Chair)
- **MEMBERSHIP**
  - WHO (Health programme)
  - UNICEF (Emergencies Officer)
  - INGO x 2 (self-selected & possibly rotating)
  - Red Cross (IFRC)
  - Technical Focal Points from Line Ministries
  - Directors of MoHS Departments
  - Western Area DMO
  - C4 Technical Focal Points
    - WASH Group
    - Social Mob
    - Epidemiology
    - Case Management
    - Logistics
    - [UN-OCHA (if present)]
    - [Donors]

## DISTRICT CHOLERA CONTROL & COMMAND CENTRE (C4)
- **CHAIR**
  - District Medical Officer
  - Head of District Council (Co-Chair)
- **MEMBERSHIP**
  - Sierra Leone Red Cross
  - Private health providers
  - INGOs
  - CBOs
  - District Surveillance Officer
  - District Water Supply Officer (MEWR)
  - Education Officer
  - Hospital Director
  - District Medical Stores
  - Schools Liaison Officer
  - UN (WHO and UNICEF) where present
  - ONS-DMD (where present)

## ACCOUNTABILITY
- **PTF**
  - To HE The President
- **C4**
  - To Minister of Health
  - To Director MoHS-DDPC

## RESPONSIBILITIES
- **PTF**
  - Approve national policy recommendations from the C4
  - Adherence to international norms and standards
  - Maintain appropriate linkages with neighbouring countries
  - Appropriate engagement by line ministries
  - Inclusion of Red Cross
  - Disaster Risks have been correctly identified and appropriate preparedness and response measures taken to reduce

- **C4**
  - Assign sector and sub-sector responsibilities
  - Formulation of a multi-sectoral cholera response strategy & related action plan
  - Assure equity and proportionality when assigning who is to do what, where according to technical skills and capacities
  - Advocacy to PTF
  - Strategic oversight of operational response
  - Resource Mobilisation (prioritisation and approval of project proposals)
  - Ensure that needs, risks, capacities and gaps in

As per National C4, but with emphasis on
- Operational coordination at Chieftdom and community level
- Linkages with National C4
- Outbreak investigation and tactical response
<table>
<thead>
<tr>
<th><strong>such risks</strong></th>
<th><strong>Act as spokesperson for GoSL</strong></th>
<th><strong>Ensure donor engagement</strong></th>
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<tbody>
<tr>
<td></td>
<td>coverage are assessed, priorities set, and appropriate action taken</td>
<td>Information Management (including website)</td>
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<td>Set and promote appropriate standards</td>
<td>Provide technical advice on minimum technical standards</td>
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<td>Oversees quality assurance</td>
<td>Performance monitoring</td>
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<td></td>
<td>Ensure effective integration of cross-cutting issues (HIV, nutrition, disability, environment)</td>
<td>Ensure linkages with Districts</td>
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<td>Monitor progress (outputs and health outcomes)</td>
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</tbody>
</table>

| **MEETING FREQUENCY** | Weekly for 4 weeks then monthly | Daily at first, then three times per week, then weekly | Daily for 4 weeks, then three times per week for 4 weeks, then weekly |