EXPLORING THE IMPACT OF THE EBOLA OUTBREAK ON ROUTINE MATERNAL HEALTH SERVICES IN SIERRA LEONE

2015

VSO WaterAid LSTM LIVERPOOL SCHOOL OF TROPICAL MEDICINE

VSO at a glance

VSO is the world's leading independent international development organisation that works through volunteers to fight poverty in developing countries.

VSO brings people together to share skills, build capabilities and promote international understanding and action. We work with partner organisations at every level of society, from government organisations at a national level to health and education facilities at a local level.

www.vsointernational.org

Credits

Text: Susan Jones and Charles Ameh (LSTM)
Research: Commissioned by VSO in collaboration with MoHS
Editing: LSTM, MoHS and VSO
Layout: Tomos Wilding, VSO
Cover photo: ©VSO/Georgie Scott

Acknowledgements

This research was conceptualised by VSO and has been finalised after the discussion with Liverpool School of Tropical Medicine and Director of Reproductive and Child Health department of MoHS (initially by Dr. SAS Kargbo and later Dr. Santigie Sesay), Government of Sierra Leone. The research is financially supported by VSO, Ebola Appeal Fund and WaterAid International.

This report is prepared by the research team of Liverpool School of Tropical Medicine (LSTM). The lead technical members of the research team includes Susan Jones and Charles Ameh of LSTM and the support team includes Betty Sam, Florence Bull, Edward Koroma, Shirley Simbo, Ibrahim Bangura and Mabinty Kamara who has helped in collecting data from the field. Administrative and technical coordination support has been provided by Peter Nderitu and Rajeev Vishwakarma.

The Technical Coordination Committee for RCH of MoHS has contributed greatly to harmonize the approach and align the content within the current context and provided input to incorporate key areas in research which was not addressed in other similar rapid research and study conducted by other agencies. Members of TCC-RCH includes Director of RCH, MoHS, Unicef, CDC, Options, LSTM, VSO and other lead INGOs working in health sector. The Ethical committee in LSTM, UK and MoHS, Sierra Leone provided valuable advice on methodological approaches and tools ensuring that all the tools are appropriate and comply with research policies and guidelines.

Last but not the least, this research acknowledges and extends special thanks to District Health Management Teams, District Medical Officers, Nurses, Midwives and MCH Aides of the respective districts and B/CEmONCs for supporting at field level and providing real time information and HMIS data.

Abbreviations

ANC	Antenatal Care
AVD	Assisted vaginal delivery
BEmONC	Basic emergency obstetric care
CDC	Centre for Disease Control
CEmONC	Comprehensive obstetric emergency care
CFA	Case Fatality Rate
CHO	Community Health Officer
CMNH	Centre for Maternal and Newborn Health
DFID	Department for International Development
DHMT	District Health Management Team
DMO	District Medical Officers
EmONC	Emergency Obstetric Care
EVD	Ebola Viral Disease
INGO	International Non-governmental Organisations
IPC	Infection Prevention and Control
LSTM	Liverpool School of Tropical Medicine
MCHA	Maternal and Child Health Aide
MD/MO	Medical Doctor/Medical Officer
MiH	Making it Happen
MNH	Maternal and Newborn Health
MoHS	Ministry of Health and Sanitation
MRP	Manual Removal of Placenta
MVA	Manual Vacuum Aspiration
PHU	Peripheral Health Unit
NERC	National Ebola Response Centre
PPE	Personal protective equipment
PNC	Post Natal Care
RMNH	Reproductive Maternal and Newborn Health
RRP	Removal of Retained Products
SECHN	State Enrolled Community Health Nurse

Contents

Executive summary

In May 2014, Sierra Leone, along with Guinea and Liberia, was hit by the biggest Ebola Virus Disease epidemic ever recorded. Up to August 2015 there have been 8696 confirmed cases and 3585 confirmed deaths in Sierra Leone. The effect of the EVD outbreak is not just related to the disease itself but on public health services also, particularly in maternal and newborn care.

In October 2014, UNICEF conducted a survey on the functionality of peripheral health units across the country. They reported that 48 (4.1%) out of the 1,185 PHUs were found closed, including 32 MCHP, 9 CHPs and 8 CHCs. These closed facilities cover a catchment population of 263,196 inhabitants. The report did not address the functioning of facilities designated to provide basic or comprehensive emergency obstetric care (BEmONC & CEmONC).

This study looks at the impact of the Ebola Virus Disease (EVD) on the provision of maternal and newborn care within BEmONC and CEmONC facilities across all 14 districts of Sierra Leone. A comparison of the pre-EVD period (May 2013-April 2014) and 12 months of EVD (May 2014-April 2014) was made.

Specifically health care facility functionality was assessed based on UN defined EmONC standards, as well as the uptake of maternal health services. Equipment, drugs and provision of signal functions were recorded as being provided if they were available for use 24 hours a day for the whole of the month.

Western Area Rural and Western Area Urban were combined for data collection as they share the same CEmONC at Princess Christian Maternity Hospital (PCMH) and some BEmONCs. Each district has 1 CEmONC and 5 BEmONCs except for Western area which has 6 BEmONCs.

A total of 13 CEmONCs and 63 BEmONCs were included from all districts. Data could only be obtained from 4 BEmONCs each in Bo, Kenema and Port Loko districts due to poor telephone coverage. Where data was unavailable from a facility, this has been mentioned in the relevant section.

This research did not compare the numbers and cadres of available health care workers with the recommended standards (defined by MoHS and WHO) rather compared the numbers and cadre pre-EBV and 12 months into EVD.

1. Manual removal of placenta (MRP); Removal of retained products (RRP); Assisted vaginal delivery (AVD); Neo-natal resuscitation (NNR)

©VSO/Georgie Scott

1. Introduction

The concept underpinning this VSO study was discussed with the Ministry of Health and Sanitation and Liverpool School of Tropical Medicine (LSTM) who agreed to work together on formulating its design. A technical and feasibility review was also completed by RCH Technical Coordination Committee and MoHS with the active involvement of key stakeholders of health including UNICEF, Centre for Disease Control (CDC) and Options.

Voluntary Service Overseas (VSO)

VSO staff and volunteers have been working with the Ministry of Health and Sanitation (MoHS) since 1961to improve the quality and reach of maternal and child health care services in order to reduce maternal and child mortality in Sierra Leone. Our work focuses on strengthening health systems through the development of health care workers. In partnership with the MoHS and with financial assistance from UNICEF, VSO has been working on a programme of in-service capacity building prior to the Ebola epidemic.

WaterAid International

WaterAid began working in Sierra Leone in the early 1980s before the civil war, when we constructed a total of 1,099 water facilities in five districts (Bonthe, Tonkolili, Kenema, Kono and Kailahun). Of these, 476 water points remain fully functional, 409 functional but partly damaged, 201 were destroyed by the war while 13 were under construction when the war broke out and could not be completed. WaterAid returned to the country in 2010 where it now operates a trans-boundary programme with Liberia which is mainly focused on policy influencing, capacity building and service delivery in response to the WASH needs of a post-conflict country.

Centre for Maternal and Newborn Health at Liverpool School of Tropical Medicine

The Centre for Maternal Health (CMNH) has been working with the Ministry of Health and Sanitation (MoHS) since 2009 on the Making it Happen (MiH) and the In-Service Capacity Building programmes funded by UNICEF and UK Government's Department for International Development (DFID). The aim of these programmes is to reduce maternal and newborn mortality and morbidity by improving skilled birth attendance and emergency obstetric and newborn care (EmONC), and to improve the quality of the maternal and child health aide (MCHA) training programme nationally. From 2009 to 2014, a total of 380 in-service health care providers; 120 pre-service tutors, 756 pre-service health care workers (MCHA students) and 157 master trainers have been trained in EmONC. In addition, 84 health care workers have attended training on the collection, aggregation and use of routine data to inform practice. Seventy-two individuals have also been trained in maternal and newborn health quality improvement methods.

In-service capacity building for health care workers in conjunction with UNICEF and VSO is being implemented countrywide with the aim of training 2000 health care workers across Sierra Leone in seven reproductive, maternal, neonatal and child health modules between 2013 and 2014.

2. Data collection

A modified Centre for Maternal and Newborn Health (CMNH) data collection tool used in the MiH programme was carried out to collect data on signal functions, uptake of services, water and sanitation provision, family planning services and infection prevention and control.

Data collection teams from both VSO and LSTM visited or telephoned facilities to collect data electronically. To enhance understanding and provide a context for the quantitative data, key informant interviews were also conducted across all districts. In consultation with MoHS and district medical officers (DMOs) key informants from the district health management team (DHMT) and C/BEmONC facilities in each district were asked to participate in an interview.

Data was analysed to look for trends of the effect of the Ebola outbreak on provision and uptake of maternal and newborn health (MNH) services within targeted facilities. EVD data was obtained from publically available sources, particularly MoHS and National Ebola Response Centre situation reports. The number of confirmed EVD cases are used in this study.

Qualitative data was also obtained through key informant interviews with service users and providers. Attempts were made to contact non-service users who had been pregnant or delivered during the outbreak

3. Summary results

There was a reduction in the uptake of maternal health services during the EVD outbreak. The data shows that 8/13 districts had a reduction in the numbers of deliveries which was statistically significant; that is EVD could be said to have impacted the numbers attending facilities for deliveries.

Nationwide, there was an 11% reduction in the numbers attending facilities for deliveries. For ANC and PNC visits 6/13 districts reported reduced numbers of visits and this again was statistically significant. Across Sierra Leone there was a statistically significant reduction in the numbers attending ANC (18%) and PNC (22%) visits and in the numbers of deliveries at facilities.

Another important finding from this study is that for all EmONC signal functions the occurrences of non-availability were never due to lack of staff of the required cadre. The data shows that throughout the EVD epidemic facilities had the staff to perform many of the signal functions. Although there is some small fluctuation in the numbers and types of staff available during the epidemic, this is not statistically influenced by the EVD epidemic nor is the fluctuation significant enough to affect provision of EmONC signal functions.

It might have been anticipated that provision of EmONC signal functions could be affected during the epidemic due to logistical problems, for example lack of supplies or supplies/resources being diverted to fight the epidemic. However, data from this study shows that there is in fact improvement in the availability of two EmONC signal functions, removal of retained products of conception and neonatal resuscitation.

Conversely, there is evidence of a reduction in the availability of assisted vaginal delivery at BEmONC level. However, assisted vaginal delivery was always available at CEmONC level. Due to the higher number of BEmONCs compared to CEmONC facilities when data for both types of facilities were combined the overall availability of assisted vaginal delivery increased.

Data from this report shows that there is no statistical association between the number of EVD cases and availability of antibiotics, oxytocics, anti-convulsants, manual removal of placenta, blood transfusions and caesarean section. Where these signal functions were not available then it was due to factors outside the EVD epidemic. When looking for reasons of non-availability, health services need to address other issues within the health system, for example, procurement, supply chain and storage of drugs. It is encouraging to note that throughout the epidemic facilities were able to maintain staffing level and provision of services with exceptions as reported above..

Overall there were increased case fatality rates for both stillbirths and maternal deaths associated with recent Ebola cases. When analysed separately for each facility type the increase was only significant for CEmONC facilities. For CEmONC facilities the IRR (95% CI) for stillbirths was 1.27 (1.16,1.39) and for maternal deaths it was 1.44 (1.17,1.75).

©VSO/Georgie Scott

4. Summary conclusion

Providing good MNH care relies on a partnership between health care providers and health service users. Staffing numbers within BEmONC and CEmONC facilities remained relatively constant during the EVD epidemic compared to the previous year (2013). Facilities were also able to provide the majority of signal functions including caesarean sections.

The main change was in numbers of women accessing services at antenatal, delivery and postnatal stages. Fear of EVD and misinformation about the role of health care workers in the EVD epidemic led many women to stay away from facilities, despite these facilities reporting that they were still able to provide services.

As the numbers of EVD cases increased the numbers of women accessing services decreased. From May 2014 to September 2014 there was a 31% decline in the number of women delivering at facilities with a corresponding rise in the maternal case fatality rate (CFR) in CEmONC facilities from 1.27 to 3.08, which rose further to 3.48 at the peak of the epidemic in November 2014. Still birth rate also increased at CEmONC facilities from 12.20 in May 2014 to 16.69 in November 2014. It could be concluded that the EVD epidemic did not significantly affect the provision of services but rather the uptake of services by the public.

In key informant interviews staff reported challenges in providing care prior to EVD, which continued during the epidemic but not that the epidemic exacerbated this. The commitment shown by health care workers to remain in their posts and motivate colleagues to do the same was evident from interviews with both service users and service providers.

Health care workers identified challenges for post EVD recovery. These included lack of resources, understaffing and women choosing alternative health services all of which were occurring pre the EVD epidemic. Though data from this study demonstrates that staffing levels were consistent throughout the epidemic, that does not mean they were at an optimum level to provide high quality care and the challenges in this area pre EVD remain post EVD. Staff also mentioned the need for a more efficient and responsive healthcare system, improved coordination of INGOs and following through on plans and meeting expectations.

Although the data from this study shows that EVD had limited impact on provision of services, it does not mean that maternal and newborn health services were being provided at an optimum level. Prior to the EVD outbreak Sierra Leone had some of the highest maternal and newborn deaths figures in the world. This report addresses if EVD had an impact on provision of services, whether that service was or was not available pre EVD. It does not assume that services were available at an optimum level pre EVD just if the EVD outbreak influenced the availability of services.

This study shows that the effect of an outbreak such as EVD is not on the provision of services but on the uptake of services and in this emergency scenario efforts needed to be focused on community sensitisation. That is not to say that maternal and newborn health services in Sierra Leone do not need to improve but that during the EVD epidemic it is communication with and sensitisation of the public that will have the greater impact. The detrimental impact of EVD on maternal mortality occurred because of public fear and lack of confidence in the system rather than as a direct impact of EVD on services. This effect should be seen as separate from the reasons for the spread of EVD and the high numbers of cases and deaths, which was due to inadequate infection prevention and control procedures, and inadequate supply of personal protective equipment.

The provision of training for health care workers in infection prevention and control by MoHS and partners was important in helping to stop the spread of the disease. Evidence from interviews with health care workers for this study shows that members of the public were afraid to use health care services for fear of contracting EVD. Rebuilding public confidence in health care services is essential to return uptake of services to pre EVD levels. Maintaining trainings for healthcare workers and public sensitisation programmes is essential if safe health care is to be provided and taken up.

©VSO/Georgie Scott

5. Summary recommendations

The following recommendations for District Health Management Teams and the MoHS take account of current levels of service provision and the impact of EVD on uptake of services.

The recommendations take account of the Sierra Leone Recovery and Transition Plan including:

- Restoration of critical RNMCH services safely.
- Assuring effective IPC at health care units.
- Social mobilisation to improve health care seeking behaviours.
- Implementing continuous improvement program for IPC.
- Audit and reform if human resources and supply programmes.

It is hoped that they will contribute to the restoration of health care and specifically maternal and newborn health services post Ebola viral disease outbreak.

1. MoHS to continue public sensitization and information sharing to restore uptake of services to pre EVD levels.

2. Long term public health promotion and health education programmes are needed to increase understanding of how infectious diseases are spread and can be controlled.

3. DHMTs and MoHS should urgently address the EmONC knowledge and skills gap amongst staff, in order to increase the availability of manual vacuum aspiration (MVA) and assisted vaginal delivery (AVD).

4. Training and retraining health care workers to perform critical EmONC signal functions is recommended to take account of staff turnover and to maintain quality of care.

5. DHMTs and MoHs should provide health care facilities with the necessary equipment and supplies to provide appropriate care on a 24 hour basis (for example where stock outs of drugs occurred).

6. National policies and procedures for IPC/PPE should be available to all facilities to provide standards of practice and care which should be adhered to. These can then be more easily monitored and their effectiveness evaluated. The aim should be for a set of universal precautions to be used in all episodes of health care and not just during critical periods such as the EVD epidemic.

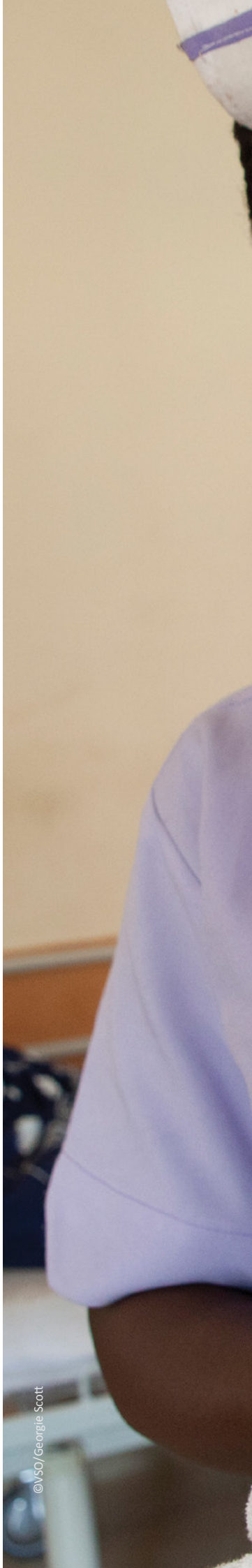
7. Training on IPC/PPE should begin at pre-service education levels to embed the importance of following procedures and adhere to standards at an early stage in a health care workers career.

8. Mandatory annual updates for all staff on IPC/PPE should be introduced and provided as cascade training within facilities. This again will help to maintain standards of infection prevention and control.

Though the study did not aim to look at deficiencies in provision of services pre EVD the issue of low numbers of health care workers prior to the epidemic came out as an important issue. The importance of adequate numbers of healthcare workers raises considerations for recovery of healthcare services post EVD. These include:

1. DHMTs and MoHS need to urgently address the inequitable distribution of Health Care Providers. This will ensure that there is increased access to health care by the population.

2. MoHS should develop a long term strategy and plan to address the critical shortage of specialist medical staff such as Obstetricians, Anaesthetists and laboratory scientists.



6. Available number of health care workers

MoHS sets standards for the numbers and cadres of health care workers which can be expected at each facility. There is an ongoing shortage of health care workers within Sierra Leone. Prior to the EVD outbreak the Sierra Leone National Health Sector strategic Plan 2010 -2015 gave a nationwide shortfall of 68% in the numbers of midwives, a 59% shortfall in the numbers of registered nurses and an 81% shortfall in the numbers of obstetricians/gynecologists.

As a consequence of this shortage, new cadres of health care workers such as Community Health Officers (CHO), State Enrolled Community Health Nurses (SECHN) and Maternal and Child Health Aides (MCHA) have been introduced to make good the shortfall. This report does not look at the numbers available compared to those required by MoHS but rather at the change in numbers, if any, during the EVD epidemic. Providing good quality healthcare does not just depend on the numbers of cadres overall but also the mix of each cadre within a facility and their individual experience and competencies. The loss of one midwife from a facility may have greater impact on provision of services than the loss of two or three non-qualified staff. The loss of an experienced midwife may be greater than the gain of providing a newly qualified CHO.

Figures 1 and 2 (overleaf) show the numbers of health care workers across all districts from April 2013 to January 2015, compared with the numbers of EVD cases nationally. For ease of reporting, cadres have been put into 5 groups:

Group 1 - doctors (including specialist obstetricians and gynaecologists).
Group 2 - registered midwives, registered nurses.
Group 3 - middle grades (CHO)
Group 4 - non-registered nurses (SECHN, MCHA)
Group 5 - unqualified grades (nursing assistants, traditional birth attendants)

In the BEmONC facilities, the numbers of middle grade and registered nursing staff remains fairly constant throughout the whole time period studied with minor fluctuations in availability. The numbers of doctors fluctuated from 1 to 2 over the months reported and therefore this small number is not visible on figure 1

Figure 1: Number of health cadres - BEmONC all districts combined

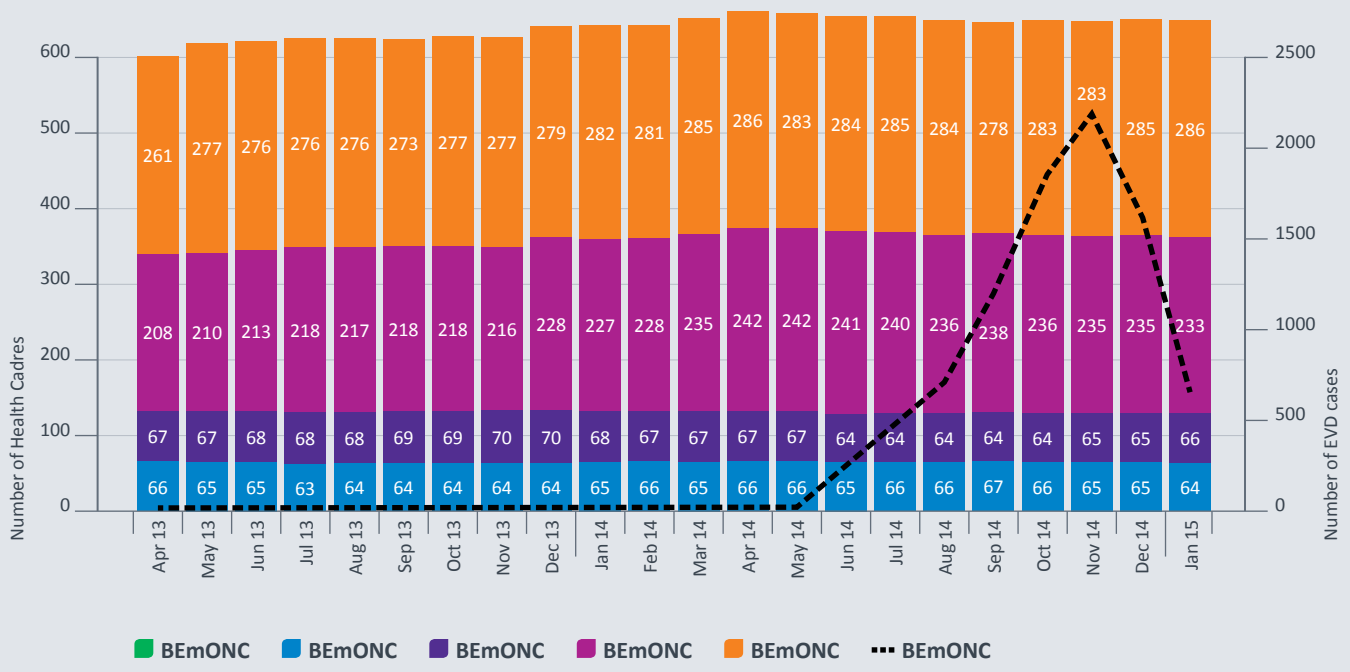
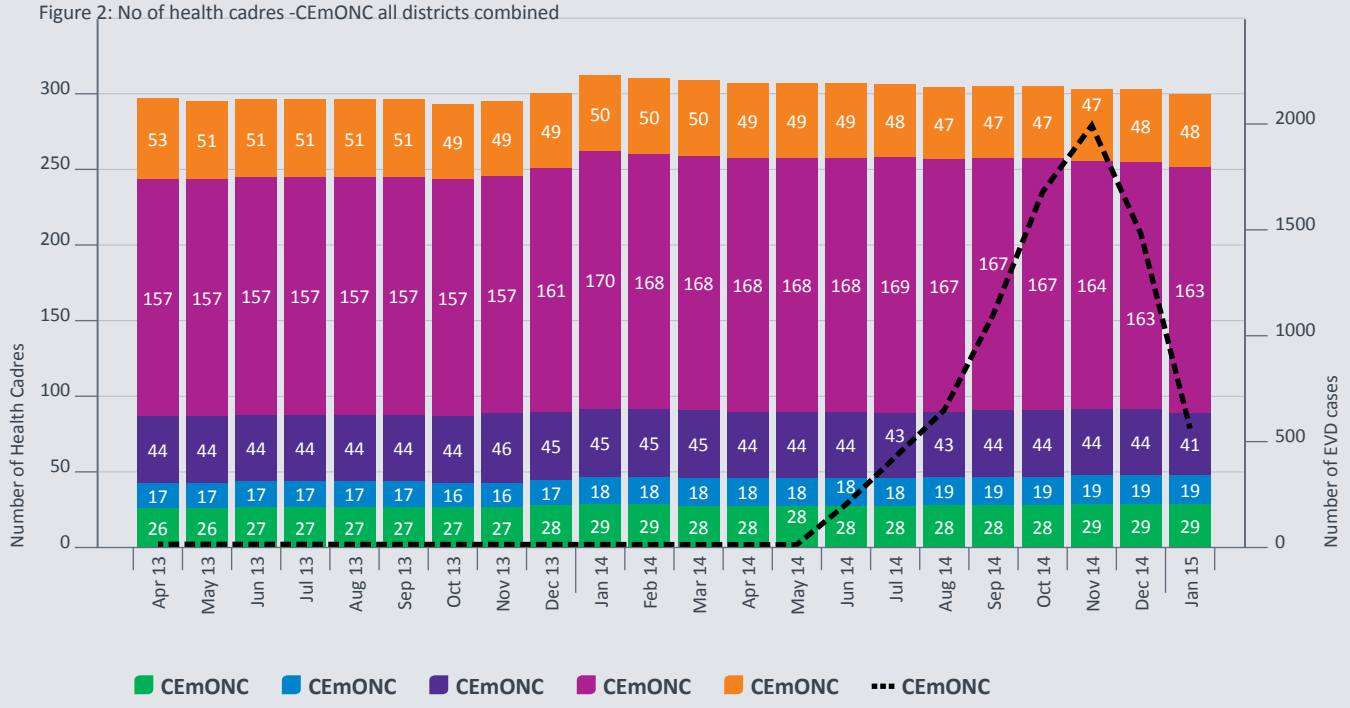


Figure 2: No of health cadres -CEmONC all districts combined



The number of unregistered nursing staff and unqualified staff were increasing from April 2013 to April 2014 pre EVD. Non-registered nursing staff number rose from 261 to 286 (9%) and unqualified grades rose from 208 to 242 (14) over the same time period. The first case of EVD was reported in May 2014 reaching a peak nationally in November 2014. At the peak of EVD cases nationally there was a small decline in the numbers of non-registered nurses working in BEmONCs from 242 to 235 (3%) with the numbers of unqualified staff remaining constant.

In the CEmONC facilities, the numbers of doctors, registered nursing cadres and middle grades remained relatively constant over the whole period. The numbers of non-registered nurses rose from 157 in April 2013 to 168 in April 2014 and then stayed constant over the period of the EVD epidemic. In contrast the numbers of unqualified staff dropped from 53 in April 2013 to 49 (7.5%) in April 2014 with a further drop to 47 (11%) at the height of the EVD epidemic.

There was a 3% increase in the total number of staff available in all facilities during the EVD epidemic but this is not statistically significant. However, it may be that having just one additional member of staff available who was available to perform a specific clinical procedure (e.g. MVA) could have made a clinical difference to a particular patient. As might be expected, the number of students declined by two-thirds (2/3), as training schools closed and students were redeployed to other areas.

©VSO/Georgie Scott

7. Uptake of services

Uptake of services was measured by looking at the numbers of deliveries and numbers of antenatal and post-natal care visits to facilities. Results are given combined for all districts for deliveries and ANC/PNC visits compared to the numbers of EVD cases nationally. Further breakdown by district is given to take account of the different time scales of the EVD epidemic in each district and also the variation in the numbers of cases by district.

Number of deliveries – all districts

In both the BEmONC and CEmONC facilities the number of deliveries declined as the numbers of EVD cases rose. In the BEmONC facilities, there was a 31% decline in the numbers of deliveries from 1759 in May 2014 to 1205 in September 2014. No similar level decline occurred in the same period for 2013. Though the numbers of deliveries increased as the numbers of EVD cases reduced, they had not returned to pre EVD levels by January 2015 (figure 3).

In the CEmONC facilities, the decline was more pronounced. From May 2014 to November 2014 at the height of the epidemic the number of deliveries reduced by 37%. Comparing numbers of deliveries in November 2014 to November 2013 shows that there was a decline in November 2014 in deliveries of 17%. The numbers of deliveries continued to decline in the CEmONC as the numbers of EVD cases reduced. There was a decline of 63% in the numbers of deliveries from a peak of 1499 in May 2014 to 553 in January 2015 (figure 4).

Figure 3: Number of deliveries - all districts combined (BEmONC)

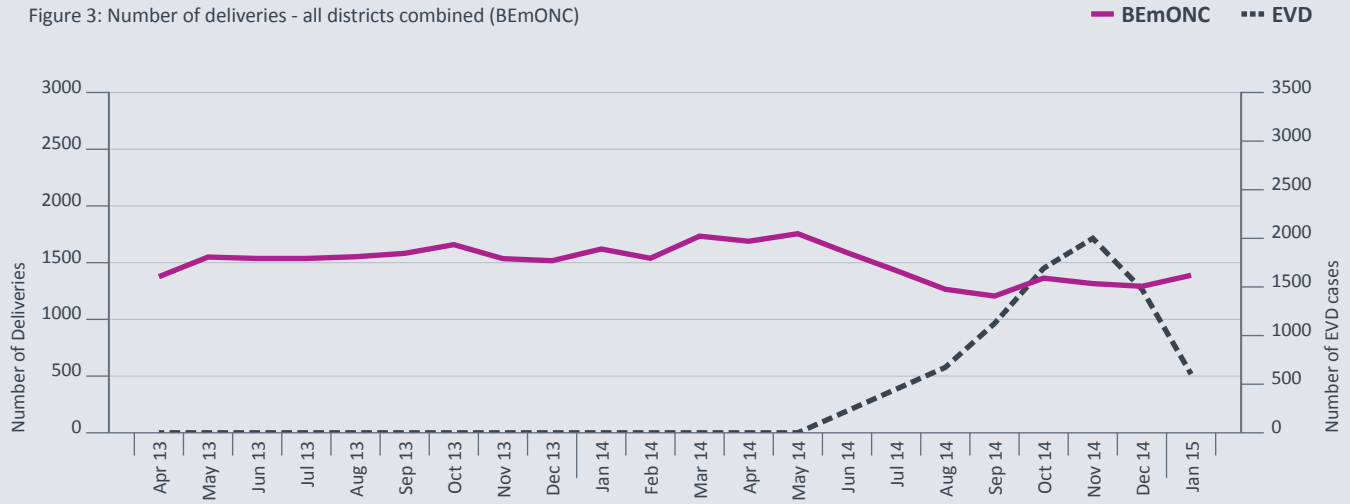
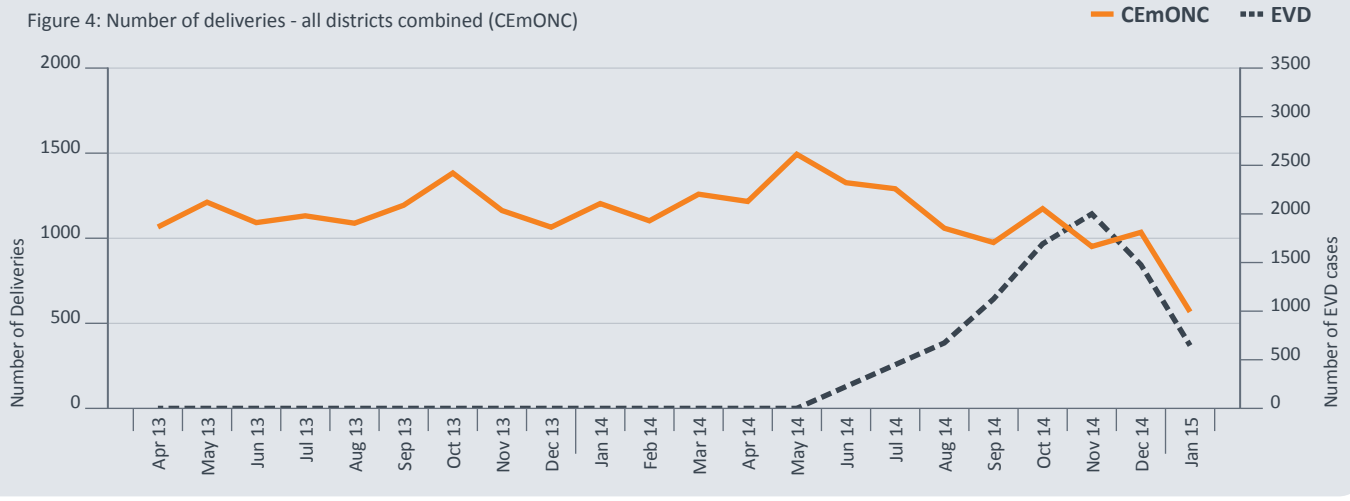


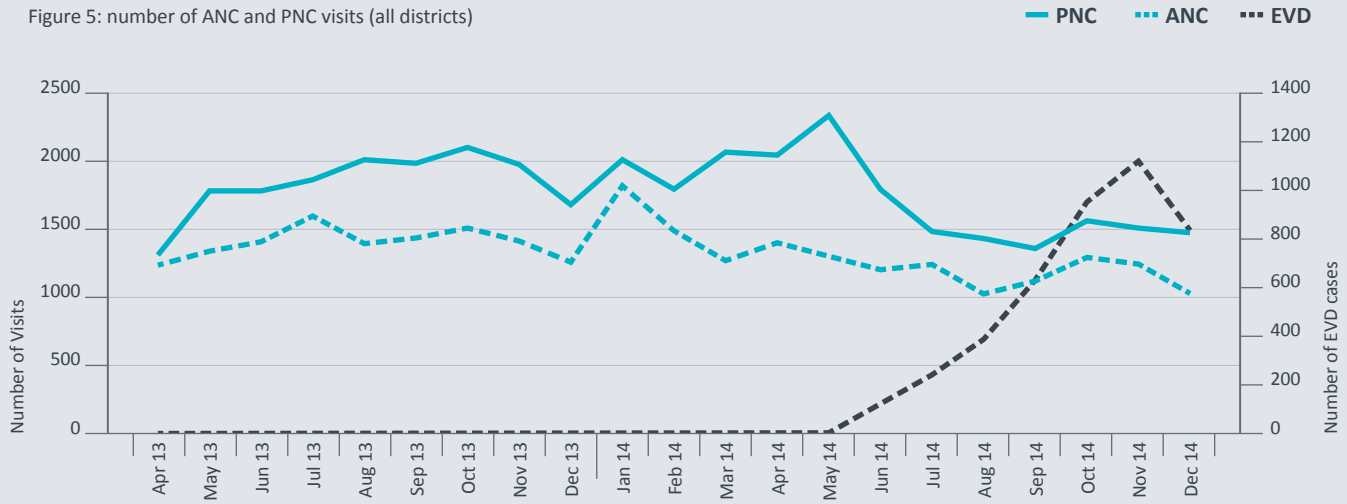
Figure 4: Number of deliveries - all districts combined (CEmONC)



Number of ANC and PNC visits

Data was available for 8 districts on ANC and PNC visits from 32 (50%) BEmONCs and 6 (46%) of CEmONCs. Overall, there was a statistically significant drop in the number of ANC visits of 18% and a 22% reduction in the number of PNC visits.

Figure 5: number of ANC and PNC visits (all districts)



© VSO / Georgie Scott

8. Maternal and newborn case fatality rate

The case fatality rate (CFR) for maternal deaths and still births was combined across all districts and both BEmONC and CEmONC facilities due to the small numbers in each district.

This study only looked at the number of deaths in facilities. It may be that other deaths occurred in the community, which were not recorded by the facilities.

Figure 6 shows that the maternal CFR rose as the numbers of EVD cases increased to a peak and dropped as the numbers of EVD cases declined. There was a statistically significant 30% rise in maternal CFR across all facilities. When type of facility was considered then there was a statistically significant rise in the numbers of maternal deaths at CEmONC facilities but not at BEmONC facilities. This pattern may be associated with the need to actually perform invasive live saving procedures such as manual removal of placenta, caesarean section and MVA, with health care providers reluctant to do this for the fear of becoming infected.[2]

Overall, there was a statistically significant rise in the numbers of stillbirths with a 24% increase in incidence. When type of facility was considered separately, the increase was significant in CEmONC facilities but not in BEmONC facilities.

Figure 6: Maternal case fatality rate

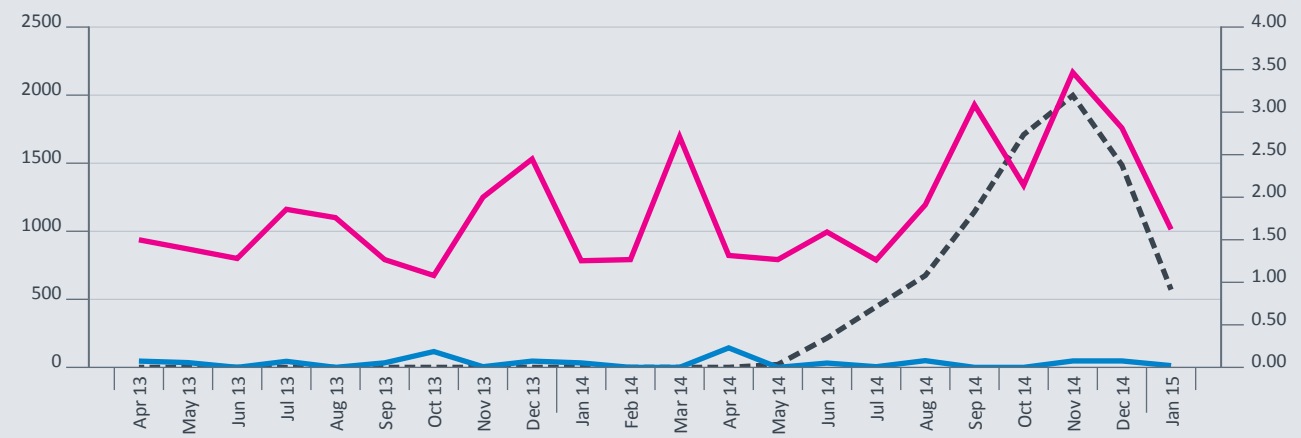
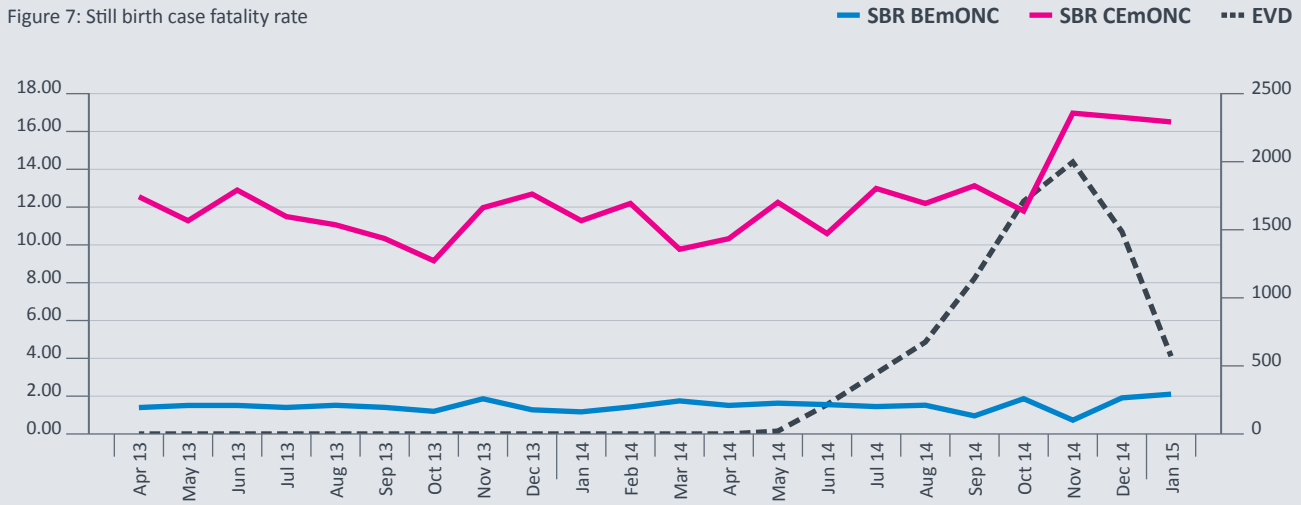


Figure 7: Still birth case fatality rate



2. Black BO. Obstetrics in the time of Ebola: challenges and dilemmas in providing lifesaving care during a deadly epidemic. BJOG 2015; DOI: 10.1111/1471-0528.13232.

9. Provision of signal functions

Provision of Skilled Birth Attendance (SBA) and availability of Essential (or Emergency) Obstetric Care (EOC) coupled with Newborn Care (NC) are key strategies that if implemented will reduce maternal and neonatal mortality and morbidity.

At least 80% of all maternal deaths result from five complications that are well understood and can be readily treated: haemorrhage, sepsis, eclampsia, obstructed labour and complications of abortion.[3]

As these life-threatening complications are generally not predictable, to reduce maternal mortality it is important that all women have access to maternal healthcare services, particularly skilled attendance at birth as well as timely access to Emergency Obstetric Care (EmOC). Two levels of EOC can be distinguished: Basic Emergency Obstetric Care (BEmONC) and Comprehensive Emergency Obstetric Care (CEmONC). The signal functions of these two levels are listed below. The UN agencies recommend that for a population of 500,000 at least one CEmONC and four BEmONC facilities should be available and functioning.[3]

Data for the provision of signal functions has been combined across all districts and compared to the numbers of EVD cases across all districts. The number of manual vacuum aspiration and assisted vaginal delivery were small in individual facilities and therefore a trend against EVD cases could not be seen. By combining the data for all facilities, any trend against number of EVD cases is discernible.

At national level there is evidence of improved availability of removal of retained products of conception associated with Ebola cases (in the previous month) (Signal Function 5; p=0.003) with an estimated improvement in odds by a factor of 2.06 (95% CI: 1.01 – 4.21). Similarly for neonatal resuscitation (Signal Function 7) there was evidence of improved availability of the signal function. Conversely, there is evidence of deterioration in availability of assisted vaginal delivery nationally (Signal Function 6; p<0.001). The deterioration was at BEmONC level. During the EVD epidemic, there was no time when assisted vaginal delivery was not available at CEmONC level. However among BEmONCs, there was an estimated change in odds by a factor of 0.16 (95% CI: 0.07 – 0.37).

Levels of Emergency Obstetric Care and their signal functions:

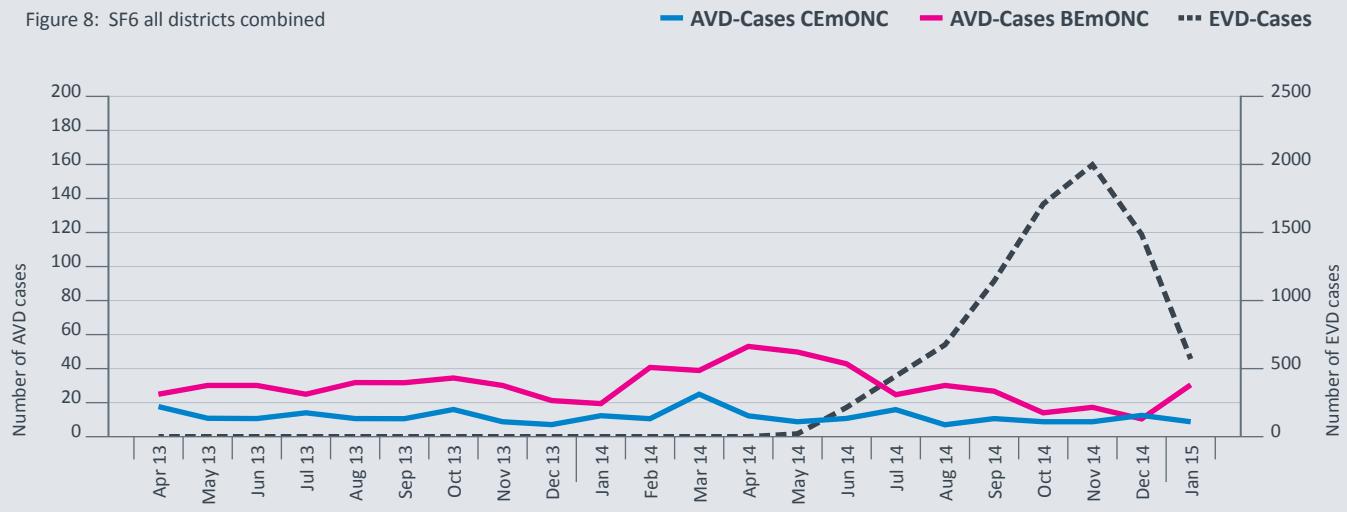
BEmONC:
- Parenteral antibiotics
- Parenteral oxytocics
- Parenteral anti-convulsants
- Manual removal of a retained placenta
- Removal of retained products of conception by manual vacuum aspiration (MVA)
- Assisted vaginal delivery (vacuum extraction, forceps)
- Neonatal Resuscitation using bag and mask

CEmONC:
- All 7 BEmONC functions, plus:
- Caesarean Section
- Blood Transfusion

There is no evidence of association between EVD cases and the delivery of signal functions 1 to 4 (antibiotics, oxytocics, anti-convulsants, manual removal of placenta), 8 and 9 (blood transfusion and caesarean section) across the country.

It is important to note that for all signal functions the occurrences of non-availability were never due to lack of staff of the required cadre. For antibiotics, non-availability was likely to be due to lack of drugs and lack of equipment. For oxytocics, it was more commonly due to lack of drugs (79% of non-availability) than lack of equipment (37% of non-availability). For anti-convulsants, the dominant reason for non-availability was lack of equipment (91% vs 9%). For blood transfusions and caesarean sections, the sole cause for non-availability of the signal function was lack of equipment.

Figure 8: SF6 all districts combined



3. WHO (2009): Emergency Obstetric Care Handbook

Figure 9: SF5 all districts combined

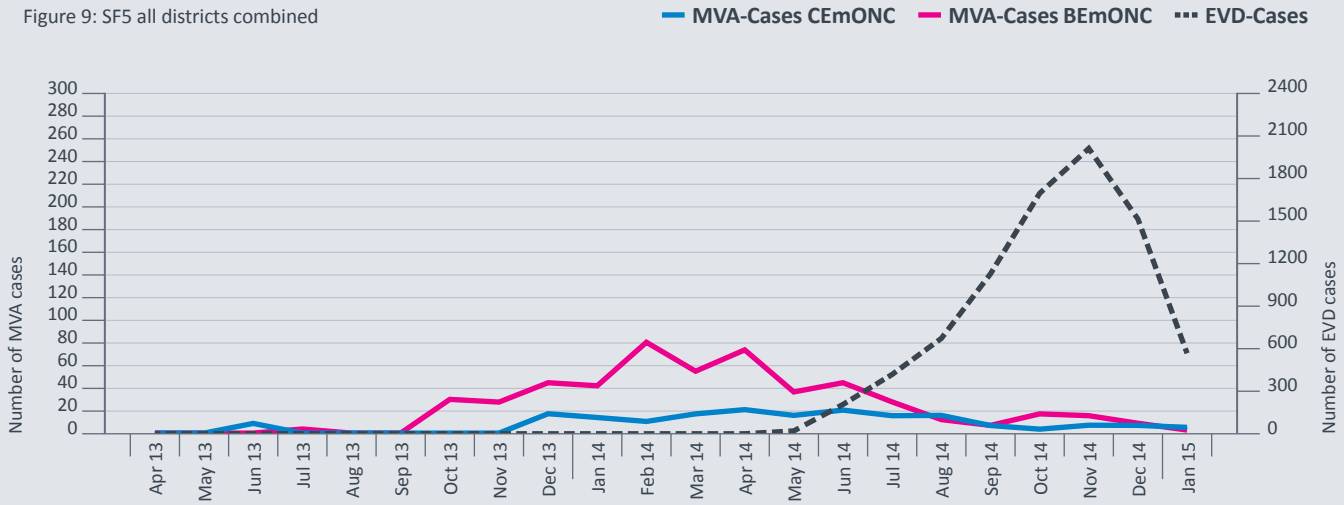
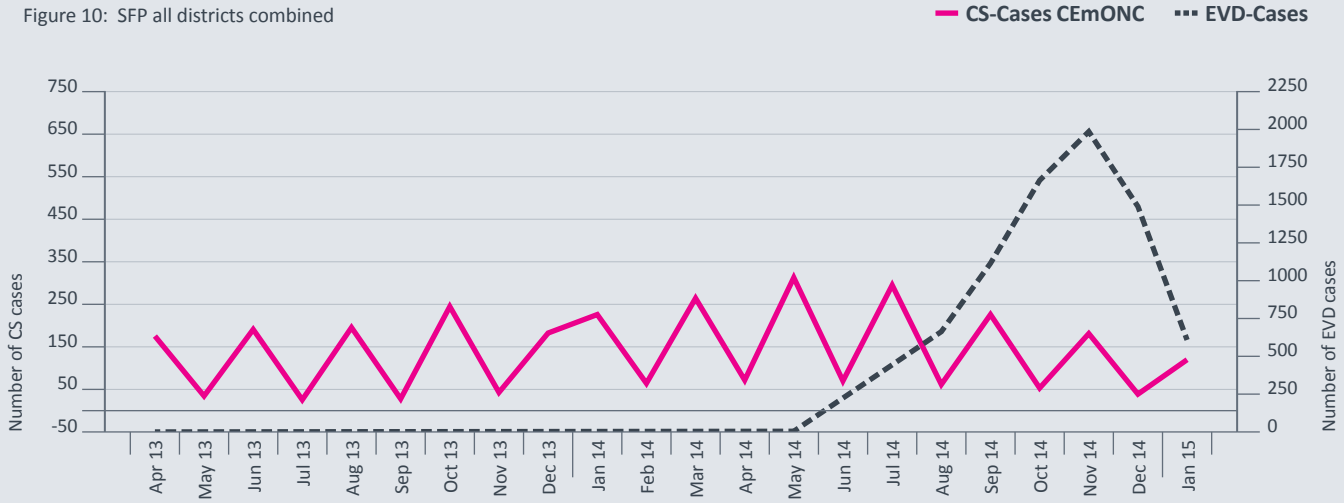


Figure 10: SFP all districts combined

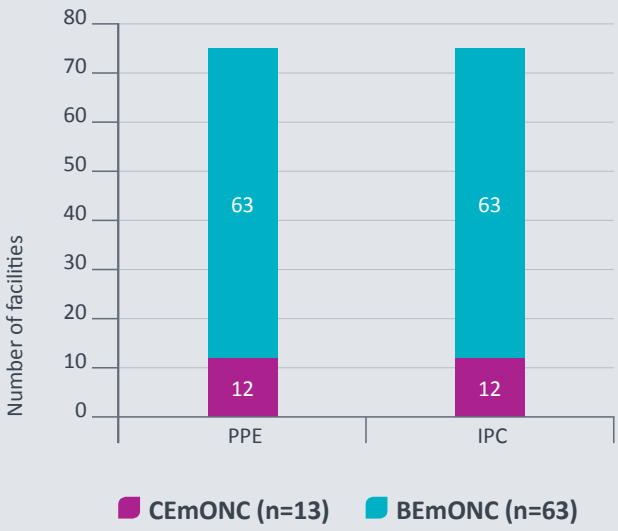


10. Infection prevention and control

Figure eleven shows that training in IPC and PPE was given in all facilities by the Ministry of Health and Sanitation and 17 partner organisations where personal protective and IPC equipment (PPE) and IPC equipment was available.

With the exception of the use of chlorine for disinfection, equipment was not continuously available for the whole of February 2015 which has implications for effective infection prevention and control.

Figure 11: Assisted vaginal delivery cases (all districts combined)



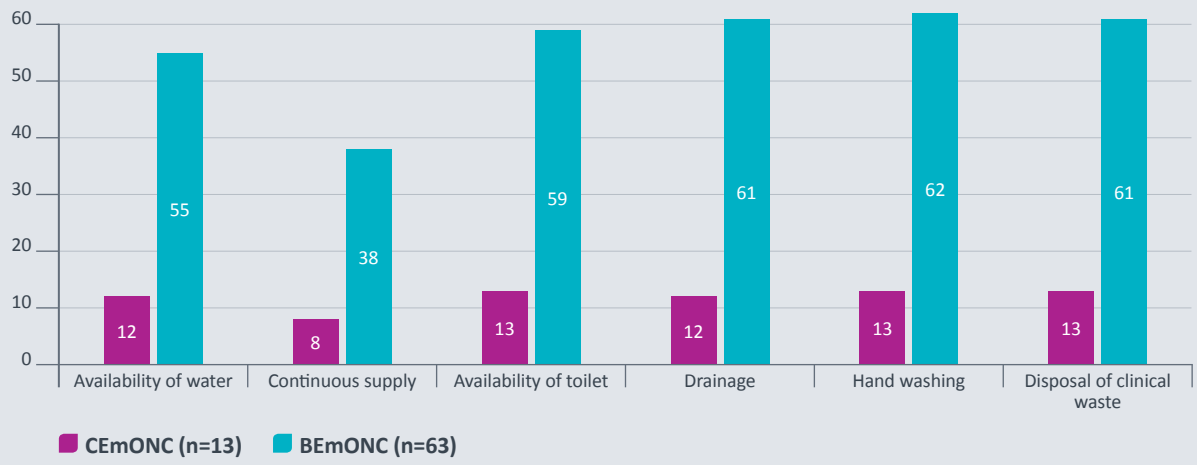
11. Availability of WASH facilities

Staff at all facilities were asked about the the availability of WASH facilities, including water supply, sanitation and hygiene in the study.

Figure twelve shows that a water supply was available in 12 out of 13 CEmONCs with eight benefitting from a continuous supply. Meanwhile, a water supply was available in 87% of BEmONC facilities (e.g. 55 out of 63 facilities) with 38 having a continuous supply.

There was good overall provision of drainage, disposal of waste and hand washing across all facilities.

Figure 12: Availability of WASH facilities



© VSO/Georgie Scott

12. Key informant interviews

A total of 81 interviews were conducted with key informants in all 13 districts. The aim was to interview service users, service providers and women who had chosen alternative care (that is non-service users). Non-service users were reluctant to come forward as they feared repercussions if they were found not to be using designated services. Both those working in and managing facilities were interviewed along with members of the DHMT.

Nine (9) themes emerged from the data analysis. An overview of each theme is given below with example quotes from key informants.

Themes

- Service provision and infrastructure pre EVD
- Service provision and infrastructure during EVD
- Service provision and infrastructure post EVD
- Emotional response to the EVD epidemic
- Teamwork and support
- Response from MoHS to the epidemic
- Community response/perceptions to the epidemic
- NGO response/support to the epidemic
- Perceptions on recovery

Service provision and infrastructure pre EVD

Participants were asked to report on the provision of services within the facility (for example, drugs, supplies, ambulance services, staffing). Facilities reported challenges with supplies such as gloves, stock outs of drugs, lack of basic equipment such as stethoscopes, or that they did have equipment but not in sufficient amounts. Ambulances were available for referral but not always in working order. If ambulances were available then the road conditions often presented challenges in referring women:

> "Often times pregnant women do delivery on the floor and this other room is where we palpate. And even after delivery, there have to be 2 lactating mothers per bed which is overcrowding." **MCHA**

A wide range of sexual and reproductive services were provided with staff taking pride in the care that they gave:

> "We do delivery, take proper care of the mother and baby after delivery, give effective medications to our patients and teach them how to take proper care of themselves and do their family planning well. These are some of the services we render to our patients." **Registered Midwife**

Staff reported facing challenges within the community pre EVD in engaging women to use services which impacted on the numbers of complicated cases that were seen:

> "We have challenges with the traditional doctors. They always convince the patients to use traditional medicines and deliver at home. They will only rush to the hospital when complications occur. That is why we have few cases that are normal." **Registered midwife**

Women who did use the service pre EVD reported that the care they received was of a good quality, with explanations given to them of the importance of ANC visits:

> "Because the nurses encourage us to come to the hospital within the first two months of the pregnancy. They say we need to register earlier in order to give birth to a baby that will survive." **Service user**
>
> "I have been coming to the hospital, they have been treating me well. I had problem sometimes ago and since I have been coming here they have been able to solve it." **Service user**

Service provision and infrastructure during EVD

Many of the senior staff within the facilities reported having to work hard to encourage staff to remain and provide care as well as trying to ensure that their staff had the correct equipment to protect them from EVD. When staff had been transferred to the EVD holding or treatment centres informants reported that it was proving difficult to get them to return to their normal postings:

> "We are asking partners to do their level best to make sure that IPC training reach every health facility and the protective gears reach every health facility." **DMO**
>
> "Some of them (nurses) later joined the treatment and holding centres. It is difficult bring them over to come and continue normal work." **DMO**

Provision of equipment/services were also adversely affected as resources were diverted to fight the epidemic:

"The care that we offer did reduced with the advent of the EVD because we were in fear and we did not have enough PPEs to work with. So we were afraid to conduct most of the services because we were challenged." **Midwife**

There was also fear reported amongst the local populations which meant that people were afraid to attend the facilities either because they were scared they would catch EVD or that they would be presumed to have EVD and be sent to a holding centre.

"All the services I mentioned above are currently running except that the turnout and flow is not as usual because of the Ebola outbreak." **MCHA**

Service provision and infrastructure post EVD

As the numbers of EVD cases has decreased, with some districts being declared free from EVD for over 42 days, the health care workers have tried to bring back a normal level of services. Challenges from this are loss of nurses to the EVD holding and treatment centres, and public perceptions on the safety of health facilities.

"Now we are fighting to remove the number of nurses from the holding facilities to go back. We ask them to go back to their normal health service delivery." **DMO**

"Now that it is stable we have started normal activities, as I am talking to you almost all members of the DHMT Team are out visiting all the 76 facilities that we have in the district to look at the facilities, what is there and the gaps and then at the same time give supportive supervision especially on infection and prevention of infections." **DHS**

"For now it is coming to normality, at the beginning as I said it earlier, a lot of women were not coming to the hospital but now a lot of people are coming." **Registered Nurse**

Emotional response to the EVD epidemic.

The overwhelming emotional response that was reported was fear. Some health care workers became emotional and began crying during the interviews. Fear was related to catching EVD themselves but also fear for their families and community.

"Thankfully I survived. When you come to work, you are not sure how you are going back to the house. You have concern for your relatives, you don't know what you are taking to the house (Sobbing)." **Midwife**

"I was traumatized, I was really, really, traumatized, because you can imagine, I am a doctor, I have a family, I have children, I have a wife, in this Ebola, I still have to give care." **Doctor**

There was also a feeling amongst staff that they had a moral duty to continue to work despite their fears and those of their families and community.

"We are health workers we sacrificed long since back to serve the nation our duty is to go ahead with the health system, we are health professionals, we cannot go to carpentry." **DMO**

Teamwork and support

The qualitative data taken for this study shows that overall staff remained available in facilities to manage not just the EVD epidemic but also their normal routine work. Despite fears for themselves and their family staff were committed to supporting each other and providing good patient care.

"I had to be strong, I have to be there for them [colleagues]." **DHS**

"This is Ebola, let's say this is a fight, we are fighting, you are the soldiers fighting a common enemy, an enemy which you don't know and you have you junior colleagues in the field and you as the head when you hear a gunshot you start to run, what would happen, everybody will run away, even when you are afraid you stay, you have to face it, because if you start running everybody will run away." **DHS**

"We would tell our nurses that you should be prepared, you are trained, a nurse you go back to your place and you have places but assuring them that we have to continue to give them incentives." **DMO**

Response from MoHS and facilities to the epidemic

Issues of preparedness and knowledge of the EVD epidemic were a major theme that emerged. Staff reported not being ready for the EVD outbreak, of hearing about it from non-official sources and in the initial stages of facilities developing their own methods of coping. Training in IPC was given from a variety of INGOs and the Government, but some facilities reported receiving training late, lack of IPC/PPE equipment. In contrast, other facilities reported receiving frequent IPC training from multiple INGOs which appeared to be an uncoordinated response.

"Sierra Leone was never prepared for this outbreak. Sierra Leone is never prepared, we were not expecting it and we never prepared because the issue of emergency preparedness is always a big problem in this country." **DMO**

"We had the second training which was directed by the XXXXXX. She came here for IPC training and that was done and then she also came again with the XXXX on the same IPC training and besides that the national programme RCH also came in to look at the Ebola in the context of maternal and new-born health care." **DMO**

"So that at least if we have any suspect let it not go to the general ward, if we have any suspicion we put the patient in there, I think that was what we did in our little way, and we tried to train our staff on the Ebola disease itself and we tried to allocate some staffs at the isolation unit permanently that just in case we have any case." **MS**

"We did not receive [IPC] training at the initial peak period of the disease. It was at a later stage that we were trained." **SECHN**

Community response/perceptions to the epidemic

At the initial outbreak fear of contamination, mistrust of health facility staff and misinformation about EVD amongst the community meant that attendance at facilities was reduced. Patients who did come, whether due to having EVD or for maternity care often came late and so were sicker, leading to poorer outcomes. Some patients who did attend facilities reported that they were not receiving care that they would normally expect.

"Then the patients were like not coming to the hospital they were afraid. They said if they come we'll tell them they have Ebola." **Midwife**

"Most of those who were admitted during Ebola they eventually died because they were coming in very very very late, a lot of other people were interfering, by the time they found out that this one needs there were no way out, they come but extremely late." **Medical Superintendent**

As the outbreak progressed initiatives were set in place by the Government, DHMTs, facilities and INGOs to sensitise the community to the reality of EVD and the need to still go for care. Women seemed to listen to their peers who had positive experiences of care which encouraged them to attend. Facility staff made every effort to engage with the community, although sometimes persistent lack of supplies meant that they did not always receive optimum care.

"Yes, we are about to begin outreach programs to sensitize and encourage people to attend clinic. We are also working with the paramount chiefs to help sensitize people." **SECHN**

"It is actually very good to attend ANC and deliver in the hospital if you get pregnant again. When you go to the hospital you will be given appropriate care. It might be that your baby got ill because of he slaps he received to make him cry which I not the right method." **Service user**

NGO response/support to the epidemic

All interviewees reported having some contact with INGOs during the EVD epidemic, in some cases this was a continuation of previous partnerships in others new partnerships. Though staff did appreciate the effort of INGOs they also voiced many frustrations which are important to address for post EVD recovery. The expectations of INGOs compared to facility staff were not always the same and this resulted in frustrations amongst health care workers.

"Regular training we had a lot for the support staff and nursing staff. We had a lot from XXXX NGO." **Doctor**

"Many people have been here. They usually collect data and leave." **CHA**

"And then we have an NGO they are not very effective they came for Ebola activity and then since the holding centre was here they said they wanted to support the hospital because they saw our problems. They are saying they want to help but am not seeing it effective." **Matron**

Perceptions on recovery

Interviewees were asked what they thought was needed for post EVD recovery within the health care sector. Many staff had good ideas on where services should be targeted and how this could be achieved. Senior staff were aware of the Government's proposed recovery plan and long term strategy and had been involved in this in some way. From hospital staff there was a perception that they were neglected for primary care, including supplies and training. Support from outside Sierra Leone for recovery was also mentioned but again there was some scepticism on how effective this would be.

"I think Ebola has taught us a lesson if we want to forge ahead we should learn from these lessons and like the hospitals I am sorry to say that we were like neglected somehow because there were times trainings are not coming on for our staff, provision of materials we use day to day were not supplied regularly, there are times we did not have soap and other toiletries." **Midwife**

"I know primary health care is paramount to prevent diseases but whatever preventive measure you take if they fail… like the Ebola it started in the community and is going to end in the hospital. Whatever you say the last case will end in the hospital. If the hospitals are not ready, are not equipped." **Midwife**

"Government is trying to put like a 5-year plan to start in 2016 or so and so I'm sure other organisations are also working on trying to improve on the health system for post Ebola." **MS**

"They are always coming but the white man's programmes are too slow as they will come and write on things to improve on but it will take them a lot of time before coming or getting to us back." **MCHA**

Conclusion

This study focused in particular on the provision of maternal and newborn health services within BEmONC and CEmONC facilities which are key providers of care for this group of patients. The aim was to determine if and how the EVD epidemic had affected patient care and what lessons could be learnt for improving service provision.

There has been some anecdotal evidence about a reduction in provision of maternal and newborn care during the epidemic and the impact this has on key health indicators such as maternal and newborn deaths. In July 2015 WHO projected that an additional 4,000 women could die because of complications of pregnancy and attributed this in part to a loss of health care workers in affected countries. The loss of so many health care workers in Sierra Leone may impact on provision of care, especially in the hardest hit areas such as Kailahun and Kenema. However, the precise effect of this loss remains unclear. One of the key findings from this research is that facilities were able to maintain some of their services during the epidemic but that public fear and lack of confidence in service providers led to the public staying away from facilities.

There were also many concerns during the height of the epidemic that health care workers were refusing to care for patients because of the risk to themselves and their families. There is some evidence that health care workers did leave their posts at the initial stages of the outbreak but there is no evidence to say that this was the majority of staff or what direct effect this had on patient care. Indeed the evidence from this study shows that facilities had similar numbers of senior cadres of staff, (doctors, midwives, registered nurses, CHO) during the epidemic as in the previous year. Facilities were explicitly asked what staff were available each month, if staff had left the facility – for example to work in holding or treatment centres – then they were not included in the numbers. Key informant interviews also support this finding. Managers reported that some staff were afraid to work during the outbreak and others moved to holding or treatment centres but that the majority of staff within the BEmONC and CEmONC facilities remained. Health care in Sierra Leone is provided by a network of 1219 peripheral health units and it may be that staff were moved from these community based units to EVD treatment and holding facilities, but these facilities are not looked at in this report.

The question of why staff numbers remained relatively stable during the EVD epidemic in these facilities is likely to be multifaceted. The numbers of cases of EVD in each district would influence if staff needed to be transferred to holding and/or treatment centres; possible transfer of staff from closed PHUs to the BEmONCs and CEmONCs; the numbers of external INGO workers in holding and treatment centres; may all have influenced staff numbers. Even when staff numbers remained stable their ability to provide care would still be influenced by the resources that were or were not available to them.

Managers at DHMT and facility level expressed that they felt morally obligated to remain and provide leadership and patient care despite severe risks to themselves, thereby setting an example to their staff and motivation to stay. The bravery of health care workers in remaining in their posts should be recognised both within and outside Sierra Leone.

Despite the presence of health care workers, there was a decline in the numbers of women receiving care in the facilities. The numbers of deliveries, ANC and PNC visits fell as did the numbers of caesarean sections, despite facilities reporting that they were able to provide these services. The implications from this are that though services were available women were reluctant to use them for fear of contracting EVD. This is supported by data from the key informant interviews, which shows that women were not just afraid of contracting EVD but that they believed health care workers were part of an EVD conspiracy. Prior to the EVD outbreak, traditional healers were often seen by many as the first people to go to for care and this continued, and perhaps increased, during the EVD epidemic, as mistrust in health care workers increased. A combination of mistrust of health care workers, lack of understanding of EVD and faith in herbalists combined to reduce the numbers of women receiving care. The implications for this were voiced by some informants who reported that women attended facilities late with increased complications.

The pattern of spread of EVD, the peak number of cases and the numbers of confirmed cases and deaths was not uniform throughout each district. Some districts for example Bonthe, reported relatively few cases compared to others. As might be expected when the first cases of EVD were diagnosed, numbers attending facilities started to decline. However, the rate of this decline varied within each district, for example in Kenema, there was a sharp decrease in ANC and PNC visits as EVD cases began to peak compared to Port Loko where there was a much less sharper decline which then plateaued out before falling again at the peak of the epidemic. As EVD case numbers fell, facility visits and deliveries generally started to rise but not necessarily to pre EVD numbers.

Another major influence on the facilities would be how they were used during the EVD crisis. Staff reported that some maternity facilities were turned over to help with the EVD response or became treatment or holding facilities. Beds and equipment were moved to treatment centres but not necessarily returned to facilities as EVD cases dropped.

It would be misleading to assume that across the whole country there would be a uniform response to the epidemic, especially given the different timescale of EVD in each district. Kailahun was the first district to report cases in May 2014, three months ahead of the first cases in Kambia and it is reasonable to assume that public awareness and preparedness for potential EVD cases was increasing across the country during that time. The differing cultures and societal norms within each district would also need to be taken account of when looking for an explanation of why and how EVD spread more in some districts than others, and how this contributed to attendance at facilities.

Health infrastructure, resilience (that is the ability to maintain services during increases in demand such as epidemics) and preparedness also came out as an area of concern within the key informant interviews. Staff reported having stock outs of drugs, lack of equipment, too few specialist staff prior to the outbreak. In some cases, this was exacerbated by the epidemic. In others, the response of Government and NGOs meant that service provisions actually improved, especially in areas of infection prevention and control.

NGOs played a major role in helping to combat the epidemic both in provision of resources and personnel. This contribution was well received but there are also lessons to learn for NGOs which emerged from the key informant interviews. Comments in key informant interviews showed health care workers were concerned about the lack of a coordinated response in IPC training. There was also a request from health care workers for agreement of expectations with INGOs of projects and following through on agreed or promised help. The Sierra Leone Government has announced revised ways of working with NGO which include the need for national rather than local programmes and for standard operating procedures which are agreed from district to ministerial level.

The key take-home message from this study is that the most significant effect of the EVD outbreak was on the uptake of services by the public rather than on the provision of services.

A lack of resilience within health care services did not significantly contribute to reductions in uptake but a lack of public confidence and understanding of Ebola did. That is not to say that the availability and quality of maternal and newborn care within Sierra Leone meets required levels but that the EVD outbreak, by and large, had little effect on this. It was public fear and lack of trust that contributed to reduced ante and post-natal visits and a reduction in facility deliveries.

Recommendations for action

The following recommendations for district health medical teams (DHMTs) and the Ministry of Health and Sanitation (MoHS) take into account the current levels of service provision and the impact of EVD on uptake of services:

1. Ongoing long term sensitisation of the public on EVD to ensure no re-emergence in districts which are considered clear, and to eradicate in remaining districts.

2. Implementing effective long term health education programmes nationwide on maternal and newborn health to inform the public of the need for ANC/PNC visits and facility delivery.

3. Nationwide review of training in maternal and newborn health (MNH) at all levels both at pre and post-graduate level, and the skills that will be needed in the short, medium and long term.

4. Re-examination of the improvements needed in MNH which goes 'back to basics' to ensure that a resilient health system is in place that can withstand future health emergencies.

5. Development of national and district level major incident plans with appropriate training for health care workers, district councils, police and key public agencies

6. Development of permanent isolation facilities within each district at CEmONC level.

7. Ongoing training and updates in IPC and use of PPE is needed to ensure that staff continue to adhere to the principles.

8. National policies and procedures for IPC/PPE should be available to all facilities.

9. Training on IPC/PPE should begin at pre-service education levels. Mandatory annual updates for all staff on IPC/PPE should be introduced and provided as cascade training within facilities.

10. INGOs to work more closely with the government and each other to ensure a coordinated effort to improve maternal and newborn health care.

11. INGOs to be held to account by the government, District Health Management Teams (DHMTs) and the public if programmes are not developed as agreed.

12. Development of peer support networks in each district to help build staff resilience and reduce levels of stress post-EVD, and in the long term.

VSO Sierra Leone

192 Wilkinson Road
Upper Kandeh Drive
Freetown
Sierra Leone

+232 76 775739

www.vsointernational.org

Centre for Maternal and Newborn Health

Liverpool School of Tropical Medicine
Pembroke Place
Liverpool
L3 5QA

+44 (0)151 705 2500

mnhu@liverpool.ac.uk

ISBN 978-1-903697-91-7