



Government of Sierra Leone



Sierra Leone Rapid Emergency Obstetric and Newborn Care (EmONC) Assessment 2017 EXECUTIVE SUMMARY



Editor: Anita Palathingal

Design and Layout: Stephanie Tailleux

Front cover @Olivia Acland

CONTENTS

ACKNOWLEDGEMENTS		4
EXECUTIVE SUMMARY		5
EmONC indicators and readiness		6
Performance of other maternal and newborn health services		7
Facility infrastructure and communication		8
Human resources		9
Essential drugs, equipment, and supplies		9
Referral system		10
CONCLUSION		11
RECOMMENDATIONS		12
Coverage and readiness for EmONC		12
Other MNH services		15
Infrastructure		16
Human resources		18
Drugs, equipment and supplies		19
Referrals for EmONC		22

ACKNOWLEDGEMENTS

Sierra Leone's country core team is very grateful to the Ministry of Health and Sanitation (MoHS) for its leadership and coordination for the successful completion of this assessment. The core team also extends its appreciation to UNFPA for overall coordination and technical support.

The team also acknowledges the financial and technical support of many agencies, including UNICEF, WHO and UK aid, that were committed to the successful completion of this assessment and to the implementation of interventions to improve the health system, based on the findings.

Appreciation goes to the data collectors and supervisors for their professional undertaking in the data collection and supervision, as well as all the health facility managers and health care workers who contributed to the data collection. Without them, this assessment would not have been successful. The core team also acknowledges the unreserved support and dedication of its members and the Technical Working Group that coordinated and facilitated this assessment.

EXECUTIVE SUMMARY



According to United Nations (UN) estimates, Sierra Leone has the highest maternal mortality ratio (MMR) of 1,360 deaths per 100,000 live births and 1 in 17 bear a lifetime risk of dying during pregnancy or childbirth. Despite substantial declines in the MMR in the last two decades from 2,900 in 1995 to 1,900 in 2005 and to 1,360 in 2015, the MMR in 2015 remains the highest in the world. Similarly, Sierra Leone also has very high child, infant and neonatal mortality rates: 156, 92 and 39 per 1,000 live births, respectively. Apart from maternal and child mortalities, Sierra Leone had been tested through multiple trajectories of economic and health crises including the Ebola disease in the last decade.

Sierra Leone's 2017 Emergency Obstetric and Newborn Care (EmONC) Assessment was the

second such assessment since the first one conducted in 2008. The 2017 EmONC covered all hospitals and a sample of Community Health Centres (CHCs) and clinics that provided delivery or maternity services at the time of the survey.

The survey used abridged versions of the Averting Maternal Death and Disabilities Program's recent EmONC assessment tools (Modules 1 to 5): infrastructure, communication, transportation, human resources and service statistics over a 12-month period (deliveries, newborn outcomes, direct and indirect obstetric complications, maternal and neonatal deaths, and referrals).¹ The provision of EmONC signal functions and other maternal and newborn health services were also covered in this assessment.

All public and private hospitals and a 50 per cent sample of CHCs and private clinics were selected for this assessment. Accordingly, a total of 181 hospitals, CHCs and clinics (public and private) were visited and 173 that provided delivery services in the last 12 months prior to the survey were included in this analysis. Sixty-eight health personnel with a minimum health background qualification of a diploma (with two years of college education) served as data collectors and supervisors. Data collection was conducted between August and September 2017.

The data analysis for this report used a weighting procedure to represent and generalize at the national and district levels due to a mix of methods (census of hospitals and sample of CHCs/clinics) used for data collection. Unless specified in each of the specific texts or tables, absolute values (n's) are presented unweighted and all proportions, percentages and rates are presented weighted.

¹ The Averting Maternal Death and Disability Program (AMDD) is part of the Department of Population and Family Health in the Mailman School of Public Health at Columbia University in New York City. Tools are accessible at AMDD's website: <https://www.mailman.columbia.edu/research/averting-maternal-death-and-disability-amdd/toolkit#toolkit>.

Key findings and recommendations

EmONC indicators and readiness



Based on the UN handbook of EmONC signal functions,² a facility qualifies as Basic if it performs all the seven basic signal functions (parenteral antibiotics, anticonvulsants and uterotonics (all by injection), manual removal of placenta, removal of retained products of conception, assisted vaginal delivery (AVD) with vacuum extractor or forceps, and neonatal resuscitation with bag and mask) and it qualifies as Comprehensive if it performs all the Basic plus caesarean delivery and blood transfusion in the last three months prior to the survey.² Accordingly, UN recommends a minimum of five EmONC facilities for every 500,000 population, of which, at least one of the five EmONC facilities should be comprehensive.

- In 2017, Sierra Leone was required to have 73 EmONC facilities – 58 Basic Emergency Obstetric and Newborn Care (BEmONC) and 15 Comprehensive Emergency Obstetric and Newborn Care (CEmONC) – and 62 were fully functioning as EmONC (85 per cent of the recommended number; 41 BEmONC and 21 CEmONC), leaving a gap of 11 EmONC facilities.
- Out of the total 73 required EmONC facilities, 15 comprehensive EmONC facilities were required. Sierra Leone exceeded this recommendation by having 21 functioning comprehensive EmONC facilities (148 per cent).
- Coverage of EmONC facilities by district was also observed as a gap of one to five EmONC facilities in nine out of the 14 districts (Kono, Bombali, Kambia, Port Loko, Tonkolili, Bo, Moyamba, and Western Rural and Urban). In terms of CEmONC facilities, only Moyamba and Western Rural had a gap of one CEmONC each.
- When we look at the facilities that are partially functioning as EmONC, 41 per cent of the total facilities were missing only one or two basic EmONC signal functions. These facilities were distributed across all districts with the highest in Bo (10 facilities), followed by Western Urban (nine facilities), and Kenema, Port Loko, and Moyamba (seven facilities each), and Kailahun and Bonthe (five each) to the lowest in Kambia and Koinadugu (two each).



Facility readiness to provide EmONC signal function is a composite indicator that helps to measure a facility's preparedness to provide EmONC services. Readiness is defined as the availability of at least one health worker cadre on staff who can provide the signal function and the availability of a minimum package of drugs, supplies and equipment.^{2,3}

- Overall, hospitals and CHCs/clinics were better staffed than equipped. This meant that facilities were not fully prepared to provide EmONC signal functions primarily due to lack of the required drugs, equipment and supplies than lack of health personnel.
- Of the seven basic EmONC signal functions, facilities were the least ready to provide removal of retained products of conception (26 per cent) services and AVD (42 per cent).
- Fifty-four per cent of the facilities did not provide AVD and 68 per cent did not perform removal of retained products of conception. The most pertinent problem for the non-performance of AVD was lack of equipment and supplies; and for removal of retained products, no indication, (no pregnant woman presented that required these procedures) lack of equipment/supplies and training were cited as the main reasons.
- Hospitals were the least ready to provide caesarean section (CS) deliveries and blood transfusions among all signal functions. Although hospitals were better staffed, they lacked supplies and equipment. In addition, actual performance of these signal functions was higher than their readiness to provide caesarean delivery and blood transfusion, indicating that hospitals might be providing these services under suboptimal conditions.

Overall, facilities were not fully prepared to provide EmONC signal functions primarily due to lack of the required drugs, equipment and supplies than due to lack of health personnel.

2. WHO, UNFPA, UNICEF, AMDD. 2009. *Monitoring emergency obstetric care: a handbook*. Geneva: World Health Organization.

3. The minimum package of drugs, equipment and supplies is determined based on a country's national standards or basic packages.

- Eighteen and 15 per cent of hospitals did not provide caesarean delivery and blood transfusion, respectively. Lack of training or skilled health workers, and a lack of supplies and equipment and weak management were some of the bottlenecks.



The institutional delivery rate rose from 10 per cent in 2008 to 28 per cent in 2016. This indicates that 72 per cent of the expected births took place either at homes or at lower level of health facilities (health posts) or never been reported in hospitals and CHC/clinics. Koinadugu, Kono and Tonkolili had the lowest proportions of expected births that took place in hospitals and CHCs/clinics.



From the 28 per cent of expected births that took place in hospitals and CHCs/clinics, over 80 per cent were in facilities that were not able to provide one or more signal functions.



Met need for EmONC⁴ in 2017 (15 per cent) was twice as high as in 2008 (7 per cent). Although progress had been made, the achievement was far below the UN standard of 100 per cent. Ten of the 14 districts (Moyamba, Bombe, Kailahun, Port Loko, Tonkolili, Kono, Kambia, Bombali, Koinadugu and Bo) were even below the national average (15 per cent).



A huge reduction of direct obstetric case fatality rate (DOCFR)⁵ was found, from 7 per cent in 2008 to 3 per cent in 2017. **Yet, the DOCFR rate remains higher than the international standard (<1 per cent).**

- Of the 475 weighted total maternal deaths, PPH/retained placenta (16 per cent), severe pre-eclampsia/eclampsia (16 per cent), and obstructed/prolonged labour (11 per cent) were the top three leading causes of maternal deaths over all other direct and indirect obstetric causes.
- When we looked at the cause-specific case fatality rates, PPH/retained placenta (24 per cent), severe pre-eclampsia/eclampsia (24 per cent), and obstructed/prolonged labour (17 per cent) were again the top three cause-specific case fatalities for mothers.



Intrapartum and very early neonatal death rate in EmONC facilities in 2017 was 34 per 1,000 deliveries, which is twice as high as in 2008 (17 per 1,000 deliveries).



Almost all facilities are using different register books for recording maternal and newborn care services. Despite facilities using a labour and delivery register (one of the many registers used to collect data on delivery, complications and maternal and newborn outcomes), only 63 per cent of hospitals and 74 per cent of CHCs/clinics had the registers complete and up-to-date.

Performance of other maternal and newborn health services



Based on self-reported data, facilities in all districts except Bo (72 per cent) and Bonthe (77 per cent) provided obstetric and neonatal care services 24/7 and only 57 per cent of private for-profits provided obstetric services 24/7.



Obstetric surgery, general and spinal anaesthesia services were provided in only 87, 82 and 80 per cent of hospitals, respectively.



All facilities provided the Active Management of Third Stage of Labour (AMTSL) and used the partograph for labour monitoring. The provision of family planning (FP) methods for post-abortion care cases, however, was reported only in 67 per cent of facilities.

3. The minimum package of drugs, equipment and supplies is determined based on a country's national standards or basic packages.

4. According to the UN estimate, 15 per cent of expected births are expected to develop major direct obstetric complications. Met need for EmONC is, therefore, defined as the proportion of women with major direct obstetric complications who were treated in the health facilities divided by the expected complications.

5. DOCFR is the proportion of women with direct obstetric complications who deliver in facilities and die before discharge.

-  Kangaroo Mother Care (KMC) was provided in 60 per cent of the facilities. Western Rural and Urban, Bonthe, Bombali, Kambia, and Koinadugu had the lowest proportion of facilities providing KMC. However, this assessment did not assess the provider's real understanding of what KMC is. It is often misunderstood and interchangeably used as skin-to-skin care.
-  Provision of corticosteroids for pre-term and low birth weight babies among districts ranged from none in Western Rural to 87 per cent in Pujehun and 75 per cent in Kailahun.
-  Coverage of essential newborn care for premature and/or low birth weight babies was also very low as only **45 per cent** of facilities were providing it.
-  **Repair and treatment of obstetric fistula was provided in only 8 per cent (n=39) of hospitals.** These few facilities were distributed only in Tonkolilii, Bo and Western Urban and all were private not-for-profit.

Facility infrastructure and communication

-  Availability of beds in the health facilities was assessed and the ratio of maternity beds (obstetric/ gynaecology + labour and delivery) to 1,000 deliveries met the international standard of 30–32 beds.
-  Ninety per cent of hospitals had operating theatres (OTs). Despite the fact that CHCs and clinics were not expected to have OTs, 2 per cent of them reported that they had an OT. These were private clinics that had the infrastructure set-up and required staffing to provide surgical services.
-  Most facilities had corners for newborn care; but only **13 per cent of hospitals and none of the CHCs/clinics had Neonatal Intensive Care Units (NICUs)**. None of the facilities in Kailahun, Kono, Kambia, Koinadugu, Port Loko, Bonthe, Moyamba, Pujehun or Western Urban had a separate room for NICUs.
-  Despite a large proportion of facilities (89 per cent) having a source of electricity, districts like Bonthe and Kenema had large gaps, as **only 46 per cent and 69 per cent of their facilities had a source of electricity**. Even in districts with greater coverage of electricity, interruptions for a day or more was common.
-  Availability of water was quite encouraging at the national level as **94 per cent of the total facilities had a source of water**. However, severe shortages of water were observed in 41 per cent of the facilities in Western Rural district.
-  Functioning toilets existed in most facilities across the country except in Western Rural, where only 59 per cent of the facilities had them.
-  On-site communication mechanisms existed in almost every facility, but the main challenge was that facility communication was highly dependent on individual cell phones and there was no clear or even existing policy regarding the reimbursement of staff for use of their cell phones.



Human resources

-  This assessment shows **severe shortages in availability of all categories of health workers**, except obstetrician/gynaecologists and general surgeons. The shortage affected all government health facilities, except the national/maternity hospital which had some gaps only with regard to nurses and lab technicians.
-  A huge gap was observed among nurses (needed 1,112), Community Health Officers (CHOs) (needed 509), maternal and child health aides (MCHAides) (needed 494), and midwives (needed 239). Lab technicians, nurse anaesthetists and medical doctors (MD) were also among the deficits.
-  Availability of health worker cadres 24/7 was a challenge in most sites. The assessment shows staff were more likely to be on site during the day, Monday through Friday, than at night or during weekends and holidays. The difference was greatest among obstetrician/gynaecologists, paediatricians, surgeons, and MDs in hospitals and lab technicians in the CHCs/clinics.
-  In hospitals, provision of basic EmONC signal functions were highly dependent on obstetrician/gynaecologists, MDs, Surgical Assistant Community Health Officers (SACHOs), CHOs, midwives and nurses; while caesarean deliveries were dependent on obstetricians/gynaecologists, general surgeons and SACHOs. Blood transfusions depended on the above-mentioned health workers plus midwives. Provision of regional/spinal/epidural anaesthesia was also dependent on anaesthesiologists (MD)/anaesthetists.
-  In CHCs/clinics, CHOs and midwives were the key staff that provided most of the EmONC services and nurses for the provision of parenteral drugs.
-  Comparing availability of the health workforce against the international standards ^{6,7}, **Sierra Leone did not meet the standard for the health workforce** – a target of seven midwives per 1,000 deliveries and 23 combined health worker cadres (physicians, midwives, and nurses) per 10,000 population. The findings stood at **five midwives per 1,000 deliveries and four physicians, midwives and nurses per 10,000 population**. Only four districts (Western Urban, Koinadugu, Kono and Bombali) met the standard for the number of midwives; and none of the districts met the health worker to population ratio.

Essential drugs, equipment, and supplies

-  All facilities reported having a pharmacy/drug store or supply of medicines.
-  For most facilities the government was the major source of medicines and supplies.
-  **Availability of essential drugs in Sierra Leone was also a huge bottleneck** as parenteral antibiotics were not available in 37 per cent of facilities, atropine in a quarter of facilities (25 per cent), magnesium sulphate (injection) in over a fifth of facilities, and ketamine and oxytocin in 19 per cent and 17 per cent of the facilities, respectively. Two of the regional hospitals had stock-outs of magnesium sulphate and oxytocin.
-  **The most common cause of delays in the supply of medicines among hospitals cited was stock-outs at the central medical stores** (45 per cent); while among CHCs/clinics, lack of transport (45 per cent) and stock-out at the central store (40 per cent) were the major problems.
-  All hospitals had one or more antibiotics, anticonvulsants, oxytocics/ prostaglandins and drugs used in emergencies, while most (79 to 90 per cent) of CHCs/clinics had one or more of these drugs.
-  Overall, 92 per cent of health facilities had one or more intravenous fluids and antimalarials.

6. United Nations Population Fund. 2011. *The State of the World's Midwifery 2011*. New York: United Nations Population Fund.

7. World Health Organization. 2010. *Monitoring the building blocks of health systems: a handbook of indicators and their measurement strategies*. Geneva: WHO.

-  Antiretrovirals, analgesics and anaesthetics were found in 84, 83 and 82 per cent of the facilities, respectively. Nationally, almost all facilities had one or more contraceptive methods; but only 66 per cent had emergency contraception.
-  Vitamin K for newborns was available in almost all (95 per cent) hospitals and 25 per cent to 38 per cent of CHCs and clinics.
-  Chlorhexidine was available in 91 per cent of facilities.
-  The most common available newborn resuscitation equipment was the mucus extractor (96 per cent), ambu bag (96 per cent) and infant facemask (90 per cent).
-  The most widely available guidelines (91 to 93 per cent of facilities) were FP, focused antenatal care, Human Immunodeficiency Virus (HIV) Prevention of Mother-to-Child Transmission, immediate newborn care and infection prevention for HIV.
-  Gloves (98 per cent) and decontamination containers (91 per cent) were the most common available basic items.
-  Stethoscopes (96 per cent) and blood pressure cuffs (85 per cent) were the most commonly available basic equipment in the maternity units. Ultrasound was available in 53 per cent of district and 83 per cent of other hospitals. A functioning autoclave with temperature and pressure gauge was found in 52 per cent of facilities. Almost all of the facilities had at least one complete delivery set. The average number of delivery sets available was three per facility.
-  **Eighty-two per cent of district hospitals and 94 per cent of other hospitals had OTs.** Among hospitals that had an OT (n=35), only 54 per cent and 60 per cent of them had anaesthesia apparatus and oxygen cylinders, respectively.
-  **Laboratories were available only in 46 per cent of CHCs and 21 per cent of clinics.** Refrigerators were found in 59 per cent of district hospitals, 65 per cent of other hospitals and only 2 per cent of clinics with a laboratory.

Referral system

-  Nationally, only **21 per cent of the facilities had a functioning motor vehicle ambulance**; while 23 per cent of facilities had at least one mode of transportation, required for transporting referrals. Kambia, Kenema, Tonkolili, Kono, Bombali, Bo and Bonthe had the lowest proportion of facilities (6 per cent to 18 per cent) having at least one mode of transportation.
-  **Six of the seven hospitals that did not provide surgical services were within the recommended 25-kilometre radius from the nearest hospital that had surgical services**, to facilitate referral services. Forty-six per cent of CHCs/clinics were within the 25-kilometre radius, while over a third of them were over the 25-kilometre radius. Seven out of 14 districts had facilities within this distance.





Coverage of EmONC facilities in Sierra Leone increased dramatically since 2008 (from 24 per cent to 85 per cent of the UN recommendation)

CONCLUSION

The 2017 EmONC assessment identified the gaps and progress made since the 2008 EmONC, which was the first assessment taken as a benchmark. Coverage of EmONC facilities in Sierra Leone increased dramatically since 2008 (from 24 per cent to 85 per cent of the UN recommendation). But the distribution of the EmONC facilities varied widely among districts with some having a chronic problem in the availability of EmONC facilities. The proportion of institutional deliveries also rose from 10 per cent in 2008 to 28 per cent in 2016. Yet, 72 per cent of the expected births happened either at homes or at lower level of health facilities (health posts), in which skilled birth attendance is always a debate and they often lack the required drugs, equipment and supplies to manage complications. Institutional delivery was very low in Koinadugu, Kono and Tonkolili. Even in the 28 per cent of the expected births that took place in hospitals and CHCs/clinics, over 80 per cent of the deliveries took place in facilities that missed one or more signal functions.

Facility readiness to provide EmONC signal functions is one of the crucial elements of analysis useful for planning. As readiness was defined in section 3.9, both hospitals and CHCs/clinics were better staffed than being equipped and supplied. This meant most of the facilities were challenged by a lack of adequate and required drugs, equipment and supplies to provide all the nine EmONC signal functions. More specifically, of the seven basic EmONC signal functions, facilities were the least ready to provide removal of retained products of conception (26 per cent) and AVD (42 per cent).

Maternal and newborn care services are highly dependent on the availability of qualified and skilled health workers. This assessment shows severe shortages of all categories of health workers, except surprisingly, obstetrician/gynaecologists and general surgeons. The shortage affects all government health facilities, except the national/maternity hospital with few gaps in nurses and lab technicians. A huge gap was observed among nurses (1,112), CHOs (509), MCHAides (494) and midwives (239).

Utilities like electricity, water, and communication materials are very helpful to facilitate quality service delivery. Despite a large proportion of facilities (89 per cent) with a source of electricity, districts like Bonthe and Kenema had gaps in the availability of electricity as only 46 per cent and 69 per cent of their facilities had a source of electricity. Even in districts with greater coverage of electricity, interruptions for a day or more were common in many of the districts. Similarly, availability of water was quite encouraging at the national level, but there was a severe shortage in 41 per cent of the facilities in Western Rural. Availability of a functioning toilet was present in almost every facility across the country, except in Western Rural, where it was found only in 59 per cent of the facilities. On-site communication mechanisms also were found to exist in almost every facility, but were challenged by the fact that facility communication was highly dependent on individual cell phones, which were very widely available, yet a reimbursement policy for this usage did not exist.

Referrals is one of the critical elements of a health system; particularly for the lower level of care facilities that often do not provide a full spectrum of health services. This assessment shows only 21 per cent of the facilities had a functioning motor vehicle ambulance while 23 per cent of the facilities had at least one mode of transportation. This leaves a huge gap to be filled in order to have an effective referral system in the country. Half of the districts fell below the national average in having at least one mode of transportation. The distance and time to reach the nearest facility with surgical services were also assessed and the results show one of the seven hospitals and over a third of CHCs/clinics that did not provide surgical services were within the distance radius of over 25 kilometres of surgical facilities. Seven out of 14 districts were in this distance range.

Governments are always constrained by a lack of resources and Sierra Leone is no different. As a priority, instead of stretching to upgrade every lower level facility, it is advisable to define the national network of EmONC facilities by focusing on a targeted number of those facilities that have an important catchment area (within 2 hours travel time) and were missing only one or two signal functions. These facilities are distributed across all districts with the highest needed in Bo (10 facilities), followed by Western Urban (nine facilities), Kenema, Port Loko, and Moyamba (seven facilities each), Kailahun and Bonthe (five each) to the lowest in Kambia and Koinadugu (two each).

RECOMMENDATIONS

The recommendations are organized into the thematic areas: coverage and readiness; other MNH services; data quality of EmONC services; infrastructure; HR; drugs/equipment/supplies; and referral systems.



Coverage and readiness for EmONC

Coverage of EmONC facilities was not met as it was found to be at 85 per cent of the UN recommended level

Gaps

- Moyamba and Western Rural had a gap of one CEmONC facility each though CEmONC coverage at the national level was 148 per cent from the recommended;
- A gap of 11 BEmONC facilities in Kono, Bombali, Kambia, Port Loko, Tonkolili, Bo, Moyamba, and Western Rural and Urban.
- Of all the facilities, 41 per cent of them were missing only one or two signal functions and have the potential for upgrading to make them fully functioning BEmONC facilities.
- Only 10 per cent of the expected births took place in EmONC facilities. Of the total births, over 80 per cent of them happened in facilities that missed one or more signal functions.
- Met need for EmONC was only 15 per cent, way below the UN standard of 100 per cent. Ten of the 14 districts were even below the national average. This implies that 85 per cent of the expected complications were delivered or treated in a non-EmONC facility or the complications had never been reported.

Recommendations

- Work with partner organizations and donor agencies to prioritize resources to fill the afore-mentioned prioritized gaps (upgrading those facilities that miss one or two signal functions and a gap of CEmONC facilities in Moyamba and Western Rural districts). In upgrading these facilities, considerations of Geographic Information System mapping and referral networking are crucial, as distance and time to reach the nearest facilities with surgical services should be the primary assumption for equity.
- Designate EmONC facilities based on the recommended EmONC targets in each district and the following two elements of referral networking:
 - (1) Geo-spatial catchment population to facility proportion
 - (2) The minimal distance and time radius (within two hours of reach) to the nearest surgical facilities
- In the short term, support the existing EmONC facilities in providing good patient care with regular monitoring.
- Work with other line Ministries' and offices (like the roads authority) to simultaneously improve facility's road access.

Low readiness to provide parenteral antibiotics in all facilities

Gaps

- Only 47 per cent of the facilities were ready to provide parenteral antibiotics, while almost all facilities were actually providing them in the three-month reference period.
- The low readiness in both hospitals and CHCs/clinics was exacerbated by a lack of required drugs though there was a time difference in the question of availability of drugs (at the time of the survey) and performance of the signal function (last three months prior to the survey). Even if 91 per cent of facilities had one or more antibiotics, clindamycin was available in only 7 per cent of facilities, ampicillin in 34 per cent, metronidazole (injection) in 44 per cent, gentamicin (injection) in 56 per cent.
- The low readiness yet high provision might also imply either inappropriate cadre had been providing parenteral antibiotics or staff used antibiotics that were not recommended in the national standards.

Recommendations

- Facilities that lack the drugs of choice mentioned above should be supplied to effectively provide parenteral antibiotics.
- Further investigation or study should be conducted if facilities are providing antibiotics that were not recommended or inappropriate cadres are providing the drugs. It is important to build the capacities of midwives (both through training and deployment of additional midwives) to ensure provision of parenteral antibiotics by appropriate cadres; particularly in CHCs/clinics.

Low provision of parenteral anticonvulsants, among CHCs/clinics

Gaps

- Although 70 per cent of CHCs/clinics were ready to provide parenteral anticonvulsants, only 22 per cent actually provided it in the three-month reference period. The main reason for the non-provision was no indication (89 per cent).

Recommendations

- With the available data, it is very difficult to recommend concrete strategies, as we do not know the full spectrum of demand and supply side gaps. But, we recommend further investigation as to why pregnant women with hypertensive disorders are not visiting mid- and lower-level facilities, while pre-eclampsia/eclampsia and PPH/retained placenta were the two leading causes of maternal deaths in Sierra Leone (each constitute 16 per cent of the total maternal deaths).
- Triangulate this EmONC data with MDSR information to explore case management and location of maternal deaths.
- If women with hypertensive disorders access CHCs/clinics and they should be referred immediately, training of health workers in CHCs/clinics may be needed, as there could be lack of confidence among providers to, as an example, provide the loading dose of magnesium sulphate.

Hospitals and CHCs/clinics were least ready to remove retained products of conception (among the BEmONC signal functions)

Gaps

- Readiness of both hospitals and CHCs/clinics were primarily challenged by lack of MVA kits for the removal of retained products
- Nationally, only a little over a quarter (26 per cent) of the facilities were ready to provide this signal function. Actual performance was also below half.
- Vacuum aspirators/syringes were available in only 51 per cent of the facilities. Facilities with syringes, one type of lubricant and all cannulae were only 8 per cent.

Recommendations

As a priority equip facilities with MVA kits to provide this critical life-saving service.

Performance and readiness to provide AVD were low

Gaps

- Nationally, only 42 per cent of the facilities were ready to provide AVD, while only a third (32 per cent) of the facilities were actually providing it.
- Sixty-eight per cent of the facilities did not provide AVD in the three-month reference period. Lack of equipment (58 per cent) was the most frequently cited reason for the non-performance; followed by no indication (50 per cent), lack of training (34 per cent), and lack of human resources to provide the signal function (17 per cent).
- Only 12 per cent of facilities had a vacuum extractor, outlet or mid-cavity forceps. No such equipment was available in the national/maternity hospital, two or the three regional hospitals and 53 per cent of district hospitals.

Recommendations

- As a matter of urgency supply facilities with AVD equipment as facilities are highly likely to miss this signal function to fully function as EmONC.
- Boost provider's knowledge and motivation through in-service training to perform this signal function.
- Facilities that have no surgical services (seven hospitals and almost all CHCs/clinics) should be encouraged to use AVD with a proper referral system to facilitate surgery if needed.

Hospitals were least ready to perform CS

Gaps

- Only 23 per cent of hospitals were ready to provide CS.
- Lack of equipment contributed to the low readiness of hospitals; anaesthesia apparatus was available in only 54 per cent and oxygen cylinder found in 60 per cent of hospitals.

Recommendations

- Equip all hospitals that lack the necessary anaesthesia apparatus and oxygen cylinders to provide surgery services.
- The quality of care associated with CS needs to be investigated, particularly in government hospitals, that provided CS at a higher rate (26 per cent) than private facilities. Based on WHO's recent evidence about CS, over 10 per cent CS rate is not a guarantee to save the lives of mothers and their newborns.

Readiness of hospitals to perform blood transfusion was low

Gaps

- Only 46 per cent of hospitals were ready to provide blood transfusions.
- Over 80 per cent of hospitals actually provided blood transfusions. This implies that facilities might have provided blood transfusion under suboptimal conditions.
- Lack of equipment and supplies contributed to the low readiness of hospitals:
 - Refrigerator for blood bank was available in 59 per cent of districts and 65 per cent of other hospitals;
 - Microscopes were available in one of the regional, 24 per cent of district, and 41 per cent of other hospitals;
 - Only 65 per cent of district hospitals had blood typing and cross-matching reagents.

*Only 46%
of hospitals
were ready to
provide blood
transfusions*

Recommendations

- Equip all hospitals with refrigerators, compound microscopes, blood typing and cross matching reagents to provide uninterrupted blood transfusions for those in need.
- Further study is recommended to identify where the hospitals get their supply of blood and to ensure a steady supply chain as this assessment did not capture the source of blood supplies.



Other MNH services

Low provision of FP methods for PAC cases

Gaps

Only 59 per cent of the facilities at the national level provide PAC FP methods. In Koinadugu, Kono, Kenema, and Bombali districts, fewer than 1 per cent of the facilities provided FP methods for PAC cases.

Recommendations

Ensure counselling and supply of FP methods for PAC cases, as almost all facilities (98 per cent) had any of the modern contraceptives in stock.

Low coverage of KMC

Gaps

- KMC was provided in only 60 per cent of the facilities. Western Rural and Urban, Bonthe, Bombali, Kambia, and Koinadugu had no facility providing KMC.
- Field observation and anecdotal information informed us that providers often consider KMC as only skin-to-skin care of a newborn.
- Availability of KMC guidelines was only 69 per cent at the national level and 52 per cent in clinics, 56 per cent private hospitals, 59 and 67 per cent in district and regional hospitals respectively and 72 per cent in CHCs.

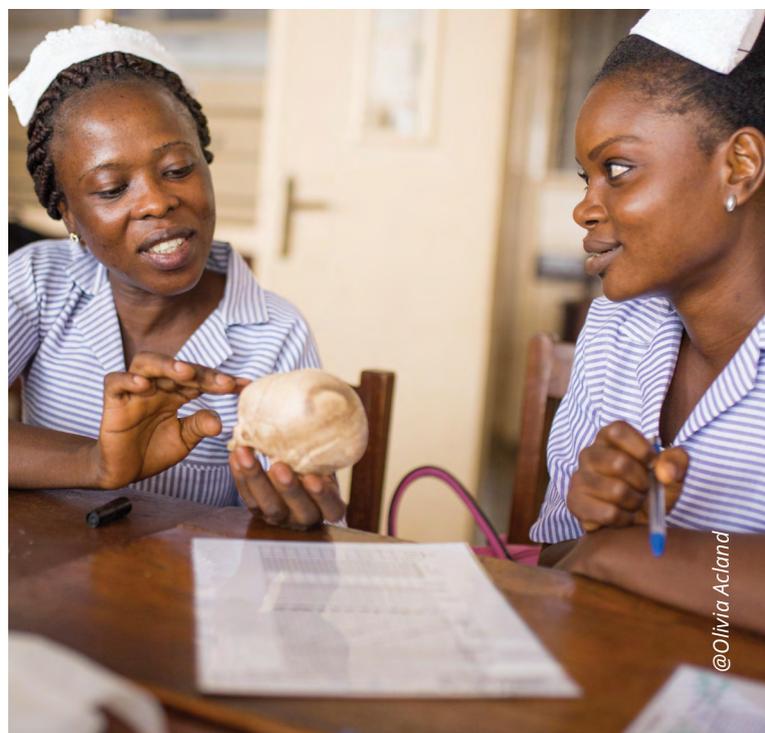
Recommendations

Train midwives and nurses in KMC as a priority and distribute of KMC guidelines as KMC is a key intervention for saving newborn lives, especially for low birth weight babies. Though small, the proportion of low birth weight babies in this assessment was 3.4 per cent (of the weighted total of live births 103,056).

Low performance of respectful maternity care

Gaps

- Thirty-nine per cent of facilities did not have sufficient lights at night.
- Seventy-four per cent of the facilities did not have fans or air-conditioning in their maternity areas.
- Thirty-six per cent of facilities did not have curtains as a means of privacy for patients.
- Twenty-five per cent did not have a waiting area in the maternity area for visitors and family.
- Nine per cent of CHCs/clinics did not have functioning toilets, particularly in Western Rural, Bombali, Kono, Kenema, Bonthe, Portloko and Western Urban districts.



Recommendations

It is known that respectful maternity care improves institutional delivery and thereby the treatment of major direct obstetric complications. It also improves the met need for EmONC. Hence, it is imperative to fulfil the above mentioned infrastructure amenities in all facilities and districts that lack such amenities.

Poor data quality of EmONC services

Gaps

- Unavailability of OT register in 13 per cent of hospitals; unavailability of maternal death (63 per cent), PNC (31 per cent), PAC (72 per cent) and MDSR (66 per cent) of facilities.
- Despite a large proportion of facilities with a labour and delivery registers, only 73 per cent and 79 per cent of them respectively had the register complete and up-to-date. Other registers were even less complete and up-to-date than the labour and delivery registers.
- The data showed that the number of newborn outcomes was lower than the number of deliveries; or the number of women with complications was higher than the number of deliveries in a facility (for example, the number of women who developed malaria might be higher than the number of women who delivered in a facility).

Recommendations

- Standardize and distribute register books to better capture complete data on types of deliveries, newborn outcomes, complications and maternal and neonatal deaths.
- Use a medical record number to synchronize with patient cards and register books to consistently capture the different services a woman or a neonate receives in different wards;
- Strengthen the monitoring system of EmONC services as part of the existing or improved system of HMIS/DHIS2 to ensure an evidence-based and responsive health system decision-making process.
- Provide up-to-date training of health providers on the improved HMIS/recording and reporting mechanisms and associated tools as observed in the gaps.
- Work with other agencies to improve civil registration and vital statistics system both at health facility as well as at the different levels of administrative units.



Infrastructure

Low coverage of beds to deliveries ratio according to international standards in some districts

Gaps

Western Rural and Urban, Bo, Pujehun and Kambia had facilities that fell short of the 30 to 32 beds per 1,000 deliveries minimum required ratio.

Recommendations

- In the short term: Conduct individual facility analyses to inform the redistribution of beds intra-district; make sure BEmONC facilities are prioritized (after the regional/district dissemination).
- In the medium term: Procure and distribute beds to the facilities in those districts mentioned, as per their need and space requirements.

Gaps in availability of separate rooms/spaces in the maternity for the provision of EmONC services

Gaps

- Labour and delivery: No national standard for labour and delivery rooms or spaces or equipment, despite some guidance in the national documents.
- ANC room/space: Five per cent of the total facilities did not have an ANC room/space.
- PNC room/space: Only 77 per cent of the total facilities had a separate room/space for PNC services.

- Newborn care infrastructure:
 - Only 13 per cent of hospitals had an NICU or special baby care unit. None of the facilities in Kailahun, Kono, Kambia, Koinadugu, Port-Loko, Bonthe, Moyamba, Pujehun, and Western Urban had a separate room for NICU.
 - Nationally, 55 per cent of facilities do not have a separate area for KMC

Recommendations

- The MoHS, in collaboration with its partners, should come up with a holistic facility standard, not only for HR, but also for infrastructure set-up (adequate room/space size per facility type). The standard should also be disseminated to facility providers and policy makers.
- Many of the facilities that lacked the afore-mentioned separate rooms/spaces may require expansion of wards or construction of additional wards/rooms. In this case, the MoHS should do an in-depth analysis of facilities requiring such rooms/spaces to develop and implement a doable plan of action. In line with this:
 - All facilities that provide delivery services should have separate ANC, labour and delivery, and PNC rooms/spaces;
 - For KMC area, either designate a space within the PNC ward as an immediate solution or establish a room/space with KMC guidelines, a table and chair;
 - All four hospitals that did not have OT should have the infrastructure to provide surgical services that saves women who develop major direct obstetric complications.
- NICU: The MoHS should develop a standard for the NICU levels of care at first referral, secondary and tertiary level facilities. In addition, an appropriate analysis should be done to equitably expand NICU services in the country, as many of neonatal complications require immediate care for newborns at intensive care units or immediate referrals to the NICU sites.

Low coverage of blood bank in district and private hospitals

Gaps

- Availability of blood banks was extremely low among district hospitals: only 53 per cent of them had a separate blood bank, while 28 per cent had both the laboratory and blood bank together.
- Similarly, 28 per cent of private hospitals had a separate blood bank and another 28 per cent had blood bank and laboratory together.

Recommendations

- Conduct an in-depth analysis of district and private hospitals with no blood bank to equitably establish blood banks and services that facilitate surgical services and blood transfusion that are in need of it. Geo-spatial mapping is crucial to assist the distribution of blood banks. Since resources are always constrained, prioritize district hospitals that provide surgical services for the immediate establishment of blood banks and strengthen central or regional blood banks as source of blood units for the rest of the facilities that lacked blood banks.
- MoHS should develop a standard of blood banks and their services depending on facility tier levels.

Shortage of electricity in health facilities, particularly in CHCs/clinics

Gaps

- Thirteen per cent of CHCs/clinics did not have any source of electricity power.
- Seventeen per cent of the total facilities that had electricity experienced interruptions for more than two days.
- Only lower than two thirds of the facilities said they had sufficient light during the night, lowest in Bonthe (32 per cent) and highest in Kailahun (100 per cent).

Recommendations

- Electrify rural CHCs with an alternative power source – solar power. Prioritize, Bonthe, Koinadugu and the Western area.

- Provide standby generators and solar facilities to all EmONC facilities that do not have them, especially in Moyamba and Pujehun, and make funds available on time for running and servicing them.
- The MoHS should work with the electricity authority to advocate for the government to supply electricity from the national grid to all EmONC facilities.

Shortage of water supplies in health facilities, particularly in CHCs/clinics

Gaps

- Seven per cent of CHCs/clinics that provided delivery services had no source of water.
- Of those facilities that had a water source, only 54 per cent of hospitals and 26 per cent of CHCs/clinics had piped water.
- Inadequate supply of water was more prevalent in Western Rural, Bonthe, and Tonkolili.

Recommendations

- Availability of an improved water supply is imperative for EmONC service delivery 24 hours a day and seven days a week. Hence, the Government of Sierra Leone should provide access to improved water supply (piped, well, hand pump, and protected rain water harvesting).
- Supply of improved water should be prioritized in facilities in Western Rural, Bonthe and Tonkolili.

Inadequate availability of communication materials/equipment in health facilities

Gaps

- Communication in health facilities was highly dependent on the staff's personal cell phones as only 48 per cent of the total facilities had facility-owned cell phones and only 2 per cent of the total facilities had two-way radio communication. Kailahun reported having no health facility with a facility-owned cell phone.
- Only 7 per cent of facilities that used staff cell phones had a policy of reimbursement.

Recommendations

Using landline telephone is not common in Sierra Leone and hence the use of cell phones and two-way radio will be the options commonly available. The MoHS should ensure that facilities that do not have a means of communication have cell phones with adequate air time, or a policy of reimbursing staff using their cell phones for facility-related communications, to ensure effective service delivery and referral systems.



Human resources

Shortages of HR to provide EmONC services 24/7

Gaps

- Severe shortage of availability of all categories of health workers, except obstetrician/gynaecologists and general surgeons. The shortage affected all government health facilities, except the national/maternity hospital with few gaps only in nurses and lab technicians.
- A huge gap was observed among nurses (needed 1,112), (CHOs) (needed 509), MCHAides (needed 494), and midwives (needed 239). Lab technicians, nurse anaesthetists and MDs were also among the deficits.
- Availability of health worker cadres 24/7 was a challenge in most sites; particularly among obstetrician/gynaecologists, paediatricians, surgeons and MDs in hospitals and lab technicians in the CHCs/clinics. The assessment shows staff were more likely to be on site during the day, Monday through Friday, than at night or during the weekends and holidays.

Recommendations

- In the short term: The MoHS should review the existing standards (Basic Packages of Essential Health Services) in relation to quantity, staff rotation and deployment of staffing practices. In addition, the MoHS should establish/strengthen the staff posting committee to respond to districts HR needs.
- Support training institutions to scale up their training capacity both in terms of quantity and quality; particularly training of midwives, nurses, medical officers, SACHOs and pharmacists/pharmacy technicians to fill in the gaps. Accelerate the training of obstetricians, gynaecologists, paediatricians, anaesthesiologists, midwives, CHOs and SECHNs.
- To improve availability of HR 24/7 and during the night and holiday shifts, the MoHS should leverage resources, in collaboration with partners, to institute the following mechanisms either one by one or in combination:
 - Introduce performance-based incentives;
 - construct living quarters;
 - provide communication facilities like cell phones;
 - institute policy of remote area allowance;
 - introduce staff rotation and relocation strategies to urban areas so that health workers improve their skills,
 - organize different technical and short-term trainings and professional seminars to boost knowledge;
 - develop/strengthen the performance appraisal system to encourage staff competition and - improve service delivery;
 - provide community support: district officers need to ensure that the staff are well cared for.

Low ratio of midwives per 1,000 institutional deliveries in many of the districts

Gaps

Only four districts (Western Urban, Koinadugu, Kono and Bombali) met the standard; and none of the districts met the health worker to population ratio.

Recommendations

- The MoHS should review the results of the EmONC assessment by facility in terms of HR to clearly redeploy and implement retention of EmONC-trained midwives in the 10 districts that did not meet the international standards of seven midwives per 1,000 deliveries.
- The MoHS should also establish a committee to review the current staffing patterns according to infrastructure set-up/standards and supply side to workout on deployment and redeployment plans.
- Provide regular supportive supervision to mentor midwives and provide on-the-job training and make sure that facilities have qualified midwives on staff.
- The MoHS should work with responsible bodies to incorporate EmONC training into midwifery training schools:
 - Revisit midwifery training curricula to scale up training of more midwives. The MoHS should also explore the possibility of implementing a Direct Entry Midwifery system;
 - Look into the possibility of upgrading the skills of MCHAides.



Drugs, equipment and supplies

Stock-out of essential drugs

Gaps

- Gentamicin and ampicillin injections were available only in 72 per cent and 73 per cent of the facilities, respectively. Two of the three regional hospitals did not have gentamicin as one of the drugs of choice. Metronidazole (injection), penicillin G (Benzyl) and procaine benzyl penicillin were not available in the national/maternity hospital.
- Magnesium sulphate (injection) was stocked out in 21 per cent of the facilities in the last 12 months prior to the survey.

- Oxytocin was also stocked out in 17 per cent of the facilities (two of the regional hospitals and 63 per cent of private clinics had stock-outs of oxytocin)
- Ketamine and atropine were stocked out in 19 per cent and 25 per cent of the facilities, respectively.
- Vitamin K and nystatin (oral) for newborn were available only in 35 per cent and 76 per cent of facilities respectively.
- Among hospitals, the most frequently mentioned cause of refilling facilities with drugs and supplies was “stock-out at central store” (45 per cent). Among CHCs/clinics, “inadequate transport” (45 per cent) and “stock-out at central store” (40 per cent) were the most common causes of delays in supplying drugs and supplies.

Recommendations

- The MoHS and its relevant bodies should strengthen the national procurement system to properly place orders based on forecasts and quantification systems at all levels. The following recommendations might be worth considering:
 - Strengthen the national logistics management information system to inform facilities and procurement entities to place orders before the stock-level reaches a minimum;
 - Build the capacity of pharmacists/pharmacy technicians and logistics officers (including staff at central store) in the logistics management information system and ensure all the required tools and forms are available in all facilities year round;
 - Make use of the report, request and issue voucher (RRIV) system for requesting and receiving drugs and supplies to facilitate quantification and procurement;
 - Improve availability of logistic officers/staff at the central store and district health offices to ensure an effective supply chain system;
 - Improve transportation and delivery of drugs and supplies to CHCs/clinics as transportation was one of their problems;
 - Improve the drug storage system in the health facilities to stock essential life-saving drugs and supplies;
 - Provide regular supportive supervision and monitoring of facilities and central store to solve problems in a timely manner.

Lack of some essential life saving medicines for mothers and newborns in all facilities

Gaps

- Pre-eclampsia and eclampsia are one of the leading causes of maternal death and magnesium sulphate injection with 50 per cent concentration was available only in 77 per cent of district hospitals and 65 per cent of private hospitals.
- Ergometrine injection and misoprostol were also available in only 59 per cent and 34 per cent of the facilities, respectively.
- Antenatal corticosteroids (betamethasone and dexamethasone injections) for preterm labour were available only in 22 per cent and 73 per cent of facilities.

Recommendations

- The MoHS should ensure a continuous supply of the above-mentioned life-saving medicines in all facilities.
- Strengthen the supply chain system in the country to stock such essential medicines and ensure an uninterrupted supply of medicines 24/7.

Insufficient supply of guidelines and protocols

Gaps

Not all guidelines and protocols were available in all facilities. In particular, the management of obstetrics and newborns package was available in only 87 per cent of facilities, PAC in 71 per cent, KMC in 69 per cent and safe abortion care guideline in 51 per cent of the facilities.

Recommendations

- The MoHS should work on revisions (if needed), reproduction and distribution of these guidelines to all facilities.
- It is also required to provide orientation and training for health workers in these guidelines.

Shortage of equipment and supplies in labour and delivery/maternity

Gaps

- MVA kits were available in 8 per cent of the facilities.
- Uterine evacuation kits were found in 10 per cent of the facilities.
- Vacuum extraction kits were also available in 12 per cent of facilities.
- Kits for episiotomy, perinatal, vaginal and cervical repair were available in 20 per cent of the facilities.

Recommendations

The MoHS should do an in-depth analysis of the facilities missing these kits and ensure their supply.

Shortage of equipment and supplies for the newborn

Gaps

- Radiant warmers were not available in many of the hospitals.
- Incubator, icterometer, fluorescent tubes for phototherapy to treat jaundice, apnoea monitor and small cups for breast milk expression were not available in the majority of the hospitals.
- Rectal thermometers for newborns were not available in the maternity and regional hospitals.
- Suction apparatus (foot or electric) and mucus trap for suction were available in 27 per cent and 46 per cent of the facilities.
- Resuscitation tables were not available in 14 per cent of the facilities.
- Ten per cent of the facilities were missing infant face masks (size 0 or 1).

Recommendations

- The MoHS should procure and supply facilities with these equipment and supplies to save the lives of newborns as per the national and/or international standards.
- There is also a need to develop/revise equipment standards not only for newborn equipment, but also for all equipment in the labour and delivery/maternity, OT, and laboratory.
- Ensure facilities are following compliance and proper use of equipment through mentoring and coaching.

Lack of refrigerators in some hospitals and almost all CHCs/clinics

Gaps

A refrigerator is an important part of laboratory equipment, needed to refrigerate medicines like Oxytocin and reagents for blood transfusion. However, only 2 per cent of CHCs had a refrigerator, none of the clinics, 59 per cent of district hospitals and 65 per cent of private hospitals.

Recommendations

- The MoHS should explore further why refrigerators were not available in the facilities and should plan for and supply this equipment. Some facilities might have it but they may not be working.

Lack of ultrasound in almost half of the district hospitals

Gaps

An ultrasound was available in only 53 per cent of the district hospitals.

Recommendations

All of the district hospitals that have no ultrasound should be supplied with a functional ultrasound and they should also receive appropriate training on how to maintain it.

Lack of autoclave in many facilities

Gaps

Close to half of CHCs, 29 per cent and 22 per cent of district and private hospitals and four fifth of clinics had no autoclave.

Recommendations

- Unavailability of an autoclave in these facilities should further be explored. The functionality of an autoclave requires a good power source.
- The MoHS should work with partners to supply facilities that lacked an autoclave.

Lack of functioning incinerators in district and private hospitals and CHCs/clinics

Gaps

Twelve per cent of the facilities did not have a functioning incinerator.

Recommendations

In collaboration with the MoHS, district health offices should work on constructing an incinerator or maintaining the existing one in each of the facilities that reported none.



Referrals for EmONC

Lack of emergency transportation for referral services

Gaps

- Only 21 per cent of the facilities had a functioning motor vehicle ambulance. Twenty-three per cent of facilities had at least one mode of transportation. Kambia, Kenema, Tonkolili, Kono, Bombali, Bo and Bonthe had the lowest proportion of facilities (6 per cent to 18 per cent) having at least one mode of transportation.
- Over a third of CHCs/clinics were over 25 kilometres away from the nearest surgical facility. Seven out of 14 districts had facilities in this distance range.
- Of the total CHCs/clinics that did not have surgical capacity (133 out of 134), the majority (40 per cent) required over an hour to access the nearest surgical facilities.
- Fifty-three per cent of CHCs were referring women to hospitals for the treatment of major direct obstetric complications.

Recommendations

- Availability of emergency transportation in all facilities is mandatory, as most of the major direct obstetric complications require anywhere up to two hours to reach the nearest higher level of care with surgical capacities. The MoHS should work with partners to make emergency transportation available:
 - All hospitals that do not have a vehicle ambulance should have one on-site;
 - All CHCs/clinics should have either a motorized vehicle ambulance at the district health office within the reachable distance and time of the catchment facilities or they should have a motorcycle or tricycle ambulance if resources are constrained, in the short term;
 - Vehicles ambulances should have emergency equipment, supplies, drugs, and drivers trained in first aid.

Supported by:

