

Service Availability and Readiness Assessment (SARA) for Basic Emergency Obstetric and newborn Care at health facilities in Ethiopia: Evidence from SARA 2016 and 2018

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Abstract

Background: Evidences suggested that the provision of timely and quality emergency obstetric care by skilled health professionals can potentially reduce maternal morbidity and mortality. This study is aimed to assess Service Availability and Readiness Assessment for Basic Emergency Obstetric and Newborn Care at health facilities in Ethiopia.

Methods: Nationally representative samples of 547 and 632 health facilities were selected for the assessment of Service Availability and Readiness Assessment 2016 and 2018, respectively, excluding health posts. The sampling method was stratified by health facility type and managing authority. An updated list of all health facilities was obtained from the completed census of health facilities from the Ministry of Health. An independent t-test was run to check whether there were differences in mean score between the two years and p-value < 0.05 was declared that statistically significant.

Results: According to the result from the 2016, the most commonly available services were manual removal of placenta (66.7%), neonatal resuscitation (65.6%), parenteral administration of Oxytocics (65.3%) and manual removal of retained products (65%). In case of the 2018 report, manual removal of placenta and neonatal resuscitation were the most commonly available services which were 73.6% each. The mean availability of signal functions were 61% and 72 % for the 2016 and 2018, respectively. Readiness to provide Basic Emergency Obstetric and Newborn Care was assessed based on the presence of the tracer items. Among facilities that provide delivery services, none of them had all the tracer items for Basic Emergency Obstetric and Newborn Care. The mean availability of the tracer items to provide services were 58% and 65% in 2016 and 2018, respectively.

Conclusion: There were significant increments in service availability of signal functions in 2018 when compared to the 2016. . The overall availability of tracer items in maternal, newborn and child health was still low. It is recommended to strengthen the leadership and coordinate the support and collaboration with partners and stakeholders to work on the private and public health facilities capacity to improve the services.

Keywords: Service Availability and Readiness Assessment; Basic Emergency Obstetric and Newborn Care; health facilities

Introduction

According to the WHO report of 2017, around 295,000 women died during pregnancy, childbirth and post-natal care (WHO 2019). Similarly, 2019 WHO maternal mortality fact sheet reported that approximately 810 women die every day from pregnancy-related complications and the majority of these deaths (94%) occurred in low-resource settings and most could have been prevented. Sub-Saharan Africa and Southern Asia accounted for approximately 86% (254 000) of the estimated global maternal deaths in 2017 with sub-Saharan Africa alone accounting for roughly 66% (196 000) (Sub-saharan Africa and Eastern Asia 2019; WHO 2019).

The maternal mortality ratio (MMR) in Ethiopia was 412 per 100,000 live births in 2016, a 39% reduction compared with an MMR of 676 in 2018. Its neonatal mortality rate showed a similar trend, with a reduction of 22% from 37 to 29 per 1000 live births (CSA 2011;

Central Statistical Agency (CSA) 2016). Basic Emergency Obstetric and Newborn Care (BEmONC) is an integrated strategy that aims to equip health facilities to deal with major causes of direct obstetric emergencies, which accounts for the vast majority of maternal and newborn deaths, particularly in high mortality countries (Bhandari and Dangal 2014).

Access to good quality obstetric care is critical for reducing maternal mortality. So, availability and quality of BEmONC is a major concern for the prevention of maternal death due to obstetric complications. Even if different factors may account for a higher number of maternal deaths, empirical studies suggested that poor quality services may lead to low coverage of maternal health care and non-effective and non-timely management of life-threatening complications of pregnancy/childbirth (Adanu 2010; Sarker et al. 2010).

Globally, efforts to reduce deaths among women from complications related to pregnancy and childbirth have been less successful than other areas of development (Keith 2005). Most countries in the world focus on reducing maternal and child mortality as health and development agendas and they are investing more energy and resources into providing equitable and adequate maternal health services. One way of reducing maternal mortality is by improving the availability, accessibility, quality and use of services for the treatment of complications that arise during pregnancy and childbirth. These services are collectively known as Emergency Obstetric Care (WHO et al. 2009).

Even if EmONC is effective in treating obstetric complications, preventing maternal and perinatal mortality and morbidity, the availability and quality of EmONC was found to be inadequate in most developing countries (Campbell et al. 2016).

Pieces of evidences suggested that the provision of EmONC services within facility-based health systems, enabling timely prevention of and intervention for the complications and saving of the lives of mothers and newborns (Emmanuel et al. 2015)). These are key medical interventions that are used to treat direct obstetric complications that cause the vast majority of maternal deaths around the globe. The seven key obstetric services or 'signal functions' includes: administering parenteral antibiotics; administering uterotonic drugs; administering parenteral anticonvulsants for preeclampsia and eclampsia; manual removal of placenta; performing removal of retained products of conception; assisted vaginal delivery and perform basic neonatal resuscitation. The purpose of this study was to conduct Service Availability and Readiness Assessment (SARA) for BEmONC at health facilities in Ethiopia based on Evidence from SARA 2016 and 2018.

Materials and Methods

Study setting: The study used secondary data from SARA 2016 and 2018. It was conducted in all health facilities from nine regions and two city administrations, consisting of Referral, General and Primary hospitals; Health centers; Higher clinics, Medium clinics and Lower clinics. In SARA 2016 and 2018, 547 and 632 facilities were included in the assessment, respectively. The health facilities were administratively structured as government and private facilities and based on geographic location; facilities were categorized as urban and rural settings.

Sampling technique and sample size determination: The sampling method for both SARA 2016 and 2018 was stratified by health facility type and managing

authority. The sample was designed to provide representative samples for Ethiopia, facility types and management authorities, and each of the country's eleven regions. An updated list of all health facilities in Ethiopia was obtained from the completed census of health facilities from the Ministry of Health. The sample allocation for the survey considered the skewed health facility distribution of the country into account (SARA 2016 and 2018 report).

Data Sources: The data used in this study were part of the 2016 and 2018 Ethiopian SARA survey conducted by the Ethiopian Public Health Institute. SARA was designed to function as a systematic tool to support annual verification of data and service delivery at the facility level. The seven key obstetric services or 'signal functions' were used to assess service availability for basic emergency obstetric and newborn care at health facilities in Ethiopia. Service availability in this study means types of service offered: diagnosis and/or management. This study used 25 tracer indicators in data analysis. Tracer indicators aim to provide objective information about whether or not a facility meets the required conditions to support the provision of basic or specific services with a consistent level of quality and quantity. Tracer indicators for service readiness were measured in terms of trained staff and developing guidelines, equipment, medicines and commodities for each of the service types.

Data collection approach and data quality control: A facility inventory questionnaire was used to obtain information on the readiness of the facilities to provide BEmONC services. The most knowledgeable person about the organization of the facility was interviewed by the data collectors. Data were collected using CAPI (Computer Assisted Personal Interview) designed using the software CSPro 6.3. The quality of data was maintained through the training given to all field staff. The training included understanding each question, an introduction to CAPI, and a mock interview. An electronic data collection template was used. Monitoring and supervision of the fieldwork were maintained throughout the data collection period.

Data management and analysis: Data were checked for consistency and entered in SPSS version 24.0 software for analysis. Descriptive statistics like frequency, proportion, mean, and standard deviation are computed to describe study variables about the population. An independent t-test was run to check whether there were differences in mean score between the two years and p-value <.05 was declared statistically significant.

Ethical Considerations: Ethical clearance was obtained from Institutional Review Board of Ethiopian Public Health Institute (EPHI-IRB). Letter of cooperation was obtained sequentially from regional, zonal and woreda health offices. Written informed consent was obtained from each study participant after informing the purpose of the study, its procedure and confidentiality of the result prior to engaging in the study.

Result

General Characteristics of assessed facilities: Total facilities assessed in SARA 2016 were 547 and 375(68.6%) were public health facilities including Referral, General and primary hospitals, health centers and health posts, 172(31.4%) were private facilities include Higher, medium and Lower clinics. The

majority of assessed facilities in SARA 2016 were health centers 165(30%) and General hospitals 117(21.4%), and the least were Referral hospitals 32(6%). Total facilities assessed in SARA 2018 were 632, the majority 467(74%) were public health facilities and 165(26.1%) were private facilities as mentioned above. Most of the assessed facilities in SARA 2018 were health centers 329(52%), General hospitals 233(36%) and Primary hospitals 217(34%) and the least assessed facilities were higher clinics 42(6.6%) (Table 1).

Basic emergency obstetric and new born care (BEmONC) service availability: According to SARA 2016 and 2018 report, 67.3% and 74.7% of the assessed facilities offered delivery services, respectively (Table 3).

Table 1: Percentage of facilities assessed, by region, facility type, location and managing authority, Ethiopia, 2016 and 2018

Characteristics	SARA 2016		SARA 2018	
	N	%	N	%
Regions				
Tigray	42	8	65	10
Afar	38	7	37	6
Amhara	61	11	98	16
Oromia	99	18	109	17
Somali	43	8	44	7
Benshangul Gumz	30	5.5	31	5
S.N.N.P	61	11	89	14
Gambella	30	5.5	30	5
Harari	23	4	24	4
Addis Ababa	91	17	77	12
Dire Dawa	29	5	28	4
Facility type				
Referral hospital	32	6	31	5
General Hospital	117	21	116	18
Primary Hospital	61	11	156	25
Health center	165	30	164	26
Higher Clinic	23	4	19	3
Medium Clinic	64	12	74	12
Lower Clinic	85	16	72	11
Managing Authority				
Public	320	59	410	65
Other	227	41	222	35
Urban/Rural				
Urban	431	79	494	78
Rural	116	21	138	22
Total	547	100	632	100

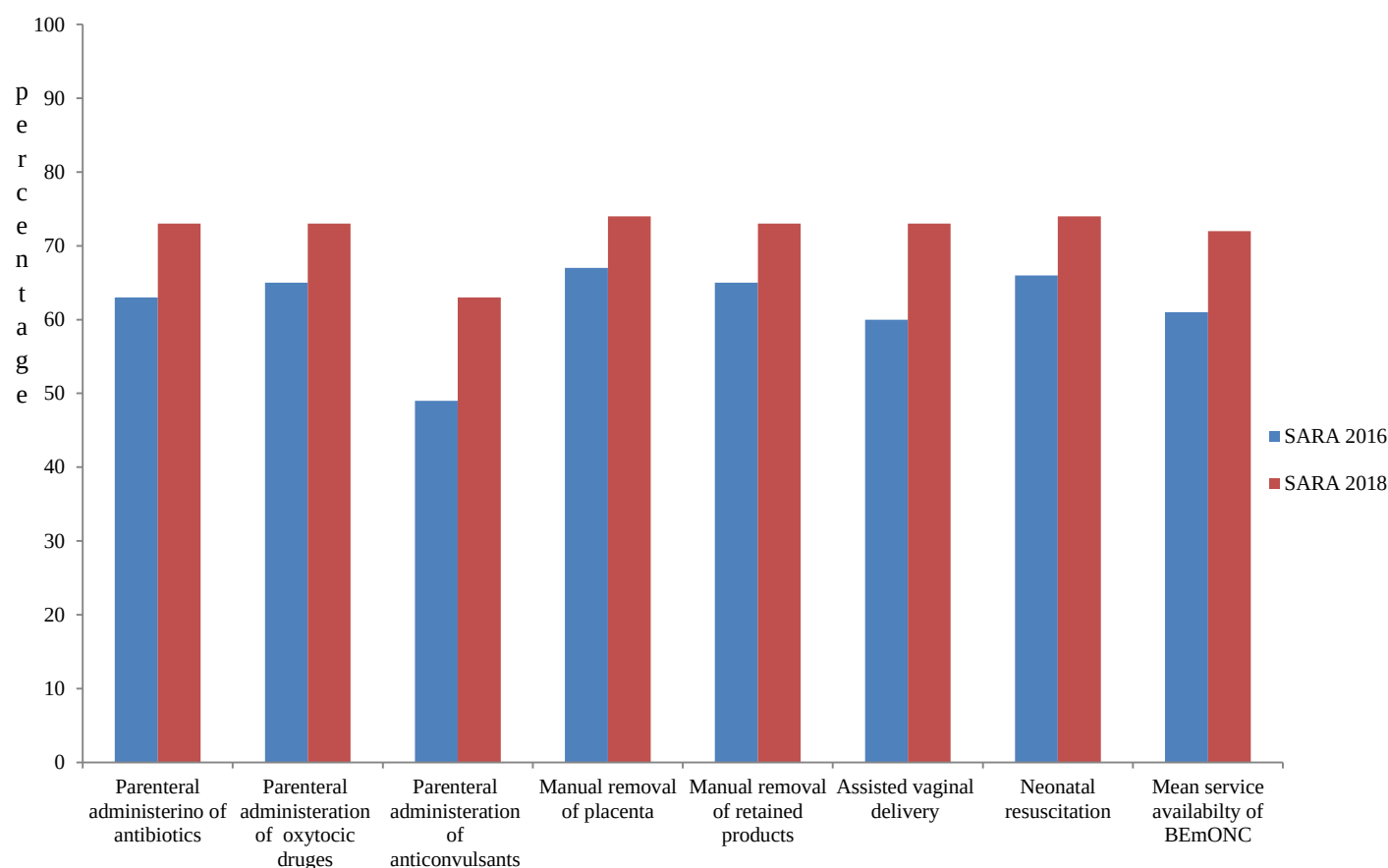


Figure 1: Shows Percentage of seven signal functions in SARA 2016 & 2018.

Based on SARA 2016 report, manual removal of placenta (66.7%), neonatal resuscitation (65.6%), parenteral administration of oxytocics (65.3%) and manual removal of retained products (65%) were the most commonly available services, whereas parenteral administration of anticonvulsants was the least available service (49%). Similarly, SARA 2018 report showed that manual removal of placenta and neonatal resuscitation were the most commonly available services 73.6% for each, whereas parenteral administration of anticonvulsants was the least available service (63.4%). The mean availability of BEmONC signal functions were 61% and 72 % in SARA 2016 and 2018, respectively (Figure 1).

BEmONC service availability in the health facilities, SARA 2016 and 2018: Availability of parenteral administration of antibiotics was higher in health centers in SARA 2016 (41%) and 2018 (33.6%), but was lower in Lower Clinics (0.3%) in SARA 2016 and Medium Clinics 0.2% SARA 2018. There was huge difference in availability of seven signal functions in primary hospital between the two years period in which parenteral administration of antibiotics was

15.6% vs 33%, parenteral administration of oxytocic drugs 15.4% vs 32.8%, parenteral administration of anticonvulsants 18% vs 35%, assisted vaginal delivery 16% vs 33%, manual removal of placenta 15% vs 33%, manual removal of retained products 15% vs 33% and neonatal resuscitation with bag and mask 16.5% vs 34.5% in SARA 2016 and 2018, respectively. However, there was no major difference in service availability of seven signal functions between the two years period in medium and Lower Clinics (Table 3). An independent t-test was run to check whether there were differences in basic obstetric and newborn care service availability mean scores between 2016 and 2018. There was statistically significant mean difference between the two years t (-4.124), p-value <0.001) (Table 2).

Facility readiness to provide BEmONC services: Readiness to provide BEmONC was assessed based on the presence of the tracer items. According to SARA 2016 and 2018 reports, among facilities that provide delivery service, none of them had all the tracer items for BEmONC.

Table 2: Basic emergency obstetric and new born care /BEmONC/ service availability, Ethiopia, 2016 and 2018

Facilities	Parenteral administration of antibiotics for mothers		Parenteral administration of oxytocic drug		Parenteral administration of anticonvulsants		Assisted vaginal delivery		Manual removal of placenta		Manual removal of retained products		Neonatal resuscitation with bag and mask	
	2016	2018	2016	2018	2016	2018	2016	2018	2016	2018	2016	2018	2016	2018
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Referral Hospital	28(8)	31(7)	28(8)	31(7)	28(10)	30(8)	28(9)	31(7)	28(8)	31(7)	28(8)	31(7)	28(9)	31(7)
General Hospital	108(31)	116(25)	109(31)	115(25)	92(34)	107(27)	107(33)	115(25)	109(30)	114(25)	108(30)	114(25)	108(33)	116(27)
Primary Hospital	54(16)	150(33)	55(15)	152(33)	49(18)	142(35)	53(16)	151(33)	54(15)	151(33)	54(15)	152(33)	54(17)	149(35)
Health Centre	142(41)	154(34)	152(43)	158(34)	93(35)	120(30)	127(39)	154(33)	159(44)	158(34)	152(43)	151(33)	127(39)	131(30)
Higher Clinic	9(3)	4(1)	9(3)	4(0.9)	5(2)	2(0.5)	8(2)	4(0.9)	9(3)	4(0.9)	9(3)	4(0.9)	7(2)	4(0.9)
Medium Clinic	4(1)	1(0.2)	3(0.8)	2(0.4)	1(0.4)	0	3(0.9)	2(0.4)	4(1)	3(0.6)	3(0.8)	3(0.7)	3(0.9)	0(0.0)
Lower Clinic	1(0.3)	3(0.7)	1(0.3)	1(0.2)	0(0.0)	0	1(0.3)	4(0.9)	2(0.5)	4(0.9)	2(0.6)	5(1)	0	1(0.2)
Total	346(100)	459(100)	357(100)	463(100)	268(100)	401(100)	327(100)	461(100)	365(100)	465(100)	356(100)	460(100)	327(100)	432(100)

The mean availability of the tracer items to provide BEmONC were 58% and 65% in SARA 2016 and 2018, respectively. According to SARA 2016, more than 75% of the health facilities had skin disinfectants, sterilization equipment and emergency transport for the service but only 16.7% of the facilities had guidelines for essential childbirth care. According to SARA 2018, among facilities that provided delivery service, more than 80% of the health facilities had skin

disinfectant and sterilization equipment, however, only 41% of the facilities had guidelines for essential childbirth care. An independent t-test was run to check whether there were differences in basic obstetric and newborn care services readiness mean scores between SARA 2016 and 2018. As shown at a 5% level of significance there was a statistical mean difference between the two years $t(-3.702)$, $p\text{-value} < 0.001$.

Table 3: List of Basic obstetric and newborn care services readiness tracers' items, Ethiopia SARA 2016 and 2018

No	Indicators (tracer items)	2016 (%)	2018 (%)
1	Guidelines for essential childbirth care	16.7	41.1
2	Check-lists and/or job-aids for essential childbirth care	28.0	55.2
3	Staff trained in essential childbirth care	22.5	42.6
4	Staff trained in newborn resuscitation	28.1	51.9
5	Emergency transport	70.5	78.0
6	Sterilization equipment	75.2	87.7
7	Examination light	35.3	51.9
8	Delivery pack	47.6	73.3
9	Suction apparatus (mucus extractor)	38.2	68.7
10	Manual vacuum extractor	33.4	60.4
11	Vacuum aspirator or D&C kit (with speculum)	25.9	53
12	Neonatal bag and mask	38.7	60.9
13	Delivery bed	48.2	74.1
14	Partograph	40.8	67.7
15	Gloves	46.6	69.5
16	Infant weighting scale	46.0	71.7
17	Blood pressure apparatus	44.7	70.7
18	soap and running water or alcohol based hand rub	35.8	59.2
19	Antibiotic eye ointment for new-born	52.2	75.2
20	Injectable uterotonic	45.9	72.9
21	Injectable antibiotic	52.3	79.3
22	Magnesium sulphate (injectable)	26.6	61.4
23	Skin disinfectant	79.0	87.8
24	Intravenous solution with infusion set	56.0	75.9
25	Mean availability of tracer items	58.0	65.0

Discussion

The Service Availability and Readiness Assessment (SARA) survey was adapted and used to generate information on service availability and readiness of maternal, newborn and child health facilities to provide basic health care interventions for obstetric care, neonatal and child health. The availability of seven signal functions for BEmONC is crucial to reducing maternal and neonatal mortality. According to SARA 2016 and 2018 reports, 67.3% and 74.7% of the assessed facilities offered delivery services, respectively.

The current study revealed 61% and 72% disparities in the mean availability of the seven signal functions between SARA 2016 and 2018, respectively. The overall service availability of the two years was 66.5%. Studies have consistently shown that low BEmONC coverage in developing countries is mostly linked with poor maternal and child health indicators (Paxton et al. 2006; Ali, et al 2008; Ouédraogo et al.

2016). The current study also showed disparities in the availability of seven signal functions according to the type of facilities. Hospitals (General and primary) consistently reported higher availability of the seven signal functions compared with lower-level facilities (Higher, Medium and Lower Clinics). This finding was in line with the study conducted in Tanzania, where hospitals reports showed availability of the seven signal functions was higher than lower-level facilities (Bintabara, Ernest and Mpondo, 2019). Similarity of these study findings might be due to the similar methodology used; both studies used data from the national representative samples collected by SARA

According to the two years report, the service availabilities of neonatal resuscitation were 66% and 74% in SARA 2016 and 2018, respectively. This finding was higher than the study report from Tanzania, which was 52%. The service availability of assisted vaginal delivery was 58% in SARA 2016 and

73% in 2018. Especially, the finding of SARA 2016 was lower than the report from Tanzania (69.6%) but the finding of SARA 2018 was higher than Tanzania (Bintabara, Ernest and Mpondo, 2019).

Facility readiness is an important aspect that demonstrates a facility's commitment to ensure the cumulative availability of components required to provide a specific service. According to SARA 2016 and 2018 reports, among facilities that provided delivery service, none of them had all the tracer items for Basic Emergency and Essential Obstetric and Newborn Care Services. The mean availability of the tracer items to provide Basic Emergency and Essential Obstetric and Newborn Care Services were 58% and 65% in SARA 2016 and 2018, respectively.

Conclusion and recommendation

The present investigation has revealed that there was significant increment in service availability of signal functions in SARA 2018 as compared to SARA 2016. The finding reflects the need for further improvement, especially in service readiness. Service availability and readiness among private facilities was found lower. The Ministry of Health and other concerned bodies in Ethiopia are advised to work in tandem on strengthening capacities of the private and public health facilities to deliver improved services. Effect of instability, which has been observed over the recent years in Ethiopia, on service availability and readiness in health care delivery remains to be investigated.

Competing of interest: The authors declare that they have no competing interest.

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