Health facilities' capability to provide comprehensive post abortion care in Sub-Saharan Africa

Health facilities' capability to provide comprehensive post abortion care in Sub-Saharan Africa: evidence from a cross-sectional survey across 210 high volume facilities

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Keywords: Post abortion care, health facilities' capability, quality of care, signal functions, sub-Saharan Africa

Synopsis: Generally, we find high levels of availability of key resources necessary for managing abortion-related complications in our sample of high volume health facilities. However, some resources important for the management of the most severe abortion-related complications were not readily available, notably specialised human resources and an ICU, and this needs to be urgently addressed.

Authors contribution

RC conceptualized the study and wrote the first draft. CC, HM, OT and SK made substantial contribution to the study methodology, data analysis and critically reviewed the first draft. HM, CC, ZQ, OT, FAB, AB, OTM, NI, PG, and SK reviewed and edited all versions of the manuscript.

Acknowledgement:

Rachidatou COMPAORE received funding from the HRP Alliance, part of the UNDP-UNFPA-UNICEF-WHO-World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP), a cosponsored programme executed by the World Health Organization (WHO), to complete his/her studies. This article represents the views of the named authors only and does not represent the views of the World Health Organization.

ABSTRACT

Objective: To evaluate the capability of high-volume Comprehensive Emergency Obstetric Care (CEmOC) health facilities on the provision of comprehensive post abortion care (PAC) in Sub-Saharan Africa and to determine the frequency of women with severe abortion-related complications in high capability facilities.

Method: A cross-sectional analysis was conducted across 11 countries in three sub-Saharan African (SSA) regions (West, Central, East), using facility-level information from the World Health Organization (WHO) Multi-Country Survey on Abortion-related morbidity (MCS-A) between 2017 and 2018. We adapted the PAC signal functions approach proposed by Campbell et al to assess facilities' capability to deliver comprehensive PAC through three categories: infrastructure, standard comprehensive and extended comprehensive capability to provide PAC. The percentage of facilities with each signal function and the distribution of facilities by the number of signal functions were calculated for the three categories of capability. The distribution of severe abortion complications by facility capability score was then assessed.

Results: A total of 210 high volume CEmOC facilities were included. Of these, 47.9% had the capability to provide all the facility infrastructure signal functions, 54.4% for standard comprehensive PAC, dropping down to 17.7% for the extended comprehensive PAC capability. Overall, there were gaps in extended capabilities including the availability of a functioning intensive care unit (ICU) (available in 37.3% of facilities) and of providers 24h/7 (65.5% facilities reported an obstetrician available 24/7 dropping down to 41.3% for anaesthesiologists). Facilities' PAC capability varied across regions. Overall, 34.6% of women with severe abortion-related complications

were treated in facilities with the maximum capability score for extended comprehensive PAC.

Conclusion: Although we document high levels of capability of these health facilities to provide abortion-related care for most signal functions, there are still significant gaps that impact on the management of severe abortion-related complications, particularly related to extended facility capabilities including specialised human resources and ICU.

BACKGROUND

Global commitment to provide high quality post abortion care (PAC) was prioritized at the International Conference on Population and Development (ICPD) in 1994 and reemphasized at the 25th anniversary meeting in Nairobi [1,2]. However, rates of morbidity and mortality due to unsafe abortion remain high across many settings in sub-Saharan Africa (SSA) [3], where abortion practice is still largely legally restricted. Many abortion-related complications are still potentially life-threatening in these contexts [4], and key challenges remain in ensuring access to quality care for these complications[3]. In these contexts, high-quality PAC is critical to reduce mortality and prevent complications as a result of unsafe and spontaneous abortions[5].

Facility capability is key in the provision of quality PAC. Building on the model initially developed to assess emergency obstetric care availability, Healy et al. proposed a framework of essential components ("signal functions") that could be used to measure the availability and implementation of key resources and procedures for the provision of safe abortion care (SAC) in health facilities[6]. The

signal functions approach was then adapted by Campbell et al. to define a set of composite indicators constructed from key preventive and curative services to assess health systems capability to provide basic PAC at primary level and comprehensive PAC at referral levels of care[7]. Comprehensive PAC comprises essential components for abortion complications' management, including long-acting contraceptive methods, surgical and blood transfusion capacities[7].

The PAC signal function framework has been used in several studies in low and middle income countries[8–11]. However, most of these studies were secondary data analysis and could only include signal functions for which information was available, and were almost exclusively from surveys looking at facility capabilities for a wide range of health conditions and not necessarily focussed on post-abortion care [8,9]. As such, these studies did not include important signal functions needed to support quality of care (specific PAC guidelines, clinical audits) or for the management of very severe complications of unsafe abortion, such as the availability of an intensive care unit (ICU).

Our study is a multi-country analysis assessing high volume comprehensive emergency obstetric care (CEmOC) facilities' capabilities to provide comprehensive PAC in SSA using data from the World Health Organization (WHO) multi-country study on abortion-related morbidity (MCS-A) [14]. We draw on the health facility assessment tool, that was designed specifically to collect information on abortion-related services from facilities that had a designated gynaecology ward and reported surgical capability. We apply similar signal functions to those used in previous studies, as well as propose an expanded set of signal functions that could measure the availability of services or components necessary for quality of care or better management of severe cases at high volume CEmOC facilities. We also

explore the extent to which the most severe abortion complications are managed in facilities with optimal PAC provision capabilities.

MATERIAL AND METHODS

Study design and data source

We conducted a secondary analysis using data from the MCS-A study in Africa, a large cross-sectional study with data collected prospectively in 210 facilities, over three months in each of the 11 countries (Benin, Burkina Faso, Chad, Democratic Republic of Congo (DRC), Ghana, Kenya, Malawi, Mozambique, Niger, Nigeria, and Uganda) between February 2017 and February 2018. Participating countries and facilities' selection is described in the main study's protocol [12]. Briefly, each country had three geographical province/state including the capital city plus two provinces/states with probability proportional to the population size, were first sampled. Ten facilities fulfilling inclusion criteria were then selected from the census of private and public facilities within each selected area (with up to a total of 30 facilities per country). Facilities were included based on the following criteria: >1000 deliveries per year, a gynaecology ward and surgical capability. When there were less than 10 facilities fulfilling inclusion criteria within a geographical area, all eligible facilities in that area were selected [12].

As part of the MCS-A survey, facility-level data were collected, using an institutional assessment form that was filled in by hospital coordinators (typically obstetrician-gynaecologists or healthcare providers responsible for gynaecology and obstetrics wards at identified facilities). This form was used to collect information on the location and type of facility, the capacity to provide emergency obstetric care and a more detailed assessment of the facilities' ability to provide PAC within the previous three months (infrastructure, utilities, equipment, and human resources).

Hospital coordinators reported, where necessary, equipment or services as available and/or functioning. Individual level information on women attending the facilities with abortion-related complications was also collected from medical records[12].

Defining the signal functions

We used a set of signal functions to assess facilities' capability to provide PAC across three categories: infrastructure, standard comprehensive capability and extended capability to provide PAC. Table 1 describes in detail each signal function and the accompanying definition used in this study.

We defined an "infrastructure" category to emphasize the structural capacity of hospitals to provide quality care, and included all components for which data were collected. While the elements of the infrastructure category are essential for quality care provision, they are not specific to the provision of comprehensive post-abortion care. To measure the infrastructure category, seven signal functions were selected: the availability of electricity, generator, refrigerator, telephone/radio call, email/internet, incinerator, ambulance, water supply, and sewerage system.

The Campbell et al. approach[7] was adapted to assess the standard comprehensive PAC category which include seven specific curative and preventive services, and also one staffing criteria on the availability of a provider on duty 24/7. Surgical capability was an inclusion criterion for facilities in the MCS-A study, therefore this capability was not included as a signal function in this study.

We then measured the extended comprehensive capability category by adding six components to the comprehensive category, to assess the capability of health

facilities to manage all abortion complications, including severe cases, appropriately: the availability of guidelines, clinical audits, an adult ICU, ultrasound services, biochemical/clinical laboratories, and at least one anaesthesiologist on duty 24/7[13]. The choice of additional signal functions included in this analysis was based on recommendations from the WHO clinical management for abortion care guidelines. The main author first developed these criteria, and they were then validated by a senior obstetrician and researchers involved in the study.

Data analysis

The data were analysed using Stata 15. We initially examined the distribution of facilities with respect to key characteristics – facility type (hospital, health centre/maternity) and facility location. These analyses were done for all facilities pooled together, and also stratified by region and country. Regions were defined as East (Kenya, Uganda, Malawi, Mozambique), Central (Chad, DRC) and West (Benin, Burkina Faso, Ghana, Niger and Nigeria).

The percentage of facilities with each signal function was calculated, overall and stratified by country. The signal functions were subsequently used to create composite measures for each of the three categories (infrastructure, standard comprehensive PAC and extended comprehensive PAC), by calculating the total number of functions which each facility was reported to be able to conduct. We calculated the mean number of signal functions available across facilities for each category, and the distribution of facilities by the number of signal functions, overall, and by country.

To assess the percentage of severe abortion-related complications that were managed in facilities with the capability to provide comprehensive quality PAC, we

calculated the percentage of the severe abortion-related complications that were managed at different levels of facility capability. Severe abortion-related complications included women who died, or were considered either near miss or having potentially-life threatening complications, according to WHO criteria for near miss and on indicators present at assessment[14]. For this analysis, both comprehensive PAC capabilities (standard and extended) scores were grouped into four categories. The first category was included facilities where all components were met ("criteria met"). The remaining facilities were categorised as follows: "criteria unmet with 1-2 signal functions missing", "criteria unmet with 3-4 signal functions missing" or "criteria unmet with 5 or more signal functions missing". The percentage of severe abortion complications treated at each facility capability level was calculated overall and by country.

RESULTS

Table 2 shows the distribution of the overall facility sample and characteristics. Most facilities were located in urban areas (66.2%). Medical abortion services and first trimester PAC using surgical methods (manual vacuum aspiration (MVA) or dilatation and curettage (D&C)) were offered in 80.8% and 76.4% of the facilities, respectively. Overall, 90.5% of facilities reported to offer contraception as part of PAC.

There was substantial variation in bed capacity and service utilisation, both within and between countries (Table 2). The overall average number of gynaecologic beds in use was 19.9, ranging from 0 to 217. Differences were noted between countries within the same region: In West Africa, the mean number of gynaecologic beds available ranged from 14.1 (range: 4-58) in Nigeria to 58.8 (range: 23-217) in

Benin. On average, approximately 37 women were reported to seek care for post abortion complications in a typical month in these facilities (range: 0-350).

Table 3 presents the percentage of facilities performing each of the PAC signal functions, overall and by country. With the exception of email/internet availability, which was available only in 64.3% of facilities, all infrastructure signal functions were reported as available in more than 80.0% of facilities overall. Within countries, some infrastructure signal functions availability were notably lower than in the overall sample, such as telephone/radio (47.4%) in Uganda, email/internet in Benin (50.0%), Burkina Faso (52.4%), Chad (33.3%) and Uganda (42.1%), incinerator in Nigeria (58.6%) and Uganda (47.4%), ambulance (57.9%) and sewerage system (63.2%) in Uganda. The percentage of facilities able to provide each component of standard comprehensive PAC was relatively high across regions; almost all standard comprehensive components were performed at above 80%, except for the availability of obstetrician on duty 24h/7 (65.5%). Availability of providers was particularly low in Chad (46.7%), the DRC (38.1%), Malawi (26.1%), Mozambique (31.6%) and Uganda (68.4%). For the extended comprehensive PAC category, adult ICU (37.3%) and anaesthesiology specialists (41.3%) were the least available components. There were regional differences in the availability of adult ICU. In West Africa it ranged from 38.1% in Burkina Faso to 90% in Benin while in East Africa, it ranged from 13.0 % in Malawi to 26.3% in Uganda.

Figure 1 illustrates the distribution of the facilities' capability score for comprehensive PAC. For the infrastructure category score, facilities' capability ranged from zero to all nine functions (Figure 1A). Less than half the facilities (47.9%, n=100) could perform all nine signal functions, varying from 30.8% (n=12) in Central Africa to 58% (n=48) in East Africa. The majority of health facilities could

fulfil at least seven infrastructure signal functions (88.0%). The mean score for the infrastructure category was 7.9 (standard deviation (SD)=1.6) (table 4).

Facilities' capability for the eight components of the standard comprehensive PAC category varied from three to the maximum number of functions (Figure 1B). More than half (54.4%, n=105) of facilities could provide all standard comprehensive signal functions, ranging from 28.2% in Central to 81.2% in West Africa. About 88.6% (n=171) facilities overall could provide at least six functions. The mean score for this category was 7.4 (SD=0.9), ranging from 6.4 (SD=1.4) in Uganda to 8.0 (SD=0.0) in Niger (Table 4).

The composite score for the 14 functions of the extended comprehensive PAC category ranged from a minimum of four to all 14 components across the facilities. Only 17.7% (n=34) of facilities could meet all functions. West Africa countries had the highest percentage of facilities which reported all functions (26.2%, n=22) and Central Africa the lowest (6.5%, n=2). Overall, most facilities could provide from 10 to 14 signal functions (93.7%, n= 180) (Figure 1C). The mean score of this category was 11.8 (SD=1.6), varying from 10.0 (SD=2.4) in Uganda to 12.9 (SD=1.3) in Nigeria (Table 4).

Table 5 presents the distribution of severe abortion-related complications by reported facility capability to provide standard or extended comprehensive PAC. Approximately two thirds (65.8%) of women with very severe abortion-related complications (SMOs/PLTCs) were managed in facilities with full capability for standard comprehensive PAC. This percentage dropped to about one third (34.6%) for extended capability score overall, ranging from 70.0% in Benin to 0% in DR Congo, Niger and Uganda. 3.6% of severe abortion-related complications

were managed in facilities with the lowest extended comprehensive capability score.

DISCUSSION

We used a set of signal functions to assess facilities' capability to provide PAC across three categories: infrastructure, standard comprehensive capability and extended capability to provide PAC. Our results suggest a high level of capability for the provision of each PAC signal function in 210 health facilities across 11 SSA countries. Across the three categories, certain components were less consistently available across all facilities and countries: incinerator, health care specialists, email/internet, and adult intensive care. The percentage of facilities that could provide all components of PAC varied by category of capability, but also within and between regions. There were more facilities for which criteria for signal functions were all met for the standard comprehensive PAC category (54.4%), compared to the percentage of facilities that could perform all functions for both the infrastructure (47.9%) and the extended comprehensive PAC (17.7%) categories. Capabilities to provide standard comprehensive PAC (81.2%) and extended comprehensive PAC (26.2%) in West African countries were higher compared with other regions, while East Africa presented a better infrastructure capability score (at 56.0%). Our findings also showed that the percentage of women with the most severe complications that are treated in facilities with full capability to address severe abortion complications is low (34.6%).

The levels of capabilities found in our study can vary with results from referral-level facilities from previous studies in SSA [7–9,15]. The standard PAC comprehensive capability that we found in West African countries (81.2%) was

much higher than was documented in referral-level facilities in Senegal in 2015 (37.0%) [8]. There were also notable differences between our findings and those in the multi-country study of PAC capacity by Owolabi et al[8]. We find that 61.9% of facilities in Kenya had all signal functions to provide PAC, compared with 44% in the study by Owolabi et al; conversely, in Malawi, we found lower capability to provide PAC compared with Owolabi et al (44% and 58%, respectively) [8]. While the better results in West Africa and Kenya could be interpreted as progress due to quality PAC improvement interventions in that region[16,17], the wide variation in levels is likely to be explained, at least in part, by the difference in the sampling method of facilities used to assess the capacity of the health system to provide PAC. Most previous studies used nationally representative samples and this study selected for high volume CEmOC facilities.

We find low levels of facilities reporting a functioning ICU (37.3%) and of skilled health professionals 24h/7 (65.5% for obstetricians and 41.3% for anaesthesiologists), which is particularly concerning for the treatment of the most severe maternal outcomes. The MCS-A facility survey tool specifically captured whether there was a functioning adult ICU. Therefore, we could not identify facilities that did not have an ICU but did have high dependency units or standalone rooms to manage women with severe abortion-related complications which require monitoring but not intubation. The availability of specialists for near-miss management has not been directly reported in the published literature to our knowledge, but studies did measure the availability of doctors or staff capable of undertaking caesareans. Owolabi et al reported different availability rates of medical doctors at referral level facilities in SSA: 50% in Kenya in 2010, 75% in Senegal in 2015, 88% in Tanzania in 2014-2015 and 89% in Malawi in 2013-2014

[8]. It is difficult to make a comparison with our results because of task shifting recommendations for PAC[18], which means that not every medical doctor who can perform a caesarean section is necessarily an obstetrician-gynaecologist. Nevertheless, this high availability of specialized health providers in the referral facilities could reflect subnational imbalances in skilled health workers' availability between urban and rural areas [18]. In general, differences in PAC signal functions' performance across countries in the different studies could reflect the different contextual factors within each country's health system.

In this study, we proposed an extended measurement of capabilities of health facilities to provide comprehensive post abortion care, by including specific signal functions for the diagnosis, management, and prevention of severe abortion complications that are rarely assessed in PAC signal function studies. We found that clinical guidelines (92.9%), audit services (91.4%), and functioning laboratories (91.9%) were generally reported to be available. We included use of clinical guidelines as an extended capability as it had not been included in previous studies looking at PAC signal functions; however, given that guidelines should be available and followed in all facilities, this could be considered as an important signal function not just to be included for measuring extended capability, but for measuring all facilities capability to provide PAC. Given that having a functioning ICU and ultrasound and the capability to undertake laboratory investigations is essential for managing the most severe abortion complications, we would encourage further studies to collect data on these components within referral level facilities to track progress in ensuring the availability of these services.

There are still relatively large numbers of women with abortion-related complications in referral facilities in SSA with low capability that may be at risk of

not receiving timely appropriate care [14,19], and at an increased risk of severe morbidity and mortality. A missing PAC component that falls under this level of care, such as the availability of an ICU, may be the one most urgently needed at a given time to save a woman's life. Nevertheless, as ICUs do require a lot of infrastructure and human resource, ensuring their availability at larger facilities and a well-functioning referral system to this level of care from the lowest level of facilities is necessary. Other factors such as delays in seeking care and reaching the appropriate facilities, and provision are also reported as a result of the high frequency of abortion-related complications reported in studies from DRC, Kenya, Nigeria and Zimbabwe[20–23].

Our study was unable to deduce health professionals' knowledge and practices necessary on the provision of quality care, or their compliance with evidence-based PAC recommendations. However, these are important factors to consider in the capability to provide quality PAC. For example, while we showed high levels of facilities reporting providing post-abortion contraception, we did not determine whether women in these facilities were more likely to get contraceptive counselling and, among women wanting contraception, to receive a contraceptive method. A study in Kenya showed that adherence to the predefined PAC service standards was low, with less than half (41.8%) of all women admitted for first-trimester PAC treated with the appropriate technology [15].

This study had some limitations inherent to the methodology used. Hospital coordinators were asked to report on the availability and functioning of most signal functions, but this was not independently verified nor were there any checks that the commodities or equipment to provide the services were available. We also noted some limitations to specific questions that were asked, notably that both

methods of uterine evacuation were grouped together and it would have been better to ask about each separately. We could only investigate signal functions for PAC, due to the lack of relevant data collected on procedures for safe termination. Moreover, due to the type of facilities included in our sample, we are not able to generalise to private for-profit facilities, which were not included in the study sample. However, by using a large cross-sectional approach, this study provides updated estimates on the capacity of SSA facilities to provide comprehensive post-abortion care, while allowing for comparison across regions and countries to a certain extent, albeit somewhat limited by small numbers of countries in some of our regions (i.e. Central Africa). The data collection tool that included additional indicators in the assessment of facilities' capability to provide quality comprehensive PAC is one of the key strengths of this study. By using this tool in a standardized way, this approach could constitute one more step for more comprehensive and harmonized assessments of health facility service quality, based on global service standards.

CONCLUSION

This study provides important information on the availability of equipment, supplies and services for quality PAC provision in and across eleven countries in different SSA regions. While overall capabilities were generally high for most signal functions, key functions important for the management of severe abortion-related complications were not always available, in particular with respect to specialized human resources and ICU, and needs to be urgently addressed. Some gaps were found by adding specific components through the extended comprehensive PAC category. There is a clear need to improve the capability of facilities, and the

referral system, given the frequency of severe abortion complications that do not reach high capability facilities.

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FIGURES AND TABLES

Table 1: Postabortion care signal functions

Categories*	Signal functions	Maximum score per facility*****
Facility general capability: Facility infrastructure	Electricity available and functioning Generator available and functioning Refrigerator available and functioning Telephone/radio call available and functioning Email/Internet available and functioning Incinerator available and functioning Ambulance available and functioning Water supply available and functioning Sewerage system available and functioning	9
Capability to provide standard comprehensive post-abortion care (adapted from Campbell et al) **	Removal of retained products available Parenteral antibiotics available Uterotonics available *(oxytocin or misoprostol)* Intravenous fluids available Blood transfusion available 3+ contraceptives offered 1+ long-acting modern contraceptive(s) offered 1+ obstetrician on duty 24/7	8******
Extended capability to provide comprehensive post-abortion care******	*Comprehensive indicators* + At least one guideline currently in use*** Clinical audits currently in use Adult intensive care unit available and functioning Ultrasound services available and functioning Biochemical/clinical laboratories available and functioning 1+ anaesthesiologist on duty 24/7	14******

* Facility infrastructure designs hospital general capability while the two capability rows present two comprehensive PAC specific capabilities

**Surgical capacity is just for mention here as this was among criteria for facility selection

***Safe Abortion Guidance/Clinical Handbook or WHO guidelines (e.g., for postpartum haemorrhage) or Evidence-based, locally adapted guidelines

**** This category includes the components in capability to provide comprehensive PAC
*****Presence of a given indicator for a facility adds on a score of one to the total category score for that facility
****** Comprehensive PAC and extended comprehensive PAC capabilities both includes infrastructure capability signal functions; however, we made the choice to exclude hospital general capability signal functions in the analysis of the facilities PAC specific capabilities.

Table 2: Facility characteristics description

	Overall	West Africa					Central Africa		East Africa			
		Benin	Burkina Faso	Ghana	Niger	Nigeria	Chad	DR Congo	Kenya	Mozambique	Malawi	Uganda
Number of facilities	210	10	21	19	10	29	15	24	21	19	23	19
Location												
Urban	66.2	90.0	95.2	63.2	100.0	69.0	86.7	70.8	42.9	52.6	34.8	57.9
Peri-urban	16.7	10.0	4.8	21.1	0.0	24.1	6.7	4.2	42.8	0.0	39.2	10.5
Rural	17.2	0.0	0.0	15.8	0.0	6.9	6.6	25.0	14.3	47.4	26.1	31.6
Abortion services												
Surgical abortion method employed for gestational age up to 12-14 weeks (MVA or D&C)	76.4	70.0	85.7	73.7	90.0	60.7	80.0	56.5	81.0	73.7	100.0	79.0
Medical abortion offered at the facility (including medical management of incomplete abortion)	80.8	100.0	90.5	73.7	80.0	93.1	93.3	54.6	85.7	57.9	82.6	84.2
Abortion for GA>13-14 weeks offered	63.0	70.0	85.7	52.6	60.0	62.1	86.7	45.5	66.7	42.1	87.0	36.8
Post abortion contraception offered	90.5	90.0	90.5	94.7	100.0	96.6	93.3	75.0	90.5	100.0	95.7	73.7
Average of hospital capacity and services provided for PAC (Mean (min-max)												
Hospital structure and capacity												
Average number of obstetrical beds in use	37.9(1-400)	52.5(16-217)	36.5(10-90)	53.2 (10-400)	38.2(10-173)	30.1 (4-107)	11.1 (2-35)	51.2(3 - 132)	58.0(15-120)	40.8(10-126)	28.0(6-92)	20.4 (1-62)
Average number of gynaecologic beds in use	19.9(0-217)	58.8(23-217)	19.3(0-90)	25.1(5-150)	21.2(12-35)	14.1 (4-58)	16.3 (1-50)	24.7(5 - 156)	20.0(5-62)	15.5(0-84)	16.5 (1-76)	10.3 (0-30)
Average number of gynaecologic patients having overnight stay	95.5(0-1000)	436.6(6-999)	135.0(0 - 1000)	74.7(15-239)	57.3 (3-298)	22.8 (0-85)	113.5 (10-999)	28.2 (0-108)	117.4(15-705)	84.6(1-600)	86.3 (24-450)	90.4 (0-450)
Abortion complications in a typical month												
Average number of women who received abortion related care or PAC	37.1(0-350)	21.3(14-36)	25.0(5-68)	24.8 (3-100)	26.3 (5-87)	14.2 (0-43)	18.3 (6-33)	17.3(2 - 163)	57.9(14-150)	74.0 (2-350)	69.5 (3-300)	53.3 (2-300)
Average number of gynaecology admissions due to abortion complications	32.1 (0-602)	18.6(15-23)	43.7(0-602)	14.7(0-55)	16.6 (2-50)	8.0 (0-25)	20.9 (6-66)	8.1(0-37)	44.3(3-150)	59.8(2-480)	68.5 (0-300)	40.3 (0-300)
Number of surgical uterine evacuation (MVA or D&C)	30.9 (0-340)	16.7(9-30)	18.7(2-68)	27.1 (2-120)	22.6 (5-87)	17.1 (0-170)	15.4 (3-65)	10.9(0-90)	48.0 (15-150)	57.1 (1-340)	58.3 (3-300)	42.1 (0-240)
Number of medical abortions	10.3(0-213)	12.4 (3-30)	11.7(0 37)	8.0 (0-45)	17.1(0-87)	4.8 (0-15)	14.7 (2-54)	4.7 (0-67)	13.3(0-58)	17.4 (0-213)	6.7 (0-40)	11.5 (0-30)

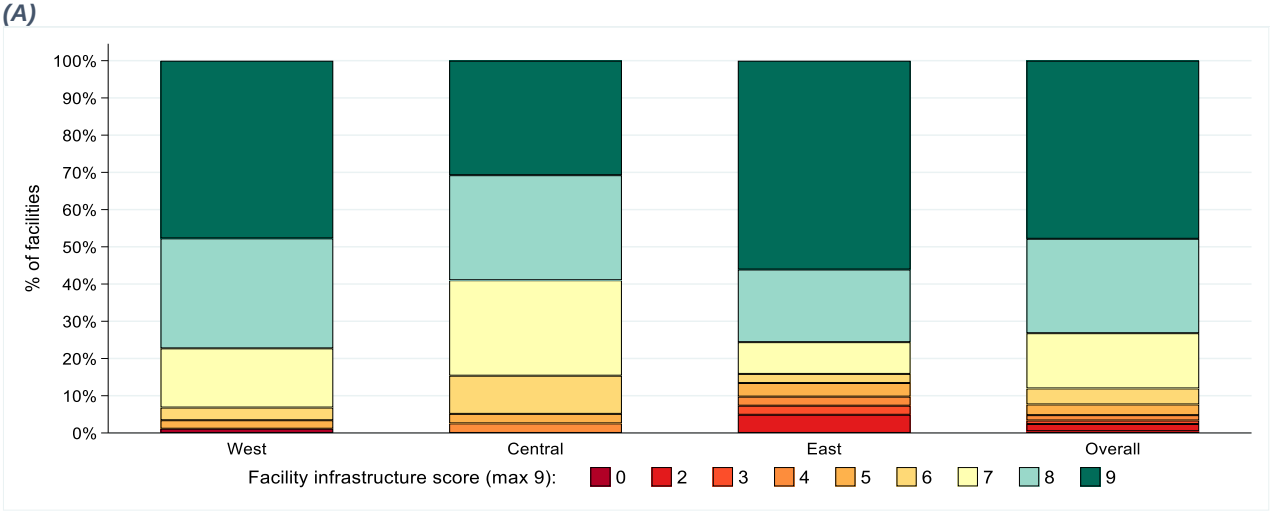
GA: gestational age
MVA: manual vacuum aspiration

Table 3: Capability to provide each PAC signal function, overall and per country

	Number of facilities with information	Overall percentage with indicator	Regions										
				West (N=89)				Central (N=39)		Eastern (N=82)			
			Benin	Burkina Faso	Ghana	Niger	Nigeria	Chad	DR Congo	Kenya	Malawi	Mozambique	Uganda
	No.	%	%	%	%	%	%	%	%	%	%	%	%
Facility infrastructure													
Electricity	209	94.3	100.0	95.2	100.0	100.0	92.9	93.3	83.3	100.0	100.0	100.0	79.0
Generator	210	94.8	100.0	90.5	100.0	100.0	100.0	100.0	91.7	100.0	95.7	84.2	84.2
Refrigerator	210	91.9	100.0	95.2	100.0	100.0	100.0	73.3	79.2	100.0	100.0	94.7	68.4
Telephone/radio	210	86.7	100.0	85.7	100.0	80.0	82.8	86.7	87.5	100.0	95.7	89.5	47.4
Email/Internet	210	64.3	50.0	52.4	89.5	80.0	62.1	33.3	62.5	95.2	73.9	57.9	42.1
Incinerator	210	83.8	80.0	90.5	100.0	70.0	58.6	100.0	91.7	90.5	100.0	94.7	47.4
Ambulance	210	87.1	100.0	90.5	79.0	100.0	93.1	93.3	75.0	95.2	95.7	89.5	57.9
Water supply	210	95.7	100.0	95.2	100.0	100.0	100.0	100.0	91.7	100.0	100.0	94.7	73.7
Sewerage system	210	91.4	90.0	90.5	100.0	100.0	86.2	93.3	100.0	95.2	95.7	94.7	63.2
Capability to provide standard comprehensive PAC													
Removal of retained products	207	99.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	89.5
Parenteral antibiotics	209	98.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	84.2
Uterotonics	210	98.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.7	89.5
Intravenous fluids	207	98.1	100.0	95.0	100.0	100.0	100.0	100.0	95.8	100.0	100.0	100.0	89.5
Blood transfusion	209	96.2	100.0	100.0	100.0	100.0	96.6	100.0	95.8	100.0	100.0	100.0	68.4
3+ contraceptive methods offered	202	90.1	80.0	90.5	100.0	100.0	92.9	100.0	73.7	85.7	95.7	94.7	76.5

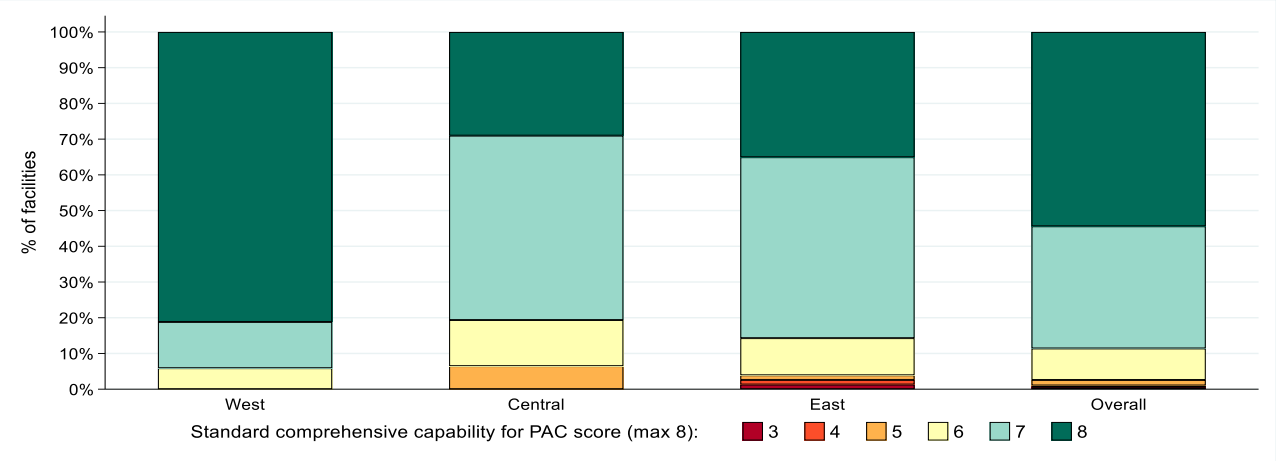
1+ long-acting contraceptive methods offered	203	93.6	80.0	90.5	100.0	100.0	100.0	100.0	80.0	95.2	100.0	94.7	82.4
1+ obstetrician on duty 24/7	206	65.5	90.0	80.0	89.5	100.0	93.1	46.7	38.1	76.2	26.1	31.6	68.4
Extended capability to provide comprehensive PAC													
At least one guideline currently in use	210	92.9	100.0	90.5	100.0	100.0	96.6	73.3	87.5	95.2	100.0	100.0	79.0
Clinical audits currently in use	210	91.4	100.0	90.5	100.0	100.0	93.1	53.3	91.7	100.0	95.7	100.0	79.0
Adult intensive care unit functioning (ICU)	209	37.3	90.0	38.1	42.1	70.0	46.4	26.7	50.0	23.8	13.0	21.1	26.3
Ultrasound services functioning	210	92.9	100.0	95.2	100.0	100.0	100.0	93.3	100.0	100.0	91.3	79.0	63.2
Biochemical/Clinical laboratories functioning	210	91.9	100.0	95.2	94.7	90.0	100.0	100.0	70.8	100.0	95.7	100.0	68.4
1+ anaesthesiologist on duty 24/7	206	41.3	40.0	40.0	31.6	10.0	79.3	40.0	14.3	57.1	34.8	26.3	47.4

(A)



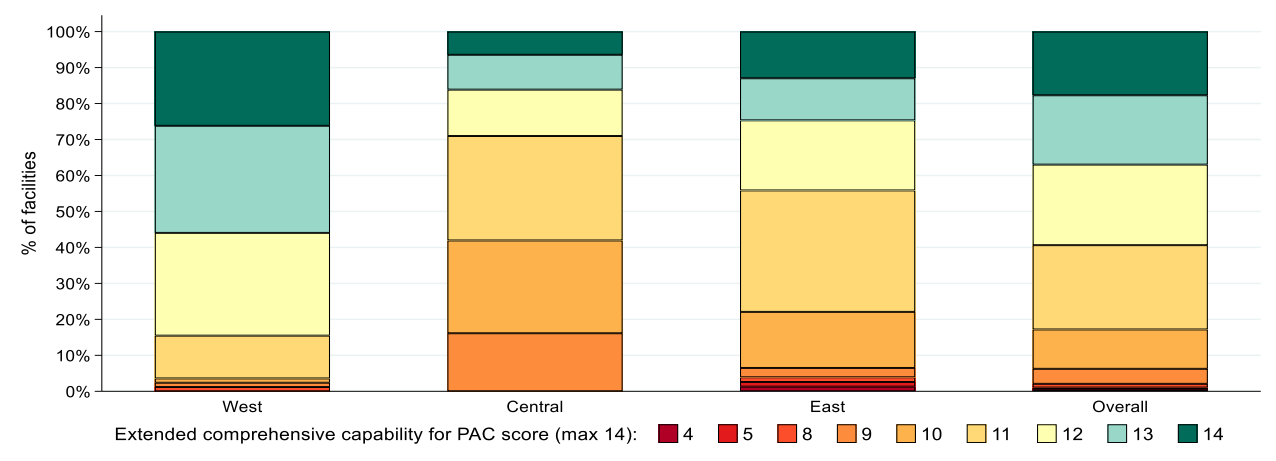
N=209 (West Africa (N=88), Central Africa (N=39), East Africa (N=82)).

(B)



N=193 (West Africa (N=85), Central Africa (N=31), East Africa (N=77)).

(C)



N=192 (West Africa (N=84), Central Africa (N=31), East Africa (N=77)).

Figure 1: Facility capability to provide abortion-related care, overall and stratified by region for: (A) facility infrastructure; (B) standard comprehensive capability to provide post-abortion care (PAC) and; (C) extended capability to provide post-abortion care.

Table 4. *Mean score for key categories, overall and per country*

	Mean score (standard deviation)			
	Total observations	**Facility infrastructure (Max score=9) ***	**Standard capability to provide comprehensive post-abortion care (Max score=8) ****	**Extended capability to provide comprehensive post-abortion care (Max score=14) *****
Overall	210	7.9 (1.6)	7.4 (0.9)	11.8 (1.6)
Region/country				
West Africa	89			
Benin	10	7.5(0.8)	7.5(0.8)	12.8(1.2)
Burkina Faso	19	7.5(0.7)	7.5(0.7)	12.0(1.3)
Ghana	19	7.9(0.3)	7.9(0.3)	12.6(1.0)
Niger	10	8.0(0.0)	8.0(0.0)	12.7(0.7)
Nigeria	27	7.8(0.5)	7.8(0.5)	12.9(1.3)
Central Africa	39			
Chad	15	7.5(0.5)	7.5(0.5)	11.3(1.6)
DR Congo	16	6.6(0.9)	6.6(0.9)	10.6(1.2)
Eastern Africa	82			
Kenya	21	7.6(0.6)	7.6(0.6)	12.3(1.2)
Malawi	21	7.2(0.5)	7.2(0.5)	11.5(1.4)
Mozambique	18	7.2(0.5)	7.2(0.5)	11.5(1.5)
Uganda	17	6.4(1.4)	6.4(1.4)	10.0(2.4)

*excludes one facility from West Africa
**excludes 17 facilities: 4 from West Africa; 8 from Central Africa and; 5 from East Africa
***excludes 18 facilities: 5 from West Africa; 8 from Central Africa and; 5 from East Africa

Table 5: Distribution of severity of complications per facility capability to provide extended comprehensive post-abortion care, overall and per country

Score	Total number of facilities (n=192)	Total number of women with abortion-related complications (n=14,557)	% of women with SMOs/PLTCs complications (1,773)	% of women with SMOs/PLTCs complications treated at each level of facility capability										
				Benin (n=184)	Burkina Faso (n=169)	Ghana (n=236)	Niger (n=22)	Nigeria (n=155)	Chad (n=95)	The DRC (n=90)	Kenya (n=373)	Malawi (n=223)	Mozambique (n=66)	Uganda (n=160)
	Facility capability score for standard comprehensive PAC*													
Criteria met (all 8 signal functions)	105	9,228	65.8	78.8	87.6	97.0	100.0	96.9	52.6	26.7	52.8	45.3	57.6	37.5
Criteria unmet (1-2 signal functions missing)	83	5,167	32.0	21.2	12.4	3.0	0.0	3.1	47.4	62.2	47.1	54.7	42.4	44.4
Criteria unmet (3-4 signal functions missing)	4	99	0.6	0.0	0.0	0.0	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.0
Criteria unmet (5 and plus signal functions missing)	1	94	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.1

Score	Total number of facilities (n=192)	Total number of women with abortion-related complications (n=14,557)	% of women with SMOs/PLTCs complications (1,773)	% of women with SMOs/PLTCs complications treated at each level of facility capability										
				Benin (n=184)	Burkina Faso (n=169)	Ghana (n=236)	Niger (n=22)	Nigeria (n=155)	Chad (n=95)	The DRC (n=90)	Kenya (n=373)	Malawi (n=223)	Mozambique (n=66)	Uganda (n=160)
Facility capability score for extended comprehensive PAC **														
Criteria met (all 14 signal functions)	34	3,922	34.6	70.1	44.4	39.0	0.0	63.2	6.3	0.0	35.7	27.4	30.3	0.0
Criteria unmet (1-2 signal functions missing)	80	6,075	33.9	13.6	37.3	53.4	100.0	35.5	26.3	35.6	27.6	31.8	31.8	36.2
Criteria unmet (3-4 signal functions missing)	66	3,878	27.9	16.3	17.7	7.6	0.0	0.0	51.6	51.1	36.7	39.9	37.9	43.8
Criteria unmet (5 and plus signal functions missing)	12	682	3.6	0.0	0.6	0.0	0.0	1.3	15.8	13.3	0.0	0.9	0.0	20.0

*Standard comprehensive PAC score included (Removal of retained products available, Parenteral antibiotics available, Uterotonics *(oxytocin or misoprostol)* available, Intravenous fluids available, Blood transfusion available, 3+ contraceptives offered, 1+ long-acting modern contraceptive(s) offered, 1+ obstetrician on duty 24/7)

***Extended comprehensive PAC score included the following indicators: standard comprehensive indicators* + at least one guideline currently in use, Clinical audits currently in use, Adult intensive care unit available and functioning, Ultrasound services available and functioning, Biochemical/clinical laboratories available and functioning, 1+ anaesthesiologist on duty 24/7.