Quality of Antenatal, Labour and Delivery Services in Selected Districts in Malawi, Zambia and Zimbabwe: A Descriptive Cross-Sectional Study

Clara Opha Haruzivishe[1]*, Chirwa Ellen[2], Maimbolwa Margaret[3], Maluwa Alfred[2], Mukwato-Katowa Patricia[3], Mambulusa Janet[2], Kwaleyela Concepta[3], Gomo Exnevia[1], Chidzonga Midion[1]

[1]College of Health Sciences, University of Zimbabwe, Zimbabwe

[2]Kamuzu College of Nursing, University of Malawi, Malawi

[3]School of Nursing, University of Zambia, Zambia

Correspondence to: Clara Opha Haruzivishe, College of Health Sciences, University of Zimbabwe, Zimbabwe; **E-mail:** claraopha@gmail.com

ABSTRACT

Background: High Maternal and Neonatal Mortality Ratios persist in Sub-Saharan Africa despite increasing perinatal care coverage. This suggests that coverage alone is not adequate to reduce maternal and neonatal morbidity and mortality. Quality of care should be the emphasis of maternal and child care services.

Materials and Methods: A descriptive cross-sectional multicentre study was conducted in selected health facilities in Zambia, Malawi and Zimbabwe using purposive sampling. A World Health Organization-WHO 2016 Quality of Maternal and New-born assessment Framework and the WHO (2015) Service Availability and Readiness Assessment tool were used for data collection. Data was analyzed using Statistical Package for Social Scientist (SPSS) version 24.0.

Results: Less than 43% of the health facilities satisfied at least three of the five Performance Standards of availability and adequacy of Antenatal infrastructure and supplies. Regarding Antenatal processes/care, an observation was the most common performance standard satisfied by 70.6% of all health facilities assessed while less than 30% fulfilled all other standards. Only 57.1% of the health facilities satisfied 5 of the 11 standards for labour and delivery infrastructure, while only 55.6% of the Health facilities satisfied only two of the 13 standards of Labour and delivery care.

Conclusion: To achieve a significant and sustainable reduction in maternal and neonatal morbidity and mortality, there is a need for investment and improvement in maternity care services infrastructure and processes as opposed to focusing on mere attendance of Antenatal, and deliveries by trained birth attendants.

Keywords:

Quality, Antenatal, Labour, Delivery-Services, Evaluation

Introduction

Significant progress has been made in reducing maternal and neonatal deaths over the past few decades. However maternal and neonatal morbidity and mortality remain major public health challenges globally, more so in Low and Middle-Income Countries (LMICs). World Health Organisation (WHO) estimated that globally 295,000 maternal deaths occurred in 2017 alone, with Sub-Saharan Africa (SSA) accounting for 66% of these deaths [1]. The global Maternal Mortality Ratio (MMR) was estimated at 211 maternal deaths per 100,000 live births. In SSA the MMR was more than twice (542 per 100,000 live births) the global estimate. In 2017, the lifetime risk of maternal death was over 200 times higher SSA compared to Australia (1 in 37 versus 1 in 7,800) [1]. The burden of neonatal mortality is equally daunting. In 2018, it was estimated that about 7,000 neonates in the first month of life died every day translating to 2.5 million deaths or 18 deaths per 1,000 live births globally [2]. One third to three-quarters of these deaths occur in the first week of life [3,4]. Neonatal deaths accounted for 47% of all under-fives deaths. Similar to MMR, Neonatal Mortality Rates (NMR) in SSA is one and half times the global rate (28 vs 18 deaths per 1,000

live births) [2].

Paradoxically, high MMR and NMR have persisted in SSA despite the significant progress made in increasing perinatal care coverage. This suggests that coverage alone is neither adequate to reduce maternal and neonatal morbidity and mortality nor alone, an adequate indicator of the success of maternal and neonatal care programs. Instead, effective coverage i.e. quality of care should be the emphasis of maternal and child care services. The most common causes of maternal morbidity and mortality include pregnancy complications, high blood pressure and infection among others [1,5]. Most neonatal deaths are due to inadequate care at or immediately after birth. Studies have established the association between quality of maternal health care services and maternal and neonatal deaths in LMICs [1,2,6]. About half of mothers and newborns in SSA receive perinatal care from unskilled care providers [6]. Quality ANC alone can reduce neonatal mortality by up to 20% [7,8].

Poor maternal health care services are partly due to the persistently adverse economic situations which lead to inadequate infrastructure, drugs, appropriately trained human resources, electricity and water supply disruptions among others [9-11]. Therefore, most maternal and neonatal deaths are could be prevented through improvements in maternal care

infrastructure, supplies and processes. To achieve Sustainable Development Goal 3 of reducing MMR to 17 deaths per 100,000 live births and NMR to 12 deaths per 1,000 live births, there is a need to improve the quality of maternal and child health delivery services, and not only increase and maintain high coverage.

Like other LMICs, Southern African countries still experience high maternal and neonatal mortality despite the achievements in ANC and delivery care coverage [1,2]. In Malawi (2015), Zambia (2018) and Zimbabwe (2018) MMR ratios were 634, 278, and 458 deaths per 100,000 live births, while NMRs were 22.4, 23.5, and 20.9 deaths per 1,000 live births, respectively [12-14]. To improve maternal and newborn care, there is a need for identification of the gaps in infrastructure and processes of ANC, labour and delivery care, and other determinants of quality of care. However, studies on maternal and child health services in Africa have focused mostly on coverage and/or satisfaction of clients with the services [14-17]. Few have addressed the quality of care, more so the quality of infrastructure for and processes of ANC, labour and delivery care, and even fewer on determinants of quality of care [18,19]. In Malawi, Wang et al. reported a significant gap between crude coverage and effective coverage of delivery services pointing to inadequate labour and delivery care processes, and perhaps infrastructure [20]. Similarly, studies in Zambia and Zimbabwe have shown that despite high coverage perinatal services maternal and neonatal mortality remain a major public health burden [21-24]. Therefore there is need for detailed analysis of infrastructure and processes for maternal and newborn care, and to identify the other key determinants to inform policy and practice in improving the delivery of care. To ascertain the quality of health facility infrastructure and processes for ANC, labour, and delivery in Malawi, Zambia and Zimbabwe we conducted a multicentre study in the three countries. The overall goal was to identify gaps in quality of care and inform strategic interventions to improve services.

Methods

This was a descriptive cross-sectional multicentre study conducted in three HFs in Chiradzulu District, Malawi (2015), four HFs in Lusaka and Mumbwa districts in Zambia (2017), and 11 HFs in Goromonzi and Murehwa Districts in Zimbabwe (2018). Purposive sampling was used to select the study sites. All sites had records of high maternal and neonatal mortality. The HF assessment was conducted using the framework of the WHO Standards for Improving Quality of Maternal and New-born Care (WHO, 2016) [25]. Perinatal care infrastructure, processes, and client satisfaction with the services were assessed.

For the process assessments, health care providers and women accessing perinatal services were interviewed. The women included pregnant and lactating women up to six weeks postpartum. On the other hand, checklists were used to assess the health facility infrastructure, for availability, adequacy and quality.

Data collection tools were adapted from the WHO Service Availability and Readiness Assessment (WHO, 2015) [26]. Data on infrastructure was collected through structured questionnaire interviews with HCP and observation using checklists. Infrastructure assessments included availability and

status of laboratories, equipment, amenities, availability drugs and other supplies, guidelines, electricity and water supply. Performance Standards were defined for the ANC, and Labour and Delivery structural assessment (Table 1). Each standard had set of criteria.

Table 1: Performance standards assessed for ANC, labour, and delivery infrastructure

ANC	Labour and Delivery
1. The facility has a conducive waiting/reception area	1. The facility has a conducive waiting/reception area
2. The facility has an adequate counseling area and examination /procedure area	2. The facility has a reliable water supply
3. The facility has working toilets for clients and providers	3. The facility has laboratory facilities
4. The facility has equipment, supplies, and materials to provide ANC	4. The facility has the equipment, supplies and materials to provide care
5. The facility has ANC guidelines	5. The facility provides for women in labour
	6. The facility has working toilets for clients and providers
	7. Adequate equipment for normal deliveries
	8. Infection Prevention
	9. Records and forms
	10. Resuscitation area for new born
	11. Essential Drugs

Similarly, Performance Standards with sets of criteria were defined for assessment of the quality of ANC, Labour and Delivery processes (Table 2). Structured questionnaires were administered to HCP and exit interviews were conducted with women attending perinatal care.

Table 2: Performance Standards assessed for ANC, labour, and delivery process.

ANC	Labour and Delivery
1. History taking	1. General admission
2. Observation	2. Past obstetric history
3. Examinations	3. Present obstetric History
4. Blood tests	4. Observation carried out on admission
5. Urine tests	5. Examinations are done on admission
6. Drugs and immunizations	6. Communication of information on findings
7. Information during ANC	7. Care provided during labour
8. Antenatal Education and Counselling	8. Care during delivery

9. Education and counselling (HIV)	9. Immediate newborn care
10. PMTCT	10. Care during the third stage of labour
11. Client perception of quality	11. Post-partum care in 1st 24 hours.
12. Provision of privacy	12. Post-partum education on care of the mother
13. Respect during consultation	13. Post-partum education on care of the baby.
14. Care about woman's well being	
16. Asked questions to the provider	
17. Level of client satisfaction with antenatal	

For both infrastructure and process assessments, performance criteria were scored Yes=1 and No=0. For each Performance Standard (PS) the level of performance was defined as the proportion of criteria that had a Yes, and was presented as a percentage. For example, for a process PS with 5 criteria, if 3 were fulfilled (Yes) then the level of performance for the HF would be 60%. To describe overall performance of the HFs the median and range of PS scores was used. No statistical comparisons were done.

The studies were approved by the relevant Ethics regulatory bodies and Institutional Review Boards in the three countries.

Results

The Infrastructure and processes for ANC and labour and delivery were assessed in a total of 17 health facilities; Malawi (3), Zambia (4), and Zimbabwe (10). Exit interviews were conducted with 320 women in Malawi, 436 in Zambia, and 592 in Zimbabwe accessing perinatal services. Table 3 shows the distribution of women by District and service.

Table 3: Distribution of women interviewed by service and district.

Country	City	ANC	Labour and Delivery	Total	Study Period
Malawi	Chiradzulu	160	160	320	March–June 2015
Zambia	Lusaka	128	174	218	June–September 2017
	Mumbwa	44	90	218	
Zimbabwe	Goromonzi	151	145	296	2018
	Murehwa	151	145	296	

Assessment of ANC Services

Structural Assessment: Table 4 shows the scores of five Performance Standards (PS) for ANC infrastructure in Malawi and Zambia. Overall less than 43% of the HFs fulfilled at least three of the five PS assessed. Only 14.3% of the HFs satisfied the PS standard on 'Working Toilets', 'Essential Equipment' and Essential Laboratory Supplies'. On the contrary, nearly all (85.7%) HFs had ANC guidelines. One HF in Zambia did not have the guidelines. Zambian HFs performed better with three of four HFs satisfying PS of 'Waiting Area', Counselling and Examination Area', and 'Essential Drugs'. On the contrary, in Malawi none of the HFs satisfied all PS except ANC guidelines. For Malawi, overall, performance scores ranged from 55.0% to 75%, while for Zambia HF scores ranged from 0% to 100% on the same four of the five PS (Table 1). Median scores ranged from 55% to 67% on all PS for Malawi HF compared to 57.1% to 80% in Zambian HFs.

Zimbabwe used a different tool for infrastructure assessment, combining ANC, Labour and delivery care. The performance of the HFs is shown in Table 5. Of the eight PSs assessed only two were fulfilled by some HFs. Seventy percent (70%) of the HFs fulfilled the PS of Record-Keeping while only 20% fulfilled the PS of Maternity Homes. No facility fulfilled all other PSs.

Table 4: Performance Standard Scores for ANC Infrastructure in 7 district hospitals in Malawi and Zambia.

S.No.	Performance Standard	Malawi				Zambia				Total
		Score								
		Median (%)	Range (%)		# of facilities meeting the Std (N=3)	Median (%)	Range (%)		# of facilities meeting the Std (N=4)	% of facilities meeting the Std (N=7)
			Min	Max				Max		
1	The facility has conducive waiting/reception area	60	50	60	0	80	0	80	3	42.9
2	The facility has adequate counselling area and examination /procedure area for ANC	59	50	63	0	84.6	62	100	3	42.9
3	The facility has working toilets for clients and providers	67	58	75	0	57.1	28	86	1	14.3

4	The facility has equipment, supplies and materials to provide ANC									
4.i	Essential equipment	55	50	57	0	66.6	33	94	1	14.3
4.ii	Essential Drugs	65	65	70	0	80	70	100	3	42.9
4.iii	Essential laboratory supplies	67	58	75	0	75	63	88	1	14.3
5	ANC Guidelines	100	100	100	3	75	0	100	3	85.7

Table 5: Performance Standard Scores for ANC, Labour and Delivery Infrastructure in 10 health facilities in Mashonaland East Province, Zimbabwe.

S.No.	Performance Standard	Performance Scores (%)			# of Facilities Meeting Std (N=10)
		Median	Range		
			Min	Max	
1	State of the clinic	59.5	41.7	75	0
2	Maternity waiting Homes	60	40	80	2
3	How many functional assets	0	0	0	0
4	Delivery room	61	53.3	73.3	0
5	Record keeping tools	100	100	100	7
6	Strategic documents	14.3	0	50	0
7	Health centre committee	83.3	83.3	83.3	0
8	EmNOC supplies kit	66.2	60.6	69.7	0

ANC Processes Assessment: Seventeen (17) performance standards (PS) were assessed through exit interviews in a total of 17 HFs (Malawi 3, Zambia 4, and Zimbabwe 10). Malawi did not assess on four of the standards and Zimbabwe on 1 PS. Table 6 shows the scores for each PSs assessed. Overall performance was well below the globally accepted standards in HFs in all three countries. The observation was the most common PS satisfied by HFs overall (70.6%) while less than 30% of the HFs fulfilled all other PS. None of the facilities met the standards for 'Blood Tests, Urine Tests', and 'Client Perception of Quality'.

Zimbabwe HFs satisfied 6/16 (37%), Zambia 10/17 (58.8%) and Malawi 2/12 (16%) of the PS assessed. All HFs in Zimbabwe fulfilled the Observation PS, compared to 2/4 and none in Zambia and Malawi, respectively. On the contrary, all HFs in Zambia satisfied the PS on Information on ANC and Drugs

and Immunization compared to 1/10 in Malawi and none in Zimbabwe, respectively. Although below the acceptable PS levels, median performance scores were generally higher in Zambian than Zimbabwean and Malawian HFs. In Zambia, none of the median performance scores were below 50%, while scores were below 50% on 8 of the PS for Zimbabwe and 6 for Malawi. For Zimbabwe lowest median scores were recorded for Urine tests (6%), Asked Questions to Provider (26%), PMTCT (31%), Client Satisfaction, and Respect During Consultation (33% & 34%, respectively). For Zambia, the lowest median score for the HFs was on PS Questions to Provider (19.5%), and Urine Tests (33.8%). For Malawi the lowest were Urine Tests (4.6%), PMTCT (23.7%), Client Perception of Quality (36.2%), HIV Education and Counselling (42.7%) and Blood Tests (42.6%).

Table 6: Performance scores for quality of ANC Processes.

S.No.	Performance standard	Malawi				Zambia				Zimbabwe				Total
		Median (%)	Range (%)		# of HFs meeting PS (N=3)	Median (%)	Range (%)		# of HFs meeting PS (N=4)	Median (%)	Range (%)		# of HFs meeting PS (N=10)	% HFs meeting PS
			Min	Max			Min	Max			Min	Max		
1	History taking	66.9		76.7	0	74.9	66	90.8	1	66	0	95	2	17.6
2	Observation	54.1		61.3	0	80.8	63	96	2	94	82	100	10	70.6
3	Examinations	38		51.6	0	80.4	68	90.6	2	57	29	90	1	17.6
4	Blood tests	42.6	30	53.5	0	63	38.6	76	0	39	16	62	0	0
5	Urine tests	4.6	3.3	6.3	0	33.8	20.3	63.6	0	6	0	26	0	0
6	Drugs and immunizations	51.3		66.5	0	87.8	86	90.6	4	59	4	100	1	29.4
7	Information on ANC	56.6		61	0	87.5	79.5	95.2	4	54	17	100	1	29.4

8	Antenatal Education and Counselling	81.7	78	86.5	2	74.5	69.8	85.4	1	39	0	80	0	15.4
9	Education and counselling (HIV)	42.7		46	0	74.5	69.8	85.4	1	51	33	75	0	5.9
10	PMTCT	23.7		25	0	66.8	48.4	81.8	1	31	11	69	0	5.9
11	Client perception of quality	36.2		39.8	0	47.1	36.3	59	0					0
12	Provision of privacy					52.3	40.7	64.6	0					0
13	Respect during consultation					76.6	74	81.4	1	34	9	73	0	7.1
14	Care about woman's well being					70.8	50.8	80.4	1	54	9	80	1	14.3
15	Asked questions to the provider					19.5	16.7	24.2	0	25	17	40	0	0
16	Client satisfaction with ANC	95.3	90	97.9	3	51	18.2	72.7	0	33	11	58	0	17.6

Labour and Delivery Services

Structural Assessment: Table 7 shows the PSs for labour and delivery infrastructure. Overall only 57.1% of the HF satisfied 5 of the 11 PS while 71.4% satisfied only one PS (Equipment). Less than 43% of the HF satisfied 5 of the 11 PS. None of the HF had adequate antibiotics and uteronics. None of the HFs satisfied the PS of Infection Prevention. Only one HF in Malawi satisfied 4 PS while 2 satisfied one PS. All Malawian HF did not satisfy the PS for Adequate Laboratory facilities, Equipment, working toilets, Infection prevention, Records and forms. Similarly, the HF did not have adequate Essential drugs. In Zambia all HF met 4 PS, three HFs satisfied 3 PS, and one satisfied 3 PS.

Median performance scores were generally lower in Malawian compared to Zambian HFs. Malawi HF had a median score ≤ 50% on 3 PS (Working Toilets, Analgesics, Antibiotics) while Zambia had median score ≤ 50% on 2 PS (Provides for Women in Labour, Uterotonics).

Zimbabwe did a combined structural assessment for ANC, labour, and delivery. Data on the assessment has been presented above (Table 5). Briefly, only two of the eight PSs assessed were fulfilled by at least one HF. The median PS scores show that most of the HFs were fulfilling less 60% or less of the criteria for most PSs.

Table 7: Performance Standard Scores for Labour and Delivery Infrastructure in 7 district hospitals in Malawi and Zambia.

S.No.	Performance Standard	Malawi				Zambia				Total
		Performance Score								
		Median (%)	Range		# of Facilities Meeting Std (N=3)	Median (%)	Range		# of Facilities Meeting Std (N=4)	% of Facilities Meeting Std (N=7)
			Min	Max			Min	Max		
1	Conducive waiting/ reception area	60	50	80	1	85	60	100	3	57.1
2	Reliable water supply					100	100	100	4	57.1
3	Laboratory facilities	62.33	50	75	0	87.5	50	100	3	42.9
4	Equipment	64.4	58	73.5	0	75	68.8	87.5	1	14.3
5	Provides for women in labour	71.67	66	83	1	41.7	33.3	100	1	28.6
6	Working toilets for clients and providers	45.33	43	50	0	87.5	87.5	87.5	4	57.1
7	Adequate equipment for normal deliveries	58.2	50	66.6	1	83.3	83.3	83.3	4	71.4
8	Infection Prevention	61.33	50	70	0	57.8	43.8	62.5	0	0
9	Records and forms	58.33	50	75	0	100	100	100	4	57.1
10	Resuscitation area for newborn	74.67	50	87	2	68.8	50	100	1	42.9

11	Essential Drugs									
i	Analgaesics	50	0	100	1	87.5	50	100	3	57.1
ii	Antibiotics	50	37.5	62.5	0	50	37.5	75	0	0
iii	Antihypertensives	33.3	0	50	0	75	50	100	2	28.6
iv	Uterotonics	66.7	66.7	66.7	0	41.6	33.3	66.6	0	0
v	Other drugs	70.33	65	75	0	59.1	0	90.9	1	14.3

Process Assessment: Quality of labour and delivery processes was assessed using 12 Performance Standards (PS) in 18 health facilities (HFs) (11 in Zimbabwe, 4 in Zambia, and 3 in Malawi). Zambia assessed a 13th PS of Communication of findings. These were the same HFs included in the assessment of infrastructure and quality of the ANC process. The quality of processes is shown as performance scores in Table 8 below. Overall, only a few HFs satisfied only 5 of the 13 PS. The PS were: Examination on Admission (22.2% of HFs), Care during delivery (16.7%), Immediate newborn care (55.6%), and Care during third stage (55.6%). None of the HFs satisfied all other PS. Only three of the PS were satisfied in the Zimbabwe HFs. Three of 11, 8/11 and 8/11 HFs satisfied the PS of Care during delivery, immediate newborn care, and Care during the third stage, respectively. Zambian HFs satisfied five of the PS: Observation carried out on admission (4/4), Examination on admission (4/4), Communication of findings (1/4), immediate newborn care (2/4), Care during third stage (2/4) and postpartum education on the care of the baby (3/4). Malawian HF satisfied the PS for Examination on admission (2/3), Immediate newborn care (3/3) and Care during third stage (3/3). Median performance scores were in the order Zambia>Malawi>Zimbabwe in 8 of 12 PS. HFs in Zimbabwe had median scores below 50% in 8/12, Zambian HFs in 2/11 and Malawian HFs in 6/12 PS. The lowest median scores were in the PS General Admission (9.0% - Zimbabwe), and Post-partum care in the first 24 hours (15.2% - Malawi).

Table 8: Performance scores for quality of labour and delivery process in 18 health facilities in Malawi, Zambia, and Zimbabwe.

S.No.	Performance standard	Malawi				Zambia				Zimbabwe				Total
		Median (%)	Range (%)		# of HF meeting PS	Median (%)	Range (%)		# of HF meeting PS	Median (%)	Range (%)		# of HF meeting PS	% of HF meeting PS
			Min	Max			Min	Max			Min	Max		
1	General admission	53.4		68.9	0	39.7	35.4	49.1	0	9	1.5	26	0	0
2	Past obstetric history	41.9	40	44.6	0	65	56.1	74.9	0	33.4	13.6	43.8	0	0
3	Present obstetric History	42.9		53.5	0	56.5	46.6	65.4	0	32.9	26.7	39.6	0	0
4	Observation carried out on admission	27.8	13	57.5	0	68.5	59	78.2	4	34.8	25	41.3	0	0
5	Examinations done on admission	78.5		83.9	2	91.4	88.3	96.5	4	29.9	20.1	39		
6	Communication of information on findings					71.8	55	82.8	1					25
7	Care provided during labour	54.5	49	57.3	0	65.2	60.8	70.4	0	32.7	22	42.7	0	0
8	Care during delivery	72.6		76.8	0	48.5	37.5	67.6	0	63.2	26.7	84.9	3	16.7
9	Immediate newborn care	88.9	88	90.9	3	77.8	73.5	80.5	2	83.3	73.8	94.3	8	55.6
10	Care during third stage	80.7		82.3	2	75.6	61.2	87.5	2	83.9	74	95.4	8	55.6
11	Post-partum care in 1st 24 hours.	15.2		17.2	0	63.9	55.1	70.9	0	66.1	52.4	78.6	0	0
12	Post-partum education on care of the mother	36.9	36	37.4	0	53.5	42.3	69.3	0	35.4	25	45.8	0	0
13	Post-partum education on care of the baby.	47.6		50	0	88.4	78.3	94	3	47.7	41.7	58.3	0	16.7

Discussion

The paradox of high coverage of perinatal services and a persistently high burden of maternal and neonatal morbidity and mortality is a major challenge for most Low and Middle-Income Countries (LMICs). This paradox may explain why very few LMICs, and only one in Africa (Rwanda) achieved Millennium Development Goal 5A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio [27]. To ensure progress towards Sustainable Development Goal 3 of reducing MMR to 17 deaths per 100,000 live births and NMR to 12 deaths per 1,000 live births, there is need for LMICs to not only improve and maintain high coverage but equally emphatically address the quality gaps in antennal, labour and delivery services.

We have shown that the quality of perinatal services is generally poor in Malawi, Zambia and Zimbabwe. The structural assessment for ANC showed that in most instances less than 50% of the health facilities (HFs) assessed fulfilled the fundamental Performance Standards (PSs) for Working space, Amenities such as toilets, Equipment and supplies including Essential drugs and laboratory supplies. The median performance scores also showed that most HFs fulfilled half the criteria for each PSs. The ANC process performance scores were even lower with less than half of the HFs assessed fulfilling about half of the 13 PSs assessed. This is despite nearly all facilities having ANC guidelines. Similar findings have been previously reported in Zambia where only 50% of ANC facilities offered adequate ANC service. In Zambia, Katowa-Mukwato et al. (2019) reported that, while only 5% of women perceived ANC service to be poor, four health facilities assessed in Lusaka and Mumbwa did not attain the minimum standards [28]. In Lusaka, Katemba et al. reported that the majority of women did not receive basic investigations such as urine and blood tests [29]. In Malawi, well reasonably resourced HFs were more likely to provide optimum ANC service than less-resourced HFs [30].

Our findings on the assessment of labour and delivery infrastructure and processes mimic the ANC assessment. For Malawi and Zambia, less than 50% of the HFs assessed fulfilled only half of the PSs. None of the facilities fulfilled the PSs for General admission, Past obstetric history, admission examination, Care during labour, Post-partum care in the first 24 hours and Postpartum education on care of the baby. These, among others, are basic and critical processes for the reduction of maternal and neonatal morbidity and mortality [1,2,4]. Even more disconcerting, none of the seven HFs assessed fulfilled the PS for infection prevention. Zimbabwe assessed preparedness for emergency obstetric care and all HFs performed poorly. A study conducted in nearly 1,000 HFs providing delivery services in Malawi showed that, while accessible and highly utilised, the performance was below acceptable global standards [31]. Indeed the study showed that better-resourced facilities had significantly lower neonatal deaths. Our findings are similar to reports in other African countries which showed that the quality of maternal care services was generally poor [32].

We did not assess outcomes of care. However, an assessment of client satisfaction with the perinatal services showed that women were generally unsatisfied with the services provided. None of the HFs in Zambia and Zimbabwe fulfilled the minimum standards for client satisfaction. Similar findings have been reported in other African countries [33-35]. Studies have also shown that despite the high client satisfaction reports, the services were below the minimum standards of care [28,29,33-35]. This discrepancy could be due to several reasons including the users' lack of knowledge of the minimum standards. On the other hand, quality of care is a significant factor influencing the utilization of maternal care services [36-38].

While skilled staff are essential for the delivery of quality care, this can only be realised with adequate infrastructure. In SSA up to 60% of HFs lack basic infrastructure, equipment and supplies such as electricity, drugs, and water [1,2,10,11,39]. This has been reported to negatively affect the performance of health care providers. Makate and Makate showed that a one-unit increase in the quality of maternal care services reduces the risk of neonatal mortality by more than 30% [36]. A study in Malawi reported that two-thirds of maternal deaths occurred at a health facility for several reasons including delay in receiving care. There are several reasons for such delays, some of which are the skills level and attitude of HCP providers and the availability of the relevant resources for care. However, what these studies clearly show is that improving the quality of care requires comprehensive strategies ranging from addressing the infrastructure and the processes of care. This cannot be achieved without a skilled and motivated HCP.

The economic status of countries is a major determinant of the quality of care. Studies have shown the dichotomy in quality of care in rich and poor countries, well-resourced and poorly resourced health facilities and between rich and poor communities [10,11]. Under-five mortality in countries considered economically fragile was reported to be three-time higher than in all other countries [10,40]. Although no statistical comparisons were made, we observed that quality of care indicators was generally better in Zambia than in Malawi than in Zimbabwe. This may reflect the economic fragility of Malawi and Zimbabwe compared to Zambia, despite the time difference. Thus, if the resourcing of HFs is not addressed as a matter of urgency most LMICs will not achieve the SDG on maternal and neonatal mortality.

Conclusion

While significant effort has been invested and progress made in improving maternal and neonatal health, our study has shown that in Malawi, Zambia, and Zimbabwe provision of perinatal services is generally below the global minimum standards. This partially explains why maternal and neonatal mortality remains a major public health problem. To achieve SDG 5 of reducing maternal and neonatal mortality, governments need to invest in maternal care services infrastructure and process improvement.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper

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