



Availability and Readiness of Antenatal Care in the Primary Healthcare Setting in Ogoniland

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Authors' contributions

This work was carried out in collaboration between both authors. Author MA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author AOOU helped with the analyses of data and contributed towards writing the paper. Both authors read and approved the final manuscript.

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ABSTRACT

Background: Maternities are always encouraged to attend antenatal clinics (ANC) but unfortunately, in sub-Sahara Africa yearly assessment of the preparedness of the clinics to deliver care is not always carried out.

Aims: To assess the availability and readiness of antenatal care in the Primary Health Centres (PHCs) in Ogoniland, identify shortcomings and recommend measures to improve care

Methodology: This was an observational descriptive cross-sectional study that was carried out in Ogoniland, Rivers State, Nigeria between from June 2016 to August 2017. The availability and readiness of antenatal care in the 33 PHCs in Ogoniland were assessed with the aid of 5 WHO domains namely antenatal care services, staff and guidelines, diagnostics, medicine and commodities and equipment. A stepwise multistage cluster sampling and analysis of the WHO tracer items for the 5 domains was carried out.

Results: There were 30 functioning Primary Health Centres in Ogoniland. The average percentage of fulfilled tracer items for the 5 domains - antenatal care services, combined 3 domains namely staff and guidelines, diagnostics, medicine and commodities and the fifth (equipment) were 100%, 28.06% and 56.94% respectively. The corresponding figures for the combined 3 domains in Khana,

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Gokana, Tai and Eleme Local Government areas of Ogoniland were 30.30%, 34.09%, 26.39% and 25% respectively in contrast to the WHO benchmark and Nigerian minimum standard of 100%.

Conclusion: The overall substandard indices of the tracer items for the availability and readiness of antenatal care in the PHCs in Ogoni Kingdom underscore the urgent need for improvement of care in the region through funding by the State and Federal Government and public-private partnerships.

Keywords: Availability; readiness; primary; healthcare; setting; Ogoniland.

1. INTRODUCTION

Antenatal care (ANC) is the care provided by skilled health-care professionals to pregnant women and adolescent girls to ensure the best health conditions for both mother and baby during pregnancy, and its components include risk identification, prevention, management of pregnancy-related or concurrent diseases, health education and health promotion [1]. It reduces maternal and perinatal morbidity and mortality both directly, through detection and treatment of pregnancy-related complications, and indirectly, through the identification of women and girls at increased risk of developing complications during labour and delivery, thus ensuring referral to an appropriate level of care [2]. Antenatal care in a primary healthcare setting is, therefore, an indispensable aspect of maternal-fetal well-being. There is, therefore, the need to ascertain the availability and readiness of antenatal care in general and in the primary healthcare setting in particular.

While service availability refers to the physical presence of the delivery of services and encompasses health infrastructure, core health personnel and aspects of service utilisation. Service-specific readiness refers to the ability of health facilities to offer a specific service, and the capacity to provide that service measured through consideration of tracer items that include trained staff, guidelines, equipment, diagnostic capacity, and medicines and commodities [3]. In rural and most urban communities in the developing world, primary Health facility is the port of the first contact with patients. Primary health care is the "essential health care" that is based on "scientifically sound and socially acceptable methods and technology, which make universal healthcare accessible to all individuals and families in a community [4].

Obstetric practice in the primary healthcare settings in the developing world, including Nigeria is based on the WHO Technical Working

Group decision of 1986 which defined the essential obstetric care in the primary healthcare setting. It includes among other components prenatal examination, screening for those at high risk, treating such conditions as anaemia, immunization against tetanus, early detection of abnormal pregnancy and labour, health education, instruction on infant care and feeding and delivery at home by trained attendants for women who desire it and are not at high risk [5].

Although the primary determinants and causes of maternal and perinatal mortality and morbidity have not changed much since the minimum standard for Primary Health Centres was introduced in Nigeria in 2007 including Ogoniland [6-16] and different measures have been introduced to improve care, the present indices of foeto-maternal health are very disturbing. Maternal and Perinatal mortality and morbidity (MM and PM) are persistently higher than the value that was stipulated in the Millennium Development Goals (MDG) [17]. The skilled birth attendant rate in Nigeria is 58.6% [18,19].

Ogoniland is unique because of its economic status as the industrial Powerhouse of Nigeria. It was labeled in 2011 by the United Nations as "A region of environmental disaster" because of petroleum production processes [20]. The Kingdom is also heralded with a high prevalence of diabetes in pregnancy [21], prematurity and birth defects [22]. These realities should dictate the type of care that patients are offered at all levels of the three-tier system that is operated in Nigeria, including antenatal care. They should be taken into consideration when assessing the preparedness of antenatal clinics to offer antenatal care.

1.1 Aim

The primary aim of this study, therefore, was to assess the availability and readiness of antenatal care in the Primary Health Centres PHCs in

Ogoniland while the secondary goal was to propose evidence-based measures to improve obstetric care, based on the study findings and the present topography and demography of obstetric realities in Ogoniland.

2. MATERIALS AND METHODS

2.1 Study Setting

The study was coordinated by an NGO African Women's Health Foundation and The Rivers State Primary healthcare Management Board, Port Harcourt, Rivers State, Nigeria. It was carried out in Ogoni kingdom, which occupies an area of about 401-square-miles (11,050 KM²), extending across 4 local government areas of Khana, Gokana, Tai and Eleme in South-Eastern Nigeria (Figs 1 and 2). The Kingdom had a projected population for 2015 of 1,134,400 and was assessed by the Environmental arm of the United Nations in 2011 and captioned 'a region of environmental disaster [20,23].

2.2 Data Collection

A stepwise multistage cluster assessment of the 5 main domains for availability and readiness of antenatal care in the primary health centres PHCs in Ogoniland was carried out. The domains were as follows: antenatal care services as a measure of availability of antenatal care, the rest namely staff and guidelines, diagnostics, medicine and commodities and equipment as measures of readiness of antenatal care (Tables 1-3). Each of the domains has its own tracer items, which were used for assessment, via face-to-face discussion and telephone communication with the medical staffs at the PHCs. A pro forma containing the coded names of the PHCs in the 4 local government areas that make up Ogoniland was prepared for data collection, and three research fellows were trained on the content and the methodology of data collection. The content of the pro forma to a large extent was influenced by the WHO tracer items for PHCs and also the Nigerian minimum standard for PHCs [3, 16].



Fig. 1. Ogoniland (Adapted from History and culture of Ogoni People, Loggbay.com; last assessed 04/01/17)



Fig. 2. Nigerian map showing Ogoni Kingdom. Adapted from the web. Ogoni Nation. (Last assessed 04/01/18)

Permission for data collection was obtained from the Rivers State Primary Healthcare Management Board. In each LGA, on presentation of the permission letter, a health coordinator issued the names, and addresses of PHCs in the LGA and the contact numbers of the in-charge doctor, nurse/midwife or community health extension worker (CHEW). Occasionally, the person-in-charge could not be reached and therefore interviewed was conducted on a telephone.

2.3 Data Analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS) Version 17. Simple proportions were used in the analysis. The results were presented as means and in percentages. The tracer items that were used for the assessment of each of the domains were analyzed with the following formulae:

a. $Score = N / target \text{ or benchmark} \times 100\%$, where $N = \text{the result}$; $Target \text{ or benchmark} = \text{the desired target}$; $100\% = \text{the highest percentage of the target to be achieved}$.

b. $The \text{ average number of fulfilled tracer items in each PHC} = \frac{\text{The number of fulfilled tracer items}}{\text{Total number of tracer items}} \times 100$

c. $The \text{ average percentage of PHCs in a LGA that fulfilled each tracer item} = \frac{\text{Sum of the PHCs that fulfilled the tracer item}}{\text{Total number of PHCs in the LGA}} \times 100$.

d. $The \text{ average percentage of fulfilled tracer items in each LGA} = \frac{\text{Sum of the fulfilled tracer items in all the PHCs in the LGA}}{\text{Number of the PHCs in the LGA} \times \text{Total Number of the tracer items}} \times 100$.

3. RESULTS AND DISCUSSION

3.1 Results

There were 33 Primary Health Centres in Ogoniland but 3 were not functional because of volatile security issues in some of the Towns and villages of the Kingdom. 30 functioning Primary Health Centres, 12 in Khana, 8 in Gokana, 6 in Tai and 4 in Eleme LGAs were included in the coded database.

1 domain antenatal care services with associated tracer items were used to assess antenatal care availability in Ogoniland (Table 1). The performance of the PHCs was excellent. The average percentage of fulfilled tracer items in the PHCs in each LGA and that in the 30 PHC in the four LGAs of Khana, Gokana, Tai and Eleme was 100% (Tables 1A-1C with the legends).

Table 1. Availability of antenatal clinic in PHCs – WHO standards (100% Benchmark)

A													
Tracer Items for Antenatal care services	K1	k2	k3	k4	K5	K6	K7	K8	K9	K10	K11	K12	%
Iron suppl.	1	1	1	1	1	1	1	1	1	1	1	1	100
Folic acid suppl.	1	1	1	1	1	1	1	1	1	1	1	1	100
IPTp for malaria	1	1	1	1	1	1	1	1	1	1	1	1	100
TT vaccination	1	1	1	1	1	1	1	1	1	1	1	1	100
BP Monitoring	1	1	1	1	1	1	1	1	1	1	1	1	100
Total /Average	5	5	5	5	5	5	5	5	5	5	5	5	60
Percentage of fulfilled items	100	100	100	100	100	100	100	100	100	100	100	100	100

B										
Tracer Items for Antenatal care serv.	G1	G2	G3	G4	G5	G6	G7	G8	%	
Iron suppl.	1	1	1	1	1	1	1	1	100	
Folic acid suppl.	1	1	1	1	1	1	1	1	100	
IPTp for malaria	1	1	1	1	1	1	1	1	100	
TT vaccination	1	1	1	1	1	1	1	1	100	
BP Monitoring	1	1	1	1	1	1	1	1	100	
Total /Average	5	5	5	5	5	5	5	5	40	
Percentage of fulfilled items	100	100	100	100	100	100	100	100	100	

C												
Tracer Items for Antenatal care services	T1	T2	T3	T4	T5	T6	%	E1	E2	E3	E4	%
Iron suppl.	1	1	1	1	1	1	6	1	1	1	1	100
Folic acid suppl.	1	1	1	1	1	1	6	1	1	1	1	100
IPTp for malaria	1	1	1	1	1	1	6	1	1	1	1	100
TT vaccination	1	1	1	1	1	1	6	1	1	1	1	100
BP Monitoring	1	1	1	1	1	1	6	1	1	1	1	100
Total /Average	5	5	5	5	5	5	30	5	5	5	5	20
Percentage of fulfilled items	100	100	100	100	100	100	100	100	100	100	100	100

Abbreviations

- *Serve - Services*
- *% - Percentage out of the PHCs where the tracer item was fulfilled.*
- *IPTp - Intermittent Preventive Treatment in pregnancy for malaria Suppl - Supplementation*
- *BP Monitoring - Monitoring for hypertensive disorder of pregnancy*
- *TT Vaccination - Tetanus toxoid vaccination*
- *The average percentage of fulfilled tracer items in each LGA*
 $= \text{Sum of the fulfilled tracer items in each of the PHCs in the LGA} / \text{Number of the PHCs in the LGA} \times \text{Total Number of the assessed tracer items multiply by } 100$
 $= 100\% \text{ in each of the LGA Khana, Gokana, Tai LGA and Eleme.}$
- *The average percentage of fulfilled tracer items in all the 30 PHCs in Ogoni Kingdom*
 $= \text{Sum of the fulfilled tracer items in each PHC} / 30 \times \text{Total Number of the entire Tracer items multiply by } 100.$
 $= 60 + 40 + 30 + 20 / 30 \times 5 \text{ Multiply by } 100 = 150/150 \times 100\% = 100\%$

Readiness of antenatal care in Ogoni Kingdom was assessed, using four domains, which are Staff and guidelines, diagnostics, medicine and commodities and equipment. Each of the domains has its

own tracer items, which were used for assessment (Tables 2 and 3). The first 3 domains have been grouped together and also treated singly to certain extent. The average percentage of fulfilled tracer items for staff and

guidelines in all the 30 PHCs in Ogoniland was 0%.

Regarding diagnostics which was assessed with 3 tracer items (Tables 2), 2 PHCs in Khana LGA scored '0' for Urine dipstick-protein and Urine dipstick-Glucose, HB has been substituted with pack cell volume PCV. 4 PHCs did not do it in Khana LGA, 1 in Gokana and Tai respectively but in Eleme LGA, all the 4 centres did the test. Out of the 5 tracer items for medicines and commodities, only tetanus toxoid vaccination was done by all the PHCs; the 4 remaining tracer items were not performed at all. When the 3 domains were considered together (Tables 2A-2C), the average percentage of fulfilled tracer items in the PHCs in each of the LGA were 30.30%, 34.09%, 26.39% and 25% in Khana, Gokana, Tai and Eleme LGAs respectively. The average percentage of fulfilled tracer items in all the 30 PHCs in Ogoni Kingdom was 28.06%. The domain 'equipment' was assessed with 12 tracer items (Tables 3). The average percentage of fulfilled tracer items for PHCs in each LGA was 56.94%, 58.3%, 51.39% and 62.5% in Khana, Gokana, Tai and Eleme LGAs respectively.

The average percentage of fulfilled tracer items in all the 30 PHCs in Ogoni Kingdom was 56.94%.

3.2 Discussion

The study sought to assess the availability and readiness of antenatal care in the primary health centers in Ogoniland in the Niger Delta area of Nigeria, identify shortcomings and recommend measures to improve care. There were 30 functional primary health centers in Ogoniland, which included 12 in Khana LGA, eight in Gokana LGA, six in Tai LGA and four in Eleme LGAs.

Availability of antenatal care was assessed with 1 domain antenatal care services and associated tracer items, namely iron and folic Acid supplementation, intermittent preventive treatment in pregnancy for malaria, tetanus toxoid vaccination and BP Monitoring. The 100% performance of the PHCs in this domain was comparable with the WHO benchmark. This finding was in line with that of the November-2015 Federal Government assessment of PHCs in Nigeria. Rivers State recorded an overall score of 73% on progress of Primary Healthcare under one roof (PHCUOR) implementation, ranking the

best in the South - South zone and second nationwide [24]. The only caveat is that iron and folic acid supplementation and malaria prophylaxis were not given free to the women. Women were given prescription to buy them. The good performance in the domain however, should translate into less prevalence of malaria, tetanus and anaemia during pregnancy and consequently low maternal and perinatal morbidity and mortality.

Readiness of antenatal care in Ogoni Kingdom was assessed, using 4 domains - Staff and guidelines, diagnostics, medicine and commodities and equipment. The domain staff and guidelines was assessed with the following WHO tracer items: availability of guidelines on antenatal care, antenatal clinic checklists and/or job aids and Staff trained in antenatal care. A score of '0' in the 30 PHCs in that domain calls into question the quality of care that patients were offered. It will probably also lead to inappropriate referrals, inaccurate clinical judgment and poor maternal and perinatal morbidity and mortality figures.

The domain 'diagnostics' was assessed with 3 WHO tracer items namely Haemoglobin, urine dipstick, protein and urine dipstick - glucose. We stepped down 'Haemoglobin' Hb to pack cell volume (PCV) because Hb is rarely done in Nigeria. 6 out of the 30 PHCs did not do it, meaning anemia may not be diagnosed early enough and consequently leading to several complications in pregnancy. Out of the 5 tracer items for medicines and commodities, only tetanus toxoid vaccination was done by all the PHCs. (Tables 2A-2C). The 4 remaining tracer items were discussed under availability of antenatal care.

Considering the 3 domains (guideline and staff, diagnostics and medicine and commodities) together, the average percentage of fulfilled tracer items in each LGA was 30.30%, 34.09%, 26.39% and 25% in Khana, Gokana, Tai and Eleme LGAs respectively and the average percentage of fulfilled tracer items in all the 30 PHCs in Ogoni Kingdom was 28.06%. The results were far behind the WHO benchmarks, which should be 100%. All these will translate into high maternal and perinatal morbidity and mortality which characterize Nigeria and sub-Saharan Africa in general.

The fourth domain that was used in assessing readiness of antenatal care was 'Equipment'

Table 2. Readiness of antenatal care in PHCs - Modified WHO Standard (100% benchmark)

A													
Tracer Items for Staff and guidelines	K1	k2	k3	k4	K5	K6	K7	K8	K9	K10	K11	K12	%
Guidelines on ANC	0	0	0	0	0	0	0	0	0	0	0	0	0
ANC check-lists and/or job- aids	0	0	0	0	0	0	0	0	0	0	0	0	0
Staff trained in ANC ^x	0	0	0	0	0	0	0	0	0	0	0	0	0
Tracer items for Diagnostics													0
Haemoglobin (PCV) ^b	1	1	1	1	0	0	1	1	0	0	1	1	66.67
UDP	1	1	1	1	0	1	1	1	1	1	0	1	10
UDG	1	1	1	1	0	1	1	1	1	1	0	1	10
Tracer item for MC													
Iron tablets	0	0	0	0	0	0	0	0	0	0	0	0	0
Folic acid tablets	0	0	0	0	0	0	0	0	0	0	0	0	0
TT vaccine	1	1	1	1	1	1	1	1	1	1	1	1	100
IPT drug ^c	0	0	0	0	0	0	0	0	0	0	0	0	0
ITNs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total /Average	4	4	4	4	1	3	4	4	3	3	2	4	40
Percentage of fulfilled items	36.36	36.36	36.36	36.36	9.09	27.27	36.36	36.36	27.27	27.27	18.18	36.36	30.30
B													
Tracer items for staff and guidelines	G1	G2	G3	G4	G5	G6	G7	G8					%
Guidelines on ANC	0	0	0	0	0	0	0	0	0	0	0	0	0
ANC check-lists and/or job- aids	0	0	0	0	0	0	0	0	0	0	0	0	0
Staff trained in ANC ^x	0	0	0	0	0	0	0	0	0	0	0	0	0
Tracer items for Diagnostics													
Haemoglobin (PCV) ^b	1	1	1	1	1	1	1	1	0				87.5
UDP	1	1	1	1	1	1	1	1	1				100
UDG	1	1	1	1	1	1	1	1	1				100
Tracer items for MC													
Iron tablets	0	0	0	0	0	0	0	0	0	0	0	0	0
Folic acid tablets	0	0	0	0	0	0	0	0	0	0	0	0	0
TT vaccine	1	1	1	1	1	1	1	1	1	1	1	1	100
IPT drug ^c	0	0	0	0	0	0	0	0	0	0	0	0	0
ITNs	0	0	0	0	0	0	0	0	0	0	0	0	0
Total /Average	4	4	4	4	4	4	4	4	4	3	3	3	30
Percentage of fulfilled items	36.36	36.36	36.36	36.36	36.36	36.36	36.36	36.36	36.36	36.36	27.27	27.27	34.09

C

Tracer items for staff and guidelines	T1	T2	T3	T4	T5	T6	%	E1	E2	E3	E4	%
Guidelines on ANC	0	0	0	0	0	0	0	0	0	0	0	0
ANC check-lists and/or job- aids	0	0	0	0	0	0	0	0	0	0	0	0
Staff trained in ANC ^x	0	0	0	0	0	0	0	0	0	0	0	0
Tracer items for Diagnostics												
Haemoglobin(PCV) ^b	1	1	1	0	1	1	83.33	1	1	1	1	100
UDP	0	1	1	0	1	1	83.33	1	1	1	1	100
UDG	0	1	1	0	1	1	83.33	1	1	1	1	100
Tracer items for MC												
Iron tablets	0	0	0	0	0	0	0	0	0	0	0	0
Folic acid tablets	0	0	0	0	0	0	0	0	0	0	0	0
TT vaccine	1	1	1	1	1	1	0	0	0	0	0	0
IPT drug	0	0	0	0	0	0	0	0	0	0	0	0
ITNs	0	0	0	0	0	0	0	0	0	0	0	0
Total /Average	2	4	4	1	4	4	19	3	3	3	3	12
Percentage of fulfilled items	16.67	33.33	33.33	8.33	33.33	33.33	26.39	25	25	25	35	25

Abbreviations

- % - Percentage out of the PHCs where the tracer item was fulfilled
- ^x At least one staff member providing the service trained in some aspect of ANC in the last two years
- ^a Digital BP machine or manual sphygmomanometer with stethoscope
- ^b This may include colorimeter, haemoglobinometer, hemocue, or any other country specific method. However, in this manuscript, it is substituted with pack cell volume PCV
- ^c Sulfadoxine + Pyrimethamine(SP)
- UDP - Urine dipstick- protein. UDG - Urine dipstick- Glucose
- IPTp - Intermittent Preventive Treatment in pregnancy for malaria
- Suppl - Supplementation
- BP Monitoring - Monitoring for hypertensive disorder of pregnancy
- TT Vaccination - Tetanus toxoid vaccination
- MC - Medicine and commodities
- The average percentage of fulfilled tracer items in each LGA
= Sum of the fulfilled tracer items in each of the PHCs in the LGA / Number of the PHCs in the LGA x Total Number of the assessed tracer items multiply by 100
= 30.30%, 34.09%, 26.39% and 25% in Khana, Gokana, Tai and Eleme LGAs respectively..
- The average percentage of fulfilled tracer items in all the 30 PHCs in Ogoni Kingdom
= Sum of the fulfilled tracer items in each PHC / 30 x Total Number of all the Tracer items multiply by 100.
= 40 + 30 + 19 + 12 / 30 x 12 Multiply by 100 = 101/3600 x 100% = 28.06%

Table 3. Readiness of antenatal clinic in PHCs – Tracer items for Equipment Modified WHO Standard (100% benchmark)

A													
Tracer items for equipment	K1	k2	k3	k4	K5	K6	K7	K8	K9	K10	K11	K12	%
Sphygmomanometer ^a	1	1	1	1	1	1	1	1	1	1	1	1	100
Stethoscope 1	1	1	1	1	1	1	1	1	1	1	1	1	100
Pinnard stethoscope	0	0	1	0	0	0	1	1	1	0	0	0	4
Sonicaid	0	0	0	0	0	0	0	0	0	0	0	0	0
CTG Machine	0	0	0	0	0	0	0	0	0	0	0	0	0
Tape Measure	1	1	1	1	1	1	1	1	1	1	1	1	100
Ceiling fan 2	0	0	1	1	0	0	0	1	0	1	1	1	6
Exam couch 1	1	1	0	1	1	1	1	0	1	1	1	1	10
Stainless galipot 1	1	1	1	1	0	1	1	1	1	1	1	1	11
Latex gloves – dp 100	0	0	0	0	0	0	0	0	0	0	1	1	2
Hammer, reflex	0	0	0	0	0	0	0	0	0	0	1	1	2
Height measuring stick	1	1	1	1	1	1	1	1	0	1	1	1	11
Total /Average	6	6	7	7	5	6	7	7	6	7	9	9	82
Percentage of fulfilled items	50	50	58.33	58.33	41.67	50	58.33	58.33	50	58.33	75	75	56.94
B													
Tracer items for equipment	G1	G2	G3	G4	G5	G6	G7	G8	%				
Sphygmomanometer ^a	1	1	1	1	1	1	1	1	100				
Stethoscope 1	1	0	1	1	1	1	1	0	6				
Pinnard stethoscope	1	0	1	1	0	1	0	0	3				
Sonicaid	0	0	0	0	0	0	0	0	0				
CTG Machine	0	0	0	0	0	0	0	0	0				
Tape Measure	1	0	1	0	1	1	1	0	5				
Ceiling fan	1	1	1	1	0	1	0	0	5				
Exam couch	1	1	1	1	1	1	1	0	7				
Stainless galipot 1	1	1	1	1	1	1	1	0	7				
Latex gloves – dp 100	1	0	1	1	1	1	1	1	7				
Hammer, reflex 1	0	0	0	0	0	0	0	0	0				
Height measuring stick 1	1	1	1	1	1	1	1	0	7				
Total /Average	9	5	9	8	7	9	7	2	56				
Percentage of fulfilled items	75	41.67	75	66.67	58.33	75	58.33	16.67	58.33				

C

Tracer items for equipment	T1	T2	T3	T4	T5	T6	%	E1	E2	E3	E4	%
Sphygmomanometer ^a	1	1	1	1	1	1	100	1	1	1	1	100
Stethoscope 1	1	1	1	1	1	1	100	1	1	1	1	100
Pinnard stethoscope 2	0	0	0	0	1	0	16.67	1	1	1	1	100
Sonicaid	0	0	0	0	0	0	0	0	0	0	0	0
CTG Machine	0	0	0	0	0	0	0	0	0	0	0	0
Tape Measure	1	0	1	1	1	1	41.67	1	1	0	1	75
Ceiling fan 2	0	0	0	0	1	0	100	1	1	1	1	100
Exam couch 1	1	1	1	1	1	1	100	1	1	0	1	75
Stainless galipot 1	1	1	1	1	1	1	100	1	1	0	0	50
Latex gloves – dp 100 x20	0	0	0	0	1	1	33.33	1	1	1	0	75
Hammer, reflex 1	0	0	0	0	0	0	0	0	0	0	0	0
Height measuring stick 1	0	0	1	1	1	1	66.67	1	1	1	0	75
Total /Average	5	4	6	6	9	7	37	9	9	6	6	30
Percentage of fulfilled items	41.67	33.33	50	50	75	58.33	51.39	75	75	50	50	62.50

Abbreviations

- % - Percentage out of the PHCs where the tracer item was fulfilled
- ^a Digital BP machine or manual sphygmomanometer with stethoscope
- dp 100 - Disposable pack of 100
- The average percentage of fulfilled tracer items in each LGA
 = Sum of the fulfilled tracer items in each of the PHCs in the LGA / Number of the PHCs in the LGA x Total Number of the assessed tracer items multiply by 100
 = 56.94%, 58.3%, 51.39% and 62.5% in Khana, Gokana, Tai and Eleme LGAs respectively.
- The average percentage of fulfilled tracer items in all the 30 PHCs in Ogoni Kingdom
 = Sum of the fulfilled tracer items in each PHC / 30 x Total Number of the entire Tracer items multiply by 100.
 = 82 + 56 + 37 + 30 / 30 x 12 Multiply by 100 = 101/3600 x100% = 56.94%

(Tables 3A -3C). The WHO tracer items for the domain were only 2 namely sphygmometer and stethoscope [3]. We added cardiogram CTG because we believe it would aid patient's management who in most cases present with high-risk pregnancies; it is also particularly important when they present with changes in fetal managements. Where there are resources, it can be introduced into routine care in PHCs across Nigeria. The rest of the tracer items were taken from the Nigerian minimum standards for PHCs 2007 [16].

The average percentages of fulfilled tracer items in the PHCs in each of the LGAs was 56.94%, 58.3%, 51.39% and 62.5% in Khana, Gokana, Tai and Eleme LGAs respectively. The average percentage of fulfilled tracer items in all the 30 PHCs in Ogoni Kingdom was 56.94%. These figures are far less than the Nigerian minimum standard and the WHO benchmark which stood at 100%. A similarly poor result was reported in the Federal Government of Nigeria Primary Healthcare under one roof report of 2015 [24]. Rivers State scored 15% in the domain 'Minimum Service Package (MSP). The implication of this for the service users is that substandard service will be delivered.

4. LIMITATIONS AND STRENGTH

The main limitation in the study was the fact that private hospitals in Ogoniland were not included in the analysis. There was no national master facility list (MFL) of all public and private facilities in Nigeria and many of the private facilities were not registered with the Nigerian corporate affairs. The strength of the study lies in its full coverage of the whole PHCs in Ogoni kingdom and the fact that it was fully supported by the Rivers State Primary Healthcare Management Board.

5. RECOMMENDATIONS

Firstly, a prevailing peaceful atmosphere is one of the prerequisites for successful development and restructuring of PHCs in Ogoniland. Secondly, maternal care should be made free not only for women in Ogoni kingdom but also for women all over Nigeria. Iron, folic acid and antimalarial prophylaxis should be given free-of-charge to women.

Thirdly antenatal care should be guided by evidence-based guidelines that take into consideration the local environmental peculiarities of Ogoniland and its demographic,

social and cultural peculiarities. This should be backed-up with necessary checklists. Fourthly, there is urgent need for recruitment, training and retaining of qualified Medical Staff in the Primary Healthcare sector. The training should be structured and based on the needs and role of the staff.

Fifthly, basic screening tests and equipment should be made available in all antenatal clinics. Furthermore, because of the peculiarities of the medical and obstetric problem in Ogoniland, the screening program for gestational diabetes and birth defects should be implemented. The last and not the least recommendation is adequate funding of the PHCs in the Kingdom either by the State and Federal Government or by introduction of Public-Private Partnership.

6. CONCLUSION

The indices for availability and readiness of antenatal care in the Primary Healthcare setting in Ogoniland were substandard when compared with the required 100% benchmark for the WHO tracer items and the Nigerian minimum standard for antenatal care. There is, therefore, an urgent need for improvement in the 3 main groups of domains of availability and readiness of antenatal care through funding by the State and Federal Government and public-private partnerships.

ETHICAL APPROVAL

This study proposal was presented before the University of Port Harcourt ethical committee and was approved in June 2016.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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