

The Role of Transport and Logistics in Maternal Healthcare Delivery in the Abureni Bloc of Bayelsa and Rivers States, Nigeria

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Abstract

The problem of poor Maternal Health (MH) is largely that of poor access to Maternal Health services which is blamed for type-2 delay (delay in accessing healthcare due to distance between patients and health care facilities) most severe in the Abureni Bloc, Nigeria, and is resulting to loss of lives (Babies & Mother's) to this very moment. This paper provides insight to what is access to MH services; identifies factors that affect access to MH, and sheds light on why transportation development and logistics is necessary for promoting MH in rural Abureni communities. 200 out of total 250 copies of questionnaire were retrieved and analysed in the Abureni Bloc; where 66% cited poor transportation in the Abureni as an obstacle in accessing MH services. The remaining 34% laid blame on spatial and temporal distribution of MH services, social structure, poor supervision and the ruddy behaviour of some MH personnel in the Abureni as the cause for poor MH services in the Bloc. The study reveals the inextricably links between transport and Health, which has manifested on the health seeking behaviour in the utilization and non-utilization of MH services. At 5% confidence level, there is a significant relationship between access to Maternal Health and utilization of maternal services (Chi-square). The paper therefore, recommends for transport and non-transport based approach for an effective MH services in the Abureni Bloc.

Keywords: Abureni, Maternal Health, Transportation, Logistics and Type-2 delay.

Introduction

Maternal Health (MH) is generally refers to the health of women during pregnancy, childbirth and post-partum period. MH care is regarded as a component of primary health care that is at bottom end of the health hierarchy that is a major problem, especially in developing countries due to maternal mortality (Okafor, 2015). It also encompasses the health care dimensions of family planning, preconception, prenatal, and postnatal care in order to reduce maternal morbidity and mortality.

The World Health Organisation (WHO, 2004) defines maternal mortality as the death of women while pregnant or within forty-two (42) days of the termination of pregnancy, arising from any related cause made worse by the pregnancy or its management. Often a time this problem is yet to be fully acknowledged, understood while underestimated the

role of transport, mobility and logistic in improving poor people's health and maternal health in developing countries (Isaach, Mensah & Anyanful, 2014).

According to Adesokan (2011); the average life time risk for a woman dying of pregnancy and related causes in the developed countries is between 1:1,000 and 10,000, while in the developing countries is 200:4000; 22 compared to 49000 in developed countries (Ope, 2020). WHO (2007) reported 536,000 maternal deaths across the world in 2005, with the developing countries accounting for 533,000 (99%) of the global total; out of this amount African take 86% of the total death, most of its are preventable if the transport facilities and logistics improved.

Statement of Problems

According to Oladosu Ojengbede, professor and director of the University of Ibadan's Center for Population and Reproductive Health "*Nigeria's population is only two percent of the world population, but we contribute about 10 percent of the maternal mortality,*" (Wilsoncenter, 2014). These placed maternal mortality ratio in Nigeria at 1:100, 5:1000; 512:100000 making Nigeria a leading contributor to maternal deaths (Hill *et.al.* 2007) and in the year 2017, Maternal mortality ratio in the country is 917.00 (Macrotrends, 2017). Still, Meh, Thind, Ryan and Terry (2019) opined that health disparities exist between the Northern and Southern part; more pronounced in the North; and concluded that, Media exposure and education were associated with maternal mortality in the North while contraceptive method, residence type and wealth index were associated with maternal death in the South. Despite the 34,000 Primary Health Care Services available at the entry level in the country; Nigeria occupied the fourth positions in maternal Mortality rate in Africa after South Sudan, Chad and Sierra Leone (Okonufa, *et.al.*, 2018). The statistics place the problem of poor maternal health in sharp relief, largely that of poor access to MH due to type-2 delay.

According to Okafor (2015) type-2 delay refers to delay in accessing health care due to distance between patients and health care facilities. Thus, it highlights the importance of transportation and logistics in maternal health to improved access especially in rural communities. Similarly, the study of Born, Aikins, Asibey and Agyemang-Duah (2014) confirms to the existence of Healthcare in the Southern District of Ashanti; however, the poor road network in the district affect access to maternal health care. The Nigerian Demographic and Health survey by the NPC (2004) found that 24 percent of women cited the problem of transportation and accessibility to health facilities as the major problem in maternal health care.

Adesokan (2011) also observed that nearly 80% of rural women live more than five (5) kilometres away from the nearest hospital, and many have to walk even when in labour, an observable fact in the Abureni communities. Many a times it leads to loss of lives (Babies & Mother), and because of this many women resents to traditional practitioners for prenatal care instead.

It is on records that a good transportation infrastructure facilitates the movement of people (workers and patient) goods and services, diminishing the adverse effect of distance on the utilization of MH services. This is very true as distance, travel time and transport costs are dis-incentives to seeking care, delaying the decision to seek MH care. Alternatively, logistic would have close this gap where it is readily available but the reverse is the case in the Abureni Bloc. Logistics in this paper encompasses government policies such as subsidised MH services, public enlightenment, promoting women education, provision of basic amenities, and special allowance to health personnel working in rural health centres, collaboration with community leaders for effective health work supervision.

Like any other rural communities in Nigeria, the Abureni bloc are very disadvantage when it comes to land transportation, accessibility and logistics, paucity of service facilities, small population, poverty, consequent upon non-availability of motorable roads, absents of basic amenities and unfavourable government policies, thus contributing to maternal death in the region.

Aim and Objectives of the study

This study aimed at investigating the place of transportation and logistics in promoting Maternal Healthcare (MH) Delivery in the Abureni Bloc of Bayelsa and Rivers states, Nigeria. Specific objectives pertinent to the study include:

1. Provide insight to what access to MH services is
2. Identify factors affecting access to MH service in the Abureni Bloc
3. Highlight fundamental role of Transportation and logistics in MH of the Abureni Bloc
4. Provide workable solutions that will promote access to MH services in the Abureni Bloc, as key participants to Goal 3 (Good Health and Well-Being) of the Sustainable Development Goals.

Material and Methods

Study Area

The study Area (Fig 1) Abureni is located in the central Niger Delta within Bayelsa and Rivers State in Nigeria [Etire, 2015a; Etire, 2015b]. The Abureni extends from $4^{\circ}41^1 - 4^{\circ}59^1\text{N}$ and $6^{\circ}18^1 - 6^{\circ}59^1$; it is bounded in the North by Odual Clan, In the East by the Kalabari of Rivers State; in the West by the Kolo Creek (Agholo Clan) in Ogbia L.G.A. and South by the Nembe L.G.A of Bayelsa State. The Abureni symbolised communities and satellite settlements with identified language (Okpara, 2013). According to Etire (2016), the Abureni is divided into two native speaking blocs such as the Kugbo bloc comprises of Emago, Amuruto, Akani and Amorokeni; geographically occupying the Northern part and Mini bloc comprises of Idema, Okoroba, Agrisaba and Opume; geographically occupying the southern parts. Five out of the total eight (8) are in Bayelsa State (Idema, Amorokeni, Okoroba, Agrisaba and Opume) while Akani, Emago and Amuruto are in Rivers State. All the communities and satellite villages are situated along the banks of rivers and creeks; within marine environment

cutting across saline, brackish and freshwater bodies (Okpara, 2013; Etire, 2015a]. Hence, they are basically peasant (subsistence) farmers and mini fishermen and women.



Fig 1: Niger Delta: Abureni and Neighbouring Area
Source: Crafted from Etire (2016)

Data Collection

Data for this study was collected with the aid of a well-structured questionnaire, administered and retrieved from five (5) purposive Communities label S₁-S₅ (Akani, Emaguo, Amuruto in Rivers state; Amorokeni and Opume in Bayels state); Three (3) from Rivers State and two (2) from Bayelsa State. The choice of this sampling site is for comparism due to presents and absent of health facilities.

Table 1. Sampled sites and Observed feats

Symbols	Communities	Observed Facts
S ₁	Akani	No motorable roads and absents of Maternal Health centre
S ₂	Emaguo	No motorable roads and presents of Health centre
S ₃	Amuruto	No motorable roads with non-functional Health Centre
S ₄	Amorokeni	No Motorable roads and absent of Health centre
S ₅	Opume	Motorable roads and presents/functional Health Centre

Source: Researchers field work, 2022.

Data Analysis

A total 250 questionnaires were administered (50 each); only 200 where retrieved and analysed on the role of transportation and logistics in Maternal Health in the Abureni bloc.

The analysed results were statistically tested using Percentile and pie chart, Two ways Anova (F) and Chi Square (X^2) at 5% significant levels for statistical differences and correlation.

Results and Discussion

Analysis of Variance

Hypothesis 1. H_0 : There is no statistically significant difference between improved transportation and access to maternal health in Abureni.

Table 2. Responses from sampled sites

Communities	Responses				
	SA	A	DA	SDA	TOTAL
S1	18	10	8	4	40
S2	15	12	7	6	40
S3	17	13	6	4	40
S4	18	11	6	5	40
S5	9	9	12	10	40
TOTAL	77	55	39	29	200
MEAN	15.4	11	7.8	5.8	40
% Responses	38.5%	27.5%	19.5%	14.5	100%
	66%		34%		

Where: SA= Strongly Agreed; A= Agreed; DA= Disagreed; SDA = Strongly Disagreed

Source: Researchers field work, 2022

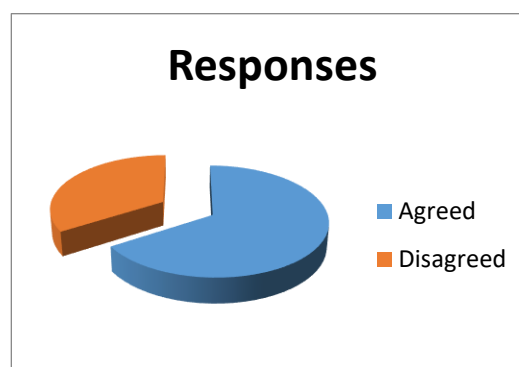
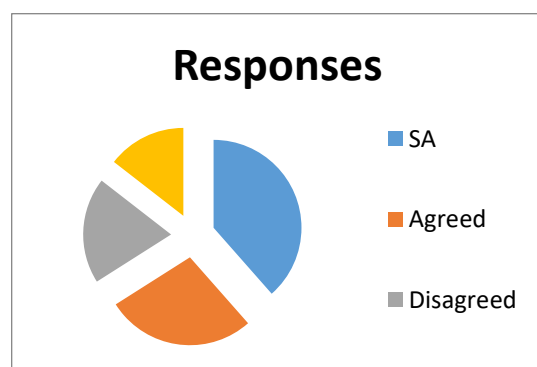


Chart 1 and 2. Responses level on the role of transport to access MH in the Abureni Bloc.

Table 3. Two Way Anova for Level of responses

Source	SS	d.f	MS	F-ratio	5% F Limit
B/w Columns	263.2	3	87.73	19.94	(3,12) = 3.49
B/w Rows	0	4	0	0	(4,12) = 3.26

Erro	52.8	12	4.4
Total	316	18	

Source: Researchers field work, 2022.

There is a statistical significant relationship between access to Maternal Health and Utilization of maternal health services in the Abureni (Table 3) at 5% significant level. In the same vein, Okafor (2015) has note that lack of effective access to essential obstetric services is a key cause of maternal death; conversely, the utilisation of maternal health care services is important tool for the reduction of maternal mortality. Moreover, Kunst and Houweling (2001) have note that 88-98% of maternal deaths can be avoided if all women have effective access to reproductive health care. In the case of Abureni the direct distribution of necessities for pregnant women through motorcycles can enhance MH services for the now (Plate 1.)

Correlations

Hypothesis 2. H_0 : There is no statistically significant correlation between accessed to Maternal Health and Utilization of Maternal Health Services in Abureni Communities.

Table 4. Computed Field Data

Communities	Utilised	Non-Utilised	Total
S ₁	29	11	40
S ₂	27	13	40
S ₃	28	12	40
S ₄	29	11	40
S ₅	9	31	40
TOTAL	122	78	200

Source: Researchers field work, 2022.

Table 5. Chi Square table for MH Utilization

O	E	O – E	(O - E) ²	(O - E) ² / E
29	24.4	4.6	21.16	0.867
11	15.6	-4.6	21.16	1.356
27	24.4	2.6	6.76	0.277
13	15.6	-2.6	6.76	0.433
28	24.4	3.6	12.96	0.531
12	15.6	-3.6	12.96	0.831
29	24.4	4.6	21.16	0.867
11	15.6	-4.6	21.16	1.356
9	24.4	-15.4	237.16	9.720

31	15.6	15.4	237.16	15.20
	200		598.4	31.44

Source: Researchers field work, 2022; where: O=Observed variables; E= Expected variables; d.f = (c-1)(r-1) = 4; @5% = 9.488.



Plate 1. Logistics Box for improving Maternal Health in the Abureni

Source: Researcher, 2022

Good road networks facilitate the utilization of health care services by reducing the friction of distance. Generally, increasing distance diminishes services utilization, so what good transport infrastructure does is to reduce the effect of distance thereby increasing the catchment area of the service outlet in both supplies and personnel to maternal health facilities. From the analysis, 66% of the Abureni women cited poor transport facilities (roads and facilities) a problem to access to maternal health while only 34% cited social structure in the form of income and educational barriers, shortage of manpower, obsolete medical facilities; that mounted pressure on delay in making decision to seek maternal health care, delay in locating and arriving at a medical facility, delay in receiving skilled pregnancy care upon arriving to access maternal health facilities in the Abureni. Since the primary mode of transportation for women in labour in the Abureni remains walking and care seeking practices, thus increasing the fear of delivery en route. Similar results were observed by Isaac, Menash and Anyanful (2014) when they note that excessive time and distance influences patients seeking care at a health institution rather turned to traditional practitioners at home for delivery. More so, Kifle, Azale, Gelaw and Melsew (2017) in their

studies also recorded that Maternal Health care service seeking of women in Rural Haramaya District in Ethiopia was 74.3% (95% CI; 72.5, 76.14) for antenatal care; 28.7% (95% CI; 26.8, 30.6) for attending institutional delivery and 22.6% (95% CI; 20.84, 24.36) for postnatal care.

Conclusion and Recommendations

The key to improving Maternal Health lies not just in providing roads networks, but more importantly in making available reliable transport services and logistics. Truly speaking, Logistics is a key pointer to improved access to Maternal Health care. In a keen to review the problem of poor access to Maternal Health in Bayelsa State, the Restoration Government of Bayelsa state of recent through the ministry of Health has approved the placement of all registered pregnant women in various public and government recognised hospitals on a monthly stipend of three thousand naira (3,000) each in addition to the free routine antenatal and post-natal exercised in the state (Radio Fm, 2018), all to promote the access and utilisation of maternal health services in the state. On the coronary, the implementation of transport infrastructure should therefore be affected along with measures designed to reduce structural barriers if maternal health is to be enhanced in the Abureni. These measures include the provision of free MH services; public enlightenment and the empowerment of women to enable women take decisions in matters that affect their lives, including cares without undue cultural and financial embracement.

The study therefore recommends

- The urban bias in the provision of Modern Health facilities and Maternal Health services as note in this study should be minimised to manage infant mortality especially in the Abureni through the proximate location of maternal health services in the village were need is also high.
- There should be flexible opening hours and availability of MH care personnel through partnership with local leaders to enhance regular supervision in the Abureni.
- In as much as the transport base (Roads network and facilities) provision in the Abureni necessary; it should be coupled with functional communication systems between the different health care facilities in the health care delivery.

Declaration of Interest

We (all authors) hereby declared that there is no conflicting of interest.

References

- Adesokan, F.O.O. Reproductive Health for All Ages. Ado Ekiti: *Faxwell Nigeria Ltd*, 2011:2-9.
- Born, O.A.; I. Aikins; O. Asibey and Agyemang-Duah, B. The Contribution of Transport (Road) in Health Care Delivery: A Case Study of Mankranso District Hospital in the Ahfo Ano; South District of Ashanti Region; *British Journal Of Marketing Studies*, 2014; 2(4): 30-51. ISSN: 2053-4051.
- Etire, D. Onu Abureni 1, *Onyoma Research Publications*, Port-Harcourt, Rivers State, Nigeria. (2016): 3-8; ISBN: 978-978-8196-62-7.

- Etire, D. Owai Abureni: Abureni Numerals, *Onyoma Research Publications*, Port-Harcourt, Rivers State, Nigeria. (2015b):1-15; ISBN: 978-978-8196-60-3.
- Etire, D. The Orthography of the Abureni Language. *Onyoma Research Publications*, Port-Harcourt, Rivers State, Nigeria. (2015a): 1-23; ISBN: 978-978-8196-59-7.
- Hill, K.; K. Thomas; C. Abouzahr; N. Walker; L. Say; M. Inoue and Suzuki, E. Estimates of Maternal Mortality Worldwide Between 1990-2005: An Assessment of Available Data. *Lancet*, 2007; 370 (95):1311-1319.
- Isaach, O.; C. Mensah and Anyanful, T. K. The Role of Transportation in Accessing Maternal Health Services: A case Study of Sumbrungu Health Clinic; *European Journal of Logistics, Purchasing and Supply Chain Management*, 2014; 2(3):24-38. www.eajournals.org.
- Kifle, D.; T. Azale, Y. A. Gelaw and Melsew, Y.A. Maternal health care service seeking behaviors and associated factors among women in rural Haramaya District, Eastern Ethiopia: a triangulated community-based cross-sectional study; *Reproductive Health* 14, 6 (2017). <https://doi.org/10.1186/s12978-016-0270-5>
- Kunst, A. S. and Houwelling, T. A Global Picture of Poor-Rich Differences in the Utilization of Delivery Care. *Safe Motherhood Strategies: A Review of the Evidence*, (2001): 17, 297-315. *Belgium: ITG Press*.
- Macrotrends, (2017). Access from <https://www.macrotrends.net/countries/NGA/nigeria/maternal-mortality-rate>
- Meh, C., A. Thind, B. Ryan and Terry, A. Levels and determinants of Maternal Mortality In Northern and Southern Nigeria, *BMC Pregnancy and Childbirth* (2019) 19:417; <https://doi.org/10.1186/s12884-019-2471-8>.
- NPC Nigeria Demographic and Health Survey, 2003. *Abuja National Population Commission*; 2004 and access November 25, 2022.
- Okafor, S. I. The Role of Transport and Infrastructural Development in Maternal Health, Unpublished *Paper presented at the Post-Graduate Seminar*, Faculty of Social Sciences, Niger Delta University, Amassoma, Bayelsa State, Nigeria 2015.
- Okonufa, F.; L. Ntoimo, J. Ogungbangbe, S. Anjorin; W. Imongan and Yaya, S. Predictors of Women's Utilization of Primary Health Care for Skilled Pregnancy Care in Rural Nigeria; *BMC Pregnancy and Childbirth*, 2018; 18:1-15, 2018. doi:10.1186/3/2884.018-1730-4.
- Okpara, M. O. *The Origin of the Ogbia Man*. Anno Domini by Live Dots, Port-Harcourt, Nigeria. (2013):2-34.
- Ope, B.W. Reducing Maternal Mortality in Nigeria: Addressing Maternal Health Services, Perception and Experience, *Journal of Global Health Reports*; 2020; 4:e2020028. doi:10.29392/001c.12733 and access on December, 4, 2022.
- Radio Bayelsa-97.1 Government News: Placing Registered Pregnant women on Monthly Stipends. *Government Special Announcement*, 96.1 FM, Bayelsa State; 2018: anchored on 15th September 2018.
- WHO. Integrated Management of Pregnancy and Childbirths. Geneva: World Health Organisation, 2007
- WHO. Maternal Mortality in 2000 Estimates, Department of Reproductive Health Research, Geneva: World Health Organisation 2004.
- Wilsoncenter (2014): Emerging Priorities for Maternal Health in Nigeria (Abuja and Washington, DC); In Olonade, O., [T. I. Olawande](#), [O.J. Alabi](#) and [Imhonopi](#), D. Maternal Mortality and Maternal Health Care in Nigeria: Implications for Socio-Economic Development; *Open Access Maced J Med Sci*. 2019 Mar 15; 7(5):849-855. doi: [10.3889/oamjms.2019.041](https://doi.org/10.3889/oamjms.2019.041). Access from <https://www.wilsoncenter.org/event/emerging-priorities-for-maternal-health-nigeria-abuja-and-washington-dc>