Contributors to disparity in missed opportunity for intermittent presentive treatment for malaria in pregnancy in Nigeria

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des tendances.

Abstract

Background: Malaria remains a challenging public health issue in Africa, with preponderance for pregnant women. Considering Nigeria's significant contribution to the global burden of malaria, the low uptake of IPTp-SP is of significant concern considering several evidences of disparity in missed opportunity for delivering IPTp-SP. This study was conducted to determine the contributors to and the magnitude of their effect on uptake, to provide baseline information for measuring disparity and monitoring effects of interventions through trend analysis.

Method: The Nigeria Demographic Health Survey (NDHS) dataset 2013 was used and data on sociodemographic, (Antenatal care) ANC characteristics and IPTp-SP use were used to assess IPTp uptake and missed opportunity. A missed opportunity for IPTp delivery is an ANC visit in which IPTp was not delivered per policy. Analysis was done using SPSS version 21. Measures of associations used chisquare test. The level of significance was set at 5%. Index of disparity was used as a summary measure of disparity for determinants of missed opportunity. Results: The mean age of the respondents was 28.69±0.19 years. Majority (25.4%) were Hausa/ Fulani tribe, 41.5% had secondary education. Most (28.6%) are of the richest wealth quintile, 52.6% are Christians and 94.9% are currently cohabiting. Majority (51.1%) resided in urban area and (23.5%) South West while 41.1% had less than two previous pregnancies. Contributors to disparity for missed opportunity in Nigeria were level of education, wealth index, ethnicity, place of residence, region and parity of respondents. The greatest contributor to disparity for missed opportunity was region of residence with the least being parity. 11.11

Conclusion: The need for strategic cost-effective interventions that focuses on the greatest contributors to decrease disparity for missed opportunity is important. There is an increased need to explore regional determinants of missed opportunity.

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Keywords: Disparity, missed opportunity, intermittent preventive treatment of malaria, malaria in pregnancy, Nigeria. A second and some models and second se

is particularly predominant [12] and a second Abstrait and the read lie tooling of a work at Contexte : Le paludisme reste un problème de santé publique difficile en Afrique, avec une prépondérance pour les femmes enceintes. Compte tenu de l'importante contribution du Nigeria à la charge mondiale du paludisme, la faible absorption d'IPTp -SP est très préoccupante compte tenu de plusieurs preuves de disparité dans occasion manquée pour la prestation IPTp -SP. Cette étude a été menée dans le but de déterminer les facteurs contributifs et l'ampleur de leur effet sur l'absorption, afin de fournir des informations de base permettant de mesurer les disparités et de surveiller les effets des interventions au moyen d'une analyse

Méthode : L'ensemble de données de l'enquête sur la santé démographique du Nigeria (NDHS) 2013 a été utilisé et les données sur les caractéristiques socio-démographiques de l'ANC, (soins prénatals) et l'utilisation d'IPTp -SP ont été utilisés pour évaluer l'absorption d'IPTp et opportunité manquée. Une opportunité manquée pour la prestation IPTp est une visite ANC au cours de laquelle IPTp n'a pas été livré conformément à la stratégie. L'analyse a été réalisée à l'aide de la version 21 de SPSS. Les mesures d'associations ont été utilisées avec le test du chi-carré. Le niveau de signification a été fixé à 5%. L'indice de disparité a été utilisé comme mesure synthétique de la disparité pour les déterminants des opportunités manquées.

Résultats : L'âge moyen des répondants est de 28,69 \pm 0,19 ans. La majorité (25,4%) était composée de tribus Hausa / Fulani, 41,5% avaient suivi des études secondaires. La plupart (28,6%) appartiennent au quintile de richesse le plus riche, 52,6% sont chrétiens et 94,9% cohabitent actuellement. La majorité (51,1%) réside en zone urbaine et (23,5%) dans le sud-ouest, tandis que 41,1% ont eu moins de deux grossesses antérieures. Les facteurs contribuant à la disparité des opportunités manquées au Nigéria sont le niveau d'éducation, l'indice de richesse, l'origine ethnique, le lieu de résidence, la région et la parité des répondants. Le facteur qui contribue le plus à la disparité des opportunités manquées est la région de résidence, le moins égal étant la parité. Conclusion : Le besoin d'interventions stratégiques rentables axées sur les principaux contributeurs afin de réduire les disparités pour les opportunités

manquées est important. Il est de plus en plus nécessaire d'explorer les déterminants régionaux des opportunités manquées.

Mots - clés : Disparité, opportunité manquée, traitement préventif intermittent du paludisme, paludisme pendant la grossesse, Nigéria.

Introduction

Malaria remains a challenging public health issue in the African region, where the impact of the disease is particularly predominant [1]. Although the disease is known to affect all persons living in malaria endemic regions, vulnerability is higher for pregnant women and children under five in these regions [2]. Of the 125 million pregnant women at risk of malaria globally, approximately half of this burden is from malaria endemic regions of which sub-Saharan Africa contributes 50% [3, 4].

In view of the dire consequences that malaria has on pregnant women and their fetus, the World Health Organization (WHO) in conjunction with several stakeholders [2] under the Roll Back Malaria Initiative in 2001 recommended the intermittent preventive treatment of malaria in pregnancy (IPTp-SP) as one of the malaria control strategies targeted specially for pregnant women in malaria endemic regions. It recommends that every pregnant woman be administered at least two doses of Sulphadoxine Pyrimethamine during Antenatal care (ANC) visit starting from the second trimester, as a preventive treatment for malaria in pregnancy. This recommendation is based on the evidence that IPTp-SP is cost effective and reduces the risk for maternal anemia, low birth weight, and perinatal mortality by 38%, 43% and 27% respectively among first and second time pregnancies [5].

Following this, IPTp-SP adoption across Africa has been slow and national implementation has been slower. More so, adoption across countries was largely dependent on political will and the strength of the national health system [6, 7]. These coupled with the low uptake of IPTp-SP has been largely responsible for the slower progress in the prevention of the occurrence of malaria in pregnancy compared to the success reported in the battle against malaria [8]. Hence, no African country has met the RBM uptake target since 2006 where only 6 countries met the 60% expected coverage for IPTp-SP. This low uptake for IPTp-SP was initially attributed to low ANC attendance, but recent evidences have shown that this trend is independent of ANC attendance [9]. This sub-optimal IPTp-SP uptake within the context of reported high ANC

attendance represents significant missed opportunities for IPTp-SP at ANC facilities [10]. Consequently, an ANC visit with non-delivery of IPTp-SP as per policy is termed a missed opportunity [9].

Nigeria is not exempt from this, with persistently high level of missed opportunities despite high rates of ANC visits. Five years post implementation, the 2010 Nigeria Malaria Indicator survey reported that only 15% of women who had given birth in the last two years preceding the survey had received even one dose of SP during ANC [12]. While several studies have shown that missed opportunity for IPTp-SP uptake is a complex mix of social, demographic, economic and cultural factors that influence the demand side for service [13,14,11], institutional challenges are also significant influences on the supply side [13,14]. These factors have resulted in observed disparities for missed opportunities for IPTp-SP across socio-demographic characteristics of pregnant women and exploring the contribution of each of these characteristics can assist in proffering effective and practical solutions to the challenge of low uptake and high missed opportunity for IPTp-SP in Nigeria. This initiative has become imperative following the global call for the upscale of IPTp-SP uptake across implementing states following the updated recommendation for the preventive treatment of malaria in pregnancy [15]. This study utilizes secondary data to explore the pattern of disparity in missed opportunity for IPTp-SP and its contributors across Nigeria.

Methods

We carried out a secondary analysis of data from the 2013 National Demographic and Health Survey (11); a nationally representative population-based cross-sectional survey involving data collection from selected locations in the 36 states of the federation and the Federal Capital Territory. Permission to use the NDHS dataset was obtained from the MEASURE DHS program.

The study population was randomly selected using a three-step stratified sampling method. Stratification was achieved by separating each state into urban and rural areas. Selected localities were used in the first stage, enumeration areas in the second and a fixed number of household were selected through equal probability sampling for the third stage. All women aged 15-49 who were either permanent residents of the selected households or visitors who stayed in the households the night before the survey were eligible to be interviewed.

The women's health questionnaire was administered to women aged 15- 49 years where a

sample of 37,928 individuals was originally drawn. For the purposes of this study a total of 6910 women whose most recent pregnancy resulted in a live birth in the past 2 years with more than 4 ANC visits were analyzed. Respondents were recategorized into 2 groups; those who received less than two doses of IPTp-SP and those with two or more doses. As nearly all surveys were conducted before the updated WHO policy in 2012 emphasizing dosing of IPTp-SP at each ANC visit, the proportion receiving two or more doses of IPTp-SP was used as the primary comparison in this analysis.

Relevant questions were identified from the women questionnaire dataset. To ensure that calculated estimates were independently observed from recent births, analyses was performed using information on the most recent pregnancy resulting in a live birth within the last two years prior to survey date. Data on pregnancy, ANC attendance and Sulphadoxine pyrimethamine use were extracted from the survey and analyzed using SPSS statistical package (version 21). The data was weighted using the women individual sample weight. The independent variables were derived from the sociodemographic details of the women while the dependent variable used for this study was missed opportunity for IPTp-SP. Bivariate analyses of selected socio-demographic characteristics were associated with missed opportunity for IPTp-SP.

Statistical significance level was set at P <0.05. Missed opportunity among women whose most recent pregnancy resulted in a live birth in the past 2 years in percentage was defined as:

Women aged 15-49 who had a live birth 2 year preceding the survey and who attended ANC at least 4 times in their last pregnancy and received less than 2 doses of IPTp.

Total number of women aged 15-49 who had a live birth 2 year preceding the survey and who attended ANC at least 4 times in their last pregnancy.

Negative values show lower rates compared to reference while positive deviance values indicate rates that are more than the reference. The index of disparity was used to summarize the observed disparity from a pre-determined reference value (national average of missed opportunity for IPTp-SP) and was defined as the ratio of the absolute differences between rates of the specific groups within the population and the total population and the number of specific groups within the population, multiplied by the total population rate as a percentage. This was used to measure disparity as a reference to total population across the different socio-demographic characteristics by standardizing disparity measure. It gave a summary of deviation across the observed socio-demographic contributors of disparity for missed opportunity in Nigeria while providing a standardized measure for determining the magnitude of contribution to disparity across the different contributors to missed opportunity for IPTp-SP. It is also an effective measure for tracking disparity for different health parameters across subpopulation groups and changes over time.

Index of Disparity = $(1 | r_{(1-n)} - R|/n)/R*100$

r=Group rate, R=Total population rate, n= number of sub-populations

 Table 1:
 Socio-demographic characteristics of respondents

Variables	N=6910	n(%)	
Respondents	s age group (years)	and the second of the second se	
<20		418 (6.1)	
20-34		5028 (72.8)	
>35		1464 (21.2)	
Mean age in	28.69±0.19		
Ethnicity			
Yoruba		1375 (19.9)	
Igbo		1288 (18.6)	
Hausa/Fulan	i	1753 (25.4)	
Others	2493 (36.1)		
Highest level	l of education		
No education	1	1807 (26.1)	
Primary educ	cation	1467 (21.2)	
Secondary ed	2867 (41.5)		
Higher/Tertia	769 (11.1)		
Wealth Index			
Poorest		607 (8.8)	
Poorer		1086 (15.7)	
Middle		1466 (21.2)	
Richer		1776 (25.7)	
Richest		1976 (28.6)	
Living status	5		
Never in uni	on	204 (3.0)	
Currently in	union/Living with partner	6558 (94.9)	
Formerlyin	148 (2.1)		
Religion			
Christian		3614 (52.6)	
Islam		3217 (46.9)	
Traditionalis	st	35 (0.5)	
Missing data	a	44	
Type of plac	e of residence		
Urban		3531 (51.1)	
Rural		3379 (48.9)	
Region of re	esidence		
North centra	al	996 (14.4)	
North east		930 (13.3)	
North west		1475(213) 1024(14.8)	
South couth		857 (12 4)	
South west		1623 (23.5)	
South west		1025 (25.5)	

186

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Table 2: Missel opportunity across selected socio-demographic characteristics and its index of disparity

g/Variable of one of opportunity of from National. nN=6788, yhruged to opportunity to from National.			Index of disparity	95% CI	x ²	p-value
			10	11 - 1 I		
melser of success more for the land			1			
Level of education			7'9	58 2-64 9	175 250	<0.001
Primary 2011 1240 2075 0 bits 20102 5 minute			1.7	73.2-78.4		-0.001
Secondary)()[*51((1)()78.5 ··) ·································				76.4-80.5		
Tertiary (1,0161,001) 77.11				73.1-80.7		
Wealth index		5				
Poorest	69.3	-4.1	5.2	65.0-73.3	69.670	< 0.001
Poorer	68.9	-4.5		65.0-72.5		
Middle	70.8	-2.6		67.3-74.0	•	
Richer		-1.2		69.0-75.2		
Richest (c')	80.2	6.8		77.6-82.6		
Ethnicity						
Yoruba	86.0	12.6	12.5	83.4-88.3	383.687	< 0.001
Igbo	79.0	5.6		75.9-81.8		
Hausa/Fulani	56.8	-16.6		53.5-60.1		
Others	75.3	1.9		72.8-77.7		
Place of residence					i. Conversion	
Urban	76.0	2.6	3.5	73.8-78.0	23.571	0.001
Rural	70.8	-2.6		68.4-73.0		
Region of residence						NC
68.4	-5.0	13	63.8-72.7	526.780	< 0.001	
NE	70.8	-2.6		67.7-73.7		
NW	53.8	-19.6		49.6-57.9		
SE	78.3	4.9		74.8-81.4		
SS(2 12)	85.2	11.8		82.1-87.8		
SW -) 102	86.7	13.3		84.3-88.8		
Parity						
1-2	76.1	2.7	3	74.1-78.1	25.662	< 0.001
3-4	73.5	0.1		70.9-76.0		
>4	69.6	-3.8		66.9-72.2		
National Average	73.4			71.8-75.0		

Results

This study analyzed socio-demographic and health data of 6,910 women aged 15 to 49 years who gave birth within two years of the survey and who made a minimum of four antenatal care (ANC) visits during Socio-demographic the last pregnancy. characteristics are presented in Table 1. The mean age of the women was 28.69±0.19 years, with majority 5028 (72.8%) of the eligible respondents falling within the age group of 20-34 years. The Hausa/Fulani tribe comprised about a quarter, 1753 (25.4%) of the respondents. The highest level of education for 2867 (41.5%) of the respondents was secondary education. Most of the respondents 6558 (94.9%) were currently in union or living with a partner, 1976 (28.6%) were in the richest wealth quintile and 3614 (52.6%) were Christians. Furthermore, it shows that most 3531 (51.1%) of the respondents resided in the urban area and aggregation by region of residence shows that 1623 (23.5%) of the women reside in the South west region while only 857 (12.4%) resided in the South South.

Table 2 shows the rates of missed opportunity across selected socio-demographic characteristics of respondents, deviation from the National average rate for missed opportunity for IPTp-SP and index of disparity for each variable analyzed. Missed opportunity was highest amongst respondents with secondary education (78.5%) compared to those with other levels of education. It was also highest among those within the richest wealth quintile (80.2%) compared to those within other level of the wealth index. Regarding ethnicity, missed opportunity was highest among the Yorubas (86.0%) compared to other tribes and higher in the South West (86.7%) compared to other regions. Missed opportunity in urban places of residence (76.0%) was also higher than those in rural places (70.8%) while those with 1-2 children had more missed opportunity (76.1%) compared to those with 3-4 (73.5%) or those with greater than 4 children (69.6%). All these differences were statistically significant.

Region of residence was the greatest contributor to disparity in missed opportunity with an index of disparity of 13, followed by ethnicity (12.5), level of education (7,9), wealth index (5.2), place of residence (3.5) and the least is parity with an index of 3.

Discussion -

This study explored the disparate rates of missed opportunity across selected socio demographic and economic characteristics and provides information on disparity using a summary measure of health disparity.

The study shows that level of education, wealth index, ethnicity, type of place of residence, region and parity are associated with missed opportunity in Nigeria. Similar studies have also shown the association between education [8] and socio-economic status [16,17] with missed opportunity for IPTp-SP. This study showed that women with secondary and tertiary education were more at risk for missed opportunity compared to those with no education which is contrary to the study by Masaninga et al., (2016) where increased uptake of IPTp-SP was associated with secondary education [17]. This is likely because educated women are more likely to have a busier schedule because of work and thus do not fully maximize all the benefits of the ANC visit. This may be problematic in the face of other limited information provided by lower level health workers on the rationale for using IPTp-SP in pregnancy. This same pattern was observed among women within the richest quintile who were more likely to have missed opportunity compared to women of other quintiles. · 1

Bivariate analysis shows that type of place of residence was associated with missed opportunity which was higher in the urban place of residence; this is in contrast with findings from the study of uptake of intermittent preventive treatment for malaria in pregnant women in Zambia [17]. This might be due to the inequity of access which may be higher in the urban compared to the rural type of residence hence the increased chances for missed opportunity among clients. This study also shows that region of residence is also associated with missed opportunity for IPTp-SP which is similar to report from other studies [8,018] done on determinants of IPTp-SP which is a proxy measure for missed opportunity.

The highest rate for missed opportunity was found in the South West while the lowest was reported in the North West region. Previously in Nigeria, the Northern part of the country was reported to have worse pregnancy related indices. A case in study is that of a comparative study of ANC attendance in the Northern region compared to other regions of the country [19], which showed better ANC attendance in the Southern regions. This current reversal may be due to more detailed programme planning and implementation in the Northern part of Nigeria compared to the Southern part because of perceived cultural and religious belief that hinder uptake of hospital-based health or educationally disadvantaged regions, interventions, With regards to pregnancy characteristics, this study in similarity with others shows that parity is a contributor to missed opportunity; with missed opportunity reducing with increasing birth orders [8,16,18]. This may reflect a better knowledge about IPTp-SP with increasing birth order occasioned from attending ANC from previous pregnancies!" could d ¹⁰ The deviance from national average rate for missed opportunity shows the highest deviation was under region of residence where North West region had a deviance of -19.6 which reports the widest negative disparity which was better than the national average. Using the same reference, ethnicity reported a deviation of -16.6 among Hausa/Fulani. This shows that these sub populations have very good indices for missed opportunity when compared to the deviance reported from South West (SW) and South South (SS) with values of 13.3 and 11.8. These deviations from SW and SS are significant and worse compared to the reference rates from the national average for missed opportunity for IPTp-SP. It shows at a glance that rates from these sub population groups with the positive values are worse than national average for missed opportunity for IPTp-SP and such sub units will require strategic interventions focused on reducing the observed margin compared to the reference value (national average for missed opportunity for IPTp-SP). Interestingly, personal characteristics such as education and wealth index were not the greatest contributor. Conversely, region was the greatest contributor to disparity wherein the regions in Northern part of Nigeria where cultural and religious factors predominate have the best indices. This

suggests that other factors such as organization of health services not studied herein may be important.

Conclusion

In the face of the global call to scale-up national uptake of IPTp-SP, by reducing missed opportunity for delivery of IPTp-SP, there is need for stronger political commitment to enforce its implementation and uptake in clinics, as well as increased community awareness about malaria in pregnancy to correct misconceptions about SP. It is also expedient that to reduce or eliminate health disparity with missed opportunity for IPTp-SP, the most cost-effective strategies that will target regional factors responsible for disparity is mandatory while interventions should be individualized to local circumstances within each region. There is a need to highlight the disadvantages of focusing interventions to perceived economically or educationally disadvantaged regions to the neglect of other regions. Replicating successful programme to other regions and allowing programme adaptability to local circumstance is a key way of ensuring successful malaria control interventions in Nigeria.

Ethics approval and consent to participate

The study utilized a secondary data analysis of the Demographic Health Survey, the ethical approval and consent to participate is as described in the Nigerian Demographic Health Survey report of 2013 [20].

Availability of data and material

The data that support the findings of this study are available from the women individual recode dataset of Nigeria Demographic and Health Survey 2013 (NDHS) but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of Demographic and Health Survey (DHS) Program.

Acknowledgements

The authors acknowledge all teaching and administrative staff of the Department of Community Medicine, University of Ibadan for their support and commitment towards the production of a quality manuscript.

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