

Original Research Article

Determinants of malaria treatment seeking behaviour

among urban and rural households in north central Nigeria

Abstract

Background: Malaria is a major cause of morbidity and mortality in Nigeria accounting for a significant proportion of household expenditure in treatment and prophylaxis. Nigeria account for 25% of global clinical cases and mortality and also has the highest malaria burden in sub Saharan Africa. In most cases of malaria illness, treatment takes place at the community level and only few serious cases are taken to healthcare facilities. A number of cultural, socioeconomic, patient related and health service provider variables often in a complex interplay are known to influence treatment seeking behaviour, though the relative importance of variables differ widely between settings.

Objectives: To identify where households receive malaria treatment services as well as prevalence of malaria related hospitalization. Also to identify the most common factor(s) that most influence malaria treatment behaviour.

Methods: This is a cross section study using multistage sampling method for household survey. Six towns with high urban and rural population density in Benue State were purposely selected for survey. A total of 1705 completed household administered questionnaires were found usable for analysis. The data was entered into SPSS20 for descriptive and inferential analysis. Factor analysis using principal component analysis, varimax rotation with KMO normalization was carried out. Factor loadings lower than 0.4 was suppressed. Mean item scores with high factor loading and mean total extracted component score were used for further analysis. P values ≤ 0.05 was considered significant.

Results/Discussion: The average malaria prevalence in rural areas was twice that of urban areas, though the rates of hospitalization were similar. About 50% of households in both rural and urban areas reported at least one episode of malaria within the study period reflecting persistence of high malaria transmission. Many variables have been shown to influence treatment behaviour.

27 **Conclusion:** Malaria cases and malaria related hospitalization remain high and while public health
28 facilities play more dominant roles, while in rural areas private providers dominates the landscape.
29 Treatment seeking behaviour is largely influenced by many variables relating to availability,
30 accessibility, affordability and perceptions of household healthcare decision makers.

31 **Keywords:** Malaria, Treatment behaviour, Determinants, Household

32 **Title: Determinants of malaria treatment seeking behavior among urban and rural households**
33 **in north central Nigeria.**

34 **Background:** Malaria is a major cause of morbidity and mortality in Nigeria particularly in pregnant
35 women and children below five years. (FMOH 2001). The disease is estimated to be directly
36 responsible for 20 – 40% of global hospital out-patient consultations in malaria endemic countries. In
37 sub Saharan Africa malaria is estimated to be responsible for 10 – 15% of hospitalizations primarily
38 due to complications (Okeke, *et al* 2006). Nigeria has the highest malaria burden among six endemic
39 countries in the region accounting for 25% of all cases and deaths (MIS 2010). An estimated 60% of
40 all outpatient hospital visits, 36% of all hospital admissions and 11% of maternal mortality in Nigeria is
41 due to malaria. Over 110 million cases of clinical malaria is diagnosed annually in Nigeria, though
42 there have been concerns about over diagnosis (Bloland, *et al* 2003). Malaria is estimated to cause
43 an annual economic loss of about \$132 billion in treatment, prevention and loss of productivity (Jimoh,
44 *et al* 2007).

45 A nationwide malaria indicator survey reported that prevalence was between 20 – 60% across the
46 country (MIS 2010), however several studies reported much higher prevalence of malaria. Onyido, *et*
47 *al* 2011 reported prevalence of 70.8%, Bassey, *et al* 2007 (73.9%) and Okonko, *et al* 2009 (81.9%).
48 The national malaria treatment policy recognized several shortcomings in malaria management
49 practices when it noted that 80% of malaria is poorly managed at the community level, laboratory
50 confirmation is low and up to 40% of patients with malaria die for lack of proper care.

51 Despite many interventions in the last decade malaria remains a major public health problem. The
52 participation of community and households in detection and treatment of malaria has been vigorously
53 emphasized in most malaria control programmes. The behaviour of households and other care givers
54 in the community to febrile illness has been noted to be an important factor in prevention of
55 complications and reductions in mortality. While the concept of treatment seeking behavior is

56 complex, multifaceted and multidimensional; behavioural model proposed by Anderson et al 1973 has
57 been widely used in literature. A number of other models have been proposed to explain treatment
58 seeking behaviour, however many variables of the models frequently overlap, thus producing
59 inconsistent results with wide variations between settings (Cummings, *et al* 1980).

60 The generally held belief that patients are passive participants in healthcare decisions has been
61 challenged by the work of Leonard, *et al* 2001 in which he noted that, though patients cannot
62 influence treatment or less likely to challenge it, they exercise considerable power is choice of where
63 and how to access healthcare services. There is often a complex interplay between patient related
64 and provider variables (Aakfe, *et al* 2012) and determinants may vary due to language problems
65 (Dixon, *et al* 2010), long travel times (Burge, *et al* 2004), ease of transportation (Magee, *et al* 2003),
66 waiting time at healthcare facility (Ringard, *et al* 2011) and quality of care provided (Damman, *et al*
67 2011).

68 In a systematic review Kizito, *et al* 2012 concluded that low cost of services, proximity, confidence in
69 treatment methods and positive attitude of healthcare personnel are strong predictors of behaviour.
70 Other determinants of treatment seeking behaviour reported include friendliness of staff (Onyejekwe,
71 *et al* 2005), cultural factors (Tanner, *et al* 1998), family size (Hetzel, *et al* 2008) and educational status
72 (Dzator, *et al* 2004).

73 The complexity of determinants of malaria treatment seeking behaviour and wide variability in results
74 is a source of much debate. However continuous evaluation of determinants in different settings is
75 critical to developing appropriate strategies to effectively reach communities, households and decision
76 makers with information that will inform malaria control policy implementation efforts.

77 **Objectives**

- 78 ▪ To identify the most common factors that influence malaria treatment behaviour
- 79 ▪ To determine malaria prevalence and malaria related hospitalizations.
- 80 ▪ To determine where households access malaria treatment services.

81 **Methods**

Setting: The study was carried out in Benue State north central Nigeria. The State comprises 23 local government areas and is populated by many ethnic groups with diverse cultures. The major languages spoken there are Tiv, Idoma and Igbo, agriculture is the major occupation of the people. The State capital Makurdi is about 270 km south east of Abuja the federal capital.

Study design: This is a cross sectional survey of selected households across the State. The study was carried out during the rainy season June and July 2015.

Selection of survey areas: The selection of survey areas was by multistage sampling method. In the first stage three major towns and three rural areas were purposely selected across the state such that major ethnic groups were represented. In stage two, four major residential districts were randomly selected using information from State town planning department. Stage three involved random selection of four streets in each selected residential district. All houses in the selected streets were numbered serially and every other household was surveyed.

Data collectors: Data collectors included pharmacists and nurses were recruited from among staff of private and public healthcare facilities the State. One of the data collectors understand and can speak fluently at least one local language in the assigned survey area. Three day field training on all aspects of data collection was carried out after which data simulation collection exercise was conducted in a few selected households

Sample size: The sample size of 1639 was determined using the formula

$$N = 4PQ/l^2$$

Where

N = sample size

P = Prevalence (49.4%)

Q = 1 – P

l^2 = Permissible error of P (5%)

Questionnaire design: The seventeen item five point Likert scale pretested questionnaire was administered in randomly selected households in Makurdi and the results analyzed for internal consistency of the instrument. The Cronbach alpha of 0.822 is an indication of high internal validity of

the instrument. The questionnaires used for pre-testing the instrument were not included in the final data analysis.

Questionnaire administration: Two thousand questionnaires were distributed between urban and rural areas in the ratio of 2:1. Houses earlier marked for survey were visited by a pair of data collectors and identified caregiver is administered the questionnaire after informed consent have been secured. Those who have difficulties reading or writing are assisted by data collectors either to interpret or enter the response of respondents. Where respondents in preselected houses decline participation, an extra household in the same area is surveyed as replacement.

Data analysis: A total of 1705 questionnaires were found suitable for analysis giving a retrieval rate of 85.2%. The data were collated, checked for errors and entered into Microsoft excel and subsequently loaded into SPSS 21 for descriptive and inferential analysis. Factor analysis using principal component analysis and varimax rotation with KMO normalization was performed. Factor loading less than 0.4 was suppressed. Mean item score and total mean score for extracted components with high factor loading were extracted and used for further analysis.

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124 Result/Discussion

125 Demographic data

126 Table 1

127 Variable	Number	Percentage	P value
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128 Gender

129 Male	847	49.8	0.002
130 Female	853	50.2	

131 Marital Status

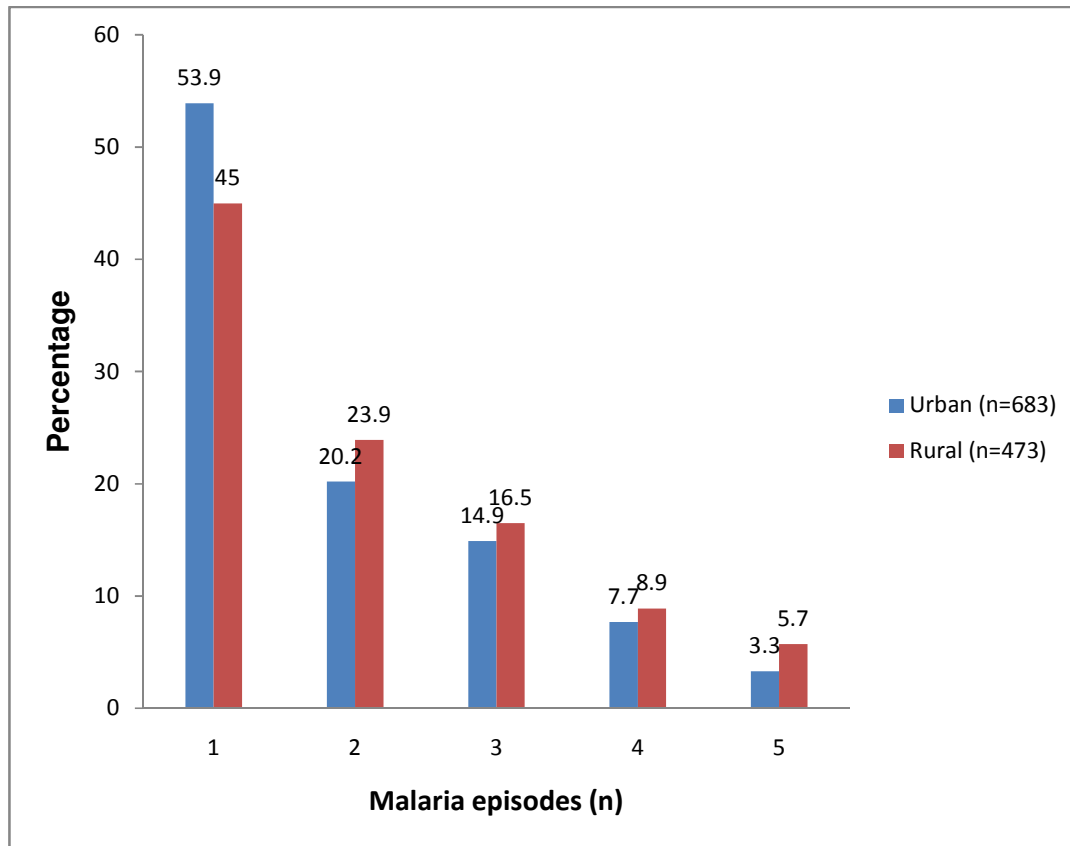
132 Married	823	48.3	0.128
133 Single	723	42.5	
134 Others	156	9.2	

135 Occupation

136	Civil servant	641	37.6	
137	Self-employed	583	34.2	
138	Farming	147	8.6	
139	Others	334	19.6	0.035
140	Education status			
141	Primary	172	10.1	
142	Secondary	396	23.2	
143	Tertiary	1137	66.7	0.194
144				
145	Household characteristics			
146	Table 2			
147		Urban	Rural	P value
148	Mean age of respondents (yrs.)	42.8±12.9	40.4±9.2	< 0.001
149	Household size (n)	5.5±2.9	4.7±2.8	0.001
150	Distance to healthcare facility (km)	7.7±5.5	9.5±5.3	0.022
151	Antimalarial drug cost (\$)	2.41±1.56	2.34±1.28	0.139
152	Other drugs (\$)	2.31±2.08	2.64±1.35	0.016
153	Consultation	2.54±1.48	2.42±1.26	0.161
154	Laboratory test	2.79±1.48	2.91±1.24	0.138
155	Monthly income	135.6±2.99	121.3±87.5	<0.001
156	Average number of malaria episodes/family	1.5	2.6	
157	Average number of hospitalization/family	2.3	2.2	
158				
159				

Household reported episodes of malaria in one month

Figure 1

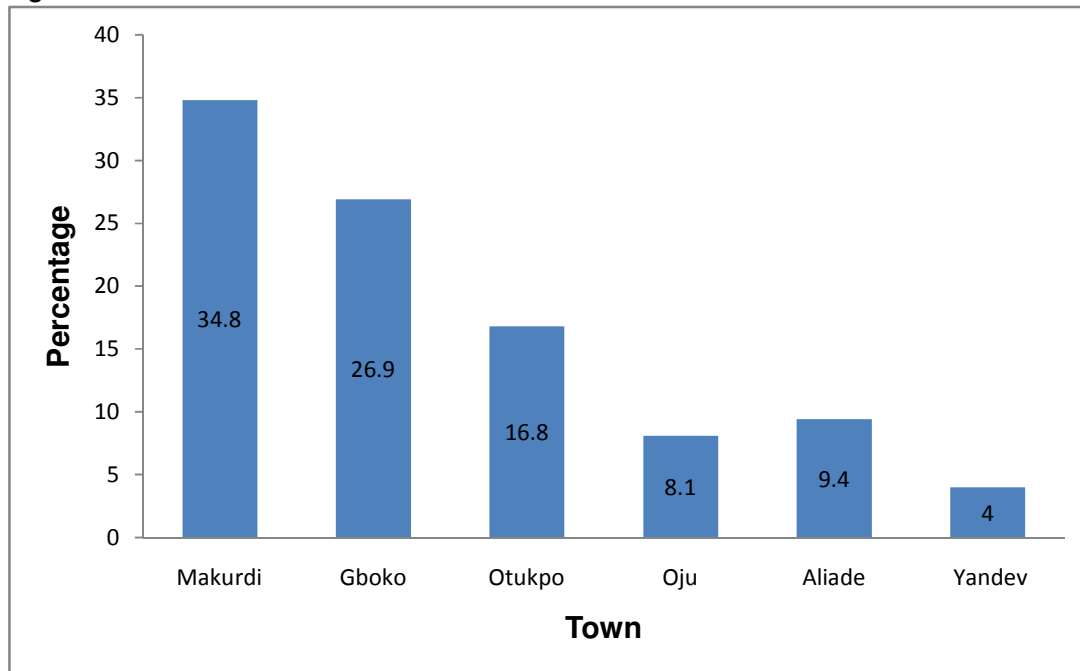


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Household reported malaria cases per town

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Figure 2



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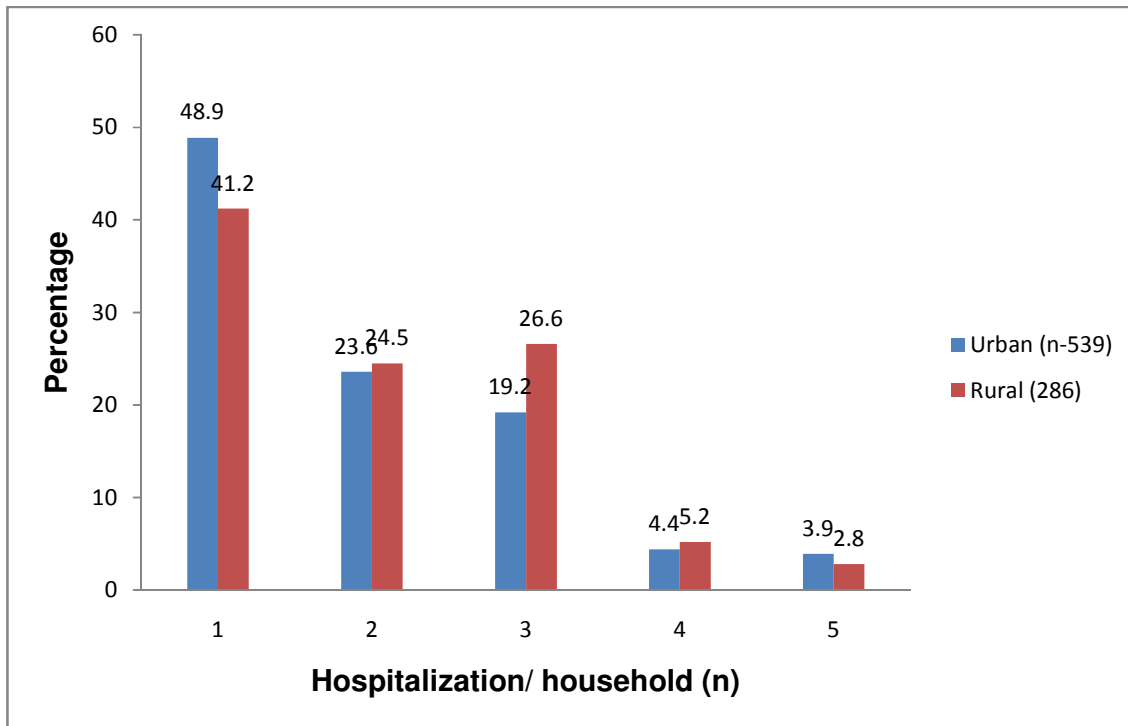
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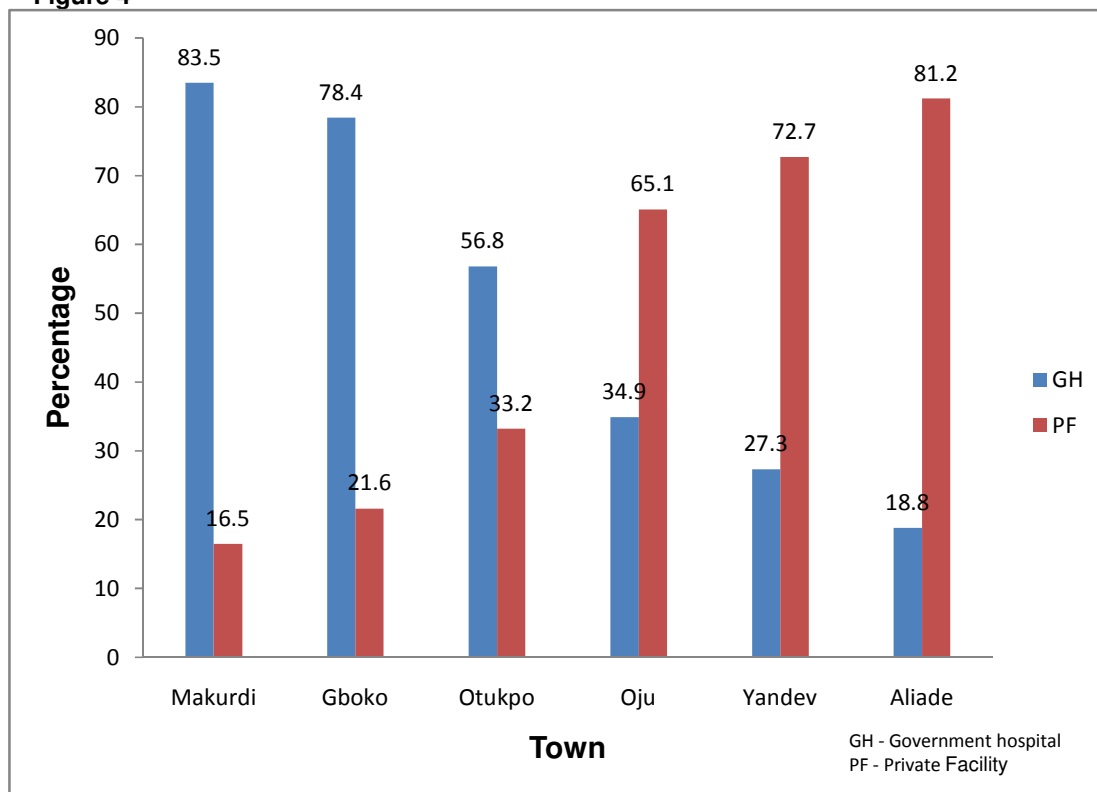
Household malaria related hospitalization in one month

Figure 3



Source of antimalarial medications

Figure 4



233	Distribution of components and mean scores (n=1705)		
234	Table 3		
235	Items	Factor loading	Mean score + SD
236	Component 1 Availability		
237	Laboratory services available	0.704	2.27±1.24
238	Staffs are courteous and friendly	0.798	2.20±1.25
239	Personnel are experienced	0.756	2.10±1.25
240	Services are of high quality	0.610	2.20±1.25
241	Subtotal mean score		2.19±1.25
242	Component 2 Accessibility		
243	Waiting time is acceptable	0.689	2.44±1.30
244	Working hours is convenient	0.714	2.42±1.34
245	Familiarity with facility/staff	0.730	2.72±1.31
246	Subtotal mean score		2.53±1.32
247	Component 3 Affordability		
248	Private or public ownership	0.693	2.67±1.32
249	Cost of services	0.532	2.59±1.27
250	Transport cost to facility	0.609	2.58±1.23
251	Prior cost experience with facility	0.568	2.53±1.35
252	Subtotal mean score		2.59±1.29
253	Component 4 Perception		
254	Presence of co-morbidities	0.713	2.23±1.06
255	Overall health status	0.722	2.26±1.08
256	Influence of family/friends	0.719	2.46±1.28
257	Severity of malaria attack	0.722	2.60±1.30
258	Closeness of facility to my residence	0.533	2.50±1.29
259	Facility is clean and looks attractive	0.543	2.20±1.23
260	Subtotal mean score		2.37±1.21
261			
262			
263			
264			

Discussion

Demographic data of respondents indicated that females were more than males accounting for 50.3% as against 49.7% for males. Majority of respondents were married accounting for 48.3% while most are either civil servants or unemployed (Table1). The average number of persons per household in urban areas is more than in rural and the difference is significant. This is largely because of rural urban migration of children living with relatives in the urban areas. Other differences between urban and rural areas exist in distance to healthcare facilities; the distance is longer in rural areas, mean age of respondents and monthly income (Table 2). Respondents in urban areas reported cases of malaria more than twice as frequently as those in the rural areas overall, however when percentage number of cases was considered, no significant differences existed overall. Households in both urban and rural areas that reported one malaria episode were more than double those who reported more than one malaria case (figure 1). While significant percentage of respondents reported at least one malaria episode the rate is higher in urban areas. This may be due to the fact that detection of malaria symptoms, treatment and preventive behaviour are better among the urban educated elite compared to rural dwellers. Analysis of data clearly indicate that between 16 – 34% and 4 – 9% of households reported malaria episodes in urban and rural areas respectively indicating clear difference knowledge and response to malaria (Figure 2).

Similarly, malaria related hospitalization is much higher in urban areas accounting for as much as 48.9% of all malaria cases. Households with more than one case of malaria related hospitalization also occurred in urban areas (Figure 3). This result is similar of Kazembe, *et al* 2006 and Alison *et al* 2014; although they noted that the rate of hospitalization is higher during the wet season and decreases with increasing age. Malaria related hospitalization found in this study is lower than 60% reported by Adekunle, *et al* 2015.

Most households in urban areas obtained their antimalarial medications from government hospitals accounting for 56 – 83% of respondents. However in rural areas profit oriented private healthcare facilities are the major source of malaria medications accounting for 60 – 81% of respondents (Figure 4). This trend is reflective of the availability of government healthcare facilities which are dominate urban areas as against privately owned facilities which are widely found in every nook and cranny of rural landscape.

Malaria treatment seeking behaviour is complex and multifaceted and relative strength of determinants are again dependent on other variables. The findings of this study reveal that there are four components including availability, accessibility, affordability and perceptions of patients are the major determinants of malaria treatment seeking behaviour (Table 3). The high factor loading and mean item scores on a five point Likert scale (strongly agree to strongly disagree) all indicate that these variables influence treatment seeking behaviour. The response to variables represent the opinion of respondents with the mean score providing a measure of how strongly there is agreement or otherwise. Mean scores less than 3.0 imply strong influence on malaria treatment seeking behaviour. These determinants explained by associated variables have earlier been reported by Chibwana, *et al* 2009 and Olumide, *et al* 2014. In many parts of Benue State government healthcare facilities in rural areas are few and far in between, healthcare personnel are few, poorly trained and accessibility is a common issue of concern. This leaves profit oriented private healthcare facilities to dominate the rural areas.

Perception is among the variables that strongly influence malaria treatment seeking behaviour in this study (Table 3). This was earlier reported by Okeke, *et al* 2010 who also noted that provision of laboratory services was perceived to be an important determinant of choice of providers, Nanyonjo, *et al* 2012 experienced personnel in the facility was a strong determinant. While perception and its relative importance in treatment behaviour may vary widely within and between patients of different socioeconomic status, it is recognized that positive perception is a strong indicator of future use of the healthcare facility. Perception of malaria severity and co-morbidities has influence on treatment seeking behaviour. Several studies reported that respondents often practice home management first and only when that either fail or they perceive that the symptoms are severe do they refer to a healthcare facility for management. Similar findings by Ha, *et al* 2002 and Asante, *et al* 2010 noted that perception of health status, severity of symptoms and presence of other diseases determine treatment seeking behaviour of patients. Other studies by Ager, *et al* 2005 and Atkinson, *et al* 1999 similarly included perception of proximity to facility and waiting times as influencers of treatment behaviour.

Affordability of malaria treatment costs was found in this study to be a predictor of treatment seeking behaviour among households (Table 3). The costs associated with malaria treatment such as

transportation to point of care, laboratory tests, consultations, drugs etc are entirely borne by households. The results showed that malaria treatment costs range between US\$3.9 - \$9.8 depending on whether the facility is a public hospital or it's privately owned. There are no significant differences between direct cost of malaria medications and laboratory test between urban and rural areas. The cost of treatment in public facilities is comparable to US\$3.52 reported by Karyana, *et al* 2016; although US\$12.46 reported as malaria treatment cost in private facilities is higher than found in this study. When treatment cost is considered against the \$1.9 daily wage of the least paid unskilled government employee, malaria treatment remains unaffordable to majority of households. This expectedly will have a huge impact on treatment behaviour; the result of this study showed that households largely patronize public hospitals where costs are comparatively affordable, except in areas where options are limited like in rural areas (Figure 4). So a combination of lower costs and ease of access in urban areas comparatively account for the higher patronage of public hospitals; however in rural areas patronage is driven by costs, availability of facilities and ease of access among others.

Accessibility was found in this study to influence of treatment seeking behaviour (Table 3). This was also earlier reported by Atkinson, *et al* 1999 and later confirmed by Noor, *et al* 2006, OMeara, *et al* 2009 and Nathan, *et al* 2011. Generally public hospitals provide round the clock healthcare services as well as well funded private facilities, however waiting times are considered long in public facilities. While the economically well off may choose private facilities where they receive immediate attention, the waiting times in public hospitals can be a significant source of patient dissatisfaction.

Conclusion: Malaria incidence remains high across the State with household reports of incidence higher than national average. Malaria treatment behaviour is strongly influenced by availability of healthcare facilities, ease of access, cost of malaria treatment services as well as perceptions of their experience with healthcare services. Majority of households in the urban areas access malaria treatment services in public health facilities as against privately owned ones in rural areas.

References

1. Federal ministry of health; national strategic plan for roll back malaria. FMOH Abuja. Nigeria 2001.

- 351 2. Okeke TA, Uzochukwu BSC, Okafor HU. An indepth study of patent medicine sellers
352 perspectives on malaria in a rural Nigerian community. Malaria Journal 2006 5: 97
- 353 3. Malaria indicator survey 2010. Nigeria. Final report from National population commission,
354 National Malaria control programme and MEASURES DHS 2012
- 355 4. Bloland PB, Kachur SP, Williams HA. Trends in antimalarial drug deployment in Sub Saharan
356 Africa. J exp Biol 2003 206: 3761 – 3769
- 357 5. Jimoh A, Sofola O Petu A et al. Quantifying the economic burden of malaria using willingness
358 to pay approach. Cost effectiveness and resource allocation 2007: 5: 6
- 359 6. Onyido AE, Obinatu SC, Umeanaeto PU et al. Malaria prevalence and mosquito abundance
360 in Uli town Ihiala LGA. Anambra State Nigeria. Afr J Biomed Res 2011 14(3): 175 - 182
- 361 7. Bassey BE, Asor JE, Useh MF. Profile of malaria in pregnant women attending antenatal
362 clinic in rural community in Nigeria. The open parasitology journal 2007 1: 1-6
- 363 8. Okonko IO, Soleye FA, Amusan TA et al. Prevalence of malaria plasmodium in Abeokuta.
364 Malaysian J Microbiol 2009 5(2): 113 – 118
- 365 9. Anderson R, Newman J. Social and individual determinant of medical care utilization.
366 Millibank memorial fund quarterly 1973 51(1): 95 – 124
- 367 10. Cumming JN, Ploypradith P, Posner GH. Antimalarial activity of artemisisnin (Quinghaosu)
368 and related trioxanes; Mechanism of action. Adv pharmacol 1997 37: 253 – 297
- 369 11. Leonard KL, Mliga GR, Marian DH. Bye passing healthcare centers in Tanzania revealed
370 preferences for observable and unobservable quality. University of Colombia, New York.
371 [http://www.colombia.edu/~K1206/papers/bypass\(p\).pdf](http://www.colombia.edu/~K1206/papers/bypass(p).pdf) Accessed 15/7/15
- 372 12. Aakfe V, Diana MJD, Roland DF et al. Determinants of patient choice of healthcare providers;
373 a scooping review. BMC health services Research 2012 12: 272
- 374 13. Dixon A, Robertson R, Bal R. The experience of implementing choice at point of referral; a
375 comparism of the Netherlands and England. Health economic policy and law 2010 5: 295 –
376 317
- 377 14. Burge P, Devlin N, Appleby J et al. Do patients always prefer quicker treatment? A discrete
378 choice analysis of patients stated preferences in London patient choice project. Appl. Health
379 econs health policy 2004 3: 183 – 194

- 380 15. Magee H, Davis LJ, Coulter A. Public views on healthcare performance indicators and patient
381 choice. *J R soc Med* 2003 96: 338 – 342
- 382 16. Ringard A, Hagen TP. Are waiting times for hospital admissions affected by patients' choices
383 and morbidity? . *BMC health services Res* 2011 11: 170 – 178
- 384 17. Damman OC, Spreeuwenberg P, Rademakers J et al. Creating compact comparative
385 healthcare information; what are the key attributes to present for Catarract and total hip and
386 knee replacement surgery. *Med Decis making* 2011 32: 287 – 300
- 387 18. Kizito J, Kayendke M, Nabirye C et al. Improving access to healthcare for malaria in Africa; a
388 review of literature of what attract patient. *Malaria Journal* 2012 11: 55
- 389 19. Onyejekwe O, Ojukwu J, Uzochukwu B et al. Where do people from different socioeconomic
390 groups receive diagnosis and treatment for presumptive malaria in south eastern Nigeria.
391 *Ann Trop Med parasitol* 2005 99: 473 – 481
- 392 20. Tanner M, Vlassoff C. Treatment seeking behaviour for malaria; a typology based on
393 endemicity and gender. *Soc Sci med* 1998 46: 523 – 532
- 394 21. Hetzel MW, Alba S, Frankhauser M et al. Malaria risk and access to prevention and treatment
395 in the paddies of Kilombero valley, Tanzania. *Malaria Journal* 2008. 7: 7
- 396 22. Dzator J, Asafu-Adjaye J. A study of malaria care provider choice in Ghana. *Health policy*
397 2004. 69: 389 – 401
- 398 23. Kazember LN, Immo K, Brian LS. Pattern of malaria related hospitalization and mortality
399 among Malawian children; an example of spatial modeling of hospital modeling of hospital
400 register data. *Malaria journal* 2006 5: 93
- 401 24. Alison BC, Janneke H, Van Dijk, Sungano M et al. Hospitalization and costs incurred at the
402 facility level after scale up of malaria control; pre-post comparism from two hospitals in
403 Zambia. *Am J Trop Med Hyg* 2014. 90(1): 20 – 32
- 404 25. Adekunle OA, Ebenezer AA, Akande OA et al. Pattern and outcome of medical admission in
405 Ekiti State University teaching hospital, Ado Ekiti – a five year review. *Am J Med and Med Sci*
406 2015. 5(2): 92 – 98
- 407 26. Chibwana AI, Mathanga DP, Chinkhumba J, Campbell CH. Sociocultural predictors of health
408 seeking behaviour for febrile under five children in Mwanza – Neno district, Malawi. *Malaria*
409 *Journal* 2009. 8: 219

- 410 27. Olumide AA, Oluwatosin OOA. The determinants of choice of health facility in Sagamu, south
411 west Nigeria. *Sch J appl Med Sci* 2014 2(1c): 274 – 287
- 412 28. Okeke TA, Okeibunor JC. Rural – urban differences in health seeking for the treatment of
413 childhood malaria in south east Nigeria. *Health policy* 2010 95(1): 62 – 68
- 414 29. Nanyonjo A, Nakirunda M, Majumbi F, Tomson G et al. Community acceptability and adoption
415 of integrated community case management in Uganda. *Am J Trop Med Hyg* 2012 85(5): 97 –
416 104
- 417 30. Karyama M, Angela D, Kenangalem E, Burdam L et al. Treatment seeking behaviour and
418 associated cost in Papua, Indonesia. *Malaria Journa* 2016l 15: 536
- 419 31. Atkinson S, Ngwengwe A, Macwangi M, Ngulube TJ et al. The referral process and urban
420 health care in Sub Saharan Africa; the case of Lusaka Zambia. *Soc Sci Med* 1999 49(1): 27 –
421 38
- 422 32. Noor AM, Amin AM, Getting PW et al. Modeling distances travelling to government health
423 services in Kenya. *Trop Med Int health* 2006 11: 188 – 196
- 424 33. Omeara WP, Noor AM, Gatakaa H et al. Impact of primary healthcare on malaria morbidity –
425 defining access by disease burden. *Trop Med Int health* 2009 14: 29 – 35
- 426 34. Nathan S, Andrew O, Chrispinus S et al. Accessibility, availability and affordability of
427 antimalarials in a rural district in Kenya after implementation of a national subsidy scheme.
428 *Malaria Journal* 2011 10: 316
- 429 35. Asante KP, Abokyi L, Zando C, Owusu R et al. Community perception of malaria and malaria
430 treatment behaviour in a rural district of Ghana; implication for artemisinin combination
431 therapy. *BMC public health* 2010 10: 409
- 432 36. Ha N, Berman P, Larsen U. Household utilization and expenditure on private and public
433 health services in Vietnam. *Health policy and planning* 2002 17(1): 61 – 70
- 434 37. Ager A, Pepper K. Pattern of health service utilization and perception of needs and services in
435 rural Orissa. *Health policy and planning* 2005 20(3): 176 – 184