



THE STATE OF IMPLEMENTATION OF FREE TREATMENT OF SEVERE MALARIA IN CHILDREN LESS THAN FIVE YEARS IN HEALTH FACILITIES IN THE BAMENDA HEALTH DISTRICT: A CROSS SECTIONAL STUDY

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ARTICLE INFO

Article History:

Received 9th November, 2017

Received in revised form 21st December, 2017

Accepted 3rd January, 2018

Published online 28th February, 2018

Key words:

Free treatment, Severe Malaria, children under-five years, Bamenda Health District.

ABSTRACT

Since July 2014, the Cameroon Government implemented free treatment of severe malaria in children under five. There is paucity of information on the level of implementation of such a policy in health facilities in the country. The objective of this study was to determine the level of implementation of free treatment of severe malaria in children under five in the Bamenda health district from July 2014 to June 2015. A hospital base cross sectional descriptive study was conducted, using purposive sampling method to choose 23 health facilities in the District. Data was collected using a semi-structure questionnaire from 22 consulting health personnel and 15 parents/guardians of children under five in October 2015 with a retrospective collection in consultation registers. Data was analysed using SPSS version 20. All the 22 interviewed health personnel had received training on the management of severe malaria and were informed and knowledgeable on the policy. Only 8 (36%) of the health facilities had a specific register for the follow up of severe malaria in children under five. 8 (36%) health facilities had a shortage of artemether between July 2014 to June 2015. Artemether was the drug frequently used for first line treatment (96%). The proportion of children under five treated with artemether and quinine were 56% and 27% respectively. 2 (13%) of the parents/guardians of under-five were informed on the free treatment policy and non-had their child treated free during the data collection period. Free treatment of severe malaria in under-five has not been effectively implemented as stipulated by policy. An elaborate plan of following up its implementation in health facilities should be done by means of massive sensitization of the population on the policy.

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INTRODUCTION

Malaria is a major Public Health problem in the world in general and Sub Saharan Africa in Particular.[1]In 2016, 91 Countries reported a total of 216 million cases of Malaria, an increase of 5 million cases over the previous years. The Global Tally of malaria deaths reached 44500 about the same number reported in 2015. The WHO African Countries continue to account for about 90% of malaria cases and deaths worldwide.[2] Children under five and pregnant women are the people most vulnerable to malaria or suffering from serious

consequences of the disease, especially in Regions where transmission is intense or stable. [3]

The epidemiologic profile of malaria in Cameroon appears to be aligned along three geographical and climatic regions:(i) an endemic and perennial transmission zone covering the southern equatorial forest, coastal and western plateau with 7-12 months of rainfall, ii) an endemic and seasonal transmission zone in the Adamawa and savannah forests with 4-6 months of rainfall. (iii) an epidemic and strongly seasonal zone covering the Sudano-sahelian region with seasonal transmission of 1–3 month.[4] In 2016, the hospital morbidity and Mortality rates for malaria were 23.6% and 12% respectively in Cameroon.[5] 22% of deaths in health facilities.[6] Severe malaria is a life threatening emergency that requires prompt and effective treatment to prevent death.[7] Nearly all deaths from severe

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malaria results from *P. falciparum*. [8] The clinical spectrum of paediatric falciparum infection range from asymptomatic parasite carriage to a febrile disease that may develop into severe life threatening illness. [9] Due to the weak immune system of children, they are more vulnerable to the disease, with more than 15% of them suffering from neurological deficits. In cases of poor management, these deficits may interfere with their learning and Development. [10] However, effective management of severe malaria is relatively expensive and relies heavily on well-equipped hospitals, with adequately trained health workers, both often lacking in Sub Saharan Africa. [11] Severe malaria has been described as a neglected disease that poses a significant economic burden on most African countries which typically have weak health systems and are unable to finance basic services and infrastructures. [12]

Deaths due to malaria increased in Cameroon from 3209 to 4348 cases between 2012 and 2013 giving a growth rate of 35.45%, with children under five remaining the most vulnerable group of malaria mortality with a mortality rate of 67%, 66%, 62%, and 69% in 2010, 2011, 2012 and 2013 respectively. [6] The mortality associated with severe malaria remains high, ranging from 10% to 50% depending on the setting. [11] This sudden increase in high mortality rate coupled with its high cost of treatment prompted the Cameroonian Government under the impetus of the Minister of Public Health in June 2014 to implement free treatment of severe malaria in children under five in all health facilities in the Country. This was in accordance with Decision number 0399/D/MINANTE/CAB implementing directives on free treatment of severe malaria in children under five. This policy consists of reducing the cost of managing severe malaria by offering drugs, consumables and diagnostic test free to children under five. After one year of implementing this policy, nothing is known on the level of its effective implementation. There is therefore need for data to provide necessary information at different levels of the health system pyramid; especially the National Malaria Control Program (NMCP) and other possible stakeholders in order to provide strategies to ameliorate the implementation of such a policy. This will enhance the management of severe malaria in children under 5. A hospital based pilot study was therefore, undertaken in the Bamenda health district with main objective to determine the state of implementation of free treatment of severe malaria in children less than five years in health facilities of the Bamenda health district within a one year period from July 2014 to June 2015.

MATERIALS AND METHODS

Study design

We carried out a cross sectional descriptive survey, with study population being health personnel in health facilities and parents of children under five admitted for severe malaria. Data was collected in the month of October 2015, with a retrospective data collection from the 1st of July 2014 to the 30th of June 2015 in 23 health facilities.

Study Setting

This study was done in Health facilities in the Bamenda Health District (BHD). It is one of the 19 Districts found in the North West Region of Cameroon. It is located at the heart of the Region's Headquarters and the largest District in terms of

population and Surface area with a total population of 379,928 inhabitants as of 2017. BHD is bordered to the South by The Health District of Santa and Bali, to the East by Health Districts of Ndop and Kumbo East, to the West by Mbengwi Health District and to the North by Fundong and Bafut Health Districts. The BHD is comprise 18 Health Areas, 14 public and 4 conventional. It has 35 health facilities, 18 public, 11 private and 06 denominational. This District is marked by 2 distinct seasons, dry and rainy seasons. The former sets in the beginning of November and peaks in February. It begins to subside from the middle of March gradually giving way to the rainy season. Malaria transmission peaks are during the long rainy seasons.

Ethical Statement and Consent to participate

This study was given ethical clearance by the Cameroon National Ethics review committee (CNERSH) with reference number 2016/04/751/CE/CNERSH/SP. The inform consent and assent forms were written for health workers and parent/guardians of the under-five suffering from severe malaria respectively. The authorization to carry out the research was obtained from the District Medical Officer of the Bamenda Health District.

Study Population

Target Population were Health personnel who carry out consultation and parents or caretakers of children under five admitted for severe malaria during the study period

Inclusion Criteria

Operational health facilities in which Health personnel have reported malaria indicators on a monthly bases within the period from July 2014 to June 2015.

Exclusion Criteria

Non-operational health facilities within the last three months or operational but haven't reported malaria activities within the period from July 2014 to June 2015 were excluded.

Severe Malaria

Severe Malaria was defined as malaria infection that may cause vital dysfunction or death. Severe malaria is known by clinical or laboratory evidence of vital organ dysfunction. [8]

Sample size and sampling

The sampling technique that was adopted for choosing health facilities was the non-probability sampling technique with the use of a purposive sample.

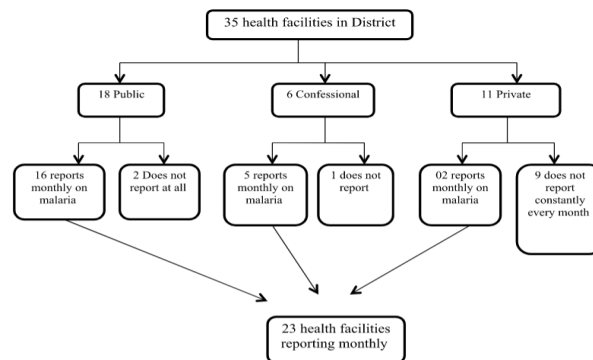


Figure 1 Sampling design.

The reason for using the purposive sample is because; it aimed at getting valid information from a particular set of health facilities from the entire population. These health facilities were chosen purposely because they were best placed to provide the information needed for the study. Figure 1 shows how the different health facilities were chosen.

A total of 23 health facilities were involved in the study. With regards to parents or caretakers of under-five suffering from severe malaria, a sample size was not calculated. This is because we could not determine the number of patients to meet at the time of data collection.

Data collection and Tools

Data collection instrument: Two types of semi-structured interviews were applied face to face. The first was administered to health professionals of the selected facilities and contained questions about socio-demographic characteristics of participants, qualification and adherence of professionals to the free treatment guideline and the availability of drug and material for treatment. The second interview was administered to caretakers of under-five children during the child admission period to treat severe malaria and included questions about socio demographic characteristics and use of free treatment.

Technic of data collection: After having administered the questionnaire to consulting health personnel in the chosen health facilities, a documentary review was done in the consulting register(s). All suspected, confirmed and treated cases of severe malaria in children under five were collected. Data collected in registers was from July 2014 to June 2015. Using the admission register, all children under -five years admitted for severe malaria at the time of data collection were recorded. We then move to the admission Ward where we gave out informed assent to the targeted participant. We then administered the questionnaire to the caretaker or parent of the child who agreed to participate in the study. The interviewed caretakers were selected among those of children admitted at the time of the research

Statistical Analysis

The data were analysed using SPSS version 20 software. In the data cleaning process, some key variables were run and the consistency and coherency of the variable checked. The major analysis done was purely descriptive running frequency and calculating the confidence interval at 95% level of confident.

RESULTS

Characteristics of health facilities and Participants

Our study was conducted in the Bamenda Health District in which 23 health facilities were planned to be involved. Out of this 22 participated in the study. This gave a response rate of 95.5%. In these health facilities, 22 consulting health personnel were interviewed. During the data collection process, a total of 15 parents/caretakers of children under 5 suffering from severe malaria were interviewed. No health worker or parent/guardian declined to participate.

46% of the health personnel were male, most guardians of children with severe malaria who were interviewed were mothers. Additionally the age of children whose guardian was interviewed was approximately uniformly distributed

The availability of Qualified Health Personnel to manage Severe Malaria

Among the 22 health personnel interviewed 3 (14 %) were medical Doctors, 10 (46%) were state registered Nurses (SRN), 5(23%) were mid wives, 2(9%) were assistant nurses and 2 (9%) were Laboratory technicians. All (100%) personnel interviewed were aware of the free treatment initiative and had received training on management of severe malaria, with the majority 19 (86%) haven received training in the beginning of 2015. An average of 2 personnel (SD=2.3) per health facility were trained to manage severe malaria.

Adhesion of Health Personnel to free treatment Policy

Majority of the health facilities 21(96%) had the management guideline for severe malaria treatment. Only 8 (36%) of the health facilities had specific follow up registers for treatment of severe malaria in under 5. 15 (68%) of the health facilities prescribe artemether for first line treatment, 7 (32%) of the health facilities prescribe quinine infusion for second line treatment. Artemether and Quinine were the only two drugs used for treating severe malaria in under 5. The Ministerial directives on free treatment policy were present in only 4 (18%) of the health facilities. Inter personal communication during consultations 8 (36%) was the most common method in sensitizing the population on free treatment initiative.

Availability of drugs and Inputs

Table 1 below presents the Proportion of inputs shortages and its duration in the 22 health facilities in the Bamenda Health District from July 2014 to June 2015

Inputs	Stock Shortage		Duration of Stock Shortage	
	Yes	No	≤7 days	>7days
artemether	8 (36%)	14 (64%)	2	6
Quinine	2 (10%)	20 (90%)	2	0
RDT	1 (4%)	21 (96%)	1	0
Glucose Solution	3 (14%)	19 (86%)	2	1
Drip Set	2 (10%)	20 (90%)	1	1
Syringes	0 (0%)	22 (100%)	0	0
Microscope	1(4%)	21 (96%)	0	1

Table 1, shows that the input with the highest stock shortage was artemether in 8 health facilities (36%) and in 6 health facilities the shortage was for more than 7 days. The only inputs that were available in all the health facilities from July 2014 to June 2015 were Syringes. 90% of health facilities had quinine available within this time frame. Only 1 health facility had shortage of RDT within this time frame.

State of implementation of free treatment Policy

The evaluation of the free treatment policy was evaluated with regards to the proportion of children with severe malaria treated with artemether. 40mg artemether is considered to be administered free to under-fives suffering from severe malaria. Figures 2, 3 and 4 show the level of implementation of such a policy This figure shows that from the beginning of July 2014, artemether was the first line drug used for treating severe malaria for under-fives. From January 2015, the use of artemether as first line dropped and quinine infusion was mostly used as first line right up till June 2015. Quinine tablet was not used within the period of July 2014 till June 2015 and

quinine Syrup was used in a minor proportion in October 2014.

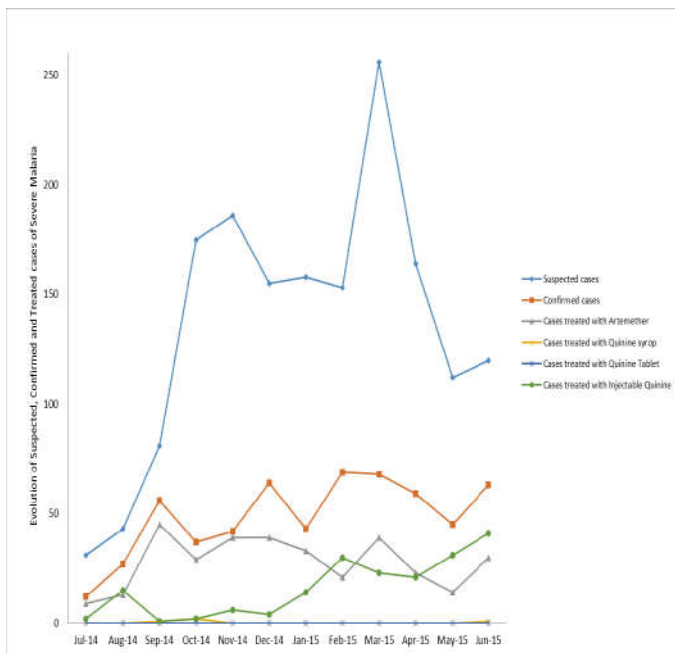


Figure 2 Evolution of the free treatment of severe malaria for under-fives from July 2014 to June 2015 in 22 Health facilities of the Bamenda Health District

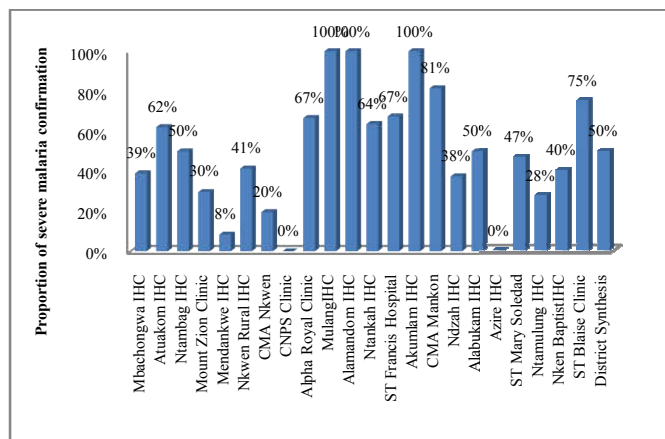


Figure 3 Rate of severe malaria confirmation per Health facility

According to figure 3, 75% of health facilities had confirmation rate of severe malaria. Only 14% of health facilities had a positive confirmation of all their suspected cases of severe malaria for under-fives. (9%) of the health facilities had no positive confirmed case of severe malaria. The District Synthesis for positive confirmation of severe malaria was 50%

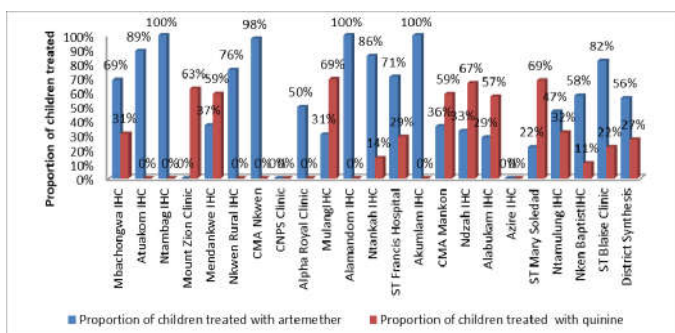


Figure 4 Proportion of children treated with artemether and proportion treated with quinine (Infusion and Syrup)

With respect to figure 4, more than 50% of health facilities treat severe malaria with artemether. The proportion of children treated in the District with artemether and quinine were 56% and 27% respectively.

Awareness and Degree of Satisfaction of Beneficiary

Out of the 15 parents/guardians of children of under 5 suffering from severe malaria during the data collection phase, only 2(13%) were aware on free treatment policy. None of them (100%) testify of their child been treated free as prescribed by policy. 7(47%) had no comment with regards to appreciation of treatment policy and 8 (53%) testify that implementation of policy was not satisfactory.

DISCUSSION

This study was conducted to evaluate the level of implementation of free treatment of severe malaria in children less than five years in health facilities of the Bamenda Health District.

All the personnel interviewed were aware of the policy and had received training on the management of severe malaria of which 86% of them was in early 2015. 95% of the consulting health personnel had the management guideline for malaria and 15 (68%) of them prescribed artemether for first line against 7 (31%) who prescribed but quinine Infusion. Only 36% of health facilities had a specific register for the follow up and management of severe malaria in under-fives. All the 22 health facilities carry out a confirmatory laboratory test before any treatment. 8 of 22 health facilities had stock shortages of Artemether and Quinine respectively within July 2014 and June 2015. The only input with no shortage in all the health facilities within this period were Syringes. From implementation of policy (July 2014, the drug mostly used was artemether. From January 2015 quinine infusion was the most used drug to treat severe malaria in under-fives. 13% of parents/guardians of children were informed of the free treatment policy. None of them had their child treated free of charge for severe malaria during data collection period.

Firstly, looking at the qualification and availability of health personnel, the findings of this study shows that majority (45%) of them were State Registered Nurses. This is consistent with findings in study conducted in Uganda by Acha J and her colleagues who found that nurses/midwives represented the majority of the staff. (40% of them in patient unit) [13] To add, all the personnel interviewed had received training on the management of severe malaria. These results are in the same line with a study conducted in Mali by Drissa Sanogo in which 96% (24/25) interviewed personnel had received training on management of severe malaria.[14] On the other hand, Acha J and her colleagues conducted a study in Uganda and findings from it showed that only 23% of the personnel were trained on severe malaria [13] This was the same scenario in Haiti in a study conducted by Keren Landman Z where 22% of the health personnel received such training. [15] A possible explanation is that in these studies, the sample size used was different to that of our study as it involved all personnel in health facilities whereas this study included only consulting health personnel.

21/22 (95%) of the health facilities had the management guideline for malaria. This same result was found in Mali by Drissa Sanogo in 2010 where 96% (24/25) of health facilities

had the management protocol for malaria.[14] To add, 68.1% (15/22) of the health personnel administered artemether as first treatment for severe malaria. This result is contrary to the management guideline in Cameroon which stipulates artemether to be for 3rd line treatment. A possible explanation is that artesunate, the recommended first line drug was not supplied to health facilities. As for quinine, it is difficult to get the vein of child to administered quinine infusion and most parents/guardians of children refuse admission of their children. The study of Jane Achane and her colleagues revealed that Intramuscular artemether with intravenous quinine have shown no benefit of treatment with artemether over quinine in children with severe malaria in Sub Saharan Africa.[16] So whether it is artemether or quinine being used as first line for treating severe malaria has no major problem. However, all the 22 health facilities carry out a laboratory diagnostic test before treatment, confirming to the guidelines for the management of malaria in Cameroon. In this guideline, a confirmatory test is mandatory before any treatment.[17]

With regards to drugs and inputs, this study documented that 8/22 (36%) of the health facilities had stock shortages of artemether within July 2014 to June 2015. 6 of these health facilities had such shortages for more than 7 days. Syringes were the only input found in all health facilities within the time frame. Drisso Sanago in her study in Mali had a different result. 20% of health facilities had malaria kit permanently from January 2007 to March 2010. [14] This inconsistency may be due to the difference in the system of stock management of different countries. Also, her study included severe and simple malaria.

Considering the implementation of free treatment policy using artemether Injection, findings from this study showed that only 32% (7/22) of health facilities treated severe malaria in under-five solely with artemether. About 60% (13/22) of these health facilities used artemether or Quinine. The use of artemether for treating severe malaria in under-fives is considered free in Cameroon. Although a majority of health facilities use artemether, the treatment was not free. A possible explanation for this is due to its stock shortage in health facilities as artemether is not frequently supplied to health facilities. Some health facilities use quinine instead of artemether since it is not free.

Lastly, findings from this study also showed that only 13% (2/15) Parents/guardians of under-fives were aware about the free treatment policy. This result is contrary to that conducted in Mali by Drissa Sanago in 2010 where 63% (132/210) of parents/guardian under five had knowledge on free treatment policy.[14] This difference may be due to the variation in sample size. In her study, the sample size was 210 respondents taken from the community. In this study, only respondents met at the hospital in time of data collection were considered. To add, this might be because people in Mali are more interested and aware of health program than people in Cameroon.

A limitation to this study was that the period of data collection was not sufficient to adequately evaluate the benefits patient had to this free treatment policy. The fact that the study was done only at a particular period of the year can also bias the results since we could hardly know what happens throughout the year To add, not all health facilities adequately indicated suspected cases of severe malaria in their consulting registers.

The poor recording of such data in some health facilities influences the calculation confirmation rate of severe malaria. Thus, affecting the results of the study, only the principal investigator and one other trained personnel were involved in the data collection process. Therefore the results of this study are less likely to be explained by measurement bias. It can thus be said that the results presented by this research is a true picture of what happens in the Bamenda Health District and not a representation of the Region nor the entire Country.

CONCLUSION AND RECOMMENDATIONS

Free treatment of severe malaria in under-five in Cameroon has not been effectively implemented in the Bamenda Health District as stipulated by policy. Despite the fact that health personnel have been trained to manage severe malaria in under 5, they don't still adhere to such a policy. Drugs and consumables for the management of severe malaria in under 5 have not been constantly supplied on monthly bases in health facilities. The drugs used for treating severe malaria in under 5 were artemether and quinine though artemether has not been constantly offered free as prescribed by the policy. The beneficiaries are not adequately informed of the policy not to talk of been treated free as prescribed by the policy. We recommend the following practices in the various levels of the health system pyramid of Cameroon.

To Health facilities

- Educate and sensitise the parents/guardians of under-fives on free severe malaria treatment, during all activities in the health facility that involve promotion of the health of the child.
- Conduct sensitisation campaign for the general population and health care providers on the free treatment initiative of severe malaria in order for all implicated actors to have the same definition of the said policy.

To District Health Service

- Do monthly supervision on the effective free treatment of severe malaria in under-five in health facilities
- Carry out mass sensitization of the community at large on the free treatment policy
- Ensure proper monthly reporting by all health facilities on the treatment of severe malaria in under-fives.

North West special Fund for Health

Supply inputs especially artemether to health facilities on a monthly basis and on time.

To Regional Malaria Control Unit

- Elaborate a plan of following up the implementation of the free treatment policy in under-fives.
- Distribute directives on free treatment initiatives and price tariff for treating severe malaria in individuals above five to all health facilities.

To National Malaria Control Programme

- Institute health operational research after implementation of such policies.

- Evaluate the financial impact on the implementation of the free treatment policy in private health facilities.
- This study should be done on a large scale involving many other Districts.

Abbreviations

BHD: Bamenda Health District, HF:Health Facility, NMP: National Malaria Program

Competing Interest

The authors declare that they have no competing interest

Authors' contribution

VAT and ZB conceived the study, guided the study design, organised and coordinated collection of field data. VAT analysed the data and drafted the manuscript. NMM contributed in field data collection. WPJ contributed in revising the manuscript. All authors read and approved the final manuscript.

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Acknowledgment

We heartily thank the Bamenda District Health Service staff especially the District Team headed by the District Medical Officer, Dr TEGUIA Stephane for their material support, remarks and guidance towards the production of this work was very timely. Our sincere gratitude also goes to the Department of Biomedical Science of the University of Dschang for their technical support.

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How to cite this article:

Vukugah Achombwom Thomas *et al* (2018) 'The State of Implementation of Free Treatment of severe Malaria In Children Less Than Five Years In Health Facilities In The Bamenda Health District:A Cross Sectional Study', *International Journal of Current Advanced Research*, 07(2), pp. 9849-9854. DOI: <http://dx.doi.org/10.24327/ijcar.2018.9854.1644>
