

PATTERN AND TREND OF MALARIA MORBIDITY AND MORTALITY IN TIGRAY REGION, ETHIOPIA FROM 2011/12-2014/15

Hadgu Gerensea

School of Nursing, College of Health Science and Referral Hospital, Axum University,
Axum, Tigray, Ethiopia

ABSTRACT: *Malaria is vector borne disease. Even though there is global reduction in malaria mortality still the African Region continues to shoulder the heaviest burden: in 2015, this one region accounted for approximately nine in 10 malaria cases and deaths globally. Methods: The main aim of this study was to assess four year pattern and trends of malaria morbidity and mortality in Tigray region using retrospective study design from patients' registration and Health Management Information System (HMIS) data. The data was interred and coded to Epi Info and exported to SPSS version 21 for statistics analysis. Result: A total of 1.5 million malaria cases were analyzed. 78% of the cases were confirmed though liberator where as 22% of the cases diagnosis were made though clinical manifestation without liberator. The most common species of malaria morbidity is Plasmodium falciparum which accounts 71% where are the rest were other species. The magnitude of malaria morbidity in 2014/15 is 1.5 times lower than 2011/12. Similarly the magnitude of malaria mortality is 1.74 times lower than 2011/12. Conclusion: Although elimination and eradication of malaria morbidity and mortality were not possible reduction of malaria morbidity and mortality were achieved. But still know it needs high-level and sustained political commitment and constant vigilance, intense programmatic efforts in affected areas for eradication and elimination of malaria.*

KEYWORDS: Impact, Vector born, Plasmodium falciparum, Eradication

INTRODUCTION

Malaria is a very serious public health problem and most important vector borne disease in most developing countries. According to World Health Organization report half of the world population are at risk of malaria with almost all African population.¹⁻³ Global progress in malaria control masks disparities between and within countries. The African Region continues to shoulder the heaviest burden: in 2015, this one Region accounted for approximately nine in 10 malaria cases and deaths globally.⁴

Focal outbreaks are common and the distribution varies from place to place depending on climate and altitude. In Ethiopia malaria is a major concern since it is one of the leading causes of morbidity and mortality. Despite the current efforts to control malaria in Ethiopia, the situation has not improved mainly due to the increasing problems of parasite resistance to the relatively cheaper anti-malarial drugs, vector resistance to insecticides, low coverage of malaria preventive service.⁵⁻⁶

Worldwide Malaria mortality has been declined 42% since 2000. In which Africa contributes 49% reduction due to prevention and control measures,²⁻³ but in 2010 still 90% malaria death

occurred in Africa mostly in under five year age which accounts 24% of the cause of mortality.^{3,7}

Similarly in 2002 and 2012 Global reports shows 90% and 80% of deaths are from Africa.⁸⁻⁹ Moreover in 2015 Africa accounted for approximately nine in 10 malaria cases and deaths globally. Malaria is still headache for African countries even there is disparities between and within countries.⁴

MATERIALS AND METHODS

Study area and period

The study was conducted in Tigray region which covers an area of 109 square kilometers and its elevation is 2,084 meters above sea level. The region has 18 public hospitals and 170 health centers with total population of 4,316,988.

Study design

Retrospective study design from August 2011 up to August 2015 were used to address the pattern and trend of malarial morbidity and mortality.

Sample size

All the four year data of public hospitals and health centers of Tigray region was taken.

Data collection procedures and instrument

Data extraction tool was developed to extract data from HMIS registration.

Data analysis

First the data was entered and coded to Epi info version 3.5.4 and exported to analyses in to SPSS version 21 window7. Data analyses included descriptive statistics was used to describe participants' demo-graphic characteristics and trend of malaria mortality and morbidity.

Data quality management

Data was extracted by statistician from HMIS data of Tigray region with close supervision.

Ethical clearance

Institution Review Board (IRB) of Aksum University, College of Health Science was reviewed the protocol to ensured full protection of the rights of study subjects. Following the approval by IRB of Aksum University, IRB of Tigray Region Health bureau also approved and official letter of co-operation was written to the directorate of health information system. In order to keep confidentiality of any information obtained, the data collection procedure was treated anonymous.

Availability of data and material

The data and materials used for analysis and draw conclusion are available at the supplementary data.

RESULTS

Scio-Demographic

The study was conducted in all public hospitals and Woreda health offices (170 health center) of Tigray region. A total of 1.5 million cases of malaria was extracted from IPD (inpatient department) and OPD HMIS data. From the total study subjects in the data 1,515,483 (68.8%) were male. No data was excluded since all were complete and readable. For further see the Table-1

Pattern of Malaria Morbidity and Mortality

78% of the cases were confirmed though liberator where as 22% of the cases diagnosis were made though clinical manifestation with out liberator. The most common species of malaria morbidity is Plasmodium falciparum which accounts 71% where are the rest were other species. Similarly 43% of mortality of malaria were diagnosed by clinical with out liberator but the rest were diagnosed both clinical and confirmed though liberator. More over 76% of the deaths were related to Plasmodium falciparum. For further see Figure1 and Figure-2.

Trend of Malaria Morbidity and Mortality

The trend of malaria morbidity is decreasing every year. The magnitude of malaria morbidity in 2014/15 is 1.5 times lower than 2011/12. Similarly the magnitude of malaria mortality is 1.74 times lower than 2011/12. for further see Figure 1 and 2.

DISCUSSION

Even though there is no full data and enough evidences of diagnosis of malaria registry in Ethiopia yet, starting from 2011/12 HMIS was introduced. There is also deficient registration of death certificates and an underestimation of Malaria mortality in Ethiopia. In the absence of reliable population registration in developing countries like Ethiopia using HMIS is the only available window to observe the trend and pattern of malaria morbidity and mortality in Tigray region.

Worldwide Malaria mortality has been declined 42% since 2000. In which Africa contributes 49% reduction due to prevention and control measures.²⁻³ Similarly this study also shows decline in the four year trend by 1.74 times which indicates some improvement in the prevention and control of malaria. Not only prevention and control it also shows improvement in early detection and management of malaria. This achievements may be resulted from increased political commitment, the burgeoning of regional initiatives and improved tool. But still know the Prevention and control strategy did not achieve the World Health Organization (WHO) launched the Global Malaria Eradication Programme.⁴

The study also shows *P. Falciparum* is the most common cause of malaria morbidity which is consistent with world health report of 2002. Moreover the trend of *P.falciparum* increase unlike *P.vivax* which is comparable with the study conducted in general hospital of Ethiopia.¹⁰ This may be related with the availability of Rapid Diagnostic Test (RDT). Similarly the study also shows decrease malaria morbidity and mortality with clinical diagnosis without liberator.

The study indicates morbidity of malaria decreased by 1.5 times. This is similar with the study conducted in Mbakong have shown a fluctuating, but declining trend over the last seven years with a practically relevant significance.¹¹

Although elimination and eradication of malaria morbidity and mortality were not possible reduction of malaria morbidity and mortality were achieved. But still know it needs high-level and sustained political commitment and constant vigilance, intense programmatic efforts in affected areas for eradication and elimination of malaria. More over best strategies should be shared from countries of free malaria.

Limitation of the Study

Data from health facilities are potentially useful for monitoring time trends in the number of malaria cases and deaths but have severe limitations. Analysis was based on routinely collected clinical malaria data from public health institution. There is a possibility of both under and over reporting of malaria cases due to other febrile illnesses which mimic with malaria. Since retrospective data were used its accuracy and completeness could not be fully verified. Reporting from facilities to districts and from districts to the ministry of health varies in its completeness and timeliness from institution to institution and often does not include nongovernment facilities.

Abbreviation and acronym

TRHB: Tigray Regional Health Bureau

HMIS: Health Management Information System

IPD: Inpatient Departement

OPD: Outpatient Department

RDT: Rapid Diagnostic Test

P. falciparum: Plasmodium falciparum

P. Vivax: Plasmodium Vivax

IRB: Institutional Review Board

Acknowledgments

My deepest gratitude goes to Aksum University and TRHB for giving full data and supportive materials and information

Author contributions

Hadgu Gerensea conceived and designed the study, analyzed the data and wrote and approved the final manuscript.

Disclosure

The author reports no conflicts of interest in this work.

REFERENCES

- 1) WHO. World malaria report 2013: World Health Organization; 2014.
- 2) WHO. World malaria report 2012. 2012. Geneva: World Health Organization. 2014:1–276.
- 3) WHO. Malaria fact sheet; 2011. Available: <http://www.who.int/features/factfiles/malaria/en/2013>.
- 4) WHO Report GMP Eliminating malaria 2016
- 5) Deressa, W., D. Olana and S. Chibsa, 2004. Magnitude of malaria admissions and deaths at hospitals and health centers in Oromia, Ethiopia. *Ethiopian Medical Journal*, 42: 237-246
- 6) Nigatu, A., G. Homa and D. Getachew, 2014. Can training Health Extension Workers in the integrated pharmaceutical logistics system (IPLS) be effective, affordable and opportunistic? *Ethiopian Medical Journal*, 52: 11
- 7) Murray CJ, Rosenfeld LC, Lim SS, Andrews KG, Foreman KJ, Haring D, Fullman N, Naghavi M, Lozano R, Lopez AD: Global malaria mortality
- 8) WHO: World Malaria Report 2013. Geneva: World Health Organization; <http://www.who.int/mediacentre/news/releases/2013/world-malarreport-20131211/en/> - 20131211
- 9) The World Health Report 2002: reducing risks, promoting healthy life. Geneva, World Health Organization, 2002
- 10) Ramos JM, Reyes F, Tesfamariam A. Change in Epidemiology of Malaria Infections in a Rural Area in Ethiopia. *J Travel Med*. 2005;12(3):155-6.
- 11) Ndong et al.: Trends in malaria admissions at the Mbakong Health Centre of the North West Region of Cameroon: a retrospective study. *Malaria Journal* 2014 13:328

APPENDIX

Table 1 Socio-demographic characteristics of participants

Age		<5yr	5-15 Yr	>15 Years	Total
Sex	Male	98867	178870	765093	1042830
	Female	79244	121753	271656	472653
Total		178111	300623	1036749	1515483

Figure 1 Trend and Pattern of Malaria morbidity in Tigray Region, Ethiopia from 2011/14-2014/15.

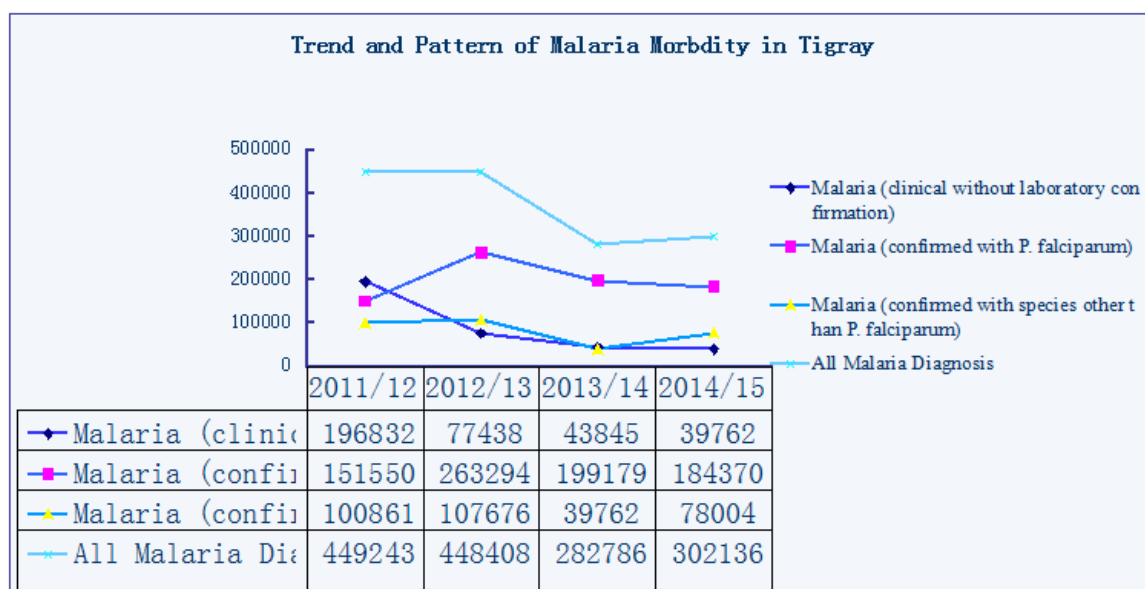


Figure 2 Trend and Pattern of Malaria Mortality in Tigray Region, Ethiopia from 2011/14-2014/15.

