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# Estimation of the Average Direct Cost of Treating Severe Malaria in Infants 0-59 Months Old in the CSRef of Fana, Mali

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Short Communication

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## ABSTRACT

Malaria continues to be a significant burden on both the health and economy of nations, particularly in regions like Africa. This study focuses on estimating the direct economic costs incurred by families in managing severe malaria in children under five years old at the Fana Reference Health Center in Mali. Through an observational, descriptive, prospective, and cross-sectional approach, data were collected from July 2017 to June 2018. Of the 944 hospitalized cases, 109 were included. The majority were in the 24-36 months age group, with boys being predominant. Severe anemia and convulsions were the most common complications. The average direct cost of treating severe malaria was estimated at $42.6, which exceeds half of Mali's minimum wage. These findings underscore the significant economic burden placed on families by malaria treatment, highlighting the urgent need for interventions to alleviate this burden and improve health outcomes in affected communities.

**Keywords:** Malaria; Anemia; Direct economic costs; Nations; Children

## INTRODUCTION

Malaria affects the health and wealth of countries and people; the mere presence of malaria in a community or country is also detrimental to individual and national prosperity because of its influence on social and economic decisions [1]. The World Malaria Report, published in December 2016, recalls that nearly half of the world's population was at risk of contracting malaria in 2015 in 91 countries, with 212 million cases of malaria and 429,000 deaths [2-8]. In Africa today, it is recognized that malaria is both a disease of poverty and a cause of poverty; annual economic growth in countries with high malaria transmission has always been lower than in malaria free countries, and economists attribute malaria to an annual growth deficit of up to 1.3% in some African countries. Indeed, it consumes 40% of public health expenditures in Africa and hinders the schooling of children and social development [9]. Malaria is the leading cause of morbidity and mortality in Mali and is among the ten countries with the highest number of malaria cases and deaths (3% of cases and deaths in the world, and 6% of cases in West Africa). In addition to the human burden, malaria affects the national economy by reducing Gross National Product (GNP) due to working days lost by working people and hinders children's schooling and social development. According to a study conducted by the National Institute of Research in Public Health (INRSP), the economic losses due to malaria are estimated at 72 billion CFA francs per year. It is thus considered a disease of poverty and a cause of poverty [10]. The direct cost of malaria care covers individual and public expenditure on malaria prevention and treatment. In some highly malarial countries, expenses can account for up to 40% of public health expenditure, 30%-50% of hospital admissions and up to 50% of outpatient consultations [11]. Fana is a rural area with a poor population whose economy is mainly based on agriculture dependent on the rainy season. In this context, what would be the cost of treating severe malaria? Can this cost affect this fragile family economy? In the absence of data on the cost of managing severe malaria, we set ourselves the objective of estimating the direct economic cost borne by families in the management of severe malaria in children aged 0 to 5 years hospitalized in pediatrics at the Fana Reference Health Center.

## DESCRIPTION

This was an observational, descriptive, prospective, and cross-sectional study. It aimed to estimate the direct costs of treating severe malaria in children under 5 years of age. It was conducted from July 2017 to June 2018 at the reference health center in Fana health district [12].

It included cases hospitalized for more than 24 hours for severe malaria in children aged 0-59 months whose parents or caregivers gave their consent to participate. Cases were excluded if they died, were evacuated, transferred, or were referred. The data were collected from the medical records, prescriptions, analysis forms, consultation and hospitalization vouchers, and food vouchers. The calculation method was based on the estimation of average direct costs as follows: Total Cost (TC)=ΣPi.Qi, *i.e.,* Average Direct Cost (ADC)=Total Cost (TC) of the activity divided by the total number of output units produced (Q).

The information was input into a pre-prepared excel 2013 spreadsheet. The analysis focused on the socio-epidemiological and clinical data of the cases. The economic costs of the different activities were estimated for each case [13].

The case management was in accordance with the national malaria management protocol and the WHO guide to the management of severe malaria, 3rd edition.

For ethical considerations, authorization was obtained from the district management team and an informed consent form was presented to those responsible for the sick children [14].

### Epidemiological and clinical aspects

The number of cases hospitalized during the study period was 944 of whom 109 patients (11.55%) were included in the study. The age group 24-36 months was in the majority, representing 26.6% (n=29) compared with 12% (n=13) of patients aged 0-12 months [15]. The boy/girl ratio was 1.5 in favor of boys (n=64). The most frequent complications were severe anemia 45.8% (n=50); convulsion 32.1% (n=35); severe sepsis 7.3% (n=8).

### Estimated economic cost of management

The average cost of drugs and other medical consumables was USD 28 (66%), paramedical analyses USD 5.5 (13%), hospitalization and consultation USD 1.6 and 2.5 (4% and 6%) each, and transport USD 5. The average direct cost of treating severe malaria was therefore 42.6 dollars, and this cost is still higher than half of minimum wage in Mali (67.4 USD).

## CONCLUSION

This study sheds light on the significant economic burden imposed by severe malaria on families in the Fana region of Mali. With malaria being both a disease of poverty and a cause of poverty, its impact extends far beyond individual health to impede economic growth and development. The findings reveal that the average direct cost of treating severe malaria in children under five years old amounts to $42.6, a substantial expense that surpasses half of Mali's minimum wage. Such expenses can severely strain already fragile family economies, exacerbating poverty and hindering socio-economic progress.

These results underscore the urgent need for targeted interventions to alleviate the economic burden of malaria on affected families. Implementing effective preventive measures, improving access to affordable treatment, and strengthening health systems are essential steps toward reducing the economic impact of malaria. Additionally, investing in research and innovation to develop more cost-effective treatment and control strategies can contribute to long-term sustainability and prosperity in malaria-endemic regions like Fana.

By addressing the economic challenges associated with malaria management, policymakers and stakeholders can work towards not only improving health outcomes but also fostering socio-economic development and resilience within affected communities. Ultimately, combating malaria requires a multifaceted approach that recognizes and addresses its profound economic implications alongside its health consequences.

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