Editorial
Volume 10:2, 2021

Malaria Control & Elimination

ISSN: 2470-6965 **Open Access**

Cooperation Initiative in Malaria Control and Elimination

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Abstract

The objectives of this study are to describe the malaria situation in Ghana and give a brief account of how mathematical modelling techniques could support a more informed malaria control effort in the Ghanaian context. A review is carried out of some mathematical models investigating the dynamics of malaria transmission in sub-Saharan African countries, including Ghana. Collaboration between malaria control experts and modellers will allow for more appropriate mathematical models to be developed. A core set of intervention and treatment options are recommended by the World Health Organization for use against falciparum malaria.

Keywords: Elimination • Malaria • Policy • Process

Introduction

Globally, about 3.2 billion people were at risk of malaria infection in 2015, with the number of cases being 214 million. Deaths attributable to malaria were estimated to be 438,000, most of which occurred in sub-Saharan Africa.However, readily available mathematical models to support decisions for planning and subsequent evaluation of these strategies remains a challenge, given the limited research undertaken in this field in Ghana.

Models have been developed elsewhere in Africa where the diversity in malaria transmission across regions is taken into account through the incorporation of meteorological factors such as rainfall and temperature. Other models in Nigeria, Ivory Coast and Mali aided the investigation of malaria transmission dynamics, the conduct of stability analysesinvestigation of the impact of ITNs and malaria acquired immunity and the study of the relationship between temperature and precipitation with malaria incidence. These interventions constitute a core cost-effective toolkit for malaria control. LLINs remain a highly cost-effective intervention and their mass production and distribution has led to falling costs since their introduction .Cost-effective prevention is coupled with cost-effective front-line treatment in the form of ACT.

Treatment has a relatively larger impact on case incidence in the lower transmission setting, where infections are more likely to be symptomatic and lead to treatment seeking. Antimalarial centres have played not only a role in diagnosis and treatment, but also have contributed to communication and capacity building, including improvement of capacity in local medical research and treatment. Experiences with the malaria control centres are variable, e.g. some have been successful, while others are faced with the challenges of financing and the lack of local contribution.

Conclusions

There seems to be no evidence of country-specific mathematical models playing a role in supporting policy decision making with regards to malaria intervention strategy development. Packaging these mathematical modelling tools into user friendly interfaces and making them available for use by malaria control management teams at various levels across Ghana will be the way to exploit synergies for a common goal of a possible malaria elimination by 2030 as envisaged by the Global Malaria Programme.This study reiterates the importance of a combination of prevention, via vector control (here LLINs), and treatment as the cornerstone of malaria control in SSA. Additional currently recommended interventions (chemoprevention) and tools in development (RTS,S) will be valuable in those many areas where vector control and treatment are themselves not enough to bring about a transition to elimination.

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Received 14 May 2021; **Accepted** 15 May 2021; **Published** 22 May 2021

How to cite this article: Ning Xiao. "Cooperation Initiative in Malaria Control and Elimination." *Malar Contr Elimination* 10 (2021): e165.