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REVIEW

An epidemiological overview of malaria in Bangladesh

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Summary Bangladesh is one of the four major malaria-endemic countries in South-East Asia having approximately 34% of its population at risk of malaria. This paper aims at providing an overview of the malaria situation in this country. Relevant information was retrieved from published articles and reports in PubMed and Google Scholar.

Malaria in Bangladesh is concentrated in 13 districts with a prevalence ranging between 3.1% and 36%, and is mostly caused by *Plasmodium falciparum*. Geographical conditions pose a potential risk for *Plasmodium knowlesi* malaria. Resistance to a number of drugs previously recommended for treatment has been reported. Low socio-economic status, poor schooling and close proximity to water bodies and forest areas comprise important risk factors.

Despite the significant steps in Long Lasting Insecticide Net (LLIN)/Insecticide Treated Net (ITN) coverage in Bangladesh, there are still many challenges including the extension of malaria support to the remote areas of Bangladesh, where malaria prevalence is higher, and further improvements in the field of referral system and treatment.

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Introduction

Genetic research suggests that human malarial parasites might have originated some 2—3 million years ago, although some studies propose a later appearance of malarial pathogens in human populations, perhaps 10,000 years back.[1,2] Since then, malaria has established itself as a major cause of morbidity and mortality globally. The recent World Health Organization (WHO) estimates showed that 106 countries were malaria-endemic in 2010, and more than 3.3 billion people worldwide were likely to get a malarial infection that year.[1,3] The global malaria trends show a decline in the percentage of population exposed, at least up to 1994, but the total number of people at risk for malaria has never declined since 1900.[1,3]

The burden of malaria is significant in South-East Asia, which follows Africa in terms of reported malaria cases; almost 70% of a total of 1.8 billion people living in this region are at risk of malaria.[1,3] All the countries in the area except the Maldives are malaria endemic. Cases of malaria in South-East Asia account for approximately 15% of the global toll and 38,000 people died from malaria in 2010.[3] In addition, these numbers may be even higher because existing surveillance systems suffer from substantial underreporting.[4] Conversely, signs of reduction have been observed in both malaria cases and deaths over the last years as depicted in Fig. 1.[5]

Bangladesh is one of the four major malaria endemic countries in the region with approximately 34% of its population at risk of malaria.[3,6] Given the high burden of malaria in Bangladesh and the lack of recent comprehensive epidemiological reviews, in the current paper we try to describe the dynamics of malaria transmission in Bangladesh, explain trends and suggest measures for a better response.

Methods

Relevant information was retrieved from published articles and reports. Electronic databases (PubMed and Google Scholar) were searched using the terms: "*Malaria*" combined with "*Bangladesh*" (last search: February 07, 2012).

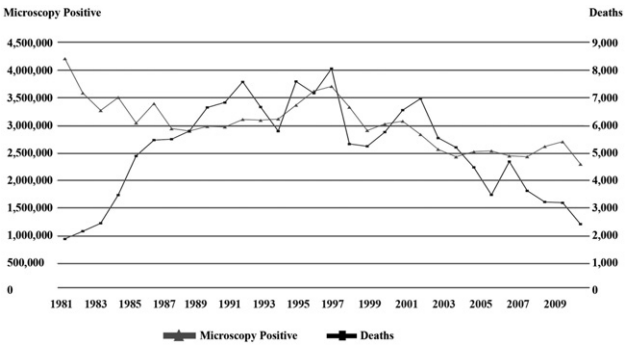

Figure 1 Malaria microscopy positive cases and deaths in South-East Asia, 1981—2010.

Results

Malaria endemicity in Bangladesh

More than 10 million people of Bangladesh are at high risk for malaria.[3] The steady rise of the prevalence of malaria in Bangladesh has partly been attributed to the 1985 ban on use of dichlorodiphenyltrichloroethane (DDT), to the discontinuation of malaria eradication program and to the large-scale population movements during the war of independence.[7,8] Malaria is not epidemic in the general population of Bangladesh.[9,10] However, certain areas of the country are more affected. Most of the malaria cases in Bangladesh (95—98%) originate from 13 Eastern and South-Eastern districts with overall weighted prevalence rates ranging from 3.10 to 3.97%.[3,6,7,11—14] The Chittagong Hill Tracts (CHT) area in particular is hyperendemic with a prevalence of 11% or even higher.[11,15—18] Among the three Hill Tract districts (Khagrachari, Rangamati, and Bandarban), an extremely high prevalence (36%) has been recorded in a sub-district of Bandarban.[16] A total of 55,873 probable and confirmed malarial cases have been reported in Bangladesh in 2010.[3,19] The trend of malaria in Bangladesh since 1990 is summarized in Fig. 2.[3] The spread of the parasite can be explained by the Bangladesh's borders in the East and North-East with India and in the South with Myanmar, where malaria prevalence is much higher. As a matter of fact, Indian areas in that region have an Annual Parasite Incidence (API) of more than 5, while approximately 50% of the population in Myanmar is at high risk for contracting malaria.[3,20]

Major malarial parasites in Bangladesh

Malaria in Bangladesh is mostly caused by *Plasmodium falciparum* with estimates ranging between 54% and 93%.[3,6,7,11,17,21,22] However, the lowest figures had been observed almost a decade ago, which indicates an increasing trend in malaria cases from *Plasmodium falciparum*.[3,22] This upwards shift has been attributed to human residence in forest areas, which explains why malaria is hyperendemic in

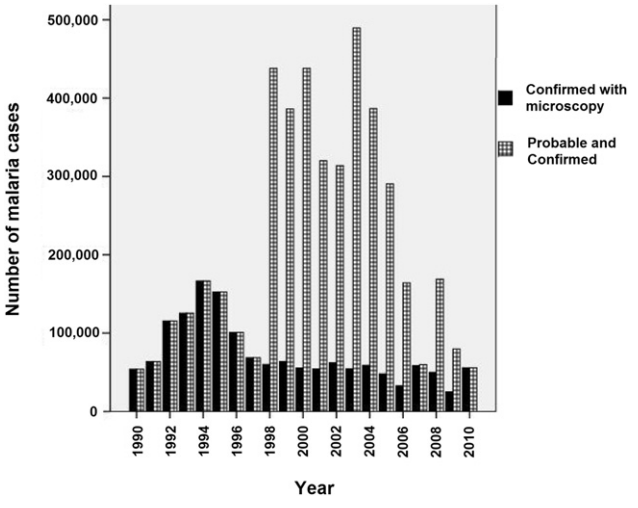

Figure 2 Malaria trend in Bangladesh, 1990—2010.