

Seasonal Malaria Chemoprevention

Introduction

In March 2012, the World Health Organisation (WHO) issued a policy recommendation for a new intervention against *Plasmodium falciparum* malaria - seasonal malaria chemoprevention (SMC), previously referred to as intermittent preventive treatment in children (IPTc), in children under five years old. SMC is defined as the intermittent administration of full treatment courses of an anti-malarial treatment combination during the malaria season to prevent illness and death from the disease.

Rationale

The objective is to maintain therapeutic anti-malarial drug concentrations in the blood throughout the period of greatest risk. This will reduce the incidence of both simple and severe malaria disease and the associated anaemia and result in healthier, stronger children able to develop and grow without the interruption of disease episodes. SMC has been shown to be effective, cost effective and feasible for the prevention of malaria among children in areas where the malaria transmission season is no longer than four months¹.

Benefits

A review of trials that evaluated the impact of SMC in preventing malaria in pre-school children living in endemic areas with seasonal transmission showed that SMC prevented approximately three quarters of all clinical malaria episodes and a similar proportion of severe malaria episodes, and that these benefits remained even where insecticide treated net usage is high². Other studies have also showed the beneficial additive effect of SMC given during the transmission season alongside other malaria control interventions such as the distribution and promotion of use of LLINs^{3 4}. Although the effectiveness and safety of SMC using amodiaquine and sulphadoxine/pyrimethamine has been proved in clinical trials, there is no established delivery system⁵.

1 WHO: SMC for *Plasmodium falciparum* malaria control in highly seasonal transmission areas of the Sahel sub-region in Africa.

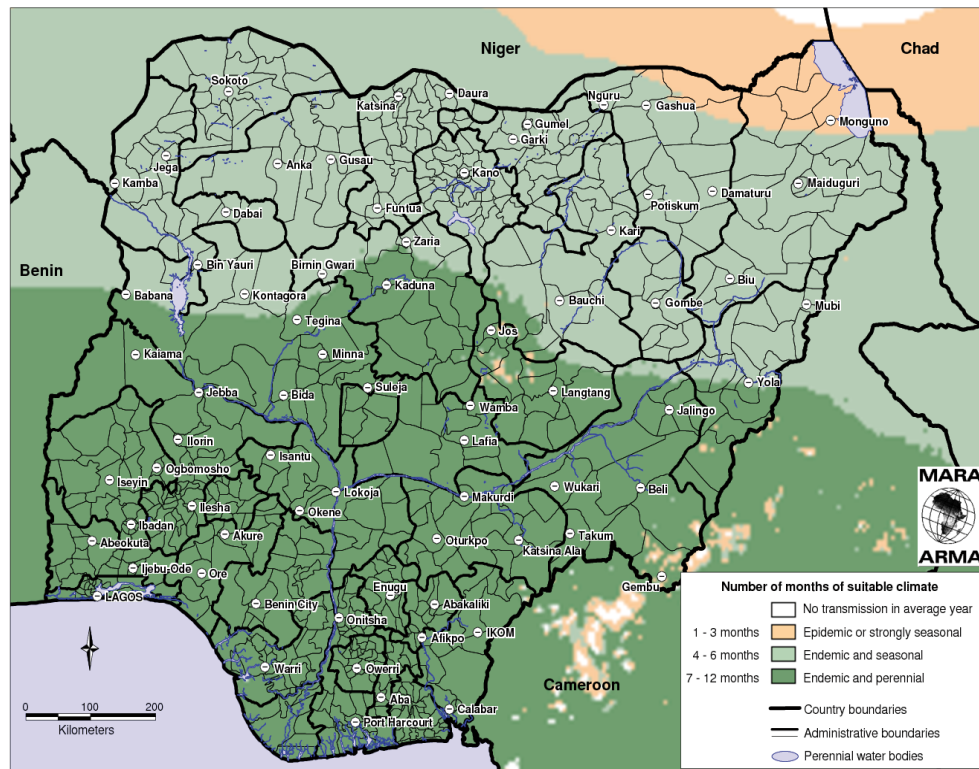
2 Intermittent preventive treatment for malaria in children living in areas with seasonal transmission (Review), 2012. The Cochrane Collaboration. John Wiley & Sons, Ltd.

3 Dicko A. et al. Intermittent preventive treatment of malaria provides substantial protection of malaria in children already protected by an insecticide-treated bednet in Mali. *PLoS Medicine* (2011). Vol. 8 Issue 2.

4 Konate A. et al. Intermittent preventive treatment of malaria provides substantial protection of malaria in children already protected by an insecticide-treated bednet in Burkina Faso – A Randomised, Double-Blind, Placebo-Controlled Trial. *PLoS Medicine* (2011). Vol. 8 Issue 2.

5 Bojang K et al. Two strategies for the delivery of IPTc in an area of seasonal malaria transmission in The Gambia: a randomized controlled trial. *PLoS Medicine* (2011). Vol 8, Issue 2.

Nigeria: Duration of the Malaria Transmission Season



This map is a product of the MARA/ARMA collaboration (<http://www.mara.org.za>), July 2001, Medical Research Council, PO Box 17120, Congella, 4013, Durban, South Africa
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 Malaria seasonality model: Tanser, F et al. 2001. Paper in preparation. Topographical data: African Data Sampler, WRI, http://www.igc.org/wri/sdis/maps/ads/ads_idx.htm.

Malaria transmission in Nigeria

Nigeria is made up of six geopolitical zones and 37 states including the Federal Capital Territory. Nigeria has a tropical climate with wet and dry seasons. The dry season occurs from October to March and the wet season between April and September. There is a period of cooler weather accompanied by the dry, dusty Harmattan wind, felt mostly in the north in December and January.

The temperature in Nigeria varies between 25°C and 40°C, and rainfall ranges from 2,650 millimetres in the southeast to less than 600 millimetres in some parts of the north, mainly on the fringes of the Sahara Desert. The ecology of Nigeria varies from the mangrove swamps and tropical rain forest belts in the coastal areas through to open woodland and savannah on the low plateau, which extends through much of the central part of the country to the semi-arid plains and Sahel grassland in the north and the highlands to the east.

The geographic location of Nigeria makes the climate suitable for malaria transmission throughout the country. It is estimated that up to 97 percent of the country's more than 150 million people risk getting the disease. The remaining three percent of the population who live in the mountains in southern Jos (the Plateau State), at an altitude ranging from 1,200 to 1,400 metres, are at relatively low risk for malaria.

The seasonality, intensity and duration of the malaria transmission season vary according to the five ecological strata that extend from the south to the north. These include:

- » mangrove swamps
- » rain forest

- » guinea-savannah
- » Sudan-savannah, and
- » Sahel-savannah

The duration of malaria transmission is longer in the south and reduces as one moves north (see map), being perennial in duration in most of the south, but lasting three months or less in the northeast region bordering Chad.

The dominant vector species in Nigeria are the *Anopheles gambiae* species and the *A. funestus* group. The most prevalent species of malaria parasites in Nigeria is *Plasmodium falciparum* (over 95 percent). It is responsible for the most severe forms of the disease. The other types found in the country, *Plasmodium ovale* and *Plasmodium malariae*, play a minor role. *Plasmodium malariae* tends to only occur in children with mixed infections.

SMC in Nigeria

The areas of northern Nigeria where malaria transmission lasts less than four months present an opportunity for those at risk to benefit from the implementation of SMC. Whereas the feasibility and effectiveness of SMC has been demonstrated elsewhere, the approaches to implementation, which require high coverage levels, have to be contextualised to fit the local setting. Thus there is a need to explore possible approaches in the Nigerian context that will provide effective delivery systems for the eventual scaling up of the intervention to cover areas in northern Nigeria with highly seasonal malaria transmission.

Malaria Consortium

Malaria Consortium has already started working with the Ministry of Health to roll out SMC in Katsina through its management of SuNMaP (the DFID-funded Support for the National Malaria Programme) and with support from the Bill & Melinda Gates Foundation. SuNMaP will also support the roll out of SMC across Jigawa state and Malaria Consortium has plans to extend the activity to additional states in due course.



A newly trained role model community caregiver administers the carefully prepared preventive malaria treatment to a young child in Katsina state, Nigeria



Role model community caregivers in Katsina receive certificates to show they have completed their training in SMC

Questions and answers

What anti-malarial drugs will be used?

WHO has recommended the use of a combination of amodiaquine and sulphadoxine/pyrimethamine, which has been shown to be both safe and effective in clinical trials in other west African countries such as Senegal, Mali, the Gambia and Burkina Faso.

How often will the children have to take the drug?

The drug will be given in three single doses over three months during the course of the transmission season. It will be important for caregivers to ensure that the drug is taken properly to ensure full protection.

Why will only children be protected?

Children under five are the most vulnerable to malaria illness and likely to die from severe infection. Their growth and development are most affected by repeated attacks of malaria and the development of anaemia, so that is why they will be targeted by the intervention.

Who will deliver the intervention?

Community care givers will deliver the intervention. These people will receive appropriate training before the intervention begins and be supervised by the appropriate staff within the health system.

Will people in the community be able to choose whether or not to take part in the intervention?

It is important that a high degree of coverage is obtained for the intervention to be successful. As with vaccination, the intervention provides individual protection but high coverage also provides protection to the community as a whole. It is therefore important that both formal and informal leaders and opinion formers within the community understand the nature and importance of joining the group effort to protect all the children of the community. However no child will be included without the informed consent of its parent or guardian and they will have the right to withdraw at any time.

How will the intervention be delivered?

Before a method of delivery is chosen, local communities will be consulted on what they think would be the most acceptable method of delivery. The variety of choices by communities will help reveal what methods are most effective and able to be scaled up.