

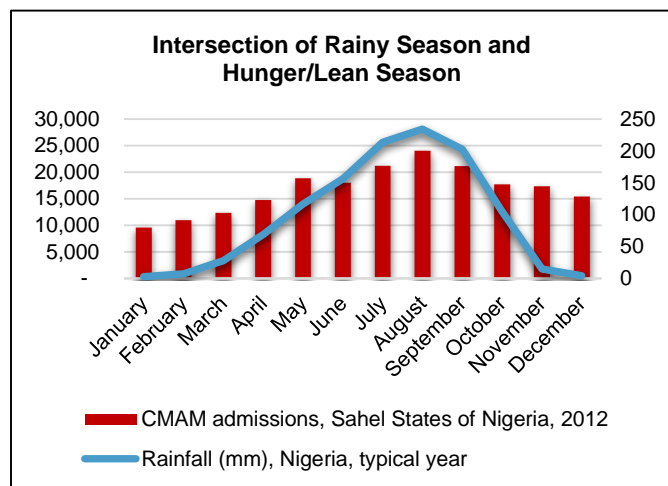


## NUTRITION AND MALARIA PREVENTION: AN INTEGRATED APPROACH FOR SAVING LIVES

With fewer than 500 days remaining to the Millennium Development Goal (MDG) deadline, new strategies are needed to accelerate progress to MDG4, which requires a two-thirds reduction in the 1990 child mortality rate by 2015. Despite a halving of child deaths since 1990 and taking into account the impact of planned child survival investments, the current rate of decline in child mortality will still not be fast enough to achieve MDG4. Our estimates<sup>1</sup> suggest that in 2015, an additional one million child deaths will still need to be prevented in order to achieve MDG4 and that as a result, new strategies are needed now to close the MDG4 achievement gap. This document outlines a “bend the curve” strategy to save additional children’s lives by delivering high impact nutrition interventions alongside planned seasonal malaria chemoprevention (SMC) campaigns in SMC-eligible countries across sub-Saharan Africa.

### Background

The interplay between infectious disease and nutritional deficiency is particularly lethal. Undernourishment is the single most important risk-factor for deaths of children under five years of age and is an underlying factor in the deaths of an estimated 1.5 million children in Africa each year. Nearly 50% of all malaria deaths are attributable to malnutrition.



**Figure 1. Intersection of rainy season and hunger/lean season in Kano State, Nigeria.**

Both malaria and acute malnutrition are highly seasonal. Across the Sahel sub-region, childhood mortality and mortality from malaria spike during the rainy season, typically a two to four month period in the latter part of the calendar year. In most countries in Africa, the “hunger season” coincides with the rainy season, typically starting one month after the rains have begun. During this time period the prevalence of undernutrition, especially severe acute malnutrition or wasting, is highest than at any other time of year, and data show that children with severe wasting are more than nine times more likely to die than adequately nourished children.<sup>2</sup> Figure 1 shows the intersection between the prevalence of undernutrition and rainfall levels in an area where SMC programs have already been implemented - Nigeria. These several months are a time period when children are extremely vulnerable to dying of causes that are completely preventable.

### Innovations and Recent Developments in Malaria Prevention

SMC scale-up presents a tremendous opportunity to save children’s lives. In 2012, The World Health Organization (WHO) released a policy recommendation for SMC, defining the treatment as “the intermittent administration of full treatment courses of an antimalarial medicine to children during the malaria season in areas of highly seasonal transmission”.<sup>3</sup> Providing malaria treatment at monthly intervals during the rainy season (when malaria disease/deaths are highest) has been shown to be 75% protective against uncomplicated and severe malaria in children under-five, who have the highest mortality risk.<sup>4</sup> As shown in Figure 2, SMC is being scaled up in several countries in the sub-Saharan Africa, and another ten countries contain areas that are eligible for SMC programming but have not yet approved official implementation plans. It is estimated that 39 million children under five live in these SMC-eligible zones across sub-Saharan Africa.<sup>5</sup>

<sup>1</sup> See “[Overview of a Proposed Roadmap to Reach MDG4](#)” released by the Office of the UN Special Envoy for Financing the Health Millennium Development Goals and for Malaria in January 2014.

<sup>2</sup> Black et al. Maternal and child undernutrition: global and regional exposures and health consequences. The Lancet. Jan 2008.

<sup>3</sup> The purpose of SMC is to prevent malaria by maintaining therapeutic antimalarial drug concentrations in the blood throughout the period of greatest malarial risk. WHO Global Malaria Programme. WHO Policy Recommendation: Seasonal Malaria Chemoprevention for *Plasmodium falciparum* malaria control in highly seasonal transmission areas of the Sahel sub-region in Africa. March 2012.

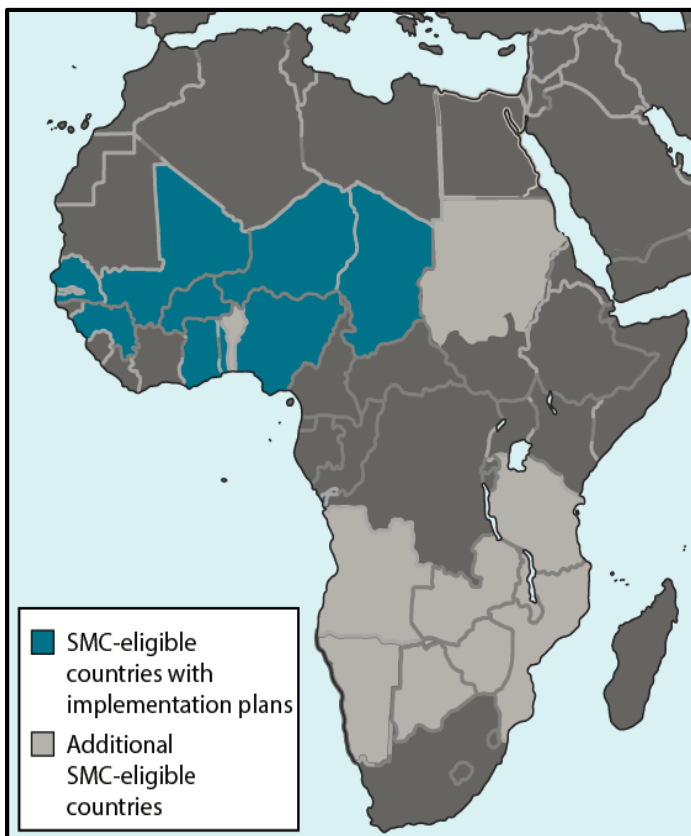
<sup>4</sup> WHO. Seasonal malaria chemoprevention with sulfadoxine-pyrimethamine plus amodiaquine in children: A field guide. August 2011

<sup>5</sup> Cairns et al. Estimating the potential public health impact of seasonal malaria chemoprevention in African children. Nature Communications, 3:881. June 2012.

Integrating additional services into existing delivery platforms is one of the global community's best tools for rapidly reaching the high and equitable coverage necessary to achieve MDG4. Bundling malaria protection and nutrition programming could fortify children during a particularly vulnerable time of year, and protect against the risk of death.

### The Case for Integration with Nutrition Commodities

The high burden of acute malnutrition in the malaria endemic regions presents a challenge for the scale-up of SMC treatment. In 2013, implementers of an SMC-only pilot program in Kano expressed concern that the full benefits of providing sulfadoxine-pyrimethamine plus amodiaquine (SPAQ) to young children may be jeopardized due to under-nutrition. Providing a Multiple Micronutrient Powder (MNP) or Lipid-based Nutritional Supplement (LNS) such as *Plumpy'Doz* could potentially boost the child's immune system, increasing the effectiveness of SMC and protecting children from one of the greatest causes of mortality and morbidity in Africa. In addition, free access to food supplements may create demand and/or serve as an incentive for parents to adhere to the SMC treatment course over consecutive months, further increasing the effectiveness of SMC treatment. Additionally, given that SMC is



**Figure 2. Ten countries with scaled-up SMC implementation plans for 2014, and the other countries containing SMC-eligible areas.**

typically delivered at the community level (door-to-door and fixed point at community health posts or schools), it allows for the screening of all children under-five for severe acute malnutrition (SAM) and referral as needed.

Table 1 (below) shows the prevalence of chronic undernutrition, also known as stunting, as well as moderate and severe acute malnutrition, known as wasting, in countries with SMC implementation plans in place for 2014. Clearly, using the SMC delivery platform to deliver only one intervention would be a missed opportunity, as nearly a third of these children are expected to suffer from undernutrition, and could benefit from nutritional interventions.

**Table 1: Prevalence of undernutrition in countries with planned SMC scale-up in 2014.**

Country	National prevalence of stunting (%) <sup>6</sup>	National prevalence of wasting (%)	Projected number of children reached with SMC in 2014 <sup>7</sup>
Ghana	23	6	1,731,836
Niger	44	18	1,050,283
Nigeria	36	10	10,516,429
Burkina Faso	33	11	406,000
Senegal	27	10	617,295
Mali	28	9	3,199,589
Togo	30	5	122,840
Gambia	23	10	293,173
Guinea	35	5	600,000
Chad	39	16	176,067
<b>Total/average</b>	<b>32</b>	<b>10</b>	<b>18,713,512</b>

<sup>6</sup> State of the World's Children Report, 2014. Wasting prevalence data sourced from this report as well.

<sup>7</sup> SMC Implementation and Planning Presentation, presented at the Roll Back Malaria Harmonization Working Group 14<sup>th</sup> meeting, 5-6 December 2013.



## Estimated Impact and Cost

The morbidity and mortality reduction impacts of SMC have been published in recent years, and it is estimated that about 30,000 to 100,000 malaria deaths could be averted depending on coverage levels of SMC as well as length of SMC treatments (3 or 4 months).<sup>8</sup> The addition of nutrition interventions such as nutritional screening, the provision of MNPs or LNS, and behavior change communications for feeding practices would bolster the immune systems of these children, further reducing the severity and duration of infections, for a relatively low incremental cost of approximately \$7 for a 4 month supply of MNPs to \$11 for 4 months of LNS. A study conducted in Burkina Faso integrated the provision of LNS with child health services (brief feeding advice and diarrhea and malaria treatment) found significant growth and development in young Burkinabe children, and reduced stunting prevalence by 25 percent and wasting prevalence by about 30 percent.<sup>9</sup> There is a need to continue to build the evidence base for integration of SMC, nutrition and other health services.

## Funding for Integration

As SMC is a WHO-recommended policy, it is expected that SMC plans would be eligible for funding through the Global Fund to Fight AIDS, Tuberculosis and Malaria in 2015. Additionally, a UNITAID grant of about \$67 million was recently approved to “accelerate impact” of SMC programs in seven countries<sup>10</sup> before the 2015 rainy season, with Malaria Consortium as the lead implementing organization. There may be an opportunity to maximize the impact of funding for SMC campaigns through leveraging the already budgeted platform/delivery costs for SMC to integrate other high impact, timely health interventions such as nutrition services that include food supplementation.

As funding rolls out for SMC implementation, it is truly a “missed opportunity” if children under five are reached with only one single intervention and are left to suffer the devastating, permanent, and possibly fatal effects of undernutrition.

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<sup>8</sup> Cairns et al. Estimating the potential public health impact of seasonal malaria chemoprevention in African children. *Nature Communications*, 3:881. June 2012.

<sup>9</sup> Results from study by Hess et al. presented at the Forum on Stunting Reduction by Kathryn G. Dewey, October 2013.

<sup>10</sup> UNITAID grants for seven countries: Burkina Faso, Chad, Guinea, Mali, Niger, Nigeria, and the Gambia