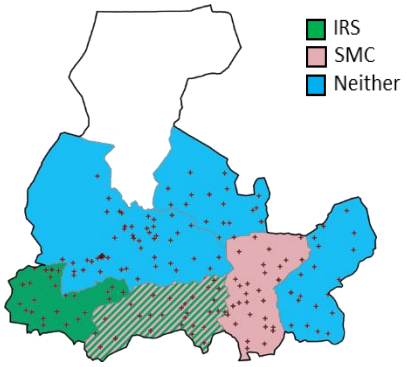
Evidence Snapshot: Combining 3rd generation IRS (3GIRS) and seasonal malaria chemoprevention (SMC) in Ségou Region, Mali

Background:

Increasing evidence is showing that 3GIRS, indoor residual spraying (IRS) using 3rd generation insecticides†, can have a substantial impact on reducing malaria incidence in many areas where mosquitoes are resistant to traditional vector control insecticides[1]. There is also mounting evidence that mass antimalarial drug administration strategies, like SMC in children, can successfully reduce malaria infections in targeted communities[2].

One exciting question to ask is how well these proven public health interventions, which target different stages of the malaria transmission cycle, might complement each other when used in combination.

- By 2014, Mali had shifted to using a 3GIRS product, Actellic® 300CS, for IRS operations in select districts of Ségou.
- Also in 2014, Ségou began expansion of a pilot program to provide SMC to children aged 3 to 59 months in select districts.
- The timing of these activities presented a unique opportunity to analyze the impact of both interventions, deployed individually and in combination, through analysis of quality-assured passive surveillance data.



San District received only SMC in 2014 Barouéli District received only 3GIRS Bla District received both

The epidemiological impact of 3GIRS and SMC in Mali, 2014:

Comparing malaria case incidence rates from each intervention district to similar, neighboring districts from Ségou region that did not receive either SMC or IRS indicates substantial impact:

- Health Centers in San (SMC only) reported 15% fewer cases from the under 5-year-old population
- Health Centers in Barouéli (IRS only) reported 48% fewer cases from the under 5-year-old population
- Health Centers in Bla, which received both interventions, reported the biggest drop in malaria: **53% fewer cases** in the under 5-year-old population

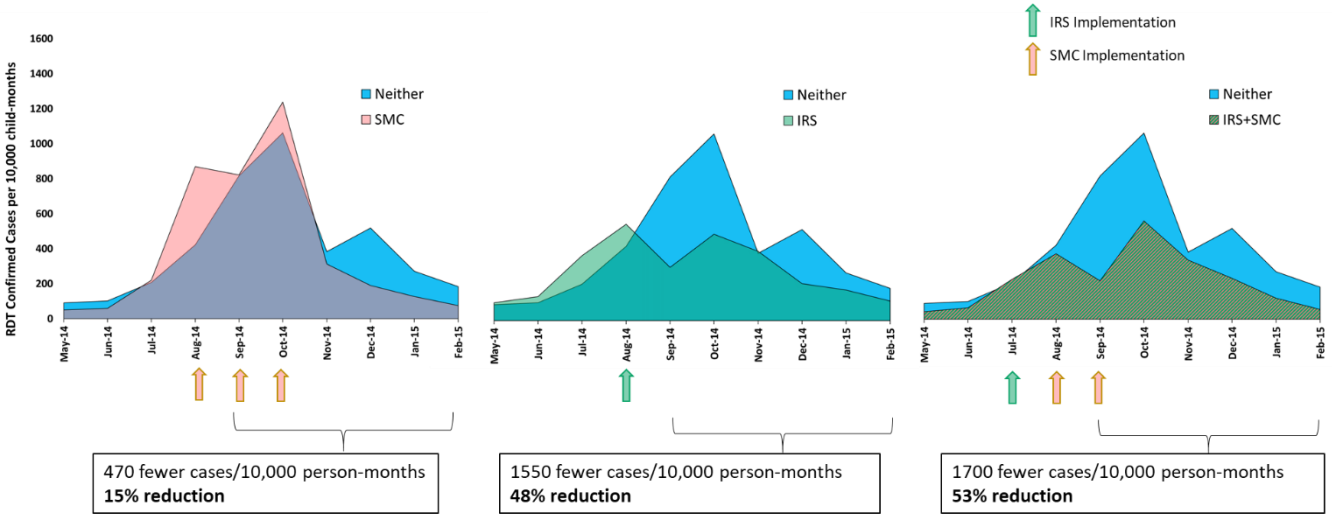


Figure 1. After SMC and 3GIRS with Actellic® 300CS in 2014, the incidence of malaria cases reported from public health clinics reduced substantially. The biggest reduction in cases (53%) was observed in the district that utilized both interventions.

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A combined effect for IRS and SMC:

Looking at the protective effect of each intervention by month describes the magnitude and timing of the malaria prevention impact:

- The SMC only intervention had a more moderate effect initially (19% fewer cases in the first month) that lasted for a longer duration (at least 6 months).
- The IRS only intervention had a rapid, comparatively large impact (63% fewer cases in the first month) of shorter duration (4 months).
- **The impact of the combined intervention was both rapid (73% fewer cases in the first month) and of longer duration (at least 6 months).**

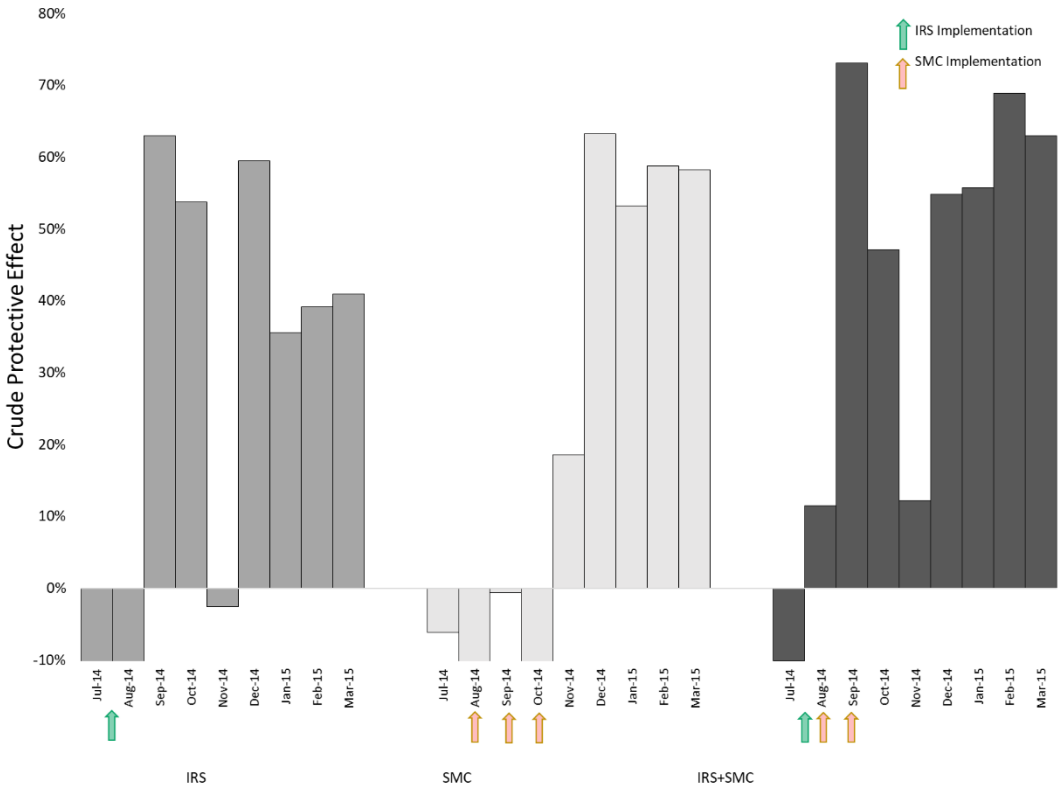

Figure 2. The rapid and sustained reduction in malaria cases in the IRS + SMC district suggests a combined effect when using both interventions at the same time.

In 2014, IRS with Actellic® 300CS and SMC were both good public health investments in Mali. Malaria rates declined after each intervention was implemented. The fact that the largest reduction was seen in Bla District, where both interventions were rolled out simultaneously, suggests a possible combined effect for these complementary strategies.

[1] Wagman, et al. 2018. *Mal J.* 17:19

[2] Diawara, et al. 2017. *Mal J.* 16:325

[†] 3rd generation IRS products effective against pyrethroid resistant vectors, with a residual efficacy of at least 6 months

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