NgenIRS evidence summary – impact and cost effectiveness in Africa

Background

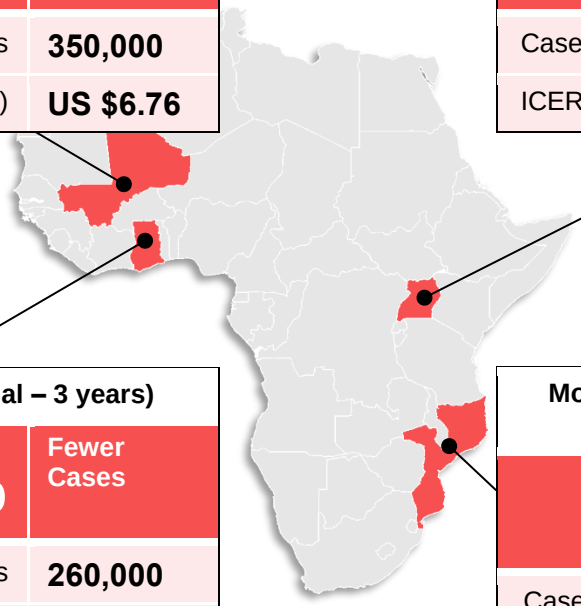
Evidence of impact and cost effectiveness for 3rd generation indoor residual spraying (3GIRS) products‡ is critical to malaria programs, implementation partners, and funders to accept and use these products with confidence.

The Next Generation IRS (NgenIRS) project aimed to overcome five barriers that create a challenging market for new IRS products: 1) Limited demand; 2) Market instability; 3) Limited competition; 4) High prices; and **5) Lack of robust evidence evaluating impact and cost effectiveness.**

To help strengthen the evidence base, NgenIRS has been working with partners in a variety of settings across sub-Saharan Africa to measure the impact and estimate the cost effectiveness of 3GIRS used in addition to standard bed nets. Below we report the results of a series of robust observational analyses from Mali, Ghana, and Uganda and a large cluster randomized controlled trial in Mozambique that measured reductions in the number of confirmed malaria cases reported in the public health sector following 3GIRS campaigns using a micro-encapsulated formulation of pirimiphos-methyl (Actellic® 300CS):

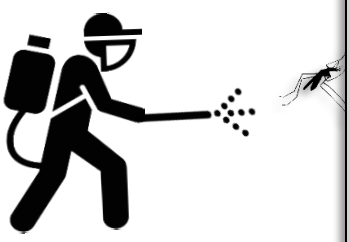
Mali (observational – 3 years)	
32%	**Fewer Cases**
Cases averted in 3 years	**350,000**
ICER* (per case averted)	**US $6.76**

Uganda (observational – 1 year)	
47%	**Fewer Cases**
Cases Averted in 3 years	**245,000**
ICER* (per case averted)	**US $41.25**



Ghana (observational – 3 years)	
40%	**Fewer Cases**
Cases averted in 3 years	**260,000**
ICER* (per case averted)	**US $3.20**

Mozambique (randomized trial – 2 years)	
22%	**Fewer Cases**
Cases averted in 3 years	**20,000**
ICER* (per case averted)	**US $34.44**



Overall, 3GIRS resulted in a **22% to 47% reduction** in confirmed cases recorded in the public health system, compared to similar communities without IRS.

*The incremental cost-effectiveness ratio (ICER) ranged from **$3.20 to $41.25** per case averted, making 3GIRS **cost-effective** or **highly cost-effective** by WHO standards in each country evaluated.

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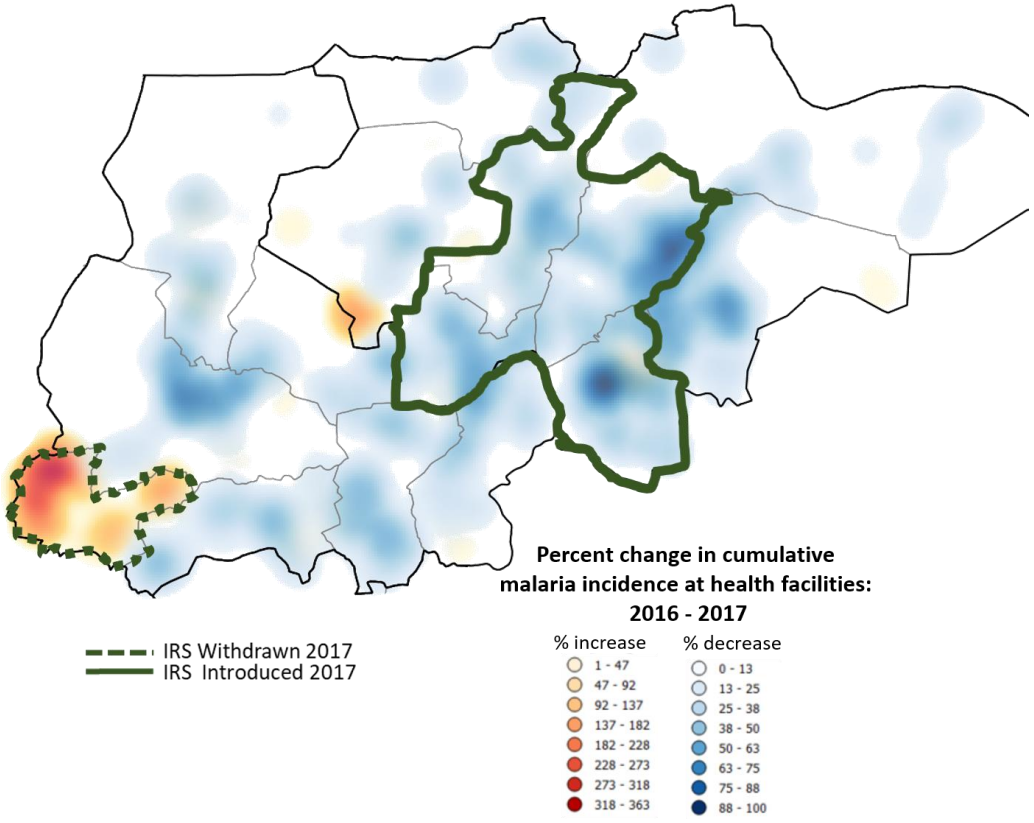
Additional evidence of impact

Unfortunately, some of the most compelling evidence for the impact of 3GIRS is observed when spray operations are suspended. In Mali, for example, IRS operations were shifted from Ségou Region to Mopti Region after 2016. While malaria cases decreased an average of 42% in the districts of Mopti where IRS was introduced, malaria cases surged by 106% in the district of Ségou where IRS was suspended.



- **3GIRS, in addition to standard LLINs, provides additional protection against malaria by reducing vector populations in communities with moderate to high transmission and evidence of pyrethroid resistance**
- **Careful consideration should be given before removing IRS**
- **Adding 3GIRS to drug-based interventions is likely to maximize the impact of those interventions**
- **Switching from an older product to a 3GIRS product significantly increased the public health impact of IRS on top of LLINs in an area of high pyrethroid resistance**

Collectively, project results show that 3GIRS in addition to standard LLINs is a **cost-effective** to **highly cost-effective** public health intervention in a variety of transmission settings across sub-Saharan Africa

‡3rd generation IRS products are effective against pyrethroid-resistant vectors and have a residual efficacy of at least 6 months.

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