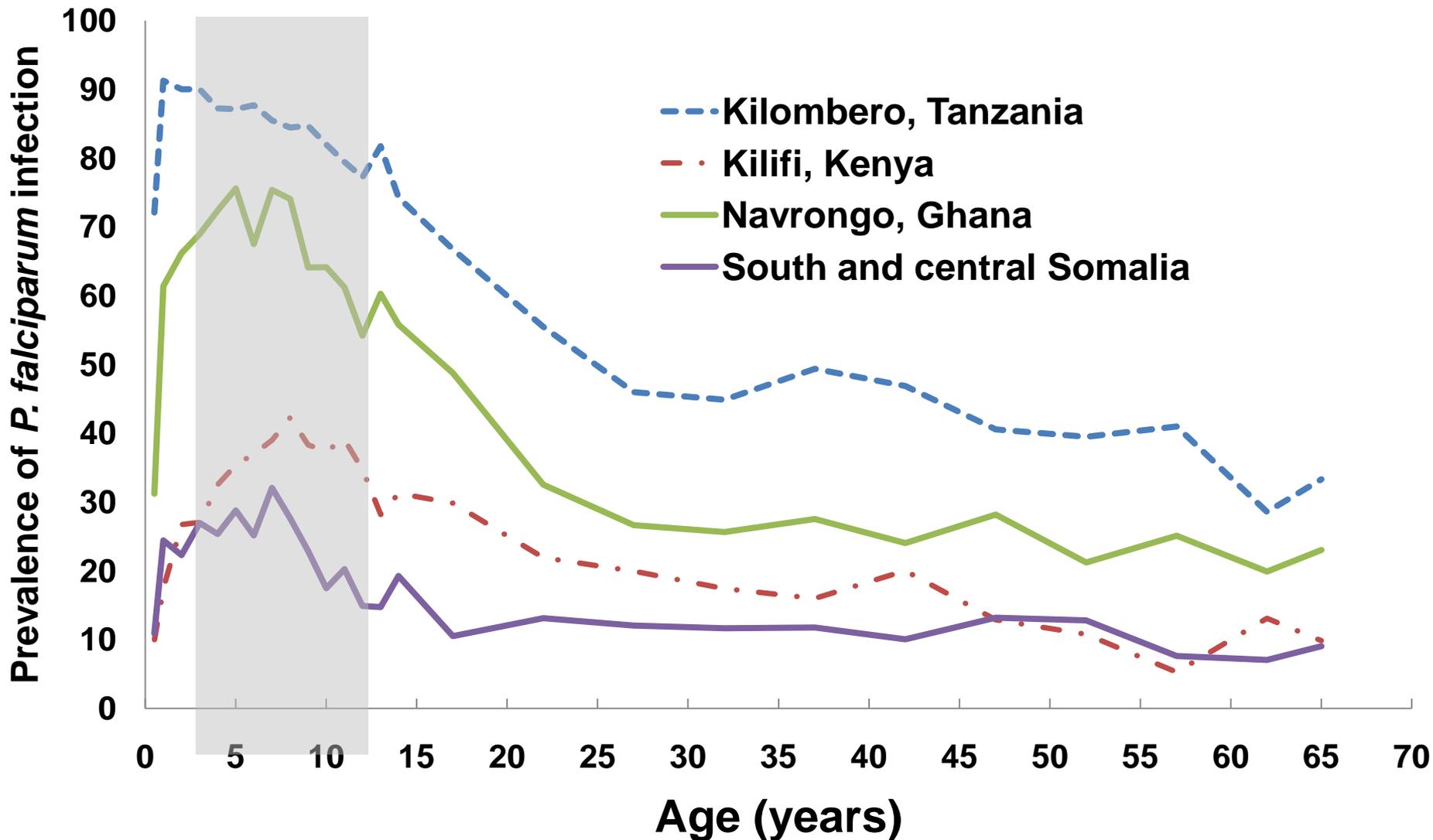


School-based malaria control: Kenya Impact Evaluation



Impact Evaluation Workshop
Cape Town, December 2009

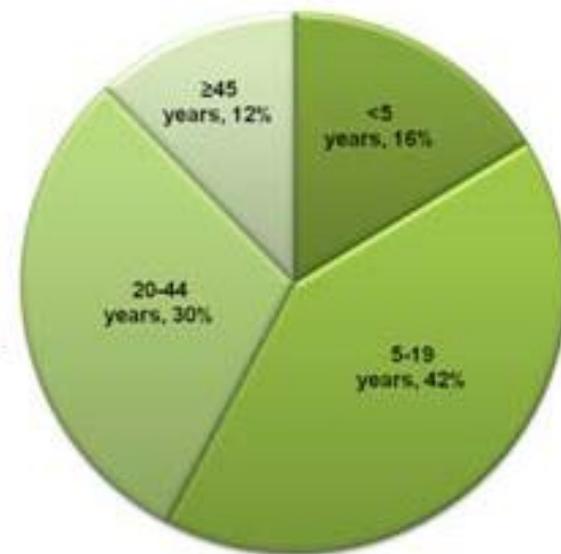
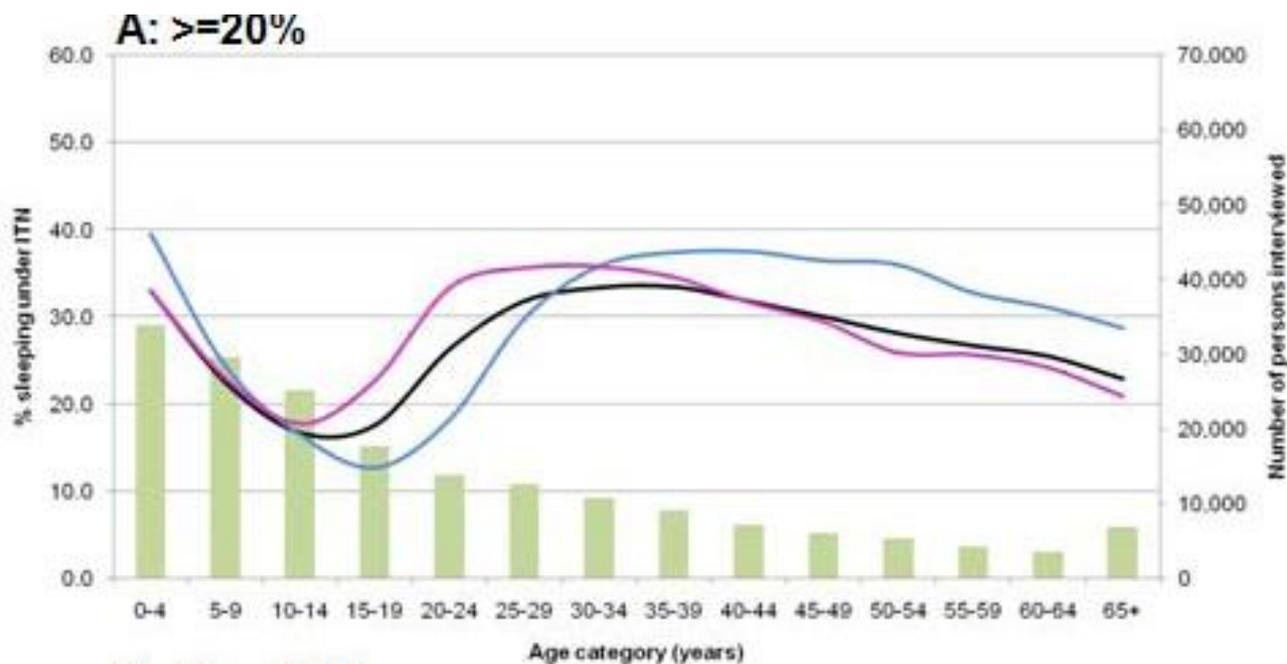
Patterns of *Plasmodium* infection by age



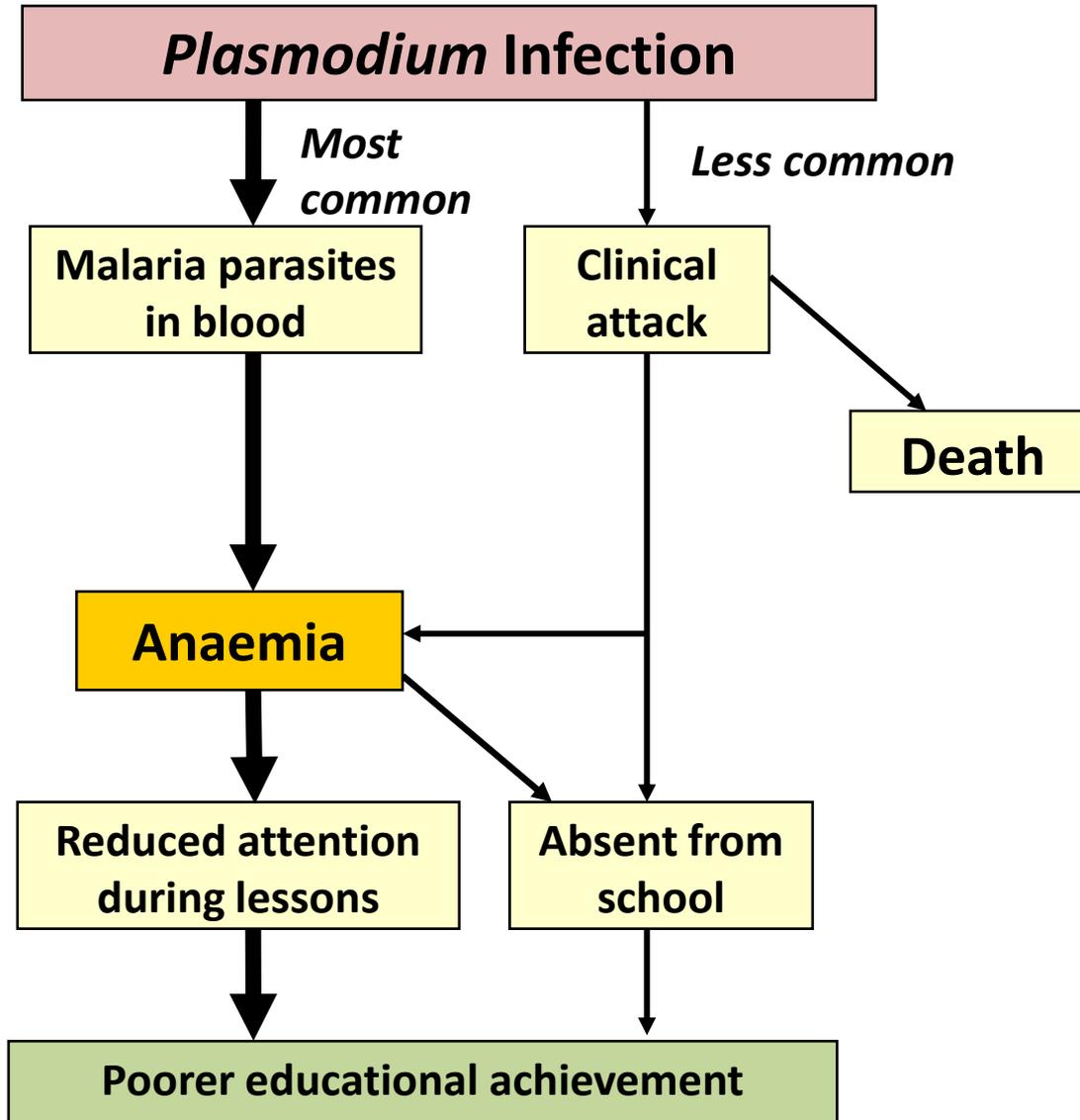
Use of insecticide treated nets by age

Percentage of population sleeping under ITN the night before survey, overall and by gender

Proportion of population who did not sleep under ITN



Causal pathway of malaria's impact on education



Why is school-based malaria control important?

Malaria affects the health of school children

- *Malaria accounts for up to 50% of all deaths among African school-age children.*
- *20% to 50% of African schoolchildren living in areas of stable transmission experience clinical malaria attacks each year.*
- *Malaria causes anaemia among school-age children.*
- *Pregnant schoolgirls are at high risk of malaria.*

Why is school-based malaria control important?

Malaria affects education

- *Malaria causes between 4 to 10 million lost school days per year in Africa.*
- *Malaria impairs cognition, learning and educational achievement.*
- *Malaria can also impact on education supply.*
- *Reducing the educational burden of malaria is integral to the Millennium Development Goals (MDGs).*

Why is school-based malaria control important?

Schools provide a cost-effective mechanism for service delivery

- *Malaria is perceived as a problem by schoolchildren, parents and teachers.*
- *Teachers can teach skills on how to prevent malaria.*
- *Schools can support community-wide malaria control.*
- *There is a clear policy context for the educational response to malaria.*

The Quality of Evidence for an Impact of Malaria Prevention Interventions

Intervention	Infants	Pregnant women	School-aged children
ITNs	+++	+++	+
Intermittent preventive treatment	+++	+++	++
Intermittent screening and testing	+	+	NA

+ = evidence from quasi-experimental evaluation

++ = evidence from at least two RCT

+++ = evidence from more than two RCTs

NA = not assessed



Republic of Kenya

Towards a malaria-free Kenya

National MALARIA Strategy 2009–2017

Division of Malaria Control
Ministry of Public Health
and Sanitation
July 2009

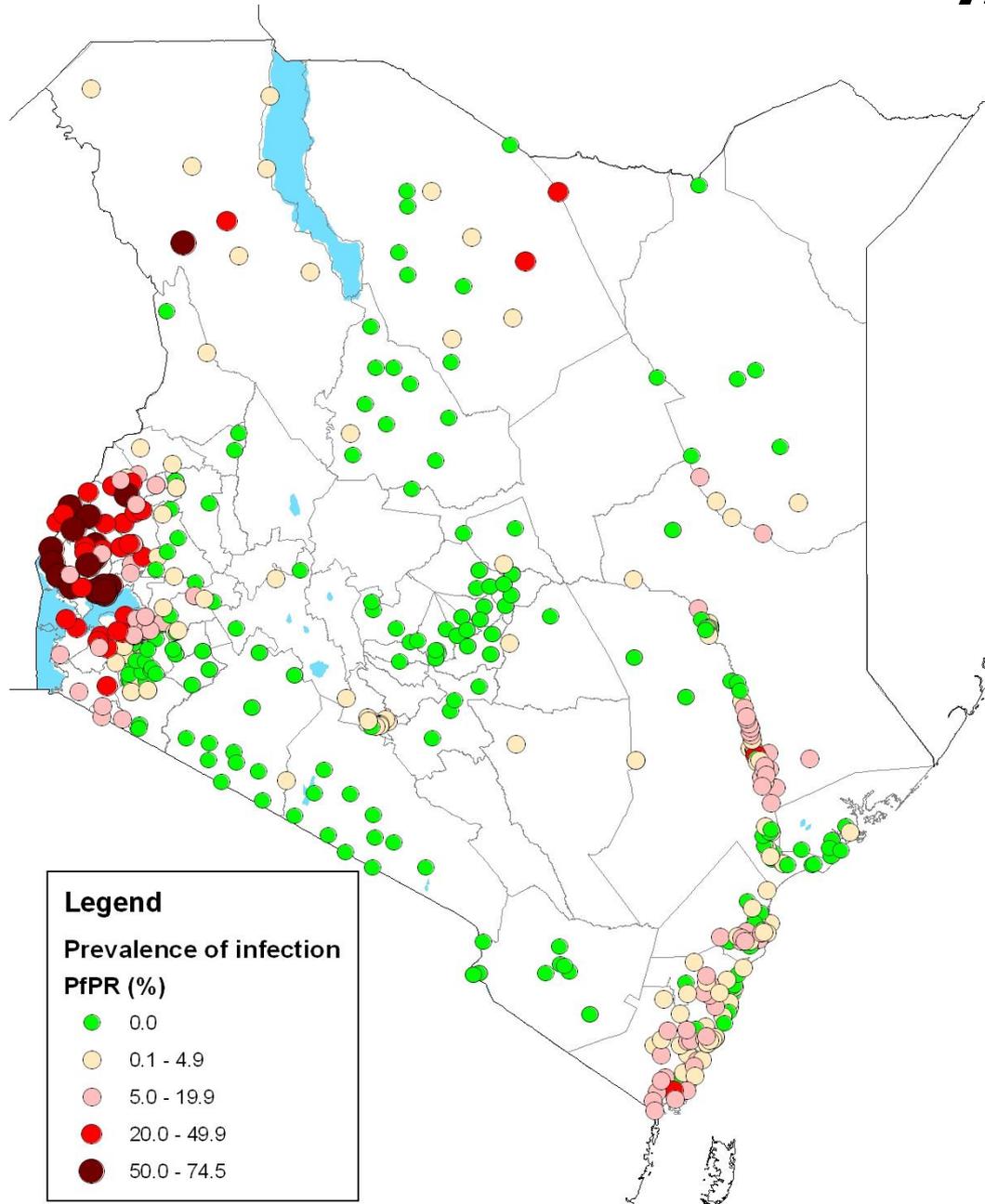


Supporting malaria-free schools initiative: *The package of interventions for the malaria-free schools initiative includes mainstreaming malaria control in the school curriculum, indoor residual spraying of schools and scaling up coverage in malaria endemic and epidemic prone areas, and testing and treating all children with parasitaemia according to the national guidelines.*

As Kenya moves to malaria elimination in the long term, there is need for operational research in key areas, including **tracking changes in malaria transmission and piloting school-based malaria parasite control (LLIN distribution, testing and treatment of school children).**



A national school malaria survey, 2009



A randomised controlled trial of IPT in 30 schools in western Kenya, 2006



Randomised according to educational strata

Age range 4-16 yrs, cognitive/educational assessment in classes 5-6

IPT Admin.

Once termly (x3 /yr)

Drugs Adm.

Over 3 days (SP and AQ)

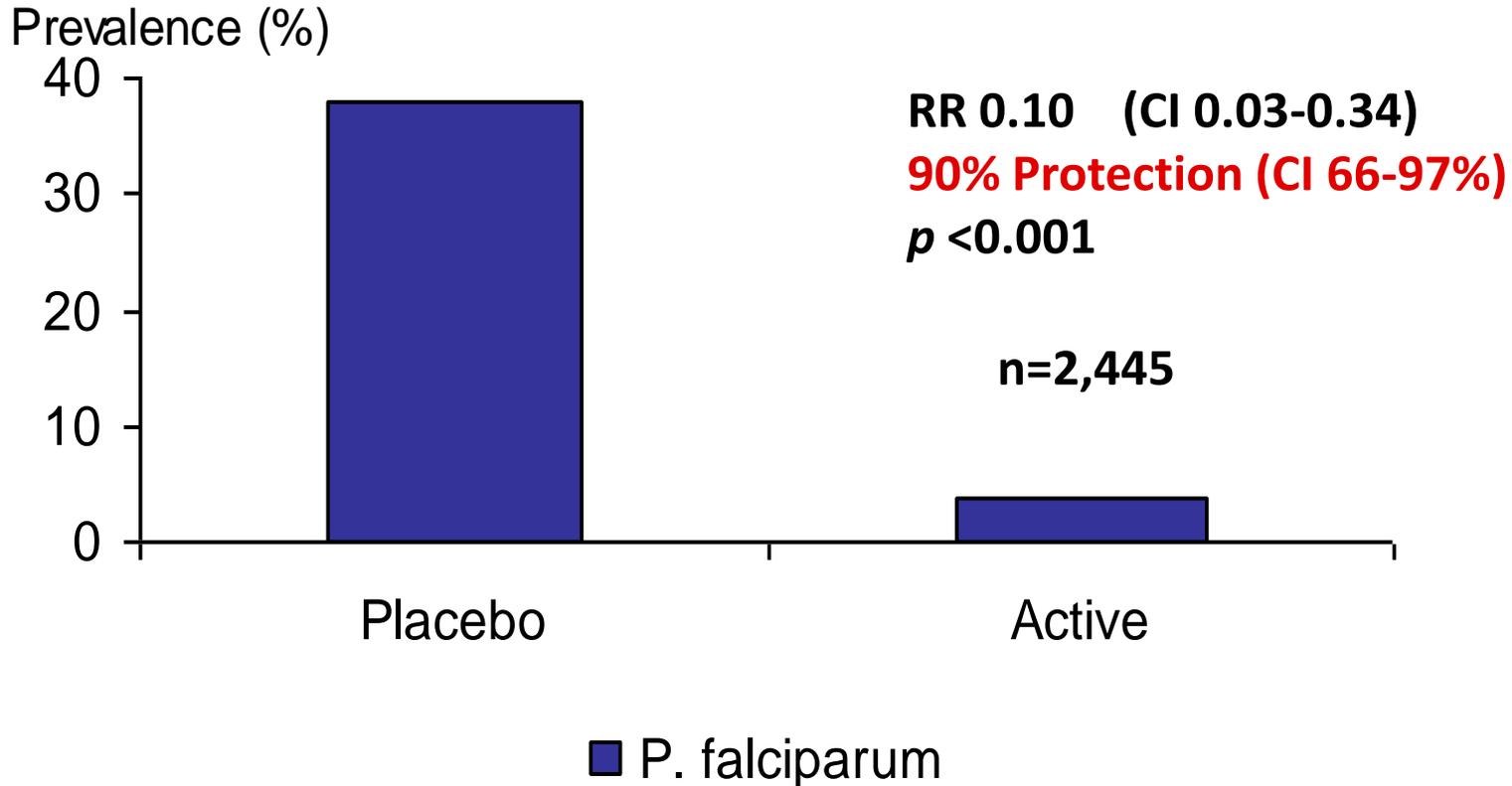
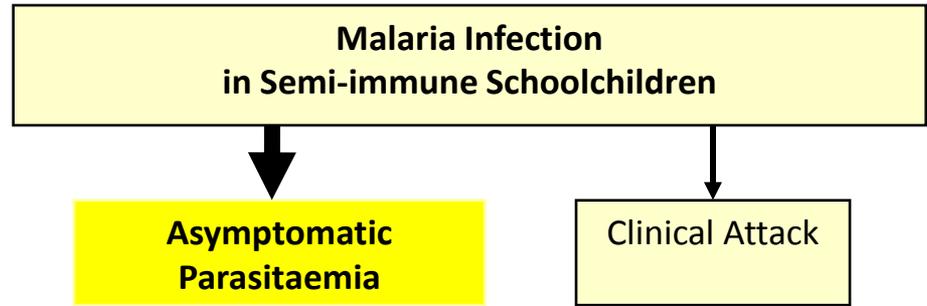
Control schools:

Double placebo

All schools

De-wormed twice a year

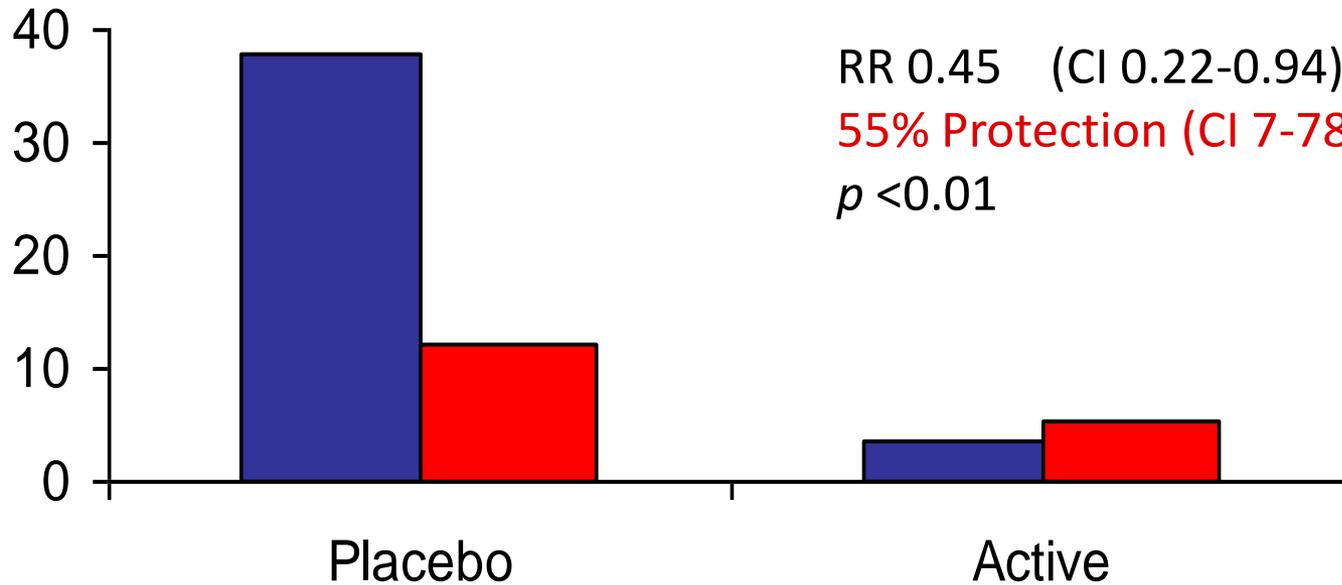
Impact of IPT on malaria parasitaemia



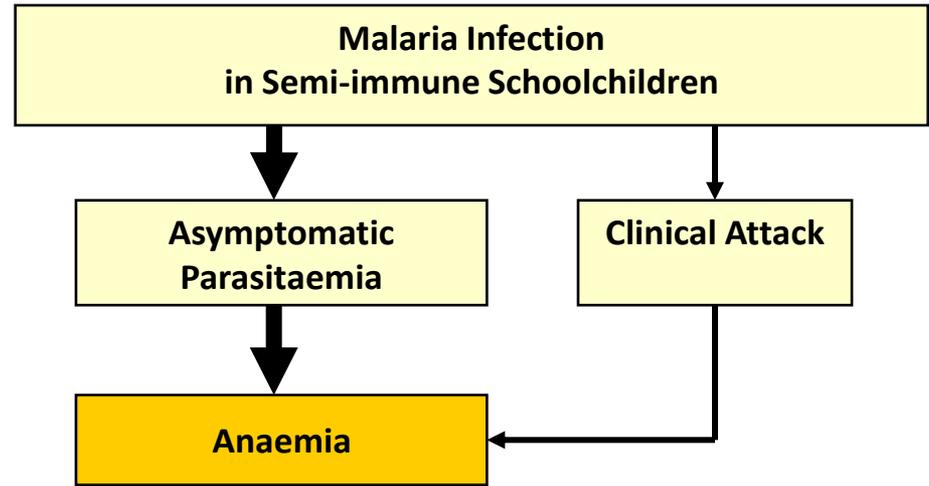
Impact of IPT on haemoglobin level

n=2,462

Prevalence (%)

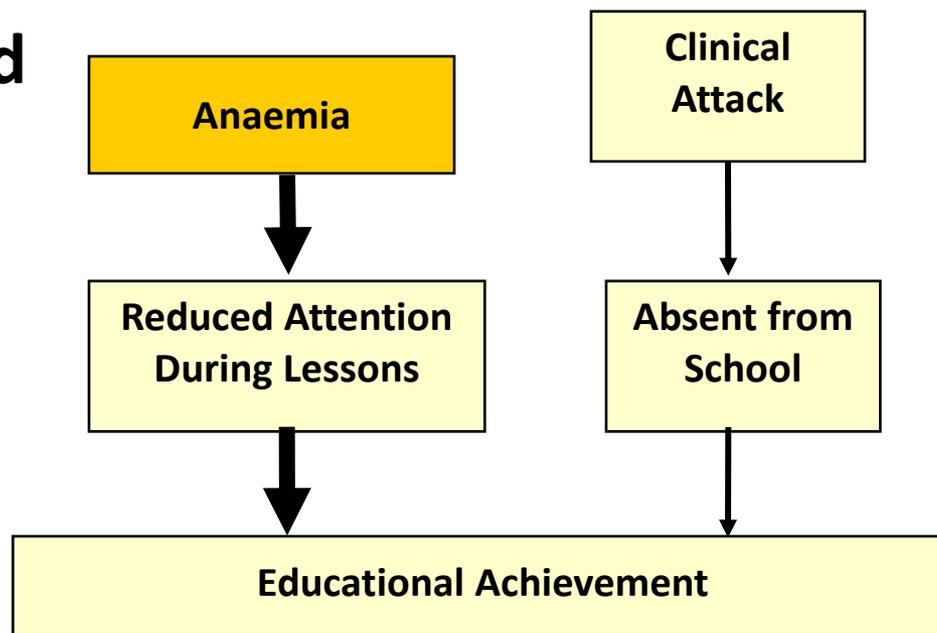


■ *P. falciparum* ■ Anaemia <110g/L



RR 0.45 (CI 0.22-0.94)
55% Protection (CI 7-78%)
 $p < 0.01$

Impact of IPT on sustained attention and education



Outcome	n	Mean difference	95% CI	p-value	Effect size
Counting sounds (max score=20)	481	2.12	(-0.17, 4.42)	0.07	0.65
Code transmission (max score=40)	469	7.74	(2.83, 10.65)	0.005	1.01
Exam score 6	286	0.55	(-2.26, 3.36)	0.35	0.15
Exam score 7	266	0.69	(-0.93, 2.15)	0.21	0.30

A randomised impact evaluation of malaria prevention and literacy instruction in 100 schools in coastal Kenya, 2009-12

Specific objectives, to evaluate :

1. Impact of malaria program in improving anaemia
2. Impact of malaria program in classroom attention, school attendance and educational
3. Impact of literary program in improving early grade reading
4. Determine whether health and education interventions work synergistically
5. Identify the causal mechanism by which malaria prevention and improved instruction improve early grade reading

Design: Randomised implementation, 100 schools in four groups

Intervention: Intermittent screening and treatment using ACT by DoMC and enhanced literacy instruction by College of Education and External Studies

Malaria Intervention

Literacy Intervention

Reduced clinical attacks

Reduced asymptomatic parasitaemia

Improved instruction & classroom interactions

Reduced anaemia

Improved letter sound knowledge

Improved word recognition & decoding skills

Increased school attendance

Improved cognition

Increased concentration

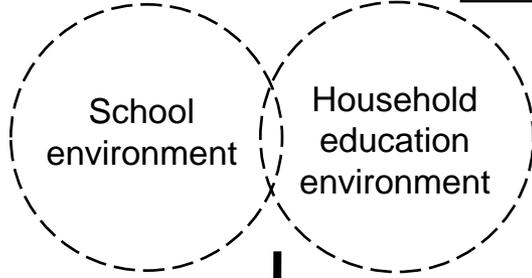
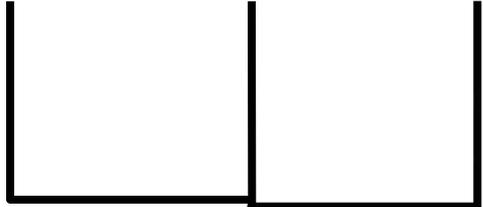
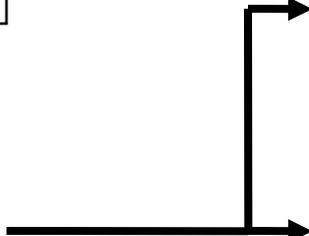
Increased ability to read connected text

More exposure to information & vocabulary

School environment

Household education environment

Improved Educational Achievement



A randomised impact evaluation of school-based distribution of LLINs along the Tana River, 2009-10



Specific objectives: To evaluate the effectiveness of distributing LLINs through schools in:

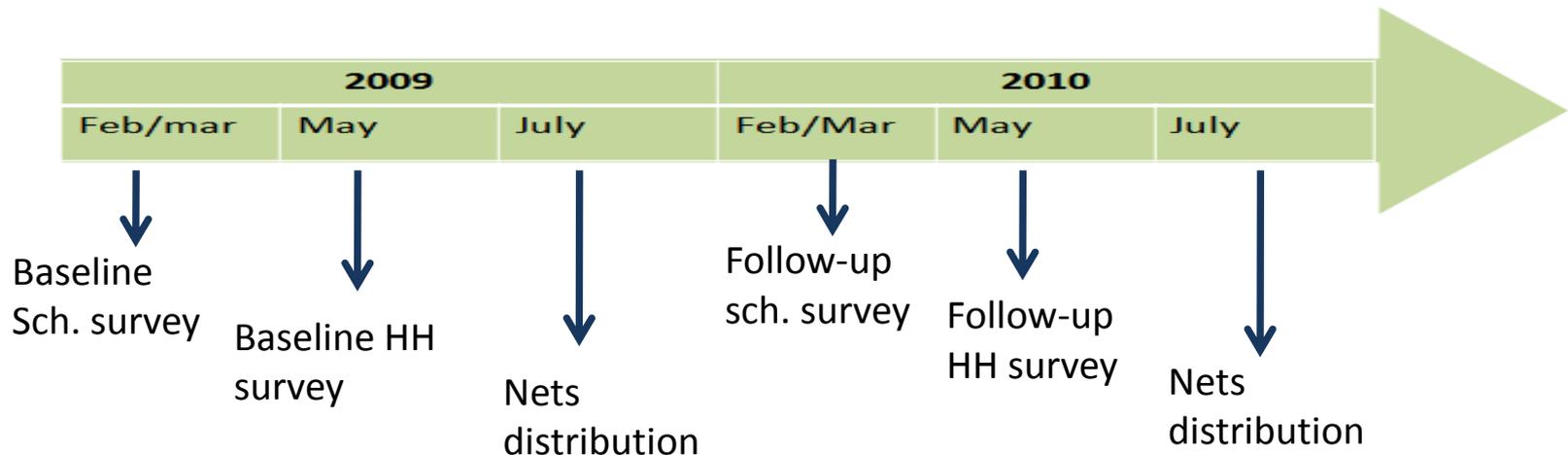
1. reducing prevalence of *Plasmodium falciparum* infection among school children
2. improving haemoglobin concentration of schoolchildren
3. improving household access to LLIN

Design: Randomised implementation, 25 schools in 2009, 25 in 2010

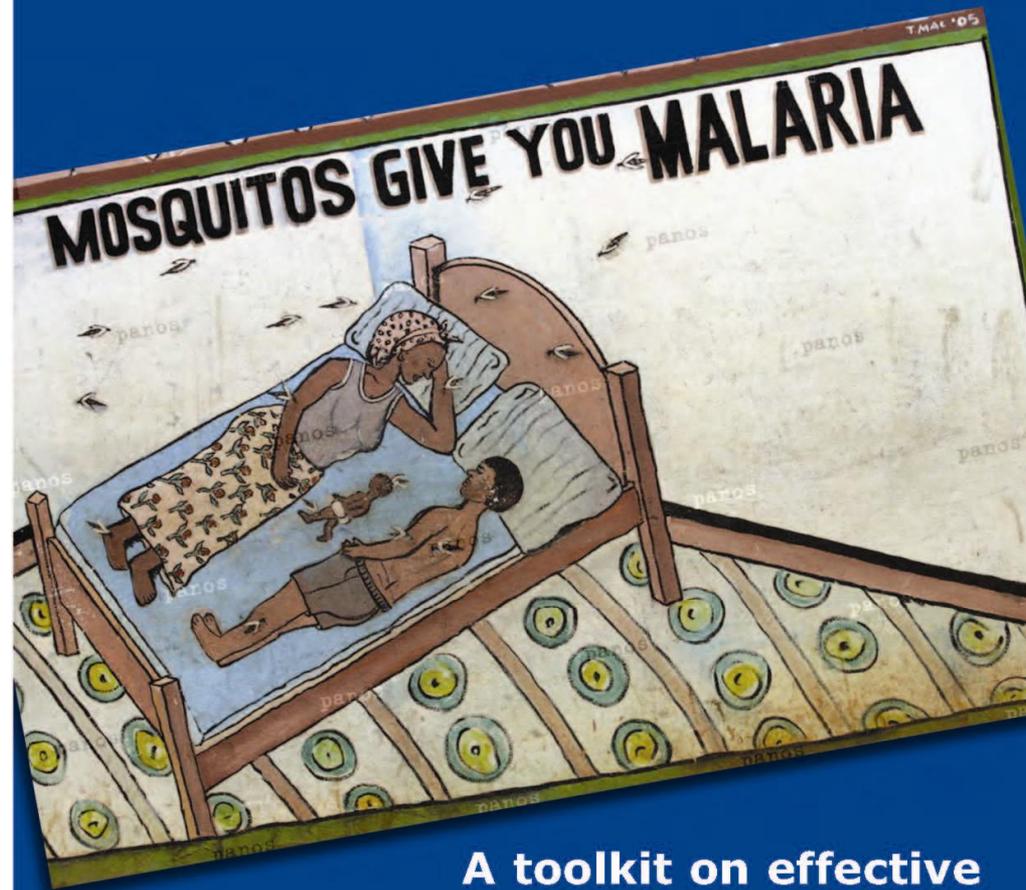
Intervention: Two LLINs per school children, distributed to schools by PSI

Main outcomes:

- Prevalence of malaria parasitaemia among school children
- Prevalence of anaemia among school children
- Household net coverage



Malaria Control in Schools



A toolkit on effective
education sector responses
to malaria in Africa



What are the contents of the toolkit?

- Highlight why the education sector should respond to malaria.
- Understand the benefits of controlling malaria in schools.
- Define the appropriate malaria interventions which can be delivered through schools.
- Learn from examples of promising practice at scale.
- Identify the key issues in developing a malaria component of a wider school health programme.