

# LLIN scale-up and its role in achieving malaria control targets

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## Evidence on ITNs

### Randomized control trials

- Tested at full coverage ( $\geq 80\%$ )
- Morbidity reduction: 50 % (39- -62 %)
- Overall child mortality reduction: 18 % (14 – 29%)

Most trials completed before 2000

*Where are we 7 years later?*

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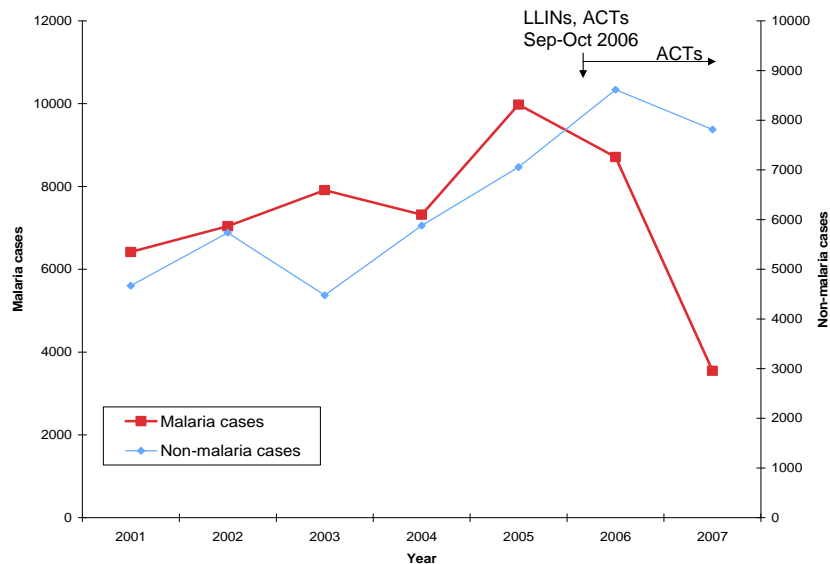
## ITN efficacy: evidence from programmes

- **Niger (2005)**
  - Coverage <5s: 54.9 %
  - Impact <5s: 30 % reduction cases
- **Kenya (2006)**
  - Coverage: 67.3 %
  - Impact: 44 % reduction in child mortality
- **Rwanda (2007)**
  - Coverage < 5: 60 %
  - Impact: 64 % reduction cases, 66 % reduction overall death

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In-patient malaria and non-malaria cases in children <5 years old, January-November, 2001-2007, 19 health facilities, Rwanda.

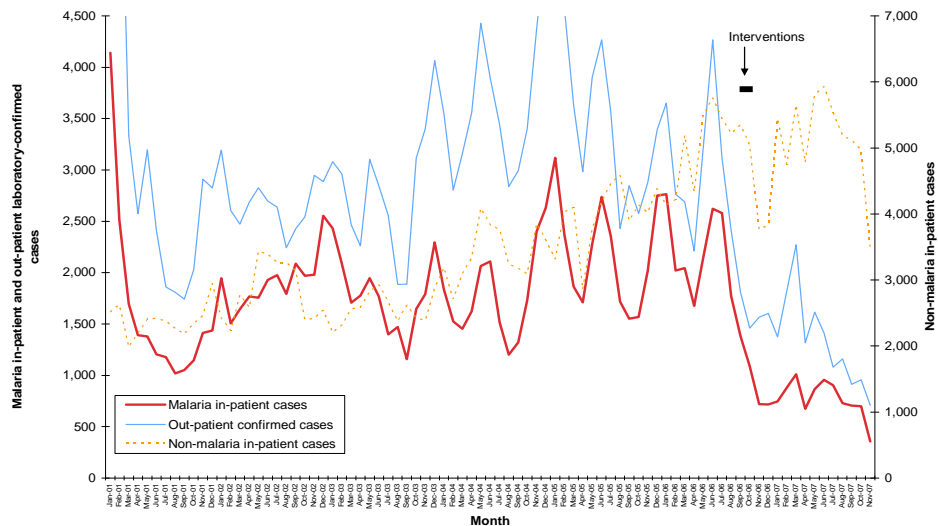


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## Sudden drop in cases in November compared to Sep-Oct shows LLINs and ACTs have an immediate impact

In-patient malaria cases, out-patient laboratory-confirmed cases, and in-patient non-malaria cases, by month, all ages, 2001-2007, Rwanda.



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## ITN efficacy: evidence from programmes

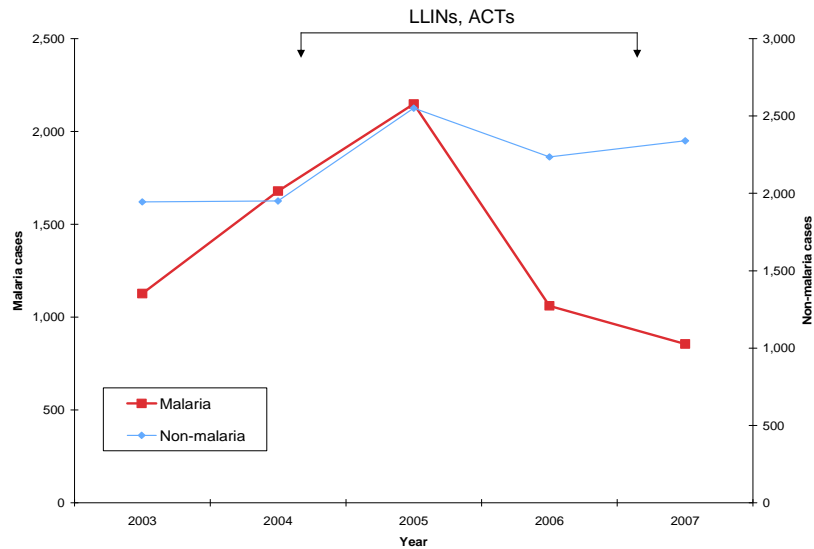
- **Ghana (2007)**
  - **Coverage** 55 % (real coverage?, expired LLINs?)
  - **Impact** Cases: 13 % reduction, Deaths: 34 %
- **Zambia (2007)**
  - **Coverage** 23 %
  - **Impact** Cases: 29% reduction, Deaths: 33 %
- **Ethiopia (2007)**
  - **Coverage** 1 net for 2 people
  - **Impact** Cases: 60 % reduction, Deaths: 51 %

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In-patient malaria and non-malaria cases in children <5 years old, January-October 2003-2007, 7 in-patient facilities, Ethiopia.



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## Protecting vulnerable groups or the whole population?

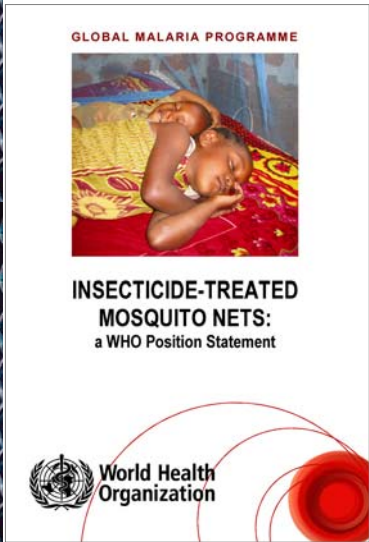
- All community members contribute to vector infection maintaining the vicious circle of transmission
- Selective protection of vulnerable groups cannot result in effective control of malaria transmission

*Emerging evidence that **high LLIN coverage** do more for public health than anticipated*

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# WHO position on ITNs



- Full coverage of all people at risk of malaria
- Use LLINs only
- LLINs distributed free or highly subsidized
- Supplemented by robust communication strategy on use & maintenance

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## Coverage, a key issue in vector control

### How to achieve and maintain *full coverage*

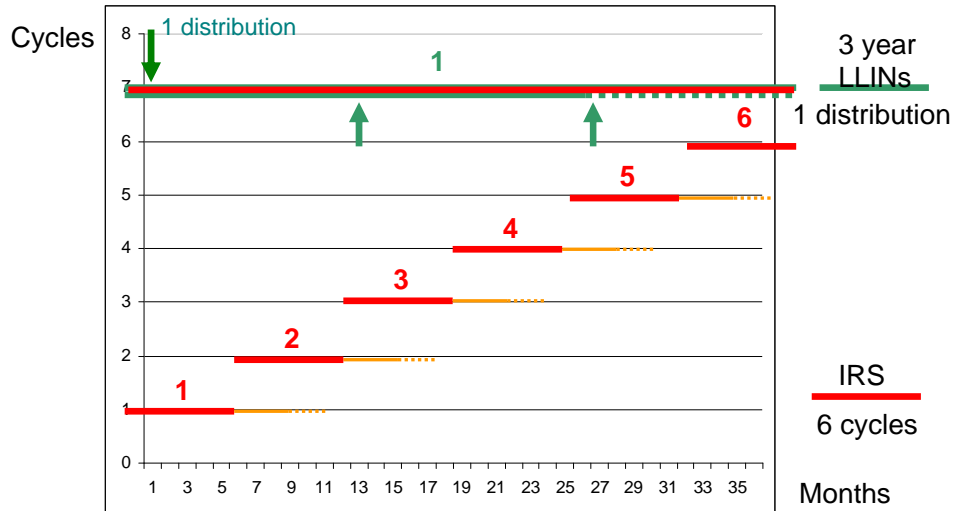
- IRS
  - all houses have to be sprayed and re-sprayed once at a time
  - Interval between spraying is based on shortest residual life of the insecticide
- LLINs
  - only non-expired LLINs should be in use
  - All LLINs have to be distributed and replaced once at a time every 3 to 5 years, holed or not

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## Timing of vector control interventions over 3 years period

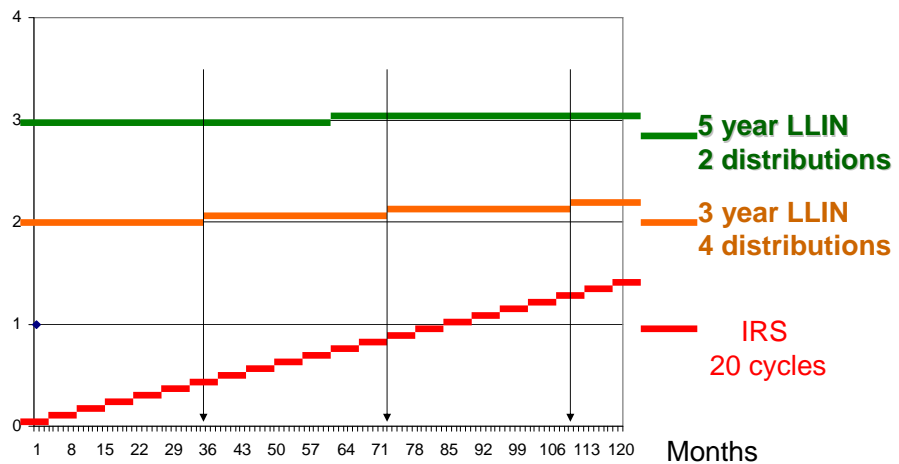


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## Timing of vector control interventions over 10 years period



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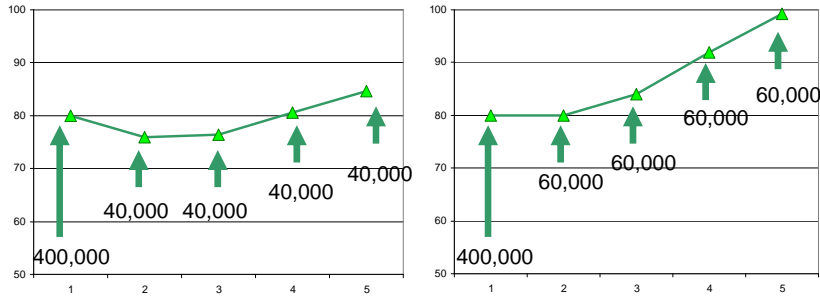


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# Protecting 1 million people with LLINs

**5-year LLIN** at 8 \$ (5.5 \$ + 2.5 \$ distribution cost)

*All LLINs in use have to be replaced after 5 years*



**\$ US 0.89 / person protected / year**  
(0.11 LLIN/person/year)

**\$ US 1.02 / person protected / year**  
(0.13 LLIN/person/year)

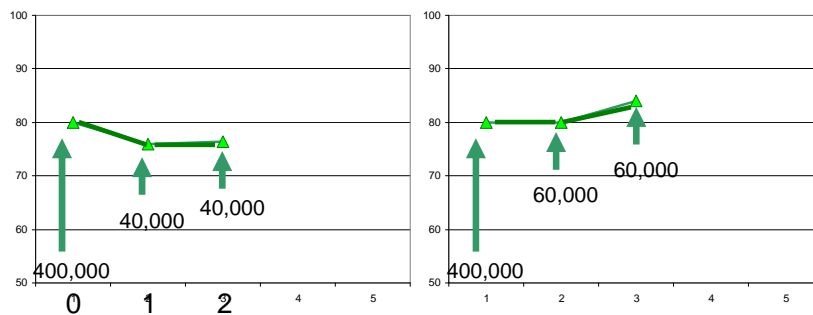
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# Protecting 1 million people with LLINs

**3-year LLIN** at 7 \$ (4.5 \$ + 2.5 \$ distribution cost)

*All LLINs in use have to be replaced after 3 years*



**\$ US 1.12 / person protected / year**  
(0.16 LLINs/person/year)

**\$ US 1.21 / person protected / year**  
(0.17 LLINs/person/year)

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## Overall cost / year to protect 1 million people

- **LLINs Full coverage**

- 5 year LLINs (\$ US 8/LLIN): **\$US 1,020,000**

- 3 year LLINs (\$ US 7/LLIN): **\$US 1,210,000**

- **IRS full coverage 2 cycles per year**

**\$US 3,500,000**

*These cost figures do not include savings on ACTs*

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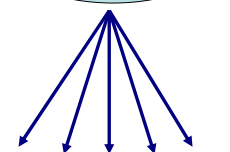
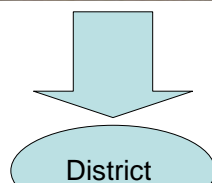


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## LLIN distribution



Negotiate price and  
delivery by manufacturers  
up to **district level**

Management of distribution starts from district

- ★ Mass distribution campaigns
- ★ E-days (malaria, women...)
- ★ Routine health services
- ★ Retail shops
- ★ NGOs, Manufacturers...

Depending on local contexts  
while achieving **coverage**

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## Advantages of the proposed approach

- ***Simplicity***
- ***Full coverage*** achieved at initial distribution and maintained ***at any time***
- Easier demand ***forecasting*** for industry
- ***Procurement***, logistics and delivery can be planned long in advance
- Possibility for ***recycling*** or ***disposal*** of used LLINs (potential role of manufacturers)
- ***Increased role*** of manufacturers and ***private sector*** in delivery

