Evidence for housing improvements against malaria

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Outline

1. Why is housing important for malaria?
2. Current evidence
3. How is housing changing across Africa?
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The big picture

Malaria prevalence halved in endemic Africa, 2000-2015...

Bhatt et al. 2015 Nature 526: 2017-215
The big picture

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Bednets, indoor house spraying and antimalarial drugs are highly effective...

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The big picture

Bednets, indoor house spraying and antimalarial drugs are highly effective...

...But do not explain the whole story

Bhatt et al. 2015 Nature 526: 2017-215
The big picture

- Malaria control is linked to socioeconomic development
- Malaria affects the poorest communities
- Housing quality may part explain the relationship between malaria and poverty

Figure 1: Malaria burden and human development index for income and education in 43 countries in sub-Saharan Africa

*Tusting et al 2013 Lancet; Tusting et al 2016 Infect Dis Poverty*
Why is housing important for malaria?

- In Africa, *Anopheles* mosquitoes mainly bite indoors at night.
- So reducing house entry by mosquitoes can lower the risk of human malaria exposure.
- Protective features may include:
  - Closed eaves
  - Screened doors, windows
  - Ceiling
  - Metal not thatch roof

*Lindsay et al 2002 Trends Parasitology*

...It’s all about the eaves
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House screening shown to reduce malaria risk in India, South Africa and the USA

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WW2: Development of DDT; insecticide-based methods of malaria control take over, housing neglected

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**References:**

- Lindsay et al. 2002. *Trends Parasitology*
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1990s

2015: systematic review
2017: cross-country analysis

2018

Lindsay et al 2002 Trends Parasitology
Current evidence
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- Modern versus traditional housing:

- House screening versus no screening:
Current evidence

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- **Modern versus traditional housing:**
  - 2015 systematic review: 47% lower odds of infection and 45-65% lower odds of clinical malaria (15 observational studies)
  - 2017 analysis of 29 African DHS/MIS surveys: 9-14% lower odds of infection (and 15-16% lower odds in ITN users vs non-users)

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- **Photos:** S Lindsay

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- **Summary:** Most evidence is observational but the consistency of effects suggests housing is a promising malaria intervention

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Housing is transforming in Africa

- Rapid population growth and urbanisation e.g. Africa’s population will increase from 1.2 billion in 2015 to 2.1 billion in 2050

- Alongside economic growth we are seeing incremental housing changes

- But can we quantify these?

Photos: S Lindsay
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