February 2017 – SUPPORT Summary of a systematic review

What are the effects of strategies to increase possession and use of insecticide-treated bednets to prevent malaria?

Malaria is a life-threatening parasitic disease that affects approximately 40% of the world's population (mostly in the poorest countries). Insecticide-treated bednets effectively prevent malaria. However, cost and other barriers can hinder possession and use of insecticide-treated bednets. Strategies to increase possession and use include providing bednets for free or reducing the cost, education about appropriate use of bednets, and providing incentives to encourage use of bednets.

Key messages

➔ **Providing free insecticide-treated bednets compared to providing subsidised or full market price bednets probably increases the number of pregnant women, adults and children who possess insecticide-treated bednets, but probably leads to little or no difference in appropriate use of bednets.**

➔ **Education about appropriate use of insecticide-treated bednets may increase the number of adults and children under five sleeping under bednets.**

➔ **Providing incentives to encourage the use of insecticide-treated bednets may lead to little or no difference in use.**

➔ **The included studies were conducted in rural communities in Africa, India and Iran.**

Who is this summary for?

People making decisions about prevention and treatment of malaria

! This summary includes:

- **Key findings** from research based on a systematic review
- **Considerations about the relevance of this research** for low-income countries

X Not included:

- Recommendations
- Additional evidence not included in the systematic review
- Detailed descriptions of interventions or their implementation

This summary is based on the following systematic review:

Augustincic Polec L, Petkovic J, Welch V, et al. Strategies to increase the ownership and use of insecticide-treated bednets to prevent malaria. Cochrane Database Syst Rev 2015; 3: CD009186.

What is a systematic review?

A summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise the relevant research, and to collect and analyse data from the included studies

SUPPORT was an international project to support the use of policy relevant reviews and trials to inform decisions about maternal and child health in low- and middle-income countries, funded by the European Commission (FP6) and the Canadian Institutes of Health Research.

Glossary of terms used in this report: www.supportsummaries.org/glossary-of-terms

Background references on this topic: See back page

Background

One of the barriers to owning and using insecticide-treated bednets is their cost. Populations affected by malaria are among the poorest in the world and they may not be able to afford insecticide-treated bednets. Wealth, living in an urban rather than rural area, and higher levels of education are other important factors positively associated with insecticide-treated bednet possession and use. Not knowing how to use bednets appropriately can also be a barrier to using them.

How this summary was prepared

After searching widely for systematic reviews that can help inform decisions about health systems, we have selected ones that provide information that is relevant to low-income countries. The methods used to assess the reliability of the review and to make judgements about its relevance are described here: www.supportsummaries.org/how-support-summaries-are-prepared/

Knowing what's not known is important

A reliable review might not find any studies from low-income countries or might not find any well-designed studies. Although that is disappointing, it is important to know what is not known as well as what is known.

A lack of evidence does not mean a lack of effects. It means the effects are uncertain. When there is a lack of evidence, consideration should be given to monitoring and evaluating the effects of the intervention, if it is used.

About the systematic review underlying this summary

Review objective: To assess the evidence on the effectiveness and equity of strategies to increase ownership and proper use of insecticide-treated bednets (ITNs)

Types of	What the review authors searched for	What the review authors found
Study designs & Interventions	Randomised trials, non-randomised trials, controlled before-after studies and interrupted time series studies evaluating interventions to increase ITN ownership and use	Ten randomised trials: four studies used a combination of strategies focusing on ITN delivery to increase ITN ownership and appropriate ITN use; two studies focused on ITN delivery strategies only; and seven studies examined appropriate use strategies
Participants	Individuals (children and adults) in malaria endemic areas	Adults, children under five years, pregnant women, mothers of children under five years, rural cotton farmers
Settings	Not specified	Rural communities in Africa, India, and Iran
Outcomes	ITN ownership, ITN use and a range of secondary outcomes including (among others) equity ratio of household ITN ownership and adverse effects	ITN ownership, ITN use, and malaria morbidity
Date of most recent search: February 2013		
Limitations: This was a well-conducted review with only minor limitations		

Augustincic Polec L, Petkovic J, Welch V, et al. Strategies to increase the ownership and use of insecticide-treated bednets to prevent malaria. Cochrane Database Syst Rev 2015; 3: CD009186.

Summary of findings

The review included ten studies evaluating interventions to increase insecticide-treated bednet possession and use. All the studies were conducted in rural communities in Africa, India and Iran.

1) Free insecticide-treated bednets compared to insecticide-treated bednets at any cost for malaria prevention

Free distribution entails the provision of free insecticide-treated bednets at selected points of care, such as antenatal clinics, and mass campaigns of regional or national provision, usually in tandem with other health interventions.

Providing free insecticide-treated bednets compared to providing subsidized or full market price bednets

➔ **Probably increases the number of pregnant women, adults and children who possess insecticide-treated bednets, but probably leads to little or no difference in use of bednets. The certainty of this evidence is moderate.**

About the certainty of the evidence (GRADE) *

⊕⊕⊕⊕
High: This research provides a very good indication of the likely effect. The likelihood that the effect will be substantially different† is low.

⊕⊕⊕◯
Moderate: This research provides a good indication of the likely effect. The likelihood that the effect will be substantially different† is moderate.

⊕⊕◯◯
Low: This research provides some indication of the likely effect. However, the likelihood that it will be substantially different† is high.

⊕◯◯◯
Very low: This research does not provide a reliable indication of the likely effect. The likelihood that the effect will be substantially different† is very high.

* This is sometimes referred to as 'quality of evidence' or 'confidence in the estimate'.

† Substantially different = a large enough difference that it might affect a decision

See last page for more information.

Distributing insecticide-treated bednets (ITNs) free compared to making ITNs available for purchase

People	Adults (including pregnant women) and children
Settings	Rural communities
Intervention	Free ITN (with or without social marketing)
Comparison	ITN at any cost (with or without social marketing)

Outcomes	Impact	Certainty of the evidence (GRADE)
ITN possession among pregnant women, adults and children	Free ITN distribution probably increases the number of pregnant women, adults and children who possess ITNs compared to providing subsidized ITNs or ITNs offered at full market price.	⊕⊕⊕◯ Moderate
Appropriate use	Free ITN distribution probably leads to little or no difference in use of ITNs compared to providing subsidized ITNs or ITNs offered at full market price.	⊕⊕⊕◯ Moderate

GRADE: GRADE Working Group grades of evidence (see above and last page)

2) Education about appropriate insecticide-treated bednet use compared with no education

Different educational methods were used (e.g. training for household heads, house-to-house visits to teach how to properly hang and use insecticide-treated bednets, educational brochures).

Education about appropriate use of insecticide-treated bednets

➔ **May increase the number of adults and children under five sleeping under bednets. The certainty of this evidence is low.**

Education about appropriate insecticide-treated bednet (ITN) use compared with no education		
People	Adults (including pregnant women) and children	
Settings	Rural communities	
Intervention	Education about appropriate ITN use	
Comparison	No education about appropriate ITN use	
Outcomes	**Impact**	Certainty of the evidence (GRADE)
ITN use by adults (any ITN use)	Education may increase the number of adults using ITNs (including sleeping under ITNs).	⨁⨁◯◯ Low
ITN use by children under 5	Education may increase the number of children under 5 years old using ITNs (including sleeping under ITNs).	⨁⨁◯◯ Low
GRADE: GRADE Working Group grades of evidence (see above and last page)		

3) Providing incentives to encourage insecticide-treated bednet use compared with no incentives

An undisclosed prize was promised for appropriate use of insecticide-treated bednets together with a voucher compared to a bednet voucher and no prize in a study in rural Madagascar.

Providing incentives to encourage the use of insecticide-treated bednets

➔ **May lead to little or no difference in use. The certainty of this evidence is low.**

Providing incentives to encourage insecticide-treated bednet (ITN) use compared to no incentives		
People	Households	
Settings	Rural communities	
Intervention	Providing incentives to encourage ITN use	
Comparison	Not providing incentives to encourage ITN use	
Outcomes	**Impact**	Certainty of the evidence (GRADE)
Use (net mounted)	Providing incentives (a prize) to encourage ITN use may lead to little or no difference in ITN use compared to not providing incentives.	⨁⨁◯◯ Low
GRADE: GRADE Working Group grades of evidence (see above and last page)		

Relevance of the review for low-income countries

➔ Findings	▷ Interpretation*
APPLICABILITY	
➔ **All the included studies were conducted in resource poor settings (rural communities in Africa, India, and Iran).**	▷ *The review findings are directly applicable to low-income countries.* ▷ *Similar effects are likely, given comparable health systems and baseline condtions, such as malaria prevalence and insecticide-treated bednet delivery mechanisms.*
EQUITY	
➔ **Providing free insecticide-treated bednets and education improved possession and appropriate use of insecticide-treated bednets among vulnerable populations (pregnant women, under-five children, low-income populations, rural communities).** ➔ **Insecticide-treated bednet possession increased with decreasing cost.**	▷ *Providing free insecticide-treated bednets and education may reduce health inequities by increasing access and use of insecticide-treated bednets among disadvantaged groups most vulnerable to malaria.*
ECONOMIC CONSIDERATIONS	
➔ **Five studies evaluated the effect of insecticide-treated bednet price on possession and found that possession decreased with increasing price.**	▷ *Strategies achieving high possession and use of insecticide-treated bednets are those which are free or those which deliver insecticide-treated bednets at a very low cost. Scaling up such strategies might require substantial subsidies/resource allocation.* ▷ *Effective strategies are likely to reduce costs associated with malaria.*
MONITORING & EVALUATION	
➔ **None of the included studies examined the adverse microeconomic effects of interventions providing free or subsidized insecticide-treated bednets to the community.**	▷ *Potential adverse effects of interventions providing free or subsidized insecticide-treated bednets should be monitored alongside impacts on clinical outcomes such as malaria related morbidity and mortality.* ▷ *Use of insecticide-treated bednets should be monitored, since in some areas possession has been found to be high but use low.*

*Judgements made by the authors of this summary, not necessarily those of the review authors, based on the findings of the review and consultation with researchers and policymakers in low-income countries. For additional details about how these judgements were made see: www.supportsummaries.org/methods

Additional information

Related literature

Willey BA, Smith Paintain L, Mangham L, Car J, Armstrong Schellenberg J. Strategies for delivering insecticide-treated nets at scale for malaria control: a systematic review. Bull of the WHO 2012; 90:633-712.

Sexton, AR. Best practices for an insecticide-treated bed net distribution program in sub-Saharan eastern Africa. Malaria Journal 2011; 10:57.

Lengeler C. Insecticide-treated bed nets and curtains for preventing malaria. Cochrane Database Syst Rev 2004; 2:CD000363.

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Conflict of interest

None declared. For details, see: www.supportsummaries.org/coi

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This review should be cited as

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The summary should be cited as

Opiyo N. What are the effects of strategies to increase possession and use of insecticide-treated bednets to prevent malaria? A SUPPORT Summary of a systematic review. February 2017. www.supportsummaries.org

About certainty of the evidence (GRADE)

The "certainty of the evidence" is an assessment of how good an indication the research provides of the likely effect; i.e. the likelihood that the effect will be substantially different from what the research found. By "substantially different" we mean a large enough difference that it might affect a decision. These judgements are made using the GRADE system, and are provided for each outcome. The judgements are based on the study design (randomised trials versus observational studies), factors that reduce the certainty (risk of bias, inconsistency, indirectness, imprecision, and publication bias) and factors that increase the certainty (a large effect, a dose response relationship, and plausible confounding). For each outcome, the certainty of the evidence is rated as high, moderate, low or very low using the definitions on page 3.

For more information about GRADE: www.supportsummaries.org/grade

SUPPORT collaborators:

The Cochrane Effective Practice and Organisation of Care Group (EPOC) is part of the Cochrane Collaboration. The Norwegian EPOC satellite supports the production of Cochrane reviews relevant to health systems in low- and middle-income countries . www.epocoslo.cochrane.org

The Evidence-Informed Policy Network (EVIPNet) is an initiative to promote the use of health research in policymaking in low- and middle-income countries. www.evipnet.org

The Alliance for Health Policy and Systems Research (HPSR) is an international collaboration that promotes the generation and use of health policy and systems research in low- and middle-income countries. www.who.int/alliance-hpsr

Norad, the Norwegian Agency for Development Cooperation, supports the Norwegian EPOC satellite and the production of SUPPORT Summaries. www.norad.no

The Effective Health Care Research Consortium is an international partnership that prepares Cochrane reviews relevant to low-income countries. www.evidence4health.org

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