EVIDENCE BRIEF

Indoor residual spraying

(DCP4 ID: MALR01-01)
Cluster: Malaria

FairChoices
DCP Analytic Tool

Indoor residual spraying (IRS) in high endemic settings

Authors: Fekadu L, Ellertsen C, Kaur G, Ahmed S, Watkins D, Coates MM, Økland JM, Haaland ØA, Johansson KA

Date for updating: 2.12.2021

Description of condition and intervention

Malaria is an acute illness caused by the Plasmodium parasites that spread through the bite of infected Anopheles mosquito. It is an important public health challenge as approximately one-half of the world's population was considered at risk of malaria in 2019. High risk groups to malaria include infants, children under 5 years of age, pregnant women and people with low immunity and with immunocompromised condition like HIV/AIDS. Indoor residual spraying in high endemic settings is an important prevention strategy that could be delivered at the community level. (Source: WHO 2021)

International guidelines

Organization	Indications/recommendations	Applicability in LIC & Lower MIC settings
World Health Organization 2021	WHO guidelines for the treatment of malaria	Yes

Intervention attributes

Type of interventions

Prevention

Delivery platform

This intervention may be delivered at the community level.

Equity

In addition to considerations like cost-effectiveness and health systems factors, dimensions of equity can be relevant for priority setting. The opportunity for a long and healthy life varies according to the severity of a health condition that individuals might have, so there are inequities in individuals' opportunities for long and healthy lives based on the health conditions they face. Metrics used to estimate the severity of illness at an individual level can be used to help prioritize those with less opportunity for lifetime health. FairChoices: DCP Analytics Tool uses Health adjusted age of death (HAAD), which is a metric that estimates the number of years lived from birth to death, discounting years lived with disability. A high HAAD thus represents a disease less severe in terms of lifetime health loss, while a low HAAD represents a disease that is severe on average, causing early death or a long period of severe disability. It is also possible to estimate the distribution of HAAD across individuals with a health condition. FairChoices shows for each intervention an average HAAD value of the conditions that are affected by respective interventions that have health effects. Additionally, a plot shows HAAD values for around 290 conditions (Johansson KA et al 2020).

Time dependence

Low level of urgency. Treatment outcomes not highly affected by some days of delay.

Population in need of interventions

The target population is all population, both genders in the age group of 0 to 99 years.

Disease states addressed

This intervention targets to prevent malaria in the population under consideration.

Intervention effect and safety

Table 1: Effect and safety of insecticide-treated bednets

Effect of intervention		Certainty of evidence
Incidence	29% reduction (Kesteman 2017)	See appendix

Model assumptions

Table 2: Summary of model parameters and values in FairChoices – DCP Analytical Tool

Category	Model parameter	Notes
Intervention	**Indoor residual spraying (IRS) in high endemic settings**	
Cost calculation		
Treated population	All	Global Burden of Disease Study 2019
Gender	Both	
Age	0 to 99 years	
Treated fraction	1	
Effect calculation		
Affected Population	All	
Affected gender	Both gender	
Affected fraction age	0 to 99 years	
Affected fraction	1	
Comparison	No intervention	
Incidence Reduction (RRR)	0.29	Kesteman 2017

Intervention Cost

The cost per person-year for IRS is estimated to be USD 0.73 (Year: 2012) in Kenya (Stuckey EM et al 2014).

References

WHO 2021: https://www.who.int/news-room/fact-sheets/detail/malaria accessed on Nov 25,2021

WHO 2021: WHO Guidelines for malaria, 13 July 2021. Geneva: World Health Organization; 2021 (WHO/UCN/GMP/2021.01Rev. 1).

Johansson KA et al 2020: Johansson KA, Coates MM, Økland JM, Tsuchiya A, Bukhman G, Norheim OF, Haaland Ø. Health by disease categories. Distributional Cost-Effectiveness Analysis: Quantifying Health Equity Impacts and Trade-Offs. 2020 Sep 30:105.

Kesteman T, Randrianarivelojosia M, Rogier C. The protective effectiveness of control interventions for malaria prevention: a systematic review of the literature. F1000Res. 2017 Nov 1;6:1932. doi: 10.12688/f1000research.12952.1. PMID: 29259767; PMCID: PMC5721947.

Stuckey EM, Stevenson J, Galactionova K, Baidjoe AY, Bousema T, Odongo W, Kariuki S, Drakeley C, Smith TA, Cox J, Chitnis N. Modeling the cost effectiveness of malaria control interventions in the highlands of western Kenya. PLoS One. 2014 Oct 7;9(10):e107700. doi: 10.1371/journal.pone.0107700. PMID: 25290939; PMCID: PMC4188563.

.

Appendix

Literature Review for effectiveness & safety

This literature search is an example of a structured, focused review of literature and guidelines. You can choose to do one of the following literature reviews for your Evidence Brief:

Level 1: intervention inputs taken from DCP3 or generated in an ad hoc manner (e.g., quick google search found one study of cervical cancer screening cost-effectiveness that was used to create an effectiveness parameter for that intervention).

Level of evidence of efficacy studies:

1. low (expert opinions, case series, reports, low-quality case control studies)
2. moderate (high quality case control studies, low quality cohort studies)
3. high (high quality cohort studies, individual RCTs)
4. very high (multiple RCTs, meta-analysis, systematic review, clinical practice guidelines).