# Intermittent malaria prevention, infancy and pregnancy

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Date for updating: 2020-07-07, 2021-11-26

## Description of condition and intervention

Intermittent malaria prevention with sulfadoxine-pyrimethamine in infancy (SP-IPTi) is given at the time of routine vaccination schedules for second and third doses of DTP/Penta 3, and measles vaccination. Especially at 8-10 weeks, 12-14 weeks, and 9 months for under five children who are at risk of malaria. It reduces clinical malaria, anemia, and sever malaria among infants.

Intermittent malaria prevention during pregnancy with sulphadoxine-pyrimethamine (IPTp-SP) is provided during second and third trimesters of pregnancy. The sulphadoxine-pyrimethamine (SP) treatment can be gives two or more doses during antenatal care (ANC). This treatment can be improving birth outcomes and reduced placental parasitaemia. We assess the effect and cost of the following intervention in FairChoices:DCP Analytical tool:

*Intermittent malaria prevention in infancy*

*Intermittent malaria prevention during pregnancy*

### International guidelines

| Organization | Indications/recommendations | Applicability in LIC & Lower MIC settings |
|---|---|---|
| World Health Organization 2021 | WHO guidelines for malaria | Yes |

Intermittent malaria prevention
in infancy & pregnancy
(DCP4 ID: MALR01-06,07)
Cluster: Malaria

**FairChoices**
DCP Analytic Tool

# 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. Fair Choices: 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 population receiving and affected by the intermittent malaria prevention are the infants.

## Disease states addressed

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

# Intervention effect and safety

Table 1: Effect and safety of intermittent malaria prevention in infancy

| Effect of intervention | | Certainty of evidence |
|---|---|---|
| Incidence<br><br>Intermittent malaria prevention in infancy | Aponte 2009 reported that intermittent prevention of malaria had a protective efficacy of 0.303(0.198–0.394) against clinical malaria. | See appendix |
| Intermittent malaria prevention during pregnancy | Kayentao K et al 2013 reported that intermittent preventive therapy during pregnancy had a relative risk of 0.51 (0.38 to 0.68) for placental malaria. This effect was estimated with 3 or more doses of sulfadoxine-pyrimethamine treatment for control of malaria during pregnancy. | |

# Model assumptions

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

| **Category** | **Model parameter** | **Notes** |
|---|---|---|
| Interventions | Intermittent malaria prevention in infancy<br>Intermittent malaria prevention during pregnancy | |
| **Cost parameters** | | |
| Treated population | Incidence of malaria | Global Burden of Disease Study 2019 |
| Gender | Male and female | |
| Age<br>Intermittent malaria prevention in infancy | 0 to 1 year | |

| | | |
|---|---|---|
| Intermittent malaria prevention during pregnancy | Pregnancy | |
| Treated fraction | Malaria control | Country input file indicator |
| **Effect parameters** | | |
| Affected Population | With condition | |
| Affected gender<br>Intermittent malaria prevention in infancy<br><br>Intermittent malaria prevention during pregnancy | <br>Both gender<br><br>female | |
| Affected fraction age<br>Intermittent malaria prevention in infancy<br><br>Intermittent malaria prevention during pregnancy | <br>0 to 1 year<br><br>female | |
| Affected fraction | 1 | |
| Comparator | No intervention | |
| Incidence Reduction (RRR)<br>Intermittent malaria prevention in infancy<br>Intermittent malaria prevention during pregnancy | <br>0.3<br><br>0.49 | <br>Aponte 2009<br><br>Kayentao K et al 2013 |

*Relative risk reduction: 1- Relative risk (RR)

# Intervention Cost

The total unit cost per person-year for intermittent treatment of malaria in infancy (except where seasonal malaria chemoprophylaxis is being provided) is estimated to be USD 0.384 (Year: 2016) in a low-income country setting (Tanzania) (Hutton et al 2009).

The total unit cost for intermittent treatment of malaria in pregnancy is estimated to be USD 0.44 per affected pregnancy (Year: 2007) in a low-income country setting (Mozambique) (Sicuri E et al 2010).

# References

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.

Aponte 2009: Aponte JJ, Schellenberg D, Egan A, Breckenridge A, Carneiro I, Critchley J, Danquah I, Dodoo A, Kobbe R, Lell B, May J, Premji Z, Sanz S, Sevene E, Soulaymani-Becheikh R, Winstanley P, Adjei S, Anemana S, Chandramohan D, Issifou S, Mockenhaupt F, Owusu-Agyei S, Greenwood B, Grobusch MP, Kremsner PG, Macete E, Mshinda H, Newman RD, Slutsker L, Tanner M, Alonso P, Menendez C. Efficacy and safety of intermittent preventive treatment with sulfadoxine-pyrimethamine for malaria in African infants: a pooled analysis of six randomised, placebo-controlled trials. Lancet. 2009 Oct 31;374(9700):1533-42. doi: 10.1016/S0140-6736(09)61258-7. Epub 2009 Sep 16. PMID: 19765816.

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# Appendix

## Literature Review for effect & 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)