NUTRITION: Provision of daily iron and folic acid supplementation
(DCP4 ID: NUTR01-01)
Cluster: Nutrition

FairChoices
DCP Analytic Tool

Daily iron folic acid supplementation (pregnant women)

Authors: Henriksen ES, Kaur G, Haaland OA, Watkins D, Økeland J, Ahmed S, Coates MM, Johansson KA.

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Description of condition and intervention

More than 40% of pregnant women globally are estimated to be anemic. Iron is estimated to be the key etiologic risk factor implicated in half of these cases. It is well-understood that pregnancy demands additional nutrients to meet up with the increasing needs of mother and the developing baby. Hence, daily iron and folic acid supplementation is recommended to reduce any negative impacts on mother's health and development of the baby. Expected benefits include prevention of maternal anemia, development of puerperal sepsis, spina bifida, low birth weight and preterm birth. Universal coverage of this intervention is believed to support achievement of four global nutrition targets: (1) 40% reduction in stunting among children under the age of 5; (2) 50% reduction in anemia in women in reproductive age; (3) 30% reduction in low birth weight; and (4) decrease and maintaining childhood wasting under 5%. Source: (WHO 2014 and 2016). This evidence brief assesses effects and costs for one intervention being analyzed in FairChoices: DCP analytical tool(For an overview of other interventions, see appendix below and the separate evidence briefs for these):

NUTR01-01 **Daily Iron Folic acid supplementation (pregnant women)**

International guidelines

Organization	Indications/recommendations	Applicability in LIC & Lower MIC settings
World Health Organization	30 mg to 60 mg of elemental iron and 400 µg (0.4 mg) folic acid per day is recommended for pregnant women for the whole duration of the pregnancy. The equivalent of 60 mg of elemental iron is 300 mg ferrous sulphate heptahydrate, 180 mg ferrous fumarate or 500 mg of ferrous gluconate. If a woman is diagnosed with anemia during pregnancy her daily dose should be increased with 120 mg elemental iron until her hemoglobin concentration rises to normal, therefore the recommendation for anemic pregnant women will be: 120 mg elemental iron + 400 microgram (0.4 mg) folic acid for 3 months, followed by 6 months of 60 mg elemental + 400 microg Folic acid, then continues for 3 months postpartum with 60mg + 400 microg. Folic acid supplementation.	Yes

Source: Guideline: Iron supplementation in postpartum women. Geneva: World Health Organization; 2016.

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Intervention attributes

Type of interventions & delivery platform

Table 1: Type of interventions & delivery platform

Intervention	Type	Delivery platform
1. Daily iron folic acid supplementation	Prevention	Community

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

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

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Population in need of interventions

Table 2: Population in need of interventions

Intervention	Treated population		Affected population		Disease state addressed
	Population treated (age)	**Treated fraction**	**Affected age**	**Affected fraction**	
Daily iron folic acid supplementation	Pregnant women (10 to 54 years)	100%	10 to 54 years	100% of pregnant women with the condition	Dietary iron deficiency
	Pregnant women (10 to 54 years)	100%	newborns	100% births incidence (all newborns, both genders)	Neural tube defects
	Pregnant women (10 to 54 years)	100%	newborns	100% births incidence (all newborns, both genders)	Congenital heart anomalies

Disease stage addressed

This intervention aims to prevent or delay maternal anemia and birth defects in target population.

Intervention effect and safety

Table 3: Effectiveness and safety of daily iron and folic acid supplementation in pregnant women

Effect of intervention (outcome highlighted in bold)	Certainty of evidence
Incidence of iron deficiency anemia (population**:** pregnant women) Penna-Rossa et al 2015 reported relative risk of 0.30 (95% CI: 0.19 to 0.46) **iron deficiency anemia** in pregnant women at with intervention versus no intervention/placebo	⊕⊕⊖⊖ Low
Incidence (population**:** pregnant women) De-Regil et al. shows a protective effect of 69% (RR 0.31, 95% CI: 0.17 to 0.58) of **daily folic acid supplementation** in **preventing neural tube defects** compared with no intervention/placebo or vitamins and minerals without folic acid	⊕⊕⊕⊖ High
	⊕⊕⊕⊖ High

Feng et al 2015 reported a decreased relative risk of 0.72 by using folic acid (95% CI: 0.63–0.82) for **preventing congenital heart anomalies** in those with intervention. Only one RCT, one cohort study and 16 casus- control studies was included in this metanalysis, according to the authors this was the first quantitative meta-analysis to evaluate the association between folic acid and the risk of CHDs	

Model assumptions

Table 4: Summary of model parameters and values used in FairChoices – DCP Analytical Tool

Population	Affected Population 100% of pregnant women with dietary iron deficiency 100% of newborns with congenital heart anomalies (both genders) 100% of newborns with neural tube defects (both genders)
	Treated Population 100% of pregnant women
Intervention	Daily iron folic acid supplementation
Comparator	No intervention
Outcome	Incidence Reduction Dietary iron deficiency: efficacy (RRR) 0.7 Congenital heart anomalies: efficacy (RRR) 0.18 Neural tube defects: efficacy (RRR) 0.69

Intervention Cost

The total unit cost is estimated to be USD 8.04 (Year: 2020) for daily iron and folic acid supplementation per case according to *Henriksen et al. (Work in progress)*

References

Guideline: Iron supplementation in postpartum women. Geneva: World Health Organization; 2016.

Organization WH. Global nutrition targets 2025: Policy brief series. World Health Organization; 2014.

Organization WH. WHO recommendations on antenatal care for a positive pregnancy experience 28 November 2016

Penna Rosas et al 2015: Pena-Rosas JP, De-Regil LM, Garcia-Casal MN, Dowswell T. Daily oral iron supplementation during pregnancy. Cochrane Database Syst Rev. 2015(7):CD004736.

De-Regil LM, Pena-Rosas JP, Fernandez-Gaxiola AC, Rayco-Solon P. Effects and safety of periconceptional oral folate supplementation for preventing birth defects. Cochrane Database Syst Rev. 2015(12):CD007950

Feng Y, Wang S, Chen R, Tong X, Wu Z, Mo X. Maternal folic acid supplementation and the risk of congenital heart defects in offspring: a meta-analysis of epidemiological observational studies. Sci Rep. 2015;5:8506.

Henriksen ES, Økeland J, Malawim O, Said S, Kaur G, Rava` MS, et al. Economic evaluation of nutritional interventions in Zanzibar: An analysis using FairChoices – DCP analytic tool.

Appendix

Literature Review for effectiveness & safety

This literature search is an example of level 4 evidence for intervention inputs taken from DCP3.

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, metaanalysis, systematic reviews, clinical practice guidelines)

An overview of all NUTR interventions in FairChoices-DCP analytical tool (Interventions assessed in this evidence brief are marked in bold)

NUTR01-01	**Daily Iron Folic acid supplementation (pregnant women)**
NUTR01-02	Calcium supplementation, pregnancy
NUTR01-03	Food and caloric supplementation to pregnant women in insecure households
NUTR01-04	Promotion of breastfeeding and/ or complementary feeding
NUTR01-05	Intermittent Iron-folic acid supplementation (Menstruating women)
NUTR01-06	Food to non-pregnant women in insecure households
NUTR01-02-01-01	Daily iron supplementation for children 6 to 23 months
NUTR01-02-01-02	Daily iron supplementation in children health center

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NUTR01-02-02	Intermittent iron supplementation in children (24 -59 months)
NUTR01-02-03	Vitamin A supplementation to children 6 to 59 months
NUTR01-02-04	Zink to children 6 to 59 months
NUTR01-02-05	Food to children, if below basic food poverty line
NUTR01-03-01	Management of severe acute malnutrition without medical complications
NUTR01-03-02	Management of severe acute malnutrition associated with medical complications