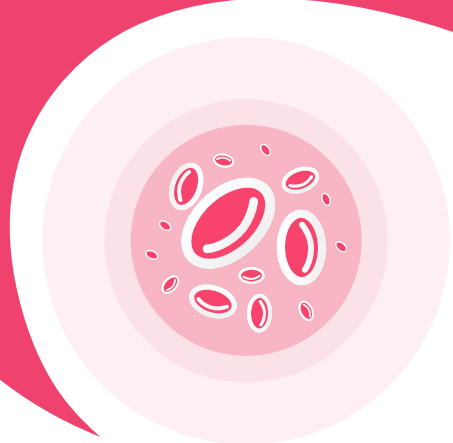


# Iron deficiency around preconception is preventable

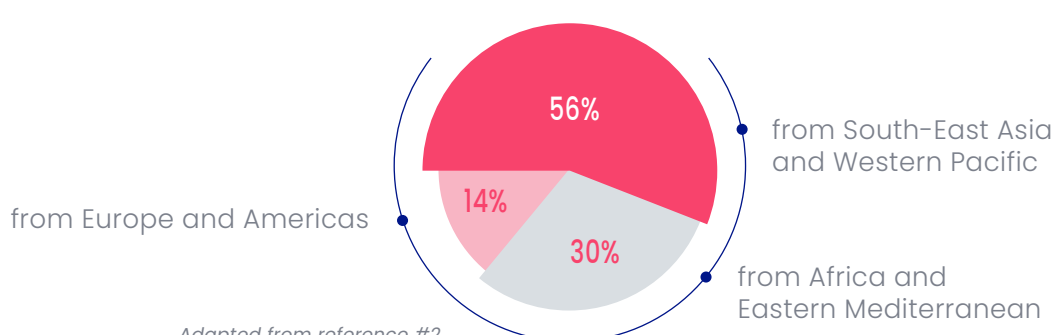


## Iron deficiency can result in poor outcomes for the mother and the baby

Anemia is characterized by insufficient hemoglobin (Hb) concentration to meet the oxygen demand of the tissue.<sup>1</sup> It is highly prevalent in women of reproductive age.<sup>2</sup>

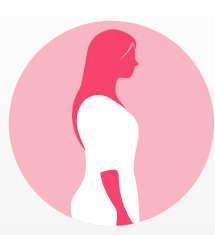


It affects 3 out of 10 women of reproductive age. Half a billion women aged 15–49 years world-wide.<sup>2</sup>



## Iron deficiency anemia (IDA) is the most common form of anemia<sup>3</sup>

Hemoglobin cutoffs to define anemia status<sup>1</sup>



**Non-pregnant women**  
Hemoglobin < 12 g/dL



**1<sup>st</sup> Trimester**  
Hemoglobin < 11 g/dL



**2<sup>nd</sup> Trimester**  
Hemoglobin < 10.5 g/dL



**3<sup>rd</sup> Trimester**  
Hemoglobin < 11 g/dL

## WHO categorization of anemia severity in non-pregnant women (hemoglobin cutoffs: 15 years and above)<sup>4</sup>



**Non Anemia**  
> 12 g/dL



**Mid Anemia**  
11–11.9 g/dL



**Moderate Anemia**  
8–10.9 g/dL



**Severe Anemia**  
< 8 g/dL

## Iron deficiency is the leading cause of anemia around preconception<sup>5</sup>



### Inadequate iron intake

Diets low in iron – Only 1 mg is absorbed for every 10 to 20 mg of iron ingested from diet.<sup>3</sup>



### Increased iron requirement

Increased demand for iron and RBC production to support the fetoplacental development and maternal adaptation to pregnancy.<sup>3</sup>



### Blood loss

Blood loss due to GI bleeding, menstrual bleeding or injury.<sup>3</sup>



### Iron Malabsorption

Malabsorption is common after surgeries due to gastrointestinal abnormalities or with medications that stop stomach acid production.<sup>3</sup>



### Nutritional inadequacy

Nutrients including folic acid, Vitamin A, B12, B6, C, D, E, Riboflavin, copper, zinc are responsible for RBC production. Nutrient deficiency can cause anemia.<sup>5</sup>

## Identifying symptoms can help in managing depleted iron stores<sup>6</sup>



Tiredness and lack of energy



Shortness of breath



Noticeable palpitations



Pale skin

**Preconception care can address maternal health problems in the prepregnancy period to improve gestational outcomes**

## WHO recommendations for non-pregnant women of reproductive age<sup>7</sup>

	For women in areas with the prevalence of anaemia $\geq$ 40%	For women in areas with the prevalence of anaemia $\geq$ 20%
<b>Supplement composition</b>	Iron: 60 mg of elemental iron* Folic acid: 400 $\mu$ g (0.4 mg)	30–60 mg of elemental iron* Folic acid: 2800 $\mu$ g (2.8 mg)
<b>Frequency</b>	Daily	Weekly
<b>Duration and time interval between periods of supplementation</b>	3 consecutive months in a year	3 months of supplementation followed by 3 months of no supplementation, after which the provision of supplements should restart

\*30–60 mg of elemental iron equals 90–180 mg of ferrous fumarate, 150–300 mg of ferrous sulfate heptahydrate or 250–500 mg of ferrous gluconate

## If not prevented, iron deficiency anemia throughout pregnancy adversely affects the maternal and fetal well-being<sup>8</sup>



### Impact on maternal well-being

- Breathing difficulties, fainting, tiredness, palpitations, and sleep difficulties<sup>9</sup>
- Reduced physical performance, increased fatigue level, reduced cognitive performance<sup>9</sup>
- Increased risk of infection and hospitalization, and inhibited lactation<sup>9</sup>
- Post-partum cognitive impairment and behavioral difficulties<sup>8</sup>
- Perinatal mortality and morbidity<sup>9</sup>



### Impact on fetal well-being

- Spontaneous abortion, premature delivery, small for gestational-age babies<sup>9</sup>
- Hypertension and neurologic impairment<sup>9</sup>
- Intrauterine growth retardation, prematurity, and low birth weight<sup>9</sup>
- Increased morbidity and fetal death<sup>8</sup>

### References

1. Msemo OA, Bygbjerg IC, Møller SL, et al. Prevalence and risk factors of preconception anemia: A community based cross sectional study of rural women of reproductive age in northeastern Tanzania. PLoS One. 2018 Dec 18;13(12):e0208413. 2. Anaemia in women and children. Available at: [https://www.who.int/data/gho/data/themes/topics/anaemia\\_in\\_women\\_and\\_children#:~:text=Summary%20findings&text=in%202019%2C%20global%20anaemia%20prevalence,women%20aged%2015%2D49%20years](https://www.who.int/data/gho/data/themes/topics/anaemia_in_women_and_children#:~:text=Summary%20findings&text=in%202019%2C%20global%20anaemia%20prevalence,women%20aged%2015%2D49%20years). Accessed on 24 April 2022. 3. Iron-Deficiency Anemia. Available at: <https://www.hopkinsmedicine.org/health/conditions-and-diseases/irondeficiency-anemia>. Accessed on 24 April 2022. 4. WHO. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva, World Health Organization, 2011. (WHO/NMH/NHD/MNM/11.1). Available at: <http://www.who.int/vmnis/indicators/haemoglobin>. Accessed on 24 April 2022. 5. Chaparro CM, Suchdev PS. Anemia epidemiology, pathophysiology, and etiology in low- and middle-income countries. Ann N Y Acad Sci. 2019 Aug;1450(1):15–31. 6. Iron deficiency anaemia. Available at: <https://www.nhs.uk/conditions/iron-deficiency-anaemia/>. Accessed on 24 April 2022. 7. WHO. Nutritional anaemias: tools for effective prevention and control. Geneva: World Health Organization; 2017. Available at: <https://www.who.int/publications/i/item/9789241513067>. Accessed on 14 August 2022. 8. Abu-Ouf NM, Jan MM. The impact of maternal iron deficiency and iron deficiency anemia on child's health. Saudi Med J. 2015 Feb;36(2):146–9. 9. Zhang Q, Lu XM, Zhang M, et al. Adverse effects of iron deficiency anemia on pregnancy outcome and offspring development and intervention of three iron supplements. Sci Rep. 2021 Jan 14;11(1):1347.