

# THE PREVALENCE OF IRON DEFICIENCY AND IRON-DEFICIENCY ANAEMIA

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**Abstract:** Anaemia is a public health problem that affects both Third World countries and the developed countries, having major consequences on human, social and economic health. Anaemia could occur in all stages of one's life cycle, but it is more encountered in little children, pregnant women and old people. Although during the past years several educational campaigns have been lead in order to increase the iron intake from diet, the iron-deficiency anaemia still represents a serious public health problem around the world. The current article compiles data from literature with regard to the occurrence of this condition. Purpose: This study aims at analysing the incidence of iron deficiency and iron deficiency anaemia in various countries and regions. Results: The study emphasis the fact that the prevalence of anaemia is high world-wide affecting especially preschool children. Conclusions: All these data together prove that the iron deficiency and iron-deficiency anaemia represents a significant pathology, which is encountered frequently due to the lack of iron from the diet.

## INTRODUCTION

Around the world, anaemia represents a major public health issue. The most frequent cause of anaemia in infants, children, teenagers and pregnant women is iron deficiency.(1) Iron-deficiency anaemia is the most frequent form of anaemia. Iron-deficiency anaemia is more frequent than B12 vitamin deficiency.

The iron-deficiency anaemia can be found in up to 50% of the patients.(2) In industrialised countries, the prevalence of iron deficit is up to 15% according to the World Health Organisation (WHO).(3)

In the developed countries, in the 70's, the screening and prophylaxis of iron-deficiency anaemia was introduced. Iron fortified food was introduced as well as iron supplements for infants. Thus, in the industrialised world the prevalence of anaemia decreased.

Despite iron supplementation, a part of the population still has iron deficit (little children 9%, teenage women 9%, and fertile age women 11%).(4)

## PURPOSE

The purpose of this paper work is to study the incidence of iron deficit and iron-deficiency anaemia in different countries and regions.

## MATERIALS AND METHODS

The study was done by analysing systematically the results from the literature regarding the prevalence of iron deficiency and iron-deficiency anaemia. Several representative studies were selected and analysed comparatively. The strategy of searching and accessing the data was to consider as many sources as possible but in the same time to ensure that the studies are thorough and representative; the sources are made available through the databases of the international agencies and which have been adopted by the World Health Organisation (WHO).

## RESULTS AND DISCUSSIONS

In the study presented by Michael B. Zimmermann and Richard F. Hurrell in 2017, the World Health Organisation (WHO) estimates that 39% of under 5 year old children, 48% of the children between 5 – 14 years old, 42% of women and 52% of pregnant women who live in the developing countries have iron deficit and half of these have iron-deficiency anaemia.(5) The pre-school children have the highest iron deficit and iron-deficiency anaemia.

In the United Kingdom, 21% of teenage women between 11 and 18 years old and 18% of the women between 16 and 24 years old have iron deficiency.(5)

In the United States, 2% of the children between 1 and 2 years old have iron-deficiency anaemia, 9-11% of non-pregnant women between 16 and 49 years old have iron deficiency and 2 – 5% of them have iron-deficiency anaemia. 2% of pregnant women from poor areas have iron deficit in the 1<sup>st</sup> trimester, 8% in the 2<sup>nd</sup> trimester and 27% in the 3<sup>rd</sup> trimester. In France, 29% of the children younger than 2 years old have iron deficiency and 4% have iron-deficiency anaemia.(5)

The study presented by Shafira T., et. al, 2009 shows that in the developing countries, 23 – 33% of the children under 4 years have iron deficiency.(6)

Another study done in 2009 by Mora J O., et. al, presents data about the prevalence of anaemia. This is based on a re-examination of the studies done in 38 countries from Latin America and Caribbean Islands in the period 1981 – 2009. In Mexico / Central America, the prevalence of anaemia is of 33.9% in children (6 – 59 months old), 16.3% in non-pregnant women and 21.3% in pregnant women. In South America, the prevalence of anaemia is of 46.2% in children, 24.2% in non-pregnant women and 34.5% in pregnant women. In the Caribbean Islands, the incidence of anaemia is of 42.9% in children, 29% in non-pregnant women and 42.5% in pregnant women. The highest prevalence was recorded in the age group: 6 – 11 years, of 65.6%.(7)

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## CLINICAL ASPECTS

In a retrospective study done by Gretchen A Stevens, et al, in 2013, it was concluded that the prevalence of anaemia decreased in comparison to the 90's. The study was conducted by using data from 107 countries around the world and organised in 11 regions in the period 1995 – 2011. The data was classified by different age categories as follows: children between 6 – 59 months old, pregnant women and non-pregnant women between 15 – 49 years old.

**Table no. 1. The prevalence of anaemia in children (≤ 5 years old) by regions in 1995 and 2011(8)**

Children ≤ 5 years old	The prevalence of anaemia % (Year 1995)	The prevalence of anaemia % (Year 2011)
Regions with high income	11	11
Central and Eastern Europe	11	26
Eastern and South-Eastern Asia	29	25
Oceania	42	43
Southern Asia	70	58
Central Asia, Middle East, North Africa	43	38
Central and Western Africa	80	71
Eastern Africa	74	55
Southern Africa	30	46
Central Latin America and Caribbean Islands	38	33
Southern and Tropical Latin America	28	23
Global	47	43

**Table no. 2. The prevalence of anaemia in non-pregnant women (15 – 49 years old) by regions in 1995 and 2011(8):**

Non-pregnant women, 15 – 49 years old	The prevalence of anaemia % (year 1995)	The prevalence of anaemia % (year 2011)
Regions with high income	14	16
Central and Eastern Europe	12	22
Eastern and South-Eastern Asia	29	21
Oceania	37	28
Southern Asia	53	47
Central Asia, Middle East, North Africa	38	33
Central and Western Africa	52	48
Eastern Africa	40	28
Southern Africa	33	28
Central Latin America and Caribbean Islands	30	19
Southern and Tropical Latin America	22	18
Global	33	29

The study has shown that global wide the average of haemoglobin has slightly improved between 1995 and 2011. The prevalence of anaemia decreased from 47% to 43% in children, from 43% to 38% in pregnant women, and from 33% to 29% in the case of non-pregnant women. In some regions of Southern

and Central Asia, as well as in Western Africa, it was noticed that in 2011 the incidence of anaemia increased, in these regions additional improvements being required in order to reduce the prevalence of anaemia.(8)

**Table no. 3. The prevalence of anaemia in pregnant women (15 – 49 years old) by regions in 1995 and 2011(8):**

Pregnant women, 15 – 49 years old	The prevalence of anaemia % (year 1995)	The prevalence of anaemia % (year 2011)
Regions with high income	23	22
Central and Eastern Europe	30	24
Eastern and South-Eastern Asia	34	25
Oceania	48	36
Southern Asia	53	52
Central Asia, Middle East, North Africa	37	31
Central and Western Africa	61	56
Eastern Africa	46	36
Southern Africa	34	31
Central Latin America and Caribbean Islands	37	27
Southern and Tropical Latin America	37	31
Global	43	38

In the developing countries, the high incidence of iron deficiency has been found to be caused by low consumption on bio-available iron, parasite infection and malaria.(9) During the past 5 decades, in the developed countries, the food fortification with iron decreased the prevalence of iron-deficiency anaemia.(4)

In respect of the prevalence of iron deficiency in the industrialized countries, the estimations are frequently based on representative samples nationally wide where one or more iron level indicators were used. On another hand the results obtained in the developing countries are based on haemoglobin measurements only and are many times limited to target groups or from limited areas. These results have to be interpreted cautiously because they do not take into considerations other causes of anaemia.(10)

Internationally, numerous studies have been published about establishing the prevalence of iron deficiency and iron deficiency anaemia as well as about strategies for preventing the iron deficit and iron-deficiency anaemia.

In order to reduce the iron deficit, Great Britain, along with the most part of Western world, have emphasized the increase of iron availability in children's diet but also the education of the population.

### CONCLUSIONS

The iron deficiency remains the most frequent cause of anaemia among children from developing countries where the monotonous diets based on vegetables offer reduced quantities of bio-available iron.

In Southern and Central Asia as well as in Western Africa the prevalence of anaemia increased in 2011 because of poverty (in rural regions sanitary utilities are missing).

Also, the high prevalence of anaemia in some regions could be explained by the infection with falciparum plasmodium, which is spread more in the Eastern and Western Africa.

In order to solve the problem of iron deficiency and iron-deficiency anaemia, several strategies are necessary: improving access to diverse diets; reducing poverty; improving health care services and salubrious conditions as well as promoting better nutritional and care habits.

Better efforts to prevent iron deficiency are required by developing some programmes to detect anaemia, by introducing diagnosis screening and by bio-diversification and the introduction of iron supplements starting with the age of 6 months along with patient monitoring.

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