

1. Food Nutr Bull. 2010 Sep;31(3):400-17.

[The nutritional status of school-aged children: why should we care?](#)

[Best C](#), [Neufingerl N](#), [van Geel L](#), [van den Briel T](#), [Osendarp S](#).

Source

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Abstract

BACKGROUND:

The nutritional status of school-aged children impacts their health, cognition, and subsequently their educational achievement. The school is an opportune setting to provide health and nutrition services to disadvantaged children. Yet, school-aged children are not commonly included in health and nutrition surveys. An up-to-date overview of their nutritional status across the world is not available.

OBJECTIVE:

To provide a summary of the recent data on the nutritional status of school-aged children in developing countries and countries in transition and identify issues of public health concern.

METHODS:

A review of literature published from 2002 to 2009 on the nutritional status of children aged 6 to 12 years from Latin America, Africa, Asia, and the Eastern Mediterranean region was performed. Eligible studies determined the prevalence of micronutrient deficiencies or child under- and overnutrition using biochemical markers and internationally accepted growth references.

RESULTS:

A total of 369 studies from 76 different countries were included. The available data indicate that the nutritional status of school-aged children in the reviewed regions is considerably inadequate. Underweight and thinness were most prominent in populations from South-East Asia and Africa, whereas in Latin America the prevalence of underweight or thinness was generally below 10%. More than half of the studies on anemia reported moderate (> 20%) or severe (> 40%) prevalence of anemia. Prevalences of 20% to 30% were commonly reported for deficiencies of iron, iodine, zinc, and vitamin A. The prevalence of overweight was highest in Latin American countries (20% to 35%). In Africa, Asia, and the Eastern

Mediterranean, the prevalence of overweight was generally below 15%.

CONCLUSIONS:

The available data indicate that malnutrition is a public health issue in school-aged children in developing countries and countries in transition. However, the available data, especially data on micronutrient status, are limited. These findings emphasize the need for nutrition interventions in school-aged children and more high-quality research to assess nutritional status in this age group.

PMID: 20973461 [PubMed - indexed for MEDLINE]

[Related citations](#)

2. Public Health Nutr. 2001 Apr;4(2B):537-45.

Iron deficiency in Europe.

[Herberg S](#), [Preziosi P](#), [Galan P](#).

Source

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Abstract

In Europe, iron deficiency is considered to be one of the main nutritional deficiency disorders affecting large fractions of the population, particularly such physiological groups as children, menstruating women and pregnant women. Some factors such as type of contraception in women, blood donation or minor pathological blood loss (haemorrhoids, gynaecological bleeding...) considerably increase the difficulty of covering iron needs. Moreover, women, especially adolescents consuming low-energy diets, vegetarians and vegans are at high risk of iron deficiency. Although there is no evidence that an absence of iron stores has any adverse consequences, it does indicate that iron nutrition is borderline, since any further reduction in body iron is associated with a decrease in the level of functional compounds such as haemoglobin. The prevalence of iron-deficient anaemia has slightly decreased in infants and menstruating women. Some positive factors may have contributed to reducing the prevalence of iron-deficiency anaemia in some groups of population: the use of iron-fortified formulas and iron-fortified cereals; the use of oral contraceptives and increased enrichment of iron in several countries; and the use of iron supplements during pregnancy in some European countries. It is possible to prevent and control iron deficiency by counseling individuals and families about sound iron nutrition during infancy and beyond, and about iron supplementation during pregnancy, by screening persons on the basis of their risk for iron deficiency, and by treating and following up persons with presumptive iron deficiency. This may help to reduce manifestations of iron deficiency and thus improve public health. Evidence linking iron status with risk of cardiovascular disease or cancer is unconvincing and does not justify changes in food fortification or medical practice, particularly because the benefits of assuring adequate iron intake during growth and development are well established. But stronger evidence is needed before rejecting the hypothesis that greater iron stores increase the incidence of CVD or

cancer. At present, currently available data do not support radical changes in dietary recommendations. They include all means for increasing the content of dietary factors enhancing iron absorption or reducing the content of factors inhibiting iron absorption. Increased knowledge and increased information about factors may be important tools in the prevention of iron deficiency in Europe.

PMID: 11683548 [PubMed - indexed for MEDLINE]

[Related citations](#)

3. Lancet. 2007 Aug 11;370(9586):511-20.

Nutritional iron deficiency.

[Zimmermann MB](#), [Hurrell RF](#).

Source

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Comment in

- [Nutritional iron deficiency in patients with chronic illnesses.](#) [Lancet. 2007]

Abstract

Iron deficiency is one of the leading risk factors for disability and death worldwide, affecting an estimated 2 billion people. Nutritional iron deficiency arises when physiological requirements cannot be met by iron absorption from diet. Dietary iron bioavailability is low in populations consuming monotonous plant-based diets. The high prevalence of iron deficiency in the developing world has substantial health and economic costs, including poor pregnancy outcome, impaired school performance, and decreased productivity. Recent studies have reported how the body regulates iron absorption and metabolism in response to changing iron status by upregulation or downregulation of key intestinal and hepatic proteins. Targeted iron supplementation, iron fortification of foods, or both, can control iron deficiency in populations. Although technical challenges limit the amount of bioavailable iron compounds that can be used in food fortification, studies show that iron fortification can be an effective strategy against nutritional iron deficiency. Specific laboratory measures of iron status should be used to assess the need for fortification and to monitor these interventions. Selective plant breeding and genetic engineering are promising new approaches to improve dietary iron nutritional quality.

PMID: 17693180 [PubMed - indexed for MEDLINE]

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4. Am J Clin Nutr. 2006 Dec;84(6):1261-76.

Iron supplementation in early childhood:

health benefits and risks.

[Iannotti LL](#), [Tielsch JM](#), [Black MM](#), [Black RE](#).

Source

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Abstract

The prevalence of iron deficiency among infants and young children living in developing countries is high. Because of its chemical properties--namely, its oxidative potential--iron functions in several biological systems that are crucial to human health. Iron, which is not easily eliminated from the body, can also cause harm through oxidative stress, interference with the absorption or metabolism of other nutrients, and suppression of critical enzymatic activities. We reviewed 26 randomized controlled trials of preventive, oral iron supplementation in young children (aged 0-59 mo) living in developing countries to ascertain the associated health benefits and risks. The outcomes investigated were anemia, development, growth, morbidity, and mortality. Initial hemoglobin concentrations and iron status were considered as effect modifiers, although few studies included such subgroup analyses. Among iron-deficient or anemic children, hemoglobin concentrations were improved with iron supplementation. Reductions in cognitive and motor development deficits were observed in iron-deficient or anemic children, particularly with longer-duration, lower-dose regimens. With iron supplementation, weight gains were adversely affected in iron-replete children; the effects on height were inconclusive. Most studies found no effect on morbidity, although few had sample sizes or study designs that were adequate for drawing conclusions. In a malaria-endemic population of Zanzibar, significant increases in serious adverse events were associated with iron supplementation, whereas, in Nepal, no effects on mortality in young children were found. More research is needed in populations affected by HIV and tuberculosis. Iron supplementation in preventive programs may need to be targeted through identification of iron-deficient children.

PMCID: PMC3311916 [Free PMC Article](#)

PMID: 17158406 [PubMed - indexed for MEDLINE]

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Iron deficiency and impaired cognition in toddlers: an underestimated and undertreated problem.

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Source

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Abstract

Iron deficiency in toddlers is associated with impaired cognition and is an underestimated and undertreated problem. The prevalence of iron deficiency anemia (IDA) during the first year of life has been dramatically reduced in developed countries, mainly due to the increase in breastfeeding and the use of iron-fortified feeding formulae. However, in US and UK children aged 1-2 years, recent studies have shown prevalence rates of >10% and 30% for IDA and iron deficiency, respectively. The daily iron intake in children aged 1-2 years is lower than in any other age group during life. IDA during the first 2 years of life is associated with impaired mental and psychomotor development and these deficits are long lasting, and perhaps irreversible, despite the correction of the anemia. Another compelling reason to prevent iron deficiency in children, especially in children aged 1-2 years, is the proven association of iron deficiency with increased lead absorption. Lead-associated cognitive deficits occur at blood lead levels <10 microg/L, a level once thought to be harmless. The current prevalence rates of iron deficiency and IDA in toddlers, especially among those in the lower socioeconomic groups, are unacceptably high. These young children are doubly at risk for neurodevelopmental impairment, both from the iron deficiency itself as well as from CNS damage caused by the associated increased lead absorption. The current screening and treatment recommendations for IDA in the US and in other developed countries appear to have been unsuccessful in preventing iron deficiency and IDA in a large number of toddlers. Similarly, the associated problem of impaired mental and psychomotor development has not been adequately recognized or addressed in the existing medical literature. The author recommends that, after breastfeeding or an iron-fortified formula is stopped, iron deficiency and IDA be prevented by routine daily supplemental doses of 10mg of elemental iron via iron-fortified vitamins, iron drops, or iron-fortified drinks.

PMID: 16356022 [PubMed - indexed for MEDLINE]

[Related citations](#)