

Progress towards improving iron/folate supplementation programmes

Introduction

According to WHO, iron deficiency anaemia (IDA) is the most prevalent of the micronutrient deficiencies with more than 2 billion persons worldwide affected¹. About 56% of women in developing countries were estimated to have hemoglobin levels below 110g/l in 1988. The World Summit for Children declaration called for the reduction in iron deficiency anemia in women by one-third of 1990 levels by the end of the decade². At the International Conference on Nutrition in 1992, this goal was expanded to include young children with a specific reference to the impact of IDA on cognitive development.

It is generally acknowledged that progress in addressing IDA has lagged behind reduction of iodine and vitamin A deficiencies. As this report shows, however, there are many programmes in the field, including widespread adoption of iron/folate supplementation in pregnancy and growing support for fortification of staple foods with iron. Although programmes are numerous, there are not yet internationally agreed-upon recommendations on a number of fundamental aspects of supplementation programmes, including dosage and optimal duration of supplementation for certain target groups.

This purpose of this report is to summarize the status of iron/folate supplementation programmes in all countries where UNICEF has programmes. To do this, a questionnaire was sent to all UNICEF field offices in August 1997 with the objective of capturing countries' experiences and determining progress of programmes to control and prevent iron deficiency anemia. The questionnaire is attached as Annex 1. Specific objectives were as follows:

- Review the global situation of IDA assessments conducted and planned;
- Report on the status of policies adopted by countries to support ante-natal supplementation of pregnant women;
- Report on the procurement, utilization and cost of iron/folate supplements. Also, summarise the composition and dosages adopted by countries supporting ante-natal supplementation;

¹ Indicators and strategies for iron deficiency and anemia programmes. In draft. WHO/UNICEF/UNU. 1993

² First call for children. UNICEF 1990

- Review the status of related policies to supplement young children with iron and to support regular de-worming of women and young children.

Although the main focus of this report is on supplementation, information from UNICEF offices on the status of iron fortifications is also summarised.

Complete questionnaires were received from 57 (35%) of the 163 countries where UNICEF has programmes. Of the 57 responses, 55 (96.5%) were from large countries with populations greater than one million. Data included in the analysis are primarily based on responses provided by UNICEF field offices in consultation with Governments and other implementing partners. Additional information was obtained from UNICEF country office annual reports for 1995 and 1996 and DHS surveys from 1987 to 1996. Prevalence data on the status of IDA among pregnant women was also obtained from WHO's tabulation of anaemia data among women³. Data on iron/folate tablets was obtained from UNICEF's Supply Division in Copenhagen.

IDA prevalence

IDA prevalence by region was estimated by WHO in 1992 as follows⁴:

WHO Regions	Total number of anemic or iron-deficient subjects (millions)	Prevalence of anemia in pregnant women (%)
Africa	206	52
Americas	94	40
Europe	27	18
Eastern Mediterranean	149	50
South-East Asia	616	74
Western Pacific	1058	40
Developing countries		56
Developed countries		18
Grand total	2150	51

Prevalences of IDA among pregnant women vary from an estimated 40% in Latin America and the Caribbean to 75% in South Asia. In terms of absolute numbers, the greatest number of people affected live in the Western Pacific region, which includes China.

The cut-off points for anaemia in terms of hemoglobin and hematocrit levels, endorsed at

³ The Prevalence of Anemia in Women: A Tabulation of Available Information. Second Edition. WHO. 1992

⁴ WHO/UNICEF/UNU. 1993.

the 1993 WHO/UNICEF/UNU consultation, were used for the purposes of this questionnaire and appear below:

Hemoglobin/hematocrit levels below which anemia is present at sea level⁵

Age/sex group	Hemoglobin below (g/l)	Hematocrit below (% of whole blood)
Children < 5 years	110	33
Children 6-14 years	120	36
Non-pregnant women	120	36
Pregnant women	110	33
Men	130	40

Table 1 presents the status of IDA prevalence surveys conducted by region. Of the 163 countries where UNICEF has programmes, less than half (43%) countries have conducted at least one nationally representative survey to measure the extent to which IDA is a problem among vulnerable populations (pregnant women, women of reproductive age, pre-school and school-age children, and adolescent girls). Another 50 countries have been able to complete at least one survey to determine the extent to which IDA affects populations in parts of the country. A few countries such as India, Bangladesh, Tanzania, have successfully completed repeat surveys -- both nationally or regionally representative in scale -- since the 1970s to the present.

For this analysis, only the latest national survey and the latest regional survey with the largest sample size which best represented vulnerable populations were included. The table lists 11 countries that are planning to conduct surveys to either re-assess the situation with respect to iron deficiency anemia or to conduct first-time assessments. Proportionately, the greatest number of national IDA surveys have been conducted in South Asia with 5 of 7 countries in the region having completed IDA assessments. Nepal, one of the two countries in this region which have not yet conducted surveys, is planning to conduct a national micronutrient survey in 1998. Over half (57%) the countries in the Latin American and the Caribbean region have conducted nationally representative surveys. Less than half of the countries in each of the remaining regions have conducted national-level assessments of iron deficiency.

The large majority of surveys conducted measured the prevalence of iron deficiency anemia among pregnant women. Approximately one-third of these surveys also assessed IDA among all women (non-pregnant and lactating women). Twenty-nine of these surveys measured the anemia status of pre-school children. An additional 11 countries have conducted separate surveys to assess IDA among pre-school and/or school-age children, nearly all of which were conducted in the last ten years. Surveys in three countries (Uganda, Tunisia, and the Philippines)

⁵ Ibid.

measured the status of IDA among adolescent girls. Three countries (Burundi, Mauritius, and Syria) included men in their surveys.

Status of supplementation programmes and policies for women

In contrast to vitamin A, there are no internationally agreed-upon supplementation protocols to guide IDA control programmes. The International Nutritional Anemia Consultative Group (INACG) has drafted guidelines for iron/folate supplementation that may help fill that gap. In 1995, the UNICEF/WHO Joint Committee on Health Policy (JCHP)⁶ endorsed iron/folate supplementation as the strategy of choice and recommended that where the prevalence of IDA among pregnant women exceeds 30%, countries should implement universal supplementation of pregnant women through ante-natal clinics, regardless of women's individual haemoglobin status. (The draft INACG guidelines make a similar recommendation but where anaemia prevalence is greater than 40%.) According to the UNICEF rapid survey, 49 countries have adopted this kind of universal supplementation policy for pregnant women (Table 2).

Eight (8) countries have policies whereby only those pregnant women found to be anemic (determined by blood test) are given supplements. In three countries (Mauritania, Chad, and Romania), only those pregnant women considered to be anaemic based on the clinical judgement (using pallor or other clinical signs or complaints) of ante-natal clinic staff receive supplements. Six countries -- Dominican Republic, Guatemala, South Africa, Somalia, Cote d'Ivoire, and the Democratic Republic of Congo (Kinshasa) -- do not have a clear targeting policy. In these countries, iron supplements are provided in the Essential Drugs kits and are used at the discretion of health centre staff.

The supplement dosage recommended in the draft INACG guidelines for pregnant women is 60 mg iron (= 200 mg ferrous sulphate) and 400 µg folic acid daily from the beginning of pregnancy through parturition. The draft guidelines also recommend supplementing all mothers up to three months post-partum in countries where anaemia prevalence is greater than 40%. Of the countries with any supplementation policy for pregnant women, 43 countries used the previously recommended iron/folate combination (60 mg iron and 250 µg folic acid) which were stocked by UNICEF's Supply Division (Table 3). (In December 1997, the Essential Drugs Committee of WHO approved increasing the folic acid content of the iron/folate tablet used in the programme to 400 µg, and these will become the standard stock item for UNICEF-Copenhagen.)

⁶ Strategic approach to operationalizing selected end-decade goals: Reduction of iron deficiency anemia. UNICEF/WHO Joint Committee on Health Policy. 1995

Programmes in eight countries use ferrous salt (60 mg iron) without any folic acid. Ante-natal clinics in two countries -- Bosnia and Herzegovina, and Laos -- provide pregnant women with folic acid tablets in addition to the standard iron/folate preparation described above. Ghana and Botswana provide pregnant women with ferrous salt tablets in addition to the standard iron/folate supplement. In Honduras and Costa Rica, two tablets -- one each of ferrous salt and folic acid tablets are provided to pregnant women attending ante-natal services. Iron/folate supplements of varying compositions and dosages are used in several other countries. For example, Thailand and Cuba use the comparatively more expensive ferrous fumarate.

The draft INACG guideline also recommends supplementation through the third month post-partum when anaemia prevalence is over 40%. National anaemia control programmes in Oman, Bhutan, Bangladesh, and Pakistan include iron/folate supplementation through the post-partum period. In other countries, such as India and Madagascar, the current policy requires that pregnant women receive supplements for at least 100 days.

Based on a number of studies suggesting that weekly or bi-weekly iron supplements may be as effective as daily supplements for some purposes⁷, weekly supplements for pregnant women are being introduced in several countries including the Central Asian Republics (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan), Ecuador, Nicaragua, and Morocco. In the Central Asian Republics, the plan is to reduce IDA through a combined programme of weekly supplementation before and during pregnancy, and iron fortification of wheat flour. Chad is the only country with a policy of monthly supplementation of pregnant women; information on the dosage provided and the location of the monthly contact is not available (Table 4).

There are 29 countries where at least 50% of pregnant women are reported to have received iron/folate supplements during routine ante-natal care (Table 5). In 11 of these 29 countries, more than 80% of pregnant women presenting for ante-natal care are estimated to have received iron supplements, though the degree to which supplements were actually consumed by women is not known. A proxy for potential supplement coverage through ante-natal care facilities is the percentage of women using those services, which is shown for the countries that have those data in the last column of Table 6.

UNICEF is a major supplier of iron/folate supplements for use by pregnant women in developing countries. Field offices procure these supplements either through direct order from the UNICEF Supply Division in Copenhagen, from the Essential Drugs Programme through UNICEF-Copenhagen, or from another source outside the country of use. Thirty-four countries

⁷ Ridwan et al. 1996.

obtain supplements from UNICEF's Supply Division. Governments in 25 countries purchase iron/folate supplements directly from local vendors. In eight countries, governments procure iron/folate supplements from sources outside the country of use, but not through UNICEF Essential Drugs donors. In a few countries, iron supplements are provided by other collaborating partners such as UNFPA, the World Bank, or NGOs, or as donations-in-kind from donor governments. UNICEF offices in Oman and Ecuador report that the governments of those countries have assumed the financing of these supplements without donor support. (Table 7)

During the period 1993-1996, a total of 2.7 million packs of 1000 tablets each containing 200 mg ferrous sulphate and 250 µg folic acid were shipped by UNICEF to 122 countries at a total cost of US \$7.5 million. Table 8 shows that the greatest number of tablets was procured by the East Asia and Pacific region followed by the Middle East and North Africa. Latin America and the region of Central and Eastern Europe procured the lowest amount of tablets through UNICEF during this period.

Supplementation programmes for children

There is increased recognition of the importance of anaemia in young children, particularly as a determinant of physical and cognitive development. In 1994, the WHO/UNICEF Joint Committee on Health Policy called for preventive iron supplementation for all infants and young children in situations where the prevalence of IDA in pregnant women exceeds 30%. More recently, an USAID/UNICEF consultation on anaemia in young children recommended supplementation of children for 6-9 months beginning at age 6 months with 12.5 mg oral iron per day unless there is strong evidence that children's diets contain adequate available iron⁸.

A number of countries have adopted supplementation of pre-school children as a policy, and others have targeted school-age children (Table 9). Four countries (Philippines, Costa Rica, Ecuador, and Croatia) provide supplements to children under 12 months old. In six countries, more than 10% of pre-school or school-age children regularly received iron supplements in 1996 as shown in Table 10. Coverage of pre-school children in Ecuador and El Salvador was reported to be at least 50%.

Anaemia control activities other than supplementation

Malaria and intestinal parasites (especially hookworm) are important contributors to anaemia of women and children where they are endemic. A number of countries have explicitly

⁸ Nestel P & Alnwick D. Iron/multi-micronutrient supplements for young children. Summary & conclusions of a consultation held at UNICEF, Copenhagen, August 19-20, 1996. USAID/UNICEF.

included malaria and intestinal helminth control as part of anaemia control programmes. Twenty countries have policies of regular deworming or distribution of anti-helminthics to school-age children (Table 11). In many countries, deworming activities are carried out in the school system, but a few countries have special bi-annual mass campaigns to deworm women and children. Table 12 shows that UNICEF actively supports malaria control programmes in at least 20 countries.

Vitamin A deficiency also contributes to anaemia. National policies ensuring vitamin A supplementation of children are in place in at least 61 countries. In 46 countries, women are routinely provided with a high-dose vitamin A supplement soon after delivery. In many countries, AIDS is also a major contributor to anaemia, particularly severe anaemia, and AIDS control programmes may be expected to play a part in anaemia reduction.

Food fortification

One of the recommended actions of the JCHP was for countries to study the feasibility of food fortification as a means to reducing iron deficiency anemia. Fortification of foods with iron has been practiced for many years in developed countries such as Canada, USA, and UK, and has contributed to a reduction in anemia prevalence in these countries. The availability of iron fortificants with increased bioavailable iron and greater stability and the potential for multiple nutrient fortification suggest that fortification is an attractive solution in countries where a significant proportion of vulnerable groups consume centrally processed foods, such as wheat flour.

In Latin America and the Middle East, wheat flour is widely consumed by all populations groups and most wheat flour is centrally milled, making the fortification of flour with iron an attractive intervention. Table 13 lists 42 countries where fortification of flour (wheat or other types) and/or infant cereals with iron is currently being implemented or strongly considered. The majority of countries in Latin America and the Caribbean (81%) have already planned or implemented flour fortification programmes. Laws mandating the fortification of flour with iron have been promulgated in Venezuela, Peru, Chile, Guatemala, and Trinidad and Tobago. An evaluation of the programme in Venezuela concluded that it had successfully reduced the prevalence of anaemia in school-age children⁹.

Iron fortification of flour is also being pursued by 61% or 11 of 18 countries in the Middle East and North Africa region. At a meeting of representatives from Ministries of Health, the milling industry, bureaus of standards, and ministries of commerce from 11 Middle Eastern and North African countries in October 1996, a consensus was reached whereby participants

⁹ Layrisse et al. American Journal of Clinical Nutrition, 64:903-07, 1996

agreed on the potential of fortifying wheat with iron and on developing plans for its introduction in their respective countries¹⁰. The countries of Central Asia have also developed an area-based programme whereby all wheat flour milled in the four republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, will be fortified with iron along the lines of the flour fortification programme in Uzbekistan.

Conclusions

This summary of programme activities is UNICEF's first attempt to survey country experiences with iron/folate supplementation programmes. It should be regarded as partial since the response rate to this survey was relatively low. Nonetheless, the implementation of supplement programmes for pregnant women in so many countries signals a high level of awareness of the importance of anaemia as a public health problem in this group.

It is equally clear from the nature of the responses received that most of these supplementation programmes have not been well evaluated as to their effectiveness or sustainability, and many have not received good technical support. In too many cases, supplementation coverage is not known or very roughly estimated. Assessment and analysis of these programmes is sorely needed to identify constraints to greater accessibility and operational ease of supplementation. This survey did not touch upon the challenge of compliance of women to supplementation regimens, a central concern for supplementation programmes that merits more programme and research attention.

Many countries have obviously not been impeded from establishing supplementation programmes by the lack of global consensus on such fundamental aspects as dosage and frequency and duration of supplement administration. This does not, however, diminish the need for clear global agreement and guidelines for these programmes. The continuing practice of some countries to supplement women with iron but not folic acid must be corrected. The wide range of dosages present in existing programmes may represent local understanding of the problem but more likely result from unclear or outdated guidance. There is an urgent need for technical consensus on these fundamental programme elements.

The recent and growing body of research on intermittent (less frequently than daily) iron/folate supplementation for women and adolescents is one of the most programmatically relevant research initiatives in nutrition in recent years. The conclusions of this research must also be the subject of global review and should be expressed in a global consensus that can be

¹⁰ Consensus statement of participants in a joint WHO/UNICEF/MI/PAMM strategy development workshop on food fortification with special reference to iron fortification of flour. Muscat, Oman, 26-31 October, 1996.

directly and easily translated into programme guidance. Sharing the experiences and lessons learnt from programmes in the four countries that are planning to implement intermittent iron/folate supplementation programmes will be important as a complement to the growing body of smaller-scale research reports.

Relatively few countries have recognised and acted upon the neglected problem of young child anaemia, and this represents an urgent priority for programme action. Programmes for young children will be greatly facilitated by the development of appropriate supplements for this age group, especially products that can be transported and stored more easily and cheaply than bottled liquids and syrups.

Fortification, while not a central focus of this assessment, is clearly an essential component of anaemia control in countries with centralised production of cereal products. The spread of iron and iron/folate fortification to regions beyond Latin America and the Middle East promises to be one of the most important strategies for global anaemia reduction.