



The Micronutrient Initiative
P.O. Box 56127
250 Albert Street
Ottawa, K1R 7Z1
Canada
phone: 613-782-6800
fax: 613-782-6838
<http://www.micronutrient.org>

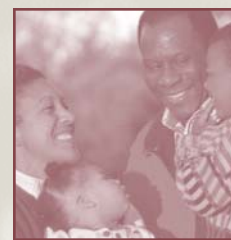
More information can be obtained from:

**US Centers for Disease Control
and Prevention**
1600 Clifton Road
Atlanta, GA 30333
USA
phone: 404-639-3534
[http://www.cdc.gov/nccdphp/
dnpa/AnemIron.htm](http://www.cdc.gov/nccdphp/dnpa/AnemIron.htm)

The World Health Organization
20 Avenue Appia
CH-1211 Geneva 27
Switzerland
phone: 41-22-791-2111
<http://www.who.int/nut/ida.htm>
Also, consult WHO regional and
country offices.

**Project IDEA - Iron Deficiency
Elimination Action**
2295 Parklake Drive, # 450
Atlanta, GA 30345
USA
phone: 770-934-1010
<http://www.idea.ilsa.org>

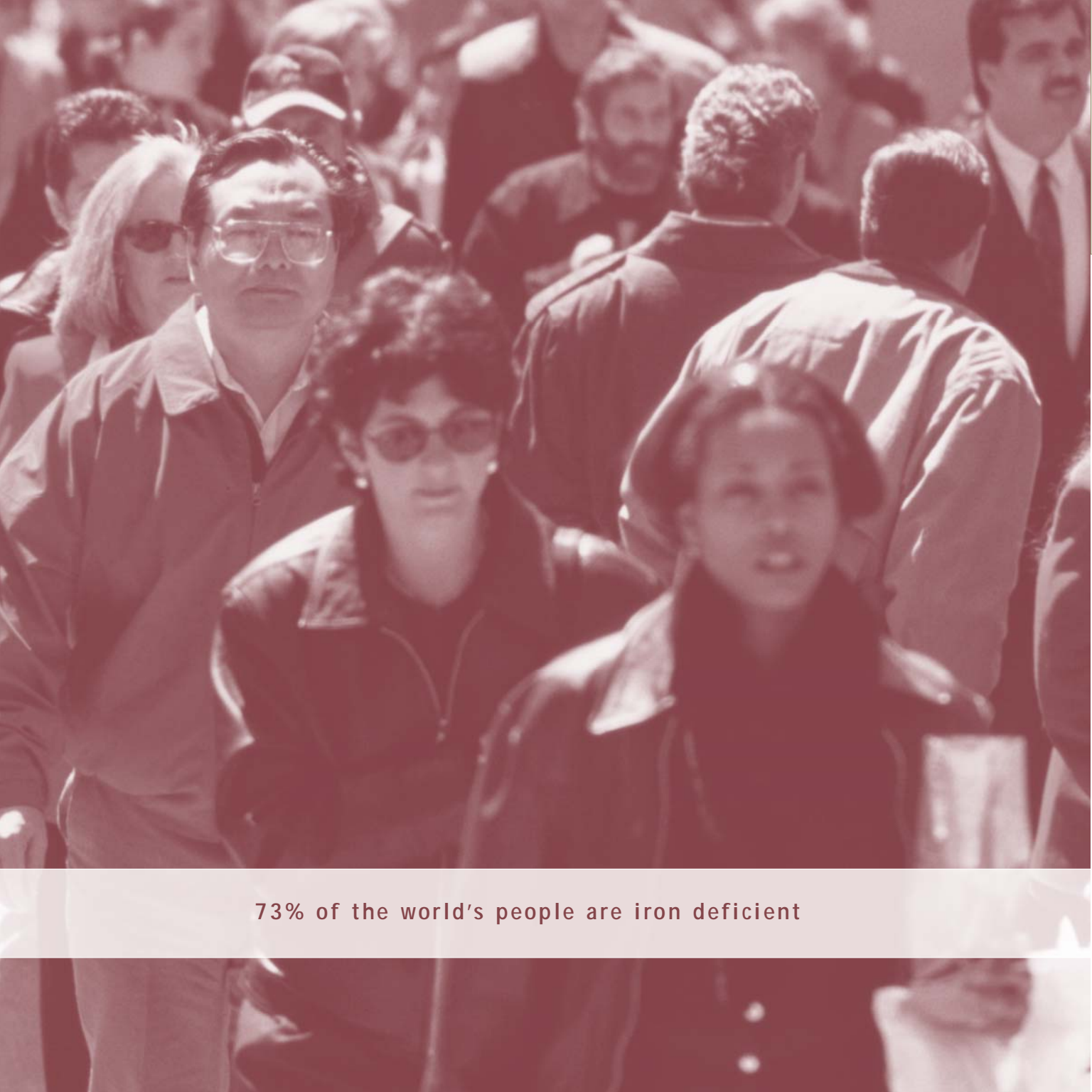
**International Nutrition Foundation (INF)
Home of IDPAS - Iron Deficiency
Program Advisory Service**
126 Curtis Street
Medford, MA 02155
USA
phone: 617-627-2291
<http://www.micronutrient.org/idpas>



IRON IMPROVES LIFE

IRON:

- Promotes child growth, development, and good health
- Improves learning
- Increases return on investments
- Strengthens economies and builds nations



73% of the world's people are iron deficient

IRON DEFICIENCY IS A CRITICAL PUBLIC HEALTH PROBLEM

Three out of every four people are affected by iron deficiency.

The signs are not always evident, but you see the consequences everywhere:

- a child slow to learn
- young mothers easily tired by the demands of family life
- adolescents struggling to be competitive in sports
- men and women performing their work in slow motion

They are among the 4.5 billion people around the world with iron deficiency. Two billion people or one out of every three people, suffer from anemia, the most severe form of iron deficiency.

There is good news. There are practical, cost-effective actions available for defeating iron deficiency. These actions do not demand new programs but instead can be integrated into health, education, and development programs that already exist.



IRON IS IMPORTANT FOR EVERYONE AT VARIOUS STAGES OF LIFE

Anemia Affects:

51% pregnant women

48% children under two years

53% school-aged children

35% preschool children

42% women

25% men



Iron deficiency affects men and women, every nationality, and all economic groups. Iron is an essential nutrient, a key element of our blood, carrying oxygen to the brain and muscles. Disease resistance, learning ability, work capacity, mental concentration, earning potential, and the ability to care for yourself and your family are reduced by iron deficiency.

From the beginning of life until old age, the prevention and treatment of iron deficiency and anemia can strengthen society.

- Iron helps a woman to prepare for a healthy pregnancy and helps prevent low birthweight for her baby. Iron aids in the prevention of maternal deaths and improves infant survival.
- Iron is critical for the early development of a child because it improves learning ability, physical coordination, and emotional development.
- Because adolescents are in a stage of rapid growth they need extra iron for optimal physical, mental, and emotional development.
- Iron deficiency and anemia cause both men and women to feel lethargic and weak, and reduces their concentration, making it harder to care and provide for their families and contribute to society.

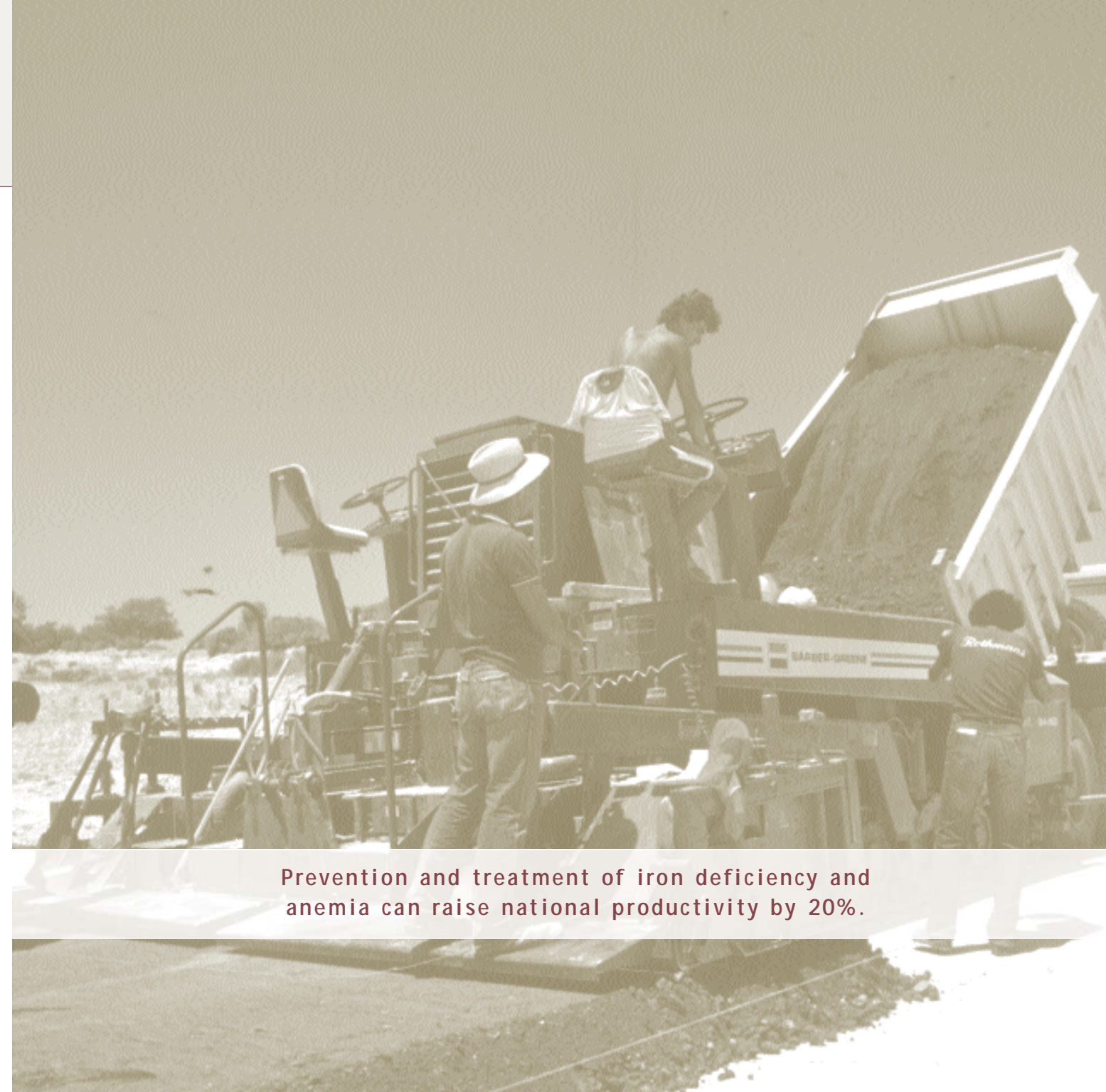


BUILD A STRONGER NATION AND INCREASE RETURNS ON PROGRAM INVESTMENTS

Iron deficiency and anemia have serious economic consequences that hold back national development. The widespread resulting lethargy, ill health, and slow achievement of large groups of people suffering from this deficiency make an urgent argument for action. Reducing iron deficiency brings a better quality of life to individuals and communities, and helps to break the cycle of poverty.

“Companies, farms, and factories addressing iron deficiency and anemia in both male and female workers increase their production rates. Employees increase their wages.”
British Journal of Nutrition, 1997.

- ❑ Large portions of the investments in education, health, and social programs are wasted because iron deficiency decreases the ability of people to fully benefit from them.
- ❑ For each US \$1 spent on an iron supplementation program for pregnant women, there is a US \$24 return in increased lifelong wages and decreased disability.
- ❑ For each US \$1 spent on iron fortification of food there is a US \$84 return in increased productivity and decreased disability of the consumer.
- ❑ Work output in many occupations can increase 10 to 30% when workers are given iron supplementation.



Prevention and treatment of iron deficiency and anemia can raise national productivity by 20%.



HELP CHILDREN GROW STRONGER AND SMARTER

Iron deficiency impairs brain development, limits attention span and shortens memory capacity. Iron deficiency can result in poor classroom performance, high absenteeism, and early dropout rates among schoolchildren. Young children with iron deficiency are often lethargic and hesitant.

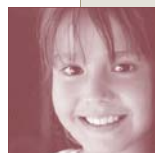
Iron improves child development and education. With adequate iron, children explore and play more, and so develop more curiosity and stronger motor skills. Iron also promotes physical growth and improved resistance to diseases in early childhood and adolescence.

“The costs of iron deficiency anemia are high: children who are slow to learn may limit the ability of the teachers to fulfill their tasks and hold back their classmates, they may need special schools, and they may have increased infection rates and therefore increase the load on the health system.” *Consultative Meeting on Child Development and Iron Deficiency, Oxford University, 1997*

- ❑ Iron deficiency anemia affects 48% of all children under 2 years of age. Around the world, some 210 million school-age children suffer from iron deficiency anemia.
- ❑ Infants born of mothers with anemia (51% of pregnant women) often have low birthweight, and face a higher risk of dying in infancy and childhood.
- ❑ Iron increases the success of early education, health, and social programs for children.
- ❑ By treating iron deficiency early, you give children a better chance to develop to their full potential—a lifelong benefit.



Anemic infants, on reaching school age, even if no longer anemic, average about 9 points lower in I.Q. testing.



ACTIONS ACHIEVE RESULTS

Iron deficiency has an impact on more than just health, so a wide variety of sectors and programs need to participate to solve the problem. There is extensive experience and agreement that the following actions, used in a combination that suit the situation of a country or community, will defeat iron deficiency. Integrating these actions into already existing programs focused on health, education, and development will be effective and sustainable, and strengthen the programs themselves.

- ❑ **SUPPLEMENTATION** involves the consumption of iron in the form of tablets, syrups, and other preparations. Supplementation is the method of choice when iron deficiency is severe or when access to regular dietary intake of iron is limited. Supplements can be distributed through a wide variety of establishments: health facilities, schools, factories, community centers, and shops and pharmacies.
- ❑ **DIETARY DIVERSIFICATION** aims to ensure that deficient populations have access to foods rich in iron such as meats, beans, and certain vegetables, and to fruits rich in vitamin C (since vitamin C helps the body absorb iron).
- ❑ **FORTIFICATION** is the addition of iron to foods that are regularly consumed and that can be fortified, such as wheat flour, soy sauce, and infant foods.
- ❑ **EDUCATION** about dietary practices or supplements will help people to use what is available to them appropriately and effectively.
- ❑ **STRENGTHENING OTHER PUBLIC HEALTH MEASURES** such as deworming, and prevention and treatment of malaria and diarrhea. These conditions cause iron deficiency through loss of blood or destruction of red blood cells.

SUSTAINED ACTIONS FOR EVERYONE

Food fortification

Increased access to iron-rich foods

Education on dietary practices

Disease prevention

CRITICAL STAGES REQUIRING SUPPLEMENTS

Times of rapid physical/mental growth
-infancy, childhood, adolescence

Times of extra need
-pregnancy, breastfeeding

Specific groups
-people without access
to the sustained actions,
some workers



MANY COUNTRIES ARE SUCCEEDING

A number of countries are adopting a combination of actions that are reducing iron deficiency. Through their maternal health services, many public health programs provide iron supplements for pregnant women. Some countries have involved the private sector, trying to reach even more women with iron supplements (for example, Bolivia). Still others are expanding their programs and placing emphasis on supplements for young children (Nicaragua). Supplementation combined with nutrition education has been found to be especially successful in addressing iron deficiency in schoolchildren (Egypt). Companies have enhanced employee health and well-being by distributing iron supplements on the job (Indonesia and Sri Lanka).

Flour fortification has been the key to success in many countries such as the United States and Sweden. Flour fortification is currently being implemented or considered by many other countries including Sri Lanka, India, Mexico, Venezuela, Egypt, Morocco, South Africa, and the Philippines.

Fortification of condiments, such as soy sauce and curry powder, is being done with success on a small-scale in the Philippines and China.

Thailand and Indonesia have mounted large-scale public education programs that have achieved success in improving consumption of iron-rich foods in people's daily diet.

TAKE ACTION NOW:

- Contact the organizations on the back of this booklet for more information and guidance on:
 - how to implement iron programs
 - available resources and funding for iron programs
- Make addressing iron deficiency a priority in your programs
- Devote resources and funding to iron deficiency to maximize return in your program investments

Developed by:

The Manoff Group
2001 S Street, NW
Washington, DC 20009
USA
phone: 202-265-7469
website: <http://www.ManoffGroup.com>

Sources:

Major Issues in the Control of Iron Deficiency, The Micronutrient Initiative and UNICEF, 1998.
Iron Deficiency Anemia-Assessment, Prevention, and Control, WHO, UNICEF, UNU, 2001.
Enriching Lives, Overcoming Vitamin and Mineral Malnutrition in Developing Countries, The World Bank, 1994.

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THE IMPACT OF PREVENTING AND TREATING IRON DEFICIENCY ANEMIA

ECONOMIC PRODUCTIVITY: *Iron raises national and individual productivity and economic gain.*

Almost 30 years ago, researchers discovered that rubber tappers in Indonesia and tea pickers in Sri Lanka demonstrated reduced physical capacity when they were iron deficient. This directly affected their income. Further studies found that with each 10% increase in hemoglobin, a 15% improvement in productivity of anemic workers occurs. Individuals with good iron nutrition suffer from fewer illnesses and have more strength and energy. Preventing and treating iron deficiency can benefit the whole population of a country, improving quality of life and reducing poverty.

CHILD DEVELOPMENT: *Children need iron for good health, cognitive, behavioral and motor skills development, and physical growth.*

Childhood is a stage of rapid growth and learning. Young children suffer serious negative effects from iron deficiency and anemia. Iron deficiency slows physical growth and mental development. As many as 9 IQ points can be lost due to anemia. Adequate iron nutrition is necessary for the brain to develop and function, motor skills and coordination to increase, and resistance to disease and illness to build up. Young children with iron deficiency are often lethargic and hesitant. With adequate iron, children explore, play, and learn more.

LEARNING CAPACITY: *Iron increases students' learning and success of education programs.*

Reducing iron deficiency can result in significant improvement in verbal and other measurable skills in primary and secondary schoolchildren. Iron deficiency limits attention span and shortens the memory capacity of students. It can result in poor classroom performance, high absenteeism, and early dropout rates.

MATERNAL HEALTH: *Iron helps save the lives of mothers.*

Preventing and treating anemia is a low-cost way to decrease the number of maternal deaths. It is estimated that 1 in 5 maternal deaths could be avoided if the mother was not anemic.

FAMILY CARE: *Iron provides vitality to family caregivers.*

Studies show the damaging effects of anemia on the work output of adults and this extends to work at home. Caring for children, cleaning and maintaining dwellings, participation in the community all suffer as a result of iron deficiency. Devastating effects occur in the well-being of the family.

IRON IMPROVES THE SUCCESS OF OTHER PROGRAMS:

Resources and funds spent on education, health, and social programs are wasted in the face of iron deficiency because it decreases the ability of people to fully benefit from them. Eliminating iron deficiency maximizes the results of resources spent on other human development programs.



HOW TO BEAT IRON DEFICIENCY

THERE ARE PROVEN, COST-EFFECTIVE ACTIONS TO PREVENT AND TREAT IRON DEFICIENCY.

FORTIFICATION OF FOODS

Fortification is a cost-effective way to prevent iron deficiency and anemia across wide sectors of the population.

When a staple food that is affordable and widely consumed is fortified, iron deficiency will decrease. Examples of these foods include: wheat and maize flour, soy and fish sauce, bread, cereals, noodles, and infant weaning foods. For success, consumer education concerning iron nutrition and fortified foods is needed.

IMPROVING DIETARY PRACTICES

Improving dietary consumption of iron-rich local foods is a sustaining action.

Communication programs that encourage proper nutrition and food consumption are effective and sustainable. Community meetings, school programs, and mass media campaigns can convey information on iron-rich diets.

- Daily diets should include foods high in iron (such as meat, beans, dates) along with foods high in vitamin C (citrus fruits, green vegetables) to enhance the absorption of iron.
- Certain drinks (tea, coffee) interfere with the absorption of iron if consumed at mealtimes. Intake of these should be delayed until one hour after a meal.
- Exclusive breastfeeding should be recommended and encouraged up to six months of age since breast milk contains adequate iron for infants.
- During weaning, complementary foods given to infants should be high in iron and vitamin C.

SUPPLEMENTATION

Supplementation is necessary for particular groups of people and for immediate treatment.

Fortified foods and a good diet are not enough if a person is iron deficient or anemic. Consumption of supplements, in the form of pills, syrup, or sprinkles, will raise iron levels and normalize a person's iron stores. Then, dietary improvement and consumption of fortified foods will prevent iron deficiency. At certain stages of the lifecycle everyone may be in need of iron supplements. Particularly vulnerable are:

- **Children (especially under two years of age):** because they are rapidly growing and developing.
- **Adolescents (boys and girls):** this is another time of rapid growth.
- **Women:** pregnant women need double their normal amount of iron in order to supply their growing fetus. Adequate iron is required in preparation for pregnancy and during breastfeeding so that the child can gain adequate weight and develop properly.
- **Men and women performing physically demanding tasks:** so they can maintain their strength and aerobic capacity.

STRENGTHEN OTHER PUBLIC HEALTH MEASURES

Addressing other factors that increase anemia, such as intestinal parasites, malaria, and diarrhea, will help decrease iron deficiency and anemia.

Strengthening programs that provide anthelmintic medicines, insecticide treated bednets, and sanitation infrastructure (such as clean water and latrines) can assist in reducing iron deficiency and are key to long-term success.