Part II: Tools and Resources

Main Menu Part One
Table of Contents
Abbreviations and Acronyms/Units of Measure
Introduction

Statistics/Technical Data
Hemoglobin and Hematocrit Values Defining Anemia at Sea Level
Shifting the Hemoglobin Distribution: Hemoglobin Distribution in Palestinian vs American Children and Women
Anemia Prevalence Rates in Vulnerable Populations, Selected Countries
Anemia Prevalence by Rural/Urban Residence, Selected Countries
Substances That Inhibit and Enhance Absorption of Iron Demands for Iron in Pregnancy
Proportion of Women Utilizing Antenatal Care (ANC) Services and Receiving/Taking Iron or Iron-Folic Acid (IFA) Supplements, Selected Countries

Program Development
Raising Awareness/Program Advocacy: Sample Fact Sheets
  Early Childhood Development
  Iron Overload
Selected Monitoring and Evaluation Indicators for Anemia Prevention and Control Programs
A Tool for Reviewing Micronutrient Programs

Continued
**Part II: Tools and Resources (Continued)**

**Main Menu** Part Two

**Table of Contents**

**Program Development (Continued)**

Qualitative Research Instrument on Perceptions of Anemia and Use of Iron Supplements – The Indramayu Project, Indonesia

  - The Plan
  - The Interview Instruments

**Trials of Improved Practices (TIPS)**

Recommended Intermittent Presumptive Treatment (IPT) or Treatment Regimens for Malaria, Hookworm, and Schistosomiasis

**Iron Supplementation/Food Fortification**

Iron Doses and Three-Month Hemoglobin Increase in Women

Iron and Folic Acid Doses for Universal Supplementation in Vulnerable Groups

Iron and Folic Acid Doses for Treating Severe Anemia in Vulnerable Groups

United States Dietary Reference Intakes for Anemia-Related Micronutrients (Other Than Iron and Folic Acid) for Vulnerable Groups

Counseling Pregnant Women and Mothers About Iron Supplements

  - Counseling Points
    - Sample Counseling Cards From Indonesia
    - Negotiating With Women to Follow Advice
  
Food Fortification: Seven Steps for Quality Control

Information Sources for Anemia Prevention and Control

- References (to Parts I and II)
Part II
Tools and Resources

Anemia Prevention and Control: WHAT WORKS
Anemia Prevention and Control:
WHAT WORKS

Part II
Tools and Resources
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June 2003
Anemia Prevention and Control: What Works

Contents

Part II: Tools and Resources

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbreviations and Acronyms/Units of Measure</td>
<td>5</td>
</tr>
<tr>
<td>Introduction</td>
<td>7</td>
</tr>
<tr>
<td>Statistics/Technical Data</td>
<td></td>
</tr>
<tr>
<td>Hemoglobin and Hematocrit Values Defining Anemia at Sea Level</td>
<td>9</td>
</tr>
<tr>
<td>Shifting the Hemoglobin Distribution: Hemoglobin Distribution in</td>
<td></td>
</tr>
<tr>
<td>Palestinian vs American Children and Women</td>
<td>10</td>
</tr>
<tr>
<td>Anemia Prevalence Rates in Vulnerable Populations, Selected Countries</td>
<td>11</td>
</tr>
<tr>
<td>Anemia Prevalence by Rural/Urban Residence, Selected Countries</td>
<td>19</td>
</tr>
<tr>
<td>Substances That Inhibit and Enhance Absorption of Iron</td>
<td>19</td>
</tr>
<tr>
<td>Demands for Iron in Pregnancy</td>
<td>20</td>
</tr>
<tr>
<td>Proportion of Women Utilizing Antenatal Care (ANC) Services and</td>
<td></td>
</tr>
<tr>
<td>Receiving/Taking Iron or Iron-Folic Acid (IFA) Supplements, Selected</td>
<td>21</td>
</tr>
<tr>
<td>Countries</td>
<td></td>
</tr>
<tr>
<td>Program Development</td>
<td></td>
</tr>
<tr>
<td>Raising Awareness/Program Advocacy: Sample Fact Sheets</td>
<td>23</td>
</tr>
<tr>
<td>Early Childhood Development</td>
<td></td>
</tr>
<tr>
<td>Iron Overload</td>
<td></td>
</tr>
<tr>
<td>Selected Monitoring and Evaluation Indicators for Anemia Prevention</td>
<td></td>
</tr>
<tr>
<td>and Control Programs</td>
<td>26</td>
</tr>
<tr>
<td>A Tool for Reviewing Micronutrient Programs</td>
<td>27</td>
</tr>
<tr>
<td>Qualitative Research Instrument on Perceptions of Anemia and Use</td>
<td></td>
</tr>
<tr>
<td>of Iron Supplements – The Indramayu Project, Indonesia</td>
<td>42</td>
</tr>
<tr>
<td>The Plan</td>
<td></td>
</tr>
<tr>
<td>The Interview Instruments</td>
<td></td>
</tr>
<tr>
<td>Trials of Improved Practices (TIPS)</td>
<td></td>
</tr>
<tr>
<td>Recommended Intermittent Presumptive Treatment (IPT) or</td>
<td></td>
</tr>
<tr>
<td>Treatment Regimens for Malaria, Hookworm, and Schistosomiasis</td>
<td>56</td>
</tr>
</tbody>
</table>
Iron Supplementation/Food Fortification
Iron Doses and Three-Month Hemoglobin Increase in Women . . . . . . 59
Iron and Folic Acid Doses for Universal Supplementation in Vulnerable Groups ................................. 60
Iron and Folic Acid Doses for Treating Severe Anemia in Vulnerable Groups ............................................ 61
United States Dietary Reference Intakes for Anemia-Related Micronutrients (Other Than Iron and Folic Acid) for Vulnerable Groups ................................................................. 62
Counseling Pregnant Women and Mothers About Iron Supplements ............................................................. 63
  Counseling Points
  Sample Counseling Cards From Indonesia
Negotiating With Women to Follow Advice ......................... 67
Food Fortification: Seven Steps for Quality Control ................. 68

Information Sources for Anemia Prevention and Control . . . 69

References (to Parts I and II) ................................. 72
### Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC/SCN</td>
<td>Administrative Committee on Coordination, Sub-Committee on Nutrition (United Nations)</td>
</tr>
<tr>
<td>AED</td>
<td>Academy for Educational Development</td>
</tr>
<tr>
<td>AIDS</td>
<td>acquired immunodeficiency syndrome</td>
</tr>
<tr>
<td>ANC</td>
<td>antenatal care</td>
</tr>
<tr>
<td>BASICS</td>
<td>Basic Support for Institutionalizing Child Survival (Project)</td>
</tr>
<tr>
<td>BF</td>
<td>breastfeeding</td>
</tr>
<tr>
<td>CARE</td>
<td>Cooperative for Assistance and Relief Everywhere</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention (United States)</td>
</tr>
<tr>
<td>CF</td>
<td>complementary foods</td>
</tr>
<tr>
<td>CIDA</td>
<td>Canadian International Development Authority</td>
</tr>
<tr>
<td>DHS</td>
<td>Demographic and Health Survey</td>
</tr>
<tr>
<td>ECD</td>
<td>early childhood development</td>
</tr>
<tr>
<td>EDTA</td>
<td>ethylene diamine tetra-acetate</td>
</tr>
<tr>
<td>FANTA</td>
<td>Food and Nutrition Technical Assistance (Project)</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization (United Nations)</td>
</tr>
<tr>
<td>FGD</td>
<td>focus group discussion</td>
</tr>
<tr>
<td>GTZ</td>
<td>Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)</td>
</tr>
<tr>
<td>Hb</td>
<td>hemoglobin</td>
</tr>
<tr>
<td>hct</td>
<td>hematocrit</td>
</tr>
<tr>
<td>HIV</td>
<td>human immunodeficiency virus</td>
</tr>
<tr>
<td>IASG</td>
<td>Interagency Anemia Steering Group</td>
</tr>
<tr>
<td>IDRC</td>
<td>International Development Research Centre</td>
</tr>
<tr>
<td>IEC</td>
<td>information, education, and communication</td>
</tr>
<tr>
<td>IFA</td>
<td>iron-folic acid</td>
</tr>
<tr>
<td>ILSI</td>
<td>International Life Sciences Institute</td>
</tr>
<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood Illness</td>
</tr>
<tr>
<td>INACG</td>
<td>International Nutritional Anemia Consultative Group</td>
</tr>
<tr>
<td>IPT</td>
<td>intermittent presumptive treatment (malaria)</td>
</tr>
<tr>
<td>IUD</td>
<td>intrauterine device</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>IVIC</td>
<td>Instituto Venezolana de Investigaciones Cientificas</td>
</tr>
<tr>
<td>LAM</td>
<td>Lactational Amenorrhea Method</td>
</tr>
<tr>
<td>MEDS</td>
<td>Monitoring, Evaluation and Design Support (Project)</td>
</tr>
<tr>
<td>MI</td>
<td>Micronutrient Initiative</td>
</tr>
<tr>
<td>MOH</td>
<td>ministry of health</td>
</tr>
<tr>
<td>MOST</td>
<td>Micronutrient Operational Strategies and Technologies (Project)</td>
</tr>
<tr>
<td>NGO</td>
<td>nongovernmental organization</td>
</tr>
<tr>
<td>NHHS</td>
<td>National Household Survey (Indonesia)</td>
</tr>
<tr>
<td>NID</td>
<td>national immunization day</td>
</tr>
<tr>
<td>OMNI</td>
<td>Opportunities for Micronutrient Interventions (Project)</td>
</tr>
<tr>
<td>PAHO</td>
<td>Pan American Health Organization</td>
</tr>
<tr>
<td>PATH</td>
<td>Program for Appropriate Technology in Health</td>
</tr>
<tr>
<td>PHNI</td>
<td>Population, Health and Nutrition Information (Project)</td>
</tr>
<tr>
<td>SCN</td>
<td>Standing Committee on Nutrition (United Nations)</td>
</tr>
<tr>
<td>TBA</td>
<td>traditional birth attendant</td>
</tr>
<tr>
<td>TIPS</td>
<td>Trials of Improved Practices</td>
</tr>
<tr>
<td>TT</td>
<td>tetanus toxoid</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children's Fund</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>UNU</td>
<td>United Nations University</td>
</tr>
<tr>
<td>VAD</td>
<td>vitamin A deficiency</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>

**Units of Measure**

- **dL**  deciliter
- **g**  gram
- **kg**  kilogram
- **L**  liter
- **mcg**  microgram
- **mg**  milligram
- **mL**  milliliter
Introduction

Anemia is defined as a low level of hemoglobin in the blood, as evidenced by a reduced quality or quantity of red blood cells. It has serious negative consequences, including increased mortality in women and children, decreased capacity to learn, and decreased productivity in all individuals. Its devastating effects on health and physical and mental productivity affect quality of life and translate into significant economic losses for individuals and for countries with high anemia prevalence.

Anemia is one of the world’s most widespread health problems. It affects more than 2 billion people worldwide – one-third of the world’s population – and is a significant public health problem throughout the developing world. In almost all developing countries, between one-third and one-half of the female and child populations are anemic. Prevalence among pregnant women and children under 2 years of age (the groups at highest risk) is typically more than 50 percent. The World Health Organization lists iron deficiency, a major cause of anemia, as one of the 10 top risk factors in developing countries for “lost years of healthy life.”

Anemia has multiple causes. Its direct causes can be broadly categorized as poor, insufficient, or abnormal red blood cell production; excessive red blood cell destruction; and excessive red blood cell loss. Contributing causes include poor nutrition related to dietary intake, dietary quality, sanitation, and health behaviors; adverse environmental conditions; lack of access to health services; and poverty. The relative importance of these causes varies by region.

Iron deficiency causes 50 percent of all anemia worldwide. Supplementing dietary iron with iron tablets, syrups, drops, or elixirs, and fortifying processed foods and condiments with iron are the best offense and defense against this cause of anemia. Where fortification has been evaluated in specific populations, it has improved iron status and reduced anemia prevalence. In most developing countries, however, food industries are not well developed. Where they are developed, most people cannot afford to buy fortified foods. Supplementing dietary iron can meet the iron needs of vulnerable groups who do not consume fortified foods. Iron supplementation also has the advantage of meeting the needs of vulnerable groups such as pregnant women and young children, whose high iron requirements cannot be met only with fortified staple foods. Iron supplementation targeted at vulnerable groups and iron fortification of a staple food or food condiments are the most cost-effective means of addressing iron-deficiency anemia in developing countries where the feasibility of general dietary improvement is limited.

Because anemia has many causes in addition to iron deficiency, many types of programs in the health sector and other social sectors have the potential to contribute to anemia prevention and control. An anemia component can and should be part of programs or activities in:

- Nutrition
- Infectious and parasitic diseases
- Antenatal care and safe motherhood
- Family planning and reproductive health

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1 The 2002 World Health Report of the World Health Organization uses this concept to measure the impact of a number of health problems, including anemia.
• Child health
• Schools
• HIV/AIDS prevention and treatment
• Food aid and security
• Environmental health
• Commercial sector: food and pharmaceutical manufacturers, marketers, and distributors

Sector-specific activities, when implemented as part of an overall strategy to prevent and control anemia, can significantly reduce the prevalence of anemia and its debilitating consequences in targeted populations. In most cases, it is possible to add anemia prevention or control activities to an already existing health or health-related program without large investments of time or resources.

Raising awareness of anemia prevention and control, promoting behavior change in the community, advocating for increased funding for national anemia programming, and training to build capacity among health workers are activities that can be implemented by any and all sectors, and across sectors. They are most effective when approached in a coordinated and targeted manner.

Health professionals, governments, donors, nongovernmental organizations, the commercial sector, and civil society all have roles to play in achieving worldwide anemia prevention and control. Effectively implementing interventions requires an integrated approach of financial, technical, and political commitment and support. Partnerships and collaboration among these various players should be built at the national, provincial/state, district, and local levels from the outset of anemia programming. Input from and coordination among all potential parties is most critical in the key initial phase of planning an anemia strategy.

The presentation of good anemia prevention and control practices in Part I: Program Guidance of Anemia Prevention and Control: What Works – knowing what has worked for others – facilitates taking action against anemia. Here, Part II: Tool and Resources provides background data, qualitative research instruments and methodologies, norms and protocols, and references that managers can use to design, implement, and monitor programs and share with others engaged or interested in anemia prevention and control. The materials appear in the order in which they are referred to in Program Guidance.
<table>
<thead>
<tr>
<th>Age or Sex Group</th>
<th>All Anemia</th>
<th>Mild Anemia</th>
<th>Moderate Anemia</th>
<th>Severe Anemia</th>
<th>All Anemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children 6-59 mos.</td>
<td>&lt; 11.0</td>
<td>10-10.9</td>
<td>7.0-9.9</td>
<td>&lt; 7.0</td>
<td>&lt; 33</td>
</tr>
<tr>
<td>Children 5-11 yrs.</td>
<td>&lt; 11.5</td>
<td>10-11.4</td>
<td>7.0-9.9</td>
<td>&lt; 7.0</td>
<td>&lt; 34</td>
</tr>
<tr>
<td>Children 12-14 yrs.</td>
<td>&lt; 12.0</td>
<td>10-11.9</td>
<td>7.0-9.9</td>
<td>&lt; 7.0</td>
<td>&lt; 36</td>
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<tr>
<td>Nonpregnant women &gt; 15 yrs.</td>
<td>&lt; 12.0</td>
<td>10-11.9</td>
<td>7.0-9.9</td>
<td>&lt; 7.0</td>
<td>&lt; 36</td>
</tr>
<tr>
<td>Pregnant women</td>
<td>&lt; 11.0</td>
<td>10-10.9</td>
<td>7.0-9.9</td>
<td>&lt; 7.0</td>
<td>&lt; 33</td>
</tr>
<tr>
<td>Men &gt; 15 yrs.</td>
<td>&lt; 13.0</td>
<td>12-12.9</td>
<td>9.0-11.9</td>
<td>&lt; 9.0</td>
<td>&lt; 39</td>
</tr>
</tbody>
</table>

Notes:
1 Hemoglobin is an oxygen-carrying protein in red blood cells that binds oxygen through its iron component. Hemoglobin concentration in whole blood is a common indicator for diagnosing anemia. Hematocrit is another commonly used indicator for anemia. It is the percent of whole blood made up of red blood cells. Low hematocrit is indicative of anemia.
2 Hemoglobin values defining anemia change as altitude increases. Medical and/or research resources should be consulted about the most appropriate estimates of hemoglobin values defining anemia in high-altitude populations, as these may change by age group and location.

Source: WHO/UNICEF/UNU (2001); values used in Demographic and Health Surveys.
Shifting the Hemoglobin Distribution:
Hemoglobin Distribution in Palestinian vs American Children and Women

Source: Yip et al. (1996).

These figures show hemoglobin distributions for Palestinian children and women compared to children and women in the United States. For anemia control, the desired approach is to prevent and treat all anemia, which will shift the entire distribution curve to the right (and make the curves above for Palestinian children and women align more closely with those for children and women in the United States, where anemia prevalence is low). Treating only severe anemia will change the configuration of the tail of the curve on the left but not shift the entire curve to the right as desired.
<table>
<thead>
<tr>
<th>WHO Region Country (Year)</th>
<th>Pregnant Women</th>
<th>Women of Reproductive Age</th>
<th>Children 0-2 Years</th>
<th>Children 2-5 Years and/or 0-5 Years</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Ghana (1999)</td>
<td>67%</td>
<td>59% (breastfeeding women)</td>
<td></td>
<td>84%</td>
<td>Schoolchildren: 71%</td>
</tr>
<tr>
<td>Madagascar (1997)</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Mali (2001)</td>
<td>73.4% (5.2% severe, 43.6% moderate, 24.5% mild)</td>
<td>63.1% (breastfeeding women) (2.6% severe, 18.5% moderate, 41.21% mild)</td>
<td>85.1% (15.4% severe, 56.0% moderate, 13.7% mild)</td>
<td>82.7% (children 6-59 mos.) (11.5% severe, 53.0% moderate, 18.2% mild)</td>
<td></td>
</tr>
<tr>
<td>The Gambia (1999)</td>
<td>73% (5% severe)</td>
<td>56% (breastfeeding women) (2% severe)</td>
<td>88% (children 1-2 yrs.) (18% severe)</td>
<td>76% (children 1-5 yrs.) (15% severe)</td>
<td></td>
</tr>
<tr>
<td>South Africa (1996)</td>
<td></td>
<td></td>
<td></td>
<td>21% (children 6-71 mos.)</td>
<td></td>
</tr>
<tr>
<td>Uganda (2000/01)</td>
<td>41.2% (2.0% severe, 17.1% moderate, 22.1% mild)</td>
<td>30.3% (all women 15-49 yrs.) (0.7% severe, 7.5% moderate, 22.1% mild)</td>
<td>78.9% (children 6-23 mos.) (12.4% severe, 49.9% moderate, 16.6% mild)</td>
<td>64% (children 6-59 mos.) (6.5% severe, 37.1% moderate, 20.5% mild)</td>
<td>Men 15-54 yrs.: 18.3% (1% severe, 7.4 moderate, 9.9% mild)</td>
</tr>
<tr>
<td>Zambia (1999)</td>
<td>46.9%</td>
<td>39% (1.2% severe)</td>
<td></td>
<td>65% (14.5% severe)</td>
<td>Men: 26%</td>
</tr>
<tr>
<td>WHO Region Country (Year)</td>
<td>Pregnant Women</td>
<td>Women of Reproductive Age</td>
<td>Children 0-2 Years</td>
<td>Children 2-5 Years and/or 0-5 Years</td>
<td>Other</td>
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<tr>
<td><strong>Americas &amp; Caribbean</strong></td>
<td></td>
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</tr>
<tr>
<td>Bolivia (1997)</td>
<td></td>
<td>27.2% (0.9% severe, 5.6% moderate, 20.7% mild)</td>
<td>73.8% (children 6-23 mos.) (5.5% severe, 49.4% moderate, 18.9% mild)</td>
<td>66.7% (children 6-35 mos.) (4.5% severe, 41.8% moderate, 20.4% mild)</td>
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</tr>
<tr>
<td>Haiti (2000)</td>
<td>63.3% (3.7% severe, 29.6% moderate, 30.0% mild)</td>
<td>55.1% (all women 15-49 yrs.) (3% severe, 15.8% moderate, 36.3% mild)</td>
<td>80.7% (children 6-23 mos.) (1.9% severe, 48.9% moderate, 29.9% mild)</td>
<td>65.3% (children 6-59 mos.) (1.6% severe, 33.8% moderate, 29.9% mild)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>52.8% (breastfeeding women) (2.2% severe, 14.3% moderate, 36.3% mild)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>54.9% (nonpregnant, nonbreastfeeding women) (3.2% severe, 14.7% moderate, 37% mild)</td>
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</tr>
<tr>
<td>Jamaica (1992)</td>
<td>1982: 61.6%</td>
<td></td>
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<tr>
<td></td>
<td>1987: 53.0%</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mexico (1999)</td>
<td>26.4%</td>
<td>20.0%</td>
<td>48.8% (children 6-23 mos.)</td>
<td>27.2% (children 6-59 mos.)</td>
<td>School-age boys: 19.0%</td>
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<td>School-age girls: 20.1%</td>
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<td>Montserrat (1992)</td>
<td>1982: 82.3%</td>
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<td>1985: 22.1%</td>
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<td>WHO Region Country (Year)</td>
<td>Pregnant Women</td>
<td>Women of Reproductive Age</td>
<td>Children 0-2 Years</td>
<td>Children 2-5 Years and/or 0-5 Years</td>
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<td>Americas &amp; Caribbean (cont.)</td>
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<td>Peru (1996, 2000)</td>
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<tr>
<td><strong>1996</strong>: 35.1%</td>
<td><strong>1996</strong>: 35.8% (women 15-49 yrs.)</td>
<td><strong>1996</strong>: 76.6% (children 6-23 mos.)</td>
<td><strong>1996</strong>: 56.7% (children 6-59 mos.)</td>
<td><strong>1996</strong>: 56.7% (children 6-59 mos.)</td>
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<tr>
<td>(0% severe,</td>
<td>(0.5% severe, 8.1% moderate, 27.2% mild)</td>
<td>(3.8% severe, 46% moderate, 26.8% mild)</td>
<td>(1.5% severe, 29.7% moderate, 25.5% mild)</td>
<td>(1.5% severe, 29.7% moderate, 25.5% mild)</td>
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<tr>
<td>16.1% moderate,</td>
<td>47.1% (breastfeeding women) (0.4% severe, 9.5% moderate, 37.2% mild)</td>
<td>46.8% (children 24-59 mos.) (0.4% severe, 21.5% moderate, 24.9% mild)</td>
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<tr>
<td>19.0% mild)</td>
<td>32.8% (nonpregnant, nonbreastfeeding women) (0.5% severe, 7.2% moderate, 25.1% mild)</td>
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<td></td>
<td>45.8% (women using IUD) (1.2% severe, 17.7% moderate, 26.9% mild)</td>
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<tr>
<td><strong>2000</strong>: 38.6%</td>
<td><strong>2000</strong>: 31.6% (all women 15-49 yrs.)</td>
<td><strong>2000</strong>: 68.8% (children 6-23 mos.)</td>
<td><strong>2000</strong>: 31.6%</td>
<td><strong>2000</strong>: 49.6% (children 6-59 mos.)</td>
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<tr>
<td>(2% severe,</td>
<td>(0.3% severe, 5.9% moderate, 25.4% mild)</td>
<td>(2.8% severe, 40.6% moderate, 25.4% mild)</td>
<td>(children 6-23 mos.) (2.8% severe, 40.6% moderate, 25.4% mild)</td>
<td>(1.3% severe, 24.9% moderate, 23.4% mild)</td>
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<tr>
<td>17% moderate,</td>
<td>40.1% (breastfeeding women) (0.2% severe, 7.1% moderate, 32.8% mild)</td>
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<tr>
<td>19.6% mild)</td>
<td>29.6% (nonpregnant, nonbreastfeeding women) (0.2% severe, 5.0% moderate, 24.4% mild)</td>
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<tr>
<td>St. Vincent &amp; the Grenadines (1992)</td>
<td><strong>1985</strong>: 25% (Hb &lt; 10 g/dL)</td>
<td></td>
<td><strong>1996</strong>: 35.8% (women 15-49 yrs.)</td>
<td><strong>1996</strong>: 56.7% (children 6-59 mos.)</td>
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<td></td>
<td><strong>1990</strong>: 14.5% (Hb &lt; 10 g/dL)</td>
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<td>(0.5% severe, 8.1% moderate, 27.2% mild)</td>
<td>(1.5% severe, 29.7% moderate, 25.5% mild)</td>
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<td></td>
<td>47.1% (breastfeeding women) (0.4% severe, 9.5% moderate, 37.2% mild)</td>
<td>46.8% (children 24-59 mos.) (0.4% severe, 21.5% moderate, 24.9% mild)</td>
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<tr>
<td>United States (1993)</td>
<td>33% (low-income women in last trimester)</td>
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<tr>
<td>WHO Region Country (Year)</td>
<td>Pregnant Women</td>
<td>Women of Reproductive Age</td>
<td>Children 0-2 Years</td>
<td>Children 2-5 Years and/or 0-5 Years</td>
<td>Other</td>
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<td><strong>South East Asia</strong></td>
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<tr>
<td>India (1998/99)</td>
<td>49.7% (2.5% severe, 25.4% moderate, 21.8% mild)</td>
<td>51.8% (ever-married women 15-49 yrs.) (1.9% severe, 14.8% moderate, 35% mild) 56.4% (breastfeeding women 15-49 yrs.) (1.6% severe, 15.8% moderate, 35.1% mild) 50.4% (nonpregnant, nonbreastfeeding women 15-49 yrs.) (1.9% severe, 13.4% moderate, 35.1% mild)</td>
<td>77% (children 12-23 mos.) (6.3% severe, 49.4% moderate, 22% mild)</td>
<td>74.3% (children 6-35 mos.) (5.4% severe, 45.9% moderate, 22.9% mild)</td>
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<tr>
<td>Nepal (1997/98)</td>
<td>74.6% (5.7% severe, 68.9% moderate/mild)</td>
<td>66.7% (nonpregnant women) (1.7% severe, 65% moderate/mild)</td>
<td>88% (children 6-23 mos.) (4.5% severe, 83.5% moderate/mild)</td>
<td>78% (children 6-59 mos.) (3.1% severe, 74.9% moderate/mild) 70% (children 24-59 mos.) (1.9% severe, 67.8% moderate/mild)</td>
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<tr>
<td>Sri Lanka (1994)</td>
<td>39% (maternal anemia)</td>
<td>45% (nonpregnant women)</td>
<td>55% (children 3-24 mos.)</td>
<td>30% (children 36-59 mos.)</td>
<td>Children 5-10 yrs.: 58% Adolescents: 36%</td>
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<tr>
<td><strong>Europe/Central Asia</strong></td>
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<tr>
<td>Armenia (2000)</td>
<td>12% (0% severe, 4.6% moderate, 7.4% mild)</td>
<td>12.4% (all women 15-49 yrs.) (0.3% severe, 2% moderate, 10.2% mild) 12.9% (breastfeeding women) (0.4% severe, 1.8% moderate, 10.7% mild) 12.4% (nonpregnant, nonbreastfeeding women) (0.2% severe, 1.9% moderate, 10.3% mild) 15.5% (women currently using an IUD) (0% severe, 1.3% moderate, 14.2% mild) 12.2% (women not currently using an IUD) (0.3% severe, 2% moderate, 9.9% mild)</td>
<td>42.3% (children 6-23 mos.) (0.9% severe, 18.9% moderate, 22.5% mild)</td>
<td>23.9% (children 6-59 mos.) (0.4% severe, 9.6% moderate, 14% mild) 15.6% (children 24-59 mos.) (13% severe, 5.3% moderate, 10.1% mild)</td>
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<tr>
<td>WHO Region Country (Year)</td>
<td>Pregnant Women</td>
<td>Women of Reproductive Age</td>
<td>Children 0-2 Years and/or 0-5 Years</td>
<td>Other</td>
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<tr>
<td>Europe/Central Asia (cont.)</td>
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<tr>
<td>Kazakhstan (1995, 1999)</td>
<td>1995: 28.3% (moderate anemia)</td>
<td>1995: 48.8% (women 15-49 yrs.) (1.1% severe, 10.6% moderate, 37.1% mild)</td>
<td>1995: 73.7% (children 0-23 mos.) (4.9% severe, 36.2% moderate, 32.6% mild)</td>
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<td></td>
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<td>Women using IUDs: 2.0% severe, 13.2% moderate</td>
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<td>Women not using IUDs: 0.8% severe, 9.6% moderate</td>
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<td>Breastfeeding women: 14.4% moderate</td>
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<td>Nonpregnant, nonbreastfeeding women: 9.5% moderate</td>
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<td>1995: 35.5% (all women 15-49 yrs.) (1.2% severe, 7.7% moderate, 26.6% mild)</td>
<td>1995: 69.2% (children &lt; 3 yrs.) (5.5% severe, 33.6% moderate, 30.1% mild)</td>
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<td></td>
<td>45.9% (women 15-49 yrs. using an IUD) (2.5% severe, 12% moderate, 31.4% mild)</td>
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<td>31.4% (women not using an IUD) (0.7% severe, 5.9% moderate, 24.8% mild)</td>
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<tr>
<td>Kyrgyz Republic (1997)</td>
<td>17% (moderate anemia)</td>
<td>38% (all women 15-49 yrs.) (1.4% severe, 9.1% moderate, 27.5% mild)</td>
<td>49.8% (children &lt; 3 yrs.) (1.4% severe, 24% moderate, 24.4% mild)</td>
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<td>Breastfeeding women: 9% moderate</td>
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<td>Nonpregnant, nonlactating women: 7.8% moderate</td>
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<td>IUD users: 2% severe, 11% moderate</td>
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<td>Non-IUD users: 1.3% severe, 8.2% moderate</td>
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<td></td>
<td>1995: 36.3% (women 15-49 yrs.) (1.4% severe, 17% moderate, 17.9% mild)</td>
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<tr>
<td>WHO Region Country (Year)</td>
<td>Pregnant Women</td>
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<td>Children 2-5 Years and/or 0-5 Years</td>
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<td>Europe/Central Asia (cont.)</td>
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<tr>
<td>Turkmenistan (2000)</td>
<td>47.3% (women 15-49 yrs.) (1.1% severe, 8.4% moderate, 37.8% mild)</td>
<td>37.8% (children 0-24 mos.) (0.5% severe, 18% moderate, 19.3% mild)</td>
<td>35.8% (children &lt; 5 yrs.) (0.6% severe, 15.9% moderate, 19.3% mild)</td>
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<td>55.5% (women currently using an IUD) (1.7% severe, 9.8% moderate, 44% mild)</td>
<td>35.2% (children 24-59 mos.) (0.6% severe, 15.4% moderate, 19.2% mild)</td>
<td>35.2% (children 24-59 mos.) (0.6% severe, 15.4% moderate, 19.2% mild)</td>
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<td>44.7% (women not currently using an IUD) (0.9% severe, 7.9% moderate, 35.9% mild)</td>
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<tr>
<td>Uzbekistan (1996)</td>
<td>26.9% (moderate anemia)</td>
<td>60.4% (all women 15-49 yrs.) (0.9% severe, 14.2% moderate, 45.3% mild)</td>
<td>60.8% (children &lt; 3 yrs.) (1.2% severe, 25.6% moderate, 34% mild)</td>
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<td></td>
<td>12.8% (Nonpregnant, nonbreastfeeding women)</td>
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<td></td>
<td>Breastfeeding women: 14.9% moderate</td>
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<td></td>
<td>IUD users: 1.5% severe, 16.8% moderate</td>
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<td>Non-IUD users: 0.6% severe, 12.9% moderate</td>
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<tr>
<td>WHO Region Country (Year)</td>
<td>Pregnant Women</td>
<td>Women of Reproductive Age</td>
<td>Children 0-2 Years</td>
<td>Children 2-5 Years and/or 0-5 Years</td>
<td>Other</td>
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<tr>
<td>E. Mediterranean</td>
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<tr>
<td>Egypt (2000)</td>
<td>45.4% (0.6% severe, 9.7% moderate, 35.1% mild)</td>
<td>29.2% (women 15-49 yrs.) (0.3% severe, 4.6% moderate, 24.3% mild)</td>
<td>40.8% (children 6-23 mos.) (0.2% severe, 11.2% moderate, 18.5% mild)</td>
<td>29.9% (children 6-59 mos.) (0.2% severe, 11.2% moderate, 18.5% mild)</td>
<td>11- to 19-yr.-olds: 29.7% (0.1% severe, 1.7% moderate, 27.9% mild)</td>
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<td>31.9% (breastfeeding women) (0.2% severe, 4.3% moderate, 27.4% mild)</td>
<td></td>
<td>24.3% (children 24-59 mos.) (0.1% severe, 7.7% moderate, 16.5% mild)</td>
<td>11- to 19-yr.-old girls: 29% (0.1% severe, 2.8% moderate, 26.1% mild)</td>
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<td>26.3% (nonpregnant, nonbreastfeeding women) (0.3% severe, 4% moderate, 22% mild)</td>
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<td>11- to 19-yr.-old boys: 30.3% (0.1 severe, 0.7% moderate, 29.5% mild)</td>
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<td>30.2% (IUD users) (0.1% severe, 4.4% moderate, 25.7% mild)</td>
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<tr>
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<td></td>
<td>28.6% (non-IUD users (0.4% severe, 4.6% moderate, 23.6% mild)</td>
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<tr>
<td>Gaza (1998)</td>
<td>53.9% (third trimester)</td>
<td>67.7% (6-11 mos.)</td>
<td>38.4% (24-35 mos.)</td>
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<tr>
<td>United Arab Emirates (1996)</td>
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<td>58.9% (12-23 mos.)</td>
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<td>children 6 mos-6.9 yrs: 31%</td>
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<tr>
<td>WHO Region Country (Year)</td>
<td>Pregnant Women</td>
<td>Women of Reproductive Age</td>
<td>Children 0-2 Years</td>
<td>Children 2-5 Years and/or 0-5 Years</td>
<td>Other</td>
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<tr>
<td><strong>Western Pacific</strong></td>
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<tr>
<td>Cambodia (2000)</td>
<td>66.4% (4.3% severe, 35.2% moderate, 26.9% mild)</td>
<td>57.8% (women 15-49 yrs.) (1.3% severe, 12.7% moderate, 43.8% mild)</td>
<td>81.7% (children 6-23 mos.) (3.6% severe, 49.2% moderate, 28.9% mild)</td>
<td>63.4% (children 6-59 mos.) (2% severe, 30.6% moderate, 30.8% mild)</td>
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<td>66.1% (breastfeeding women) (2.6% severe, 16.8% moderate, 46.7% mild)</td>
<td>55.1% (nonpregnant, nonbreastfeeding women) (0.7% severe, 9.9% moderate, 44.5% mild)</td>
<td>55.4% (children 24-59 mos.) (1.3% severe, 22.5% moderate, 31.6% mild)</td>
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<tr>
<td>Indonesia (1995)</td>
<td>50.9%</td>
<td>39.5% (women 15-44 yrs.)</td>
<td>40.5% (children 0-5 yrs.)</td>
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<td>Girls 10-14 yrs.: 57.3%</td>
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<td>Schoolchildren 5-11 yrs.: 47.2%</td>
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<tr>
<td>Philippines (2000)</td>
<td>50.3%</td>
<td>45.7% (lactating women)</td>
<td>56.6% (infants)</td>
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<tr>
<td>Thailand (1996/7)</td>
<td>15% urban 20% rural</td>
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<td>25%</td>
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<td>Men: 13%</td>
</tr>
<tr>
<td>Vietnam (1996)</td>
<td>52.5%</td>
<td>42.8% (nonpregnant women)</td>
<td>61% (children 0-5 mos.) 59.5% (children 6-11 mos.)</td>
<td>46.3% (children 6 mos-5 yrs.) 28.2% (children 24-60 mos.)</td>
<td>Schoolboys 8-14 yrs.: 23.7%</td>
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<td>Schoolgirls 8-14 yrs.: 19.3%</td>
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<td>Schoolboys 8-14 yrs. (urban): 15.4%</td>
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<td>Schoolgirls 8-14 yrs. (urban): 11.0%</td>
</tr>
</tbody>
</table>
## Anemia Prevalence by Rural/Urban Residence, Selected Countries

<table>
<thead>
<tr>
<th>Country, Year</th>
<th>Preschool Children (%)</th>
<th>Women of Reproductive Age (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td>Urban</td>
</tr>
<tr>
<td>Armenia, 2000</td>
<td>32.8</td>
<td>15.6</td>
</tr>
<tr>
<td>Bolivia, 1998</td>
<td>74.9</td>
<td>61.1</td>
</tr>
<tr>
<td>Cambodia, 2000</td>
<td>64.4</td>
<td>57.3</td>
</tr>
<tr>
<td>Egypt, 2000</td>
<td>34.0</td>
<td>23.6</td>
</tr>
<tr>
<td>Haiti, 2000</td>
<td>65.9</td>
<td>63.9</td>
</tr>
<tr>
<td>India, 1998/9</td>
<td>75.3</td>
<td>70.8</td>
</tr>
<tr>
<td>Kazakhstan, 1999</td>
<td>40.3</td>
<td>30.1</td>
</tr>
<tr>
<td>Kyrgyz Rep., 1997</td>
<td>53.1</td>
<td>38.5</td>
</tr>
<tr>
<td>Madagascar, 1997</td>
<td>66.9</td>
<td>66.7</td>
</tr>
<tr>
<td>Peru, 2000</td>
<td>53.5</td>
<td>46.7</td>
</tr>
<tr>
<td>Turkmenistan, 2000</td>
<td>32.6</td>
<td>40.9</td>
</tr>
<tr>
<td>Uganda, 2000/01</td>
<td>66.6</td>
<td>51.2</td>
</tr>
<tr>
<td>Uzbekistan, 1996</td>
<td>62.1</td>
<td>57.5</td>
</tr>
</tbody>
</table>

Source: Macro International Demographic and Health Surveys.

## Substances That Inhibit and Enhance Absorption of Iron

<table>
<thead>
<tr>
<th>Inhibitors</th>
<th>Enhancers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phytates</strong></td>
<td>Vitamin C (ascorbic acid)</td>
</tr>
<tr>
<td>Food sources: Whole grains (maize, millet, rice, wheat sorghum), cereal bran, grains, flour made from whole grains, legumes (soybeans), nuts, seeds</td>
<td>Food sources: Fruits and vegetables</td>
</tr>
<tr>
<td><strong>Polyphenols (e.g., tannins)</strong></td>
<td>Animal blood, organ, and muscle products</td>
</tr>
<tr>
<td>Food sources: Legumes (green and brown lentils), tea, coffee, cocoa, eggplant, green leafy vegetables (spinach, beetroot greens)</td>
<td>Food sources: Meat, poultry, fish and other seafood</td>
</tr>
<tr>
<td><strong>Calcium salts</strong></td>
<td>Food processing</td>
</tr>
<tr>
<td>Food sources: Milk products, tortillas prepared with calcium oxide</td>
<td>Food sources: Some fermented and germinated foods (soy sauce, miso, leavened bread)</td>
</tr>
<tr>
<td><strong>Oxalates</strong></td>
<td>Citric and other organic acids</td>
</tr>
<tr>
<td>Food sources: Green leafy vegetables (spinach, beetroot greens)</td>
<td></td>
</tr>
<tr>
<td><strong>Plant protein</strong></td>
<td></td>
</tr>
<tr>
<td>Food sources: Legumes (soybeans), nuts</td>
<td></td>
</tr>
</tbody>
</table>

### Demands for Iron in Pregnancy*

<table>
<thead>
<tr>
<th>Iron Losses</th>
<th>Amount (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fetus</td>
<td>270</td>
</tr>
<tr>
<td>Umbilical cord and placenta</td>
<td>90</td>
</tr>
<tr>
<td>Maternal blood loss</td>
<td>150</td>
</tr>
<tr>
<td>Obligatory losses from the gut, etc.</td>
<td>230</td>
</tr>
<tr>
<td>Expansion of maternal red cell mass</td>
<td>450</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>1,190</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Iron Gains</th>
<th>Amount (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraction of red cell mass after delivery</td>
<td>450</td>
</tr>
<tr>
<td>Absence of menstruation in pregnancy</td>
<td>160</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>610</strong></td>
</tr>
</tbody>
</table>

**Net Losses (1,190 - 610)**                      | 580         |

* estimated demands for a 55-kg iron-replete woman

*Source: Bothwell (2000).*
<table>
<thead>
<tr>
<th>Country, Year(s)</th>
<th>% Women Receiving ANC From Trained Provider</th>
<th>% Women With 4+ANC Visits</th>
<th>% Women With First ANC Visit at &lt; 4-6 Mos. Pregnant</th>
<th>% Women Receiving/Taking Iron or IFA Supplements¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia, '00</td>
<td>92.6</td>
<td>64.7</td>
<td>74.6 (&lt; 4 mos.) 86.3 (&lt; 6 mos.)</td>
<td>1.4 for 90+ days</td>
</tr>
<tr>
<td>Bangladesh, '99-00</td>
<td>33.7</td>
<td>10.5</td>
<td>23.3 (&lt; 6 mos.)</td>
<td>36.4</td>
</tr>
<tr>
<td>Cambodia, '00</td>
<td>37.7</td>
<td>8.9</td>
<td>23.3 (&lt; 6 mos.)</td>
<td>20.7 (90+ tablets = 2.4%)</td>
</tr>
<tr>
<td>Colombia, '00</td>
<td>90.8</td>
<td>81.0</td>
<td>85.5 (&lt; 5 mos.)</td>
<td>76.8</td>
</tr>
<tr>
<td>Egypt, '00</td>
<td>52.9</td>
<td>36.7</td>
<td>48.6 (&lt; 6 mos.)</td>
<td>28</td>
</tr>
<tr>
<td>Eritrea, '95</td>
<td>49.2</td>
<td>26.6</td>
<td>NA</td>
<td>29.5</td>
</tr>
<tr>
<td>Gabon, '00</td>
<td>91.6</td>
<td>63.3</td>
<td>85.4 (&lt; 6 mos.)</td>
<td>59.7</td>
</tr>
<tr>
<td>Ghana, '98</td>
<td>89.0</td>
<td>62.3</td>
<td>74.8</td>
<td>77</td>
</tr>
<tr>
<td>Haiti, '00</td>
<td>78.8</td>
<td>44.2</td>
<td>66.5</td>
<td>46.8 (90+ tablets = 10.8%)</td>
</tr>
<tr>
<td>India, '98/9</td>
<td>65.1</td>
<td>29.5</td>
<td>58.2</td>
<td>58 (3-mo. supply = 47.9%)</td>
</tr>
<tr>
<td>India, '92/3</td>
<td>61.9</td>
<td>26.9</td>
<td>51.0</td>
<td>50.5</td>
</tr>
<tr>
<td>Indonesia, '94</td>
<td>82.3</td>
<td>63.1</td>
<td>75.3 (&lt; 5 mos.)</td>
<td>67.1 (90+ tablets = 14%)</td>
</tr>
<tr>
<td>Indonesia, '97</td>
<td>89.4</td>
<td>70.4</td>
<td>82.6 (&lt; 5 mos.)</td>
<td>74.3 (90+ tablets = 24%)</td>
</tr>
<tr>
<td>Kazakhstan, '99</td>
<td>94.4</td>
<td>70.0</td>
<td>92.2 (&lt; 5 mos.)</td>
<td>48.1 (taking iron in current or last pregnancy for 29 days)</td>
</tr>
<tr>
<td>Kuwait, '96</td>
<td>98.5</td>
<td>76.5 (5+ visits)</td>
<td>NA</td>
<td>51</td>
</tr>
<tr>
<td>Malawi, '00</td>
<td>91.4</td>
<td>56.0</td>
<td>49.1 (&lt; 5 mos.)</td>
<td>69.7 (90+ tablets during pregnancy =12%)</td>
</tr>
<tr>
<td>Mali, '01</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>64.0 took iron (90+ tablets = 6%)</td>
</tr>
<tr>
<td>Mongolia, '98</td>
<td>96.2</td>
<td>NA</td>
<td>83.4 (&lt; 5 mos.)</td>
<td>42.5 (90+ tablets = 6.9%)</td>
</tr>
<tr>
<td>Niger, '98</td>
<td>&lt; 40.0</td>
<td>11.0</td>
<td>29.9</td>
<td>10.8</td>
</tr>
<tr>
<td>Oman, '95</td>
<td>99.0</td>
<td>57.9</td>
<td>NA</td>
<td>63.0</td>
</tr>
<tr>
<td>Peru, '00</td>
<td>84.0</td>
<td>69.0</td>
<td>74.0 (&lt; 6 mos.)</td>
<td>60 (took 90+ days = 17%)</td>
</tr>
<tr>
<td>Philippines, '98</td>
<td>85.7</td>
<td>77.0 (3+ visits)</td>
<td>85.0</td>
<td>74.6</td>
</tr>
<tr>
<td>Qatar, '98</td>
<td>100.0</td>
<td>52.6 (5+ visits)</td>
<td>NA</td>
<td>65.0</td>
</tr>
<tr>
<td>Rwanda, '00</td>
<td>92.3</td>
<td>10 (4+ visits)</td>
<td>NA</td>
<td>20.0 (took 90+ days = 0.3%)</td>
</tr>
<tr>
<td>Tanzania, '99</td>
<td>92.5</td>
<td>69.9</td>
<td>61.4</td>
<td>44</td>
</tr>
<tr>
<td>Turkmenistan, '00</td>
<td>98.1</td>
<td>82.8</td>
<td>93.0 (&lt; 5 mos.)</td>
<td>32 (avg. no. tablets = 14)</td>
</tr>
<tr>
<td>Uganda, '00/01</td>
<td>92.4</td>
<td>41.9</td>
<td>49.3</td>
<td>47.7 (90+ tablets = 1.7%)</td>
</tr>
<tr>
<td>Yemen, '97</td>
<td>34.3</td>
<td>11.4</td>
<td>23.1</td>
<td>20.7</td>
</tr>
<tr>
<td>Zimbabwe, '99</td>
<td>93.1</td>
<td>64.3</td>
<td>67.4 (&lt; 6 mos.)</td>
<td>59.7 (90+ tablets during pregnancy = 5.7%)</td>
</tr>
</tbody>
</table>

¹Women in last three to five years unless otherwise stated.

Source: Demographic and Health Surveys.
Raising Awareness/Program Advocacy:
Sample Fact Sheets

Early Childhood Development

HOW CAN EARLY CHILDHOOD DEVELOPMENT (ECD)
PROGRAMS BEAT IRON DEFICIENCY?

Basic actions achieve results
Preventing and treating iron deficiency and anemia are among the most cost-effective health actions available that can provide a key element necessary for full child development. ECD programs can efficiently integrate actions to defeat iron deficiency into their work, directly benefiting the children and the effectiveness of the ECD program itself.

There is extensive experience with the following basic actions and agreement that they should be used in a combination appropriate to the children and program.

Provide iron supplements to children. Iron supplementation, in the form of syrup, sprinkles, or pills, is available today and can be distributed within ECD programs. ECD programs that interact with health programs providing immunizations, vitamin A capsules, or basic treatment and prevention services can persuade that more attention be given to iron deficiency.

Provide appropriate meals and/or snacks. ECD programs that provide food to children in their care should choose foods that are high in iron and/or fortified with iron. Foods high in iron include: meat, beans, dried fruit. Foods that enhance the absorption of iron should be eaten during the meal. These include fruits and vegetables rich in vitamin C. Drinks such as coffee and tea block the absorption of iron and these should not be given to children.

ECD programs that provide food to the children in their care should choose foods that are fortified with iron if available. Fortification is not done everywhere so items may not be available. You can talk to officials about which foods are fortified and encourage food fortification. Some typical items that are fortified are: bread, noodles, cereals, soy sauce, flour, and maize meal.

Provide information to parents and caregivers about the effects of iron deficiency and anemia, dietary sources of iron (iron-rich foods and fortified foods), and iron supplements. Such information will encourage everyone to take action to improve children’s intake of iron.

Support iron fortification if it is not available in your community when talking to community, government, and business officials.

Encourage public health treatment and prevention programs if hookworm, malaria, or diarrhea is prevalent in your program area. These conditions cause iron deficiency through loss of blood or destruction of red blood cells.

Defeating iron deficiency and anemia can help early childhood programs be more successful.

Source: The Manoff Group (prepared for the Micronutrient Initiative).
Raising Awareness/Program Advocacy: Sample Fact Sheets

Early Childhood Development

THE IMPACT OF PREVENTING AND TREATING IRON DEFICIENCY ANEMIA

Help your children grow stronger and smarter
Iron deficiency and resulting anemia is a problem of great magnitude for young children. The evidence of iron’s beneficial impact on children is mounting and it now is clear that the inclusion of iron in early child development programs is both urgent and cost-effective. An estimated 10–20% of preschool children in developed countries and an estimated 30–80% in developing countries are anemic at one year of age.

Good health and physical growth
From 6–24 months of age, infants need additional iron, either from syrups, tablets, or iron-fortified foods, to meet the demands of rapid growth and development. Children who do not receive adequate iron and develop anemia are smaller, weaker, and develop skills more slowly. Diarrhea, respiratory illnesses, and other infections are more frequent and severe in children with iron deficiency and anemia. Iron improves resistance to illness and diseases in early childhood.

Intellectual development and learning capacity
Iron deficiency and anemia impairs brain development, limits attention span, and shortens memory. When anemic children reach school age they will have impaired performance in tests of language skills, motor skills, and coordination. Iron is fundamental for cognitive development. Anemia can cause a loss of 9 points in IQ testing. Preschool children display marked improvement after successful iron supplementation, consistently overcoming the learning problems associated with anemia.

Developing motor skills and social behavior
Children with iron deficiency anemia have delayed psychomotor development and their manual dexterity is permanently reduced. This has many effects on a child’s life, setting him/her behind in learning and physical ability.

The behavior of young children is also affected by iron deficiency. An iron deficient child is often lethargic and hesitant. This results in reduced social interaction from which children learn and develop. With adequate iron, children explore and play more. They develop intellectually and socially because they are curious and confident, expanding their experiences and strengthening their motor skills.

Defeating iron deficiency and anemia can help early childhood programs be more successful.

Source: The Manoff Group (prepared for the Micronutrient Initiative).
Iron Overload

Risk of Iron Overload From Iron-Fortified Foods

- In the United States and Europe, only 0.1 to 0.5 percent of the populations of Northern European ancestry are at risk of getting too much iron. Men are most at risk. Women of reproductive age are protected by their monthly blood loss and higher iron requirements.

- There is little risk of iron overload in Africa or Asia, except in areas where thalassemia major occurs. Thalassemia prevalence is low in most places.

- Iron fortification does not increase the risk of iron overload, even in countries with large populations of Northern European ancestry, and avoiding iron-fortified foods is not recommended for people at risk of iron overload because of hemochromatosis. It is recommended, however, that these people avoid vitamin-mineral supplements containing iron or more than 500 mg of vitamin C, which increases iron absorption.

- There is no evidence that increased iron intake from iron-fortified foods results in higher rates of heart disease, cancer, or infections.

Selected Monitoring and Evaluation Indicators for Anemia Prevention and Control Programs

**Process Indicators**
- Number of health workers trained and supervised in anemia prevention and control measures
- Types of foods available in the marketplace
- Percentage or number of food companies fortifying staples or processed foods with iron

**Outcome Indicators**
- Percentage of target group who
  - Have adequate knowledge of anemia and anemia prevention and control measures (e.g., why, how, and when to take iron-folic acid (IFA) supplements; how to manage side effects; the need for presumptive treatment for parasitic infections; etc.)
  - Are receiving the recommended number of IFA tablets
  - Are taking the recommended number of IFA tablets
  - Are not taking IFA tablets daily due to side effects, forgetfulness, feelings of good health, fear of medication, fear of having a big baby, or other reasons
  - Are receiving treatment or presumptive treatment for hookworm infections
  - Are receiving treatment or presumptive treatment for malaria
  - Consume adequate amounts of iron-rich food, including fortified foods
  - Have been told about indigenous foods that can mitigate anemia
- Percentage of health workers who
  - Have adequate knowledge of anemia and its prevention and control measures, including counseling messages
  - Can counsel adequately on anemia-related issues
  - Can use counseling materials correctly
- Percentage of pharmacies or small shops that market and sell IFA tablets
- Percentage of food companies that produce iron-fortified products with adequate levels of fortificant
- Percentage of food available at consumer retail level that is adequately fortified with iron

**Impact Indicators**
- Percentage of target group that has anemia, disaggregated by mild, moderate, and severe anemia
- Shift in population's hemoglobin curve
**A Tool for Reviewing Micronutrient Programs**

**Introduction and background**
This Nutrition Program Review includes suggestions for questions about micronutrient programs including anemia control based on an instrument developed for a study by the World Bank in Bolivia and The BASICS Project's Nutrition Essentials.

Areas of study were chosen based on a set of criteria, possibly selecting areas with higher socioeconomic indicators and those with lower socioeconomic indicators. Smaller organizational units should be chosen based on giving a representative sample by income level and distance (either near or far) from provincial or state capitals, where there is active or significant nutrition program activity (e.g., government, donors). Similar criteria should be developed for health clinic, dispensary, and community selection.

**At the province or state level**
Review nutritional status data available in the province or state and coverage of existing nutrition programs related to:

- Infant feeding (breastfeeding and complementary feeding)
- Iron-folate supplementation for pregnant women
- Vitamin A supplementation for children 6 to 59 months and postpartum women
- Availability and consumption of iodized salt
- Deworming for schoolchildren and other nutrition programs in schools
- Others

Interview selected representatives from sectors related to nutrition (e.g., health, agriculture, education, or officials of the committee on food and nutrition, if it exists) and NGOs to determine their interest in nutrition and awareness of the problem of malnutrition and its effects. Discuss current programs in the province or state addressing malnutrition and how well they are working (i.e., problems, barriers, constraints, and solutions). This is to be done as a first step to facilitate an informed interaction at the subsequent levels of the data collection at lower organizational units.

**At lower organizational units such as districts, communities**
Review nutritional status data available and coverage of existing nutrition programs related to:

- Infant feeding (breastfeeding and complementary feeding)
- Iron-folate supplementation for pregnant women
- Vitamin A supplementation for children 6 to 59 months and postpartum women
- Availability and consumption of iodized salt
- Deworming for schoolchildren and other nutrition programs in schools
- Others

Interview selected representatives from sectors related to nutrition (e.g., health, agriculture, education, or officials of the committee on food and nutrition) and NGOs to:
• Determine their interest in nutrition
• Awareness of the problem of malnutrition and its effects
• Discuss current programs addressing malnutrition and how well they are working (problems, constraints, barriers, and solutions)
• Verify the coherence/accuracy of the submission at the provincial or state level

**Health clinic (public and private)**

Discussions with head of the clinic

1) How many staff?
2) What are their qualifications?
3) What are their responsibilities?
4) Do you have any staffing shortages?
5) What are the nutrition problems that you see in your clinic?
6) What are the nutrition services provided at your clinic?
7) What protocols do you have for delivering nutrition services? (Have staff show you the protocols.)
8) What nutrition training have you and your staff had? In-service? Pre-service? When was the last time you had training on nutrition? What type of training was it? Have you had Integrated Management of Childhood Illness (IMCI) training? If yes, ask staff to show you the Food Box and explain how they use it. (Where IMCI training has taken place, observations should make note of whether or not the IMCI Food Box is used when counseling the client - mothers of children < 5 years.)
9) What type of nutrition training do you need?
10) What nutrition education materials do you have to use in counseling or in your clinic? (Have staff show you the education materials used.)

**Observations of staff with clients**

1) Observe counseling session of health worker with a woman coming in for ANC
2) Observe counseling session of health worker with a mother of a sick child < 5 years
3) Observe counseling session of health worker with a mother of a well child < 5 years

Compare information given with protocols and norms for the services being given. For example, in this counseling session with a woman coming in for antenatal care, the following should be noted (similar questions should be developed for a well and sick child visit):

1) Is this pregnant woman given iron-folate (IFA) supplements? yes no
2) How many IFA supplements was she given? ___
3) Was she given IFA supplements at the last ANC visit? yes no
4) Was she told how many IFA supplements to take/day? yes no
5) Was she told how many IFA supplements to take during pregnancy? yes no

6) Was she told why to take IFA supplements?
   - Health of mother yes no
   - Health of baby yes no
   - Prevent or cure anemia yes no

7) Was she told about side effects? yes no

8) Was she told what the symptoms of side effects are?
   - Black stools yes no
   - Gastric problems (diarrhea, constipation) yes no

9) Was she told how to manage side effects?
   - Take with food yes no
   - Take before going to bed yes no

10) Was the woman weighed? yes no

11) Did the health worker discuss her weight with her? yes no

12) Is she advised that she should be gaining 1 kg/month? yes no

13) Is she asked about what she is eating and given suggestions on how to improve her diet?
   - Improve the amount yes no
   - Improve the quality yes no
   - Asked if she is using iodized salt in cooking? yes no

14) Is she counseled about exclusive breastfeeding?
   - What it is (only breastmilk no other fluids including water) yes no
   - Immediately feed after delivery yes no
   - Use colostrum yes no
   - Why it is important (prevent infections) yes no

15) What other ANC services were given to the woman?

16) Was the health worker kind and reassuring to the woman? good/needs improving

17) Made the woman feel comfortable? good/needs improving

18) Announces the subject? good/needs improving

19) Assures it is a subject of interest? good/needs improving

20) Asks open-ended questions? good/needs improving

21) Repeats/reflects back what the client says? good/needs improving
22) Doesn't challenge client's feelings? good/needs improving
23) Avoids words that sound like the client is being judged? good/needs improving
24) Uses simple language? good/needs improving
25) Makes suggestions, not commands? good/needs improving
26) Gives only simple information and advice that can be easily remembered? good/needs improving
27) Recognizes and praises what the client is doing correctly before suggesting changes? good/needs improving
28) Checks what is practical and possible for the client to do? good/needs improving
29) Verifies client's understanding of advice and intention to try it? good/needs improving
30) Sets a date for the next appointment/follow up good/needs improving

Interviews with clinic staff (some questions for the head, some for the actual implementers)

1) What are the nutrition problems you see in your clinic?
2) What is working well for nutrition interventions and what is not working well?
3) How would you improve nutrition interventions in your clinic/area?
4) When a sick child comes in what nutrition counseling do you give the mother? (Check the advice with the standard developed from the IMCI protocol/Food Box or other counseling standards - continued breastfeeding, feeding, recuperative feeding after illness ends)
5) When a well child comes in what nutrition counseling do you give the mother? Check the advice against the standard developed - exclusive breastfeeding (BF) for children 0-6 months (e.g., encourage longer duration of BF and more frequent feeds - a newborn should be fed 10-12 times in 24 hours for 15-20 minutes on each breast), introduction of complementary foods (CF) with continued BF at six months, CF 5 times/day, enrichment of porridge, pap, active feeding of children 6-24 months, etc., encourage use of iodized salt in cooking.
6) Do you think mothers follow the advice you give? How do you know? What advice are women able to follow about feeding their children?
7) When you give pregnant women iron-folate supplements, how many do you give them each visit? What do you tell them when you give women IFA supplements?
8) Do you think women follow advice about taking IFA supplements? Do you think women take IFA supplements? How do you know?
9) Do you think it is important for women to take IFA supplements in pregnancy? Why?
10) Do you check for pallor? If you think women have pallor, what action do you take?
11) Do you advise pregnant women to have an anemia test? Is the test done here? If not, do you receive the results of tests? When is anemia considered serious and what action do you take if it is?
12) What other ANC services are given to women?

13) What other types of nutrition interventions are given to women in ANC? Do you weigh pregnant women routinely? Do you know how much weight women should be gaining in pregnancy? What advice do you give women about eating in pregnancy? Do you think women have trouble eating or eating more in pregnancy? Why or why not?

14) Do you talk to pregnant women about breastfeeding? What do you tell them? Are they interested in following this advice after they deliver?

15) If a woman says she doesn't have enough breastmilk, what advice do you give her? (increase breastfeeding, feed food to the infant, feed other milk to the infant, increase the food the woman is eating, other) (Circle all mentioned)

16) Do you check for pallor in children < 5 years of age? What body part do you use? If you think the child has pallor, what action do you take?

17) When do you give vitamin A capsules? Who receives vitamin A capsules and what is the dose?

18) What do you tell mothers of children who receive vitamin A capsules?

19) What do you tell postpartum women when they receive a vitamin A capsule?

20) What other postpartum services/interventions do women receive? How do women who deliver in the community receive this information or these services?

21) What other nutrition services/interventions are given to postpartum women? What advice do you give on eating/diet? Do you think women follow your advice? Why or why not?

22) Do you give postpartum women assistance with breastfeeding? If you don't who does?

23) Who supervises you and how often do you see your supervisor? What does your supervisor do when he/she visits you? Does he/she talk with you about nutrition? On every visit? How often does she/he visit?

24) What reporting forms do you fill out every day or month? Do you supply any nutrition information on this form? If yes, what type?

25) What type of outreach does your clinic do and how often? How often are you able to visit each community/year?

26) Do you supervise community activities in health? Are communities conducting any nutrition interventions? What are these interventions and what kind of help do you give to these activities?

**Interviews with clinic clients**

**Mother of a sick child**

1) Did the health worker give you counseling about how well your baby is eating? yes no

2) What advice did the health worker give you?

   - continued or frequent breastfeeding during illness? yes no
32
Anemia Prevention and Control: What Works
Part II: Tools and Resources

- continued feeding of solid foods for children 6 months & older? yes no
- recuperative feeding after illness ends? yes no
- stop breastfeeding or feeding? yes no

3) Did the health worker give your child a vitamin A capsule?
   - if your child has persistent diarrhea? yes no
   - is underweight? yes no
   - has measles? yes no
   - has a respiratory infection? ye no

4) Did the health worker check your child's palm or eyelids? yes no

5) Did the health worker talk with you about anemia in your child? yes no

6) What other counseling advice did the health worker give you or action did the health worker take?
   - ask you to buy iron tablets and give them to your child? yes no
   - give anti-malarials if your child was anemic? yes no
   - discuss how to feed your child when he/she is no longer ill? yes no
   - suggested you feed your child > 6 mos. at least 5 times/day? yes no
   - suggested you enrich the porridge you feed your child > 6 mos. yes no
   - suggested you give green and/or yellow & orange vegetables and fruits daily to your child? yes no
   - suggested you use iodized salt in cooking? yes no
   - suggested you feed your child using a separate plate so you know how much your child is eating? yes no
   - suggested exclusive breastfeeding for your child 0-6 mos.? yes no
   - weighed your child? yes no
   - discussed his/her weight with you? yes no
   - told you about vitamin A and when and where to obtain it? yes no

Mother of a well child

1) Did the health worker weigh your child? yes no

2) Did the health worker discuss your child's weight with you? yes no

3) What did the health worker tell you about your child's weight?
   - weight gain was adequate yes no
   - weight gain was not adequate yes no
   - how much weight your child should be gaining? yes no
4) Did the health worker give you advice on what to feed your child?  yes  no
5) What advice on feeding your child were you given?
   -to feed more?  yes  no
   -to feed at least five times a day?  yes  no
   -to enrich porridge/pap?  yes  no
   -to actively feed so you know how much your child has eaten?  yes  no
   -to give the child its own plate so you know how much your child has eaten?  yes  no
   -to give certain types of food?  yes  no
   -other advice?  yes  no
6) Did the health worker talk with you about vitamin A?  yes  no
7) Did the health worker tell you when your child should receive vitamin A?  yes  no
8) Did the health worker tell you why getting vitamin A is important for your child?  yes  no
9) What did the health worker tell you about vitamin A?
   -keeps the child from getting sick?  yes  no
   -good for the child?  yes  no
   -decreases risk of dying?  yes  no
   -other?  yes  no
10) Did the health worker check your child's palm or eyelids or tongue?  yes  no
11) Did the health worker talk with you about anemia?  yes  no
12) If the health worker thought your child had anemia, what advice did the health worker give you?
   -buy iron and give it to the child?  yes  no
   -improve the child's diet?  yes  no
   -other?  yes  no

Woman attending antenatal care
1) Did the health worker give you an anemia test?  yes  no
2) If the test was done here, did the health worker discuss the results with you?  yes  no
3) Did the health worker give you iron supplements?  yes  no
4) How many were given to you?
   - 0-10 supplements yes no
   - 11-20 supplements yes no
   - 21-30 supplements yes no
   - > 30 supplements yes no

5) Did the health worker tell you how many iron supplements to take/day? yes no

6) Did the health worker tell you how many iron supplements you should take in your pregnancy? yes no

7) How many supplements were you told to take in pregnancy?
   - < 30 supplements yes no
   - 30-89 supplements yes no
   - 90 supplements yes no
   - > 90 supplements yes no

8) Were you told why it is important to take iron in pregnancy?
   - healthy baby yes no
   - healthy pregnancy/mother yes no
   - healthy delivery yes no
   - bigger baby yes no
   - other yes no

9) Did the health worker warn you that side effects might occur when taking iron? yes no

10) Were you told how to manage side effects? yes no

11) What were you told on how to manage side effects?
   - take iron at night yes no
   - take iron with meals yes no
   - split the tablet and take one-half in the morning & other half at night yes no

12) Were you weighed in this visit? yes no

13) Did the health worker discuss your weight with you? yes no

14) Did the health worker tell you how much weight you should be gaining in pregnancy? yes no

15) Did the health worker ask you what you were eating and discuss what to eat in pregnancy? yes no

16) Did the health worker tell you to buy & use iodize salt in cooking? yes no
17) Did the health worker discuss how to breastfeed your child when you deliver?  
   yes  no

18) What did the health worker discuss?
   - exclusive breastfeeding to 6 months  
     yes  no
   - immediate breastfeeding  
     yes  no
   - using colostrum  
     yes  no
   - other  
     yes  no

19) What other ANC services are given to women?
   - checking blood pressure  
     yes  no
   - measuring fundal height  
     yes  no
   - physical exam  
     yes  no
   - anti-malarials  
     yes  no
   - deworming medicine  
     yes  no
   - other  
     yes  no

Postpartum woman

1) Were you given a vitamin A capsule?  
   yes  no

2) Were you given any advice on eating/diet?  
   yes  no

3) What advice were you given?
   - to eat more  
     yes  no
   - to eat better quality foods  
     yes  no
   - to improve your diet to produce enough breastmilk  
     yes  no
   - to use iodized salt in cooking  
     yes  no
   - other  
     yes  no

4) Were you given advice on breastfeeding?  
   yes  no

5) What advice were you given?
   - exclusive breastfeeding  
     yes  no
   - use of colostrum  
     yes  no
   - immediate breastfeeding  
     yes  no
   - proper attachment  
     yes  no
   - managing any problems with breastfeeding  
     yes  no
   - how to increase milk production  
     yes  no
   - other  
     yes  no
6) If you don't have enough breastmilk what should you do?
   - increase breastfeeding  yes  no
   - feed food to the infant  yes  no
   - feed other milk to the infant  yes  no
   - increase the food I am eating  yes  no
   - other  yes  no

**Inspecting supplies**

1) Are there enough iron-folate tablets ordered in one year for the number of pregnant women in the catchment area (to estimate, take the total population x estimated number of pregnant women [about 4% of the total population or .04] x 90 supplements/pregnancy = total number of supplements needed)?  yes  no

2) How many days in the year are there "stock-outs" of iron-folate supplements?  

3) Are there enough supplies of vitamin A capsules to give to sick children (measles, diarrhea) and postpartum women?  yes  no

4) How many days in the year are there "stock outs" of vitamin A capsules?  

5) Are there other medications to support nutrition programs such as mebendazole for deworming, anti-malarials?  yes  no

6) How many days in the year are there "stock outs" of these medications?  

7) Are other essential drugs available?  yes  no

8) How many days in the year are there "stock outs" of these medications?  

9) Is there equipment for measuring anemia?  yes  no

10) Scales to measure the weight of children and women?  yes  no

11) Are there growth charts for recording weights of children?  yes  no

**Dispensaries**

- observations of staff with clients
- interviews with clinic staff
- interviews with clinic clients
<table>
<thead>
<tr>
<th>Draft Grid for Data Presentation for Interviews With Staff-in-Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staffing</strong></td>
</tr>
<tr>
<td>% with doctors</td>
</tr>
<tr>
<td>% with nurses</td>
</tr>
<tr>
<td>% with lab technicians</td>
</tr>
<tr>
<td><strong>Supplies</strong></td>
</tr>
<tr>
<td>% with laboratories and equipment</td>
</tr>
<tr>
<td>% with others (power supply, water, etc.)</td>
</tr>
<tr>
<td><strong>Training</strong></td>
</tr>
<tr>
<td>% with pre-service training in nutrition</td>
</tr>
<tr>
<td>% with in-service training in nutrition</td>
</tr>
<tr>
<td>% reporting a need for nutrition or other public health training in:</td>
</tr>
<tr>
<td>breastfeeding</td>
</tr>
<tr>
<td>anemia control</td>
</tr>
<tr>
<td>infant feeding</td>
</tr>
<tr>
<td>helminth control</td>
</tr>
<tr>
<td>malaria control</td>
</tr>
<tr>
<td>family planning</td>
</tr>
<tr>
<td><strong>Organisation</strong></td>
</tr>
<tr>
<td>% that have delegated nutrition responsibilities to staff</td>
</tr>
<tr>
<td>% with a unit devoted to nutrition</td>
</tr>
<tr>
<td>% reporting staff shortages</td>
</tr>
<tr>
<td>Prevalence of cases of malnutrition</td>
</tr>
<tr>
<td>------------------------------------</td>
</tr>
<tr>
<td>% reporting seeing nutrition problems at their facility</td>
</tr>
<tr>
<td>% seeing undernutrition (poor growth)</td>
</tr>
<tr>
<td>% seeing severe malnutrition</td>
</tr>
<tr>
<td>% seeing anemia in women</td>
</tr>
<tr>
<td>% seeing anemia in children</td>
</tr>
<tr>
<td>% seeing VAD (xerophthalmia)</td>
</tr>
<tr>
<td>% seeing iodine deficiency (goiter)</td>
</tr>
<tr>
<td>% seeing other nutrition problems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Provision of nutrition and other services</th>
<th>Clinics (about 20% per province or state)</th>
<th>Dispensaries (about 20% per province or state)</th>
</tr>
</thead>
<tbody>
<tr>
<td>% providing growth monitoring on a monthly basis</td>
<td></td>
<td></td>
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<tr>
<td>% providing iron tablets for pregnant women</td>
<td></td>
<td></td>
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<tr>
<td>% providing vitamin A for well children</td>
<td></td>
<td></td>
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<tr>
<td>% providing vitamin A for sick children</td>
<td></td>
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<tr>
<td>% testing for anemia</td>
<td></td>
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</tr>
<tr>
<td>% giving counseling on a better diet to mothers of children (including use of fortified foods)</td>
<td></td>
<td></td>
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<tr>
<td>% giving counseling on a better diet to women (including use of fortified foods)</td>
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<tr>
<td>% weighing pregnant women in ANC</td>
<td></td>
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<tr>
<td>% giving counseling on breastfeeding in ANC</td>
<td></td>
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<tr>
<td>% giving counseling on breastfeeding other times</td>
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<tr>
<td>% looking at pallor as a sign of anemia</td>
<td></td>
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<tr>
<td>% giving counseling on taking anti-malarials</td>
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<tr>
<td>% giving counseling on taking anthelmintics</td>
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<tr>
<td>% giving counseling on family planning</td>
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<tr>
<td>% with nutrition education materials on hand</td>
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<tr>
<td>% with other public health materials on hand</td>
<td></td>
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<tr>
<td>% reporting that they had nutrition protocols for giving micronutrients and counseling on nutrition</td>
<td></td>
<td></td>
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<tr>
<td>Draft Grid for Data of Observations With Clinics</td>
<td></td>
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<tr>
<td>-----------------------------------------------</td>
<td></td>
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</tr>
<tr>
<td>% of pregnant women receiving IFA</td>
<td>Clinics</td>
<td>Dispensaries</td>
</tr>
<tr>
<td>% of pregnant women receiving at least 30 IFA at this visit</td>
<td></td>
<td></td>
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<tr>
<td>% of pregnant women receiving IFA at last session</td>
<td></td>
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<tr>
<td>% of women told how many tablets to take/day</td>
<td></td>
<td></td>
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<tr>
<td>% of women told how many tablets to take in pregnancy</td>
<td></td>
<td></td>
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<tr>
<td>% of women told why to take IFA</td>
<td></td>
<td></td>
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<tr>
<td>% of women told how to manage side effects if they occur</td>
<td></td>
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<tr>
<td>% of women weighed during the session</td>
<td></td>
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<tr>
<td>% of women advised to gain 1 kg/month in pregnancy</td>
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<tr>
<td>% of women counseled about eating/diet in session</td>
<td></td>
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<tr>
<td>% of women counseled about exclusive breastfeeding</td>
<td></td>
<td></td>
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<tr>
<td>% of women with blood pressure taken</td>
<td></td>
<td></td>
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<tr>
<td>% of women with physical exam</td>
<td></td>
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<tr>
<td>% of women checked for pallor</td>
<td></td>
<td></td>
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<tr>
<td>% of women given a TT injection</td>
<td></td>
<td></td>
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<tr>
<td>% with other</td>
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Community: Community-based focus group discussions (FGDs)

Target communities and groups

The FGDs will be conducted in 6 communities distributed as follows:
- 2 communities where appraised clinics are located
- 2 communities where appraised dispensaries are located
- 2 communities with neither clinics nor dispensaries.

At each of these locations, the FGDs will be held with three groups (men, women, and community leaders).

Discussion guide

The discussions will be separately guided by the two members of the state data collection team. Preferably a man should conduct the men's discussion while a woman conducts the women's discussion. It is proposed that the following areas be covered:
- Existing nutrition programs
- Awareness about nutrition
- Relationship with health services
- Intervention opportunities

In discussing each of the areas, the guides should endeavour to look out for the following facts under the respective sub-headings:

Draft discussion's data sheet

a) Existing programs

Existing programs: Yes [ ] No [ ]

If yes: Implementor

Focus/activities

Beneficiaries

Impact: High [ ] Medium [ ] Low/None [ ]

Comment/Quotes if any

b) Awareness about nutrition

- What is the main nutrition problem in your community?
- Appreciation of the role of food habits and well-being:
  High [ ] Medium [ ] Low/None [ ]
- Appreciation of good hygiene practices and sanitation in relation to health
  High [ ] Medium [ ] Low/None [ ]
- Knowledge of specific food items of particular benefit to mothers and children*

<table>
<thead>
<tr>
<th>Food item</th>
<th>Benefit</th>
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* To be completed during the discussion based on the output from the discussants.

- Awareness of foods/nutrient for prevention of some important micronutrient deficiency disorders: (List items identified against the appropriate parameter).
  - Blood formation
  - Prevention of blindness
  - Prevention of goiter

d) Relationship with health institutions

  - Level of patronage: [ ] High [ ] Medium [ ] Low/None [ ]
  - If high, what are those things that have encouraged the patronage?
  - For low and medium, what are the constraints?
  - What improvements are desired?

c) Relationship with health institutions

- Food security
- Health care and hygiene
- Enhancement of caring capacity

*This section is to be filled based on results from the FGDs to give some ideas on future program thrusts.
Qualitative Research Instrument on Perceptions of Anemia and Use of Iron Supplements – The Indramayu Project, Indonesia

Introduction

The following plan and research instrument was developed for the USAID-funded MotherCare/John Snow, Inc. Project by the Manoff Group. This plan and the research instrument were used in formative research for the Indramayu Project. One component of this project tested ways to improve the existing iron supplementation program for pregnant women. Social scientists from the Manoff Group gave technical assistance to this process by developing these instruments, training non-medical interviewers and analyzing the results. The results were used to develop messages for counseling women and a social marketing campaign, to train health workers and others delivering iron supplements, and to identify and develop delivery mechanisms/strategies for the improved iron supplementation program.

The Plan

Methods

Information will be collected through use of in-depth interviews. Interview guides have been prepared in draft form for pregnant and recently delivered women, traditional birth attendants (dukun bayi) and community volunteers (kaders), and midwives (bidan) and doctors in the study area. In addition, interviews will be conducted among a small number of husbands of pregnant or recently delivered women, and among older woman family members of pregnant women, who might influence compliance with iron supplements among pregnant women.

Timeframe

The draft instruments will be pretested in the study community during February 1991, and interviewers will obtain training on in-depth interview techniques. Revisions indicated by the pretest process will be completed by end of February.

Interviews will take place in March, over a three-week period. Two interviewers will have primary responsibility for the interviews of women and TBA (dukun bayi). Two additional interviewers will assist with the health staff interviews.

Sample Strategy

The project area includes approximately 10,000 households, and an estimated 1200 pregnant women according to most recent count.

A total of 30 pregnant and recently delivered women will be interviewed. Pregnant women should be in their second or third trimester of pregnancy. Current MOH policy dictates that one iron tablet/day be taken by pregnant women beginning in the sixth month of pregnancy (end of the second trimester), and continuing into the postpartum period. In the Indonesian setting, pregnant women, even in second trimester, are not necessarily eligible to receive iron through government health facilities, and therefore would not be expected to have experience with consumption/compliance of iron supplements during the current pregnancy.

Identification information collected prior to the interview will indicate parity and level of
use of antenatal care during this pregnancy. Half of interviews will be among previous users of iron, and half among non-users.

Six midwives (bidans) are currently working in the study area, and all will be included in the interview process. There are two doctors who will be interviewed.

At least 10 community volunteers (kaders) and 12 TBAs (dukun bayi) will be interviewed. Half of the dukun bayi will be trained, half untrained.

20 interviews will be conducted among people in the community who might influence women's consumption of iron supplements: 10 interviews with women with pregnant or recently delivered women in the household, and 10 interviews with husbands of pregnant or recently delivered women.

The total number of interviews is at least 78. This number might be increased slightly if patterns of information are not readily recognizable after the planned number of interviews in each category.

Overall Research Objectives, Formative Research on Iron Compliance in Pregnancy Component:
1. To identify the behavioral, attitudinal, or other factors that affect pregnant women's compliance with iron supplementation.
2. To identify sources of information/advice about pregnancy within the community and influentials who could influence compliance with iron supplementation.
3. To identify current channels or communication/media preferences for use in dissemination of iron-related IEC.
4. To identify current channels of distribution of iron supplements to pregnant women.
5. To determine the acceptability of several proposed alternative iron tablet delivery systems in the community, to both pregnant women and health providers.
6. To explore the level of awareness, use, and attitudes toward iron in pregnancy of both women and providers of maternal health care (formal and nonformal).
7. To conduct concept testing on a limited basis to get feedback from a small sample of pregnant women on iron tablet acceptability.

Formative Research Topic Areas

*Pregnant Women*

1. Attitude toward pregnancy in general, and this specific pregnancy
   - planned pregnancy?
   - aspiration for pregnancy outcome, both for baby and maternal
2. Ethnomedical view of pregnancy
   - awareness of relationship between blood and health
   - beliefs regarding effects of low blood
   - blood loss on health
   - awareness of anemia as an illness (symptoms, sequelae such as hemorrhage, low birthweight) etiology
   - perceived susceptibility
- severity
- personal experience with anemia or sequelae

3. Perceived value of preventive action during pregnancy
   - self-care practices
   - use of antenatal care
   - early care for self-detected problems of pregnancy

4. Perceived value of iron supplementation during pregnancy
   - need for and effectiveness of iron supplements
   - personal experiences with iron supplementation (use, nonuse, duration of use)
   - side effects
   - consequences of use/nonuse of iron supplements
   - other traditional or self-care for treatment of anemia in pregnancy
   - compatibility of iron supplementation with traditional ethnomedical practices during pregnancy

5. Circumferences of iron supplementation (prior experience)
   - attitude toward pill taking -- size, color, taste, mode of delivery (tab, cap, tonic, injection)
   - dose
   - timing
   - frequency
   - duration
   - with meals
   - how iron tabs obtained
   - from whom
   - how often
   - level of health education provided with iron supplements (treatment, instructions, comprehension/recall, adherence to instructions/education)
   - opinion of source of iron supplements (dukun bayi, bidan, kader, others)

6. Barriers to use
   - difficulties in access to antenatal care
   - cost of transport
   - distance to supplements at posyandu (health post)
   - not given supplements
   - unaware of need for supplements
   - cost of supplements
   - given but not instructed in use

7. Source of information on iron/anemia during pregnancy

8. Media preferences/communication channels

9. Iron supplements distribution (concept testing)
The Interview Instruments

Draft Question Guide for In-Depth Interviews With Pregnant Women

Identification

1. Name:
2. Age:
3. Current month of pregnancy (probably at least 6 months):
4. Date of Last Birth:
5. Parity: 0 1 2 3 4 or more
6. Previous Pregnancy Outcome(s):
   - normal
   - maternal problem ______
   - neonatal problem ______
7. Level of education/literacy:
8. Iron tablet use:
   - never used
   - used in previous pregnancy
   - used this pregnancy
   - # of supplements given in pregnancy or previous pregnancy
   - # of supplements taken in pregnancy or previous pregnancy
9. Antenatal care use:
   - never
   - visits this pregnancy 0 1 2 3 4 5 6 or more
   - month of pregnancy at time of ANC visit ______
   - reason for visit(s)
10. Distance from:
    - Posyandu (health post)
    - Puskesmas (health center)
    - Kader (community volunteer)
    - Dukun bayi (TBA)
    - Hospital

Introduction

I. We would like to ask you some questions about your pregnancy (explain briefly)

   Was this pregnancy (or most recent pregnancy) planned?

   Does having a baby now cause any problems for you?

   What kind?

   Overall, how have you been feeling during this (or previous) pregnancy?
What thought/hopes/fears do you have about your own health during pregnancy and delivery?

For the family during this pregnancy?

Do you notice any changes in your health during this pregnancy? What changes?

Have you had to change your daily activities in any way because of your health during this pregnancy? How?

Are you doing anything different since you became pregnant? What?

Any traditional ceremonies?

Are you taking any medicines (obat), jamu, traditional remedies, or other things especially for your pregnancy? What? Why?

What about your diet? Any changes in your diet? What changes? Why?

II. Do you know of any problems which pregnant women can have with their health?

Where do you usually go for advice about these problems?

What advice did you receive there?

Do you know of any problems in pregnancy caused by blood, low blood, bleeding?

If yes, what is this called? What are the symptoms?

If necessary, prompt tired, weak, dizzy, rapid heartbeat, headache:

- tired
- weak
- dizzy
- rapid heartbeat
- headache

Do you know of any problems a pregnant women can have if she has anemia (use local name for anemia here if women has given you one)? What?

Do you know of any problems pregnant women can have if they lose blood during childbirth? What?

Has this ever happened to you or anyone you know?
What do you think causes this to happen?
Is this a serious problem? Why or why not?

Is there anything you can do to prevent this from happening? What?

Do you know anything you can do or place to go to cure these problems?

- self-care
- dukun bayi
- household care
- posyandu
- take iron pills
- improve diet
- other

Have you ever done any of these things?
- what was the result?
- condition improved
- no change or condition worsens

III. Some pregnant women take iron supplements during their pregnancy.

Have you ever heard of pregnant women taking iron supplements?

Do you know why they take them?

Where did you hear about them?

Has anyone you know taken them?

Have you taken them?

When did you first take iron?
- this pregnancy 6 7 8 9 month
- before 6 months
- previous pregnancy
- other

When is the last time you took iron tablet?

How many did you take?

Did you stop before you took all the supplements you were given? Why?

Were there any problems which you had because of the iron supplements?

What type of problems?

If no response, prompt
- constipation
- diarrhea
- change in color/consistency of stool
- vomiting
- nausea
- abdominal pain
- dizzy
- bad taste
- heartburn

(we will also add some conditions which are not iron-related to check accuracy)
Did you take the supplements with meals?

When during the day did you take them?

How many times per day?

For how many days, weeks, months?

Why did you stop?

IV. I am going to ask you a few question about the supplements:

Is there anything about the tablet which you do not like, or which makes it difficult for you to continue taking the tablet?

**Probe:**
- size
- taste
- difficulty swallowing
- color

Would you find it easier to take iron in some other form?

**Probe:**
- jamu/tonic
- injection
- other

Did you notice any change in your health or how you were feeling after taking the iron supplements?

What?

How long were you taking the supplements before you noticed these changes?

Where did you get the iron supplements?

Who gave them to you?

How often do you have to go back and get more?

Is this difficult for you?

Do you usually return to get more supplements?

Can you remember what the person who gave you the iron supplements told you about how to use them?

**Probe:**
- when to take
- how long to take
- how many to take
- what to do if side effects occur
- reason for iron pills
- when to return for more supplements
- explain side effects
- other

Did you follow these instructions? Why/ Why Not?

Did any one else give you advise about iron/anemia in pregnancy? Who?
- bidan/nurse
- kader
- husband
- dukun bayi
- mother
- community leader
- mother-in-law
- female friend
- other

What did they tell you?

V. Did you ever hear about iron on the radio? TV? What did the messages say?

Have you seen posters about iron in pregnancy? At the posyandu? Where? What did the posters say?

Can you think of any other way that would be easier for you to get iron supplements than the way you are getting them now? Which way?

Do you have any problems getting to the posyandu or other source of iron tabs? What problems?

Can you think about any other problems with iron supplements other than those we have already discussed? Any other comments?

Do you have any iron supplements in the house now? Can you show them to me?
- type
- amount
- where stored

Do you have any other supplements or medicines in the house? Jamu, tonics, or other obat? Can I see them?

VI. Media Preference/Channels of Communication

Do you listen to the radio?
- how often?
- what stations?
- what times?
- what are your favorite programs?

Do you usually do other things while you are listening to radio, or only listen?
Who listens with you?

Do you have a TV? Do your neighbors have a TV? How often do you watch TV? What stations? What programs? What times? Who watches with you?

How often do you read newspapers, magazines?

Which ones?

Where would you prefer to learn more about iron supplements?

When you go out of the house each day, where do you usually go? How often do you go each week?

- market (weekly market or smaller daily market or food stalls)
- mosque
- cinema
- kader
- Other

How often do you go to the posyandu? To puskesmas? To private clinic or private doctor? To dukun bayi? Other?

Is this different than before you were pregnant? How?

**Trials of Improved Practices (TIPS)**

**Introduction**

The Trials of Improved Practices (TIPS) methodology, based on product testing in marketing research, was developed by The Manoff Group in Washington, D.C. to test infant feeding recommendations and is used as the key methodology for developing the IMCI Food Box and outlined in more detail in Designing by Dialogue. Historically nutritionists have set recommendations on how to feed young children based on nutritional requirements of children and have rarely consulted caregivers as to whether or not can follow the recommendations. Often these recommendations are not practical for the lifestyle or culture of caregivers but with some simple modifications can be made more feasible for caregivers to use. TIPS asks the caregiver to follow recommendations and then consults with them about their ability to follow these recommendations, if they would continue new practices, how the practice could be modified to suit the caregiver's home situation and culture, etc.

The TIPS was adapted for iron pill-taking to determine what women's experiences were with taking iron (positive and negative), if they would continue to take iron for a longer period of time (i.e., throughout their pregnancy), if they would recommend iron to other women, etc. At the time of the Indramayu Project most people working in the science of anemia felt that programs were not working because women experience side effects shortly after taking iron supplements and as a result stopped taking them. The TIPS methodology was important because it showed that not all women experience side effects. Those that experienced side effects did not stop taking iron, particularly if they were counseled about how to manage them. However, there were other barriers to taking iron supplements for an extended period of time and TIPS helps identify these barriers. It also helps identify the factors that facilitate women taking iron.
Sample population for TIPs:

- 10-20 pregnant women without experience with taking iron pills
- These women should be given enough pills for a 15-20 day period and then inter-viewed at the end of that period

Counseling messages when women are given iron for TIPs:

- Why to take (e.g., make you and your baby healthy)
- How often to take (e.g., once per day)
- When to take (between meals or before going to bed with water or fruit juice). Note this maximizes absorption
- That side effects (give examples: black stools, gastro-intestinal problems) might occur but that they are not serious and should subside in a few days
- What to do if side effects do not subside: split the pill in half and take one half in the morning and one half in the evening
- If side effects still don't subside: take with meals

TIPs Interview after 15-20 days of taking iron

Greet the woman.

How have you been feeling since the last time I was here and left the iron supple-ments for you?

Did you take the iron supplements I left with you? Why did you decide to take it? Why not?

How many supplements did you take? How often? At what time of day?

Do you have any supplements remaining? Can I see them? (Count remaining sup-plements, and notice where she kept the supplements).

Did you take the supplements with any kind of drink or foods? Which?

Where there any things about the iron tablet which you did not like? (Probe size, color, swallowing, taste, smell, hates pills, other)

Did you notice any changes in how you feel while taking the supplements? What kind of changes? (Probe benefits, side effects, note the exact words used by women to describe)

Do you know why it is important for pregnant women to take iron supplements?

What is your opinion now that you have tried them yourself? (exact words)

Were there any things that you liked about the pills? (if not mentioned above, probe for specific words, concepts)

Would you be willing to continue to take iron supplements for the rest of your preg-nancy? Why, why not?
Would you go to the posyandu (health post) for more iron supplements? To puskesmas (health center)? To the dukun bayi (TBA)? Some other place? Why, why not?

If iron supplements were available to buy, would you buy them? How much would you pay for them? What size package would you prefer? A package of 10 pills? A package of 30 pills? A package of all the pills you need in pregnancy?

Can you think of any difficulties you might face if you wanted to continue taking the supplements? What would make it easier for you?

Did you remember to take one tablet each day? If yes, how did you remember? If no, why not? Where did you keep your supplements?

Would you recommend these iron tables to some of your friends who are pregnant? Why or why not?

What would you tell them to convince them to take the supplements? (if any response, try to get exact words)

Did anyone in your family or any friends notice that you were taking these supplements?

Did they make any comments? What comments?

Are you/have you taken any other pills, obat, jamu, other while pregnant? Why?

You will be giving birth soon. Have you thought about your children?

Have you/will you make any plans for it? What plans?

What are you hoping most about the delivery (Probe safe delivery, easy delivery, short labor, strength for delivery, no problems, etc. Try to note exact words.)

Would you like me to leave some more iron supplements with you today? Why, why not?

Draft Question Guide for In-Depth Interviews for Dukun Bayi (TBA) and Kader (Community Volunteer)

How many pregnant women do you usually care for/visit each month? How many are you caring for/visiting now?

Are there many pregnant women in your area who you do not care for? How many?

Are there some common problems which pregnant women usually ask your advice about? What kind of problems?

What advice do you usually give them?

Any other things that pregnant women talk to you about?

Who else do you think pregnant women talk to about their health during pregnancy?

Have you ever heard of a problem in pregnant women called kurang darah (local term for anemia)?
Can you tell me what it is? What causes it? Is there any way to prevent it?

Do you know if a pregnant woman, or any woman, has anemia?

Do you know of any problems to health which can be caused by anemia in pregnant women? Which problems?

What do you advise a pregnant woman to do if you think she has anemia?

Do most women follow this advice?

Are there any other things you tell them to do?

Have you heard of taking iron supplements during pregnancy? (if this was not part of the answer to previous question)

Do you know why pregnant women take them?

Do you ever tell women to take iron supplements?

If so, where do you tell them to get the supplements?

Have you ever taken iron supplements yourself? When? How long?

Did you notice any change in your health (how you felt) after taking the supplements?

How do most pregnant women you know get iron supplements now?

Do they have problems getting the supplements? What problems?

Would you be willing to distribute iron supplements to pregnant women in your area?

Do you think it would be possible for pregnant women to come to your house to receive iron supplements?

What about someone delivering iron supplements to the home of each pregnant woman? Who do you think could do that? Would you be willing to deliver iron supplements to the homes of pregnant women in your area? Why? Why not?

Can you think of any other way that pregnant women could receive iron supplements?

Any other things you would like to discuss?

**Draft Question Guide for In-Depth Interviews for Bidan (Midwife) and Doctor**

How common is anemia in pregnant women in this area? About what percentage of all the pregnant women you care for have anemia?

How do you usually determine that a woman is anemic? Any reason why you use this method? Any problems with this method?

How serious do you think anemia is as a problem for pregnant women? Are there
other problems that you usually see in pregnant women which you think are more serious than anemia? Which?

Are there programs for prevention or treatment of anemia in this area? Can you describe them?

In your opinion, are these programs effective? Why or why not?

What could you suggest to improve the effectiveness of the current program?

When you give iron supplements to pregnant women, do you give them any advice? On how to take the supplements? On why it is necessary to take the supplements? On possible side effects? Anything else you usually tell them?

Do you think the women take the supplements you give them? Why or why not? Do women usually give you any reason why they are not taking the iron supplements? Do many women return for resupply of the iron supplements throughout the pregnancy?

Do you know of any difficulties that may prevent pregnant women from obtaining iron supplements?

Do you know of any other medicines, tonics, jamu or other traditional medicines which pregnant women commonly take? Are any of these used for anemia?

How do pregnant women receive iron supplements now? How do those women who do not attend posyandu or puskesmas obtain iron supplements?

Can you suggest any other ways or locations which might be used to distribute iron supplements to pregnant women? Who might be an appropriate person to distribute iron supplements at places other than health facilities?

Any other things which might make it easier for women to receive and take iron supplements?

Can you think of any benefits or problems that might occur if iron supplements were distributed in the community, rather than only at health facilities?

**Draft Question Guide for In-Depth Interviews for Husbands or Elder Women**

**Introduction**

Overall, how would you say your wife (daughter or daughter-in-law) has been feeling during this current pregnancy?

Is it different than her other pregnancies? (if this is not her first) How?

Does your wife (daughter or daughter-in-law) ever tell you about problems she is having during her pregnancy? What problems?

What advice do you give her?

Is there someone else you think is good for pregnant women to talk with when they have these problems? Who? Do you send your wife (daughter or daughter-in-law) there? Does she go?
Do you think pregnant women should talk to/receive care from someone even if they do not have problems? Why, why not? Who?

Do you know of any problems in pregnancy caused by blood/low blood/bleeding? How would you know if your wife (daughter or daughter-in-law) had this problem?

Have you heard of a problem called anemia? Can you tell me anything about it?

Has this happened to anyone you know? Is there anything that can be done to prevent this from happening? What can cure it?

Has your wife (daughter or daughter-in-law) or anyone you know ever done these things? What happened?

Some pregnant women take iron supplements during their pregnancy. Have you ever heard of this?

Do you know why they take iron supplements? Where did you hear about it?

Has your wife (daughter or daughter-in-law) or any woman you know taken them?

Do you know where they got the supplements?

How long did she take them? Why did she stop?

Did your wife (daughter or daughter-in-law) tell you anything about the supplements while she was taking them? What?

Did you notice any change in her health while or after she was taking the iron supplements? What changes?

Do you think it is necessary for pregnant women to take iron? Why, why not?

Do you know of any other special things your wife (daughter or daughter-in-law) or other women do or take when they are pregnant? What things? Do you think these things are necessary?

Before we started the talking did you ever hear about iron tablets for pregnant women? Where? On radio? TV? At the posyandu (health post) or puskesmas (health center)?

How often do you go to the posyandu (health post)? Why? How often do you go to the puskesmas (health center)? Why?

How often does your wife (daughter or daughter-in-law) go to posyandu? Why? Puskesmas? Why?

Is there a radio in your house?

How often do you listen? What station? What programs? What times?

Do you have a TV? Do you ever see TV? Where how often? What programs? What times?

How often do you read newspapers, magazines? Which ones?

Do you attend market? Mosque, etc.? When? How often?
<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Indication for IPT or Treatment</th>
<th>Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Malaria (Plasmodium falciparum)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Children 2 mos. to 3 yrs. | *IPT:* not recommended at this time  
*Treatment:* as determined by anemia using palmar pallor or fever with no cough with fast breathing | Combined 500 mg sulfadoxine, 25 mg pyrimethamine (SP) tablet:  
½ tablet for children 2-12 mos. (4-< 10 kg weight)  
1 tablet for children 12 mos. to 3 yrs. (10-< 14 kg)  
Intramuscular quinine injection (150 mg/ml quinine salt in ml ampoules)  
2-4 months (4-< 6 kg): 0.4 ml  
4-12 months (6-< 10 kg): 0.6 ml  
12 months-2 years (10-< 12 kg): 0.8 ml  
2 years-3 years (12-< 14 kg): 1.0 ml | Single dose  
Give the first dose immediately and refer child urgently to hospital. If referral is not possible, give first dose and repeat the dose 4 and 8 hours and then every 12 hours until the child is able to take oral antimalarials. Do not continue quinine injections for more than one week. If low risk for malaria, do not give quinine to a child less than 4 months of age. |
| Children 3-5 yrs. | *IPT:* not recommended at this time  
*Treatment:* as determined by anemia using palmar pallor or fever with no cough with fast breathing | Combined 500 mg sulfadoxine, 25 mg pyrimethamine (SP) tablet:  
1 SP tablet (children 14-19 kg weight)  
Intramuscular quinine injection (150 mg/ml quinine salt in ml ampoules)  
3 years up to 5 years (14-19 kg): 1.2 ml | Single dose  
Give the first dose immediately and refer child urgently to hospital. If referral is not possible, give first dose and repeat the dose 4 and 8 hours and then every 12 hours until the child is able to take oral antimalarials. Do not continue quinine injections for more than one week. |
<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Indication for IPT or Treatment</th>
<th>Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women</td>
<td><strong>IPT:</strong> recommended</td>
<td>Combined 500 mg sulfadoxine, 25 mg pyrimethamine (SP): 2 tablets</td>
<td>IPT started in second trimester; tablets given not less than monthly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 SP tablets or follow national protocols</td>
<td></td>
</tr>
<tr>
<td><strong>Hookworm</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children 2-5 yrs.</td>
<td><strong>Endemic hookworm (prevalence = 20-30%) and child has anemia as determined by palmar pallor</strong></td>
<td>Mebendazole, 500 mg, one dose (only children &gt; 2 yrs.) (IMCI generic protocol)</td>
<td>Whenever the child presents with clinical signs for anemia and has not had a dose of mebendazole in the last six months.</td>
</tr>
</tbody>
</table>
| Children > 5 yrs.                | **Endemic hookworm (prevalence = 20-30%)** | Single dose of any of the following: Albendazole, 400 mg  
Mebendazole, 500 mg  
Levamisole, 2.5 mg/kg body weight  
Pyrantel, 10 mg/kg body weight | At least annually; optimally 2-3 times/year                                |
| Adult women, including lactating women | **Endemic hookworm (prevalence = 20-30%)** | Single dose of any of the following: Albendazole, 400 mg  
Mebendazole, 500 mg,  
Levamisole, 2.5 mg/kg body weight  
Pyrantel, 10 mg/kg body weight | At least annually; optimally 2-3 times/year                                |
### Treatment Group

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Indication for IPT or Treatment</th>
<th>Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnant women</td>
<td>Endemic hookworm (prevalence = 20-30%)</td>
<td>Any of the following:</td>
<td>One treatment in second trimester</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Albendazole, 400 mg, single dose</td>
<td>If hookworm prevalence is 50%, one dose in the second trimester and one dose in the third trimester</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mebendazole, 500 mg, single dose or 100 mg twice daily for three days</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Levamisole, 2.5 mg/kg body weight, single dose (but better if this dose is repeated on the next two consecutive days)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pyrantel, 10 mg/kg weight, single dose (but better if this dose is repeated on the next two consecutive days)</td>
<td></td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td></td>
<td>Praziquantel, 40 mg/kg body weight, single dose</td>
<td>Annually (one dose/year)</td>
</tr>
<tr>
<td>School-age children</td>
<td>Schistosomiasis is endemic</td>
<td>Praziquantel, 40 mg/kg body weight, single dose</td>
<td></td>
</tr>
</tbody>
</table>

* Where malaria is endemic

** Recent studies show it might be cost-effective to routinely deworm children < 5 years to decrease anemia and improve growth. This recommendation may thus change.

Sources: WHO (1995); Stoltzfus and Dreyfuss (1998); Parise (2000).
## Iron Doses and Three-Month Hemoglobin Increase in Women

<table>
<thead>
<tr>
<th>Daily Dose (mg)</th>
<th>Increase (g/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 60</td>
<td>0.2</td>
</tr>
<tr>
<td>61-90</td>
<td>1.0</td>
</tr>
<tr>
<td>91-120</td>
<td>1.2</td>
</tr>
<tr>
<td>&gt; 120</td>
<td>1.6</td>
</tr>
</tbody>
</table>

1 Calculated from studies/programs with both supervised and unsupervised iron supplementation.

## Iron and Folic Acid Doses
### For Universal Supplementation in Vulnerable Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Iron-Folic Acid Doses</th>
<th>Duration</th>
</tr>
</thead>
</table>
| Low-birthweight infants (< 2,500 g)                | *Iron*: 2 mg/kg body weight/day  
*Folic acid*: 50 mcg/day                                                               | 2-24 mos. of age                                                        |
| 6- to 24-month-old children                        | *Iron*: 2 mg/kg body weight/day  
*Folic acid*: 50 mcg/day                                                               | 6-12 mos. of age where anemia prevalence is < 40%  
6-24 mos. of age where anemia prevalence is ≥ 40%                                        |
| 24- to 59-month-old children*                       | *Iron*: 20-30 mg iron                                                              | At least once/week for three months                                      |
| School-age children (6-11 years)*                  | *Iron*: 30-60 mg/day                                                               | At least once/week for three months                                      |
| Adolescents/women of childbearing age*             | *Iron*: 60 mg/day  
*Folic acid*: 400 mcg/day for girls and women                                         | At least once/week for three months                                      |
| Pregnant and lactating women                       | *Iron*: 60 mg/day  
*Folic acid*: 400 mcg/day                                                             | Six months during pregnancy where anemia prevalence is < 40%  
Six months during pregnancy and three months postpartum where anemia prevalence is ≥ 40%  
If it is not possible for women to take iron and folic acid for six months in pregnancy, supplementation should continue into the postpartum period or the dose should be increased to 120 mg/day. |

* The need for universal supplementation in these groups may change if there are iron-fortified foods targeted to them.

**Sources:** WHO/UNICEF/UNU (2001); Stoltzfus & Dreyfuss (1998). **Note:** Where the recommendations differ, recommendations in the Stoltzfus & Dreyfuss document were used. For example, WHO/UNICEF/UNU does not recommend folic acid for low-birthweight infants and children 6-59 months.
Iron and Folic Acid Doses
For Treating Severe Anemia in Vulnerable Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Iron/Folic Acid Doses</th>
<th>Duration*</th>
</tr>
</thead>
</table>
| Children < 2 years old**                        | *Iron: 25 mg/day  
Folic acid: 100-400 mcg/day*               | 3 months  |
| Children 2-12 years old                         | *Iron: 60 mg/day  
Folic acid: 400 mcg/day*                   | 3 months  |
| Adolescents and adults, including pregnant women** | *Iron: 120 mg/day  
Folic acid: 400 mcg/day*                  | 3 months  |

*Indications for supplementation:* Presence of severe anemia as assessed by clinical signs (pallor) or hemoglobin/hematocrit tests

* After completing three months of treatment for severe anemia, young children and pregnant women should continue on preventive supplementation regimen.

** Children with kwashiorkor or marasmus should be assumed to be severely anemic. Oral iron supplementation should be delayed until the child starts eating again and gains weight, usually after 14 days.

Source: Stoltzfus and Dreyfuss (1998).
## United States Dietary Reference Intakes* for Anemia-Related Micronutrients (Other Than Iron and Folic Acid) for Vulnerable Groups

<table>
<thead>
<tr>
<th>Age/Gender Group</th>
<th>Vitamin A (retinol activity equivalents, mcg/day)</th>
<th>Vitamin C (mg/day)</th>
<th>Riboflavin (mg/day)</th>
<th>Vitamin B-6 (mg/day)</th>
<th>Vitamin B-12 (mcg/day)</th>
<th>Copper (mcg/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6 mos.</td>
<td>400</td>
<td>40</td>
<td>0.3</td>
<td>0.1</td>
<td>0.4</td>
<td>200</td>
</tr>
<tr>
<td>7-12 mos.</td>
<td>500</td>
<td>50</td>
<td>0.4</td>
<td>0.3</td>
<td>0.5</td>
<td>220</td>
</tr>
<tr>
<td>1-3 yrs.</td>
<td>300</td>
<td>15</td>
<td>0.5</td>
<td>0.5</td>
<td>0.9</td>
<td>340</td>
</tr>
<tr>
<td>4-8 yrs.</td>
<td>400</td>
<td>25</td>
<td>0.6</td>
<td>0.6</td>
<td>1.2</td>
<td>440</td>
</tr>
<tr>
<td>9-13 yrs.</td>
<td>600</td>
<td>45</td>
<td>0.9</td>
<td>1.0</td>
<td>1.8</td>
<td>700</td>
</tr>
<tr>
<td>14-18 yrs.</td>
<td>700 females 900 males</td>
<td>65 females 75 males</td>
<td>1.0 females 1.3 males</td>
<td>1.2 females 1.3 males</td>
<td>2.4</td>
<td>890</td>
</tr>
<tr>
<td>Males, 19-50 yrs.</td>
<td>900</td>
<td>90</td>
<td>1.3</td>
<td>1.3 19-50 yrs. 1.7 &gt; 50 yrs.</td>
<td>2.4</td>
<td>900</td>
</tr>
<tr>
<td>Females, 19-50 yrs.</td>
<td>700</td>
<td>75</td>
<td>1.1</td>
<td>1.3 19-50 yrs. 1.5 &gt; 50 yrs.</td>
<td>2.4</td>
<td>900</td>
</tr>
<tr>
<td>Pregnant women</td>
<td>750 ≤ 18 yrs. 770 &gt; 19 yrs.</td>
<td>80 ≤ 18 yrs. 85 &gt; 19 yrs.</td>
<td>1.4</td>
<td>1.9</td>
<td>2.6</td>
<td>1000</td>
</tr>
<tr>
<td>Lactating women</td>
<td>1200 ≤ 18 yrs. 1300 &gt; 19 yrs.</td>
<td>115 ≤ 18 yrs. 120 &gt; 19 yrs.</td>
<td>1.6</td>
<td>2.0</td>
<td>2.8</td>
<td>1300</td>
</tr>
</tbody>
</table>

*These intakes are the most recent set of dietary recommendations established by the Food and Nutrition Board of the Institute of Medicine in the United States, 1997-2001.

Counseling Pregnant Women and Mothers About Iron Supplements

Counseling Points

When and how to take supplements
• Take supplements between meals or before going to bed with a little juice or water.

How to store supplements
• Keep tablets in a cool storage place out of the reach of small children.

Where to return for more tablets
• Return for more tablets at the health center, store, or other usual supplier.

How to give supplements to children
• Crush supplements and stir into child’s food (or stir sprinkles into child’s food); feed the food to the child.

The importance of taking all supplements
• Take all supplements to ensure the health of the baby and the health and strength of the mother.
• Children who take all supplements will be easier to feed and take care of and will do better in school in the future.

Side effects
• They may occur as dark or black stools, gastric upset, nausea, diarrhea, or constipation.
• They are not serious and should subside in a few days.

Managing side effects
• Take supplements with meals (instead of between meals or before bed).
• Split scored tablets in half and take each half at a different time of day.

No negative effects
• Iron is not a medicine and will not harm an unborn baby if taken as directed.
• Iron does not increase the baby’s birthweight (i.e., it does not cause "large babies").
• Iron does not increase the amount of blood or cause high blood pressure.

Source: Galloway et al. (2002).
Anemia Prevention and Control: What Works

Part II: Tools and Resources

Counseling Pregnant Women and Mothers About Iron Supplements

Sample Counseling Cards From Indonesia – Pregnant Women

**TANDA TANDA KURANG DARAH**

- Lesu, letih, lemah, cepat lelah dan lalai
- Pusing dan mata berkunang-kunang

**SIGNS OF LOW BLOOD**

- Pale, tired, no energy
- Lack of concentration, dizzy

**MANFAAT TABLET TAMBAH DARAH**

- Membuat ibu sehat dan kuat selama hamil
- Membuat bayi tumbuh sehat dan kuat
- Membuat ibu lebih bertenaga waktu melahirkan

**ADVANTAGES OF IRON TABLETS**

- Make you strong and healthy
- Make your baby strong and healthy
- Replace your blood used by the baby

**CARA MINUM TABLET TAMBAH DARAH**

- Minumlah satu tablet sehari
- Selama hamil minumlah 1 tablet per hari, paling sedikit 90 tablet selama kehamilan
- Minumlah menjelang tidur untuk mengurangi rasa mual
- Tablet tambah darah diminum bersama air putih atau buah
- Jangan minum tablet tambah darah dengan teh atau kopi karena teh dan kopi mengurangi manfaat tablet tambah darah

**HOW TO TAKE IRON TABLETS**

- Take a minimum of 1 tablet per day
- Take a minimum of 90 tablets during pregnancy
- Take before going to bed
- Take tablets with water or fruit
- Don’t take with tea or coffee because they reduce the advantages of iron tablets
TABLET TAMBAH DARAH

- Tidak menyebabkan darah tinggi atau kebanyakan darah
- Tidak menyebabkan bayi menjadi terlalu besar

KELUHAN YANG BISA TIMBUL BILA MINUM TABLET TAMBAH DARAH

- Mual-mual
- Susah buang air besar
- Tinja berwarna hitam
- Perut terasa tidak enak setelah minum tablet tambah darah

Ini mungkin terjadi dan sama sekali tidak berbahaya, akan hilang dengan sendirinya

IRON TABLETS

- Tablets will not cause high blood pressure
- Tablets will not cause a big baby

SIDE EFFECTS THAT SOMETIMES OCCUR WHEN TAKING IRON TABLETS

- Nausea
- Constipation
- Black stools
- Upset stomach

Don’t worry about these side effects. They should disappear in a few days and they are not serious.

WHERE TO GET IRON TABLETS

- For free at health center, health post, maternal/child health care center
- For a small cost at small shop or drug store with a banner. Your village midwife can also tell you where to get them.

IBU BISA MENDAPATKAN TABLET TAMBAH DARAH

- Gratis di Puskesmas, Pustu, Posyandu
- Ibu bisa beli pada Bidan di desa atau di warung / toko obat yang bertanda khusus
Sample Counseling Cards From Indonesia – Mothers

MEGAPA IBU YANG BARU MELAHIRKAN PERLU MINUM TABLET TAMBAH DARAH?

- Tanda-tanda kurang darah tidak terasa / tidak terlihat;
- Pada waktu melahirkan ibu banyak mengeluarkan darah;
- Mengganti darah yang hilang pada waktu melahirkan;
- Tablet tambah darah tidak menyebabkan darah tinggi atau kebanyakan darah.

CARA MINUM TABLET TAMBAH DARAH

- Minumlah satu tablet sehari
- Selama masa nifas, minumlah satu tablet, sampai selama 40 hari
- Minumlah menjelang tidur untuk mengurangi rasa mual
- Diminum bersama air putih atau buah
- Jangan minum tablet tambah darah dengan teh atau kopi, karena teh dan kopi mengurangi manfaat tablet tambah darah.

KELUHAN YANG BISA TIMBUL BILA MINUM TABLET TAMBAH DARAH?

- Mual-mual
- Susah buang air besar
- Tinja berwarna hitam
- Perut terasa tidak enak

Ibu tidak perlu khawatir, ini mungkin terjadi dan sama sekali tidak berbahaya, akan hilang dengan sendirinya.

IBU BISA MENDAPATKAN TABLET TAMBAH DARAH

- Gratis di Puskesmas, Pustu, Posyandu
- Ibu bisa beli pada Bidan di desa atau di warung / toko obat yang bertanda khusus

WHY DOES THE WOMAN WHO HAS JUST DELIVERED NEED IRON TABLETS?

- Signs of too little blood aren’t felt or seen
- At the time of childbirth women can lose a lot of blood
- To replace lost blood at the time of childbirth
- Tablets don’t cause high blood pressure or too much blood

HOW TO TAKE IRON TABLETS

- Take a minimum of one tablet per day
- Take tablets for 40 days
- Take before going to bed
- Take tablets with water or fruit

Don’t take with tea or coffee because they reduce the advantage of iron tablets.

SIDE EFFECTS THAT SOMETIMES OCCUR WHEN TAKING IRON TABLETS

- Nausea
- Constipation
- Black stools
- Upset stomach

Don’t worry about these side effects – they aren’t serious and should go away after a few days.

WHERE TO GET IRON TABLETS

- For free at health center, health post, maternal/child health care center
- For a small cost at small shop or drug store with a banner. Your village midwife can also tell you where to get them.
Negotiating With Women to Follow Advice

The counseling technique of "negotiating" for behavior change was developed for infant feeding, but it can also improve compliance with iron supplementation and food intake in women. Effective negotiating with a woman taking iron supplements or giving iron to her young children includes:

- Asking and discussing what she is doing now
- Asking her to try a new behavior
- Asking what practice she is able or willing to do
- Addressing initial resistance/concerns
- Agreeing on what practices she can continue
- Following up later to see if she was able to follow the new advice

The counselor and woman can then identify and discuss barriers to following the advice and consider ways to overcome them.

Source: Dickin et al. (1997).
Food Fortification: Seven Steps for Quality Control

- Decide on specifications for fortificant (particle size, color, potency, acceptable amount of fortificant) and food vehicle
- Through random testing, control fortificant, food vehicle, and fortified food for potency, particle size, color, packaging integrity, net weight, adulteration, and storage conditions, including temperature, light, moisture, and oxygen
- Identify and regulate critical control points such as shipping, industrial processing, storage, retailing, and household
- Establish a recall policy and procedure
- Audit the system periodically to ensure that manufacturers adhere to fortification standards and maintain quality
- Empower manufacturers to respond to consumer complaints
- Document all aspects of the quality assurance system and make this information available to those responsible for food fortification
Information Sources for Anemia Prevention and Control


- Asian Development Bank (ADB), P.O. Box 789, 0980 Manila, Philippines; Tel. 63-2-632-4444; Fax 63-2-636-2444; (http://www.adb.org/). Special Initiative includes Central Asia Forum on Micronutrient Malnutrition.


- Centers for Disease Control and Prevention (CDC), 1600 Clifton Road, Atlanta, GA 30333, USA; Tel. (inquiries): 1-800-311-3435; (http://www.cdc.gov/). Overview of Iron Overload and Hemochromatosis and others on iron overload.

- Food and Agriculture Organization of the United Nations (FAO), Viale delle Terme di Caracalla 00100, Rome, Italy; Tel. 39-06-5705-1; Fax 39-06-5705-3151; (http://www.fao.org/). Documents on food composition including iron content of food and food based solutions to malnutrition including Preventing Micronutrient Malnutrition: A Guide to Food Based Approaches (FAO/ILSI).

- Global Alliance for Improved Nutrition (GAIN), c/o World Health Organization, Avenue Appia 20, 1211 Geneva 27, Switzerland; telephone and fax not yet available; (http://www.gainhealth.org/). New initiative to provide funding and other resources to reduce micronutrient malnutrition.


- The International Life Sciences Institute (ILSI), One Thomas Circle, N.W., 9th Floor, Washington, D.C. 20005, USA; Tel. 1-202-659-0074; Fax 1-202-659-3859; (ilsi@ilsi.org). See ILSI publications for nutrition-related publications and links to INACG and IDEA.

- International Nutrition Foundation (INF), 150 Harrison Avenue, Room 243, Boston, MA 02111, USA. Tel. 1-617-636-3771; Fax 1-617-636-3781; (http://www.inffoundation.org/index4.html). Closely associated with United Nations University, INF offers nutrition information including the Iron Deficiency Project Advisory Service (IDPAS) supported by the Micronutrient Initiative. For information about IDPAS and to access its database on projects and resources related to iron-deficiency anemia, contact Gary Gleason: ggleason@inffoundation.org.

- The International Nutritional Anemia Consultative Groups (INACG), INACG Secretariat, ILSI Human Nutrition Institute, One Thomas Circle, N.W., Washington, D.C. 20005-5802, USA; Tel. 1-202-659-9024; Fax 1-202-59-3617; (http://www.ilsi.org/inacg.html). Safety of Iron Supplementation Programs in

- Iron Deficiency Elimination Action (IDEA), ILSI Center for Health Promotion (CHP), 2295 Parklane Drive, Suite 450, Atlanta, GA 30345, USA; Tel. 1-770-934-1010; Fax 1-770-934-7126; (http://idea.ilsi.org/). Produces a newsletter on its activities to control iron-deficiency anemia.

- Iron Deficiency Project Advisory Service (IDPAS) – see International Nutrition Foundation (INF) entry for more information.

- John Snow, Inc. (JSI), 1616 N. Fort Myer Drive, 11th Floor, Arlington, VA 22209-3100, USA; Tel. 1-703-528-7474; Fax 1-703-528-7400; (http://www.jsi.com/home.html). Alleviation of Maternal Anemia in Indramayu Regency, Indonesia: Results from the MotherCare Project, Improving the Quality of Iron Supplementation Programs: The MotherCare Experience, and others.


- The Micronutrient Initiative (MI), P.O. Box 56127, 250 Albert Street, Ottawa, Canada; Tel. 1-613-782-6800; Fax 1-613-782-6838; (http://www.micronutrient.org/). Preventing Iron Deficiency in Women and Children, Regulation of Fortified Foods to Address Micronutrient Malnutrition, Economic Consequences of Iron Deficiency and others.


- Pan American Health Organization (PAHO), Regional Office of the World Health Organization, 525 Twenty-third Street, N.W., Washington, D.C. 20037, USA; Tel. 1-202-974-3000; Fax 1-202-994-3663; (http://www.paho.org/). Iron Fortification: Where Are We in Terms of Iron Compounds?

- Program Against Micronutrient Malnutrition (PAMM), Department of International Health, Rollins School of Public Health of Emory University, 1518 Clifton Road, N.E., Atlanta, GA 30322, USA; Fax 1-404-727-4590; (http://www.sph.emory.edu/PAMM/oldpamm.htm). Iron Overview and others.

• Standing Committee on Nutrition (SCN) of the United Nations, SCN Secretariat, c/o The World Health Organization, Avenue Appia 20, 1211 Geneva 27, Switzerland; Tel. 41-22-791-0456; Fax 41-22-798-8891; (http://www.unsystem.org/scn/Default.asp). Nutrition information including background information on iron-deficiency anemia. Working groups on nutrition including micronutrients.

• SUSTAIN (Sharing United States Technology to Aid in the Improvement of Nutrition project), 1050 Connecticut Avenue, N.W., Suite 1000, Washington, D.C. 20036, USA; Tel. 1-202-772-1030; Fax 1-202-772-3313; (http://www.sustaintech.org/). Research Protocol Summary: SUSTAIN Evaluation of the Bioavailability of Elemental Iron Powders Used for Food Fortification; Guidelines for Iron Fortification of Cereal Food Staples; Storage, Sensory and Bioavailability Evaluation of Iron Fortified Corn Masa Flour; and others.


• The USAID Micronutrient Program (MOST), International Science and Technology Institute, Inc., 1820 North Fort Myer Drive, Suite 600, Arlington, VA 22209, USA; Tel. 1-703-807-0236; Fax 1-703-807-0278; (http://www.mostproject.org/). Improving Iron Status Through Diets, Anemia Detection Methods in Low-Resource Settings, and others.


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Chapter I, Anemia: “Lost Years of Healthy Life”

What is Anemia?


What Is the Impact of Anemia?

Adult Productivity


Levin, H. (1986). A benefit-cost analysis of nutritional interventions for anemia reduc-


**Maternal Health**


**Young Child Development and Learning, Adolescent Development**


Stoltzfus, R.J., J.D. Kvalsvig, H.M. Chwaya, A. Montresor, M. Albonico, J.M. Tielsch, L.


**How Prevalent Is Anemia?**


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What Are the Causes of Anemia?

Direct Causes: Poor, Insufficient, or Abnormal Red Blood Cell Production (Iron Deficiency, Deficiencies in Other Nutrients, HIV/AIDS, Other Infectious Diseases, Genetic Conditions)


**Direct Causes: Excessive Red Blood Cell Destruction (Malaria)**


Parise, M. (2000). Personal communication with CDC, Atlanta, Ga., on malaria control measures in pregnancy.


Anemia Prevention and Control: What Works

Part II: Tools and Resources


Direct Causes: Excessive Red Blood Cell Loss (Helminth Infections, Bacterial and Viral Infections, Reproduction and Contraception)


Information Sources/References


Contributing Causes (Poor Knowledge and Behavior, Environmental Causes, Lack of Access to Health Services, Poor Sanitation, Poverty)


Chapter II, Taking Action: Developing a Strategy for Anemia Prevention and Control


UNICEF (1996). Statement on the significance of iron overload for iron deficiency control programmes. UNICEF.


Chapter III, Providing Iron Supplements to Combat Anemia


Baker, S. (2000). Personal communication with the Helen Keller International Africa regional bout anemia control programs in West Africa.


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INACG (1990). Combating iron deficiency anemia through food fortification technology. Summary XII INACG meeting, 5-7 December, Washington, D.C.


Mannar, V. (2000). Personal communication with MI director regarding work in the Middle East and North Africa region.


SUSTAIN (1999). Final report of the micronutrient assessment project. Submitted to USAID.


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Manoff Group (nd.) The impact of preventing and treating iron deficiency anemia. Fact sheet developed for the MI.


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