Forging Effective Strategies to Combat Iron Deficiency

EMORY CONFERENCE CENTER HOTEL
ATLANTA, GEORGIA
MAY 7–9, 2001

Control Iron Deficiency Anemia Challenge and Experience from Developing Countries

Ray Yip

UNICEF

Overview

- Developed vs. Developing
- Challenge in developing countries
  - Problem is greater
  - Problem is more complex
  - Resource is more limited
- Define which part works - do more

Assessments - Iron Deficiency

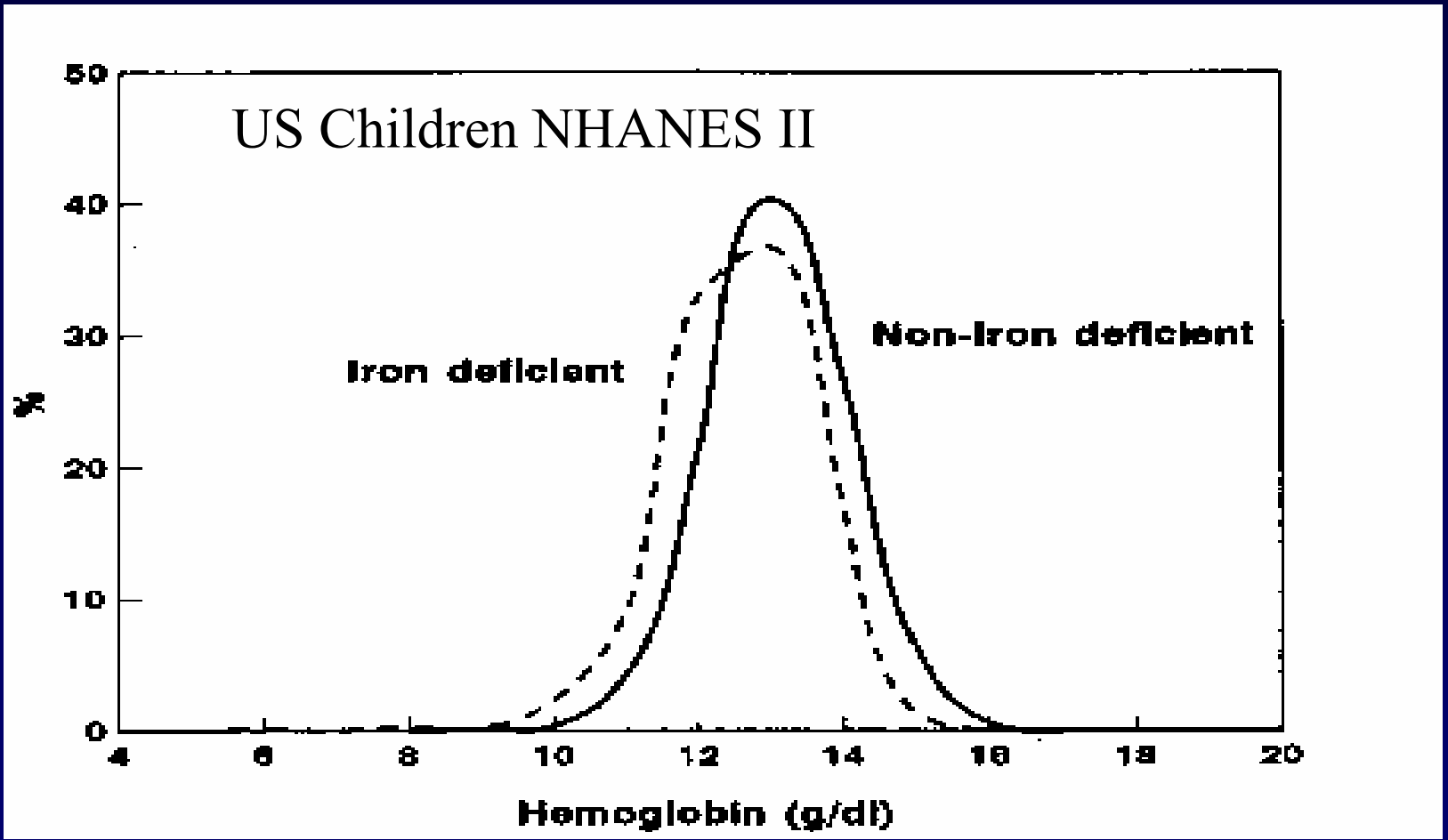
- **Developed areas**
  - Iron Def is mild
  - Anemia is not common
  - Iron deficiency is the main cause of anemia
- **Developing areas**
  - Iron Def is severe
  - Anemia is common
  - Iron Def is one of the several causes of anemia

Assessing Iron Deficiency

- **Developed areas**
  - Anemia has limited predictive value due to low prevalence of iron deficiency
  - Iron biochemistry tests are useful and available
- **Developing areas**
  - Even though multiple factors contributing to anemia burden, it is still useful
  - Iron biochemistry tests are of limited value because of infections and accessibility

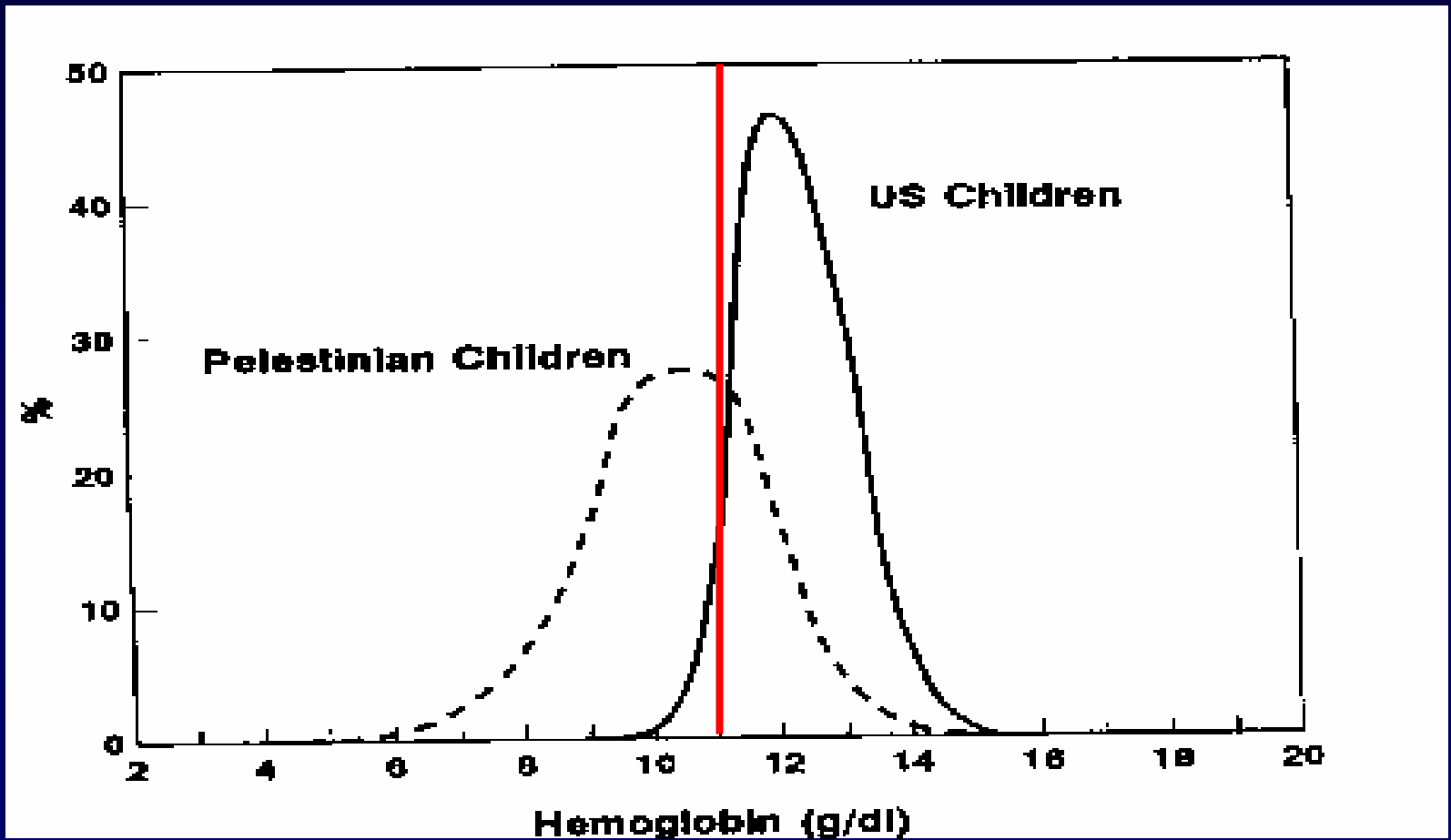
Hemoglobin Distributions

Iron deficient vs. Non-deficient



Hemoglobin Distributions

An example of an iron deficient population

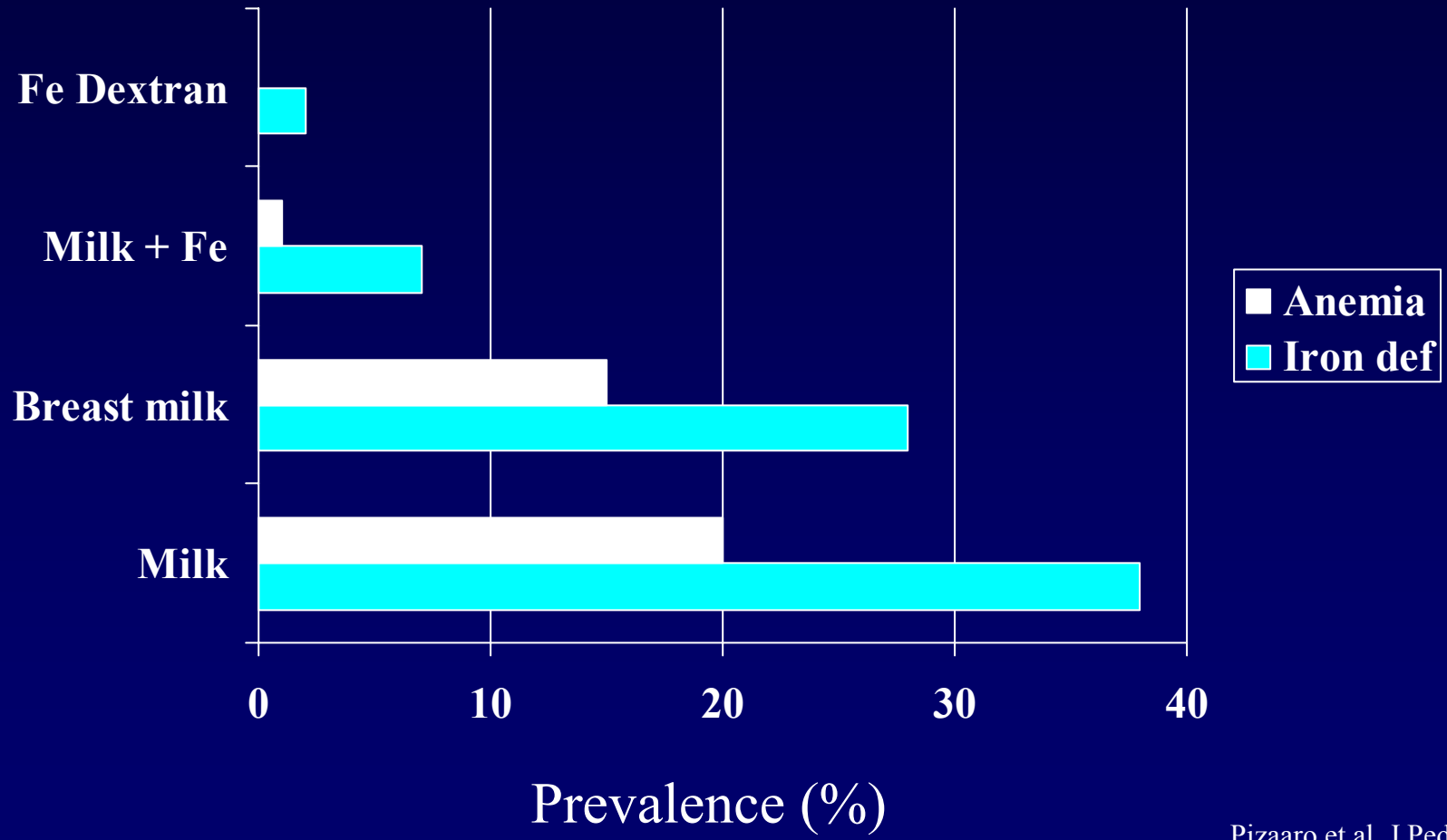


Yip, J Nutr, 1994

Iron Nutrition - Young Children

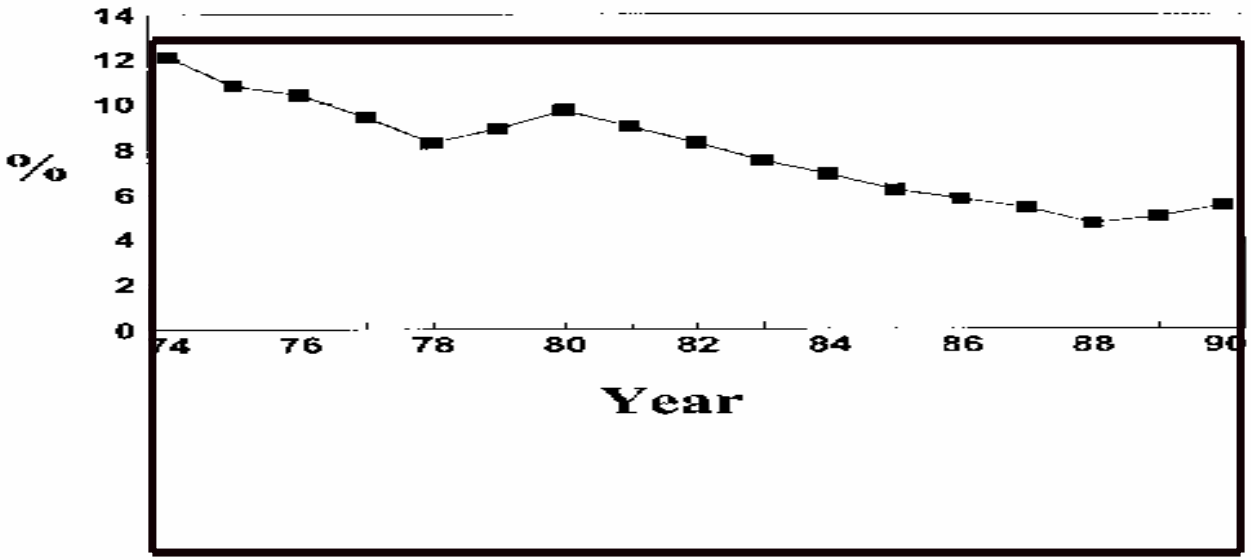
- **Developed areas**
  - low iron content in infant diet
  - Common exposure to industry-produced food - a proven opportunity in improving iron nutrition
- **Developing areas**
  - low iron content in infant and family diet
  - less or no exposure to industry-produced food

Feeding Regimens and Iron Status 9 month old infants - Chile



Pizaaro et al. J Ped, 1991

Declining Prevalence of Anemia United States



CDC Pediatric Nutrition Surveillance System

Experience to build on

- Adequate iron in adult diet does not assure adequate iron level in infant diet - special provision needed

- The critical window for prevention of childhood iron deficiency is late infancy - complementary feeding

Experience to build on

- Distribution and use of iron fortified food items for infants has demonstrated success

- In areas where industry produced infant food items are commonly used, adequate micronutrient fortification must be assured

Challenges to address

- When food distribution or use of industry produced items is not feasible
  - be part of the Early Child Development / Care effort initiative
  - be part of the complementary feeding improvement effort

Challenges to address

- Iron supplementation during critical period
  - Multiple micronutrient indicated
  - How to assure the effectiveness of such program?

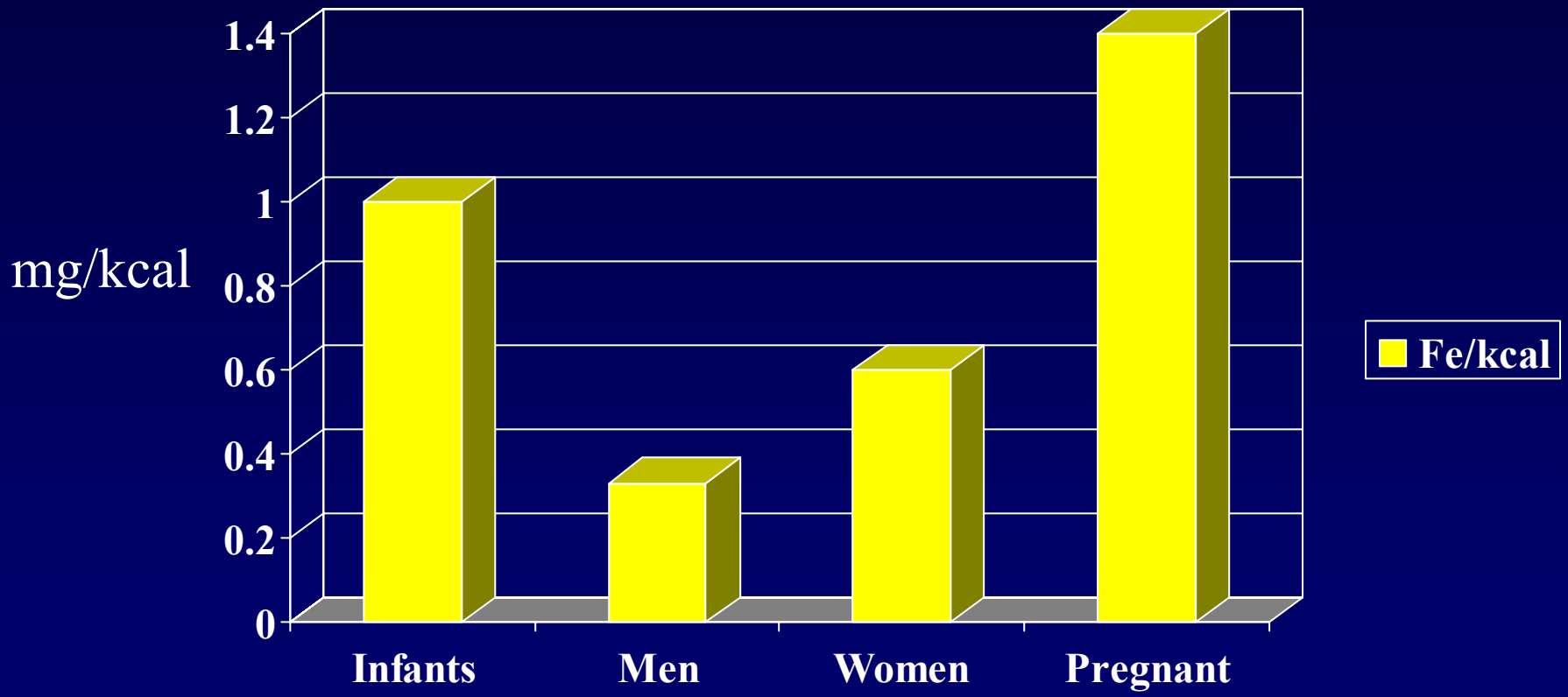
Iron Deficiency - Child bearing age Women

- **Developed areas**
  - Increased menstrual blood loss is a major risk factor
  - Mainly iron affected
- **Developing areas**
  - Low iron intake due to limited food quality
  - Multiple micronutrient affected
  - Hookworm infection in heavy endemic areas

Iron Deficiency - Pregnant Women

- **Developed areas**
  - Estimated half of the women can not meet their iron need - the only nutrient short
  - Iron supplementation during pregnancy indicated
- **Developing areas**
  - Majority women can not meet iron and other micronutrient even before pregnancy
  - Improving iron and other micronutrient intake *before* and *during* pregnancy indicated

Iron Requirement By Energy Intake



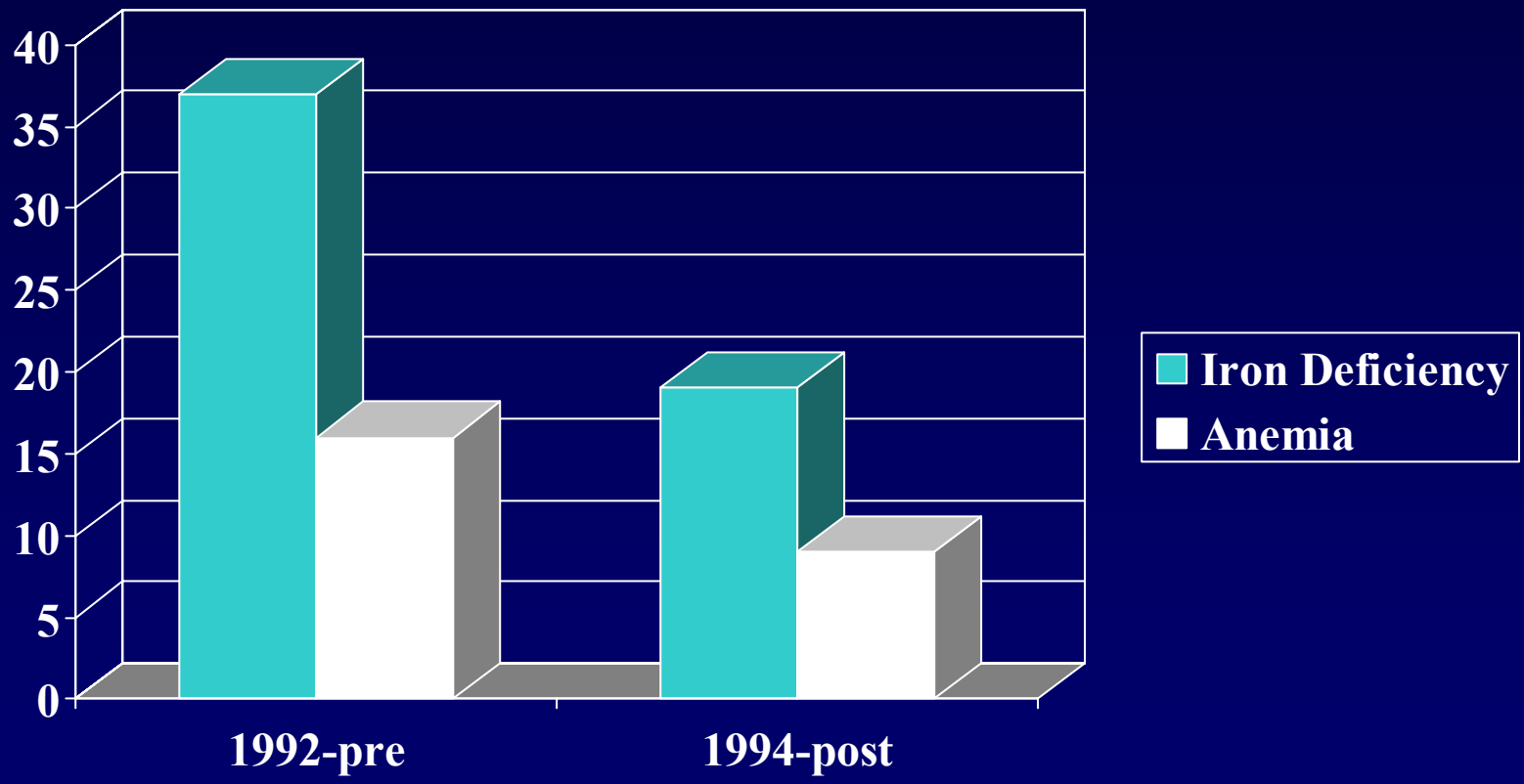
Options to improve iron status *before* pregnancy

- Fortification of common staple - feasible and has been done in many countries

- Periodic supplementation - efficacy demonstrated under *supervised* condition such as school or work sites

Evidence of effectiveness of Fortification

Wheat and corn flour - Venezuela



Issues related to Wheat Flour Fortification

- Nutrition benefit can be limited in low consumption areas - reason not to do it?
  - Example of 20 kg of annual flour consumption fortified with 60 ppm of iron
  - Annual additional intake of 1200 mg of iron or 3 mg/day - 25% of RDA for women
  - Equivalent of 40 days of supplementation of 30 mg of iron - a dose known to be efficacious

Issues related to Wheat Flour Fortification

- Can the poor people in developing country afford the extra cost?
  - Cost of premix - US $1.30 per metric ton flour or 0.13 cent per kg of flour
  - For 20kg consumption - 2.6 cent/ person when fortified at 60 ppm
  - For 60 kg consumption - 5.2 cent/ person when fortified at 40 ppm

What have we learned from existing fortification efforts?

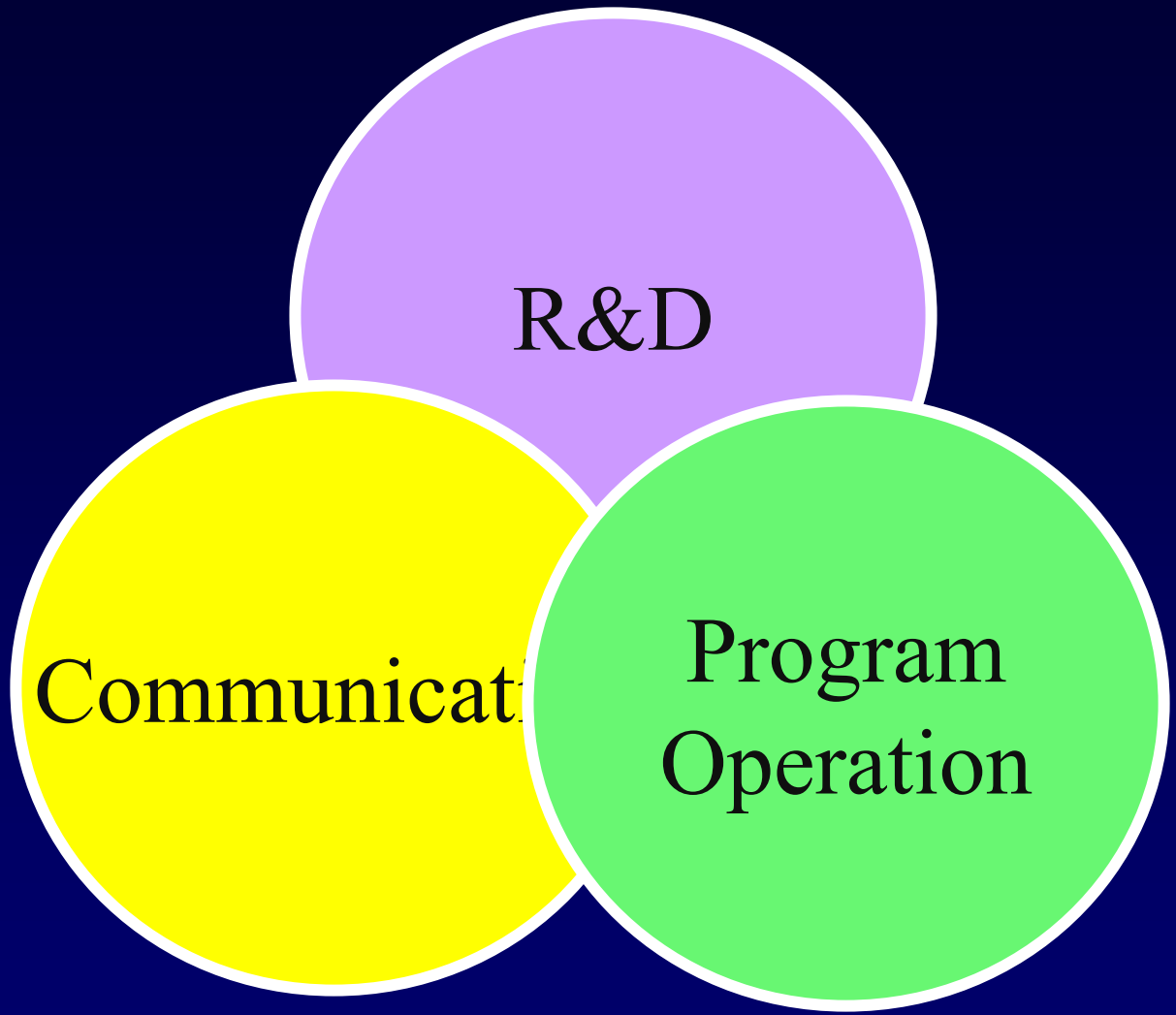
- Financial feasibility - cost shouldered by consumers
- Regulatory and monitoring requirement - level playing field for manufactures
- Leadership and ownership of the producers - it is their product and their factory !

Future opportunity in improving baseline iron status

- Improving the iron content and bioavailability of grains - the agriculture solution
  - Green revolution increased the yield - solving the energy intake or food security problem
  - Technology to improve the plants is greater now than in the 1960's

Meeting the iron requirement during pregnancy

- Iron/folate supplementation migrating to multiple micronutrient - why wait?
- Effort for supplementation should be on assuring program effectiveness - communication and service delivery is gaining attention
- Can we look at how other system is doing? e.g. TB treatment program


R&D
Communicati
Program
Operation

Preventing Iron Deficiency Throughout the Life Cycle

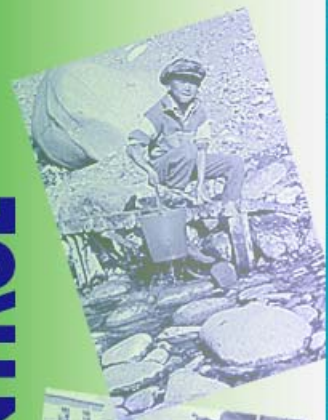
Fetal Development | Infancy | Child Development | Adolescence | Reproductive Age | Adulthood | Pregnancy

DIETARY EDUCATION

ORAL SUPPLEMENTATION

FOOD FORTIFICATION

INFECTION CONTROL



PUBLIC HEALTH MEASURES

Monitoring and Research

Forging Effective Strategies to Combat Iron Deficiency

EMORY CONFERENCE CENTER HOTEL
ATLANTA, GEORGIA
MAY 7–9, 2001