International Nutrition

Current & Emerging Issues in Nutrition, Health & Survival

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### International Nutrition: Major Nutritional Problems

- General food insecurity
- Protein-energy malnutrition (PEM)
- Micronutrient deficiencies
  - Vitamin A deficiency & disorders
  - Iron deficiency anemia
  - Zinc deficiency
  - Iodine deficiency & disorders
  - Other micronutrient deficits
- Infection and infectious morbidity
- Overweight & obesity
  - Chronic diseases of imbalance and overabundance
International Nutrition: Responses to Nutritional Stress

- **Household Responses:**
  - Breast feeding/Complementary feeding
  - Home-based fortification
  - Improving household food security (quantity, quality distribution)
  - Improving household hygiene
  - Food and non-food budgeting

- **Community Responses:**
  - Growth monitoring & promotion
  - Supplementary feeding
  - Cooperatives
  - Nutrition education activities

- **National and International Responses:**
  - Nutritional surveillance and program monitoring
  - Food aid
  - National food & nutrition policies
  - Multilateral and bilateral assistance programs
International Nutrition: Other Issues Covered

- Obesity and the Nutrition Transition
- Nutrition and Reproductive Health
- HIV and Micronutrient Nutrition
- Epidemiology of Famine
- Nutritional Problems Emerging from Student Papers (aka consultant reports!)
Population Distributions of Nutritional Status
Mostly Undernourished (PEM, Micronutrient Deficiencies)

Population Distributions of Nutritional Status
Mostly Undernourished (PEM, Micronutrient Deficiencies)

- Undernourished Deficient Famished
- Normally Nourished
- Overnourished Overweight Toxic

- Low weight for height.....Normal weight for height
- Low circulating retinol....Normal circulating retinol levels
- Low hemoglobin..........Normal hemoglobin
- Low urinary iodine.........Normal iodine status

Burden of Undernutrition

- ~20% of world popn → inadequate food
- Growth failure → ~1/3 of children
- ~40% of women → under weight and/or anemic
- >1 billion suffer nutritional deficiencies

ACC/SCN of the UN 2000
Spectrum of nutritional well-being and examples of types of responses in developing countries.
World Declaration on the Survival, Protection and Development of Children

Plan of Action for Implementing the World Declaration on the Survival, Protection and Development of Children in the 1990s

UNICEF 1990
• Reduce severe & moderate malnutrition < 5 yrs by half of 1990 levels;
• Reduce rate of low birth weight (≤ 2.5 kg) to < 10 %;
• Reduce iron deficiency anemia in women by 1/3 of 1990 levels;
• Virtually eliminate iodine deficiency disorders;
• Virtually eliminate vitamin A deficiency and consequences, including blindness;
• Empower women to exclusively breast-feed for four to six months (now 6 months) and to continue breastfeeding, with complementary food, well into the second year;
• Institutionalize growth promotion and monitoring in all countries by the end of the 1990s;
• Disseminate knowledge and support services to increase food production to ensure household food security.
By the year 2000 . . . eliminate:

- famine and related deaths
- starvation
- man-made disaster-induced deficiencies
- iodine deficiency
- vitamin A deficiency

ICN, Rome 1992
World Food Summit of 1996
FAO

• Monitoring adequacy of food supplies
• Gender equality for education, training in food industry
• Increased expert guidance to countries on human nutrition
• Improved opportunities for nutrition education
• Attention to food quality and safety
• Ensure fair food trade practices
• Establish linkages between nutrition and development
Millennium Development Goals (MDGs)
(based on Goals at UN Millennium Summit, Sept 8, 2000)

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality
4. Reduce child mortality
5. Improve maternal survival
6. Combat HIV/AIDS, malaria & other diseases
7. Ensure environmental sustainability
8. Develop a Global Partnership for Development

www.developmentgoals.org
Goal 1: Eradicate Extreme Poverty and Hunger

Target 1: Halve, between 1990 and 2015, the proportion of people whose income is less than $1 (0.80 Euros) a day

Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger
• Good governance
• Economic & development plans
• Grains & livestock production
• Trade policies
• Human rights (including food & nutrition)

UNICEF Conceptual Model of the Causation of Undernutrition, Modified To Include Its Consequences

• Clinical treatment protocols (eg, severe PEM, keratomalacia)
• Supplementary feeding

• Nutrition surveillance & surveys
• Direct nutrient provision
  • Supplementation
  • Food fortification
• Feeding programs
• Nutrition education
• Food subsidies
• Horticulture (gardens)
• Pisciculture (fish farms)
• Animal husbandry

• Education
• Equal opportunity
• Health care system
• Market access
• Food aid
Undernutrition

- Wasting
- Stunting
- Underweight
- Micronutrient Deficiencies
Severe Wasting w/ edema

Three-year old Indonesian boy with measles, marasmic-kwashiorkor and keratomalacia (right eye).

The synergy between malnutrition and infection can be devastating, threatening a child's sight and life.

Photo: Alfred Sommer
Mild-to moderate stages of undernutrition are clinically less evident, less acute but much more frequent, associated with increased risks of poor health, developmental delay and mortality.

Most preschool child deaths occur among those who are mildly-to-moderately undernourished.

Photo: Keith West
Underweight in Under Fives

- Excess infection
- Excess mortality
- Decreased activity
- Delayed development
- Poor school performance

ACC/SCN, 1991
Micronutrient Malnutrition: Hidden Hunger

- ~2 billion people affected
- VA, iron, iodine, and zinc deficiencies
- Effects: poor growth, increased morbidity, intellectual impairment, increased mortality
- Preventable: supplements, fortification, diet change
Poor Dietary Quality

A key determinant of multiple micronutrient deficiencies and complex nutritional etiologies of poor growth and increased morbidity
Vitamin A Deficiency

- 4-5 million children with xerophthalmia
- 125-130 million deficient children
- 1-2.5 million child deaths/year
- ~7 million deficient women
- ~6 million night blind pregnant women

KP West J Nutr 2002
Iron Deficiency and Anemia

World’s Most Common Micronutrient Deficiency
Iron Deficiency/Anemia: A Major Global Problem

- ~ 2 billion anemic
- Severe anemia → high mortality
- Mild to moderate anemia
  - Impairs child development
  - Decreases work capacity
  - Pregnancy complications
Anemia: Many Causes

- Iron deficiency
- Other nutritional deficiencies
- Hookworm
- Malaria
- Chronic infection (HIV)
Anemia: Many Solutions

- Iron supplementation
- Supplement with other nutrients
- Deworm/hygiene
- Malaria prophylaxis
- Prevent chronic infections
Iodine Deficiency Disorders
WHO 2004

54 countries with IDD as public health problem based on urinary iodine concentration
Effects of Iodine Deficiency on Neural Function

- Intelligence
- Learning capacity
- School performance
- Cognition
- Other outcomes
Zinc Deficiency

- Vast problem, hard to assess
- Low meat, high grain diets
- Increases risk of
  Diarrhea
  Respiratory infection
  Severe malaria
  Death (likely)
Zinc in the National Food Supply
(% mean per capita requirement)

Effects of Daily Zinc Supplement Use on Diarrhea and Pneumonia in Preschoolers

Diarrhea Incidence
9 countries

Diarrheal Prevalence
9 countries

Pneumonia Incidence
4 countries

~25% reduction for diarrhea
~40% reduction for pneumonia

For more information see: Zinc Investigators’ Collaborative Group
J Pediatrics 1999;135:689
Household and Mother: 1st Line of Response

Photo: Keith West
Breast and Complementary Feeding

Source: WHO/NUT/98.1
Today, 23 March 2004, UNICEF and WHO launched the “Global Strategy for Infant and Young Child Feeding”:

Goal: “Exclusive breast feeding in the first half-year of life and continued breast feeding coupled with appropriate foods thereafter to reduce the number of children < 5 dying from malnutrition”

www.who.int/mediacentre/releases/2004
Household Food Security

Adequate access to food needed for a healthy and active life for all household members (in terms of quality, quantity, safety, cultural acceptance, and future expectations).

ACC/SCN, 1991
“Although malnutrition has multiple causes, reality simply is not conducive to developing effective nutrition plans which simultaneously deal with all such causes.”

ACC/SCN, 1991
Examples of Community Responses: Growth Monitoring and Promotion & Supplementary Feeding

Photo: Keith West
Enhance Resilience
- Food for work
- Food subsidies
- Animal husbandry
- Fish farms
- Reforestation

Enhance Capacity
- Markets/Trade
- Foodgrains production
- Infrastructure building
- Credit schemes
- Rural services

Build Human Capital
- Education
- Growth monitoring
- MCH programs
- Multiple nutrition interventions
- Breast & home feeding

Strengthening Food Security (FANTA Project)

Preventing Undernutrition
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National & International Responses

- Food Aid
- Nutritional Surveillance and Program Monitoring
- Equitable trade policies
- Conflict resolution
- Economic Development policies
“Classic” Chain of Causation

Food Shortage

↓

Starvation

↓

Famine
The Nutrition Transition
- An Emerging Global Epidemic of Obesity-

Prevalence (%) in Women 15-49 Years of Age

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<th>Region</th>
<th>Obese</th>
<th>Over Wt</th>
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<td>S Asia</td>
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<td>2</td>
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Obesity: BMI > 30 kg/m²; Overweight BMI > 25 kg/m²

Martorell R. Nutrition Transition ed Caballero & Popkin, 2002
Trends in Prevalence of Underweight and Obesity in the Poorest and Richest 25% of Brazilian Women

Monteiro C, Conde W, Popkin B. AJPH 2004;94:433

![Graph showing trends in prevalence of underweight and obesity in the Poorest and Richest 25% of Brazilian women from 1975 to 1997.](image-url)
<table>
<thead>
<tr>
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<th>Poorest 25%</th>
<th>Richest 25%</th>
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<td>1997:1975</td>
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Monteiro, et al AJPH 2004
Welcome to International Nutrition

Very Important Website

http://www.who.int/nut/publications.htm