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International Nutrition

Current & Emerging Issues in Nutrition, Health & Survival

Keith P. West, Jr. DrPH, MPH

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

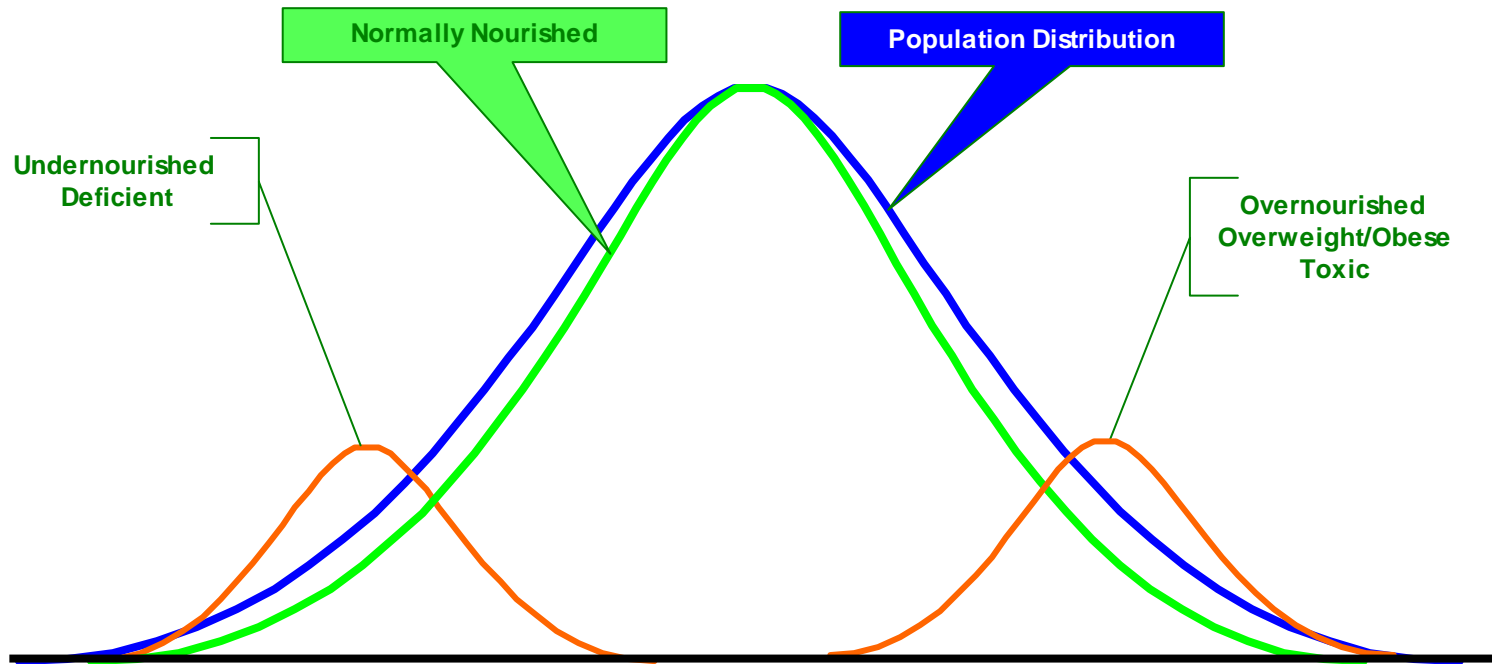
International Nutrition: Responses to Nutritional Stress

- **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

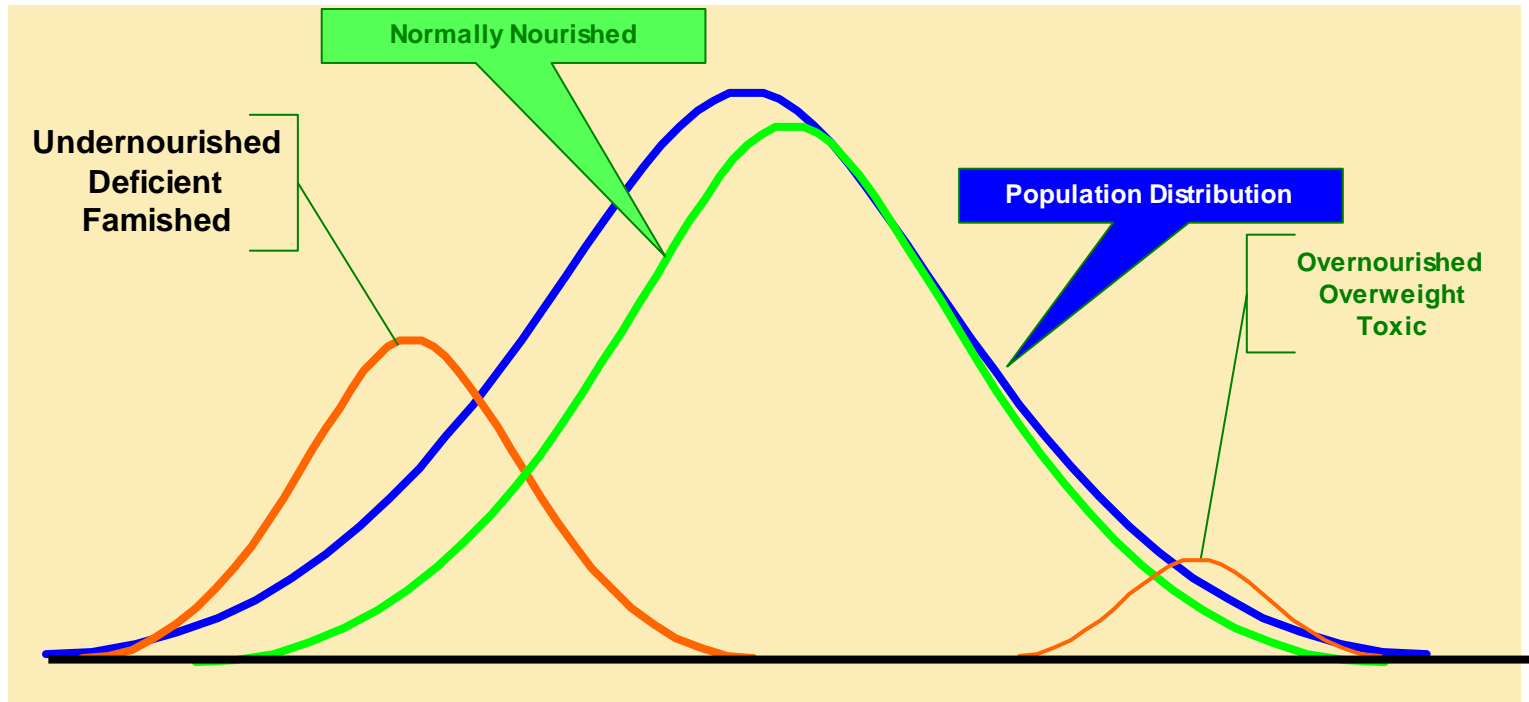
International Nutrition: Other Issues Covered

- 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!)

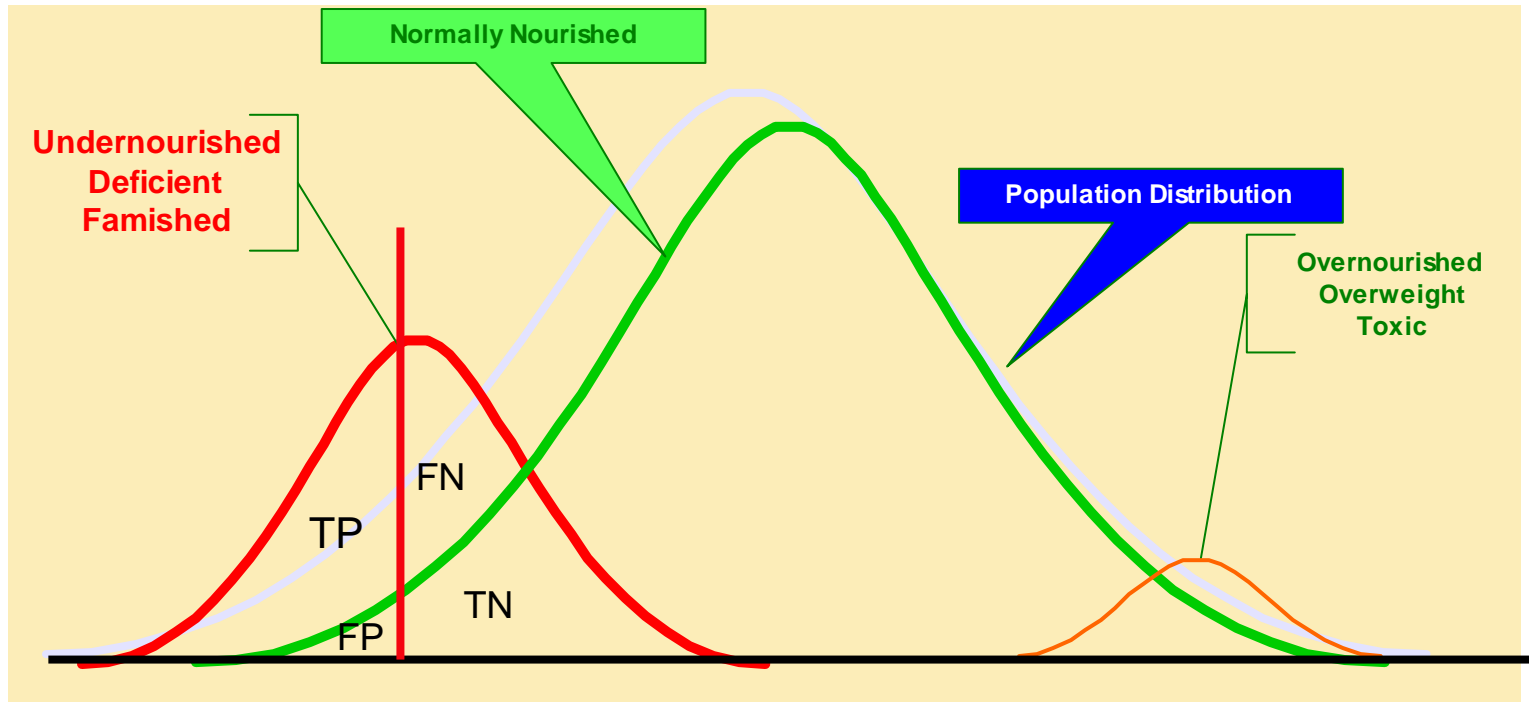
Population Distributions of Nutritional Status



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



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



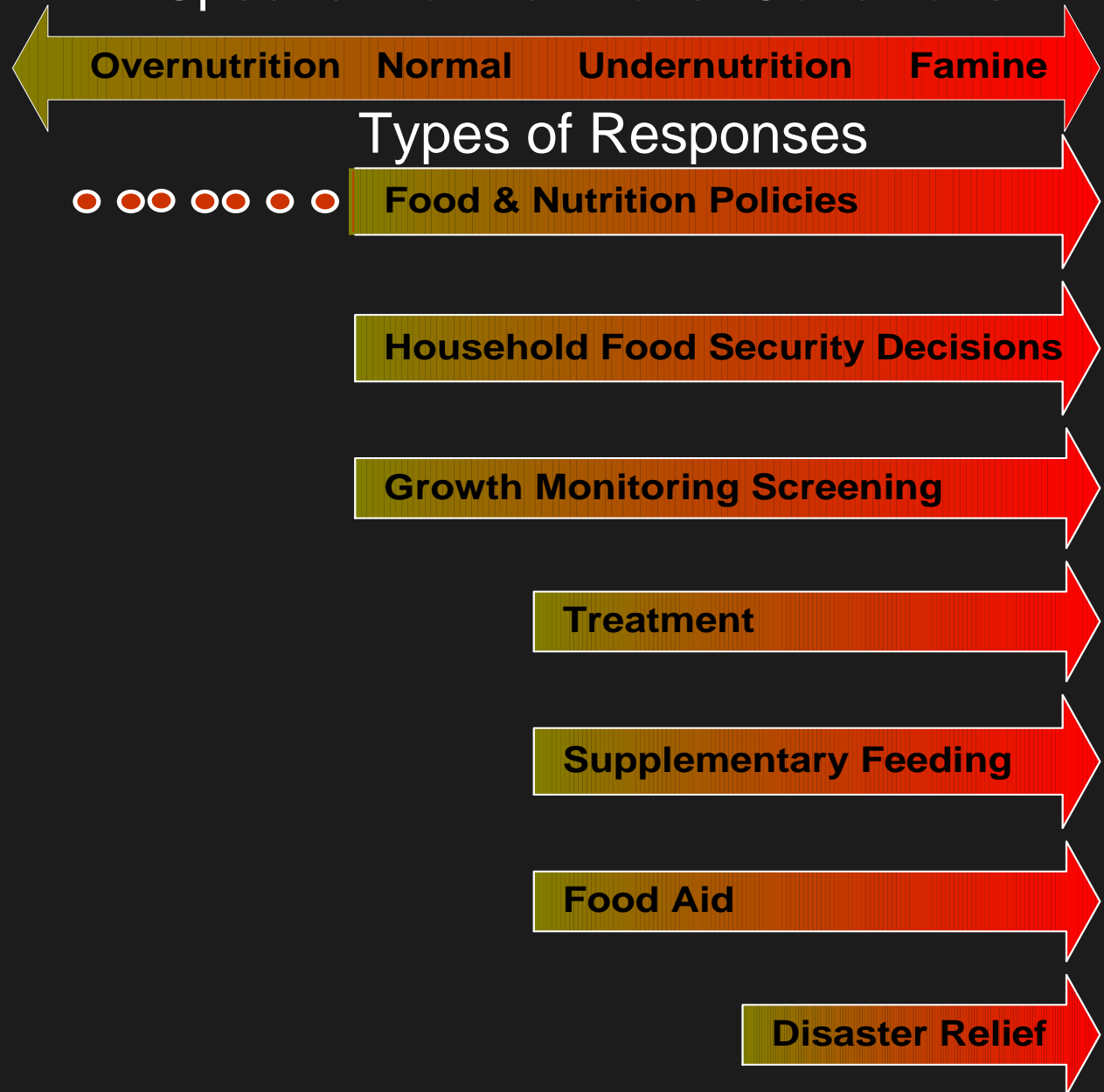
Low weight for height.....Normal weight for height
Low circulating retinol....Normal circulating retinol levels
Low hemoglobin.....Normal hemoglobin
Low urinary iodine.....Normal iodine status

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

Spectrum of Nutritional Conditions

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

World Summit for Children 1990: Nutrition Goals

- 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.



INTERNATIONAL CONFERENCE ON NUTRITION

December 1992
FAO & WHO



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)

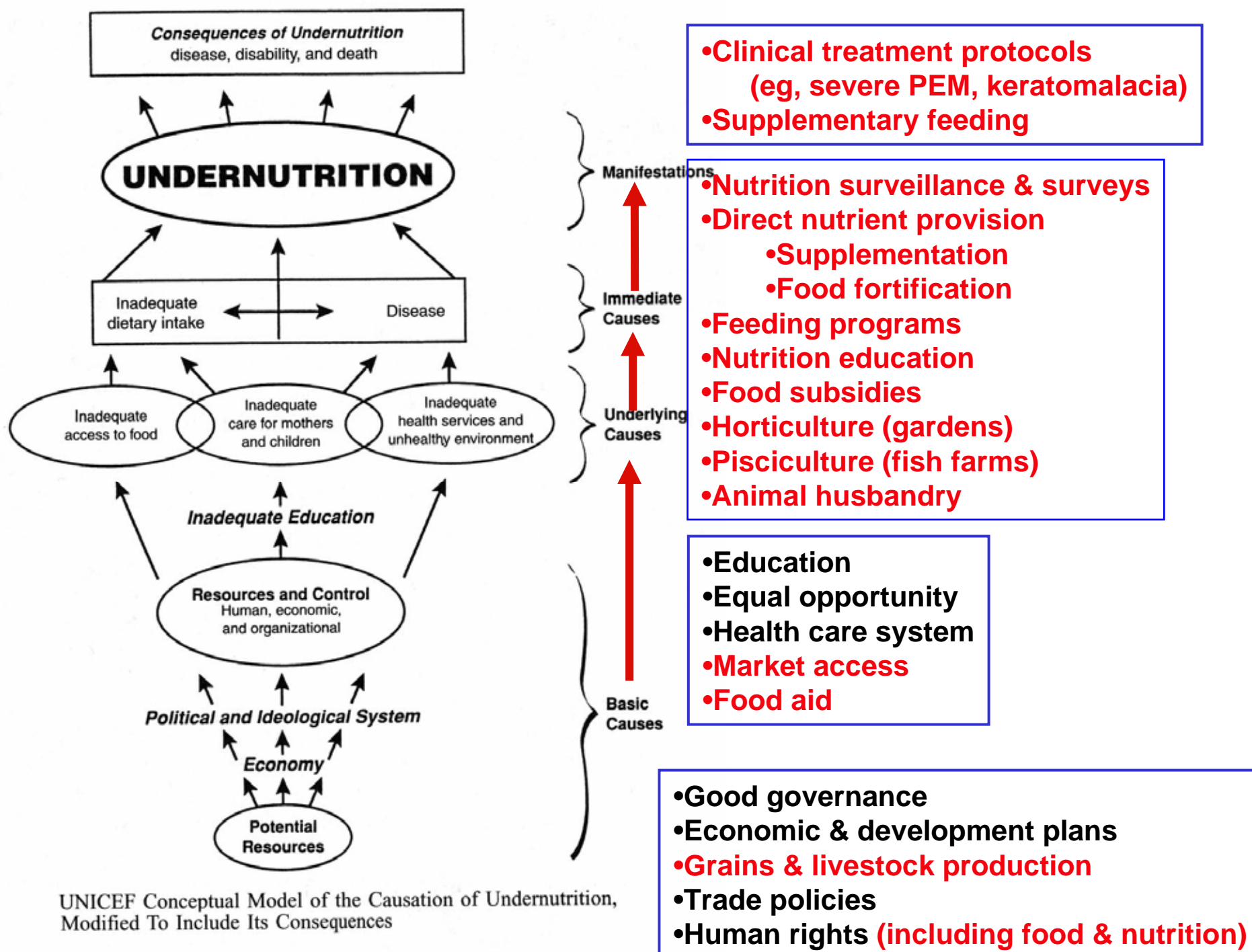
(based on Goals at UN Millennium Summit, Sept 8, 2000)

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

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



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

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

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

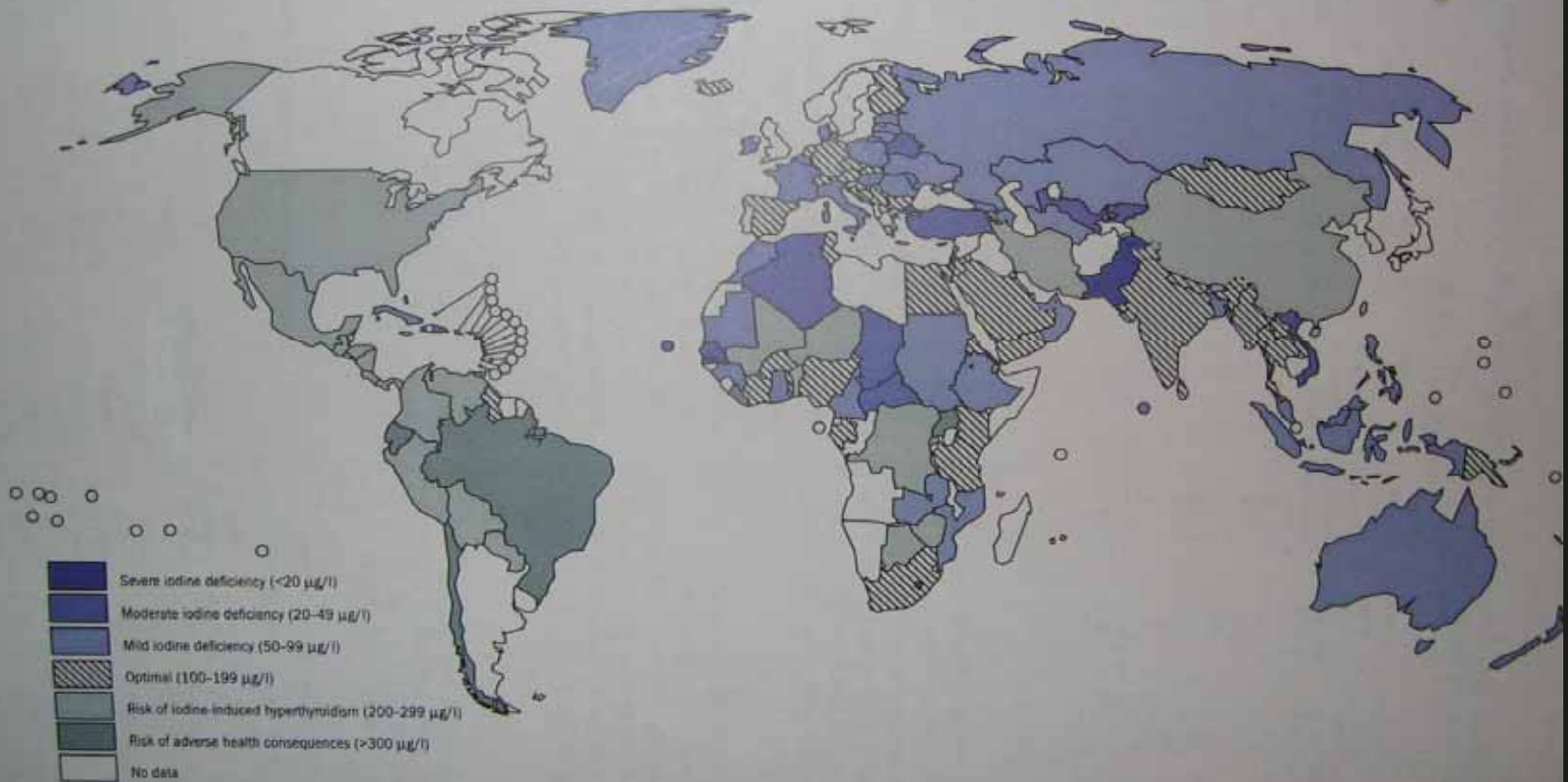
- Iron deficiency
- Other nutritional deficiencies
- Hookworm
- Malaria
- Chronic infection (HIV)

Anemia: Many Solutions

- Iron supplementation
- Supplement with other nutrients
- Deworm/hygiene
- Malaria prophylaxis
- Prevent chronic infections

Iodine Deficiency Disorders WHO 2004

Figure 3.3 Degree of public health significance of iodine nutrition based on median UI



54 countries with IDD as public health problem based on urinary iodine concentration

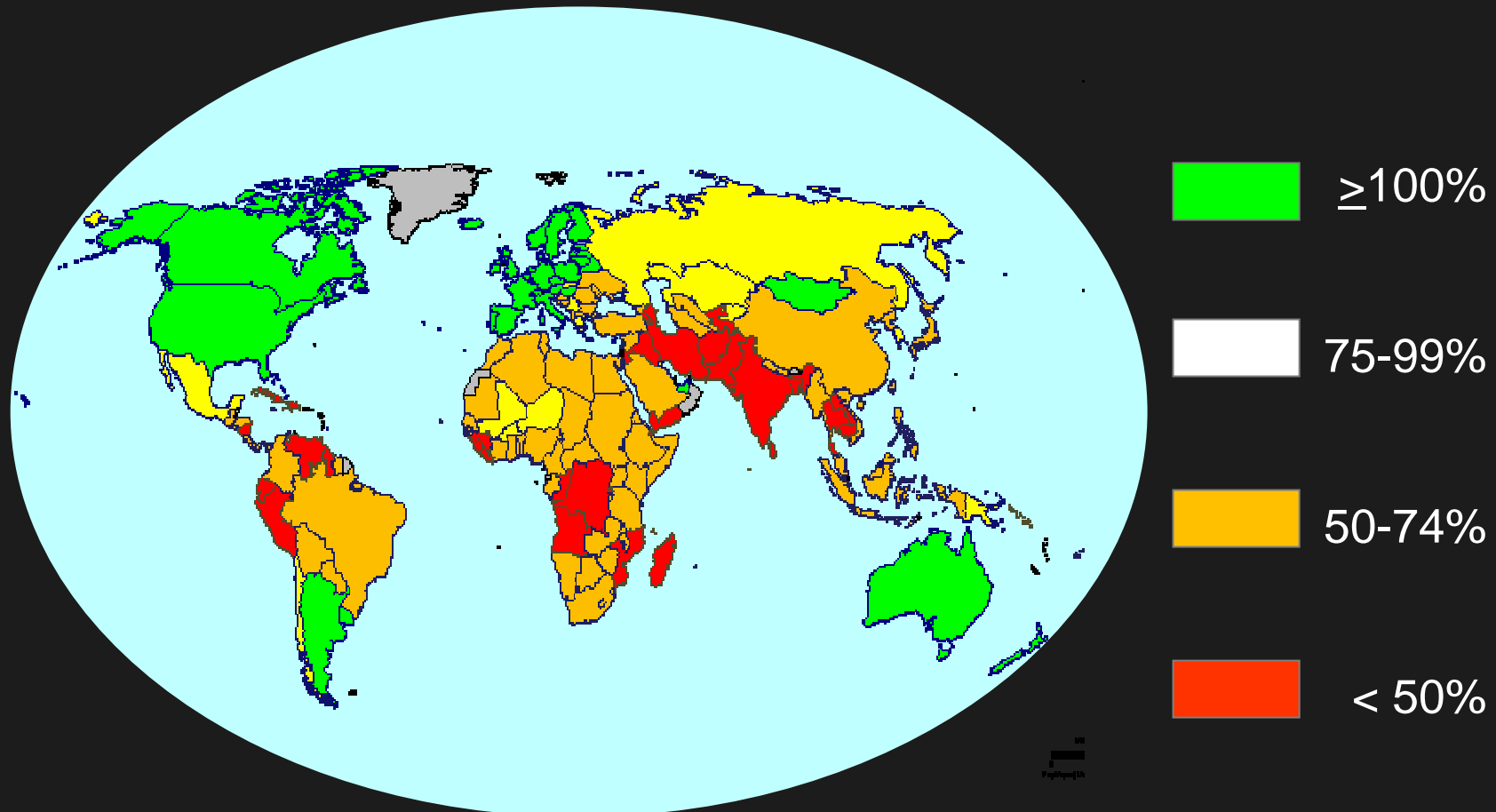
Effects of Iodine Deficiency on Neural Function

- 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)



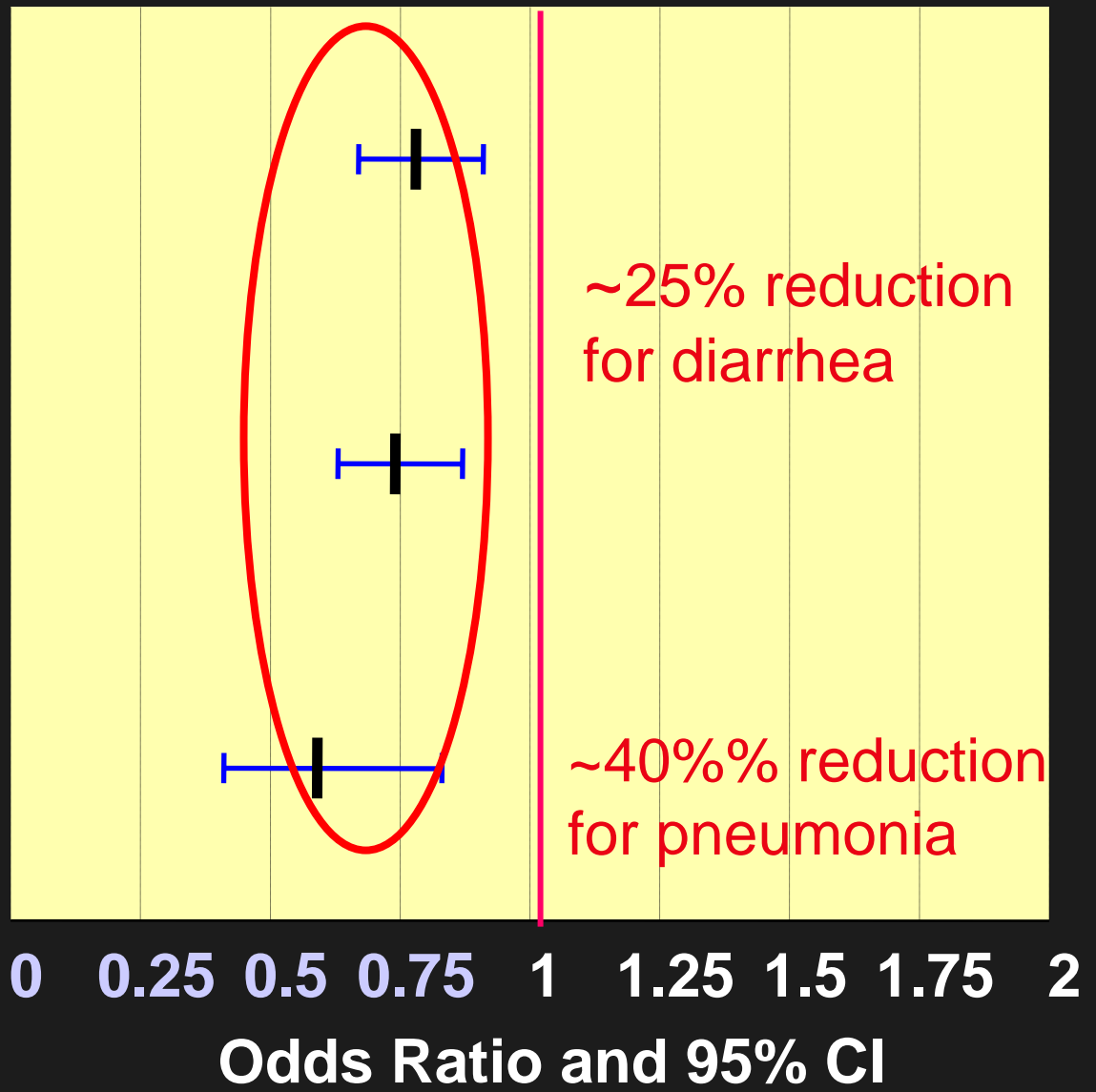
For more information see: Food & Nutrition Bulletin, v25,n1, March 2004.

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

Diarrhea Incidence
9 countries

Diarrheal Prevalence
9 countries

Pneumonia Incidence
4 countries



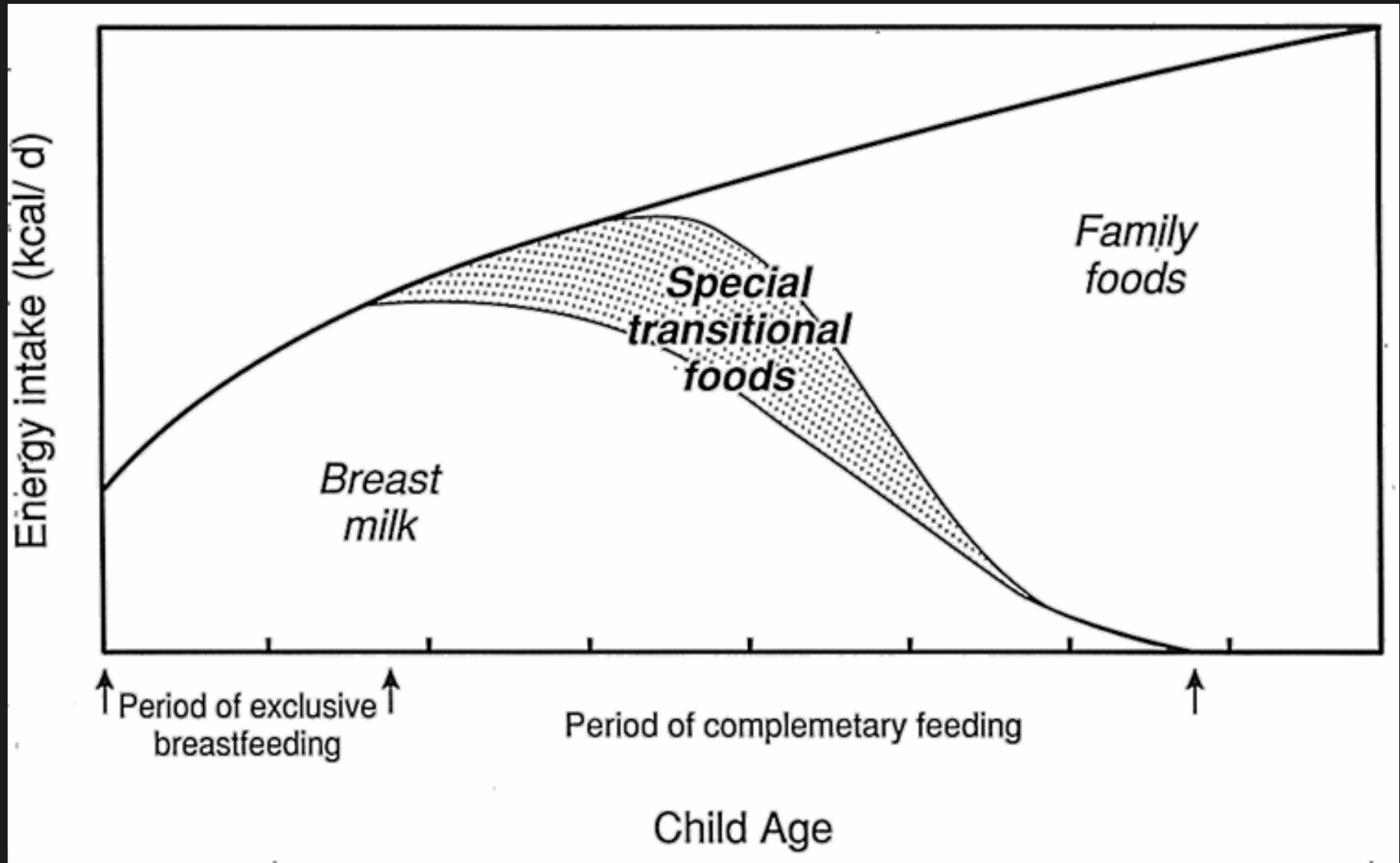
For more information see: Zinc
Investigators' Collaborative Group
J Pediatrics 1999;135:689



Household and Mother: 1st Line of Response

Photo: Keith West

Breast and Complementary Feeding





Breast feeding...

- 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”

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



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

POST-HARVEST

Producing Areas



Traders



Urban
Markets

PRE-HARVEST

Producing Areas



Traders



Urban
Markets

The Nutrition Transition

- An Emerging Global Epidemic of Obesity-

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

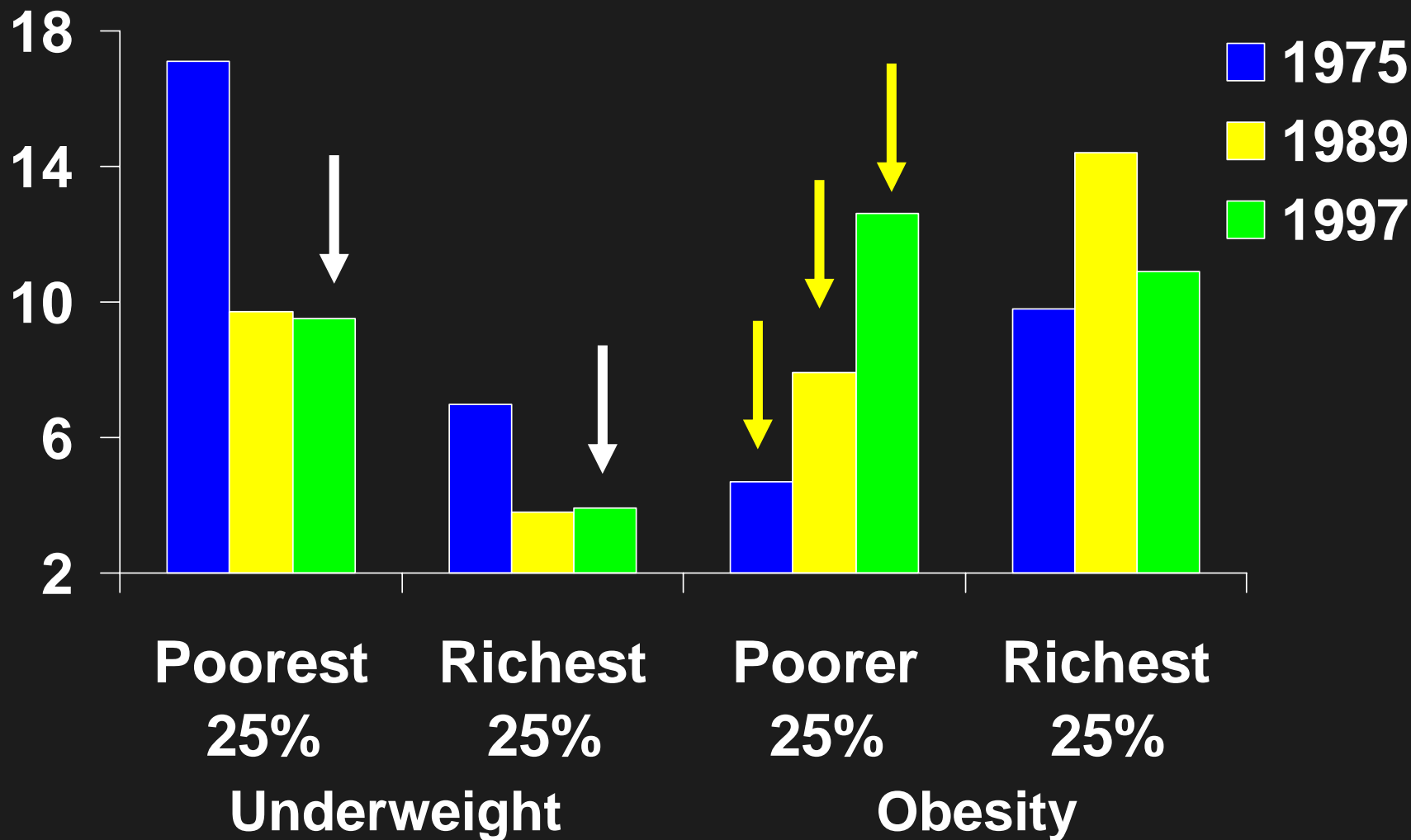
Region	Obese	Over Wt
USA	21	21
N Africa	20	31
ME/NA	17	29
CIS	15	27
LAC	14	29
SSA	4	12
S Asia	0.1	2

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



Prevalence Ratios for Underweight and Obesity Among Brazilian Women, 1975-97

	Poorest 25%	Richest 25%
Underweight 1997:1975	0.5	0.4
Obesity 1997:1975	2.7	1.1

A group of children in a rural setting, some looking distressed, with text overlaid. The children are of various ages and are dressed in simple, worn clothing. The background shows a dirt path and some greenery, suggesting a rural or developing area. The text is overlaid in the center of the image.

Welcome to International Nutrition

Very Important Website

[http://www.who.int/nut/
publications.htm](http://www.who.int/nut/publications.htm)