What is Malnutrition?

- Malnutrition = “lack of nutrients / poor nutrition”

- Two principle constituents:
  - Protein-energy malnutrition
  - Deficiency in micronutrients
Overview of Micronutrient Deficiencies

• Common when dependent on relief food or even stable conditions

• Preventable, BUT
  – Food sources not common and are expensive
  – Fortification and supplementation

• Difficult to recognize
  – Symptomatic cases often represent tip of iceberg
  – Laboratory assessment difficult & expensive

• Lack of 1 micronutrient typically associated with deficiencies of other micronutrients

• Highest risk groups, Young children, Pregnant Women, Lactating women
5 Major Micronutrient Deficiencies

- Iron → Anemia
- Iodine → Iodine Deficiency Disorders (IDD)
- Vitamin A → Xerophthalmia
- Zinc → Multiple disorders
- Folic acid → Folate deficiency-NTD
Why nutrition? The facts

• Over 165 million children under 5 are stunted as a result of malnutrition.

• 52 million children are too thin and require special treatment.

• At the same time, 43 million children are overweight - some as a result of poverty, when families are unable to afford a balanced, nutritious diet.

• 2 billion people are deficient in key vitamins & minerals
171 million children under 5 stunted growth (2010)
293 million children under 5 are anaemic

Category of public health significance (anaemia prevalence)

- Normal (<5.0%)
- Mild (5.0-19.9%)
- Moderate (20.0-39.9%)
- Severe (≥40.0%)
- No Data
Anemia- Risk Factors

• Low dietary intakes
  • Diet poor in iron-rich foods/animal foods
  • High intake of inhibitors (Tea)

• Infections (malaria, helminthes infection, schistosomiasis)

• Blood loss
Iron Deficiency:

- Affects *more people* than any other health condition
- Reduces *work capacity*
- Impairs a child’s physical and intellectual *development*
- Contributes to 20% of all *maternal deaths*
- Is a leading cause of anemia which affects *2 billion people* – over 30% of the world’s population


Photo by Ivan Mateev at istockphoto
Iodine Deficiency Disorders (IDD)

- Significant cause of preventable brain damage in children
- Health effects:
  - Increased perinatal mortality
  - Mental retardation
  - Growth retardation
- Preventable by consumption of adequately iodized salt
Iodine Deficiency Affects the Brain

*Goiter manifests only a small portion of IDD*
Vitamin A Deficiency (VAD)

- Leading cause of preventable blindness among pre-school children
- Also affects school age children and pregnant women
- Weakens the immune system and increases clinical severity and mortality risk from measles and diarrhoea
- Supplementation with vitamin A capsules can reduce child mortality by 23%.
- WHO (2002) estimates that 21% of all children suffer from VAD, mostly in Africa and Asia
Zinc Deficiency

- Zinc essential for the function of many enzymes and metabolic processes
- Zinc deficiency is common in developing countries with high mortality
- Zinc commonly the most deficient nutrient in complementary food mixtures fed to infants during weaning
- Zinc interventions are among those proposed to help reduce child deaths globally by 63% (Lancet, 2003)
Zinc Deficiency - Signs & Symptoms

- Hair loss
- Skin lesions
- Diarrhea
- Poor growth
- Acrodermatitis enteropathica
- Death
Insufficient Folic Acid

• An estimated **300,000 neural tube defects** (NTDs) occur every year globally.¹
• Most of these birth defects are **preventable** if the mother has enough folic acid at the right time.²

² U.S. Centers for Disease Control and Prevention: [http://www.cdc.gov/ncbddd/folicacid/faqs.html](http://www.cdc.gov/ncbddd/folicacid/faqs.html)

**Spina bifida** is malformation of the baby’s spine. It causes permanent disability.

**Anencephaly** is malformation of the baby’s brain. It is always fatal.
Conclusions

• Different interventions exists
  – Supplementation
  – Dietary diversification
  – Infection control like worms and malaria – etc
  – Food fortification