Malnutrition

Hunger and malnutrition is the greatest single threat to global public health

World Health organization
Welcome to Epidemiology: The Basic Science of Public Health!

Welcome to Epidemiology: The Basic Science of Public Health! We’re excited you’re joining us in this MOOC and looking forward to spending the next six weeks with you. The course officially begins today, Monday, February 17.
World is crossing malnutrition red line, report warns

By Mark Kinver
Environment reporter, BBC News

13 November 2014 | Science & Environment
Malnutrition

Malnutrition is a category of diseases that includes undernutrition, obesity, over-weight and micronutrient deficiency, among others.
Malnutrition is due to lack of nutritious food. It might cause either starvation or not getting enough food to eat. Serious cases include little or no weight gain, swelling of feet, dark spots, open peeling sores, thinness or loss of hair, lack of desire to laugh or play, sores inside the mouth, failure to develop normal intelligence, dry eyes (xerosis), and blindness. Mild cases involve slower growth, swollen belly, thin body, loss of appetite, loss of energy, anemia, desire to eat dirt, sores in corners of the mouth, frequent colds, and other infections, night blindness.
Malnutrition

- Morbidity ↑
- Wound healing ↓
- Infections ↑
- Complications ↑
- Convalescence ↓

Mortality ↑
Treatment ↑
Length of stay in hospital ↑

↑ COST
↓ QUALITY OF LIFE
The vicious cycle

- Impaired child development
- Compromised immunity
- Infection
- Disease
- Energy loss
- Reduced productivity
- Poverty
- Impaired development of education and health system
- Socioeconomic & political instability
- Malnutrition
Risk groups

- Women
- Children
- Elderly
- Minorities

Girls are 3 times more likely to suffer from malnutrition than boys.
<table>
<thead>
<tr>
<th>At-risk mother</th>
<th></th>
<th>At-risk child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age below 15 and over 40.</td>
<td>Low birth weight.</td>
<td></td>
</tr>
<tr>
<td>Height below 150 cm.</td>
<td>Outcome of multiple pregnancy- twins, triplets etc.</td>
<td></td>
</tr>
<tr>
<td>First and after fifth pregnancy.</td>
<td>Birth order of 5 and above.</td>
<td></td>
</tr>
<tr>
<td>Pregnancy weight of less than 40 kg or weight gain of less than 7 kg in pregnancy.</td>
<td>Pregnancy in the mother before the child is 18 months old.</td>
<td></td>
</tr>
<tr>
<td>Previous history of still birth, neonatal death or low birth weight.</td>
<td>Absence of breast milk.</td>
<td></td>
</tr>
<tr>
<td>Presence of anaemia.</td>
<td>Recent measles, whooping cough, diarrhoea or any major illness.</td>
<td></td>
</tr>
<tr>
<td>Social problems such as alcoholism or unemployment of the bread winner.</td>
<td>History of malnutrition or death in a sib.</td>
<td></td>
</tr>
<tr>
<td>Abandoned mothers.</td>
<td>Lack of weight gain in the last two months.</td>
<td></td>
</tr>
<tr>
<td>Socially deprived groups.</td>
<td>Special problems, such as:</td>
<td></td>
</tr>
<tr>
<td>Short birth interval (&lt;24 months)</td>
<td>(a). illegitimate child; one-parent family abandoned child;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b). unemployment; chronic illness, or alcoholism in parent;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(c). socially deprived group.</td>
<td></td>
</tr>
</tbody>
</table>
Impact of Malnutrition

- Low mood
- Weight loss
- Low energy
- Muscle wasting
- Increased risk of fractures
- Increased risk of hospital admissions
- Infections
- Confusion
- Reduced independence
- Increased risk of falls
- Reduced mobility
Iron deficiency

- pregnant women, infants and children aged 1–2 years, 50%;
- preschool-aged children, 25%;
- schoolchildren, 40%;
- adolescents, 30–55%;
- non-pregnant women, 35%.
Risk factors for micronutrient malnutrition

- Monotonous diet resulting in low micronutrient intake, and poor bioavailability, especially of minerals.
- Low intake of animal source foods.
- Low prevalence of breastfeeding.
- Low micronutrient density of complementary foods.
- Increased physiological demands for growth during pregnancy and lactation.
- Increased demand due to acute infection (especially if infection episodes are frequent), chronic infection (e.g. tuberculosis, malaria and HIV/AIDS) and disease (e.g. cancer).
- Poor general nutritional status, in particular, protein-energy malnutrition.
- Malabsorption due to diarrhoea or the presence of intestinal parasites (e.g. *Giardia lamblia*, hookworms).
- Increased excretion (e.g. due to schistosomiasis).
- Seasonal variations in food availability, food shortages.
- Social deprivation, illiteracy, low education.
- Poor economic status and poverty.
Nutritional deficiency
DALY WHO 2004
Malnutrition hotspots

The shaded countries have a high under-five mortality rate (greater than 50 per 1,000) and greater than 50% of stunting in under-fives.

The following legend represents 'wasting' in the under-five population of these countries:

- Countries with more than 45% acute malnutrition
- Countries with more than 30% acute malnutrition
- Countries with more than 4% acute malnutrition

* No data
Overpopulation

There are more people living inside this circle than outside of it.
Classifying malnutrition

Figure 1
Suggested new classification of severe malnutrition

- **Acute malnutrition**
  - **Complicated malnutrition**
    - < 80% of median weight for height, OR bilateral pitting oedema, OR MUAC < 110mm AND one of the following:
      - Anorexia
      - LRTI
      - High fever
      - Severe dehydration
      - Severe anaemia
      - Not alert
  - **Severe uncomplicated malnutrition**
    - < 70% of median weight for height, OR bilateral pitting oedema, OR MUAC < 110 mm AND:
      - Appetite
      - Clinically well
      - Alert
  - **Moderate uncomplicated malnutrition**
    - 70-80% of median weight for height, AND no oedema OR MUAC 110-125 mm AND:
      - Appetite
      - Clinically well
      - Alert

- **Inpatient IMCI/WHO protocols**
- **Outpatient Therapeutic Care**
- **Outpatient Supplementary feeding**
Chronology of Malnutrition

- Malnutrition and death
- Inadequate dietary intake
- Inadequate maternal and child care
- Insufficient health services and unhealthy environment
- Insufficient household food security
- Disease

**Manifestations**

**Immediate causes**

**Underlying causes**

**Basic causes**

- Political and ideological superstructure
- Economic structure
- Potential resources
- Formal and non-formal institutions
Minorities

Dawn.com

Rohingya Muslims face starvation
FRANCIS WADE

AID groups have warned of an impending humanitarian catastrophe in western Myanmar as authorities attempt to isolate tens of thousands of the displaced ethnic Rohingya minority in camps described by one aid worker as “open air prisons”.

Nutritional Practices among Ethnic Minorities and Child Malnutrition in Mountainous Areas of Central Vietnam

Download as PDF (Size: 146KB) Full-Text HTML PP. 82-89 DOI: 10.4236/fns.2013.41012

Author(s)
Le Thi Huong, Vu Thi Thu Nga

Abstract
Background: Despite the success of National Action Plan on Nutrition program in reducing malnutrition among children under 5 years old in Vietnam in recent years, the rate of malnutrition in Vietnam remains higher than that rate in other surrounding countries. The rate is especially high in mountainous areas. This study aims to explore the association between the mother’s nutrition care practice and the nutritional status of their children.
Wars

“THIS WHOLE WAR IS A WAR ON CHILDREN. LACK OF FOOD, LACK OF WATER, SHELLS – THEY ALL KILL CHILDREN FIRST.”
AHMAD, FATHER OF TWO-YEAR-OLD ZEINA

Hunger in a War Zone: The growing crisis behind the Syria conflict

Syria’s children at risk of malnutrition

Lack of access to food and soaring prices have left the children of Syria at risk of malnutrition, Save the Children warns today.

More than four million Syrians – over two million of them children – are unable to produce or buy enough food.

We have gathered testimony from residents trapped by fighting and enduring siege-like conditions, as well as from refugees who have fled to neighbouring countries, that details the desperate struggle of families

The Trajectory of Malnutrition in Iraq Under Sanctions

Pakistan

National Nutrition Survey 2011

Aga Khan University, Pakistan
Pakistan Medical Research Council (PMRC)
Nutrition Wing, Ministry of Health, Pakistan
According to the study, the stunting rate among children under the age of five years has increased from 41.6 per cent in 2001 to 43.7 per cent in 2011. PHOTO: FILE
نومولود بچوں کی اموات میں پاکستان سر فہرست؛

بتی جانی کے لیے کام کرنا، والی عالمی تنظیم سیو دی چلدروں کا کہنے پر کہ مردہ بچے بہ-da بیوہ اور پیدائش کی دن میں فوت ہو جانے والی بچوں کی تعداد کی حوالے سے پاکستان سر فہرست پہ-۔

پاکستان: نومولود بچوں کی اموات زیادہ کیوں؟
Fig 6.2: Prevalence of malnutrition in Pakistan (children under 5 years of age)

- Pakistan: 44% Stunted, 15% Wasted, 32% Underweight
- Urban: 37% Stunted, 13% Wasted, 27% Underweight
- Rural: 46% Stunted, 16% Wasted, 33% Underweight
Fig 6.3: National stunting rates for children under 5 years of age

- **Pakistan**: 22% Severe Stunting, 22% Moderate Stunting
- **Urban**: 21% Severe Stunting, 16% Moderate Stunting
- **Rural**: 22% Severe Stunting, 24% Moderate Stunting
Fig 6.6: National malnutrition trends

- Stunting
- Wasting
- Underweight

<table>
<thead>
<tr>
<th>Year</th>
<th>Stunting</th>
<th>Wasting</th>
<th>Underweight</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSWP: 1965</td>
<td>49%</td>
<td>11%</td>
<td>53%</td>
</tr>
<tr>
<td>MNS: 1977</td>
<td>43%</td>
<td>9%</td>
<td>48%</td>
</tr>
<tr>
<td>NNS: 1985-7</td>
<td>42%</td>
<td>11%</td>
<td>40%</td>
</tr>
<tr>
<td>NHS: 1990-4</td>
<td>36%</td>
<td>12%</td>
<td>40%</td>
</tr>
<tr>
<td>NNS: 2001-02</td>
<td>32%</td>
<td>14%</td>
<td>42%</td>
</tr>
<tr>
<td>NNS: 2011</td>
<td>15%</td>
<td></td>
<td>44%</td>
</tr>
</tbody>
</table>
Malnutrition figures for children

- **Stunted**
  - 2001: 41.6
  - 2011: 43.7

- **Wasted**
  - 2001: 14.3
  - 2011: 15.1

- **Underweight**
  - 2001: 31.5
  - 2011: 31.5
Fig 5.5: Micro-nutrient supplementation during last pregnancy

- Iron: 24% (Pakistan), 20% (Urban), 21% (Rural)
- Folic Acid: 33% (Pakistan), 25% (Urban), 4% (Rural)
- Micronutrient: 36% (Pakistan), 4% (Urban), 4% (Rural)
- Calcium: 36% (Pakistan), 30% (Rural)

Legend:
- Green: Pakistan
- Light green: Urban
- Light green: Rural
Fig 5.12: Maternal anaemia

- Pakistan: 51% Non-Pregnant Women, 52% Pregnant Women
- Urban: 50% Non-Pregnant Women, 52% Pregnant Women
- Rural: 52% Non-Pregnant Women, 52% Pregnant Women
- Punjab: 49% Non-Pregnant Women, 50% Pregnant Women
- Sindh: 62% Non-Pregnant Women, 61% Pregnant Women
- KP: 34% Non-Pregnant Women, 30% Pregnant Women
- Balochistan: 49% Non-Pregnant Women, 48% Pregnant Women
- AJK: 42% Non-Pregnant Women, 43% Pregnant Women
- GB: 24% Non-Pregnant Women, 35% Pregnant Women

Legend:
- Green: Non-Pregnant Women
- Light Green: Pregnant Women
Fig 5.20: Vitamin-D deficiency (pregnant women)

- **Pakistan**
  - Severe deficiency (<8.0 ng/mL): 25%
  - Deficiency (8.0 - 20.0 ng/mL): 44%
  - Desirable (>20.0 - 30.0 ng/mL): 18%

- **Urban**
  - Severe deficiency (<8.0 ng/mL): 34%
  - Deficiency (8.0 - 20.0 ng/mL): 40%
  - Desirable (>20.0 - 30.0 ng/mL): 15%

- **Rural**
  - Severe deficiency (<8.0 ng/mL): 22%
  - Deficiency (8.0 - 20.0 ng/mL): 45%
  - Desirable (>20.0 - 30.0 ng/mL): 18%

- **Punjab**
  - Severe deficiency (<8.0 ng/mL): 28%
  - Deficiency (8.0 - 20.0 ng/mL): 43%
  - Desirable (>20.0 - 30.0 ng/mL): 18%

- **Sindh**
  - Severe deficiency (<8.0 ng/mL): 21%
  - Deficiency (8.0 - 20.0 ng/mL): 46%
  - Desirable (>20.0 - 30.0 ng/mL): 16%

- **KP**
  - Severe deficiency (<8.0 ng/mL): 18%
  - Deficiency (8.0 - 20.0 ng/mL): 46%
  - Desirable (>20.0 - 30.0 ng/mL): 23%

- **Balochistan**
  - Severe deficiency (<8.0 ng/mL): 21%
  - Deficiency (8.0 - 20.0 ng/mL): 27%
  - Desirable (>20.0 - 30.0 ng/mL): 52%

- **AJK**
  - Severe deficiency (<8.0 ng/mL): 22%
  - Deficiency (8.0 - 20.0 ng/mL): 52%
  - Desirable (>20.0 - 30.0 ng/mL): 11%

- **GB**
  - Severe deficiency (<8.0 ng/mL): 44%
  - Deficiency (8.0 - 20.0 ng/mL): 32%
  - Desirable (>20.0 - 30.0 ng/mL): 21%
A national task force will soon be constituted to address malnutrition issues in the country
Minister for Planning and Development Ahsan Iqbal
How to tackle
How to tackle
The triple A cycle
UNICEF 1990

- Assessment of the situation of children and women
- Analysis of the causes of the problems
- Action based on the analysis and available resources
NUTRITION UNIT IN HEALTH SECTOR

SOCIAL AND WOMEN'S WELFARE

RELIEF AND REHABILITATION

AGRICULTURE

FOOD

PLANNING

RURAL DEVELOPMENT

COMMUNICATION AND INFORMATION

INDUSTRY

EDUCATION

Food production
- Child care
- Women's literacy
- Income generation

Food pricing
- Food production
- Food distribution

Definition of malnutrition problem
- Coordinating nutrition measures
- Monitoring and evaluation of nutrition situations and programmes

Rural poverty alleviation measures

Nutritional care of refugees
- Rehabilitation

Food industry
- Food control and standards
- IDD control

School feeding programme
- Nutrition education

Nutrition awareness through mass media
Traditional Bio-Medical Concept

- Inadequate energy intake
- Malnutrition in children
- Low birth weight
- Recurrent ARI/GI tract infections
- Decrease immunity
Socio-Epidemiological Concept

- Poverty & Illiteracy
- Large family size/no contraception use
- Underweight mother
- Low birth weight
- No access to govt. health facility
- Poor personal hygiene
- Poor environmental conditions
- Inadequate energy intake
- Worm infestation
- Recurrent ARI/GI tract infections
- Incomplete immunization
- Wrong breast feeding practices

Malnutrition in children
Politico- Developmental Concept

Uncontrolled Urbanization

Poverty & Illiteracy
- Underweight mother
- Low birth weight

Large family size/no contraception use

Wrong Breast feeding practices

Wrong Immunization

Worm infestation

Recurrent infections/Decrease immunity

No access to govt. health facility

No Immunization

Poor personal hygiene

Poor environmental conditions

Malnutrition in children

Poor living conditions in urban slums

Availability of health facility

Social & Political Discrimination
TAP TURNERS OR FLOOR MOPPERS?
"This is the first year in history that more people will die of obesity than of malnutrition." Jess Greenwood wired12
Malnutrition Care Plan
The Assessment Process

1. Nutrition Risk Screening
   - No risk identified
   - Risk of malnutrition identified

2. Detailed Assessment
   - Normal GI function, including ability to swallow
   - Normal GI function, but unable to swallow
   - GI tract inaccessible, absent and/or dysfunctional
The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.
The shape of things to come

The Economist, Dec 13-19, 2003
Figure 12.5 Developing a social network around MCH and nutrition services