NUTRITION & NUTRITIONAL ASSESSMENT
NUTRITION- DEFINITIONS
NATIONAL NUTRITION WEEK – 1ST – 7TH SEPTEMBER

• **Nutrition**: The process by which the organism utilizes food.

• **IYCN**: infant & Young Child Nutrition

• Special emphasis on **1st 1000 Days of Life** (prenatal to 2yrs/minus 9 to plus 24 months)

• **Weaning/Complementary Feeding**: The systematic process of introduction of suitable food at the right time in addition to mother’s milk in order to provide needed nutrients to the baby (UNICEF 1984).
FOOD ITEMS & FOOD GROUPS

• Cereals, Pulses (legumes), Vegetables, fruits, Milk & milk products, Meat group & Fish, Sugar, Oils & Fats
• **Energy yielding**: Carbohydrates, Fats & Oils
• **Body building**: Protein
• **Protective foods**: Vitamins & Minerals
• **Micronutrients**: those required in small quantities; mg/mcg
FOOD ITEMS & FOOD GROUPS CONTD...

- **Trace Elements**: present/required in trace quantities: <0.01% body weight

- **Balanced Diet**: Optimum quantity of all food groups and food items needed for physical activity, growth & development, repair or worn out/ageing tissues and maintenance of body functions.
NEW FOOD GUIDE PYRAMID
TYPE I AND TYPE II NUTRIENTS

• Over 40 nutrients are essential to health
• If any one is deficient then the person will not be healthy and resist disease
• Many are ignored by practitioners and their deficiency is not recognized
• They are divided into two groups in terms of the response to a deficiency
NORMAL

DEFICIENT

Type I

Type II
<table>
<thead>
<tr>
<th>Type 1</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>iron</td>
<td>nitrogen</td>
</tr>
<tr>
<td>iodine</td>
<td>essential amino acids</td>
</tr>
<tr>
<td>copper</td>
<td>potassium</td>
</tr>
<tr>
<td>calcium</td>
<td>magnesium</td>
</tr>
<tr>
<td>selenium</td>
<td>phosphorus</td>
</tr>
<tr>
<td>thiamin</td>
<td>sulphur</td>
</tr>
<tr>
<td>riboflavin</td>
<td>zinc</td>
</tr>
<tr>
<td>pyridoxine</td>
<td>sodium</td>
</tr>
<tr>
<td>niacin</td>
<td>chloride</td>
</tr>
<tr>
<td>folate</td>
<td></td>
</tr>
<tr>
<td>cobalamin</td>
<td></td>
</tr>
<tr>
<td>vitamin A, D, E, K</td>
<td></td>
</tr>
</tbody>
</table>
Type 1
Functional nutrients
.getRawText()
has a body store
 reduces in concentration with deficiency
Specific signs of deficiency
Growth failure not a feature
variable in breast milk

Type 2
Growth nutrients
• has no body store
 stable tissue concentration
 no specific signs of deficiency
 Growth failure the dominant feature
 stable in breast milk
ENERGY

• **Unit of Energy**: 1 kilocalorie (kcal./Cal.)

• Heat required to raise temperature of 1 kg of water from 14.5 to 15.5°C.

• Unit in international system: Joule

• (1 cal. = 4.184 joule)
CARBOHYDRATES: 1 G = 4 KCAL.

• Provide energy, taste, preserve foods
• Types: Starch, sugars
  – Monosaccharides: glucose
  – Disaccharides: sucrose, lactose, fructose
  – Complex: Maltodextrins, Polysaccharides, glycogen
• Glucose*
  – Fuel for brain and muscle
  – Converted to glycogen, stored in liver & muscles
  – * Heart & RBCs use only glucose or energy
• 55 – 60% of total calories
FIBER- UNABSORBABLE CARBOHYDRATES

- Constituent of plant cell wall: cellulose, pectins, gums, lignins
- Contribute to the bulk, very little to energy
- Water holding capacity, bile binding capacity, promotes growth of normal intestine microflora
- Lowers cholesterol, limits glucose absorption
- Reduces constipation, colon cancers,
- Softens stool, accelerates bowel movement
- High fiber may reduce bioavailability of minerals, cause flatulence and decreased appetite
PROTEIN: 1 G =4 KCAL.

- Protein means of ‘prime importance’
- 24 amino acid, 8 essential in all & 3: cysteine, arginine, taurine essential in LBW babies
- Helps in growth, tissue repair, formation of body fluids and enzymes
- RDA: 1.8-1.5 in child & 0.7 g/kg/day in adults
- To supply up to 15% of energy
- Complete protein supply all the essential aa.
- Reference protein : provides aa. pattern close to tissue protein, Egg with Digestibility quotient (DQ), Biological value (BV) & Net protein utilization (NPU) = 96.
LIPIDS/FAT: LONG CHAIN 1 G = 9 KCAL

- Concentrates of energy, Both Visible & non visible, transports fat soluble vitamins
- Saturated, Monounsaturated & Polyunsaturated (Ideal ratio 1:1:1)
- Long chain: 12 or more, Medium: 7-11 & Short: 6 Carbons
- Triglycerides, phospholipids (lecithin), sterols (cholesterol: HDL (good cholesterol), LDL, VLBL)
- Cis. Vs. Trans fat (trans fat unhealthy)
LIPIDS/FAT: LONG CHAIN 1 G = 9 KCAL CONTD...

- EFA- Polyunsaturated to supply 3% of energy
- Derived Long Chain polyunsat. (LCPs)
- Omega 6: Linoleic $\rightarrow$ Arachidonic & Adrenic acid
  - Proinflammatory, health of skin
- Omega 3: Alpha Linolenic $\rightarrow$ Eicosa pentaenoic acid (EPA) & Docosa hexaenoic acid (DHA)
  - Anti inflammatory, EPA for heart & DHA for brain & vision
  - (ideal ratio of Omega 6: omega 3 = 5-10:1)
MINERALS- MACRO & MICRO MINERALS

- Elements, Minerals, Electrolytes
- Calcium, Phosphorous, Magnesium, Sodium, Potassium, Chloride,
- Trace elements
  - Essential – iron, iodine, zinc, selenium, copper, molybdenum, cobalt, chromium, manganese, silicon, nickel, boron
  - Potentially toxic – fluorine, lead, cadmium, mercury, arsenic
PERIODS OF GROWTH

• Prenatal period
  – Ovum: 0–14 days
  – Embryo: 2 to 9 weeks
  – Fetus: 9 weeks to birth

• Perinatal period
  – 28 wks gestation (>1000 g) to 7 days after birth,
  – Extended: 22 wks to 7 days.
PERIODS OF GROWTH

• Postnatal period
  – Newborn: first 28 days after birth
  – Infancy: first year
  – Toddler: 1 – 3 year
  – Preschool: 3 – 6 years
  – School child: 6 – 10 years & more
  – Adolescence: 10-19 yrs..
  – LBW: <2500 irrespective of gestational age, VLBW: <1500 & ELBW: < 1000 g
ASSESSMENT OF NUTRITIONAL STATUS

• Dietary History
• Anthropometry/Auxology*
  (* preferred term than anthropometry for human measurements)
• Clinical features of Malnutrition/ specific deficiencies
• Biochemical Assessment
• Radiological Assessment: Bone, Teeth etc.
• Morphological & Histological
• Epidemiological: Vital statistics
DIETARY EVALUATION

• Record **IYCF practices**: Exclusive breast feeding, total duration of breast feeding,
• **Complementary feeding**: time of introduction, type, adequacy,
• Empowerment to **Family pot feeding**, 
• Access to any **safety net** in the form of Supplementary feeding, Group eating/ small frequent special feeding (Akshayapatra concept)
• Present diet: **24 Hrs. dietary recall**
• Adequacy with respect to energy, protein, micronutrients & comparison with RDA
• Any H/o exclusion diet, diet during illness, any supplements
Pit of malnutrition

Safety Net:
- Supplementary Feeding,
- Group Eating,
- Akshayapathra
• **Energy Requirement**: ICMR Recommended Dietary Allowances (RDA) almost on par with American RDA for reference child/ideal weight

• **Bedside Calculation- bare minimum**: 1 Yr. old 1000 kcal +100 kcal/each Yr. Adol. Boy 2400 & Girl 2200.

• **Holliday & Segar formula for both energy & fluid**:
  - 1 – 10 kg: 100 kcal/kg/day
  - 11 – 20 kg: 1000 + 50 kcal/kg/day
  - > 20 kg: 1500 + 20 kcal/kg/day
  - Adult: 40 kcal/kg/day

* Use ideal weight for energy & observed weight for fluid calculation
FOOD VALUES

• Ideally Standard measuring equipments should be demonstrated during dietary evaluation.
  • 1 teas spoon: 5 ml or 5 g
  • 1 table spoon: 15 ml or 15 g (3 teaspoon)
  • 1 glass: Usually 8 oz – 240 ml/g
  • 1 cup: Usually 6 oz- 180 ml/g
<table>
<thead>
<tr>
<th>Food item</th>
<th>Protein g</th>
<th>Kilocalories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idly – one</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Puri – two</td>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>Wheat chappati 1</td>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>Bread slice 1 1oz</td>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>Dosa</td>
<td>2</td>
<td>70</td>
</tr>
<tr>
<td>Uppma 1 cup</td>
<td>6</td>
<td>250</td>
</tr>
<tr>
<td>Ragi 6 tsp</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Cooked dhal 1 tsp</td>
<td>0.5</td>
<td>15</td>
</tr>
<tr>
<td>Oil/ghee 1 tsp</td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>Butter 100 g</td>
<td>0</td>
<td>720</td>
</tr>
<tr>
<td>Food item</td>
<td>Protein gms</td>
<td>Kilocalories</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Cooked rice 1 cup</td>
<td>4</td>
<td>175</td>
</tr>
<tr>
<td>Honey 1 tsp</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Rasam 1 cup</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Coconut water 1 cup</td>
<td>1.4</td>
<td>24</td>
</tr>
<tr>
<td>Coffee 1 cup</td>
<td>1.8</td>
<td>80</td>
</tr>
<tr>
<td>Tea 1 cup</td>
<td>1.0</td>
<td>60</td>
</tr>
<tr>
<td>Butter milk 100 ml</td>
<td>0.8</td>
<td>15</td>
</tr>
<tr>
<td>Ragi flour 6 tsp</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Ragi 100 g</td>
<td>7.3</td>
<td>328</td>
</tr>
<tr>
<td>Rice 100 g (Par boiled)</td>
<td>6.4</td>
<td>346</td>
</tr>
<tr>
<td>Wheat 100 g</td>
<td>11.8</td>
<td>25346</td>
</tr>
<tr>
<td>Food item</td>
<td>Protein gms</td>
<td>Kilocalories</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Mashed potato 1 tsp</td>
<td>-</td>
<td>40</td>
</tr>
<tr>
<td>Bengal gram 100 g</td>
<td>22.5</td>
<td>369</td>
</tr>
<tr>
<td>Black gram Dhal 100 g</td>
<td>24</td>
<td>347</td>
</tr>
<tr>
<td>Green gram dhal 100 g</td>
<td>24.5</td>
<td>348</td>
</tr>
<tr>
<td>Red gram dhal 100 g</td>
<td>22.3</td>
<td>335</td>
</tr>
<tr>
<td>Mutton 1 oz (8 bits)</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>Egg Hen 1</td>
<td>6</td>
<td>80</td>
</tr>
<tr>
<td>Fish 1oz (10 cm)</td>
<td>6</td>
<td>80</td>
</tr>
<tr>
<td>Biscuit 1</td>
<td>0.5</td>
<td>25</td>
</tr>
<tr>
<td>Papadam 1</td>
<td>0.5</td>
<td>25</td>
</tr>
<tr>
<td>Banana 1</td>
<td>0.6</td>
<td>50</td>
</tr>
<tr>
<td>Food item</td>
<td>Protein gms</td>
<td>Kilocalories</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Spinach 100 g</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>Cow’s milk 200 ml</td>
<td>6</td>
<td>120</td>
</tr>
<tr>
<td>Curd 30 ml</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Papaya ripe 100 g</td>
<td>0.6</td>
<td>32</td>
</tr>
<tr>
<td>Tomato 100 g</td>
<td>1.4</td>
<td>21</td>
</tr>
<tr>
<td>Ground nut 100 seeds</td>
<td>10</td>
<td>200</td>
</tr>
</tbody>
</table>
ITEMS THAT GIVE 6 G OF PROTEIN

- 1 egg
- 3 slice bread
- 3 idlis
- 3 chappatis
- 3 dosas
- 6 puris
- 6 vada/bonda
- 12 tsp cooked dhal
- 18 tsp ragi

- 1 glass milk
- 1 ounce (30 ml) meat / fish
- 60 groundnuts
- 15 cashew nuts
- 1 ½ cup cooked rice
- 6 tsp bengal gram
- 12 Biscuit
- 12 pappadam
AGE DEPENDENT & AGE INDEPENDENT ANTHROPOMETRIC CRITERIA

• Weight & Height for age, Length up to 2 Yrs
• & Height after 2 Yrs. (Anthropometric rod)
• Weight for Height
• Head circumference
• Chest circumference
• Mid Upper Arm circumference (MUAC Tape)
• Skin fold thickness- Harpenden Caliper
• Upper segment: Lower segment ratio
• Arm span
• Mid parental height (MPH: average of father’s & mother’s height) & predicted adult Target Height (MPH + 6.5 in boys & MPH- 6.5 cm in girls)
AGE INDEPENDENT ANTHROPOMETRIC MEASUREMENTS

- MUAC: Left upper arm
- Bangle test: Internal diameter 4 cm
- Shakir’s tape: Colored (green, yellow, red) MUAC tape
- Quac stick*: Relates height to MUAC (* Of historic importance only)
- Body mass index (BMI): very good to define both obesity & chronic energy deficiency
- Ponderal index: Used in newborns, relates weight to height.
### Classification Based on Mid Upper Arm Circumference

Between 1-5 yrs. constant 16.5-17.5 cm

<table>
<thead>
<tr>
<th>MUAC (cm)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;13.5</td>
<td>Normal</td>
</tr>
<tr>
<td>13.5-12.5</td>
<td>Mild/moderate malnutrition</td>
</tr>
<tr>
<td>&lt;12.5</td>
<td>Severe malnutrition SCAM</td>
</tr>
<tr>
<td>&lt;11.5</td>
<td></td>
</tr>
<tr>
<td>Wt / age (%)</td>
<td>Degree of malnutrition</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>&gt;90</td>
<td>Normal</td>
</tr>
<tr>
<td>75 – 90</td>
<td>I degree</td>
</tr>
<tr>
<td>60 – 75</td>
<td>II degree</td>
</tr>
<tr>
<td>&lt;60</td>
<td>III degree</td>
</tr>
</tbody>
</table>
## WEIGHT FOR AGE– WELLCOME TRUST CLASSIFICATION

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Condition</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-80%</td>
<td>Edema +</td>
<td>Kwarshiorkor</td>
</tr>
<tr>
<td>60-80%</td>
<td>-</td>
<td>Underweight</td>
</tr>
<tr>
<td>&lt;60</td>
<td>-</td>
<td>Marasmus</td>
</tr>
<tr>
<td>&lt;60</td>
<td>Edema +</td>
<td>Marasmic Kwashiorkor</td>
</tr>
</tbody>
</table>
## WEIGHT FOR AGE - IAP CLASSIFICATION OF MALNUTRITION

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;80%</td>
<td>Normal</td>
</tr>
<tr>
<td>71-80%</td>
<td>Grade I</td>
</tr>
<tr>
<td>61-70%</td>
<td>Grade II</td>
</tr>
<tr>
<td>51-60%</td>
<td>Grade III</td>
</tr>
<tr>
<td>&lt;50%</td>
<td>Grade IV</td>
</tr>
</tbody>
</table>
# HEIGHT FOR AGE: CLASSIFICATION OF STUNTING (WATERLOW)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Percentage Range</th>
</tr>
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<tbody>
<tr>
<td>Normal</td>
<td>&gt; 95%</td>
</tr>
<tr>
<td>1 degree stunting</td>
<td>90-95%</td>
</tr>
<tr>
<td>II degree stunting</td>
<td>85-90%</td>
</tr>
<tr>
<td>III degree stunting</td>
<td>&lt; 85%</td>
</tr>
</tbody>
</table>
1. Remove the child's shoes and socks. Loose or baggy socks may disguise the fact that a child's heels are lifting off the ground.

2. The child should stand with heels together, legs straight and shoulders relaxed.

3. Heels, buttocks and, if possible, scapulae should be against the wall.

4. Place the headboard on the top of the head and check that the head is in the correct position. The child should look straight ahead with the lower margins of the eyes in the same horizontal plane as the external auditory meati.

5. Tell the child to "breathe in and stand tall." Apply gentle but firm pressure to the mastoid processes to help the child stretch. Ensure the heels are not lifted from the ground.

6. Read the height to the last complete millimetre (do not round up).

7. Plot the height reading on a standard centile chart of height for age and sex. Use a simple dot to mark the height.
**WEIGHT FOR HEIGHT: CLASSIFICATION OF WASTING (WATERLOW)**

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 90 %</td>
<td>Normal</td>
</tr>
<tr>
<td>80 - 90 %</td>
<td>1 degree wasting (mild)</td>
</tr>
<tr>
<td>70 - 80 %</td>
<td>II degree wasting (moderate)</td>
</tr>
<tr>
<td>&lt; 70%</td>
<td>III degree wasting (severe)</td>
</tr>
</tbody>
</table>
MID PARENTAL HEIGHT

Boy
• paternal height + maternal height + 6.5

Girl
• paternal height + maternal height - 6.5
   2

• Predicted target height is MPH +/- 2.5 cm
Is this child a case of severe acute malnutrition?
Is this child a case of severe acute malnutrition??
One cannot tell by just looking, Take measurements, Test for edema-finger pressure for 3 seconds
MARASMUS

- Severe wasting of muscle & s/c fats
- Severe growth retardation
- No edema or hair changes or fatty liver
- Alert but miserable
- Hungry
MARASMUS – GRADE IV
<table>
<thead>
<tr>
<th>Cardinal features</th>
<th>Associated features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oedema</td>
<td>Moon face</td>
</tr>
<tr>
<td>Psychomotor changes</td>
<td>Hair changes</td>
</tr>
<tr>
<td>Growth retardation</td>
<td>Skin changes</td>
</tr>
<tr>
<td>Muscle wasting</td>
<td>Depigmentation</td>
</tr>
<tr>
<td></td>
<td>Anemia</td>
</tr>
<tr>
<td></td>
<td>Hepatomegaly</td>
</tr>
<tr>
<td></td>
<td>Flaky paint dermatitis</td>
</tr>
<tr>
<td></td>
<td>Cardiac failure</td>
</tr>
<tr>
<td></td>
<td>Ddehydration</td>
</tr>
<tr>
<td></td>
<td>Vitamin deficiencies</td>
</tr>
</tbody>
</table>
KWASHIORKOR- GRADE IV
GRADING OF SEVERITY

Marasmus

I. loose skin folds axilla & groin
II. Wasting of Thigh & buttocks
III. Wasting of Chest & back
IV. Wasting of Buccal pad of fat

Kwashiorkor

I. Pedal edema
II. Facial edema
III. Chest & body edema
IV. Ascites
MARASMIC KWASHIORKOR

• Syndrome seen in marasmic children, with severe muscle & fat wasting who suddenly develop edema, due to increased protein deficiency than before.
• Thus clinical features, combination of Marasmus & Kwashiorkor.
• Anemia is moderate & one/ more Vitamin deficiencies may be evident.
MARASMIC KWASHIORKOR
INFECTION & IMMUNITY IN PEM

- Infection & Immunity interrelated to PEM
- Infectious disease worsens PEM & vise versa
- PEM usually weakens resistance to infection $\rightarrow$ high mortality among toddlers & under 5 children
- These children may present with recurrent attacks of diarrheal diseases, pneumonia, septicemia, measles, tuberculosis and malaria.
INFECTION & IMMUNITY IN PEM

- Urinary tract infection often occur but may go undetected.
- Intestinal helminthiasis & giardiasis frequent
- All these impair nutritional status leading to growth retardation & overt PEM & contribute to high mortality
PEM & IMMUNITY

- Skin & mucus membrane barrier disrupted → infection
- Non specific defenses macrophages, tears, gastric acidity depressed
- Humoral: Ig G, IgM not significantly affected in mild to moderate PEM, hence host respond well to bacterial challenges & viral vaccines.
- Secretory Ig A → Surface tract infections, GIT & Rep. Tract
PEM & IMMUNITY

• Cell Mediated Immunity (CMI): is impaired in all grades
• This explains –ve Tuberculin (Mantoux) test in Marasmus & Kwashiorkor in spite active TB
• Following dietary treatment when the patient improves, Test may convert to +ve.
• Serum C reactive Protein & Complement C3 are depressed in severe PEM, but rise in presence of infection & behave as acute phase reactants.
ECOLOGY/ETIOLOGY OF MALNUTRITION

• Conditioning influences
  – Low birth weight
  – Infections - eg., Diarrhea,
  – Respiratory infections,
  – VPDs: Measles / Whooping cough, Tuberculosis,
  – Helminthiasis
• Socio economic factors
  – Poverty, Ignorance
  – Illiteracy
  – Lack of knowledge regarding food values
  – Unhygienic environment
  – Large family size
  – Over crowding

• Cultural practices
  • IYCF practices,
  • Undue delay in rice giving ceremony
  • Alcoholism
  – Food habits
  – Customs and belief
  – Tradition
  – Religion
  – Food fads (personal likes & dislikes)
  – Cooking practices
  – Child rearing practices
  – Superstitious belief
ECOLOGY/ETIOLOGY OF PEM – CONTD..

• Food production & intake
  – abrupt withdrawal of breast milk
  – Delayed and inadequate complementary food
  – Lack of food supplementation for target group
• Availability and utilization of health/other services
  – Lack of health education, Nutritional surveillance
  – Nutritional rehabilitation, Primary health care
  – Immunization, Early diagnosis, Prompt treatment
  – Referral services
1. Timely initiation of breast feeding within 1 hour of birth
2. Exclusive breastfeeding during the first six months of life
3. Timely introduction of complementary foods at six months
4. Age-appropriate foods for children six months to two years
5. Hygienic complementary feeding practices
6. Immunization and bi-annual Vitamin A supplementation with deworming
STRATEGIES FOR PREVENTION

7. Appropriate feeding for children during and after illness
8. Therapeutic feeding for children with severe acute malnutrition
9. Adequate nutrition and support for adolescent girls to prevent anemia
10. Adequate nutrition and support for pregnant and breastfeeding mothers

These 10 essential interventions could halve the proportion of undernourished children over the next 10 years.
THANK YOU