Epidemiology of Nutritional issues in Sri Lanka

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LEARNING OBJECTIVES

- To identify national nutritional issues in Sri Lanka
- To explain the terms malnutrition, under nutrition and over nutrition
- To describe the extent of the problem of the under nutrition and over nutrition in Sri Lanka
- To describe the different classification of under nutrition – wasting, stunting, underweight
- To describe the extent of the problem of micronutrient deficiencies of Sri Lanka

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What is "epidemiology"?

- **Epidemiology is the study of the distribution and determinant of disease frequency in human populations**.
- To describe the distribution and magnitude of health and disease problems in human populations – time,place,person
- To identify the causes/correlates of disease

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National Nutritional Problems

- Low Birth Weight
- Under 5 Under nutrition
- Iron deficiency Anemia in childhood and pregnancy
- Vitamin A deficiency
- Iodine deficiency

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Low birth weight

- Infant with weight less than 2500g measured within first 24 hours after birth

Two types of LBW:

1. Pre term infants – born before 37wks of gestation (premature or Small for gestational age)
2. Full term infants suffering from intrauterine growth retardation (gestational age more than 37wks but the BW is less than 2500g)

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If the incidence of LBW in any country is >15% it is should be considered as Public Health problem (WHO)

- Children with low birth weight – 15.7%(DHS 2016)

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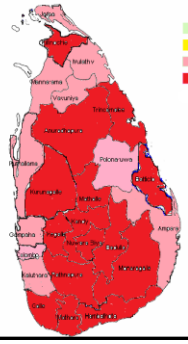
District variations in Prevalence of Low Birth Weight -2006-2009

(Source: DHS 2006, MRI 2009)



HIGHEST PREVALENCE IN NUWARAELIYA DISTRICT – 27.1% IN 2009

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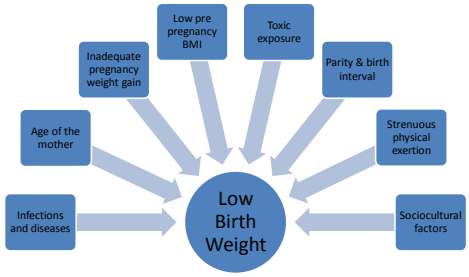
Causes of LBW



Historical factors

Strong or moderate association

- Short or long birth interval
- Previous history of preterm/ LBW births
- Maternal history of being LBW

Weak or very weak associations

- Primi parity
- History of induced abortion
- Maternal history of being born preterm

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Demographic factors

Strong or moderate association

- Adolescent mothers
- Minority race
- Unmarried/cohabiting

Weak or very weak association

- Advanced maternal age
- Biracial couples
- Native groups

Nutritional factors

Strong or moderate association

- Iron deficiency
- Low pre pregnancy BMI
- Poor maternal weight gain during pregnancy

Weak or very weak association

- Calcium deficiency
- Zinc deficiency
- Vitamin B6 deficiency
- Vitamin B 12 deficiency
- Higher BMI

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Medical conditions

Strong or moderate association

- Maternal asthma
- Maternal renal insufficiency
- Hypertensive disorders
- Diabetes during pregnancy
- Heart disease complicating pregnancies

Anatomical and pregnancy related factors

Strong or moderate associations

- Uterine abnormalities
- Placental abnormalities
- Multiple pregnancies

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Infections

Strong or moderate associations

- Malaria
- Bacterial vaginosis
- Trichomoniasis
- Syphilis
- Gonorrhoea
- Urinary tract infections
- Periodontal infections

Psychosocial factors

Strong or moderate association

- Adverse psychosocial factors
- Acute stress
- Poor neighbourhood
- Chronic stress

Weak or very weak association

- Adverse socioeconomic factors
- Psychiatric disorders
- Terrorism
- Attempted suicide
- Homelessness

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Life style related factors

Strong or moderate association

- Tobacco use
- Heavy alcohol use
- Cocaine use
- Narcotic use

Weak or very weak association

- Caffeine use
- Marijuana use
- Methyl –amphetamine use

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Environmental factors

Strong or moderate association

- Environmental tobacco exposure
- Indoor air pollution

Weak or very weak association

- Air pollution
- Water pollution
- Exposure to pesticides
- Ambient air temperature/season
- Noise

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Other factors

Strong or moderate association

- Violence /abuse
- Maternal trauma
- Infertility and IVF treatment

Weak or very weak association

- Physically demanding work
- Prolonged standing at work
- Delayed initiation or lack prenatal care
- Advanced paternal age
- Paternal history of being LBW
- Male sex
- Genetic factors

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Malnutrition

- Malnutrition refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients. The term malnutrition covers 2 broad groups of conditions.
- 1.Undernutrition— includes stunting (low height for age), wasting (low weight for height), underweight (low weight for age) and micronutrient deficiencies or insufficiencies (a lack of important vitamins and minerals).
- 2. Over nutrition – arises as a results of excess energy intake/or reduced expenditure.

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Stunting or height-for-age

- Height-for-age is a measure of linear growth retardation and cumulative growth deficits. Children whose height-for-age Z-score is below minus two standard deviations (-2SD) from the median of the reference population are considered short for their age (stunted), or chronically undernourished. Children who are below minus three standard deviations (-3 SD) are considered severely stunted

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Wasting or weight-for-height

- The weight-for-height index measures body mass in relation to body height or length and describes current nutritional status. Children whose Z-score is below minus two standard deviations (-2sd) from the median of the reference population are considered thin (wasted), or acutely undernourished. children whose weight-for-age Z-score is below minus three standard deviations (-3 SD) from the median of the reference population are considered severely wasted.

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Underweight or weight-for-age

- Weight-for-age is a composite index of height-for-age and weight-for-height that accounts for both acute and chronic under nutrition. Children whose Weight-for-age Z-score is below minus two standard deviations (-2SD) from the median of the reference population are classified as underweight. Children whose weight-for-age Z-score is below minus three standard deviations (-3SD) from the median are considered severely underweight

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Overweight in children

- Children whose weight-for-age Z-score is more than two standard deviations (+2 SD) above the median of the reference population are considered overweight.

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Stunting DHS 2016

- Overall prevalence of Stunting - 17.3%
- Severely stunted - 4%
- Nuwara Eliya – 32.4%
- Kandy – 26%
- Kegalle – 23%
- Polonnaruwa – 11%
- Puttalam,Hambanthota – 12%

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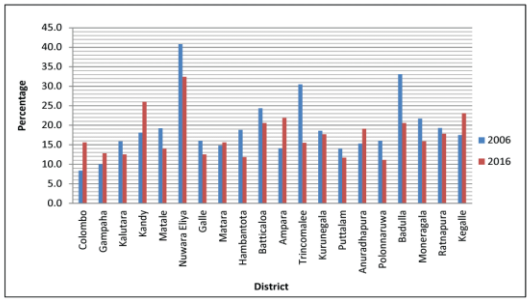
Figure 11.1 Trends in stunting of children under age 5 by district, 2006-2016



Note : Excluding Northern Province

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Wasting DHS 2016

- Overall prevalence – 15%
- Severely wasting – 3%
- Wasting is highest among children aged 0-5 months (19%)
- the lowest prevalence is observed among those children aged 18-23 months (13%)

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- Moneragala - 25%
- Mullaitivu, and Hambantota - (22% each)
  Matale - 10%
  Polonnaruwa - 11%

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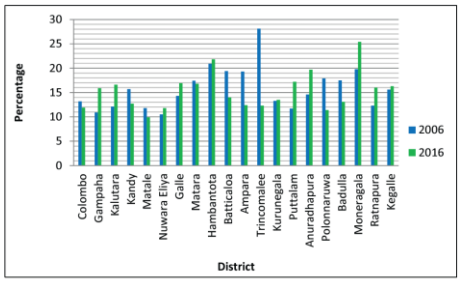
Figure 11.2 Trends in Wasting of children under age 5 by district , 2006-2016.



Note : Excluding Northern Province

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Underweight DHS 2016

- Overall Prevalence – 21%
- Severely underweight – 4%
- The highest level at 36-47 months of age 23%
- Estate sector - 30%
- Urban sector – 21% and rural sector-16%

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- Nuwara Eliya – 30%
- Mullaitivu - 26%
- Anuradhapura- 25%
- Moneragala - 24%
- Jaffna - 14%
- Colombo - 15 %

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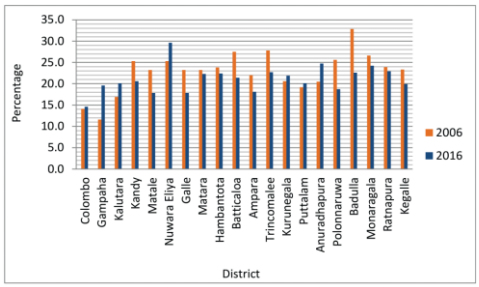
Figure 11.4 Comparision of underweight of children under age 5 by District, 2006 and 2016



Note : Excluding Northern Province

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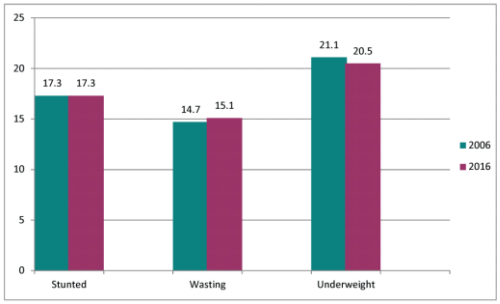
Figure 11.3 Trends in nutritional status of children under age 5



Note : Excluding Northern Province

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Over nutrition

Overweight among grade 10 students in 2015 was 4.3% . (AHB 2015)

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Over nutrition

Ethnicity	Overweight	Obesity	WC(MALES)	WC(FEMALES)
Asian cutoff	BMI > 23.0	BMI >27.5	> 90cm	>80cm
Caucasian cutoff	BMI > 25.0	BMI > 30.0	> 102cm	>88cm

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Overnutrition

- Overweight adults – 25.2%
- Obese adults – 9.2%
- Centrally obese adults – 26.2

(cut-off values for Asians)

(Obesity in Sri Lankan adults P. Katulanda et al,2010)

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Nutritional status in the women in reproductive age group

Source	Sample size	% Thinness BMI < 18.5kg/m2	% Overweight BMI 25-29.9kg/m2	% Obesity BMI > 30 kg/m2
DHS 2006-07	13749	16.2%	24%	7.2%
FHB 2009		25.4%		

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Sectoral differences in prevalence of Thinness

Source	Urban	Rural	Estate	Total
DHS 2006-07	9.7%	16.3%	33.2%	16.2%

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- The mean BMI of women in DHS 2006-07 was 23.1kg/m2.
- The mean height of women in DHS 2006-07 was 152cm.
- 10.6% were of height < 145cm indicating short stature.

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IRON DEFICIENCY

- The most common type of micronutrient deficiency in Sri Lanka.
- < 5 years prevalence of anemia – 32.5%(DHS 2006-07)
- Prevalence of anemia among non pregnant women aged 15 – 49 years – 39% (DHS 2006-07)

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Prevalence of Anemia in Children of 6-59 months

Source	Mild 10- 10.9g/dl	Moderate 7- 9.9g/dl	Severe <7g/dl	Any < 11g/dl
DHS 2006-2007	21.5%	10.8%	0.3%	32.5%

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Prevalence of anemia among 5 - 59momths old children by sectors

Source	Anemia	Urban	Rural	Estate	Total
DHS 2006-07	Any	32%	33.2%	28.1%	32.6%

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Anemia among pregnant women

Source	Mild 10-11.9g/dl	Moderate 7-9.9g/dl	Severe < 7g/dl	Any
DHS 2006-07	20.7%	13.3%	13.%	34%

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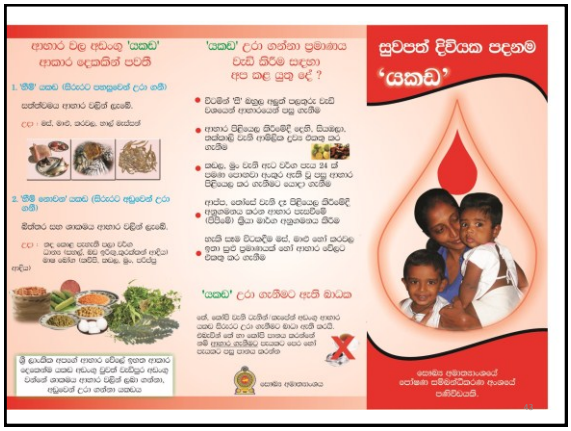

VITAMIN A DEFICIENCY

- Vitamin A refers to biologically active compound retinol and its precursor carotenoids.
- Vitamin A deficiency is a wide spread public health problem among women & children
- It is a common cause of preventable blindness
- Vitamin A deficiency is defined as " low serum retinol level less than 20ug /dl

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Prevalence

- Children aged 6-59 months – 29.3%
- Non pregnant women – 14.9%
- (Vitamin A nutrition status in Sri Lanka 2006)
- Clinical Signs of Vitamin A deficiency were not seen in the 2006 survey. However, biochemical evidence of vitamin A deficiency was seen in 29.3% in children and of these 2.3% had severe deficiency.
- Public health problem in the country.

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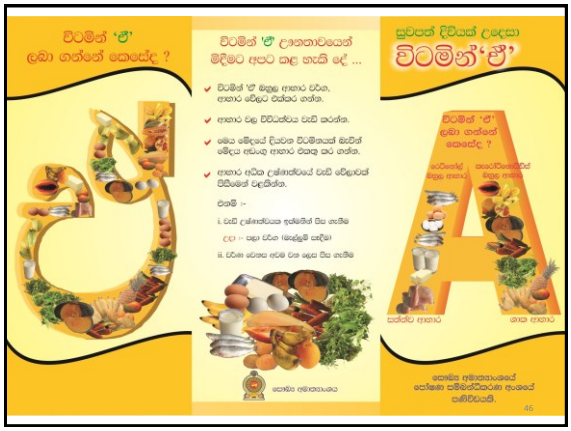

IODINE DEFICIENCY

- Iodine deficiency is the single most common cause of preventable mental retardation &brain damage in the world.
- Iodine deficiency disorders had been identified as a major public health problem in Sri Lanka in 1986 following a survey that revealed total goiter prevalence rate of 18.2% among school children. As a result, universal salt iodization (USI) program was launched in Sri Lanka in 1995.

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SURVEY IN 2010

- Overall goiter rate among children aged 6-10 years, in Sri Lanka was 4.4%
- A median urinary iodine concentration of children was 163.4Pg/L at national level
- only 1.4% was severely iodine deficient (<20Pg/L), 5.9% were moderately iodine deficient (20-49.9Pg/L), 37.5% were within ideal range (100-199.9Pg/L) and 22.2% (200-299.9Pg/L) were having more than adequate level of iodine and 14.9% were having excessive iodine intake.

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- Only 68.3% of households were using adequately iodized salt
- As demonstrated by median urinary iodine, proportion of urinary iodine samples below 100Pg/L and proportion of urinary iodine samples below 50Pg/L, currently, the iodine nutritive status is possibly adequate in Sri Lanka.
- Adequately iodized salt at household level was 68.2% indicated the poor quality of salt.

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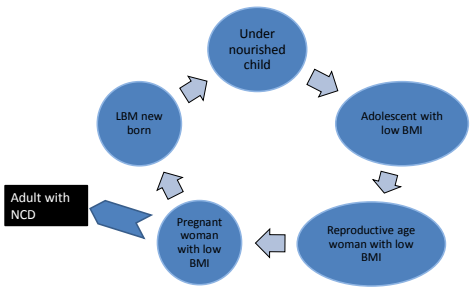
Intergenerational trans mission of LBW



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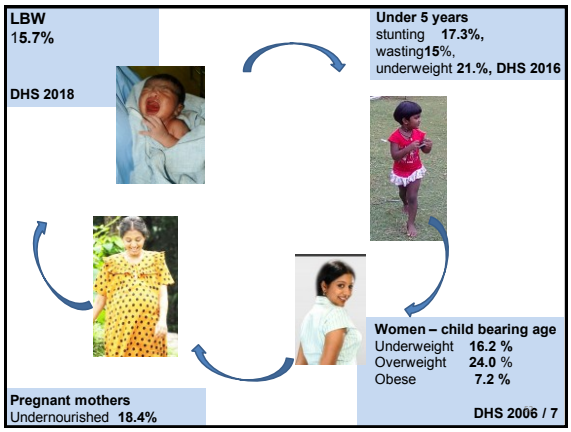

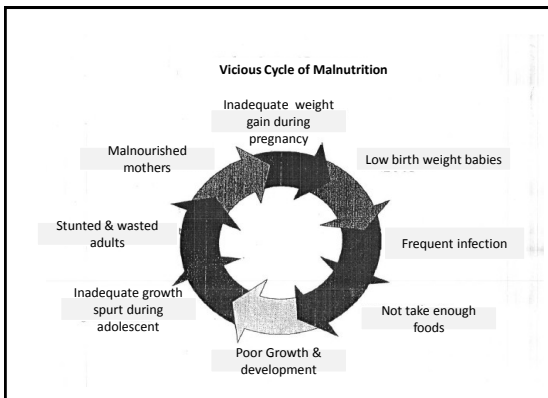

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•THANK YOU

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