



WEEKLY EPIDEMIOLOGICAL REPORT

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Overweight and Obesity: Reducing the Burden (part I)

Nature as well as nurture play their part in causing overweight and obesity. Genes appear to influence the metabolism and distribution of body fat, and are thought to contribute 25-40% to the cause of overweight and obesity. However, the rapid increase in the incidence of obesity throughout the developed and some developing countries has occurred within a short period of time for there to have been significant genetic changes in these populations. It is therefore likely that this 'epidemic' of overweight and obesity has been brought about mainly by environmental and behavioural changes which have led to a more energy-dense (high-calorie) diet and more sedentary way of life.

What are overweight and obesity?

Overweight and obesity are terms used to describe excessive amounts of body fat which adversely affect health and well-being of people. The Body Mass Index (BMI) is one of the parameters used to define overweight and obesity. BMI is defined as the person's weight in kilograms divided by the square of their height in meters (kg/m^2). BMI is used for this purpose as it correlates with the proportion of body fat in most people. According to the World Health Organization (WHO), a BMI of 25 to 29.9 kg/m^2 is defined as 'overweight', and a BMI of 30 kg/m^2 or more is defined as 'obese', in adults (see Table 1).

Recent studies in the UK have shown that people of Asian origin have a higher level of excess body fat in comparison to the general population when controlled for age, gender and BMI. Thus, the proportion of people with Asian ori-

Table 1. WHO classification of overweight and obesity in adults

Classification	BMI (kg/m^2)
Underweight	<18.5
Healthy weight	18.5 - 24.9
Overweight	25 - 29.9
Obese	30 or more
Obesity I	30 - 34.9
Obesity II	35 - 39.9
Obesity III (severely or morbidly obese)	40 or more

Source: World Health Organization, 2000

gin with a higher risk of co-morbidities (e. g., type 2 diabetes and cardiovascular disease) is substantial even at BMIs lower than the existing WHO cut-offs for weight. It is therefore possible that the current WHO recommended cut-offs may not provide an ideal basis for taking action on risks related to overweight and obesity in adults in some settings. Added to this confusion, the levels of morbidity vary between different Asian sub-populations, and for this reason it is difficult to identify one clear BMI cut-off valid across the borders. A WHO Expert Consultation group (2004) has recommended that the international cut-offs set by the WHO be retained although trigger points for public health action to be identified as 23 kg/m^2 for increased risk and 27.5 kg/m^2 for high risk.

A possible limitation of BMI is that it does not distinguish between mass due to body fat and mass due to muscular physique. Other methods of measurement, particularly waist circumference and waist-hip ratio, have emerged as useful measures of the proportion and the distribution of body fat.

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Table 2. Waist circumference thresholds for the general population and Asian adult populations in the UK

Gender	General population	Asian populations
Male	102 cm (40 inches) or more	90 cm (35 inches) or more
Female	88 cm (35 inches) or more	80 cm (32 inches) or more

Source: National Institute for Health and Clinical Excellence UK, 2006

The WHO has recommended that an individual's relative health risk could be accurately classified using both BMI and waist circumference. This is shown below in Table 3 for the general adult population in the UK.

Table 3. Combining BMI and waist measurement to assess obesity and the risk of type 2 diabetes and cardiovascular disease for general adult population in the UK

Classification	BMI (kg/m ²)	Waist circumference and risk of co-morbidities	
		Men 94-102 cm	Men more than 102 cm
		Women 80-88 cm	Women More than 88 cm
Underweight	Less than 18.5	-	-
Healthy weight	18.5 – 24.9	-	Increased
Overweight	25 – 29.9	Increased	High
Obesity	30 or more	High	Very high

Source: National Institute for Health and Clinical Excellence UK, 2006

The waist-hip ratio is another useful measure of body fat distribution. It is calculated by dividing the waist circumference (in meters) by hip circumference (in meters). Although there is no consensus about appropriate waist-hip ratio thresholds, a raised waist-hip ratio is commonly taken to be 0.95 or more in men, and 0.85 or more in women.

There is widespread international support for the use of BMI to define obesity in children even though there is no universally accepted BMI-based classification system for childhood obesity. It is so as, for children and young people, BMI is not a static measurement, but varies from birth to adulthood, and is different between boys and girls. Interpretation of BMI values in children and young people therefore depends on comparisons with population reference data using cut-offs in the BMI distribution (BMI percentiles – growth reference charts). However, the use of growth reference charts becomes more and more impractical in primary health care settings in older children and in young people.

What is the health burden of overweight and obesity?

The diseases related to overweight and obesity are classified under four main categories: cardiovascular diseases; conditions associate with insulin resistance such as type 2 diabetes;

certain types of cancer, especially the hormone-related and large bowel cancers and gallbladder disease. Other potential problems of overweight and obesity include respiratory difficulties, chronic musculoskeletal problems, depression, relationship problems and infertility.

It has been known for some time that obesity is associated with premature death. Obesity increases the risk of death from two major problems: cardiovascular diseases and cancer. However, for public health purposes, the greatest burden of disease arises from obesity-related morbidity. Table 4 gives details of the problems associated with obesity.

Table 4. Relative risks of health problems associated with obesity

Greatly increased risk (Relative risk greater than 3)	Moderately increased risk (Relative risk 2-3)	Slightly increased risk (Relative risk 1-2)
Type 2 diabetes Insulin resistance Gallbladder disease Dyslipidaemia (e.g., high cholesterol) Breathlessness Sleep apnoea (disturbance of breathing)	Coronary heart disease Hypertension Stroke Osteoarthritis Hyperuricaemia (high levels of uric acid in blood)	Cancer (e.g., colon) Reproductive hormone abnormalities Polycystic ovary syndrome Impaired fertility Low back pain Anaesthetic risk Foetal defects with maternal obesity

Note: All relative risk estimates are approximate. The relative risk indicates the risk measured against that of a non-obese person of the same age and sex. For example, an obese person is two to three times more likely to suffer from hypertension than a non-obese person. **Source:** World Health Organization, 2000

The associated health outcomes of childhood obesity are similar to those of adults and include hypertension, dyslipidaemia, hyperinsulinaemia together known as the 'metabolic syndrome'. It is becoming increasingly common although the true prevalence of the disease is still unknown. Other possible consequences for children and young people include problems such as back pain and foot strain, exacerbation of asthma, psychological problems such as poor self-esteem, being perceived as unattractive, depression, eating disorders and type 2 diabetes.

References

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- National Institute for Health and Clinical Excellence 2006. Obesity: The prevention, identification, assessment and management of overweight and obesity in adults and children. Available from: www.publichealth.nice.org.uk.

This article was compiled by Dr. Hasitha Tissera

Table 1: Vaccine-preventable diseases & AFP30th Dec 2006 - 5th Jan 2007 (1st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2007	Number of cases during same week in 2006	Total number of cases to date in 2007	Total number of cases to date in 2006	Difference between the number of cases to date between 2007 & 2006
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Measles	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Tetanus	00	00	00	00	00	00	00	00	00	02	00	02	-100.0%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Tuberculosis	130	00	05	16	03	00	08	00	162	316	162	316	-48.7%

Table 2: Diseases under Special Surveillance30th Dec 2006 - 5th Jan 2007 (1st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2007	Number of cases during same week in 2006	Total number of cases to date in 2007	Total number of cases to date in 2006	Difference between the number of cases to date between 2007 & 2006
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	71	47	19	07	24	04	00	09	181	144	181	144	+25.7%
Encephalitis	01 CB=1	00	00	00	04 PU=4	01 AP=1	00	00	06	02	06	02	+200.0%
Human Rabies	01 CB=1	00	00	01 TR=1	00	00	01 BD=1	00	03	03	03	03	00.0%

Table 3: Newly introduced Notifiable Diseases30th Dec 2006 - 5th Jan 2007 (1st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2007	Total number of cases to date in 2007
	W	C	S	NE	NW	NC	U	Sab		
Chickenpox	02 CB=1 GM=1	00	01 GL=1	00	01 KR=1	01 AP=1	00	00	05	05
Meningitis	02 KL=2	02 KD=2	01 HB=1	00	02 KR=2	00	00	03 RP=3	10	10
Mumps	00	01 NE=1	00	00	00	00	00	00	01	01

*DF / DHF refers to Dengue Fever / Dengue Haemorrhagic Fever.
NA= Not Available.
Sources:
Weekly Return of Communicable Diseases:
Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis, Chickenpox, Meningitis, Mumps.
Special Surveillance:
Acute Flaccid Paralysis.
National Control Program for Tuberculosis and Chest Diseases:
Tuberculosis.
Details by districts are given in Table 5.

Provinces:

W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions:

CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Killinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttalam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

Table 4: Laboratory Surveillance of Dengue Fever 30th Dec 2006 - 5th Jan 2007 (1st Week)

Samples	Number tested	Number positive	Serotypes				
			D ₁	D ₂	D ₃	D ₄	Negative
Number for current week	54	03	00	01	01	00	00
Total number to date in 2007	54	03	00	01	01	00	00

Source: Genetech Molecular Diagnostics & School of Gene Technology, Colombo.

Table 5: Selected notifiable diseases reported by Medical Officers of Health
30th Dec 2006 - 5th Jan 2007 (1st Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Colombo	40	40	05	05	01	01	02	02	00	00	03	03	00	00	01	01	86
Gampaha	11	11	11	11	00	00	00	00	00	00	00	00	00	00	02	02	79
Kalutara	20	20	04	04	00	00	01	01	01	01	03	03	00	00	01	01	82
Kandy	41	41	09	09	00	00	00	00	00	00	01	01	02	02	04	04	86
Matale	02	02	06	06	00	00	00	00	00	00	01	01	00	00	08	08	58
Nuwara Eliya	04	04	06	06	00	00	01	01	00	00	02	02	02	02	06	06	71
Galle	10	10	05	05	00	00	00	00	00	00	03	03	01	01	00	00	81
Hambantota	01	01	00	00	00	00	00	00	01	01	01	01	01	01	00	00	100
Matara	08	08	08	08	00	00	02	02	00	00	07	07	09	09	00	00	100
Jaffna	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Kilinochchi	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	50
Mannar	02	02	02	02	00	00	00	00	00	00	00	00	00	00	00	00	50
Vavuniya	03	03	03	03	00	00	01	01	00	00	00	00	00	00	00	00	100
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	80
Batticaloa	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01	01	27
Ampara	00	00	02	02	00	00	00	00	00	00	00	00	00	00	00	00	14
Trincomalee	02	02	01	01	00	00	00	00	00	00	00	00	00	00	01	01	44
Kurunegala	11	11	13	13	00	00	01	01	00	00	02	02	01	01	00	00	94
Puttalam	13	13	04	04	04	04	05	05	00	00	01	01	00	00	03	03	100
Anuradhapura	00	00	03	03	01	01	01	01	00	00	03	03	00	00	02	02	68
Polonnaruwa	04	04	06	06	00	00	01	01	00	00	01	01	00	00	00	00	86
Badulla	00	00	05	05	00	00	00	00	00	00	00	00	02	02	01	01	80
Monaragala	00	00	11	11	00	00	03	03	00	00	04	04	03	03	00	00	100
Ratnapura	05	05	14	14	00	00	05	05	00	00	00	00	02	02	00	00	69
Kegalle	04	04	03	03	00	00	00	00	00	00	01	01	00	00	00	00	82
Kalmunai	00	00	02	02	00	00	02	02	00	00	00	00	00	00	01	01	33
SRI LANKA	181	181	123	123	06	06	25	25	02	02	33	33	23	23	31	31	73

Source: Weekly Returns of Communicable Diseases (WRCD).

*Dengue Fever / DHF refers to Dengue Fever / Dengue Haemorrhagic Fever.

**Timely refers to returns received on or before 13 Jan. 2007. Total number of reporting units = 290. Number of reporting units data provided for the current week: 213.

A = Cases reported during the current week. B = Cumulative cases for the year.

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