Body mass index - classification

Identifying and Definitional Attributes

Data Dictionary:	NHDD		
Knowledgebase ID:	000368	Version number:	2
Metadata type:	DERIVED DATA ELEMENT		
Registration Authority:	NHIMG	Admin status:	SUPERSEDED
		Effective date:	01-MAR-05

Definition: The category of weight deficit or excess in adults and weight excess only in children and adolescents.

Context: Public health and health care:
BMI is used as an indicator of underweight, normal or healthy weight and overweight and obesity in adults and of overweight and obesity in children and adolescents. On a population basis there is a strong association between BMI and health risk.

In order to correctly categorise adults and children / adolescents, please refer to the categorisation protocol described under Guide for Use.

Relational and Representational Attributes

Datatype:	Numeric
Representational form:	CODE
Representation layout:	N*/N.N**
Minimum Size:	1
Maximum Size:	3

Data domain:

Classification	BMI	Risk of comorbidities
1 Not overweight or obese	< 25.00	
1.1 Underweight	< 18.50	Low (but risk of other clinical problems increased)
1.2 Normal rang	18.50 – 24.99	Average
2 Overweight	> or = 25.00	
2.1 Overweight	> or = 25.00	
2.2 Pre Obese	25.00 – 29.99	Increased
3 Obese	> or = 30	
3.1 Obese class	1 30.00 – 34.99	Moderate
3.2 Obese class	2 35.00 – 39.99	Severe
3.3 Obese class	3 > or = 40.00	Very severe
9 Not stated/inadequately described		

Guide for use: Adults:

Body mass index for adults cannot be calculated if components necessary for its calculation (weight or height) is unknown or has not been collected (i.e is coded to 888.8 or 999.9).

BMI for adults is categorised according to the range it falls within as indicated by codes 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 3.3 or 9.9. For consistency, when the sample includes children and adolescents, adults can be analysed under the broader categories of 1,2,3 or 9as used for categorising children and adolescents.

Children/adolescents:

Body mass index for children and adolescents aged 2 to 17 years cannot be calculated if components necessary for its calculation (date of birth, sex, weight or height) is unknown or has not been collected (i.e is coded to 888.8, 999.9 or 9).

Self-reported or parentally reported height and weight for children and adolescents should be used cautiously if at all.

To determine overweight and obesity in children and adolescents, compare the derived BMI against those recorded for the relevant age and sex of the subject to be classified, against Table 1:Classification of BMI for children and adolescents, based on BMI cut-points developed by Cole et al (see below). For example, an 11year old boy with a BMI of 21 would be considered overweight (i.e coded as 2), or a 7 year old girl with a BMI of 17.5 would be considered not overweight or obese (i.e coded as 1).

Using this method, children and adolescents can only be coded as1, 2, 3 or 9.

Table 1: Classification of overweight and obesity for children and Adolescents				
Age(years)	BMI equivalent to 25 kg/m2		BMI equivalent to 30 kg/m2	
	Males	Females	Males	Females
2	18.41	18.02	20.09	19.81
2.5	18.13	17.76	19.80	19.55
3	17.89	17.56	19.57	19.36
3.5	17.69	17.40	19.39	19.23
4	17.55	17.28	19.29	19.15
4.5	17.47	17.19	19.26	19.12
5	17.42	17.15	19.30	19.17
5.5	17.45	17.20	19.47	19.34
6	17.55	17.34	19.78	19.65
6.5	17.71	17.53	20.23	20.08
7	17.92	17.75	20.63	20.51
7.5	18.16	18.03	21.09	21.01
8	18.44	18.35	21.60	21.57
8.5	18.76	18.69	22.17	22.18
9	19.10	19.07	22.77	22.81
9.5	19.46	19.45	23.39	23.46
10	19.84	19.86	24.00	24.11
10.5	20.20	20.29	24.57	24.77
11	20.55	20.74	25.10	25.42
11.5	20.89	21.20	25.58	26.05
12	21.22	21.68	26.02	26.67
12.5	21.56	22.14	26.43	27.24
13	21.91	22.58	26.84	27.76
13.5	22.27	22.98	27.25	28.20
14	22.62	23.34	27.63	28.57
14.5	22.96	23.66	27.98	28.87
15	23.29	23.94	28.30	29.11
15.5	23.60	24.17	28.60	29.29
16	23.90	24.37	28.88	29.43
16.5	24.19	24.54	29.14	29.56
17	24.46	24.70	29.41	26.69
17.5	24.73	24.85	29.70	29.84
18	25.00	25.00	30.00	30.00

Verification Rules:

Collection Methods: *N for BMI category determined (1,2,3 or 9) for persons (children and adolescents) aged 2 to 17 years.
**N.N for BMI category determined (1.1,1.2,2.1,2.2,3.1,3.2,3.3 or 9.9) for persons aged 18 years or older.
Standard definitions of overweight and obesity in terms of BMI are used to derive age-specific and age-adjusted indicators of overweight and obesity for reporting progress towards National public health policy .

Related metadata: supersedes previous data element Adult body mass index - classification version 1
is used in conjunction with Body mass index version 2

Administrative Attributes

Source Document: Obesity: Preventing and Managing the Global Epidemic (Report of a WHO Consultation: World Health Organization 2000);

Cole TJ, Bellizi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. British Medical Journal 2000; 320: 1240-1243

Source Organisation: World Health Organization (see also Comments) and the consortium to develop an Australian standard definition of child / adolescent overweight and obesity; at the Children's Hospital at Westmead on behalf of the Commonwealth Department of Health & Ageing

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Comments: This data element applies to persons aged 2 years or older. It is recommended for use in population surveys and health care settings for adults and population surveys only for children and adolescents. It is recommended that calculated BMI for children and adolescents be compared with a suitable growth reference such as the US Centers for Disease Control 2000 BMI- for-age chart in health care settings such as hospitals, clinics and in general practice. A BMI greater than the 85th percentile would be classified as overweight, while a BMI greater than the 95th percentile would be classified as obese. These percentiles are arbitrary and do not relate to morbidity as the BMI cut-points do in adults.

BMI can be considered to provide the most useful, albeit crude, population-level measure of obesity. The robust nature of the measurements and the widespread routine inclusion of weights and heights in clinical and population health surveys mean that a more selective measure of adiposity, such as skinfold thickness measurements, provides additional rather than primary information. BMI can be used to estimate the prevalence of obesity within a population and the risks associated with it, but does not, however, account for the wide variation in the nature of obesity between different individuals and populations (WHO 2000).

BMI values for adults are age-independent and the same for both sexes.

However, BMI values for children and adolescents aged 2 to 17 years are age and sex specific and are classified by comparing against the above table, Table 1: Classification of BMI for children and adolescents. For adults and children and adolescents BMI may not correspond to the same degree of fatness in different

populations due, in part, to differences in body proportions. The classification table shows a simplistic relationship between BMI and the risk of comorbidity, which can be affected by a range of factors, including the nature of the diet, ethnic group and activity level. The risks associated with increasing BMI are continuous and graded and begin at a BMI of 25 (or equivalent to 25 for children and adolescents). The interpretation of BMI grades in relation to risk may differ for different populations. Both BMI and a measure of fat distribution (waist circumference or waist: hip ratio in adults) are important in calculating the risk of obesity comorbidities.

It is recommended that in population surveys, sociodemographic data including ethnicity should be collected, as well as other risk factors including physiological status (e.g. pregnancy), physical activity, smoking and alcohol consumption. Summary statistics may need to be adjusted for these variables.

National health data elements currently exist for sex, date of birth, country of birth, Indigenous Status and smoking. Data elements are being developed for physical activity.

Presentation of data:
Methods used to establish cut-off points for overweight have been arbitrary and, as a result, cut-off points vary between countries. The data are derived mainly from studies of mortality and morbidity risk performed in people living in western Europe or the United States of America, and cut-off points for BMI as an indicator of adiposity and risk in populations who differ in body build and genetic disposition are likely to vary. Caution is required in relation to BMI cut-off points when used for different ethnic groups because of limited outcome data for some ethnic groups, e.g. Aboriginal and Torres Strait Islander peoples. As with overweight the cut-off points for a given level of risk are likely to vary with body build, genetic background and physical activity.

The classification above is different to ones that have been used in the past and it is important that in any trend analysis consistent definitions are used.

BMI should not be rounded before categorisation to the classification above.

Data Element Links

Information Model Entities linked to this Data Element

NHIM	Physical wellbeing

Data Agreements which include this Data Element