
Waist circumference - measured

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Identifying and Definitional Attributes

Data Dictionary: NHDD
Knowledgebase ID: 000372 Version number: 2
Metadata type: DATA ELEMENT
Registration Authority: NHIMG Admin status: SUPERSEDED
Effective date: 01-MAR-05

Definition: A person's waist circumference measured half way between the inferior margin of the last rib and the crest of the ilium in the mid-axillary plane.
In order to ensure consistency in measurement, the measurement protocol described under Collection methods should be used.

Context: Public health and health care:
Originally used in the calculation of Waist to hip ratio which requires the measurement of hip circumference and waist circumference as a predictor of obesity-related morbidity and mortality. More recently it has been used in it's own right as an indicator of risk associated with excess abdominal fat.

Relational and Representational Attributes

Datatype: Numeric
Representational form: QUANTITATIVE VALUE
Representation layout: NNN.N
Minimum Size: 4
Maximum Size: 5

Data Domain: 999.9 Not collected
 NOVAL Distance in centimetres, measured to the nearest 0.1cm.

Guide For Use: If measured waist circumference is not able to be collected, code 999.9

The measurement is recorded as a continuous variable measured to the nearest 0.1 cm.

Collection Methods: The collection of anthropometric measurements, particularly in

those who are overweight or obese or who are concerned about their weight, should be performed with great sensitivity, and without drawing attention to an individual's weight.

Measurement protocol:

The measurement of waist circumference requires a narrow (< 7 mm wide), flexible, inelastic tape measure. The kind of tape used should be described and reported. The graduations on the tape measure should be at 0.1 cm intervals and the tape should have the capacity to measure up to 200 cm. Measurement intervals and labels should be clearly readable under all conditions of use of the tape measure.

The subject should remove any belts and heavy outer clothing. Measurement of waist circumference should be taken over at most one layer of light clothing. Ideally the measure is made directly over the skin.

The subject stands comfortably with weight evenly distributed on both feet, and the feet separated about 25-30 cm. The arms should hang loosely at the sides. Posture can affect waist circumference.

The measurement is taken midway between the inferior margin of the last rib and the crest of the ilium, in the mid-axillary plane. Each landmark should be palpated and marked, and the midpoint determined with a tape measure and marked.

The circumference is measured with an inelastic tape maintained in a horizontal plane, at the end of normal expiration. The tape is snug, but does not compress underlying soft tissues. The measurer is positioned by the side of the subject to read the tape. To ensure contiguity of the two parts of the tape from which the circumference is to be determined, the cross-handed technique of measurement, as described by Norton et al. (1996), should be used. Ideally an assistant will check the position of the tape on the opposite side of the subject's body.

The measurement is recorded at the end of a normal expiration to the nearest 0.1 cm. Take a repeat measurement and record it to the nearest 0.1 cm. If the two measurements disagree by more than 1 cm, take a third measurement. All raw measurements should be recorded on the data collection form. If practical, it is preferable to enter the raw data into the database as this enables intra-observer and, where relevant, inter-observer errors to be assessed. The subject's measured waist circumference is subsequently calculated

as the mean of the two observations, or the mean of the two closest measurements if a third is taken, and recorded on the form. If only a mean value is entered into the database then the data collection forms should be retained.

It may be necessary to round the mean value to the nearest 0.1 cm. If so, rounding should be to the nearest even digit to reduce systematic over-reporting (Armitage & Berry 1994). For example, a mean value of 72.25 cm would be rounded to 72.2 cm, while a mean value of 72.35 cm would be rounded to 72.4 cm.

Validation and quality control measures:

Steel tapes should be checked against a 1 metre engineer's rule every 12 months. If tapes other than steel are used they should be checked daily against a steel rule.

Within- and, if relevant, between-observer variability should be reported. They can be assessed by the same (within -) or different (between-) observers repeating the measurement, on the same subjects, under standard conditions after a short time interval. The standard deviation of replicate measurements (technical error of measurement (Pederson & Gore 1996)) between observers should not exceed 2% and be less than 1.5% within observers.

Extreme values at the lower and upper end of the distribution of measured waist circumference should be checked both during data collection and after data entry. Individuals should not be excluded on the basis of true biological difference.

Last-digit preference, and preference or avoidance of certain values, should be analysed in the total sample and (if relevant) by observer, survey site and over time if the survey period is long.

Related metadata: is used in the calculation of Waist-to-hip ratio version 2
supersedes previous data element Adult abdominal circumference -
measured version 1

Administrative Attributes

Source Document: The measurement protocol described below is that recommended by the World Health Organization (WHO Expert Committee 1995) which was adapted from Lohman et al. (1988) and the International Society for the Advancement of Kinanthropometry as described by Norton et al. (1996).

Source Organisation: World Health Organization
International Society for the Advancement of Kinanthropometry

Comments: This data element applies to persons of all ages. It is recommended for use in population surveys and health care settings.

There is evidence that waist circumference alone might be used to identify people at health risk both from being overweight and from having a central fat distribution (Lean et al. 1995; Han et al. 1995; Poulriot et al. 1994; Seidell et al. 1992). It has been suggested that waist circumference as an index of truncal adiposity in adults may have certain advantages over other measurements of adiposity in predicting obesity related diseases. However, among children and adolescents, waist circumference measures should only be used as a measure of variation in an individual. As yet, no age appropriate cut-off points indicative of risk factors have been developed for use among children and adolescents.

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:

Means, 95% confidence intervals, medians and centiles should be reported to one decimal place. Where the sample permits, population estimates should be presented by sex and 5-year age groups. However 5-year age groups are not generally suitable for children and adolescents. Estimates based on sample surveys may need to take into account sampling weights.

For consistency with conventional practice, and for current comparability with international data sets, recommended centiles are 5, 10, 15, 25, 50, 75, 85, 90 and 95. To estimate the 5th and 95th centiles, a sample size of at least 200 is recommended for each group for which the centiles are being specified.

For reporting purposes, it may be desirable to present waist circumference in categories. It is recommended that 5-cm groupings are used for this purpose. Waist circumference should not be rounded before categorisation. The following categories may be appropriate for describing the waist circumferences of Australian men, women children and adolescents, although the

