

Waist Circumference Mid-Age Fifth Survey

Age Cohorts	1946-1951, 1973-1978
Surveys	Fifth
Derived Variable	Waist
Definition	Waist Circumference
Statistical form	Continuous variable

Background

Waist circumference is useful as a measure of central obesity. It has been shown in studies to be independently associated with obesity related health outcomes and health care costs in addition to or instead of BMI . (Hojgaard et al, 2008; Janssen et al 2004)

In the 5th Mid-aged survey respondents were asked for the first time to report their own waist circumference measurement. The question was formatted as follows:

Q56 What is your waist measurement?

*Please measure your waist while in your underwear. If possible, get someone to help you take the measurement. Find your navel (belly button) and measure at that level. Be careful not to have the tape too tight. You should be able to slip your little finger under it comfortably. Write the measurement to the **nearest** centimetre (or inch if this is the only measure you have available).*

cm **OR** inches

Of the 10 639 respondents 1160 (10.9%) did not fill in either box, 348(3.3%) filled in both boxes, with the remainder (9131, 85.8%) filling in either.

A summary of the responses is given below.

	<i>N</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Median</i>	<i>25th Pctl</i>	<i>75th Pctl</i>
m5q56_in	3346	34.78 (88.3)	6.52 (16.6)	0	98(248.9)	34 (86.4)	30 (76.2)	38 (96.5)
m5q56_cm	6481	89.45	35.31	9	970	88	80	98

Centimetres Box

On examination of the data it was apparent that some women had entered the measurement in inches in the centimetre boxes or had entered the measurement in millimetres. These were corrected using the following rules:

1. If centimetres were greater than 250 cm they were assumed to be millimetres and divided by 10. (10 cases).

2. If centimetres were less than 58 cm they were assumed to be inches and multiplied by 2.54. (295 cases)

Inches boxes

If inches were greater than 66in (168cm) they were assumed to be centimetres. (11 cases)

Both Boxes

Of the 348 women where both units were filled in only 28 cases did the difference in measurement exceed 2.5 cm. It appeared most women doing this had attempted to fill in the measurement using both units and in general had succeeded. In all these cases the measurement in centimetres was used. An analysis of this group is given below.

	<i>N</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Median</i>	<i>25th Pctl</i>	<i>75th Pctl</i>
m5q56_in	348	34.97 (88.8)	6.05 (15.4)	0	55(139.7)	34.5 (87.6)	31 (78.7)	38 (96.5)
m5q56_cm	348	90.61	46.35	31	901	88.5	78	96.5

After all these corrections and conversion to centimetres, cases where the measurement appeared to be outside what would be considered plausible were set to missing. The cut-off values used were 58 and 167cm (25 cases). These values were arrived at by reviewing other studies measuring women's waist circumference in the US, Denmark and Scotland. After removing these cases there were 11.1% missing. A summary of the final data is given below.

<i>N</i>	<i>N Miss</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Median</i>	<i>25th Pctl</i>	<i>75th Pctl</i>
9454	1185	89.88	13.96	58	167	88.9	80	97

Usage

Waist circumference can be used as either a continuous or categorical variable in analysis. The agreed cut-off values for waist circumference in adult women are ≥ 80 cm (increased risk) and ≥ 88 cm (substantially increased risk) (NHMRC, 2003). The distribution in the Mid-aged cohort at survey 5 is given in the following table.

Waist Circumference (cm)	N	%
<80	2177	23.0
80 to <88	2469	26.1
≥ 88	4808	50.8

It is planned to include this question in future surveys of the Young and Mid-aged cohorts.

References

Hojgaard B, Gyrd-Hansen D, Olsen KR, Sogaard J, Sorensen TI. (2008) Waist circumference and body mass index as predictors of health care costs. PLoS ONE 3(7):e2619.

Janssen I, Katzmarzyk PT, Ross R. (2004) Waist circumference and not body mass index explains obesity-related health risk. Am J Clin Nutr. 79(3):379-84.

NHMRC. (2003) Clinical Practice Guidelines for the Management of Overweight and Obesity in Adults, NHMRC:Canberra. 2003.