

How many SizeUSA subjects meet Waist Circumference guidelines?

By Elizabeth White, [TC]²

Numerous reports identify the growing issue of obesity among the US population and the [2007-2008 HANES study](#) estimates that the prevalence of overweight and obesity in adults is [over 60%](#). However, the guidelines for determining whether someone is at risk for becoming obese continue to change.

[Waist circumference](#) is one of the more popular guidelines used for determining obesity. Women's waistlines are required to be 35 inches or less and men's waistlines are required to be 40 inches or less to be classified in the healthy category. These guidelines are to be used for people aged 20 or over with heights of 5 feet or more and BMI ([Body Mass Index](#)) in the range of 25 up to 35. However, BMI has been [controversial](#) as an obesity indicator. Using the SizeUSA database as a source for understanding the size and shape of the US populations, less than half of the subjects met the recommended guidelines.

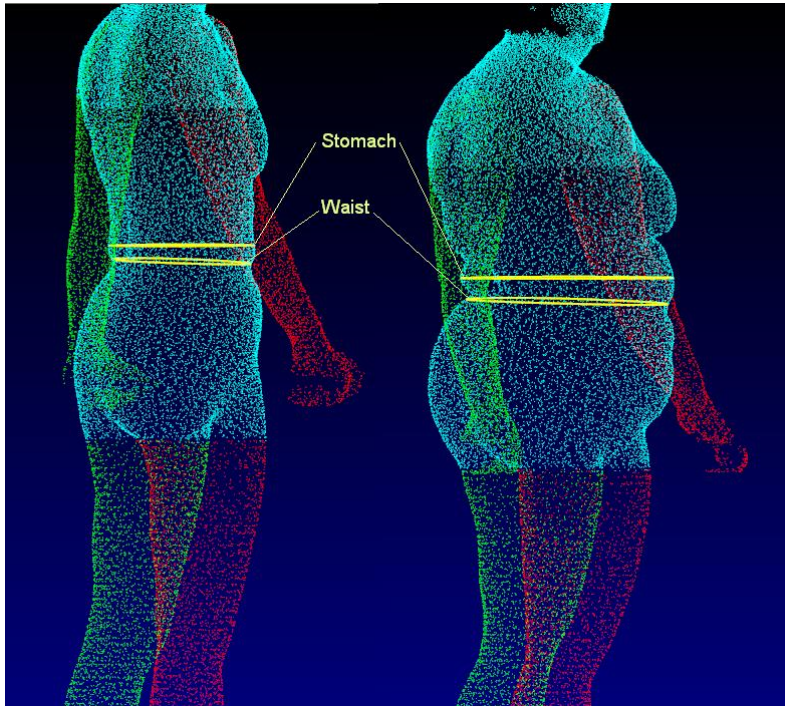
For women subjects participating in SizeUSA, around 94% were 5 feet or taller. Approximately 12% of all the women subjects met the height, BMI range, and waist guideline of 35 inches or less. For men, almost all subjects were 5 feet or taller. Around 41% met the height, BMI range, and guideline of a waist measurement 40 inches or less. (SizeUSA subjects are sorted into age categories that start at age 18 so there are subjects below the minimum age of 20 included in this sorting criteria.)

When comparing results between different studies, it should be noted that there is some discrepancy in waist measurement methods for apparel use vs. those for medical use. The waist measurements for apparel are chosen so that garments will hang correctly on the body to meet style and fit intent. Apparel waist positions may vary widely in body location. Waists used to sort the SizeUSA subjects were defined to measure the smallest circumference within a narrow range of the natural waist position.

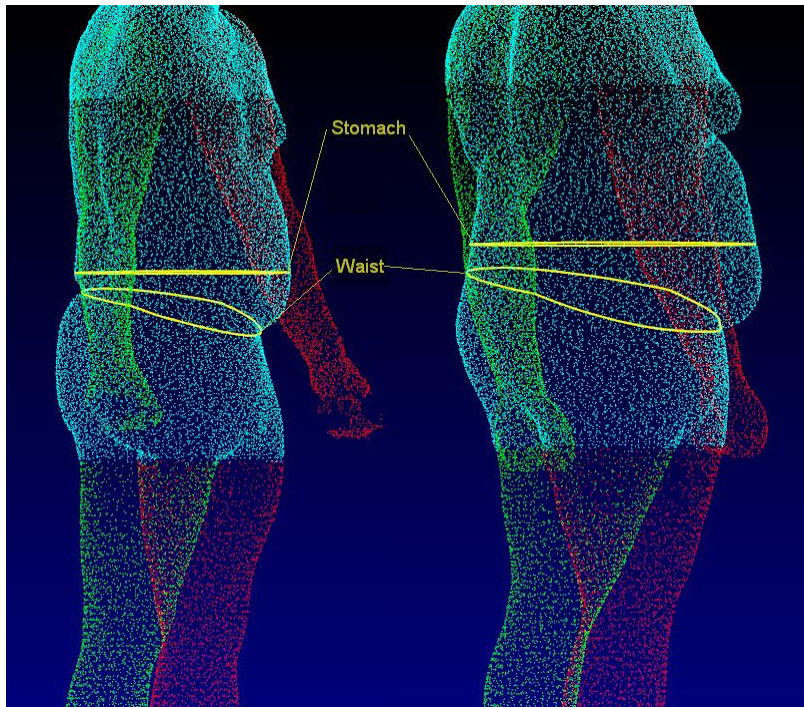
The WHO (World Health Organization) uses a different measurement method in its [guidelines on pages 5-7](#) :

“Waist circumference should be measured at the midpoint between the lower margin of the least palpable rib and the top of the iliac crest, using a stretch-resistant tape that provides a constant 100 g tension. . . . the subject should stand with feet close together, arms at the side and body weight evenly distributed, and should wear little clothing. The subject should be relaxed, and the measurements should be taken at the end of a normal expiration. Each measurement should be repeated twice; if the measurements are within 1 cm of one another, the average should be calculated. If the difference between the two measurements exceeds 1 cm, the two measurements should be repeated. “

The WHO waist measurement method is more similar to a stomach measurement than a waist measurement as illustrated in the two following images.



Women's Stomach vs. Natural Waist Measurements



Men's Stomach vs. Pant Waist Measurements

If a basic stomach measurement is used for the SizeUSA subjects, slightly over 8% of women meet the guidelines for height, BMI, and circumference. Almost 28% of men meet the guidelines.

[\[TC\]’s 3D body scanning and measurement extraction system](#) used for the SizeUSA study does not locate all of the body landmarks cited by WHO. In order to achieve the same measurement method as defined by WHO, the scan stomach measurement definition would require some modifications.

Compared to the NHANES study, the SizeUSA subjects fail to meet obesity cutoff guidelines as often or more than the US population depending on which combination of guidelines is used.

Overweight and Obese Adults

(who fail to meet healthy guidelines)

Measurement	% Women	% Men	Source
Age and BMI	64.10%	72.30%	NHANES 2007-2008
Age & BMI	54.08%	62.40%	SizeUSA subjects*
Height, Age, BMI, & Waist Measurement	88%	58%	SizeUSA subjects*
Height, Age, BMI, & Stomach Measurement	92%	72%	SizeUSA subjects*

*SizeUSA includes subjects as young as age 18.

Elizabeth White assists and instructs companies in the use of product development tools through [TC]’s seminars and consulting services. Sizing and measurement methods are basic topics within the Pattern Development, Grading for Fit, How to Build a Tech Pack, and Fit for Retailers: Pants seminars. Gratitude is expressed to David Bruner and Dave Woronka of [TC]’s for assistance with SizeUSA measurement extraction.

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