

# Ethnic Differences In Anthropometric Measures And Abdominal Fat Distribution: A Comparative Study Among Inuit, Africans And Europeans

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## Background

Evidence suggests that differences in obesity and cardiometabolic risk between populations may be explained by differences in abdominal fat distribution, particularly excess visceral fat. Ethnic differences in body composition have especially been identified as a limitation to the use of BMI. The relations between anthropometry and abdominal fat distribution are not clearly established across different populations. We aimed to examine how BMI and waist circumference (WC) are related to visceral (VAT) and subcutaneous (SAT) adipose tissue in three ethnic groups comprising an Inuit, African and European population.

## Methods

We combined data from four cross-sectional studies using similar methodology. The studies were conducted between 2005 and 2011 in Greenland (The Inuit Health in Transition Study), Kenya (The Kenya Diabetes Study) and Denmark (Helbred2008 and The ADDITION-Pro Study). A total of 7,118 individuals (3,102 Inuit, 1,139 Kenyans and 2,877 Danes) aged 17-95 years had measures of anthropometry, and VAT and SAT assessed by ultrasonography. Linear models were performed to analyse VAT and SAT as functions of BMI and WC controlled for age. The models were analysed separately for sex and ethnic group.

## Results

Africans had significantly lower mean values of BMI, WC, VAT and SAT compared to Inuit and Europeans, whereas the Inuit had the highest mean SAT values. The European women had higher levels of VAT, where a difference of 1 kg/m<sup>2</sup> in BMI corresponded a 4.1% (95%CI: 3.9-4.4) higher VAT compared to Inuit women (3.6%, 95%CI: 3.4-3.8) and African women (2.8 %, 95%CI: 2.3-3.2). In contrast, African women had significantly higher values of SAT for a given increase in BMI or WC, while the European had the lowest. Overall, the same pattern was seen for men.

## Conclusions

Differences in the relationship between anthropometry and abdominal fat distribution may contribute to explain differences in obesity-associated cardiometabolic risk across ethnic groups.