

## Introduction

High-status and low-status groups usually had different nutrition experiences, which might have intrapopulation differences in body mass<sup>1</sup>. This research:

- Investigated in the relationship between socioeconomic inequality and population body mass in the post-Medieval Netherlands.
- Compared body size of two post-Medieval urban skeletal collections with different social statuses.

## Material & Methods

**Material:** Two post-Medieval urban skeletal collections in Arnhem and Zwolle with different social status.

- The Arnhem collection (n=60): North cemetery of the Eusebius church (15th – 19th century); usually for people with low property and social status according to religious practices<sup>2</sup>.
- The Zwolle collection (n=35): Inside the Broerenkerk church (17th – 19th century); usually for people with higher social status, since burial here was costly<sup>3</sup>.

**Methods:** The body mass of the two collections was estimated using the following equations:

Ruff et al.'s (2012) BM equations of femoral head breadth<sup>4</sup>;

Ruff et al.'s (1991) BM equations of stature/bi-iliac breadth<sup>5</sup>;

Trotter (1970) Stature equations of maximum femur length<sup>6</sup>.

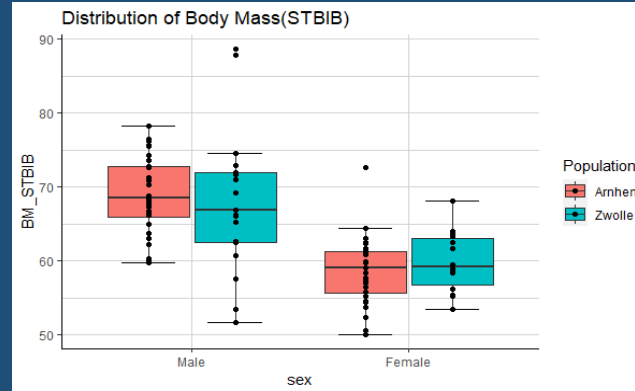


Figure 1: The box plot of body mass of two samples by sex, based on the stature/bi-iliac breadth method.

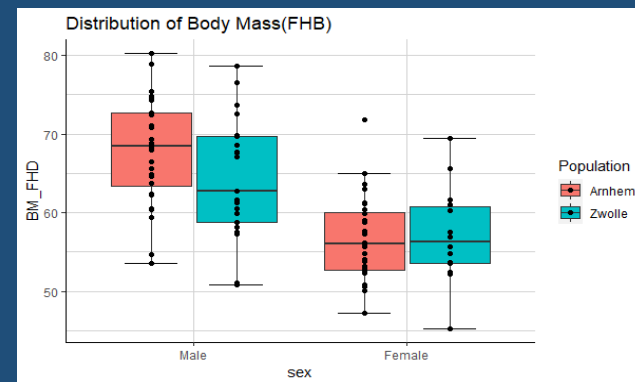


Figure 2: The box plot of body mass distributions of two samples by sex, based on the femoral head breadth method.

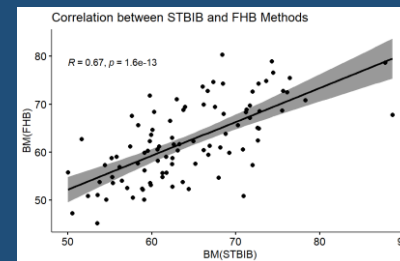


Figure 3 (left): Correlation between results of STBIB and FHB methods

t test	BM(STBIB)	BM(FHB)
Male	0.6621	0.07617
Female	0.3666	0.8153

Table 1 (left): p-value results of the Welch's t-test

## Result & Conclusion

- No significant body size differences between samples ( $p > 0.05$ ).
- Correlation between results of the STBIB and FHB methods is moderate ( $R=0.67$ ): might indicate that one or both methods is unreliable.
- Living stresses and nutrition level affecting adult body size in the populations of different social statuses are probably not significantly different.
- Limitations: biases of BM estimation methods, uniform social statuses of individuals in a collection, paradox of osteology that bone collections.
- Cannot prove that social inequality factors did not affect body size variations in the post-Medieval urban populations in the Netherlands.

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 3 Hagedoorn, J. (1992). Dood en begraven. Onderzoek naar de begravingen en zerken in de Broerenkerk. *De Doden Vertellen. Opgraving in de Broerenkerk te Zwolle 1987-88, 30-65*. Zwolle: Stichting Archeologie IJssel/Vechtstreek.  
 4 Ruff, C. B., Holt, B. M., Niskanen, M., Sladek, V., Berner, M., Garofalo, E., ... & Tompkins, D. (2012). Stature and body mass estimation from skeletal remains in the European Holocene. *American journal of physical anthropology*, 148(4), 601-617.  
 5 Ruff, C. B., Scott, W. W., & Liu, A. Y. C. (1991). Articular and diaphyseal remodeling of the proximal femur with changes in body mass in adults. *American journal of physical anthropology*, 86(3), 397-413.  
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