Separating menopause from chronological ageing in the changes in adiposity during female midlife

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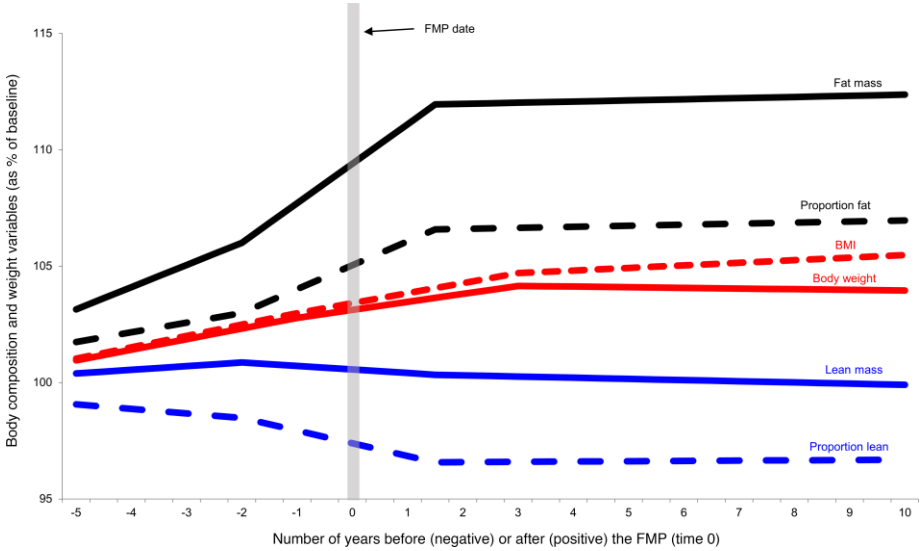
WCE

WORLD CONGRESS OF EPIDEMIOLOGY 2024

Motivation

- Increase in adiposity across menopause.
- Non-linear effects of menopause and chronological ageing.
- Important in postmenopausal health outcomes.

SWAN study of 1,246 US women (1996-2013)



Greendale, et al. (2019)

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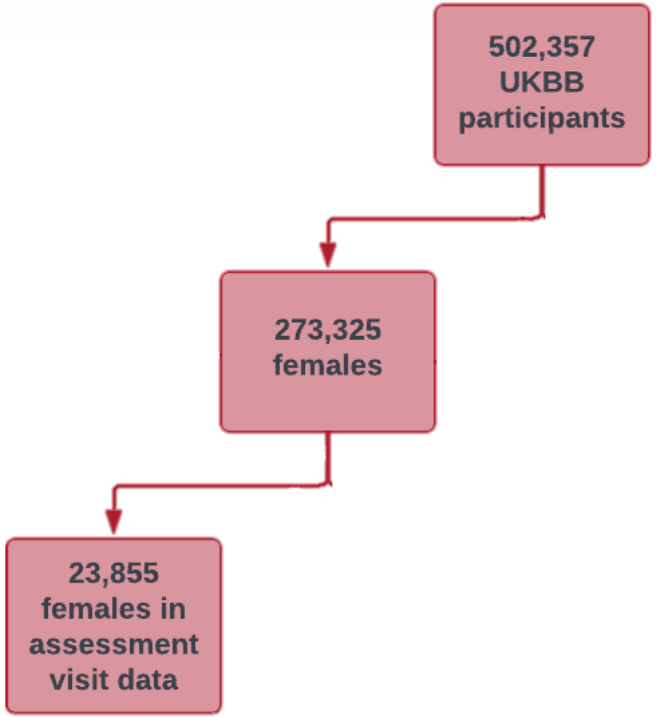
Participants from UK Biobank

- Participants included if they had
  - 2 or more adiposity measurements.
- Females included if they had
  - Age at menopause.



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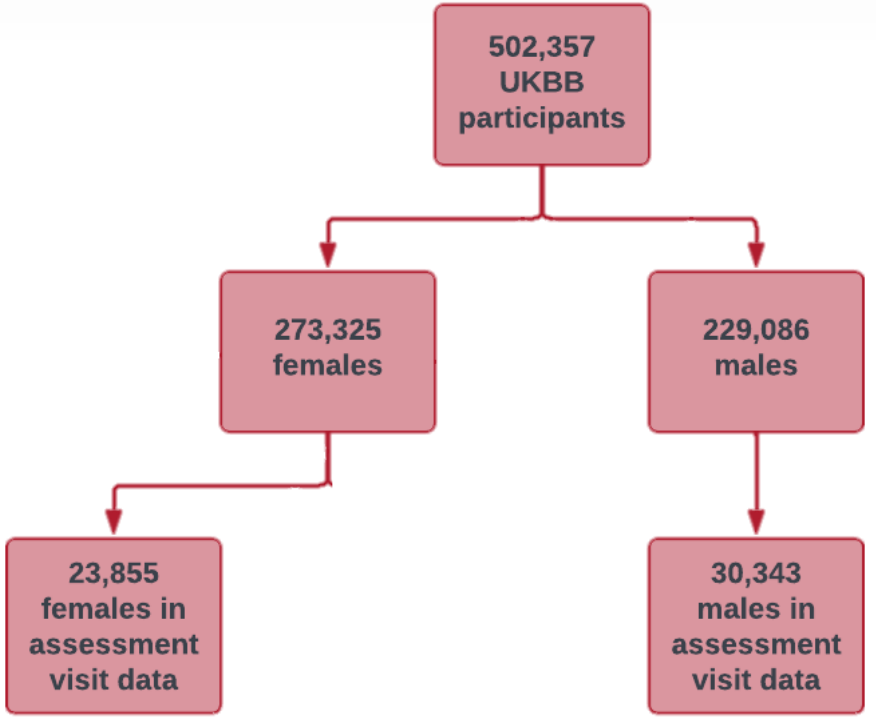
Participants from UK Biobank

- Males included if they had
  - 2 or more adiposity measurements.
  - Same age at baseline as females.



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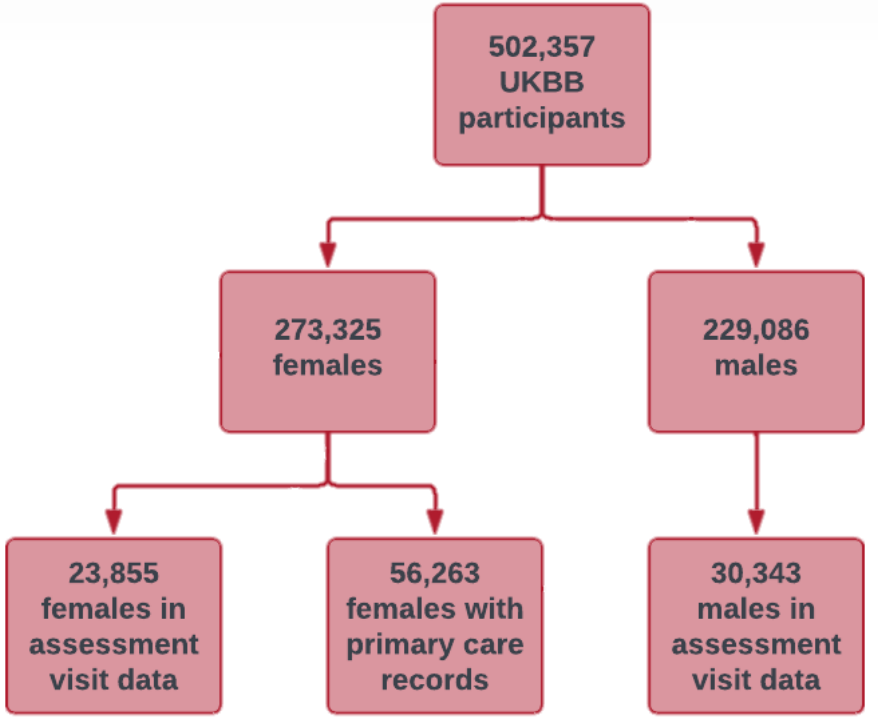

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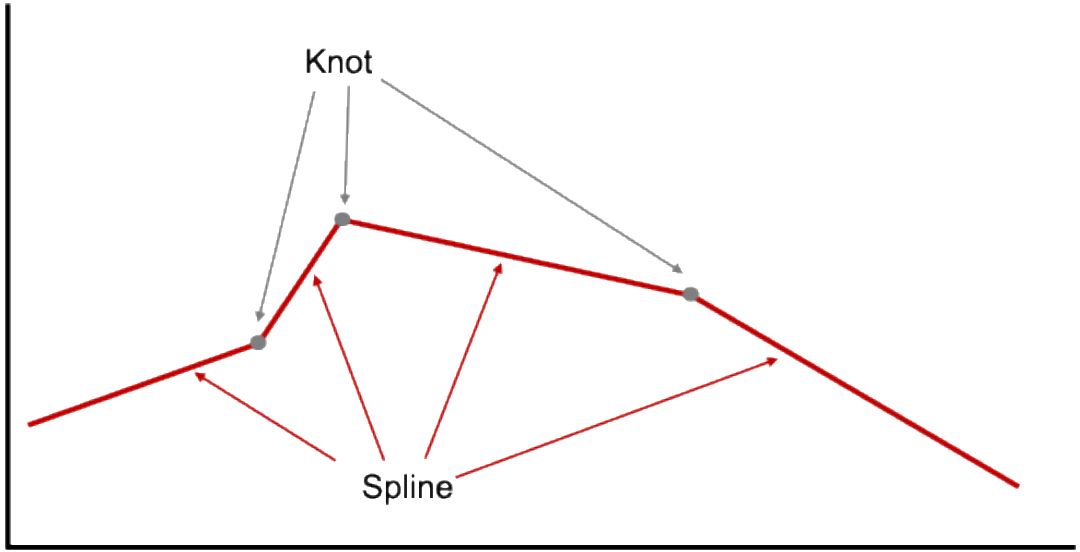
Modelling non-linear changes in adiposity using linear spline method



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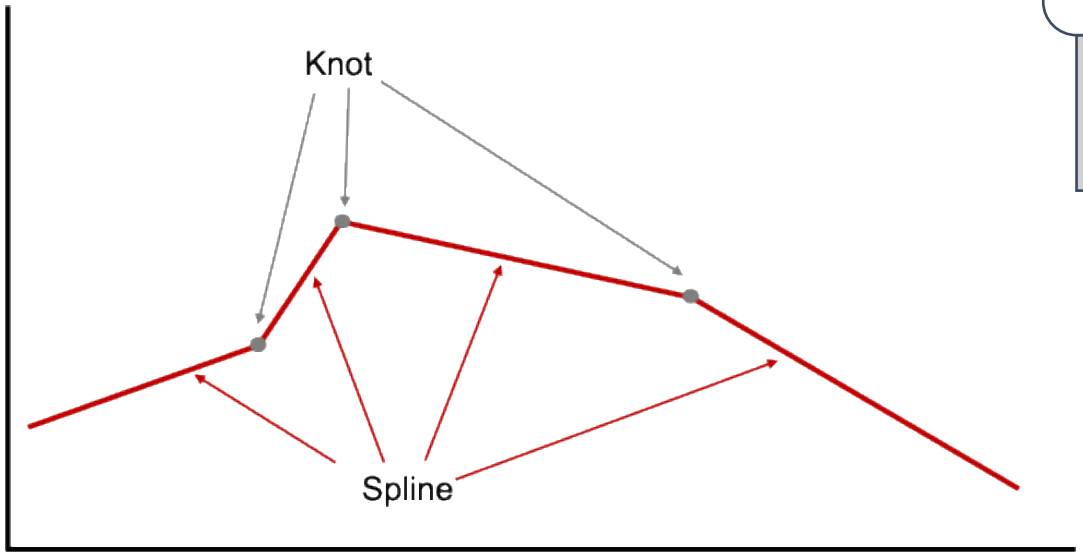


5 linear spline models

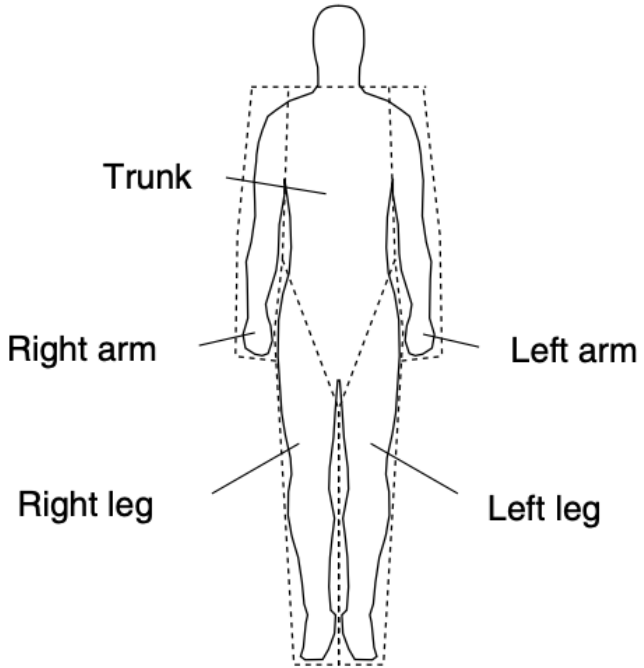
- Number of knots ranging from 2 to 6

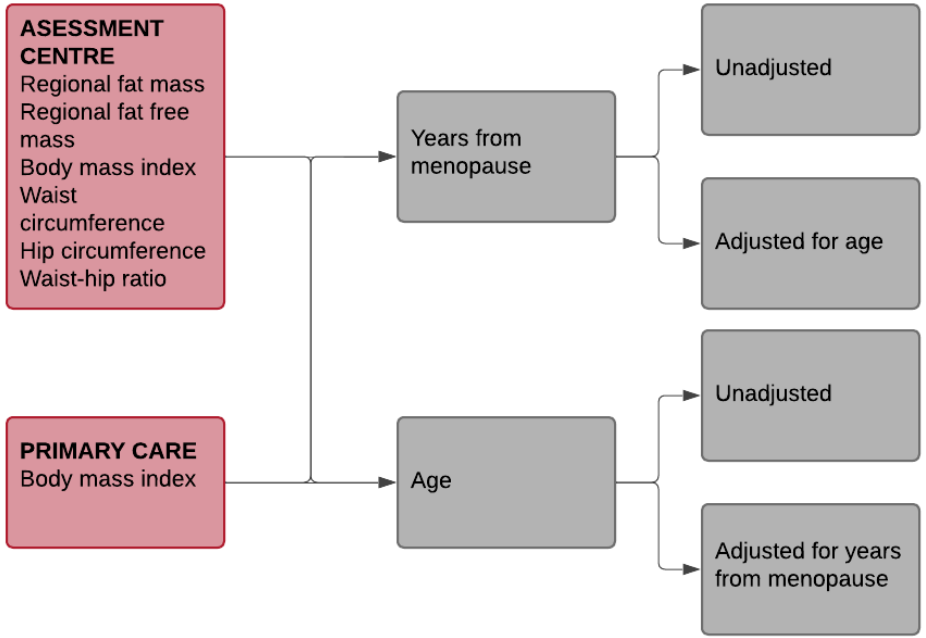
Knot placement is based on quantiles of data

- E.g. 3 knots (= 4 splines) means data is split into quartiles

Models with lowest BIC selected

Adiposity measures in UK Biobank





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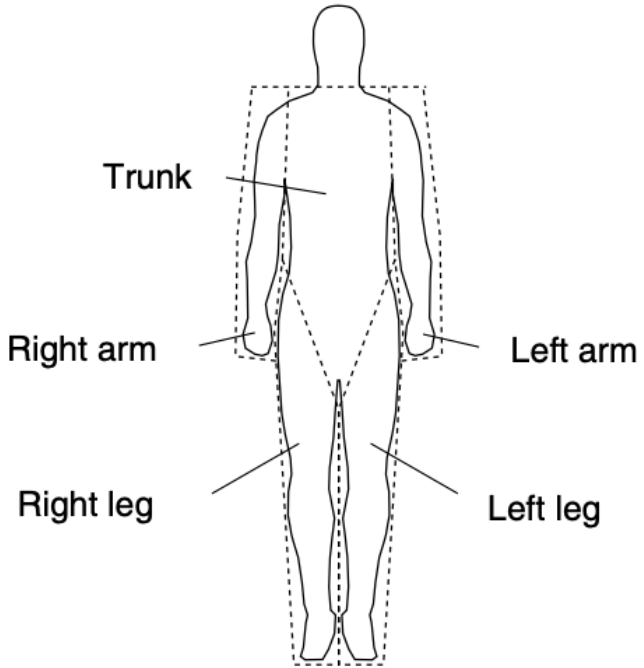

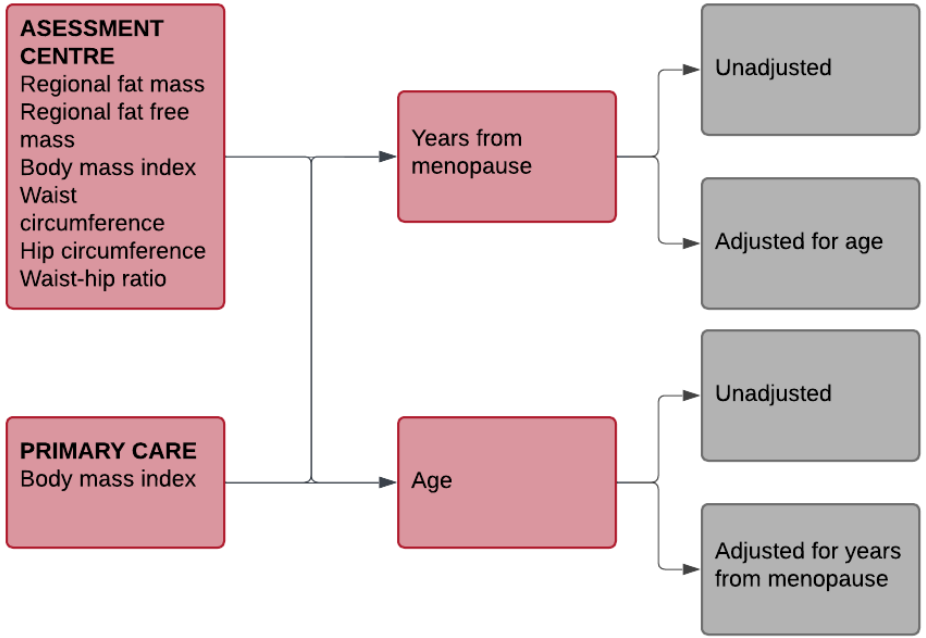

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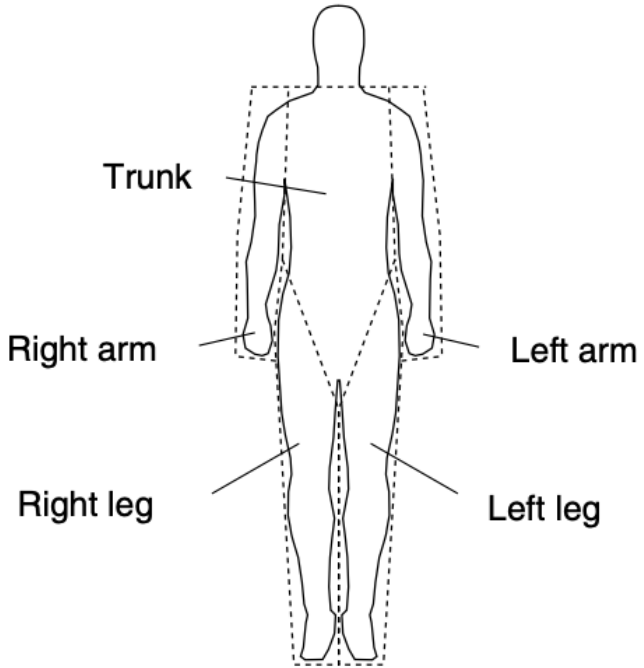

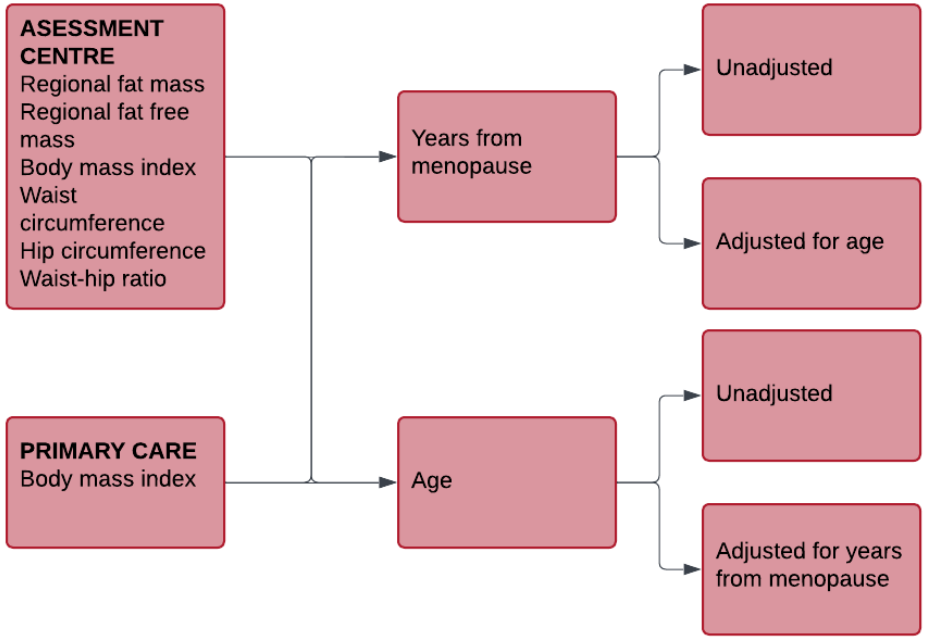

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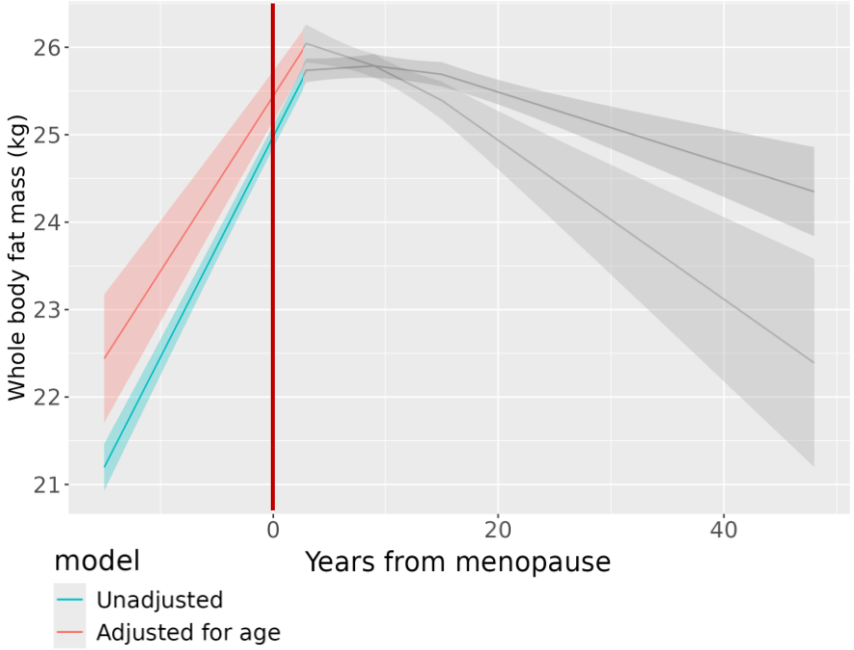
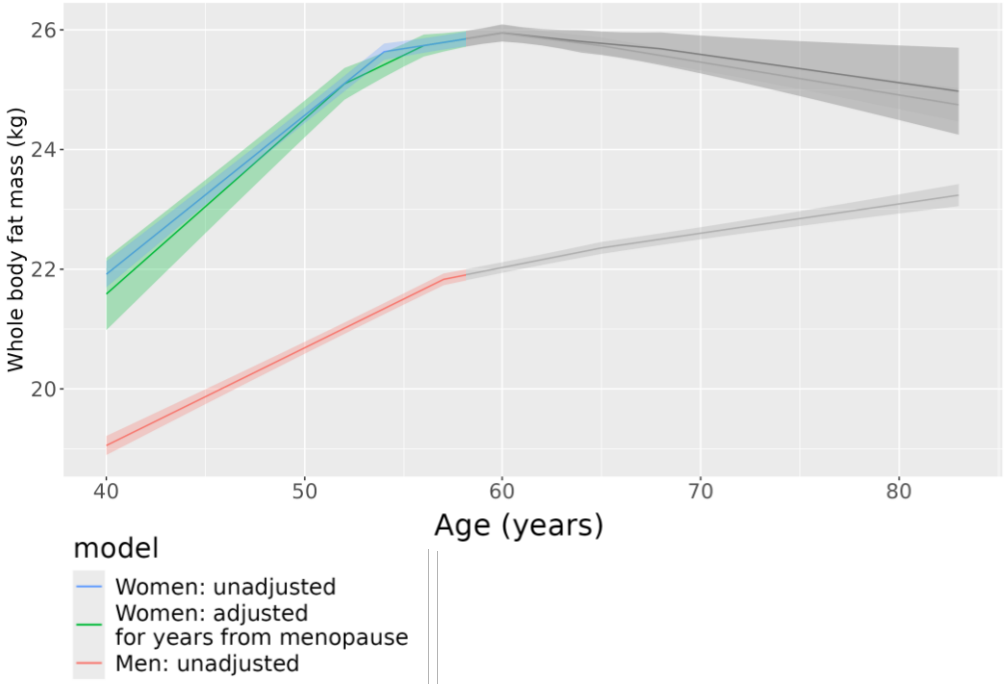
Adiposity increases with age up to 2 years postmenopause

Whole body fat mass





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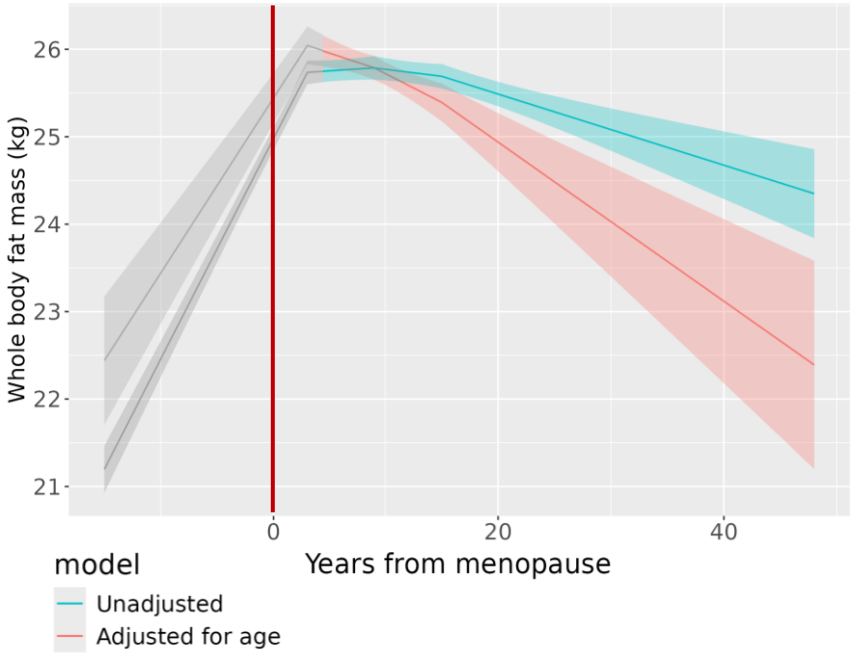
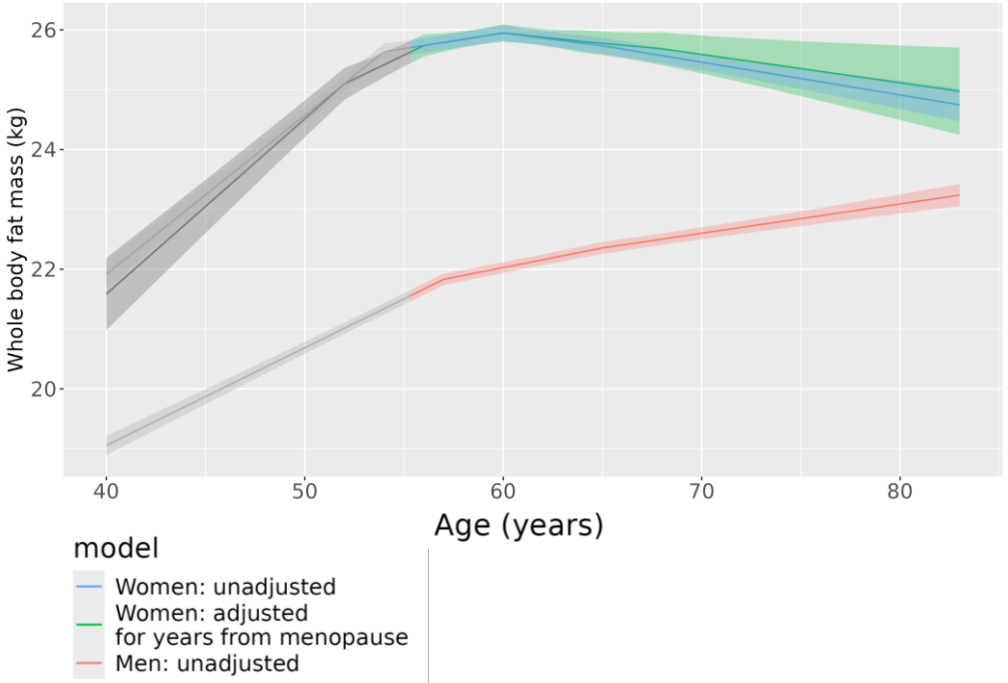
Adiposity decreases after menopause

Whole body fat mass





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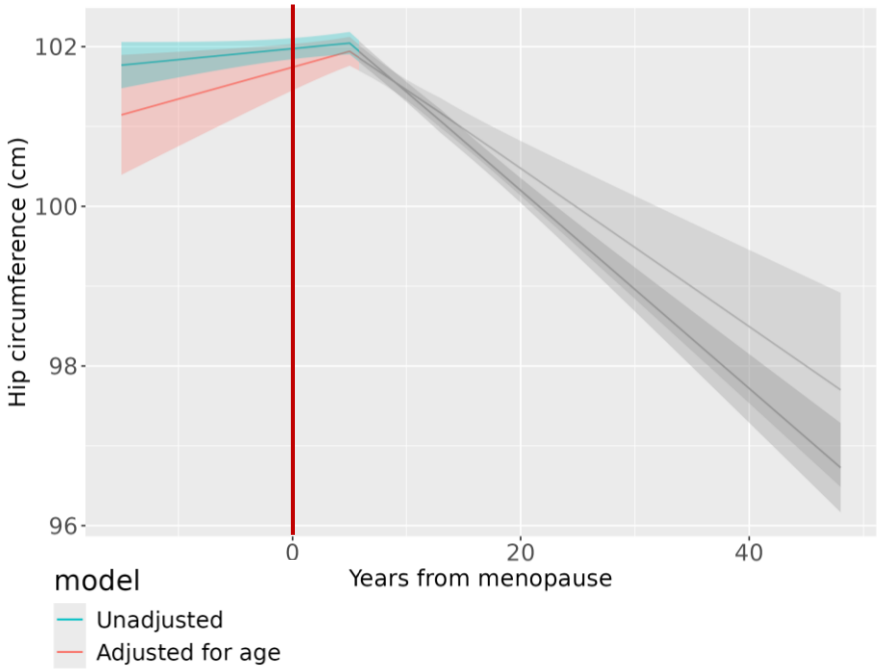
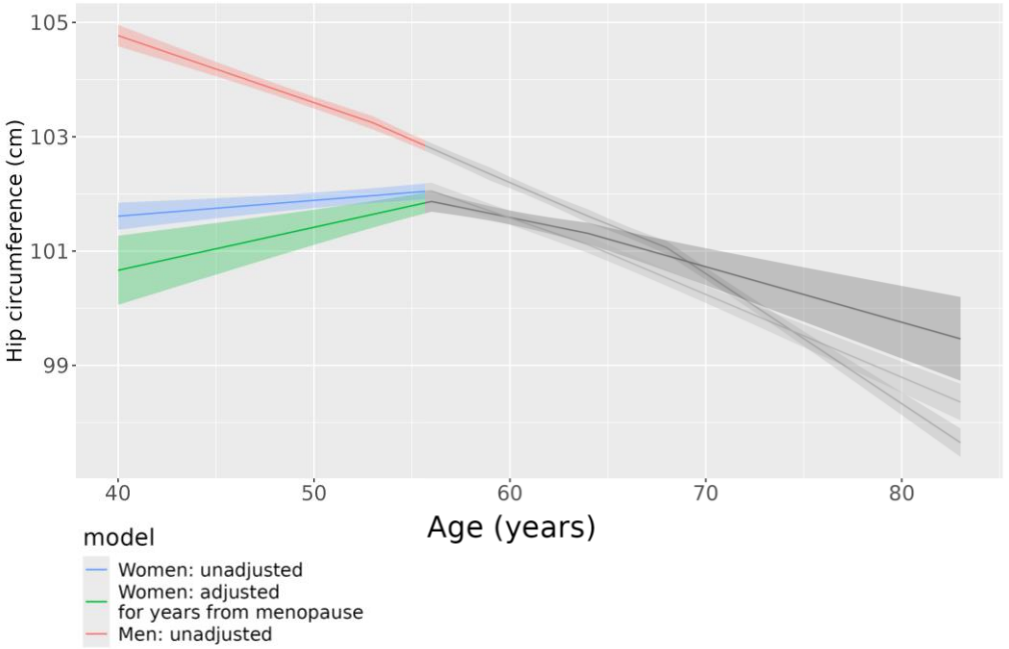
Fat distribution changes after menopause

Hip circumference





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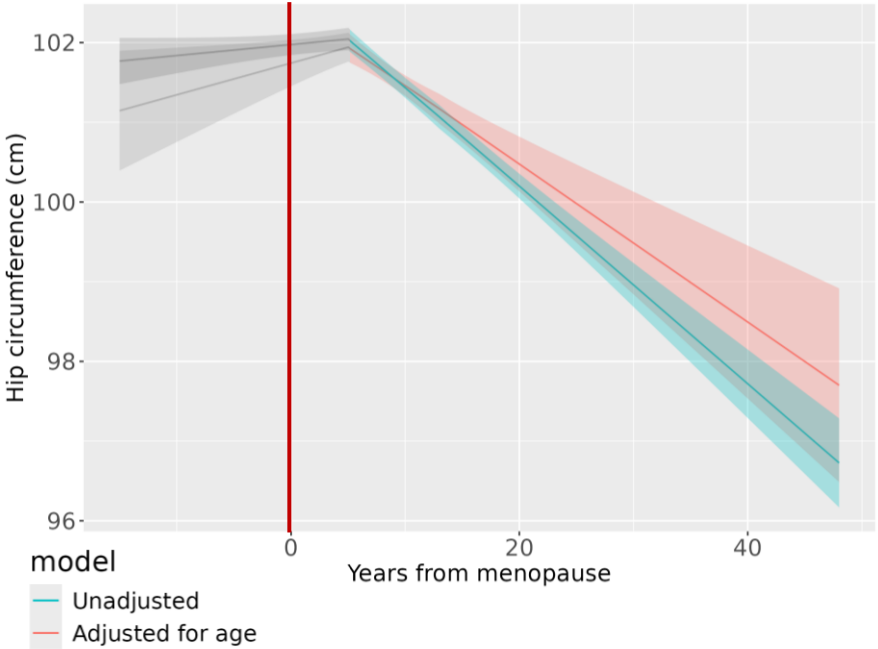

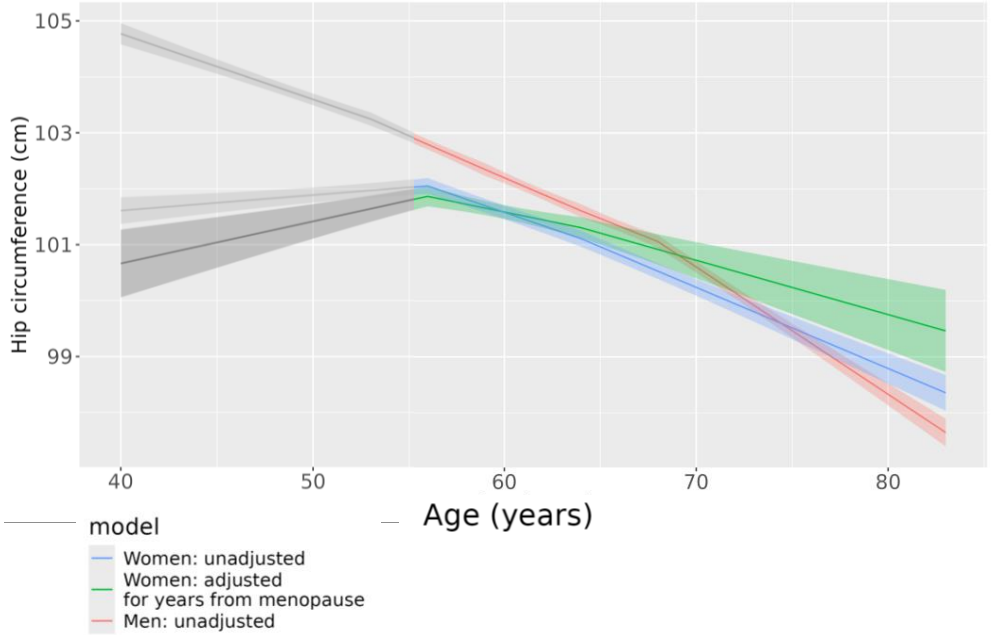

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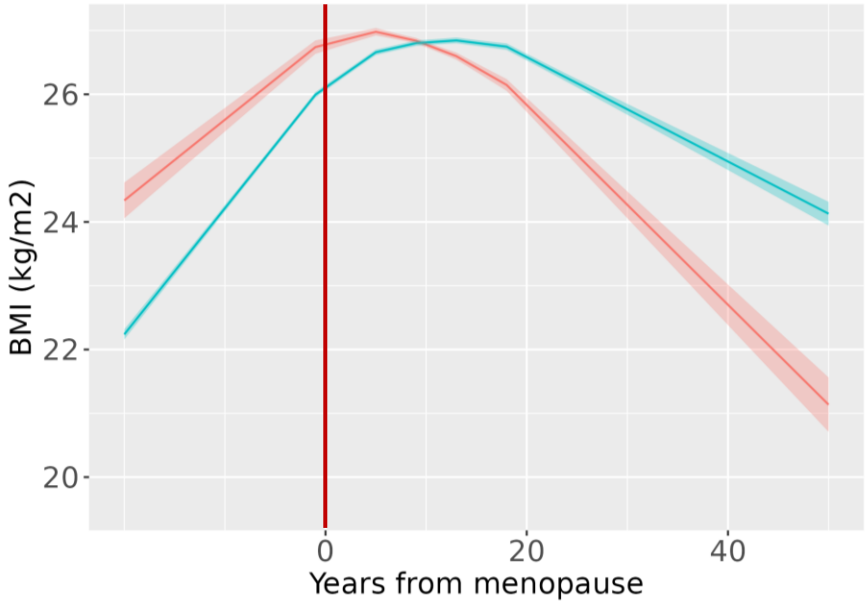
Primary care data reflects assessment centre

BMI- assessment visit

BMI- primary care



model

Unadjusted

Adjusted for age

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Conclusions

- Sample size over 20-fold larger than previous studies.
- More measures investigated.
- Consideration of age and years from menopause separately.
- Comparison with males.

- Age main driver of premenopausal adiposity increase.
- Menopausal transition does not affect adiposity increase.
- Post-menopause leads to adiposity decline.
- Change in adiposity distribution also affected by menopause.

Acknowledgements

- Prof Anna Murray
- Dr Kate Ruth
- Dr Rebecca Richmond
- Prof Sarah Lewis
- Prof Andy Wood

- UK Biobank
  - https://www.ukbiobank.ac.uk
- Cancer Research UK
  - https://www.cancerresearchuk.org

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