Air pollution from pregnancy to 18 years and cardiovascular health in young adulthood: findings from a UK birth cohort

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Background

- Particulate matter is the leading risk factor to the global burden of disease
- A growing body of evidence has shown that exposure to air pollution is associated with cardiovascular disease (CVD); fewer studies in younger ages
- Little is known about cardiovascular risk associated with lifetime exposure to air pollution
- Aim to assess the association between exposure to air pollution from pregnancy to 18 years and eight measures of cardiovascular health in young adults
  - Explore sex differences
  - Explore potential sensitive periods

Methods

- Data from the Avon Longitudinal Study of Parents and Children (ALSPAC)
- Air pollution from pregnancy (in utero) to 18 years:
  - fine particulate matter ($PM_{2.5}$)
  - black carbon (BC)
  - nitrogen dioxide (NO_2)

  Exposures estimated in the ELAPSE project with land use regression models for 2010
- Cardiometabolic markers at 18 years:
  - central (cSBP) and peripheral systolic blood pressure (pSBP)
  - central (cDBP) and peripheral diastolic blood pressure (pDBP)
  - heart rate
  - carotid intima-media thickness (CIMT)
  - pulse wave velocity (PWV)
  - augmentation index (AIx)

Methods

- Lifetime exposure to air pollution assessed by:
  - Average yearly mean estimates – changes per interquartile range (IQR)
  - Latent class growth analysis
    - Restricted cubic splines; models with 2 to 6 classes
- Linear regression models adjusted for maternal age, education, ethnicity and index of multiple deprivation; age and sex

Results

$PM_{2.5}$

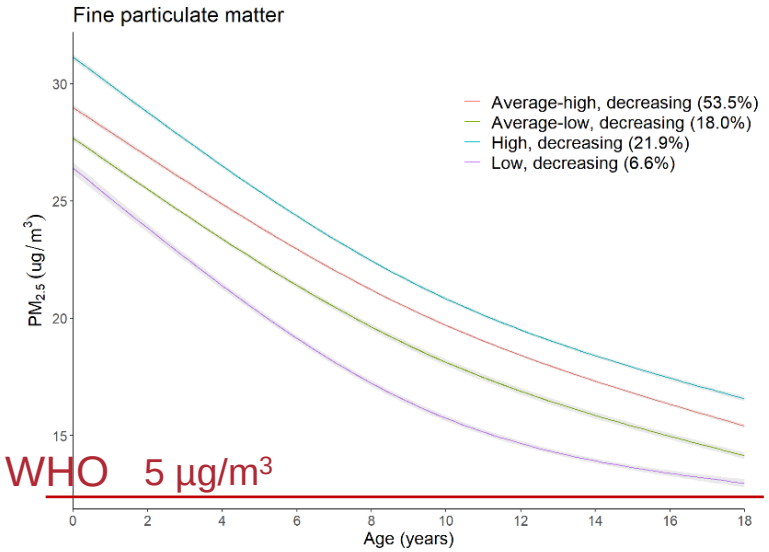
21.1 µg/m^3 (IQR 1.63)

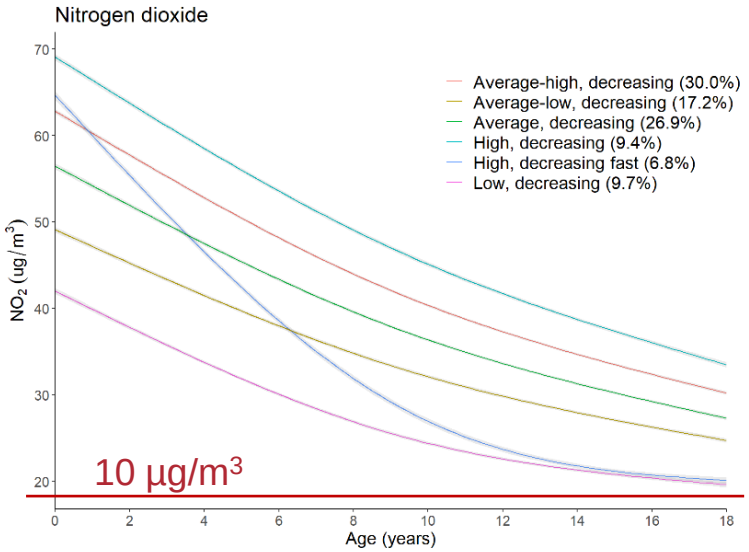
NO_2

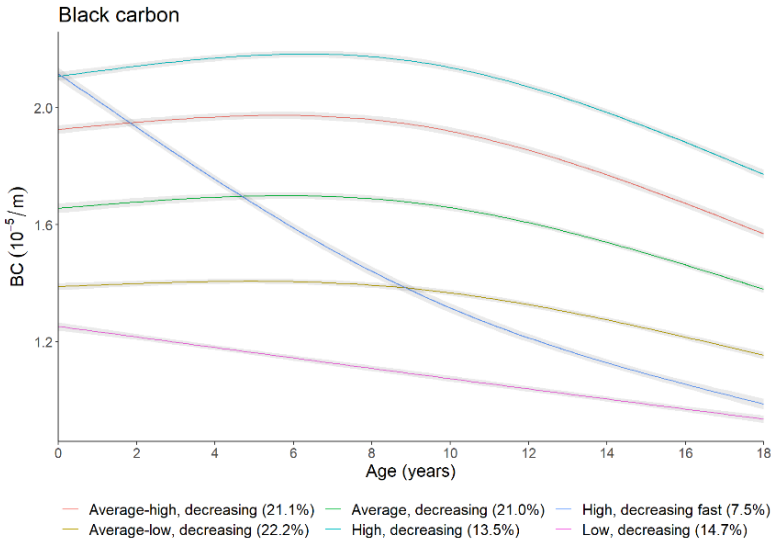
40.1 µg/m^3 (IQR 7.96)

BC

1.57 x 10^{-5}/m (IQR 0.55)







CHILDREN OF THE 90S

N = 3,767

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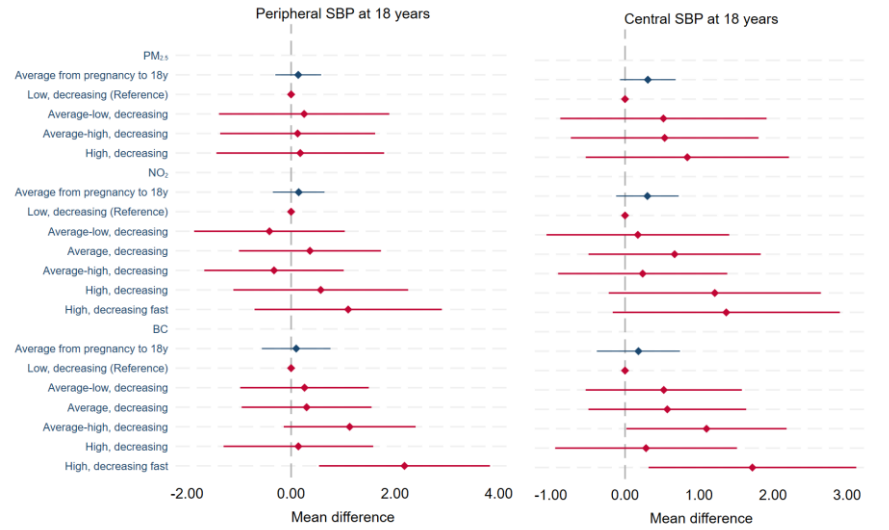
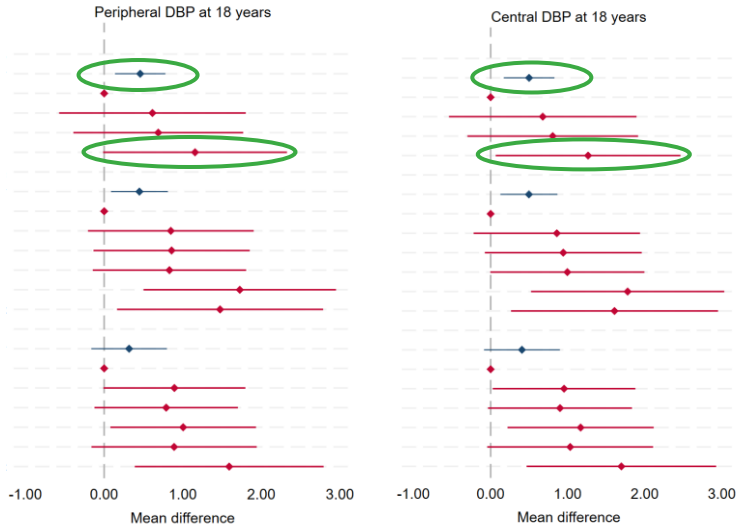
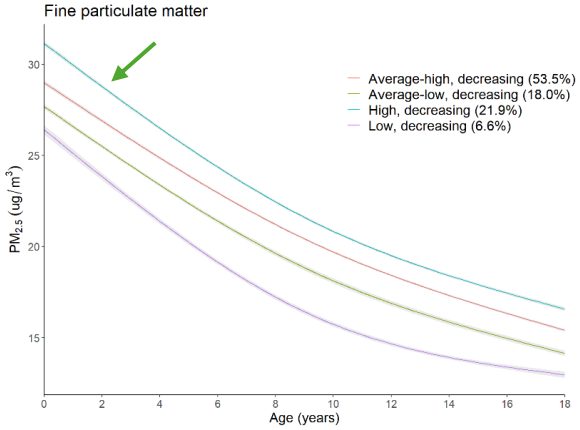
Systolic blood pressure (SBP)



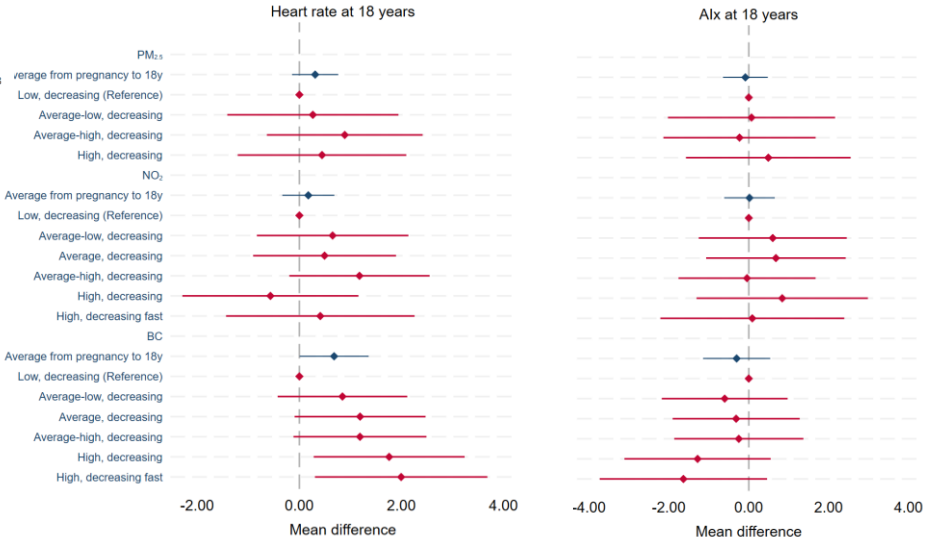
Diastolic blood pressure (DBP)



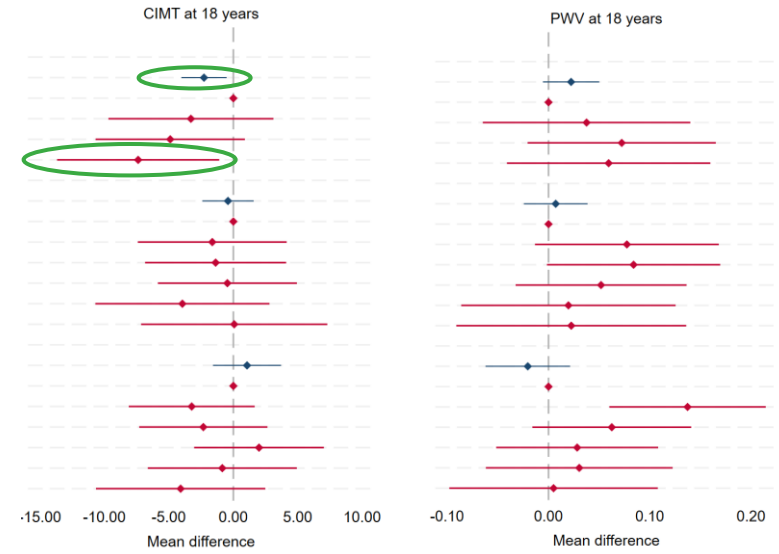
Fine particulate matter



Heart rate and augmentation index (AIx)



Carotid intima-media thickness (CIMT) and Pulse wave velocity (PWV)



◆ Average ◆ Classes

Adjusted for area deprivation, maternal education, maternal age, maternal ethnicity, age, and sex

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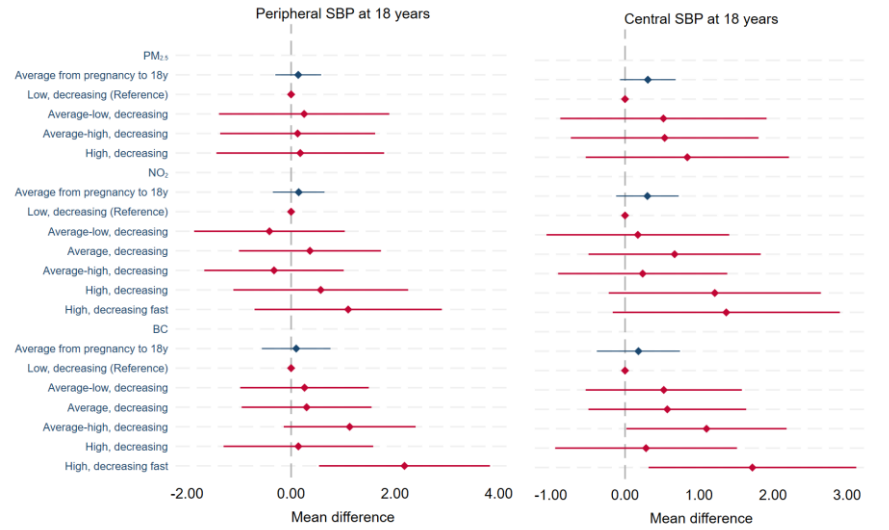

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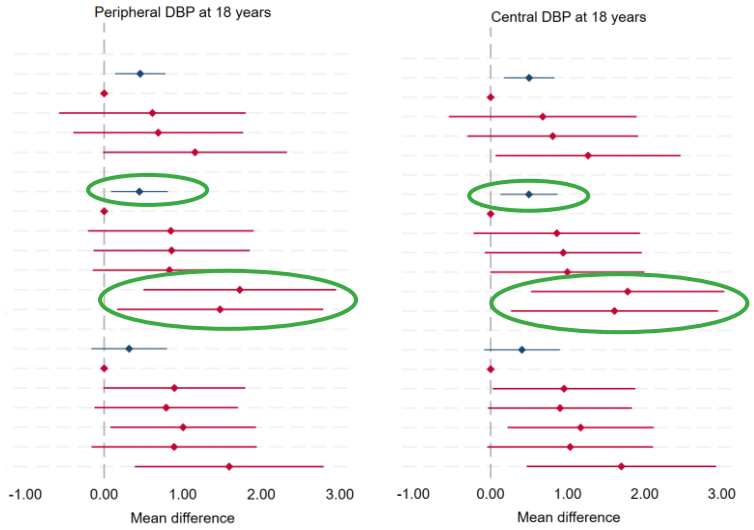
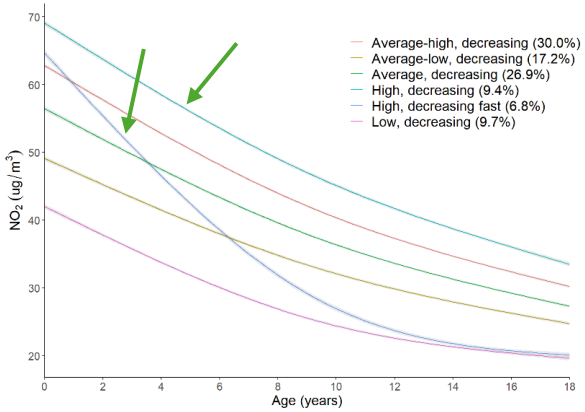


Nitrogen dioxide



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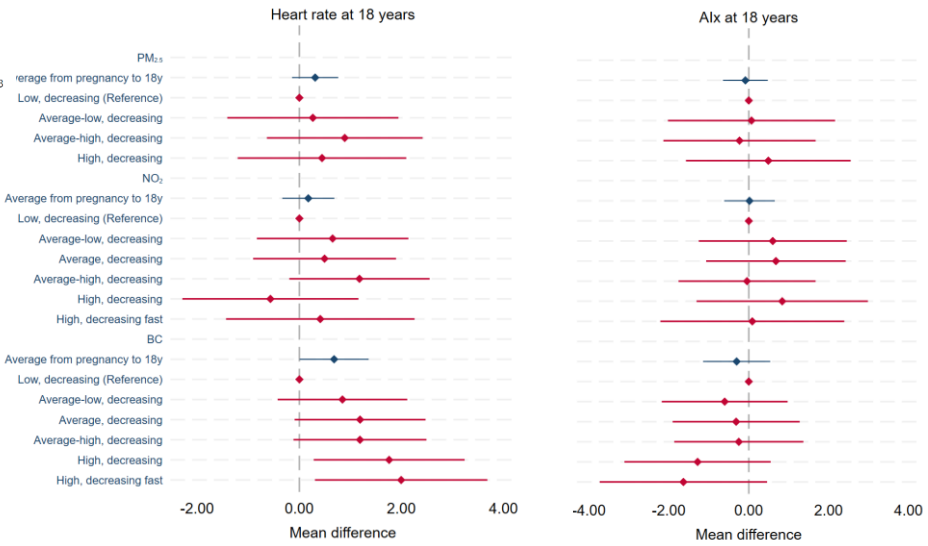

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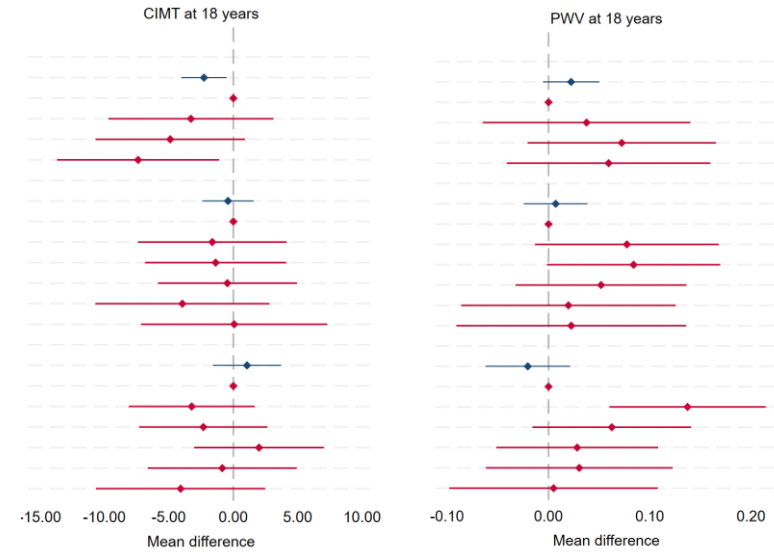

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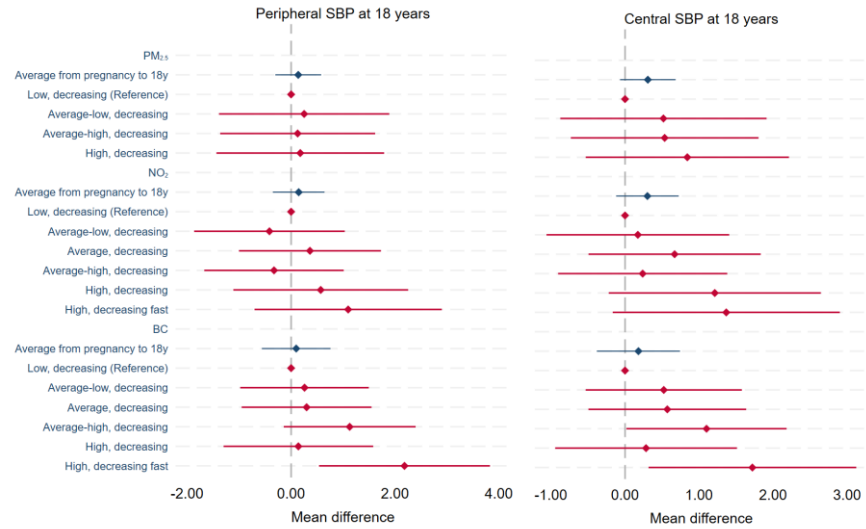

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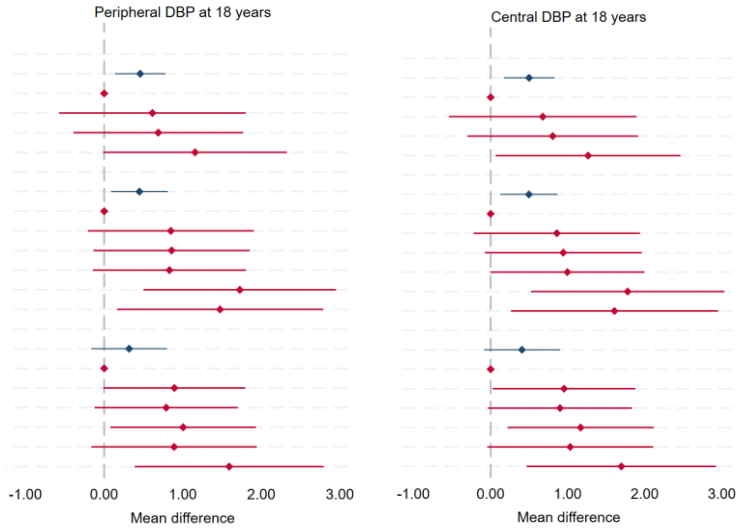

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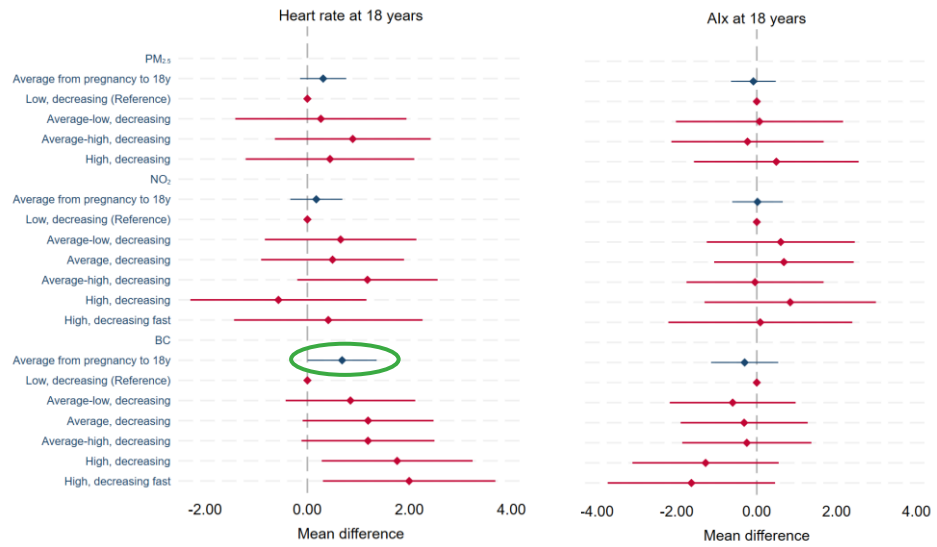

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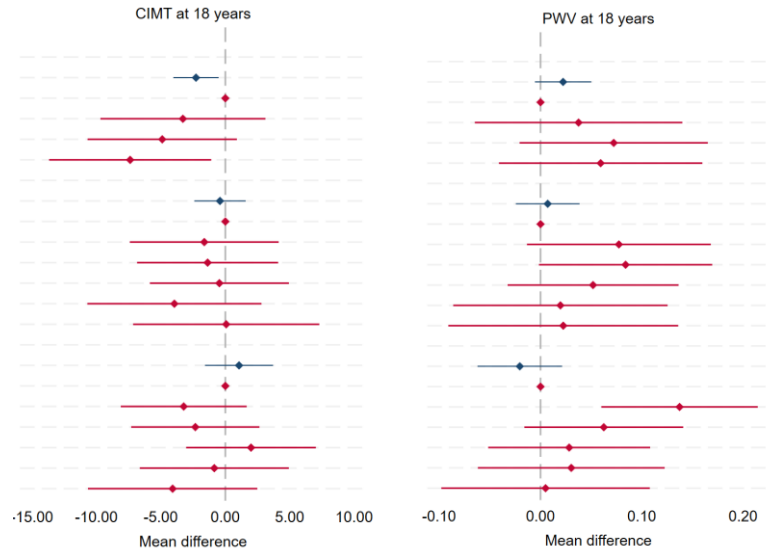

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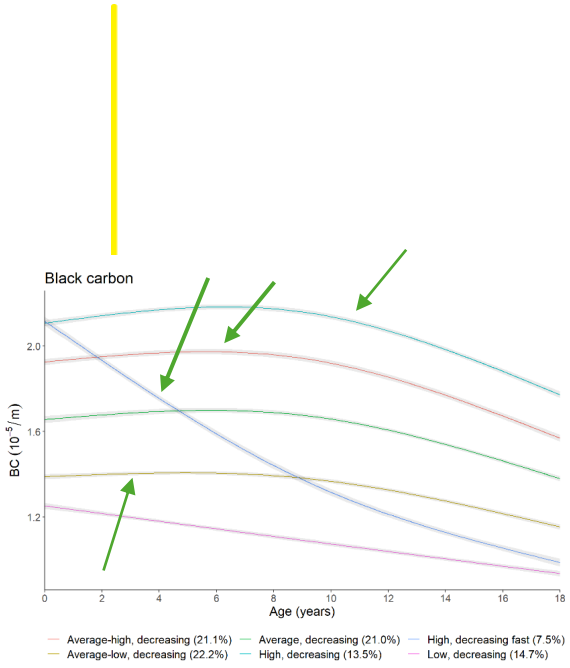

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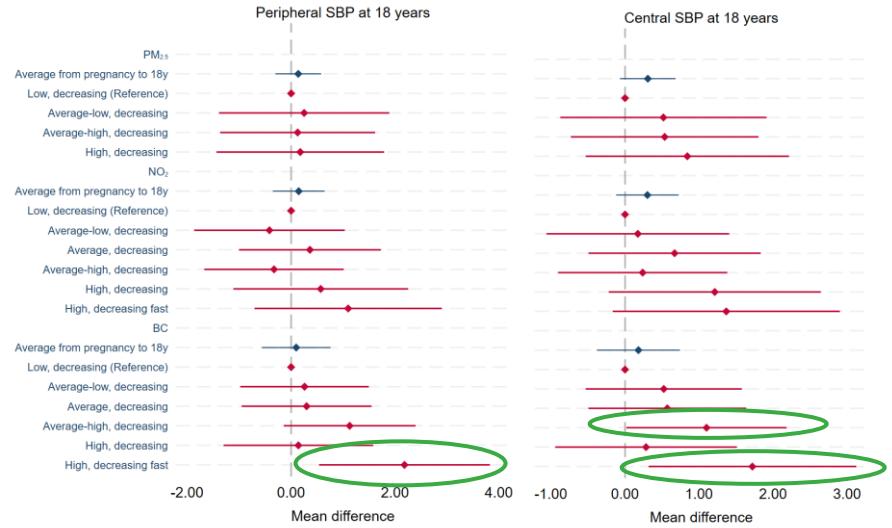

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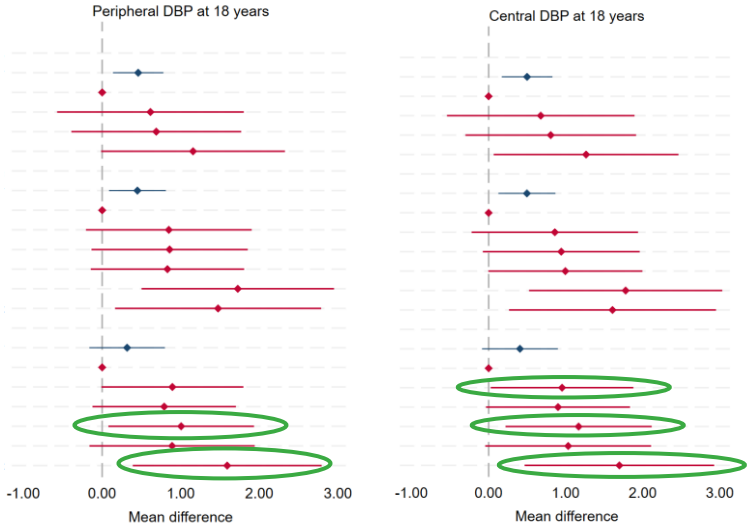

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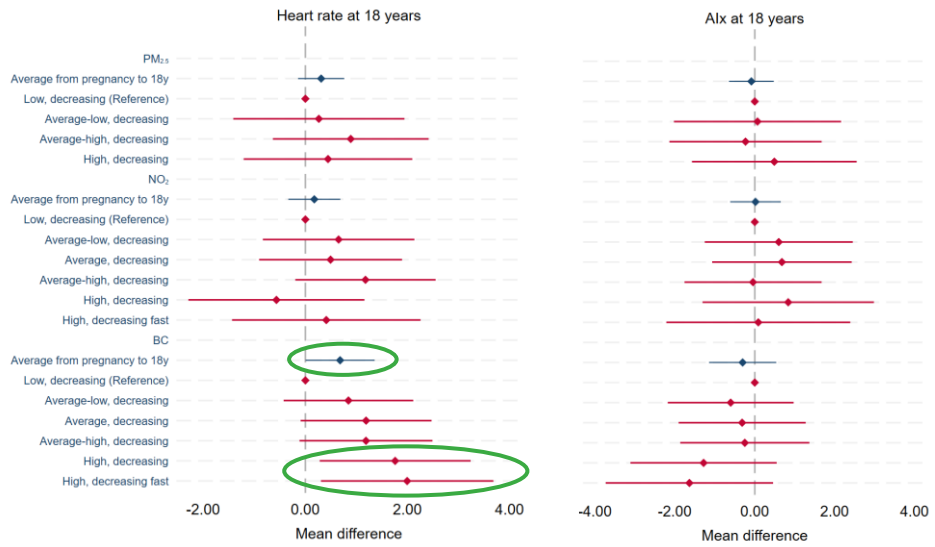

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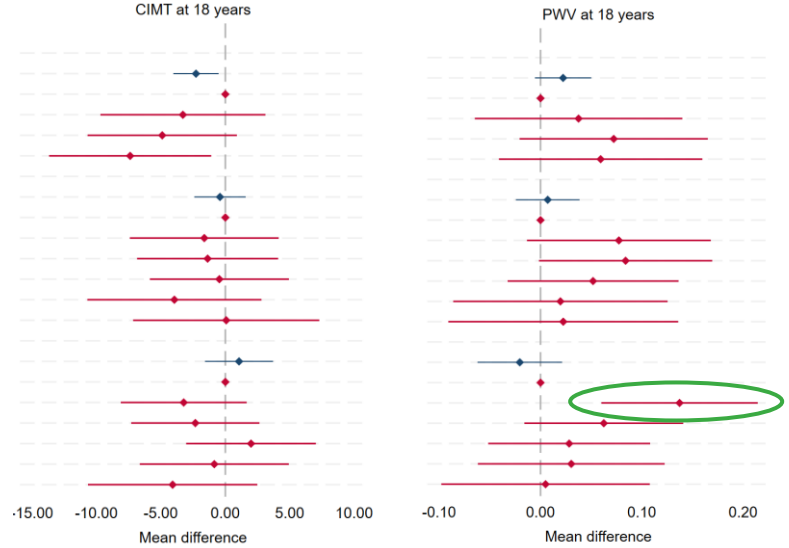

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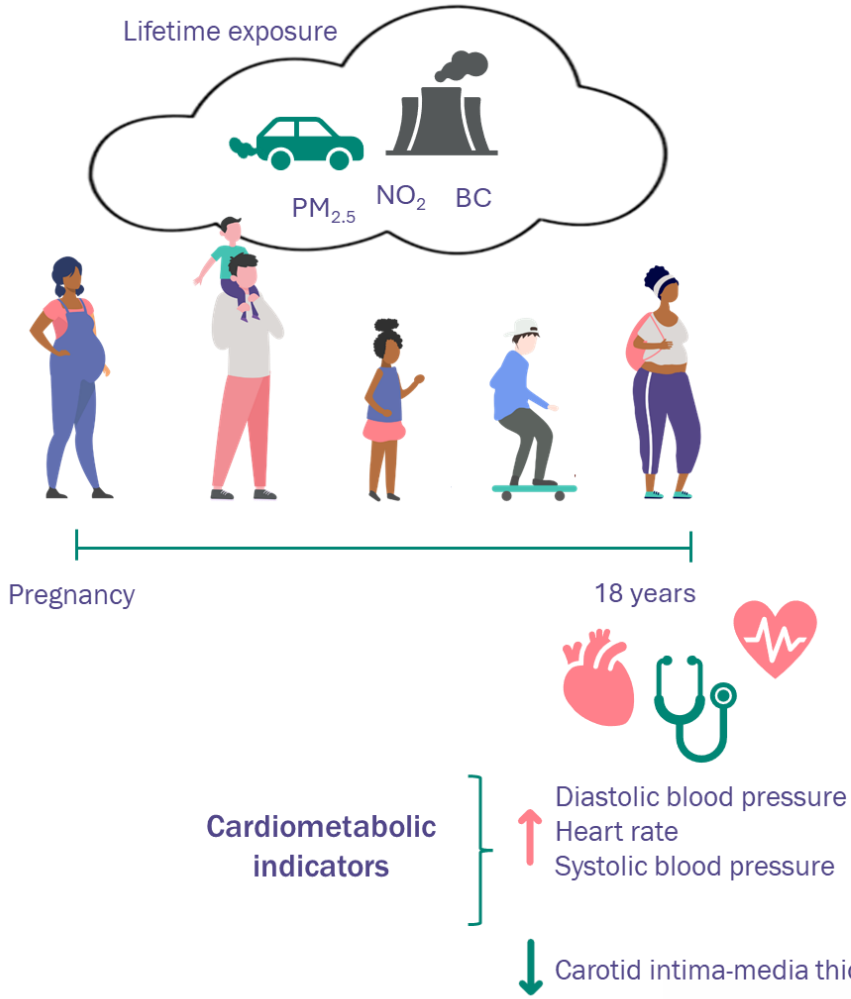
Summary and conclusions



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Thank you

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University of BRISTOL
CHILDREN OF THE 90S

MEMBER OF THE European Human Exposome NETWORK

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