

Supplement B. Summary of results

The Maternal Line

Supplementary Table B1. The maternal grandparents (G0)

| Variable considered | a | b | c | d | e |
|-----------------------------|------|------|------|------|----|
| MGM's year of birth | **** | - | - | **** | ** |
| MGM's education level | **** | **** | **** | ** | * |
| MGM's age at mother's birth | *** | - | - | ** | |
| MGM's social class | **** | - | - | ** | |
| MGF's year of birth | **** | **** | **** | **** | ** |
| MGF's education level | **** | - | - | ** | ** |
| MGF ever smoked | *** | - | - | ** | |
| MGF's age at mother's birth | **** | - | - | *** | |
| MGF's social class | **** | - | - | *** | * |

Variables that are associated with mean fat mass in the following categories: (a) all unadjusted; (b) all adjusted in subgroup model; (c) adjusted in final model; (d) female grandchildren (G2) unadjusted; (e) male grandchildren (G2) unadjusted. *P<0.05; **P<0.01; ***P<0.001; ****P<0.0001.

.

Supplementary Table B2. The mother (G1) in early childhood

| Variable considered | a | b | c | d | e |
|--|------|------|------|------|-----|
| M's year of birth | **** | **** | **** | **** | *** |
| M was born in Avon | **** | ** | - | ** | ** |
| M was born post-term | ** | ** | * | | |
| M was breast fed | **** | ** | - | * | * |
| M was badly scalded aged 6-11 | * | * | ** | | * |
| M had a head injury aged 6-11 | * | - | - | | |
| M nearly drowned aged 6-11 | * | ** | * | | |
| M had a serious accident 6-11 | * | - | - | | * |
| M lived with a stepfather 6-11 | - | - | - | * | |
| M's parents divorced/separated Aged 6-11 | * | - | | | |

Variables that are associated with mean fat mass in the following categories: (a) all unadjusted; (b) all adjusted in subgroup model; (c) adjusted in final model; (d) female grandchildren (G2) unadjusted; (e) male grandchildren (G2) unadjusted. *P<0.05; **P<0.01; ***P<0.001; ****P<0.0001.

Supplementary Table B3. The mother (G1) in mid-childhood

| Variables considered | a | b | c | d | e |
|--|------|------|----|------|----|
| MGM in household when M 6-11 | ** | ** | - | *** | |
| MGF in household when M 6-11 | **** | - | - | **** | |
| Step-father in household when M 6-11 | * | * | - | * | |
| M's grandfather in household when M 6-11 | * | ** | ** | ** | |
| M had history of daytime wetting 6-11 | * | ** | - | * | |
| M fractured arm aged 6-11 | ** | ** | - | * | |
| M's periods started before age 12 | **** | **** | ** | **** | ** |

Variables that are associated with mean fat mass in the following categories: (a) all unadjusted; (b) all adjusted in subgroup model; (c) adjusted in final model; (d) female grandchildren (G2) unadjusted; (e) male grandchildren (G2) unadjusted. *P<0.05; **P<0.01; ***P<0.001; ****P<0.0001.

Supplementary Table B4. The mother (G1) in late-childhood

| Variables considered | a | b | c | d | e |
|---|------|------|----|------|------|
| MGM in household when M 12-15 | ** | - | - | ** | ** |
| MGF in household when M 12-15 | * | - | - | | |
| M had a head injury when M 12-15 | * | - | - | | |
| M began smoking aged 12-15 | **** | **** | ** | **** | **** |
| M admitted to hospital aged 12-15 | * | - | - | | |
| M's parent had an accident when M 12-15 | * | * | * | | |
| M became pregnant aged 12-15 | * | - | - | | |
| M suspended from school aged 12-15 | * | - | - | | |

Variables that are associated with mean fat mass in the following categories: (a) all unadjusted; (b) all adjusted in subgroup model; (c) adjusted in final model; (d) female grandchildren (G2) unadjusted; (e) male grandchildren (G2) unadjusted. *P<0.05; **P<0.01; ***P<0.001; ****P<0.0001.

Supplementary Table B5. The mother (G1) in other aspects of childhood (<17)

| Variables considered | a | b | c | d | e |
|--------------------------------|----|----|---|----|---|
| M attended <3 schools | * | * | - | | * |
| M attended a special school | * | * | - | ** | |
| M was in care | ** | - | - | ** | |
| M lived with her grandparents | ** | ** | - | * | * |
| M stayed in a children's home | * | - | - | * | |
| M's mother was over-protective | * | - | - | | |

Variables that are associated with mean fat mass in the following categories: (a) all unadjusted; (b) all adjusted in subgroup model; (c) adjusted in final model; (d) female grandchildren (G2) unadjusted; (e) male grandchildren (G2) unadjusted. *P<0.05; **P<0.01; ***P<0.001; ****P<0.0001.

The Paternal Line

Supplementary Table B6. The paternal grandparents (G0)

| Variable considered | a | b | c | d | e |
|-----------------------------|------|------|-----|------|-----|
| PGM's year of birth | ** | - | - | ** | |
| PGM's education level | ** | - | - | *** | |
| PGM's age at father's birth | * | - | - | ** | |
| PGM's social class | - | - | - | - | |
| PGF's year of birth | * | **** | - | | |
| PGF's education level | * | - | - | ** | |
| PGF ever smoked | * | - | - | | * |
| PGF's age at father's birth | - | - | - | | |
| PGF's social class | **** | **** | *** | **** | * |
| PGM smoked in pregnancy | * | (*) | *** | DNA | DNA |
| X sex of G2 | | | | | |

Variables that are associated with mean fat mass in the following categories: (a) all unadjusted; (b) all adjusted in subgroup model; (c) adjusted in final model; (d) female grandchildren (G2) unadjusted; (e) male grandchildren (G2) unadjusted. DNA = Does not apply. *P<0.05; **P<0.01; ***P<0.001; ****P<0.0001.

Supplementary Table B7. The father (G1) in early/mid childhood

| Variables considered | a | b | c | d | e |
|---|-----|------|------|----|----|
| F born in Avon | ** | ** | - | | |
| F nearly drowned when 6-11 | * | * | - | | |
| F had head injury aged 6-11 | * | ** | ** | | |
| F had step-father at home 6-11 | * | | - | ** | |
| F's father died when he was 6-11 | (*) | | - | * | |
| F started smoking regularly <11 | * | **** | **** | | * |
| F often absent from school <11 | * | | - | | |
| F often absent from school due to illness <11 | * | | - | | ** |
| F often truant from school aged <11 | ** | * | - | * | |

Variables that are associated with mean fat mass in the following categories: (a) all unadjusted; (b) all adjusted in subgroup model; (c) adjusted in final model; (d) female grandchildren (G2) unadjusted; (e) male grandchildren (G2) unadjusted. (*)P<0.10; *P<0.05; **P<0.01; ***P<0.001; ****P<0.0001.

Supplementary Table B8. The father (G1) in other childhood variables

| Variables considered | a | b | c | d | e |
|--|------|------|-----|------|-----|
| PGF in household when F aged 12-15 | ** | - | - | **** | |
| F's stepfather in household when F 12-15 | * | * | - | * | |
| F started smoking when aged 12-15 | ** | - | - | * | |
| F often absent from school when aged 11+ | **** | **** | *** | ** | * |
| F absent from school because of illness 11+ | ** | - | - | | *** |
| F truant from school aged 11+ | ** | - | - | * | |
| Degree to which F disliked school | ** | - | - | *** | |
| Degree to which F did not find school valuable | * | - | - | ** | |
| F lived with foster parents < 17 | * | - | - | | * |
| F spent time in a children's home <17 | ** | ** | - | | * |
| F's mother's degree of instability | * | * | - | | * |

Variables that are associated with mean fat mass in the following categories: (a) all unadjusted; (b) all adjusted in subgroup model; (c) adjusted in final model; (d) female grandchildren (G2) unadjusted; (e) male grandchildren (G2) unadjusted. *P<0.05; **P<0.01; ***P<0.001; ****P<0.0001.