### ESM Table 1. Summary statistics for the maternal and paternal datasets.

Data are n (%) or mean ± SD. The Missing column next to each dataset refers to the number missing records for each measurement. The Missing value for the ages at type 2 diabetes diagnosis and death represent the percentage of individuals missing date of birth. For the HBSIMD, lower indexes represent higher deprivation levels. T2D, type 2 diabetes.

|                      | Maternal Dataset (n=12825) | Missing | Paternal Dataset (n=7386) | Missing | Welch p value |
|----------------------|-----------------------------|---------|---------------------------|---------|---------------|
| **Offspring BW (g)** | 3376.91 ± 411.28            | 15 (0.12%) | 3389.36 ± 410.93          | 8 (0.11%) | 0.026         |
| **Offspring PW (g)** | 651.52 ± 118.26             | 7026 (54.78%) | 653.83 ± 120.04          | 3526 (47.73%) | 0.342         |
| **Offspring GA (weeks)** | 39.89 ± 1.28               | 318 (2.48%) | 39.89 ± 1.27              | 188 (2.55%) | 0.901         |
| **Offspring sex**    | F: 5570 (43.43%) M: 7255 (56.57%) | 0% | F: 3007 (40.71%) M: 4379 (59.29%) | 0% | <0.001         |
| **T2D**              | 1965 (15.32%)               | -       | 1266 (17.14%)             | -       | -             |
| **Age at T2D diagnosis (years)** | 69.88 ± 8.66               | 209 (1.63%) | 68.57 ± 8.55              | 101 (1.37%) | <0.001         |
| **Cumulative Deceased** | 7884 (61.47%)              | -       | 5503 (74.50%)             | -       | -             |
| **Age at Death (years)** | 77.36 ± 9.91               | 209 (1.63%) | 76.14 ± 9.31              | 101 (1.37%) | <0.001         |
| **HBSIMD**           | 1: 4120 (33.49%) 2: 2719 (22.10%) 3: 1532 (12.45%) 4: 1867 (15.18%) 5: 2063 (16.77%) | 524 (4.08%) | 1: 2233 (31.16%) 2: 1519 (21.19%) 3: 901 (12.57%) 4: 1104 (15.41%) 5: 1409 (19.66%) | 220 (2.98%) | <0.001         |
ESM Table 2. Survival analysis for maternal type 2 diabetes and death including all term births. Analyses performed using wider BW (<900g or >6.5kg) and PW (<200g or >1,500g) inclusion ranges. The analysis of type 2 diabetes risk accounted for the competing risk of death. For the HBSIMD, lower indexes represent increased deprivation levels. T2D, type 2 diabetes.

|                    | Fine-Gray survival analysis for T2D diagnosis risk | Cox survival analysis for risk of death |
|--------------------|-----------------------------------------------------|----------------------------------------|
|                    | SHR       | 95% CI (α=0.05) | SE      | p value | SHR       | 95% CI (α=0.05) | SE      | p value |
| Offspring BW       | 1.062     | (1.014, 1.112)  | 0.024   | 0.011   | 0.822     | (0.750, 0.901)  | 0.047   | <0.001  |
| Offspring GA       | 0.860     | (0.775, 0.954)  | 0.053   | 0.004   | 0.931     | (0.868, 0.998)  | 0.036   | 0.045   |
| Age in 1986        | 1.073     | (1.040, 1.107)  | 0.016   | <0.001  | 1.099     | (1.086, 1.111)  | 0.006   | <0.001  |
| HBSIMD             | 0.940     | (0.912, 0.968)  | 0.015   | <0.001  | 0.721     | (0.671, 0.775)  | 0.036   | <0.001  |
| Offspring BW × log(t) | -         | -             | -       | -       | 1.030     | (0.998, 1.062)  | 0.016   | 0.065   |
| Offspring GA × log(t) | 1.049     | (1.012, 1.088)  | 0.019   | 0.010   | 1.025     | (1.001, 1.050)  | 0.012   | 0.038   |
| Age in 1986 × log(t) | 0.969     | (0.958, 0.980)  | 0.006   | <0.001  | 1.005     | (1.001, 1.009)  | 0.002   | 0.012   |
| HBSIMD × log(t)    | -         | -             | -       | -       | 1.062     | (1.037, 1.087)  | 0.012   | <0.001  |

|                    | Analysis including only BW                  |                               |
|--------------------|---------------------------------------------|--------------------------------|
|                    | SHR       | 95% CI (α=0.05) | SE      | p value | SHR       | 95% CI (α=0.05) | SE      | p value |
| Offspring PW       | 1.051     | (0.985, 1.121)  | 0.033   | 0.140   | 0.989     | (0.952, 1.026)  | 0.019   | 0.549   |
| Offspring GA       | 0.993     | (0.941, 1.047)  | 0.027   | 0.790   | 0.963     | (0.935, 0.993)  | 0.015   | 0.014   |
| Age in 1986        | 1.105     | (1.061, 1.151)  | 0.021   | <0.001  | 1.113     | (1.106, 1.120)  | 0.003   | <0.001  |
| HBSIMD             | 0.923     | (0.883, 0.965)  | 0.023   | <0.001  | 0.846     | (0.824, 0.869)  | 0.013   | <0.001  |
| Age 1986 × log(t)  | 0.965     | (0.951, 0.978)  | 0.007   | <0.001  | -         | -             | -       | -       |

|                    | Analysis including only PW                  |                               |
|--------------------|---------------------------------------------|--------------------------------|
|                    | SHR       | 95% CI (α=0.05) | SE      | p value | SHR       | 95% CI (α=0.05) | SE      | p value |
| Offspring BW       | 1.054     | (0.968, 1.148)  | 0.043   | 0.023   | 0.832     | (0.792, 0.874)  | 0.025   | <0.001  |
| Offspring PW       | 1.023     | (0.945, 1.106)  | 0.040   | 0.580   | 1.085     | (1.037, 1.134)  | 0.023   | <0.001  |
| Offspring GA       | 0.985     | (0.931, 1.041)  | 0.028   | 0.580   | 0.991     | (0.961, 1.022)  | 0.016   | 0.564   |
| Age in 1986        | 1.105     | (1.061, 1.151)  | 0.021   | <0.001  | 1.115     | (1.108, 1.121)  | 0.003   | <0.001  |
| HBSIMD             | 0.921     | (0.881, 0.963)  | 0.023   | <0.001  | 0.853     | (0.831, 0.876)  | 0.013   | <0.001  |
| Age in 1986 × log(t) | 0.964     | (0.951, 0.978)  | 0.007   | <0.001  | -         | -             | -       | -       |

|                    | Analysis including BW and PW               |                               |
|--------------------|--------------------------------------------|--------------------------------|
|                    | SHR       | 95% CI (α=0.05) | SE      | p value | SHR       | 95% CI (α=0.05) | SE      | p value |
| Offspring BW       | 1.054     | (0.968, 1.148)  | 0.043   | 0.023   | 0.832     | (0.792, 0.874)  | 0.025   | <0.001  |
| Offspring PW       | 1.023     | (0.945, 1.106)  | 0.040   | 0.580   | 1.085     | (1.037, 1.134)  | 0.023   | <0.001  |
| Offspring GA       | 0.985     | (0.931, 1.041)  | 0.028   | 0.580   | 0.991     | (0.961, 1.022)  | 0.016   | 0.564   |
| Age in 1986        | 1.105     | (1.061, 1.151)  | 0.021   | <0.001  | 1.115     | (1.108, 1.121)  | 0.003   | <0.001  |
| HBSIMD             | 0.921     | (0.881, 0.963)  | 0.023   | <0.001  | 0.853     | (0.831, 0.876)  | 0.013   | <0.001  |
| Age in 1986 × log(t) | 0.964     | (0.951, 0.978)  | 0.007   | <0.001  | -         | -             | -       | -       |
## Survival Analysis of Walker Fathers (all term births, n=8,002)

### Fine-Gray survival analysis for T2D diagnosis risk

| Offspring BW | SHR  | 95% CI (α=0.05) | SE   | p value |
|--------------|------|-----------------|------|---------|
|              | 0.912| (0.860, 0.968)  | 0.030| 0.002   |
| Offspring GA | 1.037| (0.993, 1.984)  | 0.022| 0.100   |
| Age in 1986  | 1.042| (1.011, 1.075)  | 0.016| 0.009   |
| HBSIMD       | 0.981| (0.946, 1.017)  | 0.018| 0.290   |
| Age in 1986 × log(t) | 0.967| (0.956, 0.979)  | 0.006| <0.001 |
| HBSIMD × log(t) | -   | -               | -   | -       |

### Cox survival analysis for risk of death

| Offspring BW | SHR  | 95% CI (α=0.05) | SE   | p value |
|--------------|------|-----------------|------|---------|
|              | 0.949| (0.922, 0.976)  | 0.014| <0.001 |
| Offspring GA | 1.015| (0.994, 1.037)  | 0.011| 0.159   |
| Age in 1986  | 1.112| (1.108, 1.117)  | 0.002| <0.001 |
| HBSIMD       | 0.716| (0.664, 0.772)  | 0.038| <0.001 |
| Age in 1986 × log(t) | -   | -               | -   | -       |
| HBSIMD × log(t) | 1.073| (1.046, 1.100)  | 0.013| <0.001 |

### Analysis including only BW

| Offspring BW | SHR  | 95% CI (α=0.05) | SE   | p value |
|--------------|------|-----------------|------|---------|
|              | 0.883| (0.817, 0.954)  | 0.040| 0.002   |
| Offspring GA | 1.010| (0.955, 1.069)  | 0.029| 0.730   |
| Age in 1986  | 1.094| (1.062, 1.127)  | 0.015| <0.001 |
| HBSIMD       | 0.970| (0.927, 1.015)  | 0.023| 0.190   |
| Age in 1986 × log(t) | 0.956| (0.946, 0.967)  | 0.006| <0.001 |
| HBSIMD × log(t) | 1.063| (1.018, 1.109)  | 0.022| 0.005  |

### Analysis including only PW

| Offspring BW | SHR  | 95% CI (α=0.05) | SE   | p value |
|--------------|------|-----------------|------|---------|
|              | 0.928| (0.846, 1.019)  | 0.047| 0.120   |
| Offspring GA | 1.024| (0.966, 1.084)  | 0.029| 0.430   |
| Age in 1986  | 1.095| (1.063, 1.128)  | 0.015| <0.001 |
| HBSIMD       | 0.973| (0.929, 1.018)  | 0.023| 0.230   |
| Age in 1986 × log(t) | 0.956| (0.956, 0.967)  | 0.006| <0.001 |
| HBSIMD × log(t) | 1.098| (1.055, 1.143)  | 0.021| <0.001 |

### Analysis including BW and PW

| Offspring BW | SHR  | 95% CI (α=0.05) | SE   | p value |
|--------------|------|-----------------|------|---------|
|              | 0.909| (0.828, 0.998)  | 0.048| 0.045   |
| Offspring PW | 0.928| (0.846, 1.019)  | 0.047| 0.120   |
| Offspring GA | 1.024| (0.966, 1.084)  | 0.029| 0.430   |
| Age in 1986  | 1.095| (1.063, 1.128)  | 0.015| <0.001 |
| HBSIMD       | 0.973| (0.929, 1.018)  | 0.023| 0.230   |
| Age in 1986 × log(t) | 0.956| (0.956, 0.967)  | 0.006| <0.001 |
| HBSIMD × log(t) | 1.099| (1.056, 1.144)  | 0.021| <0.001 |

ESM Table 3. Survival analysis for paternal type 2 diabetes and death including all term births. Analyses performed using wider BW (<900g or >6,5kg) and PW (<200g or >1,500g) inclusion ranges. The analysis of type 2 diabetes risk accounted for the competing risk of death. For the HBSIMD, lower indexes represent increased deprivation levels. T2D, type 2 diabetes.
### Survival Analysis of Walker Mothers (quartile BW & PW)

| Offspring BW Q1 | SHR | 95% CI (α=0.05) | SE | p value |
|-----------------|-----|------------------|----|---------|
| Offspring BW Q2 | 0.961 | (0.843, 1.095) | 0.067 | 0.550 |
| Offspring BW Q3 | 1.070 | (0.940, 1.219) | 0.066 | 0.310 |
| Offspring BW Q4 | 1.075 | (0.943, 1.226) | 0.067 | 0.280 |
| Offspring GA | 0.858 | (0.765, 0.964) | 0.059 | 0.010 |
| Age in 1986 | 1.088 | (1.059, 1.117) | 0.013 | <0.001 |
| HBSIMD | 0.943 | (0.914, 0.972) | 0.016 | <0.001 |
| Offspring GA × log(t) | 1.051 | (1.009, 1.095) | 0.021 | 0.016 |
| Age in 1986 × log(t) | 0.964 | (0.955, 0.973) | 0.005 | <0.001 |
| HBSIMD × log(t) | - | - | - | - |

### Cox survival analysis for risk of death

| SHR | 95% CI (α=0.05) | SE | p value |
|-----|------------------|----|---------|
| 1 | Baseline Category |
| 1 | Baseline Category |

### Analysis including only BW

| SHR | 95% CI (α=0.05) | SE | p value |
|-----|------------------|----|---------|
| 1 | Baseline Category |
| 1 | Baseline Category |

### Analysis including only PW

| SHR | 95% CI (α=0.05) | SE | p value |
|-----|------------------|----|---------|
| 1 | Baseline Category |
| 1 | Baseline Category |

### Analysis including BW and PW

| SHR | 95% CI (α=0.05) | SE | p value |
|-----|------------------|----|---------|
| 1 | Baseline Category |
| 1 | Baseline Category |

**ESM Table 4. Survival analysis for maternal type 2 diabetes and death (categorical BW and PW).** Analyses performed using categorical quartile versions of BW and PW. The analysis of type 2 diabetes risk accounted for the competing risk of death. For the HBSIMD, lower indexes represent increased deprivation levels. T2D, type 2 diabetes.
## Survival Analysis of Walker Fathers (categorical BW & PW)

### Fine-Gray survival analysis for T2D diagnosis risk

| Offspring BW Q1 | SHR | 95% CI (α=0.05) | SE | p value |
|-----------------|-----|-----------------|----|---------|
| 1               |     | Baseline Category |    |         |

### Cox survival analysis for risk of death

| Offspring BW Q1 | HR  | 95% CI (α=0.05) | SE | p value |
|-----------------|-----|-----------------|----|---------|
| 1               |     | Baseline Category |    |         |

#### Analysis including only BW

| Offspring BW Q1 | SHR | 95% CI (α=0.05) | SE | p value |
|-----------------|-----|-----------------|----|---------|
| 1               |     | Baseline Category |    |         |

### Analysis including only PW

| Offspring PW Q1 | SHR | 95% CI (α=0.05) | SE | p value |
|-----------------|-----|-----------------|----|---------|
| 1               |     | Baseline Category |    |         |

### Analysis including BW and PW

| Offspring BW Q1 | SHR | 95% CI (α=0.05) | SE | p value |
|-----------------|-----|-----------------|----|---------|
| 1               |     | Baseline Category |    |         |

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**ESM Table 5.** Survival analysis for paternal type 2 diabetes and death (categorical BW and PW). Analyses performed using categorical quartile versions of BW and PW. The analysis of type 2 diabetes risk accounted for the competing risk of death. For the HBSIMD, lower indexes represent increased deprivation levels. T2D, type 2 diabetes