

1 [Supplemental data](#)2 **Supplemental Table 1.** Fetal growth and adverse pregnancy outcomes in the study population, stratified for quartiles of neighbourhood deprivation.

	n	Study population n = 8617	n	Lowest deprivation quartile n = 2170	n	Second deprivation quartile n = 2208	n	Third deprivation quartile n = 2090	n	Highest deprivation quartile n = 2149	p-value <sup>1</sup>	p-value <sup>2</sup>
<b>Early pregnancy</b>												
CRL	1614	-0.05 (1.06)	287	0.03 (1.05)	362	-0.01 (1.07)	418	-0.01 (0.95)	547	0.07 (0.87)	0.81	0.63
HC	5646	-0.27 (1.39)	1359	-0.04 (0.99)	1440	-0.04 (1.04)	1361	-0.04 (1.10)	1486	-0.09 (1.06)	0.36	0.20
FL	4682	0.61 (0.88)	1162	-0.08 (0.99)	1233	-0.18 (1.00)	1107	-0.04 (0.98)	1180	-0.10 (1.00)	0.18	0.74
<b>Mid pregnancy</b>												
HC	8035	-0.02 (1.02)	1972	-0.06 (1.03)	2049	-0.04 (1.05)	1973	-0.01 (1.02)	2041	0.03 (0.98)	<b>0.047</b>	<b>0.01</b>
FL	8058	0.03 (1.03)	1985	0.06 (1.07)	2046	0.06 (1.08)	1970	0.04 (1.02)	2057	-0.01 (0.97)	0.12	<b>0.03</b>
AC	8052	0.01 (1.01)	1977	-0.04 (1.02)	2050	-0.04 (1.02)	1971	0.02 (1.00)	2054	0.11 (0.98)	<b>&lt;0.001</b>	<b>&lt;0.001</b>
EFW	8016	-0.10 (1.01)	1975	-0.12 (1.02)	2035	-0.12 (1.04)	1957	-0.09 (1.00)	2049	-0.06 (0.97)	0.22	0.08
<b>Late pregnancy</b>												
HC	8163	0.01 (1.00)	2029	-0.08 (1.00)	2067	-0.09 (1.02)	1984	0.06 (1.00)	2083	0.17 (0.96)	<b>&lt;0.001</b>	<b>&lt;0.001</b>
FL	8234	-0.01 (1.00)	2049	-0.04 (1.00)	2083	-0.01 (1.05)	2005	0.004 (1.00)	2097	0.02 (0.97)	0.28	0.06
AC	8212	0.01 (1.01)	2042	-0.10 (1.01)	2076	-0.07 (1.04)	1995	0.04 (1.01)	2099	0.14 (0.97)	<b>&lt;0.001</b>	<b>&lt;0.001</b>
EFW	8201	0.03 (1.02)	2042	-0.06 (1.01)	2073	-0.02 (1.04)	1993	0.07 (1.00)	2093	0.15 (1.00)	<b>&lt;0.001</b>	<b>&lt;0.001</b>

**Birth**

Small for gestational age	824	854 (9.9%)	261	261 (12.2%)	220	225 (10.1%)	190	190 (9.2%)	153	153 (7.1%)	<b>&lt;0.001</b>	<b>&lt;0.001</b>
Preterm birth	460	460 (5.3%)	128	128 (5.9%)	142	142 (6.4%)	109	109 (5.2%)	81	81 (3.8%)	<b>0.001</b>	<b>0.001</b>

3 Abbreviations: SD: standard deviation. HC: head circumference. FL: femur length. AC: abdominal circumference. EFW: estimated fetal weight. Values  
 4 represent data in SD-score, mean (SD) or n (%).<sup>1</sup> Differences between groups were evaluated using one-way-ANOVA-tests for continuous variables and Chi-  
 5 square tests for proportions. <sup>2</sup>Differences in growth parameters between the lowest and highest neighbourhood status score groups were tested were evaluated  
 6 using Student's t-tests. Percentages are valid percentages.

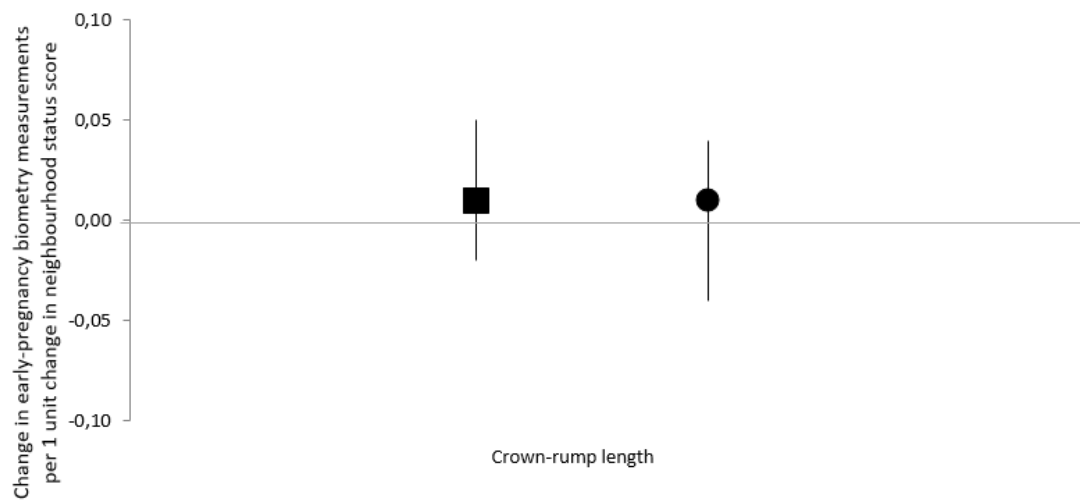
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8 **Supplemental Table 2. Regression coefficients of longitudinal associations between quartiles of neighbourhood deprivation with fetal growth**  
 9 **patterns.**

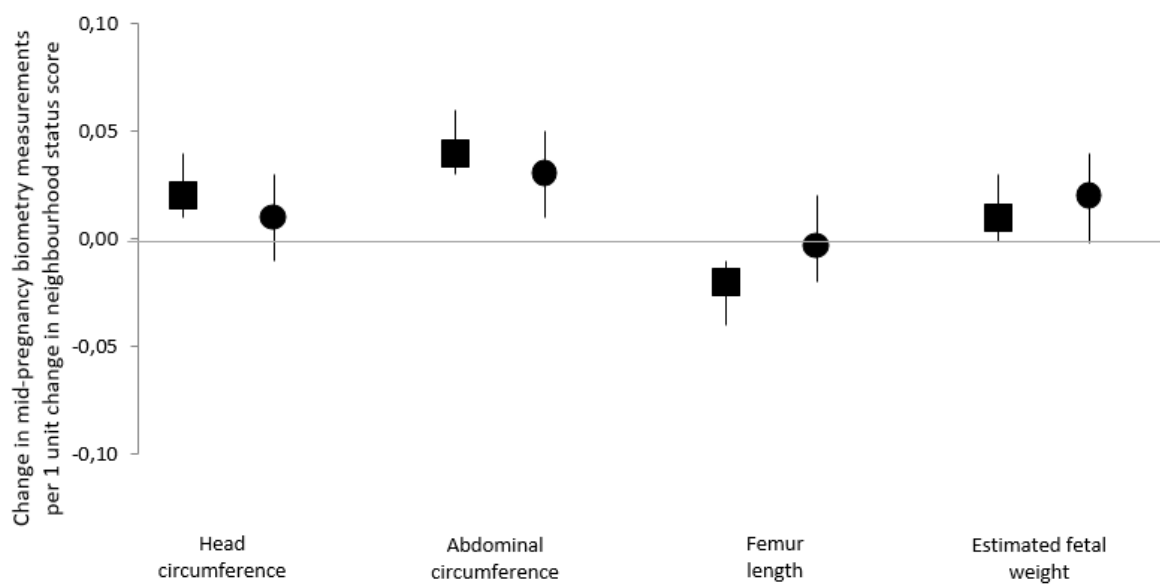
	<b>Intercept</b>	<b>Slope</b>	<b>Intercept</b>	<b>Slope</b>	<b>Intercept</b>	<b>Slope</b>
	<b>Head circumference</b>	<b>Head circumference</b>	<b>Length</b>	<b>Length</b>	<b>Weight</b>	<b>Weight</b>
	<b>(SDS)</b>	<b>(SDS)</b>	<b>(SDS)</b>	<b>(SDS)</b>	<b>(SDS)</b>	<b>(SDS)</b>
<b>Neighbourhood deprivation</b>						
<b>Quartile 1</b>	<b>0.225 (0.122; 0.328)</b>	<b>-0.010 (-0.013; -0.006)</b>	<b>0.270 (0.167; 0.373)</b>	<b>-0.012 (-0.016; -0.010)</b>	<b>0.229 (0.115; 0.3441)</b>	<b>-0.011 (-0.015; -0.008)</b>
<b>Quartile 2</b>	<b>0.104 (0.004; 0.204)</b>	<b>-0.005 (-0.008; -0.001)</b>	<b>0.103 (0.003; 0.203)</b>	<b>-0.005 (-0.008; -0.001)</b>	<b>0.155 (0.043; 0.268)</b>	<b>-0.008 (-0.011; -0.005)</b>
<b>Quartile 3</b>	<b>0.109 (0.009; 0.208)</b>	<b>-0.004 (-0.008; -0.001)</b>	<b>0.170 (0.071; 0.270)</b>	<b>-0.006 (-0.010; -0.003)</b>	<b>0.095 (-0.018; 0.208)</b>	<b>-0.005 (-0.008; -0.001)</b>
<b>Quartile 4</b>	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.

10 Values are regression coefficients obtained from linear repeated measurement models and reflect the (gestational) age independent differences (intercepts) and  
 11 the gestational age dependent differences (slopes: change in growth characteristics SDS per week per quartile of the neighbourhood deprivation score,  
 12 compared with the highest quartile of the neighbourhood deprivation score as the reference group, adjusted for maternal age, educational level, smoking,  
 13 alcohol use, folic acid supplement use, ethnicity, parity, pre-pregnancy body mass index and fetal sex.)

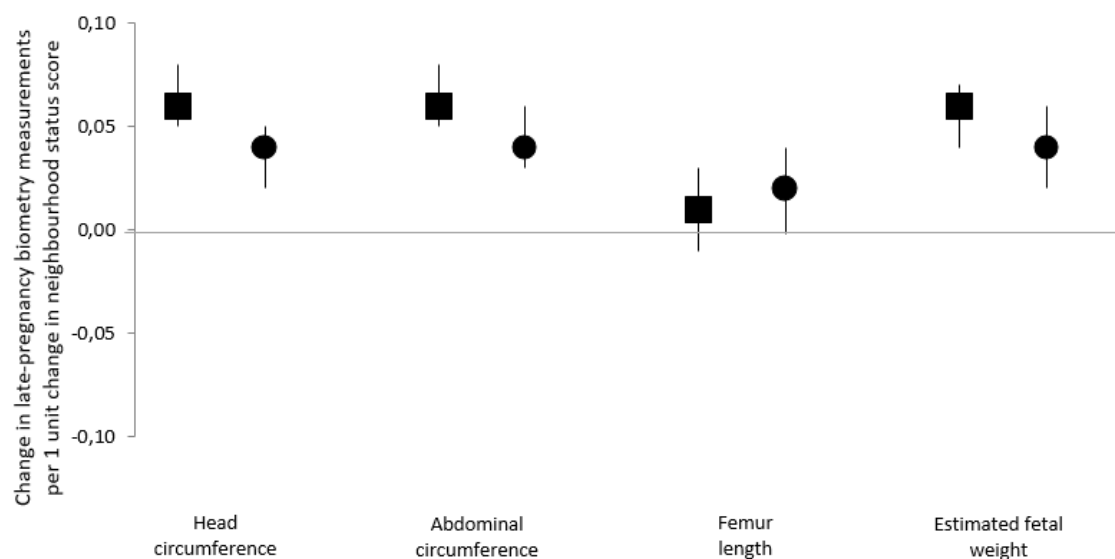
- 14 **Supplemental Figure 1.** Associations between neighbourhood deprivation with first trimester and  
15 fetal growth measurements.



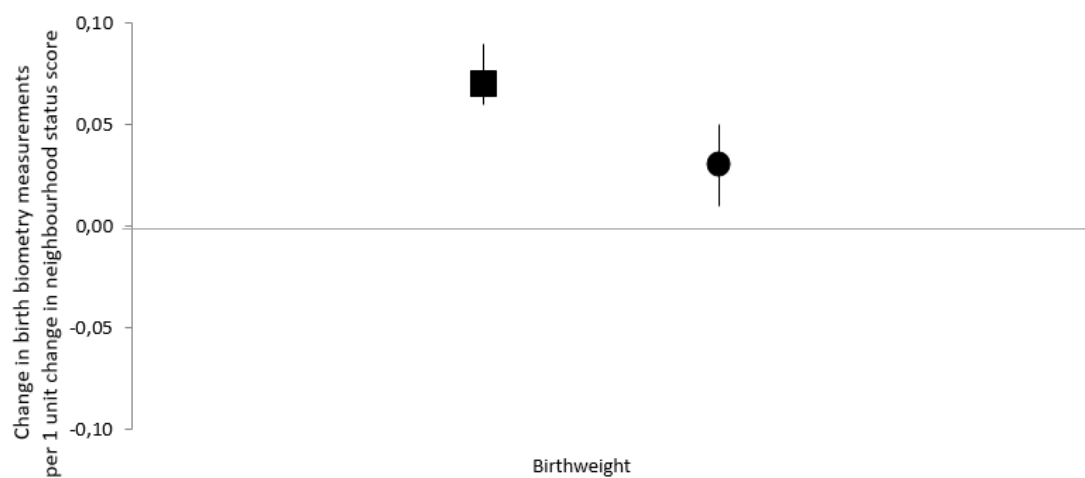
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19 Data are SDS values (95% CI) from linear regression models that reflect the differences in growth  
 20 characteristics in SDS's in early pregnancy, mid-pregnancy late pregnancy and birth, per 1 unit change  
 21 in neighbourhood status score. Analyses with crown-rump length were based on subgroup analyses (n  
 22 = 1614). Estimates are from multiple imputed data. Squares show basic model; circles show the  
 23 adjusted model: basic model and additionally adjusted for maternal age, educational level, smoking,  
 24 alcohol use, folic acid supplement use, ethnicity, parity, pre-pregnancy body mass index and fetal sex.

25 **Supplemental Table 3.** P-value of interaction terms (neighbourhood deprivation \* parity and  
 26 neighbourhood deprivation \* complications in a previous pregnancy).

<b>Study population</b>		
<b>n = 8617</b>		
	<b>Parity</b>	<b>Complications in a previous pregnancy</b>
	<b>p-value for trend</b>	<b>p-value for trend</b>
<b>Early pregnancy</b>		
CRL	0.44	0.36
HC	0.25	0.24
FL	0.52	0.91
<b>Mid pregnancy</b>		
HC	0.15	0.20
FL	0.13	0.20
AC	0.73	0.81
EFW	0.27	0.34
<b>Late pregnancy</b>		
HC	0.64	0.62
FL	0.58	0.51
AC	0.66	0.88
EFW	0.82	0.99
<b>Birth</b>		
SGA	0.95	0.85
PTB	0.17	<b>0.03</b>

27 Abbreviations:  $\beta$ : beta; CRL: crown-rump length; HC: head circumference; FL: femur length; AC:  
 28 abdominal circumference; EFW: estimated fetal weight. Values are based on the adjusted linear and  
 29 logistic regression models.

30 **Supplemental Table 4.** Associations between the neighbourhood status score and fetal growth and adverse pregnancy outcomes, split for nulliparous women,  
 31 multiparous women without a complications in a previous pregnancy or multiparous women with a complications in a previous pregnancy.

Study population n = 8617	Nulliparous N = 4739		Multiparous, no complications previous pregnancy N = 3166		Multiparous, complications previous pregnancy N = 606	
	Trend		Trend		Trend	
	$\beta$ /OR (95% CI)	p-value for trend	$\beta$ /OR (95% CI)	p-value for trend	$\beta$ /OR (95% CI)	p-value for trend
<b>Early pregnancy</b>						
CRL	0.02 (-0.04 ; 0.08)	0.42	-0.01 (-0.10 ; 0.07)	0.74	0.02 (-0.19 ; 0.22)	0.88
HC	0.004 (-0.03 ; 0.04)	0.84	-0.01 (-0.05 ; 0.04)	0.73	-0.04 (-0.15 ; 0.07)	0.45
FL	0.03 (-0.01 ; 0.07)	0.09	0.04 (-0.01 ; 0.09)	0.09	-0.04 (-0.15 ; 0.07)	0.50
<b>Mid pregnancy</b>						
HC	0.02 (-0.02 ; 0.05)	0.32	0.02 (-0.02 ; 0.06)	0.30	<b>-0.11 (-0.19 ; -0.03)</b>	<b>0.01</b>
FL	0.01 (-0.02 ; 0.04)	0.66	-0.01 (-0.05 ; 0.03)	0.59	-0.06 (-0.15 ; 0.02)	0.14
AC	<b>0.03 (0.002 ; 0.06)</b>	<b>0.03</b>	<b>0.05 (0.01 ; 0.09)</b>	<b>0.01</b>	-0.02 (-0.11 ; 0.07)	0.66
EFW	0.02 (-0.01 ; 0.05)	0.12	0.03 (-0.01 ; 0.07)	0.18	-0.04 (-0.13 ; 0.04)	0.32
<b>Late pregnancy</b>						
HC	<b>0.04 (0.01 ; 0.07)</b>	<b>0.004</b>	0.03 (-0.003 ; 0.07)	0.07	0.03 (-0.05 ; 0.11)	0.50
FL	0.02 (-0.01 ; 0.05)	0.10	-0.003 (-0.04 ; 0.03)	0.89	0.03 (-0.05 ; 0.11)	0.45

AC	<b>0.03 (0.002 ; 0.06)</b>	<b>0.04</b>	<b>0.04 (0.01 ; 0.08)</b>	<b>0.03</b>	0.07 (-0.01 ; 0.16)	0.10
EFW	<b>0.03 (0.01 ; 0.06)</b>	<b>0.02</b>	<b>0.04 (0.001 ; 0.08)</b>	<b>0.048</b>	0.07 (-0.02 ; 0.16)	0.11
<b>Birth</b>						
SGA	<b>0.90 (0.82 ; 0.99)</b>	<b>0.03</b>	0.96 (0.82 ; 1.12)	0.60	0.88 (0.63 ; 1.23)	0.46
PTB	0.91 (0.81 ; 1.03)	0.15	<b>0.73 (0.58 ; 0.93)</b>	<b>0.01</b>	0.89 (0.66 ; 1.21)	0.46

32 Abbreviations:  $\beta$ : beta; CRL: crown-rump length; HC: head circumference; FL: femur length; AC: abdominal circumference; EFW: estimated fetal weight.

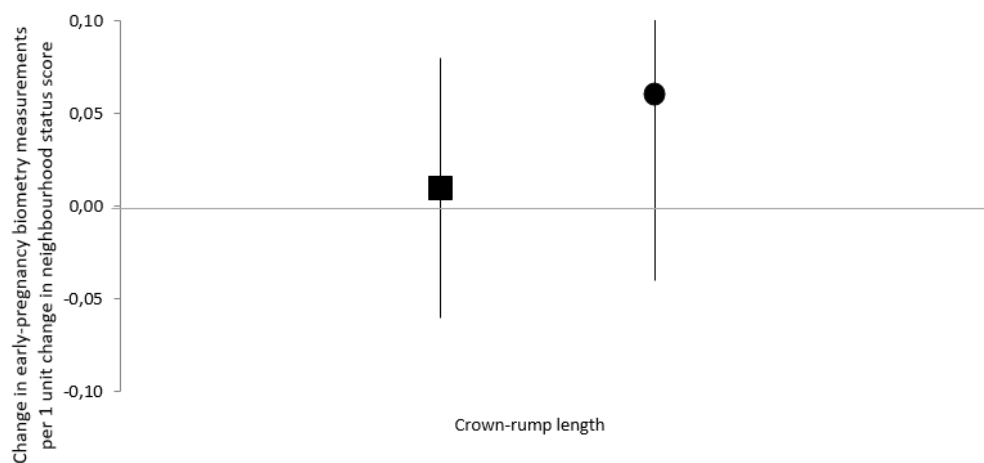
33 Values are regression coefficients with the 95% CI of the data in SD-score and are based on adjusted linear and logistic regression models. Adjusted model:

34 adjusted for maternal age, educational level, smoking, alcohol use, folic acid supplement use, ethnicity, parity, pre-pregnancy body mass index and fetal sex.

35 p-for trend analysis with the neighbourhood deprivation as a continuous measure.

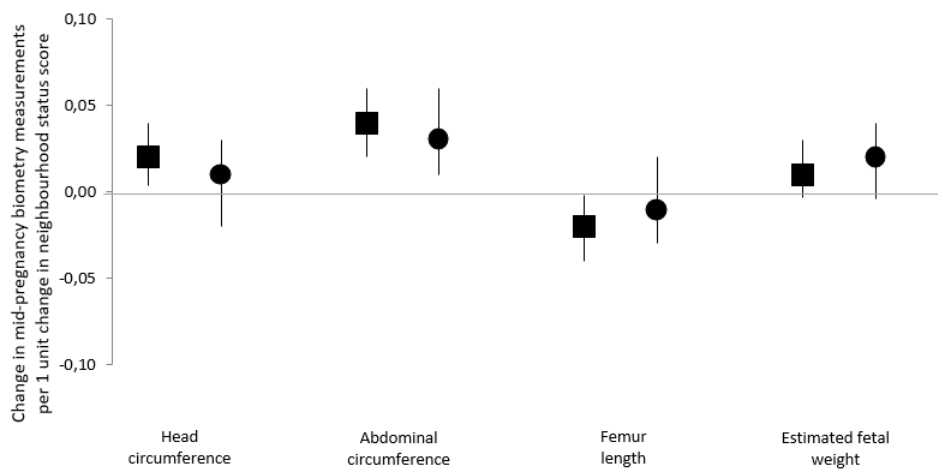


36 **Supplemental Figure 2.** Multilevel regression analysis of associations between the neighbourhood  
 37 deprivation and first trimester and fetal growth measurements.



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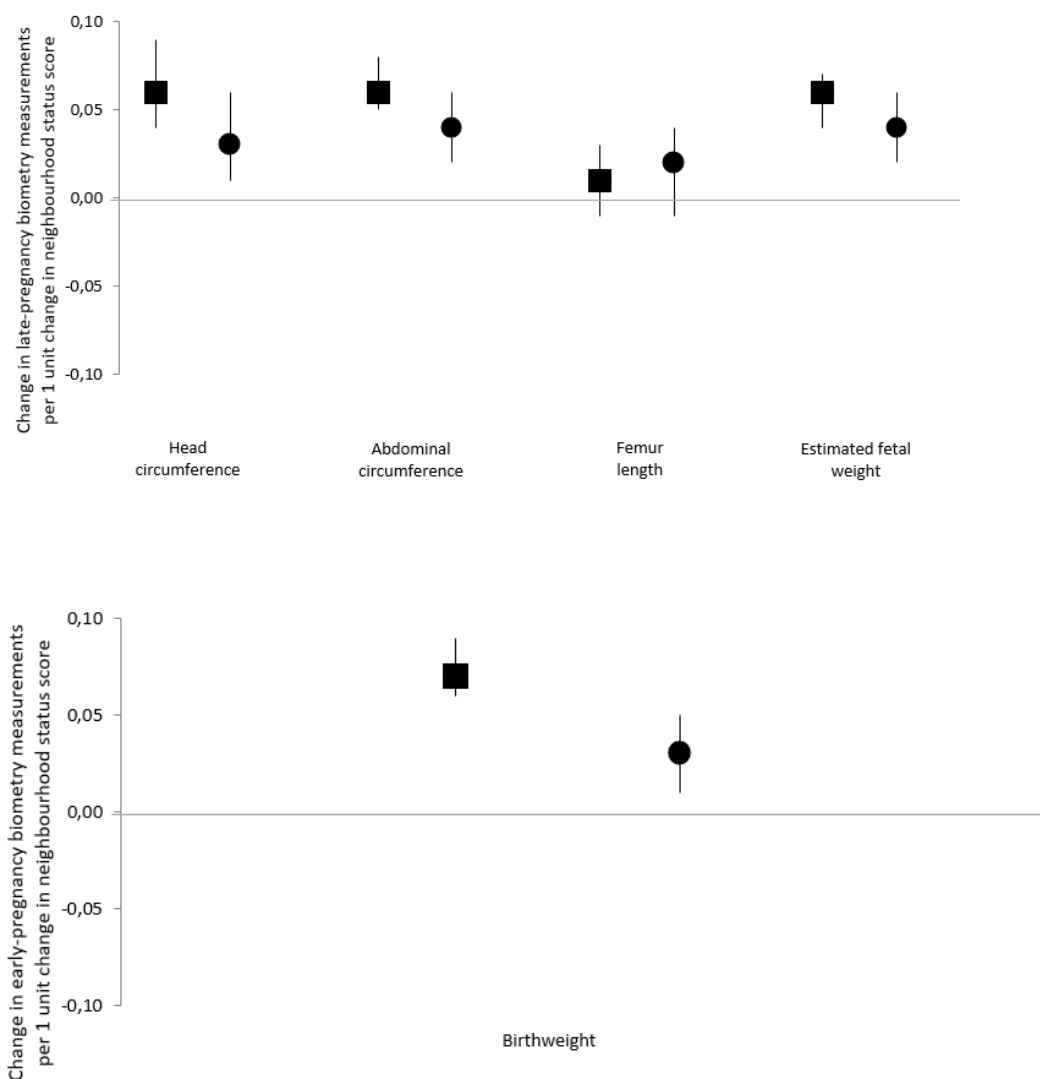
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65 Data are SDS values (95% CI) from multilevel analyses and reflect the differences in growth  
66 characteristics in SDS's in early pregnancy, mid-pregnancy late pregnancy and birth, per 1 unit change  
67 in neighbourhood status score. Analyses with crown-rump length were based on subgroup analyses (n  
68 = 1614). Estimates are from multiple imputed data. Squares show basic model. Circles show adjusted  
69 model: basic model and additionally adjusted for maternal age, educational level, smoking, alcohol  
70 use, folic acid supplement use, ethnicity, parity, pre-pregnancy body mass index and fetal sex.

71 **Supplemental Table 5.** Sensitivity analysis with all available CRL measurements in the study population.

72 **a. All CRL measurement in the study population, stratified for quartiles of the neighbourhood status score.**

	n	Study population n = 8617	n	Lowest deprivation quartile n = 2277	n	Second deprivation quartile n = 2123	n	Third deprivation quartile n = 2084	n	Highest deprivation quartile n = 2133	p-value <sup>1</sup>	Mean difference (95% CI) <sup>2</sup>	p-value <sup>2</sup>
CRL	1614		287	0.03 (1.05)	362	-0.01 (1.07)	418	-0.01 (0.95)	547	0.07 (0.87)	0.56	-0.03 (-0.17 ; 0.10)	0.61

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77 **b. All CRL measurement in the study population and the associations between quartiles of the neighbourhood status score.**

	n	Model	Lowest deprivation quartile n = 300	Second deprivation quartile n = 373	Third deprivation quartile n = 399	Highest deprivation quartile n = 542	Trend	p-value for trend
			$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)		$\beta$ (95% CI)	
CRL	1614	Basic	-0.03 (-0.17 ; 0.10)	-0.08 (-0.21 ; 0.05)	-0.08 (-0.20 ; 0.05)	<i>Reference</i>	0.01 (-0.02 ; 0.05)	0.48
		Adjusted	0.02 (-0.15 ; 0.16)	-0.04 (-0.17 ; 0.10)	-0.06 (-0.19 ; 0.06)	<i>Reference</i>	0.004 (-0.04 ; 0.04)	0.85

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80 **c. All CRL measurement in the study population and the associations between quartiles of the neighbourhood status score. Complete case analysis.**

	n	Model	Lowest deprivation	Second deprivation	Third deprivation	Highest deprivation	Trend	p-value for trend
			quartile n = 2268	quartile n = 2118	quartile n = 2081	quartile n = 2131		
			$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)		$\beta$ (95% CI)	
CRL	1143	Adjusted	-0.06 (-0.23 ; 0.12)	0.02 (-0.14 ; 0.17)	-0.06 (-0.21 ; 0.09)	<i>Reference</i>	0.01 (-0.04 ; 0.05)	0.80

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83 **d. The association between the neighbourhood deprivation status score and all CRL measurement in the study population in a selected cohort of non-SGA pregnancies.**  
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	n	Model	Lowest deprivation	Second deprivation	Third deprivation	Highest deprivation	Trend	p-value for trend
			quartile n = 2268	quartile n = 2118	quartile n = 2081	quartile n = 2131		
			$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)		$\beta$ (95% CI)	
CRL	434	Basic	0.05 (-0.26 ; 0.35)	0.10 (-0.17 ; 0.37)	-0.05 (-0.31 ; 0.21)	<i>Reference</i>	-0.01 (-0.09 ; 0.06)	0.73
		Adjusted	0.07 (-0.30 ; 0.43)	0.09 (-0.19 ; 0.38)	-0.06 (-0.33 ; 0.21)	<i>Reference</i>	-0.02 (-0.11 ; 0.08)	0.75

85 Abbreviations:  $\beta$ : beta; CRL: crown-rump length. Values are regression coefficients with the 95% CI of the data in SD-score and are based on linear  
86 regression models. Basic model: by the use of SD scores it is automatically adjusted for gestational age. Fully adjusted model: basic model and additionally  
87 adjusted for maternal age, educational level, smoking, alcohol use, folic acid supplement use, ethnicity, parity, pre-pregnancy body mass index and fetal sex.  
88 p-for trend analysis with the neighbourhood deprivation as a continuous measure. <sup>1</sup>Differences between groups were evaluated using one-way-ANOVA-tests  
89 for continuous variables. <sup>2</sup>Differences in growth parameters between the lowest and highest neighbourhood status score groups were tested were evaluated  
90 using Student's t-tests.

91 **Supplemental Table 6.** Associations between the neighbourhood status score and fetal growth in a selected cohort of non-SGA pregnancies.

Study population n = 7710	Model	Lowest deprivation quartile n = 2268	Second deprivation quartile n = 2118	Third deprivation quartile n = 2081	Highest deprivation quartile n = 2131	Trend	
		$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)		$\beta$ (95% CI)	p-value for trend
<b>Early pregnancy</b>							
CRL	Basic	0.05 (-0.26 ; 0.35)	0.10 (-0.17 ; 0.37)	-0.05 (-0.31 ; 0.21)	<i>Reference</i>	-0.01 (-0.09 ; 0.06)	0.73
	Adjusted	0.07 (-0.30 ; 0.43)	0.09 (-0.19 ; 0.38)	-0.06 (-0.33 ; 0.21)	<i>Reference</i>	-0.02 (-0.11 ; 0.08)	0.75
HC	Basic	<b>-0.38 (-0.71 ; -0.04)</b>	<b>-0.37 (-0.69 ; -0.06)</b>	-0.07 (-0.37 ; 0.23)	<i>Reference</i>	<b>0.12 (0.04 ; 0.21)</b>	<b>0.004</b>
	Adjusted	-0.22 (-0.60 ; 0.17)	-0.32 (-0.65 ; 0.01)	-0.06 (-0.36 ; 0.25)	<i>Reference</i>	0.09 (-0.01 ; 0.19)	0.09
FL	Basic	-0.19 (-0.53 ; 0.15)	<b>-0.33 (-0.63 ; -0.03)</b>	-0.11 (-0.40 ; 0.18)	<i>Reference</i>	0.08 (-0.002 ; 0.16)	0.06
	Adjusted	-0.24 (-0.66 ; 0.18)	<b>-0.36 (-0.69 ; -0.03)</b>	-0.13 (-0.44 ; 0.18)	<i>Reference</i>	0.10 (-0.01 ; 0.20)	0.07
<b>Mid pregnancy</b>							
HC	Basic	<b>-0.07 (-0.13 ; -0.001)</b>	-0.05 (-0.12 ; 0.01)	-0.03 (-0.10 ; 0.04)	<i>Reference</i>	<b>0.02 (0.003 ; 0.04)</b>	<b>0.02</b>
	Adjusted	-0.02 (-0.10 ; 0.05)	-0.03 (-0.09 ; 0.04)	-0.02 (-0.09 ; 0.05)	<i>Reference</i>	0.01 (-0.01 ; 0.03)	0.40
FL	Basic	<b>0.10 (0.045 ; 0.17)</b>	<b>0.10 (0.03 ; 0.16)</b>	<b>0.08 (0.01 ; 0.15)</b>	<i>Reference</i>	<b>-0.02 (-0.05 ; -0.01)</b>	<b>0.001</b>
	Adjusted	0.02 (-0.05 ; 0.10)	0.05 (-0.03 ; 0.11)	0.04 (-0.03 ; 0.11)	<i>Reference</i>	-0.01 (-0.03 ; 0.01)	0.42
AC	Basic	<b>-0.12 (-0.18 ; -0.05)</b>	<b>-0.13 (-0.20 ; -0.07)</b>	<b>-0.07 (-0.13 ; -0.01)</b>	<i>Reference</i>	<b>0.04 (0.02 ; 0.05)</b>	<b>&lt;0.001</b>

	Adjusted	<b>-0.09 (-0.16 ; -0.01)</b>	<b>-0.11 (-0.18 ; -0.04)</b>	-0.06 (-0.12 ; 0.01)	<i>Reference</i>	<b>0.03 (0.01 ; 0.05)</b>	<b>0.01</b>
EFW	Basic	-0.03 (-0.08 ; 0.05)	-0.03 (-0.09 ; 0.04)	0.001 (-0.07 ; 0.06)	<i>Reference</i>	0.01 (-0.01 ; 0.02)	0.77
	Adjusted	-0.04 (-0.12 ; 0.03)	-0.04 (-0.11 ; 0.03)	-0.01 (-0.08 ; 0.05)	<i>Reference</i>	0.01 (-0.01 ; 0.03)	0.19
<b>Late pregnancy</b>							
HC	Basic	<b>-0.22 (-0.29 ; -0.16)</b>	<b>-0.24 (-0.31 ; -0.18)</b>	<b>-0.09 (-0.16 ; -0.03)</b>	<i>Reference</i>	<b>0.06 (0.04 ; 0.08)</b>	<b>&lt;0.001</b>
	Adjusted	<b>-0.13 (-0.20 ; -0.06)</b>	<b>-0.18 (-0.24 ; -0.11)</b>	<b>-0.06 (-0.12 ; -0.001)</b>	<i>Reference</i>	<b>0.03 (0.01 ; 0.05)</b>	<b>&lt;0.001</b>
FL	Basic	-0.02 (-0.09 ; 0.04)	0.01 (-0.05 ; 0.07)	0.01 (-0.05 ; 0.08)	<i>Reference</i>	0.001 (-0.02 ; 0.02)	0.90
	Adjusted	<b>-0.08 (-0.15 ; -0.01)</b>	-0.01 (-0.08 ; 0.05)	-0.01 (-0.07 ; 0.06)	<i>Reference</i>	0.01 (-0.01 ; 0.03)	0.20
AC	Basic	<b>-0.20 (-0.27 ; -0.14)</b>	<b>-0.18 (-0.24 ; -0.12)</b>	<b>-0.07 (-0.13 ; -0.01)</b>	<i>Reference</i>	<b>0.06 (0.04 ; 0.07)</b>	<b>&lt;0.001</b>
	Adjusted	<b>-0.15 (-0.22 ; -0.08)</b>	<b>-0.13 (-0.19 ; -0.06)</b>	-0.05 (-0.12 ; 0.01)	<i>Reference</i>	<b>0.04 (0.02 ; 0.06)</b>	<b>0.02</b>
EFW	Basic	<b>-0.18 (-0.20 ; -0.12)</b>	<b>-0.14 (-0.20 ; -0.08)</b>	-0.05 (-0.11 ; 0.01)	<i>Reference</i>	<b>0.05 (0.03 ; 0.06)</b>	<b>&lt;0.001</b>
	Adjusted	<b>-0.16 (-0.23 ; -0.08)</b>	<b>-0.11 (-0.17 ; -0.04)</b>	-0.05 (-0.11 ; 0.02)	<i>Reference</i>	<b>0.04 (0.02 ; 0.06)</b>	<b>&lt;0.001</b>

92 Abbreviations: SGA: small for gestational age, HC: head circumference, FL: femur length, AC: abdominal circumference, EFW: estimated fetal weight.

93 Values are regression coefficients with the 95% CI of the data in SD-score and are based on linear regression models. Basic model: by the use of SD scores it  
 94 is automatically adjusted for gestational age. Fully adjusted model: basic model and additionally adjusted for maternal age, educational level, smoking, alcohol  
 95 use, folic acid supplement use, ethnicity, parity, pre-pregnancy body mass index and fetal sex. p-for trend analysis with the neighbourhood deprivation as a  
 96 continuous measure.

97 **Supplemental Table 7.** Associations between the neighbourhood status score and foetal growth, additionally adjusted for household income.

Study population	n	Model	Lowest SES quartile n = 2170	Second SES quartile n = 2208	Third SES quartile n = 2090	Highest SES quartile n = 2149	Trend	p-value for trend
			$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)	
<b>Early pregnancy</b>								
CRL	1614	Basic	-0.03 (-0.17 ; 0.10)	-0.08 (-0.21 ; 0.05)	-0.08 (-0.20 ; 0.05)	Reference	0.01 (-0.02 ; 0.05)	0.48
		Adjusted	0.002 (-0.15 ; 0.16)	-0.04 (-0.17 ; 0.10)	-0.06 (-0.19 ; 0.06)	Reference	0.02 (-0.02 ; 0.07)	0.30
HC	5646	Basic	0.05 (-0.03 ; 0.13)	0.05 (-0.03 ; 0.13)	0.05 (-0.02 ; 0.13)	Reference	-0.01 (-0.03 ; 0.01)	0.44
		Adjusted	0.02 (-0.06 ; 0.11)	0.04 (-0.04 ; 0.12)	0.05 (-0.03 ; 0.13)	Reference	0.004 (-0.02 ; 0.03)	0.75
FL	4682	Basic	0.01 (-0.07 ; 0.09)	<b>-0.09 (-0.17 ; -0.01)</b>	0.06 (-0.02 ; 0.14)	Reference	0.01 (-0.01 ; 0.03)	0.44
		Adjusted	-0.09 (-0.18 ; 0.003)	<b>-0.16 (-0.24 ; -0.07)</b>	0.01 (-0.06 ; 0.10)	Reference	<b>0.03 (0.002 ; 0.06)</b>	<b>0.04</b>
<b>Mid pregnancy</b>								
HC	8035	Basic	<b>-0.08 (-0.15 ; -0.02)</b>	<b>-0.07 (-0.13 ; -0.01)</b>	-0.04 (-0.10 ; 0.03)	Reference	<b>0.02 (0.01 ; 0.04)</b>	<b>0.01</b>
		Adjusted	-0.02 (-0.09 ; 0.05)	-0.03 (-0.10 ; 0.03)	-0.02 (-0.08 ; 0.04)	Reference	0.02 (-0.01 ; 0.04)	0.18
FL	8058	Basic	<b>0.07 (0.01 ; 0.14)</b>	<b>0.06 (0.001 ; 0.13)</b>	0.05 (-0.01 ; 0.12)	Reference	<b>-0.02 (-0.04 ; -0.01)</b>	<b>0.01</b>
		Adjusted	-0.01 (-0.08 ; 0.07)	0.02 (-0.05 ; 0.09)	0.02 (-0.05 ; 0.08)	Reference	0.003 (-0.02 ; 0.02)	0.80

AC	8052	Basic	<b>-0.15 (-0.21 ; -0.09)</b>	<b>-0.15 (-0.21 ; -0.09)</b>	<b>-0.09 (-0.15 ; -0.03)</b>	Reference	<b>0.04 (0.03 ; 0.06)</b>	<b>&lt;0.001</b>
		Adjusted	<b>-0.10 (-0.17 ; -0.03)</b>	<b>-0.11 (-0.18 ; -0.05)</b>	<b>-0.07 (-0.13 ; -0.01)</b>	Reference	<b>0.03 (0.01 ; 0.05)</b>	<b>0.01</b>
EFW	8016	Basic	-0.06 (-0.12 ; 0.01)	-0.06 (-0.12 ; 0.003)	-0.03 (-0.09 ; 0.03)	Reference	0.01 (-0.001 ; 0.03)	0.08
		Adjusted	-0.06 (-0.14 ; 0.01)	-0.06 (-0.13 ; 0.01)	-0.03 (-0.10 ; 0.03)	Reference	0.02 (-0.003 ; 0.04)	0.09
<b>Late pregnancy</b>								
HC	8163	Basic	<b>-0.24 (-0.31 ; -0.18)</b>	<b>-0.25 (-0.31 ; -0.19)</b>	<b>-0.11 (-0.17 ; -0.05)</b>	Reference	<b>0.06 (0.05 ; 0.08)</b>	<b>&lt;0.001</b>
		Adjusted	<b>-0.14 (-0.21 ; -0.08)</b>	<b>-0.17 (-0.24 ; -0.11)</b>	<b>-0.07 (-0.14 ; -0.01)</b>	Reference	<b>0.04 (0.02 ; 0.06)</b>	<b>0.001</b>
FL	8234	Basic	-0.06 (-0.12 ; 0.003)	-0.03 (-0.09 ; 0.03)	-0.02 (-0.08 ; 0.05)	Reference	0.01 (-0.01 ; 0.03)	0.21
		Adjusted	<b>-0.10 (-0.17 ; -0.02)</b>	-0.04 (-0.10 ; 0.03)	-0.03 (-0.09 ; 0.04)	Reference	0.02 (-0.01 ; 0.04)	0.16
AC	8212	Basic	<b>-0.24 (-0.30 ; -0.18)</b>	<b>-0.21 (-0.27 ; -0.15)</b>	<b>-0.10 (-0.16 ; -0.04)</b>	Reference	<b>0.06 (0.05 ; 0.08)</b>	<b>&lt;0.001</b>
		Adjusted	<b>-0.16 (-0.23 ; -0.09)</b>	<b>-0.13 (-0.20 ; -0.07)</b>	<b>-0.07 (-0.13 ; -0.01)</b>	Reference	<b>0.03 (0.01 ; 0.05)</b>	<b>0.002</b>
EFW	8201	Basic	<b>-0.22 (-0.28 ; -0.16)</b>	<b>-0.18 (-0.24 ; -0.11)</b>	<b>-0.09 (-0.15 ; -0.02)</b>	Reference	<b>0.06 (0.04 ; 0.07)</b>	<b>&lt;0.001</b>
		Adjusted	<b>-0.17 (-0.25 ; -0.10)</b>	<b>-0.12 (-0.19 ; -0.06)</b>	<b>-0.07 (-0.13 ; -0.01)</b>	Reference	<b>0.03 (0.01 ; 0.06)</b>	<b>0.001</b>

98 Abbreviations: HC: head circumference, FL: femur length, AC: abdominal circumference, EFW: estimated fetal weight. Values are regression coefficients  
 99 with the 95% CI of the data in SD-score and are based on linear regression models. Basic model: by the use of SD scores it is automatically adjusted for  
 100 gestational age. Fully adjusted model: basic model and additionally adjusted for maternal age, educational level, smoking, alcohol use, folic acid supplement



101 use, ethnicity, parity, pre-pregnancy body mass index, fetal sex and household income. p-for trend analysis with the neighbourhood deprivation as a  
102 continuous measure.

103 **Supplemental Table 8.** Associations between the neighbourhood status score and foetal growth, adjusted for different classification of ethnicity.

Study population	n	Model	Lowest SES quartile n = 2170	Second SES quartile n = 2208	Third SES quartile n = 2090	Highest SES quartile n = 2149	Trend	p-value for trend
			$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)	
<b>Early pregnancy</b>								
CRL	1614	Basic	-0.03 (-0.17 ; 0.10)	-0.08 (-0.21 ; 0.05)	-0.08 (-0.20 ; 0.05)	Reference	0.01 (-0.02 ; 0.05)	0.48
		Adjusted	0.002 (-0.15 ; 0.16)	-0.04 (-0.17 ; 0.10)	-0.06 (-0.19 ; 0.06)	Reference	0.01 (-0.03 ; 0.05)	0.73
HC	5646	Basic	0.05 (-0.03 ; 0.13)	0.05 (-0.03 ; 0.13)	0.05 (-0.02 ; 0.13)	Reference	-0.01 (-0.03 ; 0.01)	0.44
		Adjusted	0.02 (-0.06 ; 0.11)	0.04 (-0.04 ; 0.12)	0.05 (-0.03 ; 0.13)	Reference	0.002 (-0.02 ; 0.03)	0.90
FL	4682	Basic	0.01 (-0.07 ; 0.09)	<b>-0.09 (-0.17 ; -0.01)</b>	0.06 (-0.02 ; 0.14)	Reference	0.01 (-0.01 ; 0.03)	0.44
		Adjusted	-0.09 (-0.18 ; 0.003)	<b>-0.16 (-0.24 ; -0.07)</b>	0.01 (-0.06 ; 0.10)	Reference	<b>0.04 (0.01 ; 0.06)</b>	<b>0.003</b>
<b>Mid pregnancy</b>								
HC	8035	Basic	<b>-0.08 (-0.15 ; -0.02)</b>	<b>-0.07 (-0.13 ; -0.01)</b>	-0.04 (-0.10 ; 0.03)	Reference	<b>0.02 (0.01 ; 0.04)</b>	<b>0.01</b>
		Adjusted	-0.02 (-0.09 ; 0.05)	-0.03 (-0.10 ; 0.03)	-0.02 (-0.08 ; 0.04)	Reference	0.01 (-0.01 ; 0.02)	0.57
FL	8058	Basic	<b>0.07 (0.01 ; 0.14)</b>	<b>0.06 (0.001 ; 0.13)</b>	0.05 (-0.01 ; 0.12)	Reference	<b>-0.02 (-0.04 ; -0.01)</b>	<b>0.01</b>
		Adjusted	-0.01 (-0.08 ; 0.07)	0.02 (-0.05 ; 0.09)	0.02 (-0.05 ; 0.08)	Reference	-0.004 (-0.02 ; 0.02)	0.69

AC	8052	Basic	<b>-0.15 (-0.21 ; -0.09)</b>	<b>-0.15 (-0.21 ; -0.09)</b>	<b>-0.09 (-0.15 ; -0.03)</b>	Reference	<b>0.04 (0.03 ; 0.06)</b>	<b>&lt;0.001</b>
		Adjusted	<b>-0.10 (-0.17 ; -0.03)</b>	<b>-0.11 (-0.18 ; -0.05)</b>	<b>-0.07 (-0.13 ; -0.01)</b>	Reference	<b>0.03 (0.01 ; 0.05)</b>	<b>0.01</b>
EFW	8016	Basic	-0.06 (-0.12 ; 0.01)	-0.06 (-0.12 ; 0.003)	-0.03 (-0.09 ; 0.03)	Reference	0.01 (-0.001 ; 0.03)	0.08
		Adjusted	-0.06 (-0.14 ; 0.01)	-0.06 (-0.13 ; 0.01)	-0.03 (-0.10 ; 0.03)	Reference	0.02 (-0.004 ; 0.03)	0.13
<b>Late pregnancy</b>								
HC	8163	Basic	<b>-0.24 (-0.31 ; -0.18)</b>	<b>-0.25 (-0.31 ; -0.19)</b>	<b>-0.11 (-0.17 ; -0.05)</b>	Reference	<b>0.06 (0.05 ; 0.08)</b>	<b>&lt;0.001</b>
		Adjusted	<b>-0.14 (-0.21 ; -0.08)</b>	<b>-0.17 (-0.24 ; -0.11)</b>	<b>-0.07 (-0.14 ; -0.01)</b>	Reference	<b>0.03 (0.02 ; 0.05)</b>	<b>&lt;0.001</b>
FL	8234	Basic	-0.06 (-0.12 ; 0.003)	-0.03 (-0.09 ; 0.03)	-0.02 (-0.08 ; 0.05)	Reference	0.01 (-0.01 ; 0.03)	0.21
		Adjusted	<b>-0.10 (-0.17 ; -0.02)</b>	-0.04 (-0.10 ; 0.03)	-0.03 (-0.09 ; 0.04)	Reference	0.02 (-0.002 ; 0.04)	0.08
AC	8212	Basic	<b>-0.24 (-0.30 ; -0.18)</b>	<b>-0.21 (-0.27 ; -0.15)</b>	<b>-0.10 (-0.16 ; -0.04)</b>	Reference	<b>0.06 (0.05 ; 0.08)</b>	<b>&lt;0.001</b>
		Adjusted	<b>-0.16 (-0.23 ; -0.09)</b>	<b>-0.13 (-0.20 ; -0.07)</b>	<b>-0.07 (-0.13 ; -0.01)</b>	Reference	<b>0.04 (0.02 ; 0.06)</b>	<b>&lt;0.001</b>
EFW	8201	Basic	<b>-0.22 (-0.28 ; -0.16)</b>	<b>-0.18 (-0.24 ; -0.11)</b>	<b>-0.09 (-0.15 ; -0.02)</b>	Reference	<b>0.06 (0.04 ; 0.07)</b>	<b>&lt;0.001</b>
		Adjusted	<b>-0.17 (-0.25 ; -0.10)</b>	<b>-0.12 (-0.19 ; -0.06)</b>	<b>-0.07 (-0.13 ; -0.01)</b>	Reference	<b>0.04 (0.02 ; 0.06)</b>	<b>&lt;0.001</b>

104 Abbreviations: HC: head circumference, FL: femur length, AC: abdominal circumference, EFW: estimated fetal weight. Values are regression coefficients  
105 with the 95% CI of the data in SD-score and are based on linear regression models. Basic model: by the use of SD scores it is automatically adjusted for  
106 gestational age. Fully adjusted model: basic model and additionally adjusted for maternal age, educational level, smoking, alcohol use, folic acid supplement  
107 use, ethnicity, parity, pre-pregnancy body mass index and fetal sex. p-for trend analysis with the neighbourhood deprivation as a continuous measure.

108 **Supplemental Table 9.** Associations between the neighbourhood status score and SGA pregnancies, adjusted for maternal hypertension.

Study population	Model	Lowest deprivation quartile n = 1190	Second deprivation quartile n = 1068	Third deprivation quartile n = 1273	Highest deprivation quartile n = 1653	Trend	p-value for trend			
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)				
Small for gestational age	Adjusted	<b>1.39</b> (1.09 ; 1.77)	<b>0.01</b>	1.15 (0.91 ; 1.46)	0.24	1.13 (0.89 ; 1.43)	0.31	Reference	<b>0.91</b> (0.85 ; 0.97)	<b>0.004</b>

109 Abbreviations:  $\beta$ : beta; OR: odds ratio. Values are odds ratios with the 95% CI of the data in SD-score and are based on logistic regression models. Adjusted  
110 model: basic model and additionally adjusted for maternal age, educational level, smoking, alcohol use, folic acid supplement use, ethnicity, parity, pre-  
111 pregnancy body mass index, fetal sex, and additionally for maternal hypertension.. P-for trend analysis with the neighbourhood deprivation as a continuous  
112 measure. Small size for gestational age (SGA) at birth was defined as a sex and gestational age adjusted birthweight below the 10th percentile (<-1.40 SD-  
113 score) in the study cohort.  
114

115 **Supplemental Table 10.** Observed and expected values of covariates.

<b>Maternal characteristics</b>		
	<b>Observed</b>	<b>Expected</b>
Age at intake (years)	29.6 (5.3)	29.6 (5.3)
Prepregnancy body mass index (kg/m <sup>2</sup> )	22.8 (18.4 – 32.2)	22.6 (18.6 – 32.4)
Parity (nulliparous)	4796 (55.7)	4739 (55.7)
Fetal sex (boy)	4347 (50.4)	4346 (50.4)
Educational level		
Lower/no education	1101 (12.8)	916 (11.7)
Middle	4060 (47.1)	3638 (46.4)
High	3456 (40.1)	3282 (41.9)
Ethnicity		
Dutch and Western	4967 (57.6)	4793 (58.8)
Turkish and Moroccan	1464 (17.0)	1330 (16.3)
African	1178 (13.7)	1076 (13.2)
Asian	1008 (11.7)	946 (11.6)
Smoking		
Never smoked during pregnancy	6256 (72.6)	5472 (72.8)
Smoked until pregnancy was known	735 (8.5)	644 (8.6)
Continued smoking in pregnancy	1626 (18.9)	1403 (18.7)
Alcohol		
Never alcohol consumption in pregnancy	4351 (50.5)	3692 (49.8)
Alcohol consumption until pregnancy was known	1149 (13.3)	999 (13.5)
Continued alcohol consumption in pregnancy	3117 (36.2)	2728 (36.8)
Folic acid supplement use		
None	2751 (31.9)	1877 (29.4)
Start in first 10 weeks of pregnancy	2661 (30.9)	1981 (31.1)
Start preconceptional	3205 (37.2)	2518 (39.5)

116 Data are represented as n (%), mean (SD) or median with the 90% range. Percentages 'expected'

117 displayed as valid percentages.

118 **Supplemental 1.** First trimester and fetal growth, measurement guidelines.

119

120 **CRL: crown-rump length (39)**

121 CRL is measured as the largest dimension of embryo, excluding the yolk sac and extremities. A  
122 midline sagittal section of the whole embryo or fetus should be obtained, ideally with the embryo or  
123 fetus oriented horizontally on the screen. An image should be magnified sufficiently to fill most of the  
124 width of the ultrasound screen, so that the measurement line between crown and rump is at about 90°  
125 to the ultrasound beam.

126 Caliper placement: measure the fetus in a neutral position (i.e. neither flexed nor hyperextended). The  
127 end points of crown and rump should be defined clearly.

128

129

130 **HC: Head circumference (40)**

131 As described for the BPD, ensuring that the circumference placement markers correspond to the  
132 technique described on the reference chart.

133 Caliper placement: If the ultrasound equipment has ellipse measurement capacity, then the HC can be  
134 measured directly by placing the ellipse around the outside of the skull bone echoes.

135

136

137 **AC: abdominal circumference (40)**

138 - Transverse section of the fetal abdomen (as circular as possible);

139 - umbilical vein at the level of the portal sinus;

140 - stomach bubble visualized;

141 - kidneys should not be visible.

142 Caliper placement: The AC is measured at the outer surface of the skin line, either directly with ellipse  
143 calipers or calculated from linear measurements made perpendicular to each other, usually the  
144 anteroposterior abdominal diameter and transverse abdominal diameter.

145

146

147 **FL: femur length (40)**

148 The FL is imaged optimally with both ends of the ossified metaphysis clearly visible. The longest  
149 axis of the ossified diaphysis is measured. The same technique as that used to establish the reference  
150 chart should be used with regard to the angle between the femur and the insonating ultrasound beams.

151 An angle of insonation between 45° and 90° is typical.

152 Caliper placement: Each caliper is placed at the ends of the ossified diaphysis without including the  
153 distal femoral epiphysis if it is visible

154

155

156 **Supplemental 2.** Multiple imputations for missing data of covariates.

157 We imputed missing data of the covariates using multiple imputations (17). The percentages of  
158 missing values for the confounders within the population for analysis were lower than 20%. For the  
159 multiple imputation, we the Markov chain Monte Carlo approach. In the imputation model, we  
160 included all confounders, plus maternal age, ethnicity, parity and prepregnancy BMI. Furthermore, we  
161 additionally added the studied determinants and outcomes in the imputation model as prediction  
162 variables only; they were not imputed themselves. Five imputed datasets were created and analyzed  
163 together.

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164