

SUPPLEMENTARY MATERIAL

Supplementary Table S1: ICD codes

Condition	ICD-9	ICD-10
Asthma	493	J45
Asthma-like conditions		
Atopic dermatitis	691, 692, 693	L20-30
Allergic rhinitis	477	J30
Urticaria	708	L50
Cystic fibrosis	277	E84
<i>Lower respiratory illness (combination of conditions below)</i>		
Bronchiolitis	466.1*, 516.34	J21*, J84.115
Pneumonia	480-486*, 770*	J10-18*, P23*,
Respiratory interstitial virus	079.6	J12.1, J20.5, J21.0, B97.4

Supplementary Table S2: ATC codes antibiotics

ATC code	Description
A02BD*	Combinations for eradication of <i>Helicobacter pylori</i>
A07A*	Intestinal anti-infective (antibiotics, sulfonamides, imidazole derivatives, other intestinal anti-infective)
A07F*	Antidiarrheal microorganism
G01AA*	Antibiotics as gynecological anti-infective and antiseptics, exclude combinations with corticosteroids
G01BA*	Antibiotics and corticosteroids as gynecological anti-infective and antiseptics in combinations with corticosteroids
J01*	Antibacterial for systemic use
J04*	Antimycobacterial for systemic use
L01D*	Cytotoxic antibiotics and related substances as antineoplastic agents
R02AB*	Antibiotics as throat preparations

Supplementary Table S3. Unadjusted multinomial analysis on the impact of maternal, perinatal, and early life factors on asthma control categories at preschool age.

	Controlled (ref) n=3728	Partly controlled (n=2629)	Uncontrolled (n=849)	LR chi ²	p- value	Pseudo r ²
	Relative risk	Relative risk (95% CI)	Relative risk (95% CI)			
Maternal asthma	1	0.86 (0.71, 1.03)	1.18 (0.92, 1.51)	6.14	0.047	0.0004
Maternal atopy	1	0.86 (0.75, 0.98)	0.98 (0.81, 1.18)	5.37	0.068	0.0004
Maternal antibiotics during pregnancy	1	1.08 (1.03, 1.13)	1.06 (0.99, 1.13)	12.77	0.002	0.0009
Hypertensive disorders in pregnancy	1	1.09 (0.89, 1.35)	1.20 (0.89, 1.61)	1.64	0.440	0.0001
Gestational diabetes	1	1.00 (0.81, 1.23)	1.38 (1.04, 1.81)	5.38	0.068	0.0004
Smoking during pregnancy	1	1.30 (1.14, 1.48)	1.07 (0.88, 1.31)	15.32	0.001	0.0011
SES - material	1	1.16 (1.05, 1.28)	0.99 (0.85, 1.15)	8.82	0.012	0.0007
SES - social	1	1.07 (0.96, 1.18)	0.98 (0.83, 1.14)	1.97	0.373	0.0001
Mode of delivery, C-section vs vaginal	1	1.11 (1.00, 1.23)	1.21 (1.03, 1.42)	7.14	0.028	0.0005
Maternal age at delivery				8.32	0.081	0.0006
<20 years		1.35 (1.04, 1.77)	1.26 (0.85, 1.88)			
20-35 years (ref)	1					
>35 years		0.94 (0.82, 1.06)	1.09 (0.90, 1.31)			
Child sex, male vs female	1	1.10 (0.99, 1.22)	1.22 (1.04, 1.43)	7.77	0.021	0.0006
Birthweight, <2500g	1	1.15 (0.97, 1.36)	0.98 (0.76, 1.27)	3.09	0.213	0.0005
Birthweight percentile category						
SGA		0.92 (0.78, 1.08)	0.89 (0.69, 1.14)	2.8	0.591	0.0002
AGA (ref)	1					
LGA		1.00 (0.84, 1.19)	1.14 (0.89, 1.46)			
Season birth						
Spring (Mar – Apr) (ref)	1			9.28	0.159	0.0007
Summer (Jun – Aug)		1.14 (0.99, 1.32)	1.18 (0.92, 1.46)			
Fall (Sep – Nov)		1.04 (0.90, 1.20)	1.16 (0.94, 1.43)			
Winter (Dec – Feb)		1.19 (1.03, 1.37)	1.21 (0.97, 1.49)			
NICU admission	1	1.17 (1.02, 1.36)	1.15 (0.93, 1.42)	2.27	0.072	0.0004
Jaundice	1	1.11 (0.90, 1.36)	1.16 (0.86, 1.57)	1.52	0.467	0.0001
Bronchopulmonary dysplasia	1	1.60 (0.99, 2.59)	2.22 (1.21, 4.06)	7.47	0.024	0.0005
Hospitalization for respiratory illness	1	2.38 (1.95, 2.92)	1.73 (1.28, 2.35)	73.1	<0.001	0.0053

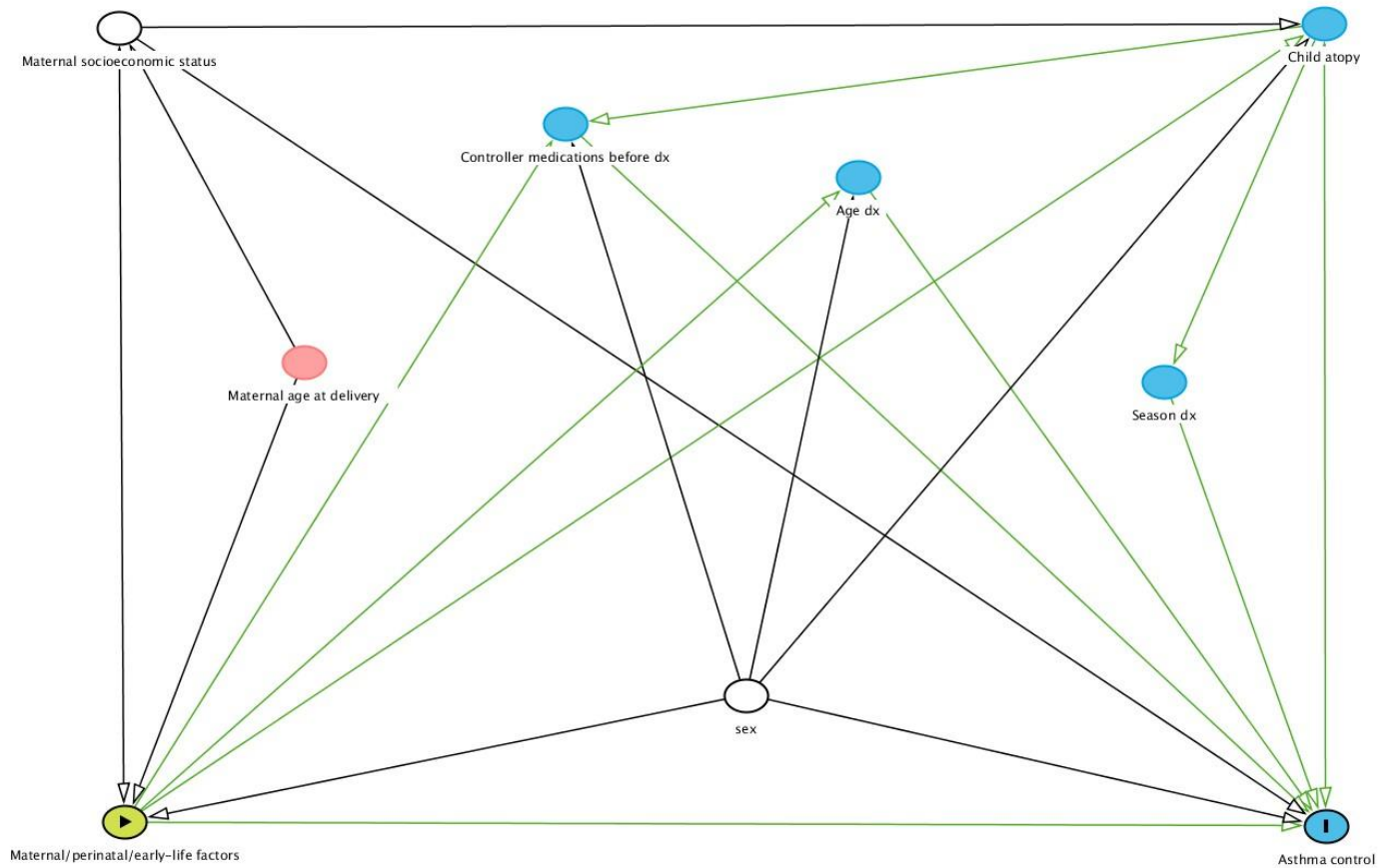
Antibiotics – child	1	1.06 (0.94, 1.20)	1.29 (1.06, 1.57)	6.94	0.031	0.0005
Controller medications before diagnosis	1	0.98 (0.88, 1.08)	1.60 (1.35, 1.89)	36.03	<0.001	0.0026
Age at diagnosis (<2.5 years)	1	1.41 (1.27, 1.56)	1.00 (0.86, 1.16)	49.08	<0.001	0.0035
Child atopy	1	0.95 (0.86, 1.05)	1.13 (0.97, 1.32)	5.21	0.074	0.0004

SES: socioeconomic status. The variables are analysed as yes vs no, unless otherwise specified.

Supplementary Table S4. Adjusted multinomial analysis on the impact of maternal, perinatal, and early life factors on asthma control trajectories at preschool age.

	Controlled (ref) n=3728	Partly controlled (n=2629)	Uncontrolled (n=849)
	Relative risk	Relative risk (95% CI)	Relative risk (95% CI)
Maternal asthma: yes vs no	1	0.85 (0.71, 1.04)	1.17 (0.91, 1.52)
Maternal atopy: yes vs no	1	0.85 (0.74, 0.97)	0.99 (0.81, 1.20)
Maternal antibiotics in pregnancy: yes vs no	1	1.19 (1.06, 1.33)	1.10 (0.93, 1.30)
Gestational diabetes: yes vs no	1	1.02 (0.82, 1.26)	1.41 (1.06, 1.87)
Smoking in pregnancy: yes vs no	1	1.18 (1.02, 1.37)	1.07 (0.86, 1.32)
Maternal age at delivery			
<20 years		1.14 (0.86, 1.51)	1.20 (0.79, 1.81)
20-35 years (reference)	1		
>35 years		0.99 (0.86, 1.13)	1.02 (0.84, 1.24)
Mode of delivery: C-section vs vaginal	1	1.11 (1.00, 1.25)	1.18 (1.00, 1.39)
Birthweight: under vs over 2500 grams		1.04 (0.87, 1.24)	0.85 (0.63, 1.13)
Season of birth			
Spring (reference)	1		
Summer		1.16 (1.00, 1.34)	1.16 (0.93, 1.45)
Fall		1.02 (0.88, 1.18)	1.12 (0.90, 1.40)
Winter		1.14 (0.99, 1.33)	1.22 (0.98, 1.51)
Bronchopulmonary dysplasia: yes vs no		1.30 (0.77, 2.20)	1.91 (0.92, 3.94)
Child antibiotics before asthma dx: yes vs no		1.09 (0.96, 1.24)	1.32 (1.08, 1.61)
Hospitalization for respiratory illness: yes vs no	1	2.24 (1.81, 2.76)	1.65 (1.19, 2.27)

The relative risk associated with each exposure and for partly controlled asthma and uncontrolled asthma compared to controlled asthma, adjusted for all other exposures included in model ($p < 0.1$ in univariate analysis), and covariates (child sex: male vs female, socioeconomic status [material]: low vs high). P-value for model < 0.0001 , LR χ^2 : 141.13, pseudo r^2 : 0.0107.



Supplementary figure 1. Directed acyclic graph of relationships between maternal, perinatal, and early-life factors, covariates, and childhood asthma control.