

Supplementary material

Duration and exclusiveness of breastfeeding and childhood asthma-related symptoms.

Short title: Breastfeeding and asthma-related symptoms

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Figure S1. Flow chart of participants in study.

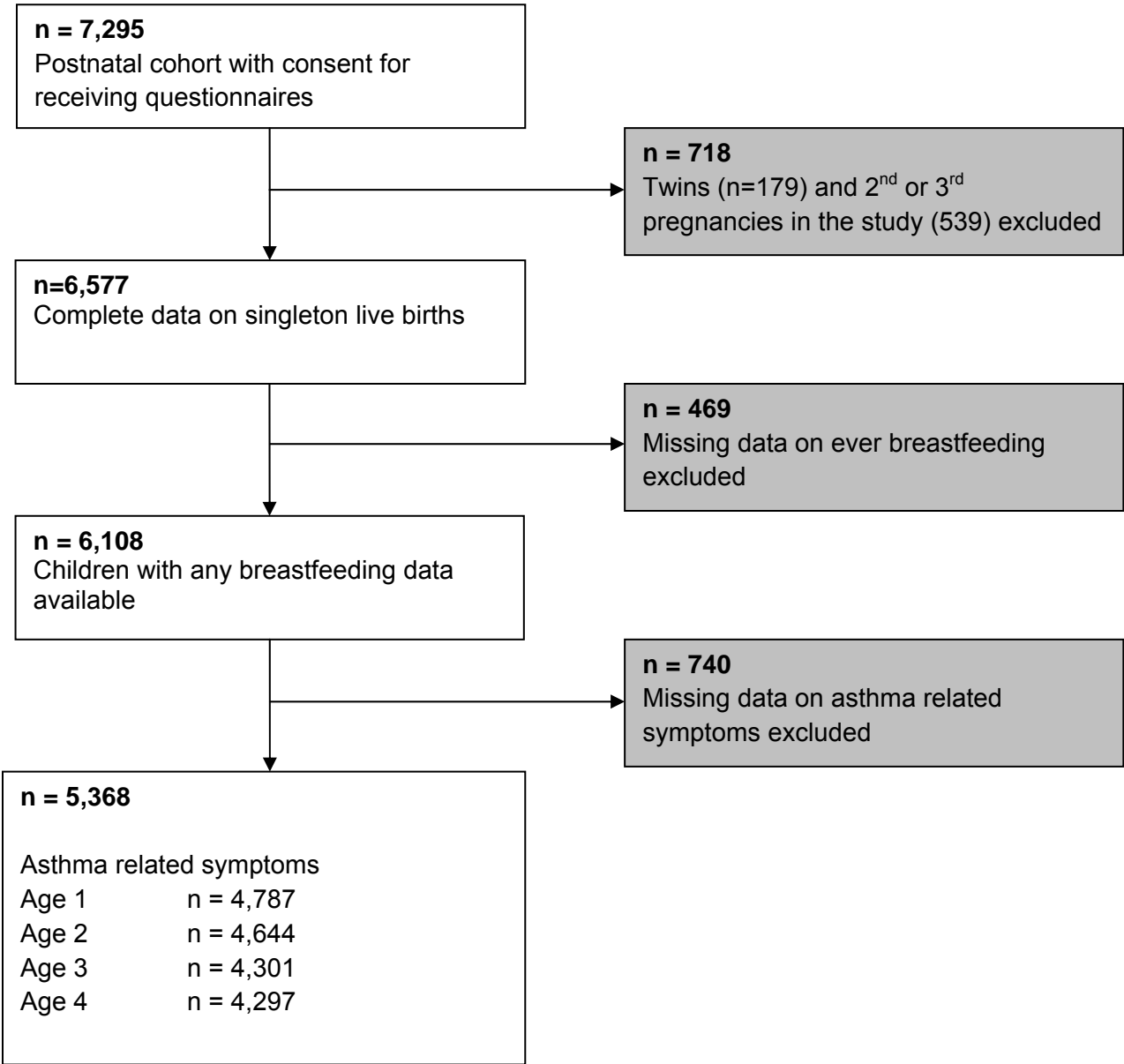


Table S1. Characteristics of children and their parents according to availability of data on asthma-related symptoms

	Singleton live births (n=6,577)		p-value
	Asthma-related symptoms data available (n=5,665)	No asthma-related symptoms data available (n=912)	
Maternal characteristics			
Age (years)	30.8 (4.9)	27.5 (5.6)	p<0.001
Education (%)			
Primary, or secondary	45.5 (2,576)	60 (547)	
Higher	48.0 (2,714)	12.4 (113)	p<0.001
Missing	6.6 (375)	27.6 (252)	
Ethnicity (%)			
European	63.8 (3,612)	20.4 (186)	
Non - European	31.5 (1,783)	54.4 (496)	p<0.001
Missing	4.8 (270)	25.2 (230)	
Parity (%)			
0	59.8 (3,388)	47.8 (436)	
≥1	36.9 (2,092)	48.1 (439)	p<0.001
Missing	3.3 (185)	4.1 (37)	
Smoking during pregnancy (%)			
No	69.2 (3,921)	53.5 (488)	
Yes	11.2 (634)	17.3 (158)	p<0.001
Missing	19.6 (1,110)	29.2 (266)	
Paternal characteristics			
Age (years)	33.5 (5.7)	30.7 (7.1)	p<0.001
Education (%)			
Primary, or secondary	29.0 (1,644)	21.5 (196)	
Higher	35.7 (2,021)	9.8 (90)	p<0.001
Missing	35.3 (2,000)	68.6 (626)	
Ethnicity (%)			
European	59.0 (3,342)	16.9 (154)	
Non - European	29.3 (1,661)	46.7 (426)	p<0.001
Missing	11.7 (662)	36.4 (332)	
Smoking (%)			
No	46.2 (2,617)	32.1 (293)	
Yes	34.6 (1,960)	38.2 (348)	p<0.001
Missing	19.2 (1,088)	29.7 (2,714)	
Child characteristics			
Male sex, no (%)	50.5 (2,858)	51.9 (473)	p=0.417

Gestational age at birth (%)			
<37 weeks	5.1 (291)	6.6 (60)	p=0.035
≥37 weeks	94.4 (5,346)	92.3 (842)	
Missing	0.5 (28)	1.1 (10)	
Birth weight (grams)			
	3,435 (556)	3,319 (525)	p<0.001
Parental history of asthma or atopy (%)			
No	47.8 (2,706)	44.1 (402)	p<0.001
Yes	45.8 (2,597)	31.7 (289)	
Missing	6.4 (362)	24.2 (221)	
Day care attendance 1 st year (%)			
No	39.2 (2,218)	1.5 (14)	p=0.027
Yes	42.0 (2,380)	0.5 (5)	
Missing	18.8 (1,067)	97.9 (893)	
Pet keeping (%)			
No	53.3 (3,018)	53.7 (490)	p<0.001
Yes	26.8 (1,519)	16.7 (152)	
Missing	19.9 (1,128)	29.6 (270)	
Ever eczema (%)			
No	75.0 (4,247)	2.1 (19)	p=0.492
Yes	23.6 (1,339)	0.9 (8)	
Missing	1.4 (79)	97.0 (885)	
Ever lower respiratory tract infections (%)			
No	76.6 (4,339)	19.5 (178)	p<0.001
Yes	22.8 (1,291)	2.0 (18)	
Missing	0.6 (35)	78.5 (716)	
Breastfeeding ever (%)			
No	7.3 (416)	8.3 (76)	p=0.018
Yes	87.4 (4,952)	72.8 (664)	
Missing	5.2 (297)	18.9 (172)	
Duration of breastfeeding (%)			
Never	12.6 (713)	27.2 (248)	p<0.001
0-3 months	27.9 (1,580)	21.1 (192)	
3-6 months	16.3 (923)	5.8 (53)	
>6 months	24.0 (1,361)	0.4 (4)	p<0.001
Missing	19.2 (1,088)	45.5 (415)	
Exclusive breastfeeding (%)			
Never	7.3 (416)	8.3 (76)	p<0.001
Non-exclusive 4 months	50.8 (2,880)	32.8 (299)	
Exclusive 4 months	18.7 (1,057)	3.7 (34)	
Missing	23.2 (1,312)	55.2 (503)	

Values are shown in % (absolute numbers). Differences in parental and child characteristics were evaluated using Student's t- test for continuous variables and chi-squared tests for categorical variables.

Table S2. Crude associations of breastfeeding duration and exclusivity with asthma-related symptoms until the age of 4 years.

	Odds ratio of wheezing (95% Confidence Interval)											
	Age 1 year			Age 2 years			Age 3 years			Age 4 years		
	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year
Duration breastfeeding n=4,280	n=1,124	n=858	n=266	n=740	n=605	n=135	n=422	n=334	n=88	n=425	n=345	n=80
Never (n=416)	1.66** (1.29, 2.14) n=123	1.53** (1.15, 2.03) n=88	2.12** (1.39, 3.26) n=35	1.47* (1.10, 1.97) n=79	1.47* (1.07, 2.02) n=64	1.48 (0.80, 2.72) n=15	1.25 (0.87, 1.79) n=45	1.19 (0.79, 1.78) n=35	1.51 (0.72, 3.20) n=10	1.39 (0.98, 1.98) n=49	1.34 (0.90, 2.00) n=37	1.58 (0.79, 3.13) n=12
0-3 months (n=1,580)	1.33** (1.12, 1.57) n=417	1.29** (1.07, 1.56) n=316	1.44* (1.06, 1.97) n=101	1.37** (1.13, 1.67) n=291	1.40** (1.13, 1.73) n=240	1.27 (0.83, 1.94) n=51	1.22 (0.95, 1.56) n=160	1.15 (0.87, 1.51) n=123	1.54 (0.91, 2.59) n=37	1.10 (0.86, 1.41) n=156	1.17 (0.89, 1.54) n=130	0.85 (0.50, 1.45) n=26
3-6 months (n=923)	1.23* (1.01, 1.49) n=247	1.23 (0.99, 1.51) n=192	1.23 (0.85, 1.76) n=55	1.19 (0.95, 1.50) n=164	1.20 (0.94, 1.54) n=134	1.15 (0.71, 1.88) n=30	0.99 (0.74, 1.33) n=86	0.98 (0.71, 1.34) n=69	1.07 (0.57, 2.01) n=17	1.07 (0.71, 1.27) n=86	1.03 (0.75, 1.41) n=73	0.67 (0.34, 1.29) n=13
> 6 months (n=1,361)	Reference n=337	Reference n=262	Reference n=75	Reference n=206	Reference n=167	Reference n=39	Reference n=131	Reference n=107	Reference n=24	Reference n=134	Reference n=105	Reference n=29
<i>P for trend</i>	<i>p</i> <0.001	<i>p</i> =0.001	<i>p</i> =0.001	<i>p</i> =0.001	<i>p</i> =0.001	<i>p</i> =0.158	<i>p</i> =0.076	<i>p</i> =0.237	<i>p</i> =0.089	<i>p</i> =0.091	<i>p</i> =0.104	<i>p</i> =0.548
Exclusive breastfeeding n=4,353	n=1,124	n=857	n=267	n=762	n=627	n=135	n=432	n=340	n=92	n=444	n=365	n=79
Never (n=416)	1.68** (1.29, 2.19) n=123	1.51** (1.12, 2.02) n=88	2.38** (1.51, 3.77) n=35	1.58** (1.17, 2.15) n=79	1.52* (1.09, 2.12) n=64	1.93 (1.00, 3.73) n=15	1.32 (0.91, 1.93) n=45	1.24 (0.82, 1.89) n=35	1.71 (0.78, 3.78) n=10	1.57* (1.08, 2.27) n=49	1.42 (0.94, 2.14) n=37	2.33* (1.09, 4.99) n=12
Non-exclusive until 4 months (n=2,880)	1.29** (1.09, 1.53) n=757	1.23* (1.02, 1.47) n=574	1.55** (1.12, 2.16) n=183	1.43** (1.17, 1.74) n=529	1.39** (1.12, 1.72) n=433	1.67* (1.06, 2.62) n=96	1.22 (0.96, 1.55) n=288	1.14 (0.87, 1.49) n=223	1.60 (0.93, 2.75) n=65	1.28* (1.00, 1.63) n=298	1.27 (0.98, 1.65) n=247	1.33 (0.75, 2.34) n=51
Exclusive until 4 months (n=1,057)	Reference n=244	Reference n=195	Reference n=49	Reference n=154	Reference n=130	Reference n=24	Reference n=99	Reference n=82	Reference n=17	Reference n=97	Reference n=81	Reference n=16
<i>P for trend</i>	<i>p</i> <0.001	<i>p</i> =0.004	<i>p</i> <0.001	<i>p</i> <0.001	<i>p</i> =0.002	<i>p</i> =0.021	<i>p</i> =0.084	<i>p</i> =0.250	<i>p</i> =0.100	<i>p</i> =0.010	<i>p</i> =0.050	<i>p</i> =0.043
	Odds ratio of shortness of breath (95% Confidence Interval)											
	Age 1 year			Age 2 years			Age 3 years			Age 4 years		
	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year

Duration breastfeeding n=4,280	n=876	n=679	n=197	n=681	n=524	n=157	n=397	n=311	n=86	n=368	n=286	n=82
Never (n=416)	1.46** (1.10, 1.90) n=90	1.21 (0.89, 1.66) n=62	2.50** (1.54, 4.06) n=28	1.21 (0.90, 1.64) n=70	1.01 (0.71, 1.44) n=46	1.92* (1.15, 3.20) n=24	1.14 (0.80, 1.64) n=45	1.06 (0.71, 1.58) n=34	1.51 (0.74, 3.10) n=11	1.38 (0.96, 1.99) n=46	1.22 (0.80, 1.86) n=32	1.96* (1.01, 3.79) n=14
0 -3 months (n=1,580)	1.25* (1.04, 1.50) n=320	1.15 (0.94, 1.40) n=241	1.72** (1.19, 2.48) n=79	1.16 (0.95, 1.42) n=262	1.15 (0.92, 1.43) n=203	1.21 (0.82, 1.80) n=59	0.96 (0.75, 1.23) n=140	0.88 (0.67, 1.16) n=105	1.30 (0.78, 2.17) n=35	1.00 (0.77, 1.29) n=133	0.96 (0.72, 1.29) n=101	1.12 (0.67, 1.88) n=32
3 -6 months (n=923)	1.23 (1.00, 1.52) n=199	1.18 (0.94, 1.49) n=157	1.45 (0.94, 2.21) n=42	0.91 (0.72, 1.15) n=136	0.92 (0.71, 1.20) n=108	0.87 (0.54, 1.40) n=28	0.73* (0.54, 0.99) n=71	0.72 (0.52, 1.00) n=57	0.78 (0.41, 1.51) n=14	0.73 (0.53, 1.00) n=63	0.80 (0.57, 1.13) n=54	0.49 (0.23, 1.04) n=9
> 6 months (n=1,361)	Reference n=267	Reference n=219	Reference n=48	Reference n=213	Reference n=167	Reference n=46	Reference n=141	Reference n=115	Reference n=26	Reference n=126	Reference n=99	Reference n=27
<i>P for trend</i>	p=0.003	p=0.141	p<0.001	p=0.064	p=0.337	p=0.021	p=0.631	p=0.844	p=0.142	p=0.188	p=0.573	p=0.067
Exclusive breastfeeding n=4,353	n=866	n=674	n=192	n=692	n=540	n=152	n=401	n=311	n=90	n=378	n=289	n=89
Never (n=416)	1.40* (1.05, 1.86) n=90	1.11 (0.80, 1.53) n=62	3.35** (1.93, 5.81) n=28	1.35 (0.98, 1.84) n=70	1.07 (0.75, 1.54) n=46	2.65** (1.50, 4.67) n=24	1.30 (0.89, 1.89) n=45	1.18 (0.77, 1.80) n=34	1.88 (0.87, 4.07) n=11	1.65* (1.13, 2.42) n=46	1.52 (0.97, 2.37) n=32	2.06* (1.03, 4.10) n=14
Non-exclusive until 4 months (n=2,880)	1.15 (0.96, 1.38) n=576	1.01 (0.83, 1.23) n=438	2.13** (1.39, 3.26) n=138	1.22 (1.00, 1.49) n=467	1.16 (0.93, 1.44) n=366	1.51 (0.98, 2.33) n=101	1.04 (0.82, 1.33) n=255	0.95 (0.73, 1.24) n=193	1.51 (0.88, 2.59) n=62	1.18 (0.91, 1.53) n=246	1.22 (0.91, 1.63) n=192	1.06 (0.64, 1.77) n=54
Exclusive until 4 months (n=1,057)	Reference n=200	Reference n=174	Reference n=26	Reference n=155	Reference n=128	Reference n=27	Reference n=101	Reference n=84	Reference n=17	Reference n=86	Reference n=65	Reference n=21
<i>P for trend</i>	p=0.020	p=0.632	p<0.001	p=0.029	p=0.368	p=0.001	p=0.254	p=0.691	p=0.078	p=0.016	p=0.058	p=0.097

Odds ratio of dry cough (95% Confidence Interval)

Duration breastfeeding n=4,280	Age 1 year	Age 2 years	Age 3 years	Age 4 years
	Ever	Ever	Ever	Ever
	n=846	n=891	n=806	n=909
Never (n=416)	1.22 (0.92, 1.62) n=82	1.14 (0.86, 1.52) n=82	1.32 (0.98, 1.76) n=79	1.07 (0.81, 1.42) n=85
0-3 months (n=1,580)	1.14 (0.95, 1.37) n=307	1.23 (1.03, 1.48)* n=337	1.52 (1.25, 1.85)** n=318	1.16 (0.97, 1.39) n=350

3-6 months (n=923)	1.07 (0.86, 1.32) n=183	1.23 (1.00, 1.51) n=210	1.38 (1.11, 1.72)** n=189	0.89 (0.72, 1.10) n=178
> 6 months (n=1,361)	Reference n=274	Reference n=262	Reference n=220	Reference n=296
<i>P for trend</i>	p=0.091	p=0.073	p<0.001	p=0.132

Exclusive breastfeeding n=4,353	n=842	n=910	n=846	n=937
Never (n=416)	1.31 (0.97, 1.75) n=82	1.13 (0.85, 1.52) n=82	1.20 (0.89, 1.62) n=79	1.16 (0.87, 1.56) n=85
Non-exclusive until 4 months (n=2,880)	1.21 (1.01, 1.46)* n=570	1.20 (1.01, 1.44)* n=619	1.33 (1.10, 1.60)** n=578	1.19 (1.00, 1.43)* n=629
Exclusive until 4 months (n=1,057)	Reference n=190	Reference n=209	Reference n=189	Reference n=223
<i>P for trend</i>	p=0.030	p=0.135	p=0.032	p=0.108

Odds ratio of persistent phlegm (95% Confidence Interval)

	Age 1 year	Age 2 years	Age 3 years	Age 4 years
	Ever	Ever	Ever	Ever
Duration breastfeeding n=4,280	n=507	n=357	n=213	n=237
Never (n=416)	1.42 (1.00, 2.01) n=49	1.44 (0.97, 2.12) n=39	1.83 (1.14, 2.94)* n=28	2.54 (1.63, 3.94)** n=36
0 -3 months (n=1,580)	1.58 (1.26, 1.99)** n=213	1.40 (1.07, 1.82)* n=147	1.56 (1.10, 2.20)* n=88	1.83 (1.31, 2.57)** n=103
3 -6 months (n=923)	1.19 (0.91, 1.56) n=104	1.01 (0.73, 1.39) n=70	1.09 (0.72, 1.66) n=41	1.19 (0.79, 1.79) n=43
> 6 months (n=1,361)	Reference n=141	Reference n=101	Reference n=56	Reference n=55
<i>P for trend</i>	p<0.001	p=0.006	p=0.002	p<0.001

Exclusive breastfeeding n=4,353	n=509	n=365	n=229	n=251
Never (n=416)	1.45 (1.01, 2.09)* n=49	1.52 (1.01, 2.28)* n=39	1.97 (1.20, 3.24)** n=28	2.88 (1.80, 4.62)** n=36
Non-exclusive until 4 months (n=2,880)	1.44 (1.14, 1.83)** n=359	1.32 (1.01, 1.72)* n=250	1.59 (1.12, 2.26)** n=159	1.89 (1.33, 2.70)** n=176
Exclusive until 4 months (n=1,057)	<i>Reference</i> n=101	<i>Reference</i> n=76	<i>Reference</i> n=42	<i>Reference</i> n=39
<i>P for trend</i>	<i>p=0.006</i>	<i>p=0.022</i>	<i>p=0.003</i>	<i>p<0.001</i>

Values are odds ratios with 95% confidence intervals from multiple logistic regression models.

*P < 0.05 and **p < 0.01.

Table S3. Non-imputed adjusted associations of breastfeeding duration and exclusivity with asthma-related symptoms until the age of 4 years.

	Odds ratio of wheezing (95% Confidence Interval)											
	Age 1 year			Age 2 years			Age 3 years			Age 4 years		
	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year
Duration breastfeeding n=4,280	n=1,124	n=858	n=266	n=740	n=605	n=135	n=422	n=334	n=88	n=425	n=345	n=80
Never (n=416)	1.55** (1.18, 2.03) n=123	1.46* (1.08, 1.98) n=88	1.78* (1.12, 3.84) n=35	1.42* (1.04, 1.95) n=79	1.41 (1.00, 1.98) n=64	1.47 (0.75, 2.89) n=15	1.17 (0.79, 1.73) n=45	1.16 (0.75, 1.77) n=35	1.14 (0.47, 2.77) n=10	1.54* (1.05, 2.24) n=49	1.50 (0.99, 2.28) n=37	1.44 (0.68, 3.06) n=12
0-3 months (n=1,580)	1.30** (1.08, 1.56) n=417	1.29* (1.06, 1.57) n=316	1.34 (0.96, 1.88) n=101	1.32* (1.07, 1.64) n=291	1.34* (1.06, 1.69) n=240	1.26 (0.79, 2.01) n=51	1.10 (0.84, 1.44) n=160	1.03 (0.77, 1.39) n=123	1.41 (0.79, 2.51) n=37	0.97 (0.74, 1.28) n=156	1.06 (0.79, 1.43) n=130	0.62 (0.34, 1.14) n=26
3-6 months (n=923)	1.18 (0.97, 1.45) n=247	1.20 (0.96, 1.50) n=192	1.13 (0.77, 1.65) n=55	1.13 (0.95, 1.52) n=164	1.20 (0.94, 1.58) n=134	1.11 (0.66, 1.88) n=30	0.98 (0.73, 1.33) n=86	0.97 (0.69, 1.35) n=69	1.03 (0.52, 2.01) n=17	0.94 (0.70, 1.27) n=86	1.01 (0.72, 1.40) n=73	0.68 (0.35, 1.34) n=13
> 6 months (n=1,361)	Reference n=337	Reference n=262	Reference n=75	Reference n=206	Reference n=167	Reference n=39	Reference n=131	Reference n=107	Reference n=24	Reference n=134	Reference n=105	Reference n=29
<i>P for trend</i>	<i>p</i><0.001	<i>p</i>=0.003	<i>p</i>=0.011	<i>p</i>=0.005	<i>p</i>=0.009	<i>p</i>=0.199	<i>p</i>=0.351	<i>p</i>=0.560	<i>p</i>=0.350	<i>p</i>=0.190	<i>p</i>=0.160	<i>p</i>=0.826
Exclusive breastfeeding n=4,353	n=1,124	n=857	n=267	n=762	n=627	n=135	n=432	n=340	n=92	n=444	n=365	n=79
Never (n=416)	1.56** (1.18, 2.06) n=123	1.43* (1.05, 1.95) n=88	2.00** (1.22, 3.30) n=35	1.55** (1.12, 2.14) n=79	1.47* (1.04, 2.09) n=64	1.99 (0.97, 4.08) n=15	1.25 (0.84, 1.88) n=45	1.23 (0.79, 1.91) n=35	1.29 (0.51, 3.26) n=10	1.75** (1.18, 2.58) n=49	1.59* (1.03, 2.44) n=37	2.22 (0.97, 5.09) n=12
Non-exclusive until 4 months (n=2,880)	1.27** (1.06, 1.51) n=757	1.22* (1.01, 1.48) n=574	1.48* (1.05, 2.09) n=183	1.42** (1.15, 1.75) n=529	1.37** (1.09, 1.71) n=433	1.73* (1.06, 2.82) n=96	1.16 (0.90, 1.51) n=288	1.08 (0.81, 1.43) n=223	1.58 (0.88, 2.83) n=65	1.19 (0.92, 1.54) n=298	1.17 (0.89, 1.55) n=247	1.20 (0.64, 2.22) n=51
Exclusive until 4 months (n=1,057)	Reference n=244	Reference n=195	Reference n=49	Reference n=154	Reference n=130	Reference n=24	Reference n=99	Reference n=82	Reference n=17	Reference n=97	Reference n=81	Reference n=16
<i>P for trend</i>	<i>p</i>=0.001	<i>p</i>=0.012	<i>p</i>=0.004	<i>p</i>=0.001	<i>p</i>=0.007	<i>p</i>=0.025	<i>p</i>=0.203	<i>p</i>=0.372	<i>p</i>=0.305	<i>p</i>=0.009	<i>p</i>=0.046	<i>p</i>=0.093
	Odds ratio of shortness of breath (95% Confidence Interval)											
	Age 1 year			Age 2 years			Age 3 years			Age 4 years		
	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year

Duration breastfeeding n=4,280	n=876	n=679	n=197	n=681	n=524	n=157	n=397	n=311	n=86	n=368	n=286	n=82
Never (n=416)	1.27 (0.94, 1.71) n=90	1.07 (0.76, 1.51) n=62	2.11** (1.23, 3.60) n=28	1.17 (0.85, 1.62) n=70	1.00 (0.69, 1.46) n=46	1.73 (0.98, 3.07) n=24	1.09 (0.74, 1.61) n=45	1.01 (0.65, 1.55) n=34	1.38 (0.61, 3.12) n=11	1.43 (0.97, 2.10) n=46	1.25 (0.81, 1.95) n=32	2.01 (0.99, 4.09) n=14
0-3 months (n=1,580)	1.31** (1.07, 1.59) n=320	1.21 (0.98, 1.51) n=241	1.73** (1.16, 2.59) n=79	1.20 (0.97, 1.49) n=262	1.18 (0.93, 1.50) n=203	1.29 (0.84, 1.99) n=59	0.89 (0.68, 1.17) n=140	0.82 (0.61, 1.11) n=105	1.21 (0.67, 2.17) n=35	0.94 (0.71, 1.24) n=133	0.91 (0.66, 1.24) n=101	1.03 (0.58, 1.83) n=32
3-6 months (n=923)	1.23 (0.98, 1.53) n=199	1.19 (0.94, 1.51) n=157	1.36 (0.86, 2.14) n=42	0.90 (0.70, 1.16) n=136	0.90 (0.68, 1.18) n=108	0.91 (0.55, 1.52) n=28	0.73 (0.53, 1.00) n=71	0.69* (0.49, 0.98) n=57	0.89 (0.45, 1.77) n=14	0.67* (0.48, 0.4) n=63	0.71 (0.49, 1.02) n=54	0.52 (0.24, 1.13) n=9
> 6 months (n=1,361)	Reference n=267	Reference n=219	Reference n=48	Reference n=213	Reference n=167	Reference n=46	Reference n=141	Reference n=115	Reference n=26	Reference n=126	Reference n=99	Reference n=27
<i>P for trend</i>	p=0.013	p=0.199	p=0.001	p=0.076	p=0.314	p=0.044	p=0.963	p=0.554	p=0.343	p=0.246	p=0.651	p=0.113
Exclusive breastfeeding n=4,353	n=866	n=674	n=192	n=692	n=540	n=152	n=401	n=311	n=90	n=378	n=289	n=89
Never (n=416)	1.26 (0.92, 1.72) n=90	1.01 (0.71, 1.43) n=62	2.97** (1.62, 5.43) n=28	1.33 (0.95, 1.87) n=70	1.10 (0.75, 1.61) n=46	2.34** (1.26, 4.35) n=24	1.26 (0.84, 1.88) n=45	1.15 (0.74, 1.79) n=34	1.70 (0.71, 4.05) n=11	1.80** (1.20, 2.70) n=46	1.67* (1.04, 2.66) n=32	2.12* (1.01, 4.45) n=14
Non-exclusive until 4 months (n=2,880)	1.24* (1.02, 1.50) n=576	1.08 (0.88, 1.33) n=438	2.31** (1.46, 3.66) n=138	1.27* (1.03, 1.58) n=467	1.22 (0.97, 1.53) n=366	1.58 (0.99, 2.51) n=101	1.02 (0.79, 1.32) n=255	0.92 (0.69, 1.22) n=193	1.60 (0.88, 2.92) n=62	1.20 (0.91, 1.58) n=246	1.26 (0.92, 1.72) n=192	1.05 (0.60, 1.83) n=54
Exclusive until 4 months (n=1,057)	Reference n=200	Reference n=174	Reference n=26	Reference n=155	Reference n=128	Reference n=27	Reference n=101	Reference n=84	Reference n=17	Reference n=86	Reference n=65	Reference n=21
<i>P for trend</i>	p=0.047	p=0.707	p<0.001	p=0.030	p=0.279	p=0.006	p=0.376	p=0.849	p=0.146	p=0.008	p=0.031	p=0.103

Odds ratio of dry cough (95% Confidence Interval)

	Age 1 year		Age 2 years		Age 3 years		Age 4 years	
	Ever		Ever		Ever		Ever	
Duration breastfeeding n=4,280		n=846		n=891		n=806		n=909
Never (n=416)		1.28 (0.95, 1.72) n=82		1.21 (0.90, 1.63) n=82		1.33 (0.96, 1.82) n=79		1.13 (0.84, 1.53) n=85
0-3 months (n=1,580)		1.17 (0.96, 1.43) n=307		1.19 (0.97, 1.45) n=337		1.42 (1.15, 1.76)** n=318		1.14 (0.93, 1.38) n=350

3-6 months (n=923)	1.16 (0.93, 1.44) n=183	1.26 (1.02, 1.56)* n=210	1.43 (1.14, 1.80)** n=189	0.93 (0.75, 1.16) n=178
> 6 months (n=1,361)	Reference n=274	Reference n=262	Reference n=220	Reference n=296
<i>P for trend</i>	p=0.060	p=0.105	p=0.005	p=0.159

Exclusive breastfeeding n=4,353	n=842	n=910	n=846	n=937
Never (n=416)	1.34 (0.98, 1.84) n=82	1.18 (0.87, 1.60) n=82	1.20 (0.87, 1.64) n=79	1.22 (0.90, 1.65) n=85
Non-exclusive until 4 months (n=2,880)	1.27 (1.04, 1.54)* n=570	1.17 (0.97, 1.41) n=619	1.27 (1.05, 1.54)* n=578	1.18 (0.98, 1.42) n=629
Exclusive until 4 months (n=1,057)	Reference n=190	Reference n=209	Reference n=189	Reference n=223
<i>P for trend</i>	p=0.018	p=0.135	p=0.065	p=0.091

Odds ratio of persistent phlegm (95% Confidence Interval)

	Age 1 year	Age 2 years	Age 3 years	Age 4 years
	Ever	Ever	Ever	Ever
Duration breastfeeding n=4,280	n=507	n=357	n=213	n=237
Never (n=416)	1.61 (1.10, 2.35) * n=49	1.36 (0.89, 2.06) n=39	1.38 (0.82, 2.33) n=28	2.78 (1.75, 4.43)** n=36
0 -3 months (n=1,580)	1.58 (1.23, 2.03)** n=213	1.16 (0.86, 1.55) n=147	1.17 (0.80, 1.71) n=88	1.55 (1.07, 2.26)* n=103
3 -6 months (n=923)	1.29 (0.96, 1.72) n=104	1.04 (0.74, 1.45) n=70	0.96 (0.61, 1.49) n=41	1.20 (0.78, 1.85) n=43
> 6 months (n=1,361)	Reference n=141	Reference n=101	Reference n=56	Reference n=55
<i>P for trend</i>	p<0.001	p=0.140	p=0.185	p<0.001

Exclusive breastfeeding n=4,353	n=509	n=365	n=229	n=251
Never (n=416)	1.49 (1.01, 2.21)* n=49	1.36 (0.88, 2.10) n=39	1.56 (0.90, 2.70) n=28	3.01 (1.83, 4.95)** n=36
Non-exclusive until 4 months (n=2,880)	1.35 (1.05, 1.74)* n=359	1.14 (0.86, 1.52) n=250	1.34 (0.92, 1.96) n=159	1.68 (1.15, 2.46)** n=176
Exclusive until 4 months (n=1,057)	<i>Reference</i> n=101	<i>Reference</i> n=76	<i>Reference</i> n=42	<i>Reference</i> n=39
<i>P for trend</i>	<i>p=0.016</i>	<i>p=0.162</i>	<i>p=0.081</i>	<i>p<0.001</i>

Values are odds ratios with 95% confidence intervals from multiple logistic regression models.

*P < 0.05 and **p < 0.01. Models are adjusted for parental age, education, ethnicity, smoking habits, maternal parity, children's sex, gestational age, birth weight, parental history of asthma or atopy, daycare attendance and pet keeping missing values were treated as a separate category.

Table S4. Imputed and adjusted associations of breastfeeding duration and exclusivity with frequencies of wheezing and shortness of breath until the age of 4 years.

	Odds ratio of wheezing (95% Confidence Interval)											
	Age 1 year			Age 2 years			Age 3 years			Age 4 years		
	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year
Duration breastfeeding n=4,280	n=1,124	n=858	n=266	n=740	n=605	n=135	n=422	n=334	n=88	n=425	n=345	n=80
Never (n=416)	1.68** (1.28, 2.19) n=123	1.59** (1.18, 2.13) n=88	1.93** (1.23, 3.03) n=35	1.37* (1.01, 1.85) n=79	1.36 (0.97, 1.89) n=64	1.45 (0.77, 2.73) n=15	1.12 (0.76, 1.62) n=45	1.05 (0.69, 1.59) n=35	1.39 (0.64, 3.03) n=10	1.28 (0.88, 1.84) n=49	1.25 (0.82, 1.88) n=37	1.32 (0.64, 2.71) n=12
0-3 months (n=1,580)	1.28** (1.07, 1.53) n=417	1.27* (1.04, 1.54) n=316	1.38 (0.99, 1.91) n=101	1.28* (1.04, 1.58) n=291	1.30* (1.04, 1.62) n=240	1.23 (0.79, 1.91) n=51	1.12 (0.86, 1.45) n=160	1.04 (0.78, 1.38) n=123	1.51 (0.87, 2.58) n=37	1.02 (0.78, 1.31) n=156	1.10 (0.82, 1.46) n=130	0.75 (0.43, 1.31) n=26
3-6 months (n=923)	1.19 (0.97, 1.44) n=247	1.20 (0.96, 1.49) n=192	1.15 (0.80, 1.67) n=55	1.17 (0.93, 1.47) n=164	1.17 (0.91, 1.50) n=134	1.15 (0.70, 1.88) n=30	1.00 (0.75, 1.33) n=86	0.98 (0.71, 1.34) n=69	1.10 (0.58, 2.06) n=17	0.98 (0.73, 1.31) n=86	1.07 (0.78, 1.47) n=73	0.66 (0.34, 1.29) n=13
> 6 months (n=1,361)	Reference n=337	Reference n=262	Reference n=75	Reference n=206	Reference n=167	Reference n=39	Reference n=131	Reference n=107	Reference n=24	Reference n=134	Reference n=105	Reference n=29
<i>P for trend</i>	<i>p</i> <0.001	<i>p</i> =0.001	<i>p</i> =0.004	<i>p</i> =0.010	<i>p</i> =0.016	<i>p</i> =0.222	<i>p</i> =0.371	<i>p</i> =0.758	<i>p</i> =0.159	<i>p</i> =0.376	<i>p</i> =0.321	<i>p</i> =0.978
Exclusive breastfeeding n=4,353	n=1,124	n=857	n=267	n=762	n=627	n=135	n=432	n=340	n=92	n=444	n=365	n=79
Never (n=416)	1.68** (1.27, 2.22) n=123	1.54** (1.13, 2.10) n=88	2.22** (1.36, 3.60) n=35	1.43* (1.04, 1.95) n=79	1.35 (0.96, 1.90) n=64	1.91 (0.96, 3.79) n=15	1.18 (0.79, 1.74) n=45	1.10 (0.71, 1.70) n=35	1.53 (0.67, 3.49) n=10	1.40 (0.95, 2.05) n=49	1.27 (0.83, 1.95) n=37	1.96 (0.88, 4.33) n=12
Non-exclusive until 4 months (n=2,880)	1.22* (1.02, 1.45) n=757	1.17 (0.96, 1.41) n=574	1.50* (1.07, 2.10) n=183	1.32** (1.08, 1.62) n=529	1.27* (1.02, 1.58) n=433	1.61* (1.01, 2.56) n=96	1.12 (0.87, 1.44) n=288	1.04 (0.79, 1.36) n=223	1.55 (0.89, 2.70) n=65	1.18 (0.92, 1.52) n=298	1.17 (0.89, 1.54) n=247	1.21 (0.67, 2.16) n=51
Exclusive until 4 months (n=1,057)	Reference n=244	Reference n=195	Reference n=49	Reference n=154	Reference n=130	Reference n=24	Reference n=99	Reference n=82	Reference n=17	Reference n=97	Reference n=81	Reference n=16
<i>P for trend</i>	<i>p</i> <0.001	<i>p</i> =0.008	<i>p</i> =0.001	<i>p</i> =0.007	<i>p</i> =0.033	<i>p</i> =0.033	<i>p</i> =0.334	<i>p</i> =0.667	<i>p</i> =0.186	<i>p</i> =0.075	<i>p</i> =0.201	<i>p</i> =0.127
	Odds ratio of shortness of breath (95% Confidence Interval)											
	Age 1 year			Age 2 years			Age 3 years			Age 4 years		
	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year	Ever	1-3 times per year	≥ 4 times per year

Duration breastfeeding n=4,280	n=876	n=679	n=197	n=681	n=524	n=157	n=397	n=311	n=86	n=368	n=286	n=82
Never (n=416)	1.44* (1.08, 1.92) n=90	1.27 (0.92, 1.76) n=62	2.11** (1.26, 3.50) n=28	1.13 (0.82, 1.54) n=70	0.97 (0.67, 1.40) n=46	1.69 (0.99, 2.87) n=24	1.00 (0.69, 1.45) n=45	0.95 (0.62, 1.43) n=34	1.26 (0.59, 2.66) n=11	1.15 (0.78, 1.68) n=46	1.07 (0.69, 1.65) n=32	1.44 (0.72, 2.90) n=14
0-3 months (n=1,580)	1.31** (1.08, 1.58) n=320	1.23 (1.00, 1.52) n=241	1.67* (1.13, 2.45) n=79	1.15 (0.93, 1.41) n=262	1.16 (0.92, 1.47) n=203	1.10 (0.73, 1.66) n=59	0.90 (0.70, 1.17) n=140	0.84 (0.63, 1.12) n=105	1.20 (0.70, 2.05) n=35	0.90 (0.69, 1.18) n=133	0.90 (0.66, 1.21) n=101	0.93 (0.54, 1.59) n=32
3-6 months (n=923)	1.23 (0.99, 1.52) n=199	1.19 (0.94, 1.50) n=157	1.37 (0.89, 2.11) n=42	0.89 (0.70, 1.12) n=136	0.90 (0.69, 1.18) n=108	0.84 (0.52, 1.36) n=28	0.75 (0.55, 1.01) n=71	0.73 (0.52, 1.02) n=57	0.83 (0.43, 1.61) n=14	0.72* (0.52, 0.99) n=63	0.79 (0.56, 1.12) n=54	0.49 (0.23, 1.05) n=9
> 6 months (n=1,361)	Reference n=267	Reference n=219	Reference n=48	Reference n=213	Reference n=167	Reference n=46	Reference n=141	Reference n=115	Reference n=26	Reference n=126	Reference n=99	Reference n=27
<i>P for trend</i>	p=0.002	p=0.045	p=0.001	p=0.169	p=0.415	p=0.104	p=0.772	p=0.452	p=0.387	p=0.837	p=0.905	p=0.428
Exclusive breastfeeding n=4,353	n=866	n=674	n=192	n=692	n=540	n=152	n=401	n=311	n=90	n=378	n=289	n=89
Never (n=416)	1.38* (1.02, 1.86) n=90	1.15 (0.82, 1.61) n=62	2.82** (1.58, 5.00) n=28	1.23 (0.89, 1.71) n=70	1.00 (0.69, 1.46) n=46	2.31** (1.28, 4.17) n=24	1.14 (0.77, 1.69) n=45	1.07 (0.69, 1.66) n=34	1.52 (0.68, 3.38) n=11	1.38 (0.93, 2.06) n=46	1.34 (0.84, 2.12) n=32	1.51 (0.73, 3.12) n=14
Non-exclusive until 4 months (n=2,880)	1.18 (0.98, 1.43) n=576	1.05 (0.86, 1.28) n=438	2.14** (1.38, 3.31) n=138	1.19 (0.97, 1.46) n=467	1.14 (0.91, 1.43) n=366	1.42 (0.91, 2.22) n=101	1.02 (0.79, 1.31) n=255	0.93 (0.71, 1.23) n=193	1.46 (0.83, 2.54) n=62	1.11 (0.85, 1.44) n=246	1.17 (0.87, 1.58) n=192	0.93 (0.55, 1.57) n=54
Exclusive until 4 months (n=1,057)	Reference n=200	Reference n=174	Reference n=26	Reference n=155	Reference n=128	Reference n=27	Reference n=101	Reference n=84	Reference n=17	Reference n=86	Reference n=65	Reference n=21
<i>P for trend</i>	p=0.023	p=0.426	p<0.001	p=0.112	p=0.600	p=0.007	p=0.579	p=0.975	p=0.223	p=0.135	p=0.182	p=0.406

Odds ratio of dry cough (95% Confidence Interval)

	Age 1 year		Age 2 years		Age 3 years		Age 4 years	
	Ever		Ever		Ever		Ever	
Duration Breastfeeding n=4,280	n=846		n=891		n=806		n=909	
Never (n=416)	1.41 (1.05, 1.90)* n=82		1.27 (0.95, 1.70) n=82		1.35 (1.00, 1.82) n=79		1.06 (0.79, 1.42) n=85	
0-3 months (n=1,580)	1.16 (0.95, 1.41) n=307		1.23 (1.01, 1.48)* n=337		1.52 (1.24, 1.85)** n=318		1.13 (0.93, 1.36) n=350	

3-6 months (n=923)	1.00 (0.81, 1.24) n=183	1.20 (0.97, 1.47) n=210	1.39 (1.11, 1.74)** n=189	0.90 (0.72, 1.11) n=178
> 6 months (n=1,361)	<i>Reference</i> n=274	<i>Reference</i> n=262	<i>Reference</i> n=220	<i>Reference</i> n=296
<i>P for trend</i>	p=0.020	p=0.033	p=0.001	p=0.249

Exclusive breastfeeding n=4,353	n=842	n=910	n=846	n=937
Never (n=416)	1.52 (1.11, 2.07)** n=82	1.24 (0.92, 1.68) n=82	1.18 (0.86, 1.60) n=79	1.14 (0.84, 1.54) n=85
Non-exclusive until 4 months (n=2,880)	1.22 (1.01, 1.47)* n=570	1.19 (0.99, 1.43) n=619	1.30 (1.07, 1.57)** n=578	1.17 (0.97, 1.40) n=629
Exclusive until 4 months (n=1,057)	<i>Reference</i> n=190	<i>Reference</i> n=209	<i>Reference</i> n=189	<i>Reference</i> n=223
<i>P for trend</i>	p=0.005	p=0.070	p=0.061	p=0.174

Odds ratio of persistent phlegm (95% Confidence Interval)

	Age 1 year	Age 2 years	Age 3 years	Age 4 years
	Ever	Ever	Ever	Ever
Duration breastfeeding n=4,280	n=507	n=357	n=213	n=237
Never (n=416)	1.43 (0.99, 2.05) n=49	1.33 (0.88, 1.99) n=39	1.83 (1.11, 3.01)* n=28	2.52 (1.58, 4.01)** n=36
0 -3 months (n=1,580)	1.43 (1.12, 1.81)** n=213	1.17 (0.89, 1.55) n=147	1.30 (0.90, 1.86) n=88	1.56 (1.09, 2.21)* n=103
3 -6 months (n=923)	1.19 (0.90, 1.57) n=104	1.01 (0.73, 1.40) n=70	1.14 (0.75, 1.74) n=41	1.23 (0.81, 1.87) n=43
> 6 months (n=1,361)	<i>Reference</i> n=141	<i>Reference</i> n=101	<i>Reference</i> n=56	<i>Reference</i> n=55
<i>P for trend</i>	p=0.003	p=0.120	p=0.024	p<0.001

Exclusive breastfeeding n=4,353	n=509	n=365	n=229	n=251
Never (n=416)	1.36 (0.93, 1.98) n=49	1.30 (0.85, 1.98) N=39	1.79 (1.06, 3.02)* n=28	2.61 (1.59, 4.26)** n=36
Non-exclusive until 4 months (n=2,880)	1.23 (0.96, 1.56) n=359	1.10 (0.83, 1.45) n=250	1.25 (0.87, 1.79) n=159	1.60 (1.11, 2.29)* n=176
Exclusive until 4 months (n=1,057)	<i>Reference</i> n=101	<i>Reference</i> n=76	<i>Reference</i> n=42	<i>Reference</i> n=39
<i>P for trend</i>	<i>p=0.067</i>	<i>p=0.246</i>	<i>p=0.035</i>	<i>p<0.001</i>

Values are odds ratios with 95% confidence intervals from multiple logistic regression models.

*P < 0.05 and **p < 0.01. Models are adjusted for parental age, education, ethnicity, smoking habits, maternal parity, children's sex, gestational age, birth weight, parental history of asthma or atopy, daycare attendance and pet keeping.

Table S5. Associations of breastfeeding duration and exclusivity with asthma-related symptoms until the age of 4 years by GEE models

	Odds ratio of wheezing (95% Confidence Interval)				
	Age 1 year	Age 2 years	Age 3 years	Age 4 years	Overall
Duration breastfeeding n=4,280					
Never (n=416)	1.62 (1.24, 2.13)**	1.34 (1.02, 1.78)*	1.34 (0.93, 1.73)	1.26 (0.91, 1.76)	1.44 (1.24, 1.66)**
0-3 months (n=1,580)	1.30 (1.10, 1.53) **	1.25 (1.04, 1.52)*	1.25 (0.99, 1.58)	1.07 (0.85, 1.34)	1.23 (1.12, 1.36)**
3-6 months (n=923)	1.24 (1.02, 1.51)*	1.11 (0.89, 1.39)	1.01 (0.76, 1.34)	0.96 (0.71, 1.30)	1.12 (0.99, 1.26)
> 6 months (n=1,361)	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
<i>P for trend</i>	<i>p<0.001</i>	<i>p=0.005</i>	<i>p=0.023</i>	<i>p=0.149</i>	<i>p<0.001</i>
Exclusive breastfeeding n=4,353					
Never (n=416)	1.50 (1.13, 1.98)**	1.44 (1.07, 1.95)*	1.41 (0.99, 2.01)	1.39 (0.98, 1.98)	1.45 (1.24, 1.69)**
Non-exclusive until 4 months (n=2,880)	1.15 (0.97, 1.36)	1.31 (1.08, 1.58)**	1.23 (0.98, 1.55)	1.20 (0.94, 1.54)	1.21 (1.09, 1.34)**
Exclusive until 4 months (n=1,057)	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
<i>P for trend</i>	<i>p=0.005</i>	<i>p=0.005</i>	<i>p=0.031</i>	<i>p=0.055</i>	<i>p<0.001</i>
	Odds ratio of shortness of breath (95% Confidence Interval)				
	Age 1 year	Age 2 years	Age 3 years	Age 4 years	Overall
Duration breastfeeding n=4,280					
Never (n=416)	1.38 (1.05, 1.80)*	1.15 (0.87, 1.52)	1.17 (0.75, 1.81)	1.24 (0.81, 1.92)	1.26 (1.07, 1.48)**
0 -3 months (n=1,580)	1.26 (1.05, 1.51)*	1.15 (0.94, 1.40)	1.08 (0.86, 1.35)	1.02 (0.76, 1.36)	1.15 (1.03, 1.29)*
3 -6 months (n=923)	1.25 (1.02, 1.54)*	0.92 (0.72, 1.17)	0.77 (0.59, 1.01)	0.80 (0.59, 1.09)	0.99 (0.88, 1.13)
> 6 months (n=1,361)	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>

<i>P for trend</i>	<i>p=0.008</i>	<i>p=0.107</i>	<i>p=0.259</i>	<i>p=0.366</i>	<i>p=0.001</i>
Exclusive breastfeeding n=4,353					
Never (n=416)	1.26 (0.96, 1.66)	1.26 (0.94, 1.68)	1.32 (0.87, 2.01)	1.40 (0.94, 2.09)	1.30 (1.10, 1.53)**
Non-exclusive until 4 months (n=2,880)	1.11 (0.93, 1.33)	1.19 (0.98, 1.45)	1.14 (0.90, 1.43)	1.15 (0.88, 1.50)	1.14 (1.02, 1.28)*
Exclusive until 4 months (n=1,057)	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
<i>P for trend</i>	<i>p=0.085</i>	<i>p=0.067</i>	<i>p=0.136</i>	<i>p=0.097</i>	<i>p=0.001</i>
Odds ratio of dry cough (95% Confidence Interval)					
	Age 1 year	Age 2 years	Age 3 years	Age 4 years	Overall
Duration breastfeeding n=4,280					
Never (n=416)	1.30 (0.99, 1.72)	1.19 (0.86, 1.64)	1.40 (1.01, 1.95)*	11.13 (0.83, 1.55)	1.25 (1.08, 1.44)**
0-3 months (n=1,580)	1.14 (0.94, 1.37)	1.17 (0.96, 1.42)	1.42 (1.17, 1.71)**	1.14 (0.96, 1.36)	1.20 (1.10, 1.32)**
3-6 months (n=923)	1.06 (0.86, 1.30)	1.18 (0.96, 1.45)	1.31 (1.06, 1.63)*	0.92 (0.74, 1.14)	1.10 (0.99, 1.22)
> 6 months (n=1,361)	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
<i>P for trend</i>	<i>p=0.052</i>	<i>p=0.158</i>	<i>p=0.003</i>	<i>p=0.119</i>	<i>p<0.001</i>
Exclusive breastfeeding n=4,353					
Never (n=416)	1.33 (0.99, 1.78)	1.20 (0.86, 1.68)	1.31 (0.97, 1.77)	1.22 (0.88, 1.69)	1.26 (1.09, 1.46)**
Non-exclusive until 4 months (n=2,880)	1.16 (0.96, 1.39)	1.18 (0.98, 1.42)	1.28 (1.03, 1.58)*	1.20 (1.01, 1.41)*	1.20 (1.10, 1.31)**
Exclusive until 4 months (n=1,057)	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
<i>P for trend</i>	<i>p=0.045</i>	<i>p=0.146</i>	<i>p=0.019</i>	<i>p=0.092</i>	<i>p<0.001</i>
Odds ratio persistent phlegm (95% Confidence Interval)					
	Age 1 year	Age 2 years	Age 3 years	Age 4 years	Overall

Duration breastfeeding					
n=4,280					
Never (n=416)	1.38 (0.99, 1.92)	1.36 (0.93, 1.99)	1.71 (1.06, 2.75)*	2.14 (1.41, 3.25)**	1.57 (1.29, 1.91)**
0 -3 months (n=1,580)	1.39 (1.11, 1.74)**	1.15 (0.88, 1.50)	1.25 (0.90, 1.73)	1.41 (1.02, 1.95)*	1.31, 1.14, 1.51)**
3 -6 months (n=923)	1.26 (0.96, 1.66)	1.05 (0.76, 1.45)	1.08 (0.73, 1.59)	1.14 (0.76, 1.73)	1.16 (0.97, 1.38)
> 6 months (n=1,361)	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
<i>P for trend</i>	<i>p=0.005</i>	<i>p=0.102</i>	<i>p=0.035</i>	<i>p<0.001</i>	<i>p<0.001</i>
Exclusive breastfeeding					
n=4,353					
Never (n=416)	1.26 (0.89, 1.78)	1.32 (0.88, 1.97)	1.69 (0.99, 2.87)	2.25 (1.42, 3.57)	1.52 (1.23, 1.87)**
Non-exclusive until 4 months (n=2,880)	1.20 (0.95, 1.51)	1.08 (0.81, 1.44)	1.23 (0.85, 1.78)	1.43 (1.00, 2.05)	1.21 (1.04, 1.42)*
Exclusive until 4 months (n=1,057)	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
<i>P for trend</i>	<i>p=0.120</i>	<i>p=0.214</i>	<i>p=0065</i>	<i>p=0001</i>	<i>p<0.001</i>

Values are odds ratios with 95% confidence intervals from generalized estimating equation models.

*P < 0.05 and **p < 0.01. Models are adjusted for parental age, education, ethnicity, smoking habits, maternal parity, children's sex, gestational age, birth weight, parental history of asthma or atopy, daycare attendance and pet keeping.

Table S6. Atopic and infectious effects on the associations of breastfeeding exclusivity with overall estimates of asthma-related symptoms.

		Overall Odds Ratios (95% Confidence Interval)			
		Wheezing	Shortness of breath	Dry cough	Persistent phlegm
Exclusive breastfeeding					
Model 1	Never	1.45** (1.24, 2.69)	1.30** (1.10, 1.53)	1.26** (1.09, 1.46)	1.52** (1.23, 1.87)
	Non-exclusive until 4 months	1.21** (1.09, 1.34)	1.14* (1.02, 1.28)	1.20** (1.10, 1.31)	1.21* (1.04, 1.42)
	Exclusive until 4 months	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
	<i>P for trend</i>	<i>p<0.001</i>	<i>p=0.001</i>	<i>p<0.001</i>	<i>p<0.001</i>
Model 1 + adjusted for eczema	Never	1.44** (1.22, 1.68)	1.29** (1.10, 1.52)	1.26** (1.08, 1.47)	1.47** (1.19, 1.81)
	Non-exclusive until 4 months	1.21** (1.10, 1.35)	1.15* (1.03, 1.30)	1.21** (1.10, 1.32)	1.21* (1.03, 1.41)
	Exclusive until 4 months	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
	<i>P for trend</i>	<i>p<0.001</i>	<i>p=0.001</i>	<i>p<0.001</i>	<i>p<0.001</i>
Model 1 + adjusted for LRTI	Never	1.31** (1.11, 1.54)	1.15 (0.97, 1.36)	1.22* (1.05, 1.42)	1.42** (1.15, 1.75)
	Non-exclusive until 4 months	1.13* (1.02, 1.25)	1.06 (0.94, 1.19)	1.17** (1.07, 1.28)	1.17 (1.00, 1.37)
	Exclusive until 4 months	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
	<i>P for trend</i>	<i>p=0.001</i>	<i>p=0.114</i>	<i>p=0.001</i>	<i>p=0.002</i>

Values are odds ratios with 95% confidence intervals from longitudinal generalized estimating equation models. Children who were exclusively breastfed for 4 months were used as reference category.

*P < 0.05 and **p < 0.01. Model 1 is adjusted for parental age, education, ethnicity, smoking habits, maternal parity, children's sex, gestational age, birth weight, parental history of asthma or atopy, daycare attendance and pet keeping. This model is additionally adjusted for eczema and lower respiratory tract infections (LRTI) which were both not imputed.

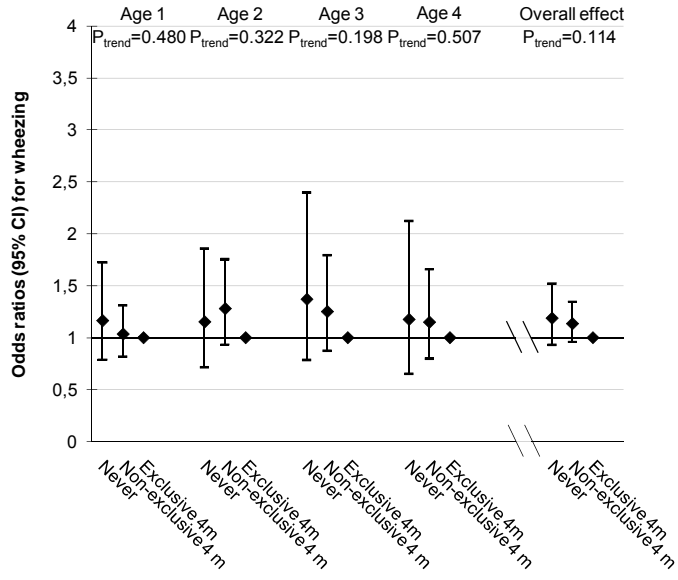
Figure S2. Association between breastfeeding exclusivity stratified for parental history of asthma or atopy.

A: no parental history of asthma or atopy; B: parental history of asthma or atopy.

Values are odds ratios with 95% confidence intervals from generalized estimating equation models. Reference group are children who were exclusively breastfed.

*P < 0.05 and **p < 0.01. Models are adjusted for parental age, education, ethnicity, smoking habits, maternal parity, children's sex, gestational age, birth weight, daycare attendance and pet keeping.

A.



B.

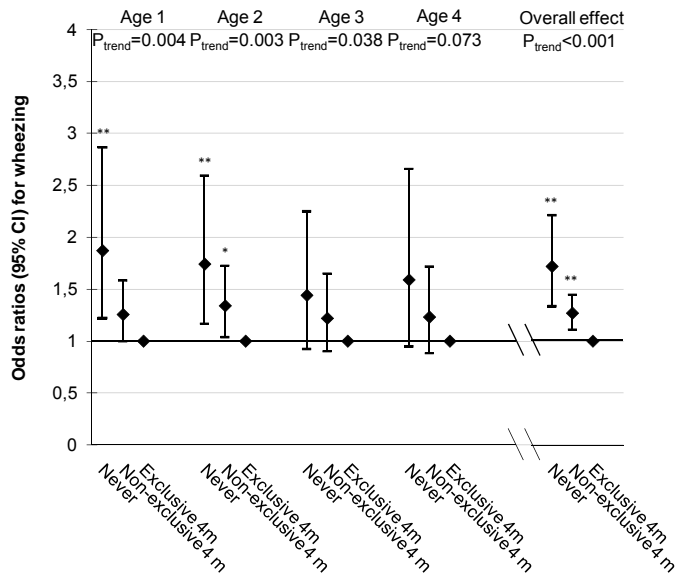


Table S7 Stratified analysis for parental history of asthma or atopy for the association between breastfeeding exclusivity and wheezing.

		Odds Ratios (95% Confidence Interval) for wheezing			
		Age 1 year	Age 2 years	Age 3 years	Age 4 years
Exclusive breastfeeding					
No parental history of asthma or atopy	Never	1.16 (0.79, 1.72)	1.15 (0.72, 1.86)	1.37 (0.78, 2.40)	1.18 (0.65, 2.13)
	Non-exclusive until 4 months	1.04 (0.82, 1.31)	1.28 (0.93, 1.75)	1.25 (0.87, 1.79)	1.15 (0.80, 1.66)
	Exclusive until 4 months	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>
Parental history of asthma or atopy	Never	1.78 (1.22, 2.87)**	1.74 (1.17, 2.59)**	1.44 (0.92, 2.25)	1.59 (0.95, 2.66)
	Non-exclusive until 4 months	1.26 (1.00, 1.58)	1.34 (1.04, 1.73)*	1.22 (0.90, 1.65)	1.23 (0.88, 1.72)
	Exclusive until 4 months	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>	<i>Reference</i>

*P < 0.05 and **p < 0.01. From generalized estimating equation models for parental age, education, ethnicity, smoking habits, maternal parity, children's sex, gestational age, birth weight, daycare attendance and pet keeping.