Supplementary Table S1. Outcomes definitions and sample sizes

Cohort	Sample size	Ever wheeze definition	Ever wheeze sample size by follow-up (child age)	Ever asthma definition	Ever asthma sample size by follow-up (child age)
BAMSE	4089	Has your child ever had problems involving: Wheezy breathing? (constructed variable combining part years)	1 N= 3924, 2 N=3346 , 4 N=3815 , 8 N=3268	1, 4, 8: Doctor´s diagnosed asthma after 3 months of life and up to 1/4/8 year(s) of age 2: Doctor´s diagnosis of asthma during the 2 first years of life? (constructed variable combining past years)	1 N=3925, 2 N=3797, 4 N=3631, 8 N=3323
BiB	1716	Has your child ever had wheezing or whistling in the chest at any time in the past?	4 N=1709	Has your child ever been diagnosed by a doctor as having asthma?	4 N=1709
GINIplus	5991	In the past 12 months, has your child had whistling or wheezy sound of breathing in the chest? Age 6: Has your child ever had whistling or wheezy sound of breathing in the chest?**	1 N=4584 6 N=3837	Doctor diagnosis in the past 12 months: asthma (constructed variable combining past years)	1 N=4611, 2 N=4200, 3 N= 3983, 4 N=3757, 5 N=3474, 6 N=3365, 7 N=2800, 8 N=2803
INMA ***Menorca*** ***Valencia*** ***Sabadell*** ***Gipuzkoa***	 482 855 772 406	Since the last interview which of these options best define your child: whistling or wheezing from the chest, but not noisy breathing from the nose, since birth.	 N=0 N=0 0 N=693, 1 N=628, 2 N=616, 4 N=599 1 N=387, 4 N=387	Menorca, Sabadell, Valencia: Has your child ever been diagnosed by a doctor as having asthma? Gipuzkoa: Has your child ever been diagnosed as having asthma?	 2 N=479, 3 N=479, 4 N=470, 6 N=459 7 N=470 7 N=542 4 N=142
LISAplus	3094	In the past 12 months, has your child had whistling or wheezy sound of breathing in the chest? Age 6: Has your child ever had	1 N=2675	Doctor diagnosis in the past 12 months: asthma (constructed variable combining past years)	1 N=2704, 2 N=2538, 3 N=2257, 4 N=2212, 5 N=1990, 6 N=1984, 7 N=1496, 8 N=1499

		whistling or wheezy sound of breathing in the chest?**	6 N=2182		
MAS	1314	In the past, has your child ever had wheezing or whistling in the chest?	6 N=1033, 7 N=938, 8 N=958	Has a doctor diagnosed your child with asthma? (reconstructed variable; only asked if parent reported asthma child) ** Data on doctor assessments of doctor-diagnosed asthma at other time points not included.*	6 N=957, 7 N=937
PARIS	1549	Has your child ever had wheezing or whistling in the chest?	1 N=1549, 2 N=1549, 3 N=1549, 4 N=1549, 5 N=1549, 6 N=1549	Has a doctor told you that your child has asthma?	1 N=1544, 2 N=1548, 3 N=1548, 4 N=1545, 5 N=1544, 6 N=1547
PIAMA	3963	Has your child ever had wheezing or whistling in the chest?	1 N=3711, 3 N=3668, 4 N=3544, 5 N=3484, 6 N=3461, 7 N=3362, 8 N=3254	Has your child ever been diagnosed by a doctor as having asthma?	1 N=3693, 3 N=3672, 4 N=3545, 5 N=3492, 6 N=3448, 7 N=3361, 8 N=3256
RHEA	1336	Has your child ever had wheezing or whistling in the chest at any time in the past?	4 N=896	Has a doctor ever told you that your child has asthma?	4 N=892
ROBBIC ***Co.N.ER Bologna*** ***GASPII Roma***	 434 694	 Bologna: Did your child have wheezing or whistling in the chest at least once? Roma: Has your child ever had wheezing or whistling in the chest at any time in the past?	 0 N=425, 1 N=415, 8 N=225 0 N=679, 1 N=650, 7 N=486, 8 N=501	 Has a doctor ever said that your child has asthma? Has your child ever been diagnosed by a doctor as having asthma?	 3 N=414, 8 N=226 7 N=486, 8 N=501

* Mean child age of data collection was rounded up to whole numbers, for example data collection at 7,5 years is reported as 7 years.

** Only age 1 and 6 included as measures of ‘ever wheeze’.

Supplementary Table S2. Table of participant characteristics

Cohort	ROBBIC	PARIS	INMA	BAMSE	PIAMA	LISA	GINI	RHEA	BiB
Sample size (N)	1128	1549	2515	4089	3963	3094	5991	1336	1716
Age in months at age 4 follow-up (mean, SD)	-	-	39.79, 0.39	48.70, 0.05	48.62, 0.02	48.88, 0.03	47.75, 0.05	50.95, 0.10	55.03, 0.10
Doctor-diagnosed allergic rhinitis by age 4 (%)									
No	-	97.93	96.92	97.67	98.47	96.36	95.03	92.28	95.91
Yes	-	2.07	3.08	2.33	1.53	3.64	4.97	7.72	4.09
Doctor-diagnosed eczema by age 4 (%)									
No	-	74.68	79.56	76.11	71.89	74.58	73.89	83.95	75.73
Yes	-	25.32	20.44	23.89	28.11	25.42	26.11	16.05	24.27
Maternal education* (%)									
low	15.03	0.65	33.86	34.10	23.48	10.07	15.82	19.29	26.13
medium	48.69	9.30	38.49	24.77	41.56	39.08	39.44	50.95	45.19
high	36.27	90.05	27.65	41.14	34.96	50.85	44.74	29.76	28.68
Pets in household (%)									
No	53.46	80.56	40.61	77.92	35.75	57.22	69.95	69.16	72.54
Yes	46.54	19.44	59.39	22.08	64.25	42.78	30.05	30.84	39.26
Parental asthma (ever) (%)									
No	73.85	81.55	83.20	74.80	85.86	83.98	80.84	90.13	73.65
Yes	26.15	18.45	16.80	25.20	14.14	16.02	19.16	9.87	26.35
Parental smoking (%)									
No	87.83	90.83	77.26	87.01	82.17	88.42	84.61	78.82	90.54
Yes	12.17	9.17	22.74	12.99	17.83	11.58	15.39	21.18	9.46
Wheeze severity at age 4 (%)**									
Low	-	3.96	82.55	85.28	88.29	89.53	97.65	-	27.35
Medium	-	82.18	15.94	10.08	8.57	8.10	1.26	-	51.93
High	-	13.86	1.51	4.64	3.14	2.37	1.09	-	20.72

* Cohort-specific definition

** Low = 0 wheeze attacks in last 12 months, medium/high = cohort-specific; based on no. of wheeze attacks in last 12 months

Supplementary Table S3. Tables of unadjusted prevalence rates and results regression analyses

Table of 'ever wheeze' prevalence at first and last time point by cohort

Cohort	Age	Prevalence (95% Confidence Interval)
ROBBIC	3	4.69 (3.45;6.20)
	8	10.74 (8.58;13.23)
PARIS	1	2.01 (1.37;2.84)
	6	9.37 (7.97;10.93)
INMA	2	1.25 (0.46;2.71)
	7	4.05 (2.92;5.46)
BAMSE	1	2.70 (2.22;3.26)
	8	15.20 (13.99;15.46)
PIAMA	1	6.06 (5.32;6.88)
	6	8.61 (7.70;9.60)
LISA	1	0.18 (0.06;0.43)
	8	6.54 (5.34;7.91)
GINI	1	1.11 (0.82;1.45)
	8	9.67 (8.60;10.82)

Unadjusted prevalence rates and regression model results: ever asthma at age four

Cohort	Unadjusted prevalence (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Cohort			
ROBBIC	-	-	-
PARIS	7.57 (6.30;9.01)	1	1
INMA	3.16 (2.24;4.31)	0.40 (0.27;0.58)	0.29 (0.17;0.50)
BAMSE	11.29 (10.28;12.37)	1.55 (1.25;1.92)	1.18 (0.93;1.49)
PIAMA	7.31 (6.47; 8.21)	0.96 (0.77;1.21)	0.82 (0.63;1.06)
LISA	1.72 (1.22;2.35)	0.21 (0.15;0.31)	0.17 (0.11;0.25)
GINI	3.96 (3.36;4.64)	0.50 (0.39;0.65)	0.31 (0.23;0.41)
RHEA	5.38 (3.99; 7.07)	0.69 (0.49;0.98)	0.61 (0.42;0.89)
BiB	13.78 (11.88;15.20)	1.90 (1.50;2.40)	1.45 (1.07;1.97)
Allergic rhinitis (doctor diagnosed)			
No			1
Yes			4.12 (3.23;5.25)
Eczema (doctor diagnosed)			
No			1
Yes			2.21 (1.93;2.53)
Maternal education			
low			1
medium			0.84 (0.70;1.00)
high			0.74 (0.62;0.88)
Pets in household			
No			1
Yes			1.02 (0.88;1.18)
Parental asthma (ever)			
No			1
Yes			2.38 (2.07;2.73)
Parental smoking			
No			1

Yes			1.31 (1.10;1.57)

Unadjusted prevalence rates and regression model results: Ever wheeze at age four

Cohort	**Unadjusted prevalence (95% CI)**	**Unadjusted OR (95% CI)**	**Adjusted OR (95% CI)**
Cohort			
ROBBIC	-	-	-
PARIS	15.11 (13.36;16.99)	1	1
INMA	55.37 (52.21;58.51)	6.97 (5.78;8.41)	5.87 (4.26;8.07)
BAMSE	32.65 (31.13;34.19)	2.72 (2.33;3.18)	2.38 (2.02;2.81)
PIAMA	27.31 (25.85;28.81)	2.11 (1.80;2.47)	2.00 (1.69;2.38)
LISA	42.75 (40.77;44.73)	4.19 (3.57;4.93)	3.36 (2.83;3.99)
GINI	32.46 (31.00;33.94)	2.70 (2.31;3.15)	2.18 (1.84;2.57)
RHEA	9.82 (7.95;11.96)	0.61 (0.47;0.79)	0.57 (0.43;0.75)
BiB	28.26 (26.14;30.46)	2.21 (1.86;2.63)	2.02 (1.62;2.51)
Allergic rhinitis (doctor diagnosed)			
No			1
Yes			2.24 (1.84;2.71)
Eczema (doctor diagnosed)			
No			1
Yes			2.24 (1.84;2.71)
Maternal education			
low			1
medium			1.03 (0.93;1.15)
high			1.01 (0.91;1.12)
Pets in household			
No			1
Yes			1.05 (0.97;1.14)
Parental asthma (ever)			
No			1
Yes			1.71 (1.57;1.87)
Parental smoking			
No			1
Yes			1.42 (1.28;1.58)

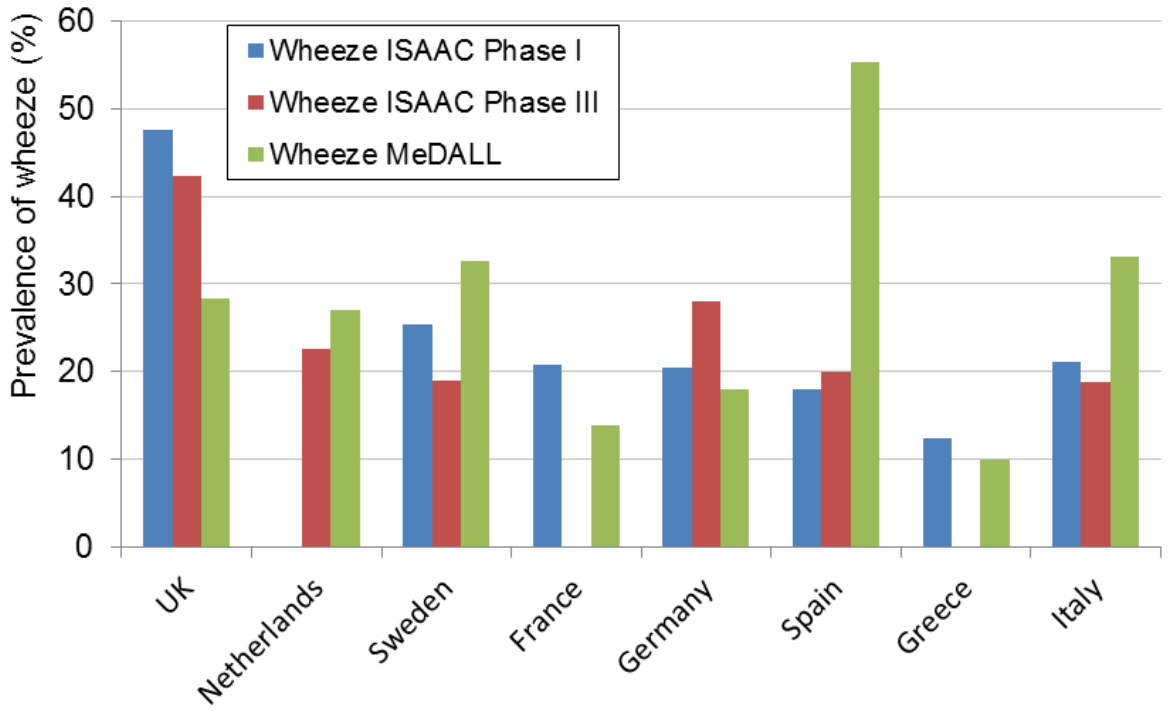
Unadjusted prevalence rates and regression model results: Children with ever wheeze diagnosed with asthma by age four

Cohort	Unadjusted prevalence (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted + wheeze severity OR (95% CI)
Cohort				
ROBBIC	-	-	-	-
PARIS	37.93 (31.66;44.51)	1	1	1
INMA	15.94 (8.34;26.74)	0.31 (0.15;0.62)	0.27 (0.12;0.60)	0.17 (0.07;0.39)
BAMSE	30.63 (27.95;33.40)	0.72 (0.54;0.97)	0.55 (0.40;0.76)	0.34 (0.21;0.55)
PIAMA	23.10 (20.47;25.90)	0.49 (0.36;0.67)	0.42 (0.30;0.60)	0.27 (0.16;0.44)
LISA	-	-	-	-
GINI	-	-	-	-
RHEA	30.23 (20.79;41.08)	0.71 (0.42;1.21)	0.63 (0.36;1.12)	-
BiB	39.53 (35.07;44.12)	1.07 (0.77;1.48)	0.89 (0.58;1.34)	0.89 (0.49;1.61)
Allergic rhinitis (doctor diagnosed)				
No			1	1
Yes			2.81 (1.86;4.24)	2.57 (1.59;4.13)
Eczema (doctor diagnosed)				
No			1	1
Yes			1.68 (1.40;2.03)	1.54 (1.25;1.90)
Maternal education				
low			1	1
medium			0.83 (0.65;1.05)	0.87 (0.67;1.13)
high			0.71 (0.56;0.90)	0.74 (0.57;0.96)
Pets in household				
No			1	1
Yes			1.01 (0.82;1.24)	1.03 (0.82;1.29)
Parental asthma (ever)				
No			1	1
Yes			1.85 (1.52;2.24)	1.66 (1.34;2.07)
Parental smoking				
No			1	1
Yes			1.85 (1.52;2.24)	1.02 (0.78;1.33)
Wheeze severity				
Low				1
Medium				1.90 (1.52;2.39)
High				5.65 (4.24;7.54)

Supplementary Appendix S1. Wheeze and asthma in MeDALL cohorts in relation to the literature

We compare wheeze reported in the MeDALL cohorts at age 6 (or the closest to this age available, ranging from 4 to 7), with wheeze reported in the international studies ISAAC Phase I and ISAAC Phase III at age 6 to 7 [1, 2]. The fieldwork for ISAAC Phase I was conducted between 1994 and 1995, and the fieldwork for ISAAC Phase III from 2001 to 2003. For a number of countries, estimated prevalence rates of wheeze differ greatly between the MeDALL cohorts and estimates from the ISAAC studies. For example, the prevalence of wheeze in Spain is 55.38% among 4 year olds in the MeDALL INMA studies, compared to 18.02% and 19.87% in ISAAC Phase I and III. MeDALL also provides higher estimates for Italy and Sweden, but a lower estimate for the UK (Figure S1). Estimates for the Netherlands and Greece are fairly similar between ISAAC Phase I and MeDALL.

Supplement Figure S1. Comparing MeDALL and ISAAC prevalence rates of childhood wheeze



Prevalence rates of asthma cannot be compared across these cohorts due to a lack of data available on childhood asthma. However, data on adults from the World Health Survey (WHS) [3] and the European Community Respiratory Health Survey (ECRHS) [4] suggest that differences in wheeze and asthma prevalence rates between countries persist into adulthood (Table A1). In both the WHS and ECRHS, rates of asthma were highest for the UK, Netherlands, France and Sweden, and lowest for Germany, Spain, Greece, and Italy. This is in line with results found for children in the MeDALL cohorts.

Wheeze among adults, as measured in the ECRHS, was highest in the UK, Netherlands, Sweden and Spain, and lower in France, Greece and Italy (Table S4). This is in line with our findings, except for the higher prevalence of wheeze in the Italian ROBBIC cohorts.

Supplement Table S4. Prevalence rates of asthma and wheeze in adults (%)

Country	Wheeze ECRHS	Diagnosed asthma (medication or asthma attack) ECRHS	Asthma (WHS)
UK	27.1	7.9	17.6
Netherlands	20.5	4.5	15.2
Sweden	20.6	6.2	20.1
France	14.7	4.9	10.4
Germany	17.3	3.3	7.6
Spain	22.0	3.8	6.8
Greece	16.0	2.9	6.6
Italy	10.0	4.2	6.0

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