

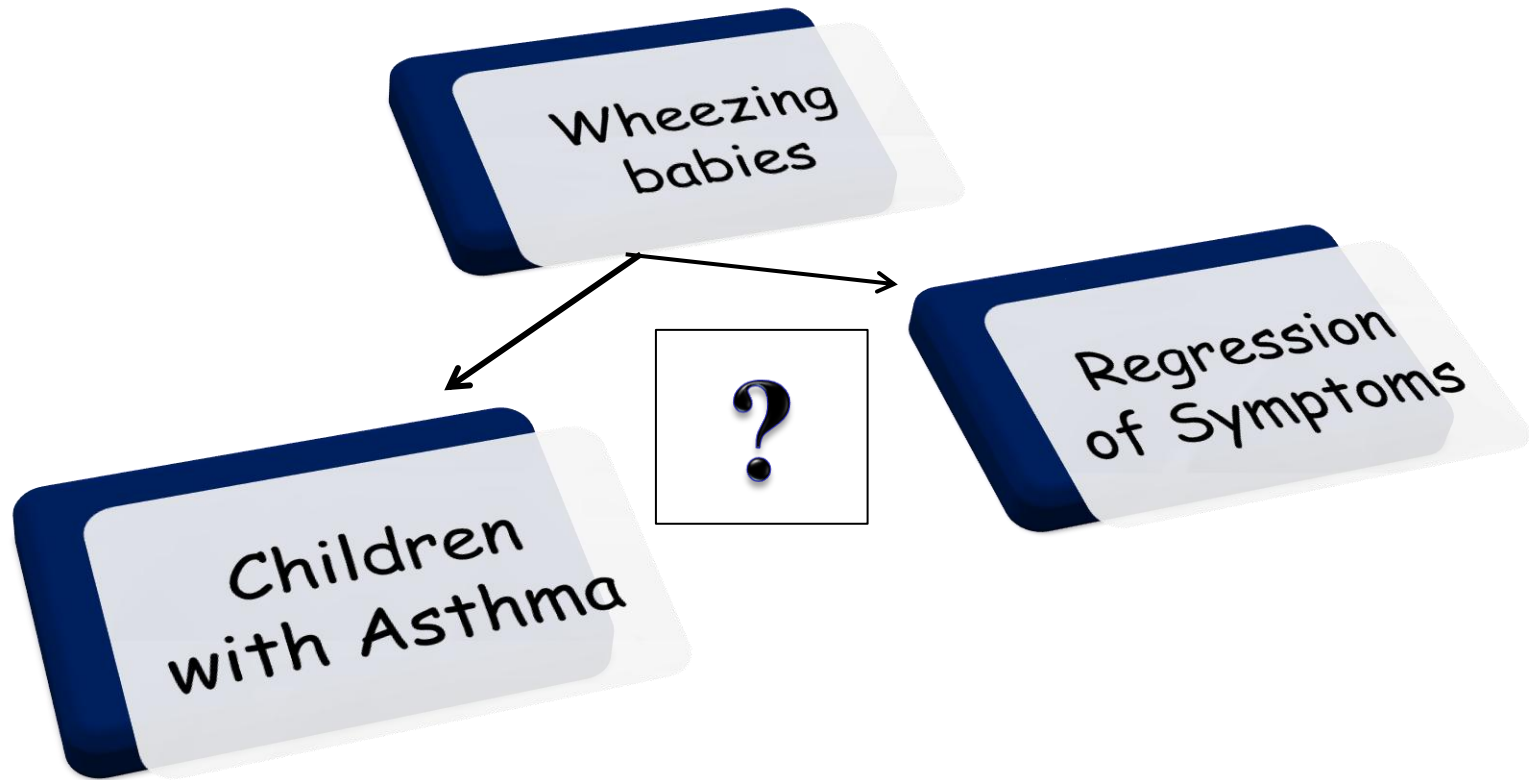


# Risk Factors for Allergy and Asthma in Latin America

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University of São Paulo

# Wheezing babies and development of Asthma



# Risk factors for wheezing/asthma

- Male gender
- Low birth weight
- Cesarean section
- Family history of asthma
- Respiratory virus infection
- Allergic sensitization
- Rhinitis
- Passive smoke exposure
- Indoor allergen exposure

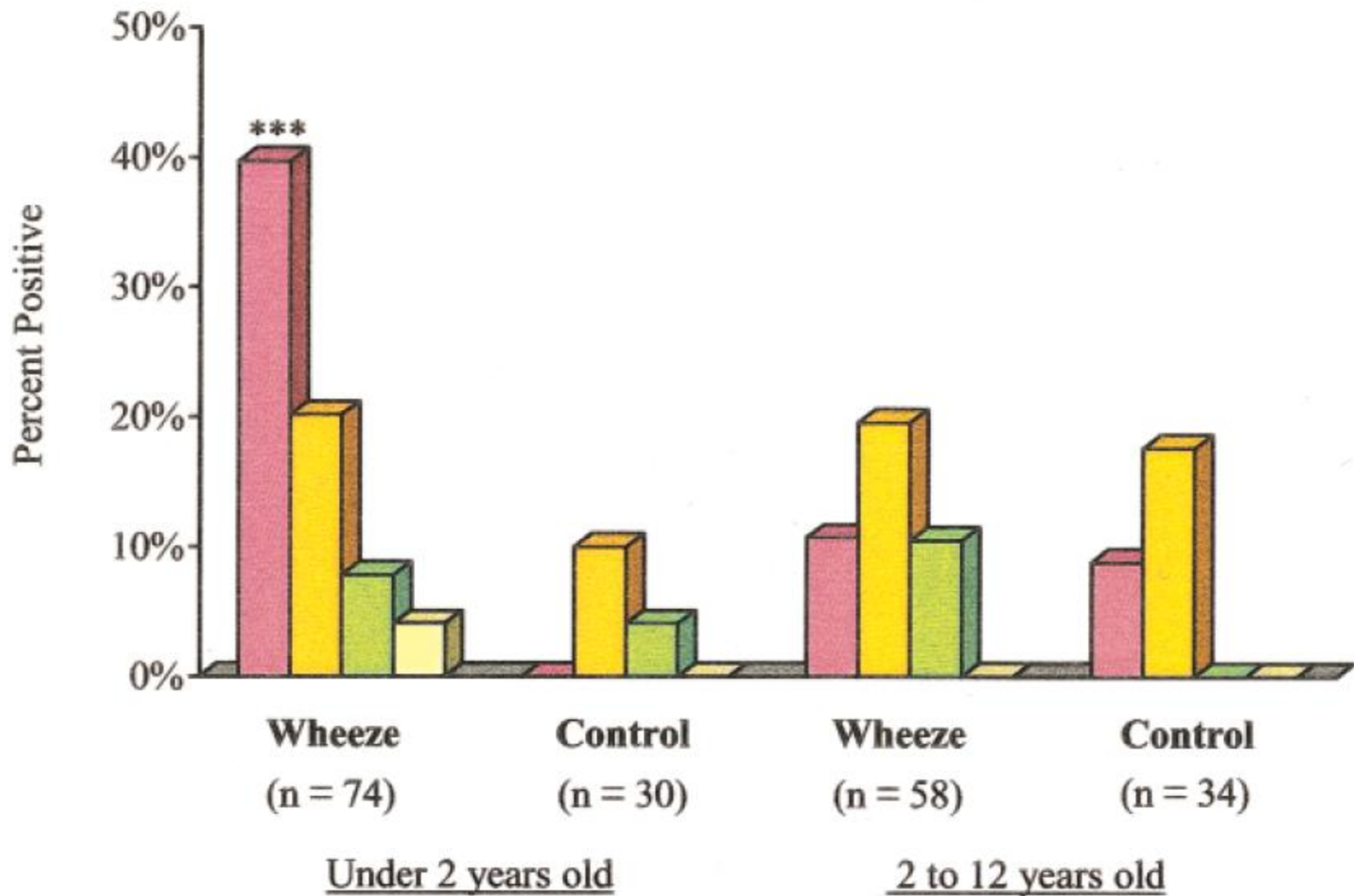
# **Risk factors for wheezing in a subtropical environment: Role of respiratory viruses and allergen sensitization**

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Ataide A. Camara, MD,<sup>a,b</sup> Jorgete M. Silva, MD,<sup>a</sup> Virginia P. L. Ferriani, MD,<sup>a</sup> Kátia R. C. Tobias, MSc,<sup>a</sup> Izolete S. Macedo, MSc,<sup>c</sup> Márcio A. Padovani, MD,<sup>c</sup> Charlotte M. Harsi, PhD,<sup>d</sup> M. Regina A. Cardoso, PhD,<sup>e</sup> Martin D. Chapman, PhD,<sup>f</sup> Eurico Arruda, MD,<sup>c</sup> Thomas A. E. Platts-Mills, MD, PhD,<sup>g</sup> and L. Karla Arruda, MD<sup>a</sup>  
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J Allergy Clin Immunol 2004;113:551-7.

■ RSV ■ Rhinovirus ■ Adenovirus ■ Coronavirus



**TABLE III.** Multivariate analysis of risk factors for wheezing in children under 2 years of age

Risk factor	Wheeze (%) n = 74	Control (%) n = 30	Odds ratio (95% CI)	P value
Viral infection*	45/74 (60.8)	4/30 (13.3)	15.5 (4.0 to 60.5)	.0001
Family history of allergy†	54/74 (72.9)	14/30 (46.6)	4.2 (1.4 to 12.4)	.008
Sensitization to inhalant and/or food allergens*	9/70 (12.8)	3/29 (10.3)	1.3 (0.2 to 6.5)	.7
Sex, male	46/74 (62.1)	17/30 (56.6)	0.9 (0.3 to 2.7)	.9

\*Detection of rhinovirus RNA, coronavirus RNA, adenovirus B, and/or RSV antigen in nasal washings.

†History of asthma, rhinitis, and/or atopic dermatitis in parent(s) and/or siblings.

‡Sensitization defined as IgE antibody levels  $\geq 0.7$  kU<sub>A</sub>/L (CAP class  $\geq 2$ ) to at least one inhalant allergen (mites, cockroach, cat, dog) or food allergen (egg, milk, soy, wheat, fish, or peanut).

**TABLE IV.** Multivariate analysis of risk factors for wheezing in children 2 to 12 years of age (model 1 and model 2)

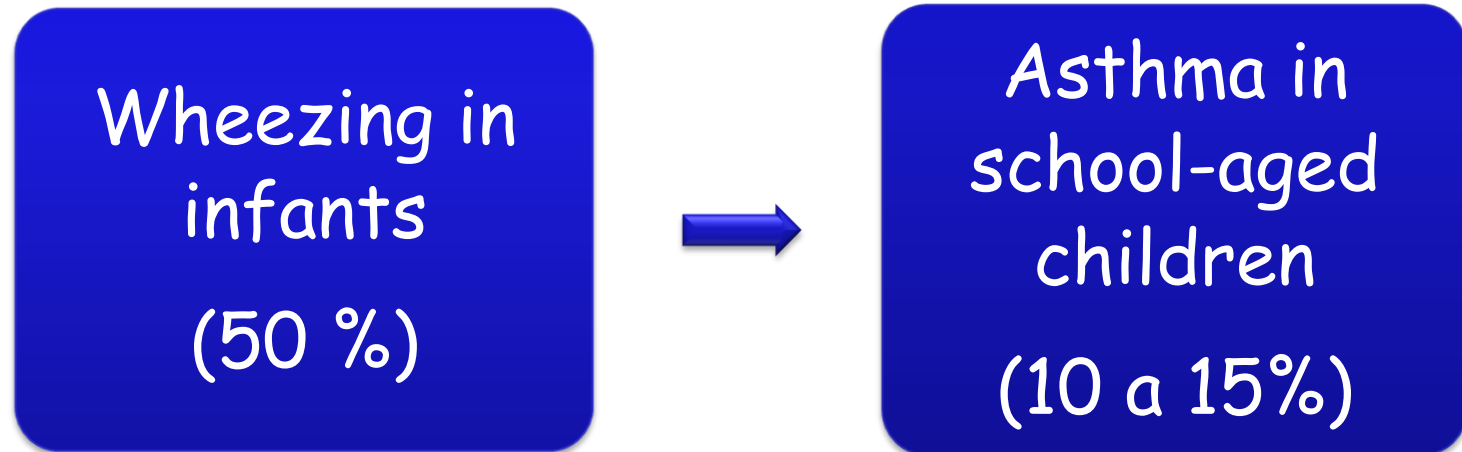
Risk factor	Wheeze (%) (n = 58)	Control (%) (n = 35)	Model 1		Model 2	
			Odds ratio (95% CI)	P value	Odds ratio (95% CI)	P value
Sensitization to inhalant allergens (IgE $\geq 0.7$ kU <sub>A</sub> /L)*	42/58 (72.4)	15/35 (42.8)	2.7 (1.06 to 7.1)	.03	—	—
Sensitization to inhalant allergens (IgE $\geq 3.5$ kU <sub>A</sub> /L)*	36/58 (62)	7/35 (20)	—	—	5.7 (1.9 to 16.7)	.001
Viral infection†	19/58 (32.7)	9/35 (25.7)	1.3 (0.4 to 3.6)	.5	1.1 (0.4 to 2.9)	.8
Family history of allergy‡	38/58 (65.5)	22/35 (62.8)	1.1 (0.4 to 3.0)	.7	1.0 (0.4 to 2.9)	.8
Specific IgE to <i>Ascaris lumbricoides</i> (IgE $\geq 0.7$ kU <sub>A</sub> /L)§	19/56 (33.9)	5/35 (14.2)	2.1 (0.6 to 7.2)	.2	1.5 (0.4 to 5.4)	.5
Sex, male	34/58 (58.6)	22/35 (62.8)	1.1 (0.4 to 3.0)	.7	1.1 (0.4 to 2.9)	.8

# Risk factors for acute wheezing among children who presented to an Emergency Department Ribeirão Preto-Brazil

- 0-2 y : Respiratory viral infection and family history of allergy
- 2-12 y: Sensitization to inhalant allergens



# Wheezing babies and development of asthma



Sears et al. N Engl J Med. 2003 9;349:1414-22.

Martinez et al. N Engl J Med. 1995 332:133-8.

Lowe et al. Am J Respir Crit Care Med. 2005 171:231-7.

# A prospective study of wheezing in young children: The independent effects of cockroach exposure, breast-feeding and allergic sensitization

Silva JM, Camara AA, Tobias KRC, Macedo IS, Cardoso MRA, Arruda E, Chapman MD, Platts-Mills TAE, Arruda LK, Ferriani VPL. A prospective study of wheezing in young children: The independent effects of cockroach exposure, breast-feeding and allergic sensitization. *Pediatr Allergy Immunol* 2005; 16: 393–401. © 2005 Blackwell Munksgaard

**Jorgete M. Silva<sup>1</sup>, Ataíde A. Camara<sup>1,2</sup>, Kátia R. C. Tobias<sup>1</sup>, Izolete S. Macedo<sup>3</sup>, M. Regina A. Cardoso<sup>4</sup>, Eurico Arruda<sup>3</sup>, Martin D. Chapman<sup>5</sup>, Thomas A. E. Platts-Mills<sup>6</sup>, L. Karla Arruda<sup>7</sup> and Virgínia P. L. Ferriani<sup>1</sup>**

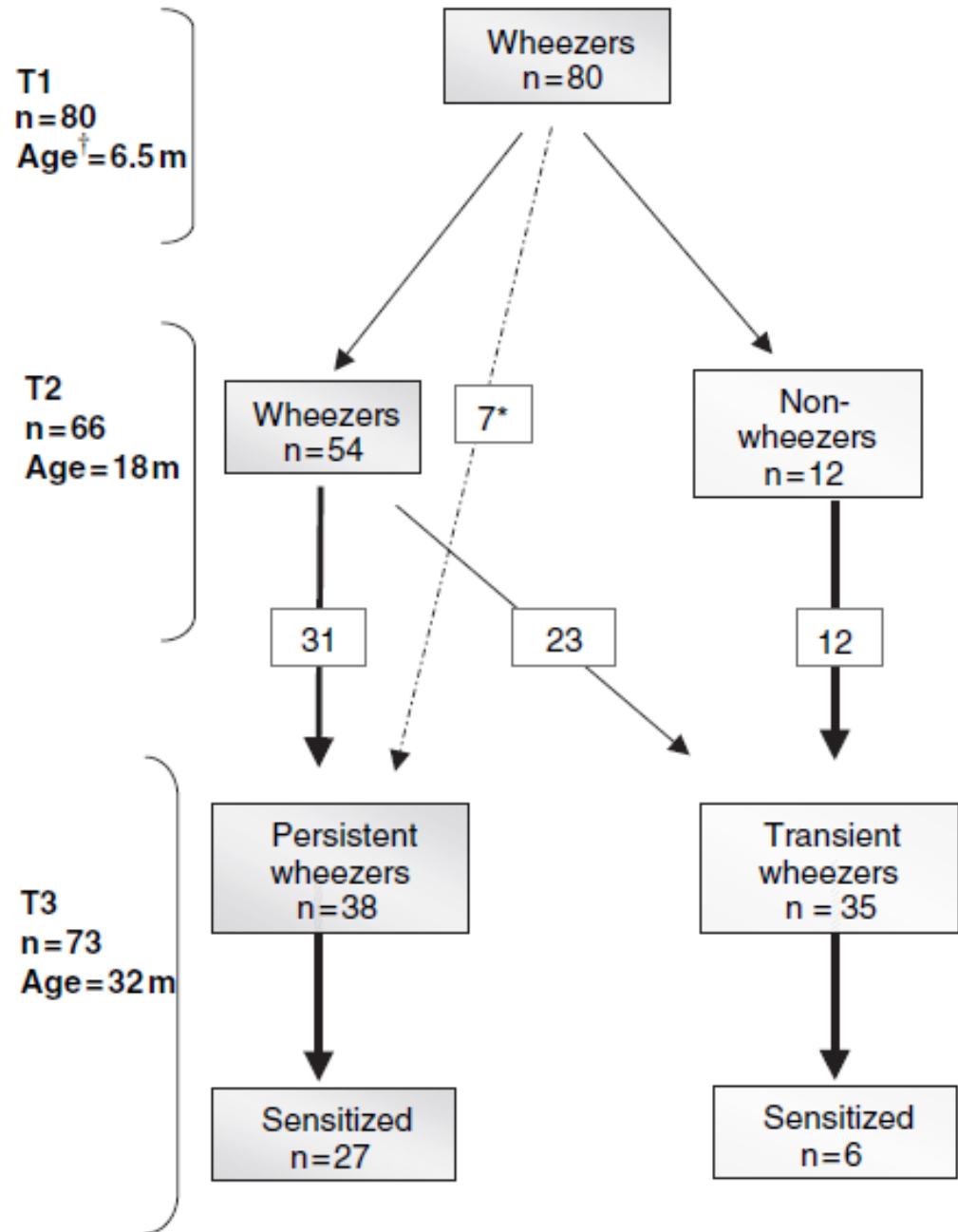


Table 3. Multivariate analysis of risk factors for persistence of wheezing among children 2–4-year old

Risk factors	Model 1		Model 2	
	OR (95% CI)	p	OR (95% CI)	p
Age	1.06 (0.95–1.2)	0.31	0.96 (0.88–1.05)	0.4
Sex	0.6 (0.14–2.8)	0.5	0.9 (0.23–3.6)	0.9
Parental history of allergy *	5.4 (1.0–28.3)	<b>0.044</b>	1.3 (0.33–5.5)	0.7
Maternal smoking during pregnancy	3.3 (0.7–13.3)	0.14	3.5 (0.86–14.5)	0.08
Exclusive breast feeding †	0.12 (0.02–0.63)	<b>0.013</b>	0.14 (0.03–0.76)	<b>0.02</b>
High-level exposure ‡ at T1 to				
Mite (bed)	0.9 (0.2–4.7)	0.9		
Cockroach (kitchen)	7.6 (1.4–40.8)	<b>0.017</b>		
Specific IgE to any allergen at T1 §	1.57 (0.15–16.6)	0.7		
Sensitization to any allergen at T3 ¶			14.7 (3.2–66.7)	<b>&lt;0.0001</b>

# Wheezing in young children after an acute episode

- 52% of the children treated in ED for acute wheezing during infancy continued to have repeated episodes of wheezing between 2-4 years of age. This outcome was highly associated with the presence of sensitization to indoor allergens
- Family history of allergy and exposure to high levels of cockroach allergen in infancy were independently associated with persistent wheezing
- Exclusive breast-feeding for at least one month may have protected these children against persistence of wheezing between two and four years of age

Young children with recurrent wheezing and sensitization to indoor allergens may represent children with early-onset asthma, or alternatively, children who may be at a higher risk for developing asthma in the following years

**Risk factors for asthma  
in 9-11 year-old children after and  
index-wheezing episode in infancy:  
a prospective study**

Ribeirão Preto - Brazil

Luciana Rocha, Jorgete Silva, Athaide Câmara, L. Karla Arruda; Virgínia P. L. Ferriani

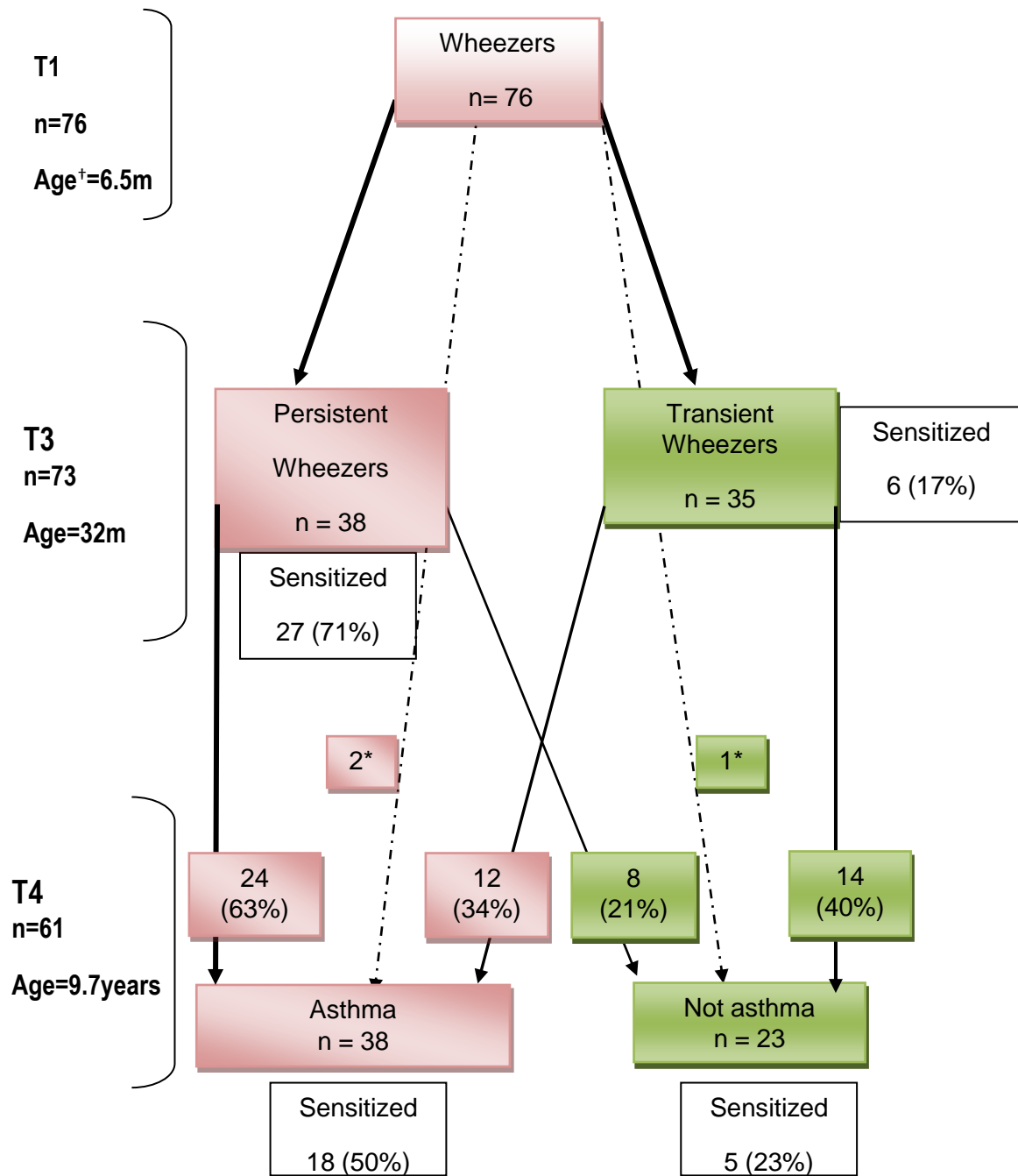
## Clinical characteristics of a 9-11-year-old group of children after and index-wheezing episode in infancy

<b>Characteristics</b>	<b>% (n)</b>
Male gender	65.6 (40/61)
Mean age in years (limits)	9.7 (8.5-12.2)
Family history of allergies	72 (44/61)
Exclusive breast-feeding (one month)	83.3 (50/60)
Smokers inside the house	59 (36/61)
Mothers smoking during pregnancy	34.5 (20/58)
Virus identification during index-wheezing episode	80 (48/60)
RSV identification during index-wheezing episode	39 (23/59)



Allergic sensitization, asthma symptoms, rhinitis and asthma diagnosis in 9-11-year-old children after and index-wheezing episode in infancy

Symptoms/diagnosis	% (n)
Allergic sensitization (T4)	44.2 (23/52)
Allergic Rhinitis (T4)	37 (19/52)
Wheezing episodes during last year	36 (22/61)
Wheezing with exercises	21 (13/61)
Cough without colds	46 (28/61)
Medical diagnosis of asthma	49.2 (30/61)
Bronchial hyperresponsiveness	54.2 (26/48)



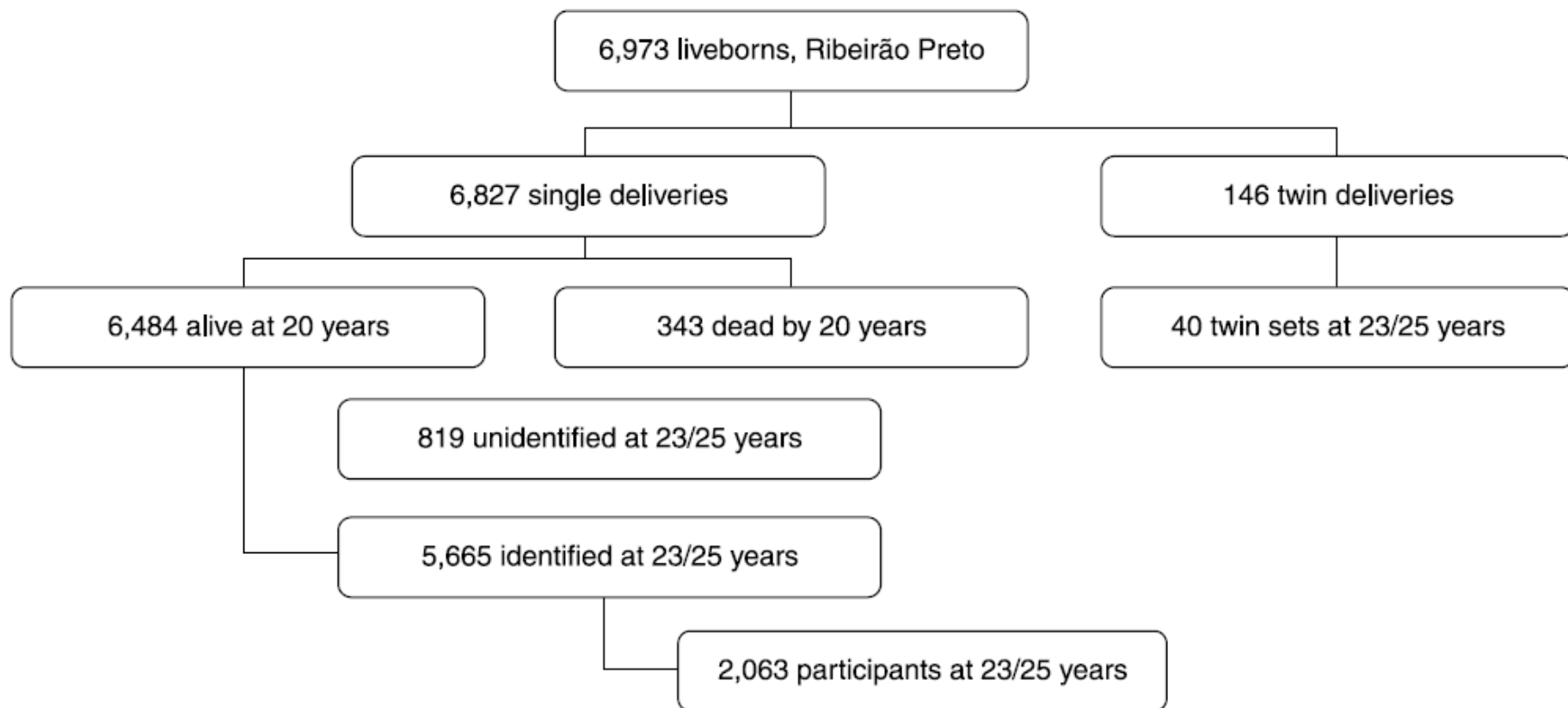
# **Atopy risk factors at birth and in adulthood**

**Erica Ferraz,<sup>1</sup> Clécia Aparecida Garcia,<sup>2</sup> Heloísa Bettiol,<sup>3</sup>**

**Roseane Durães Caldeira,<sup>1</sup> Viviane Cunha Cardoso,<sup>3</sup> Luiza Karla Arruda,<sup>4</sup>**

**Marco Antônio Barbieri,<sup>5</sup> Elcio Oliveira Vianna<sup>4</sup>**

*J Pediatr (Rio J). 2011;87(4):336-342*



Source: Barbieri et al.<sup>16</sup>.

**Figure 1** - Sampling frame of the 1978/1979 birth cohort

**Table 3 -** Atopy prevalence and risk factors in separate analysis and mutually adjusted analysis of Brazilian young adults

<b>Variable*</b>	<b>Prevalence (%)</b>	<b>Crude RR (95%CI)</b>	<b>Adjusted RR (95%CI)<sup>†</sup></b>
Birth weight (g)			
< 2,500	50/123 (40.7)	0.83 (0.67-1.03)	1.04 (0.76-1.43)
2,500-2,999	166/380 (43.7)	0.89 (0.78-1.01)	0.97 (0.83-1.15)
3,000-3,999	621/1,267 (49.0)	1.0	1.0
≥ 4,000	73/140 (52.1)	1.06 (0.90-1.26)	1.04 (0.87-1.24)
Birth length (cm)			
< 47	84/211 (39.8)	0.87 (0.72-1.06)	0.85 (0.68-1.05)
47-48.9	210/459 (45.8)	1.0	1.0
49-51	380/772 (49.2)	1.08 (0.95-1.22)	1.03 (0.90-1.18)
≥ 51	231/459 (50.3)	1.10 (0.96-1.26)	0.98 (0.83-1.14)
IUGR			
No	794/1,637 (48.5)	1.0	1.0
Yes	116/273 (42.5)	0.88 (0.76-1.01)	0.95 (0.78-1.16)
Gender			
Female	433/977 (44.3)	1.0	1.0
Male	477/933 (51.1)	1.15 (1.05-1.27)	<u>1.18 (1.07-1.30)</u>

**Table 3 -** Atopy prevalence and risk factors in separate analysis and mutually adjusted analysis of Brazilian young adults

<b>Variable*</b>	<b>Prevalence (%)</b>	<b>Crude RR (95%CI)</b>	<b>Adjusted RR (95%CI)<sup>†</sup></b>
Birth order			
First child	355/736 (48.2)	1.0	1.0
Second and third child	440/891 (49.4)	1.02 (0.93-1.13)	1.00 (0.91-1.11)
≥ forth child	106/267 (39.7)	0.82 (0.70-0.97)	0.84 (0.70-1.01)
Maternal age (years)			
< 20	95/229 (41.5)	0.84 (0.72-0.99)	0.88 (0.74-1.04)
20-34	743/1,509 (49.2)	0.83 (0.68-1.00)	0.86 (0.70-1.06)
≥ 35	65/160 (40.6)	1.0	1.0
Smoking <sup>‡</sup>			
Yes	535/1,187 (45.1)	0.86 (0.78-0.95)	<u>0.87 (0.79-0.96)</u>
No	365/697 (52.4)	1.0	1.0
Level of schooling (years)			
1-8	108/292 (37.0)	0.71 (0.60-0.83)	<u>0.74 (0.62-0.89)</u>
9-11	460/965 (47.7)	0.91 (0.82-1.01)	<u>0.94 (0.85-1.04)</u>
≥ 12	342/653 (52.4)	1.0	1.0

# Prevalence of and risk factors for wheezing in the first year of life\*

João Antonio Bonfadini Lima, Gilberto Bueno Fischer,  
Edgar Enrique Sarria, Rita Mattiello, Dirceu Solé

J Bras Pneumol. 2010;36(5):525-531

**Table 2** - Risk factors for wheezing in the first year of life (multifactorial analysis).

Characteristic	PR (95% IC)	p
Male gender	1.102 (1.030-1.211)	0.043
Pneumonia	1.183 (1.070-1.307)	0.001
Maternal smoking during pregnancy	1.135 (1.023-1.259)	0.017
Asthma (parents)	1.203 (1.090-1.329)	< 0.001
Asthma (siblings)	1.172 (1.030-1.333)	0.016
Day care center attendance	1.295 (1.172-1.431)	< 0.001
Mother with less than 8 years of schooling	1.332 (1.009-1.759)	0.043
Mother with 8-11 years of schooling	1.277 (0.947-1.723)	0.109
Siblings in the household	1.144 (1.032-1.269)	0.011
Less than 2 months of exclusive breastfeeding	1.129 (1.021-1.249)	0.018
More than 6 episodes of cold	1.440 (1.245-1.666)	< 0.001
Between 3 and 6 episodes of cold	1.197 (1.043-1.373)	0.01
First cold prior to 3 months of age	1.244 (1.042-1.486)	0.016
First cold between 3 and 6 months of age	1.187 (0.994-1.417)	0.058

PR: prevalence ratio



# Chronic virus infections suppress atopy but not asthma in a set of children from a large latin american city: a cross-section study

Rafael V Veiga<sup>1,2</sup>, Sergio S Cunha<sup>1,3</sup>, Vitor CC Dattoli<sup>1,2</sup>, Álvaro C Cruz<sup>1,4</sup>, Phillip J Cooper<sup>1,5,6</sup>, Laura C Rodrigues<sup>1,7</sup>, Maurício L Barreto<sup>1,8</sup> and Neuza M Alcantara-Neves<sup>1,2\*</sup>

*Veiga et al. BMC Pulmonary Medicine* 2011, **11**:24

<http://www.biomedcentral.com/1471-2466/11/24>

**Table 2 Logistic regression analyses of association between seropositivity to common viral infections of childhood and the presence of aeroallergen-specific IgEs using cut-offs for specific IgE of  $\geq 0.35$  and  $\geq 0.70$  kU/L**

Infection by N = 1296	*sIgE $\geq 0.35$ (n = 644/49.7%)			sIgE $\geq 0.70$ (n = 489/37.7%)		
	n (%) / N	OR (95% C.I.)		n (%) / N	OR (95% C.I.)	
		Crude	Adjusted**		Crude	Adjusted**
<b>HSV</b>						
Negative	298(51.0)/584	1	1	235(40.2)/584	1	1
Positive	346(48.6)/712	0.91 (0.73; 1.13)	0.94 (0.75; 1.18)	254(35.7)/712	0.82 (0.66; 1.03)	0.88 (0.69; 1.11)
<b>VZV</b>						
Negative	357(50.4)/708	1	1	273(38.6)/708	1	1
Positive	287(48.8)/588	0.94 (0.75; 1.17)	0.93 (0.74; 1.17)	216(36.7)/588	0.93 (0.74; 1.16)	0.93 (0.74; 1.17)
<b>EBV</b>						
Negative	80(54.4)/147	1	1	66(44.9)/147	1	1
Positive	564(49.1)/1149	0.81 (0.57; 1.14)	0.82 (0.58; 1.17)	423(36.8)/1149	0.71 (0.51; 1.01)	0.75 (0.53; 1.07)
<b>HAV</b>						
Negative	531(49.5)/1072	1	1	409(38.2)/1072	1	1
Positive	113(50.4)/224	1.04 (0.78; 1.38)	1.07 (0.80; 1.44)	80(35.7)/224	0.90 (0.67; 1.22)	0.94 (0.69; 1.28)

**Table 3 Logistic regression analyses of associations between viral infections and skin prick test reactivity (SPT) for at least one aeroallergen**

Infection by N = 1296		SPT $\geq 0.3$ mm		
		n = 391 (30.2%)		
		n (%) / N	OR (95% C.I.)	
			Crude	Adjusted*
<b>HSV</b>				
Negative	206 (35.3) / 584	**1	1	
Positive	185 (26.0) / 712	<b>0.64 (0.51; 0.82)</b>	<b>0.66 (0.51; 0.84)</b>	
<b>VZV</b>				
Negative	220 (31.1) / 708	1	1	
Positive	171 (29.1) / 588	0.91 (0.72; 1.15)	0.89 (0.70; 1.14)	
<b>EBV</b>				
Negative	58 (39.5) / 147	1	1	
Positive	333 (29.0) / 1149	<b>0.63 (0.44; 0.89)</b>	<b>0.69 (0.48; 0.99)</b>	
<b>HAV</b>				
Negative	326 (30.4) / 1072	1	1	
Positive	65 (29.0) / 224	0.94 (0.68; 1.28)	1.01 (0.73; 1.40)	

\*Adjusted for gender and age. \*\*Bold values are statistically significant ( $p < 0.05$ ).

# Long-term periodic anthelmintic treatments are associated with increased allergen skin reactivity

P. Endara<sup>1</sup>, M. Vaca<sup>1</sup>, M. E. Chico<sup>1</sup>, S. Erazo<sup>1</sup>, G. Oviedo<sup>1</sup>, I. Quinzo<sup>1</sup>, A. Rodriguez<sup>1,2</sup>, R. Lovato<sup>3</sup>, A.-L. Moncayo<sup>1,2</sup>, M. L. Barreto<sup>2</sup>, L. C. Rodrigues<sup>4</sup> and P. J. Cooper<sup>1,5</sup>

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<sup>3</sup>Programa Nacional de Eliminacion de Oncocercosis, Ministerio de Salud Publica, Guayaquil, Ecuador, <sup>4</sup>Department of Epidemiology, London School of Hygiene and Tropical Medicine, London, UK, and <sup>5</sup>Center for Infection, St George's University of London, London, UK

*Clinical & Experimental Allergy*, **40**, 1669–1677

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Table 2. Effect of the treatment on allergen skin test reactivity (SPT), exercise-induced bronchospasm (EIB), and symptoms of recent wheeze, rhinoconjunctivitis and eczema

Children	<i>N</i>	Prevalence (%)	Crude OR	<i>P</i> -value	Adjusted OR	<i>P</i> -value
SPT						
Living in non-treated communities	1983	172 (8.7)	1		1	
Living in treated communities	1782	298 (16.7)	2.11 (1.61–2.78)	<0.0001	2.10 (1.50–2.94)	<0.0001
Wheeze						
Living in non-treated communities	2068	231 (11.2)	1		1	
Living in treated communities	1831	175 (9.6)	0.78 (0.62–0.99)	0.04	0.84 (0.62–1.13)	0.3
EIB						
Living in non-treated communities	437	39 (8.9)	1		1	
Living in treated communities	1603	91 (5.7)	0.61 (0.31–1.21)	0.16	1.0 (0.50–1.99)	0.9
Rhino-conjunctivitis symptoms						
Living in non-treated communities	2070	143 (6.9)	1		1	
Living in treated communities	1831	100 (5.5)	0.72 (0.52–0.99)	0.05	0.70 (0.46–1.08)	0.11
Eczema symptoms						
Living in non-treated communities	2068	66 (3.2)	1		1	
Living in treated communities	1830	120 (6.6)	1.62 (0.98–2.70)	0.06	2.24 (1.05–4.78)	0.04

# Caesarean sections and risk of wheezing in childhood and adolescence: data from two birth cohort studies in Brazil

A. M. B. Menezes, P. C. Hallal, A. M. Matijasevich, A. J. D. Barros, B. L. Horta, C. L. P. Araujo, D. P. Gigante, I. S. Santos, G. Minten, M. R. Domingues, S. C. Dumith and F. C. Barros

*Postgraduate Programme in Epidemiology, Federal University of Pelotas, Pelotas, Brazil*

*Clinical & Experimental Allergy*, **41**, 218–223

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Table 1. Description of the two birth cohort studies in Pelotas, Brazil

Variables	Birth cohort	
	1993 ( <i>n</i> = 5249)	2004 ( <i>n</i> = 4288)
% Current wheezing		
4 years	20.2	27.8
11 years	13.5	NA
15 years	12.1	NA
% Persistent wheezing		
4–11 years	6.2	NA
11–15 years	4.5	NA
4, 11 and 15 years	2.7	NA
Mode of delivery		
Vaginal	69.5	54.8
C-section	30.5	45.2
Sex		
Males	48.8	51.9
Females	51.2	48.1
Birth weight, g (mean±SD)	3176 (521)	3172 (530)
Gestational age, weeks (mean±SD)	38.1 (1.6)	38.5 (2.3)
Intrauterine growth restriction		
No	90.4	87.6
Yes	9.6	12.4

Table 5. Odds ratios (OR) for wheezing at different ages according to type of delivery: adjusted analyses stratified by tertiles of socio-economic position (Pelotas, Brazil)\*

	First tertile (poorest)		Second tertile (intermediate)		Third tertile (wealthiest)	
	C-section, OR (95% CI)	<i>P</i>	C-section, OR (95% CI)	<i>P</i>	C-section, OR (95% CI)	<i>P</i>
2004 cohort						
4 years of age	0.74 (0.55; 0.99)	0.05	1.23 (0.91; 1.65)	0.17	0.83 (0.60; 1.16)	0.28
1993 cohort						
4 years of age <sup>†</sup>	1.09 (0.65; 1.84)	0.75	1.06 (0.51; 2.20)	0.87	1.16 (0.54; 2.49)	0.71
11 years of age	1.28 (0.89; 1.85)	0.18	1.02 (0.65; 1.55)	0.94	1.32 (0.86; 2.01)	0.20
4 and 11 years <sup>†</sup>	1.19 (0.38; 3.75)	0.77	2.17 (0.36; 12.9)	0.39	0.68 (0.16; 2.84)	0.60
15 years of age	0.94 (0.62; 1.42)	0.76	0.97 (0.61; 1.55)	0.89	1.14 (0.72; 1.79)	0.58
11 and 15 years	1.12 (0.55; 2.24)	0.76	0.80 (0.37; 1.73)	0.57	<u>1.82 (0.98; 3.36)</u>	<u>0.06</u>

\*Adjusted for child (birth weight, gestational age, intra-uterine growth restriction, skin colour and birth order), maternal (age, education, smoking during pregnancy and afterwards, and current wheezing), and paternal (smoking and current wheezing) variables.

<sup>†</sup>Analyses weighed for low birth weight.



# Can childhood asthma be predicted at birth?

K. C. Lødrup Carlsen<sup>1,2</sup>, P. Mowinckel<sup>1</sup>, B. Granum<sup>3</sup> and K.-H. Carlsen<sup>2,4</sup>

*Clinical & Experimental Allergy*, **40**, 1767–1775

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