

Early Childhood Wheeze across Europe

Findings from the EuroPrevall cohort



PIER Conference 20th September 2016
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Background

- Preschool wheeze is a common problem worldwide.
- Known risk factors include male gender, a family history of allergic disease, cigarette smoke exposure and contact with other children.
- Variations in the prevalence of wheeze across different countries have not previously been studied.

Aims

1. To determine the prevalence of wheeze in the first two years of life across all of the climatic regions of Europe.
2. To evaluate potential risk factors for wheeze, focusing on food allergy and infant feeding.

Methods- Design and study population

- EuroPrevall cohort established between 2005 and 2010.
- Questionnaires at baseline, 12 and 24 months.
- Additional assessments for those with signs/symptoms suggestive of food allergy.



Map showing study centres

Methods- Exposures

Food allergy



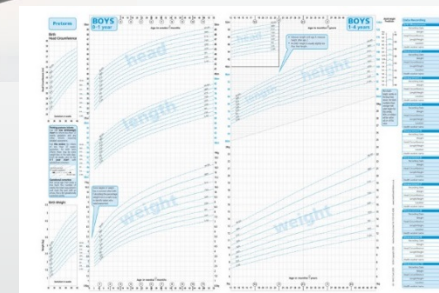
Infant feeding



Smoking



Birth details



Methods- Outcomes and analysis

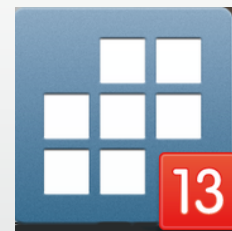
12-month questionnaire

In the last 12 months, has your child had wheezing or whistling in the chest?

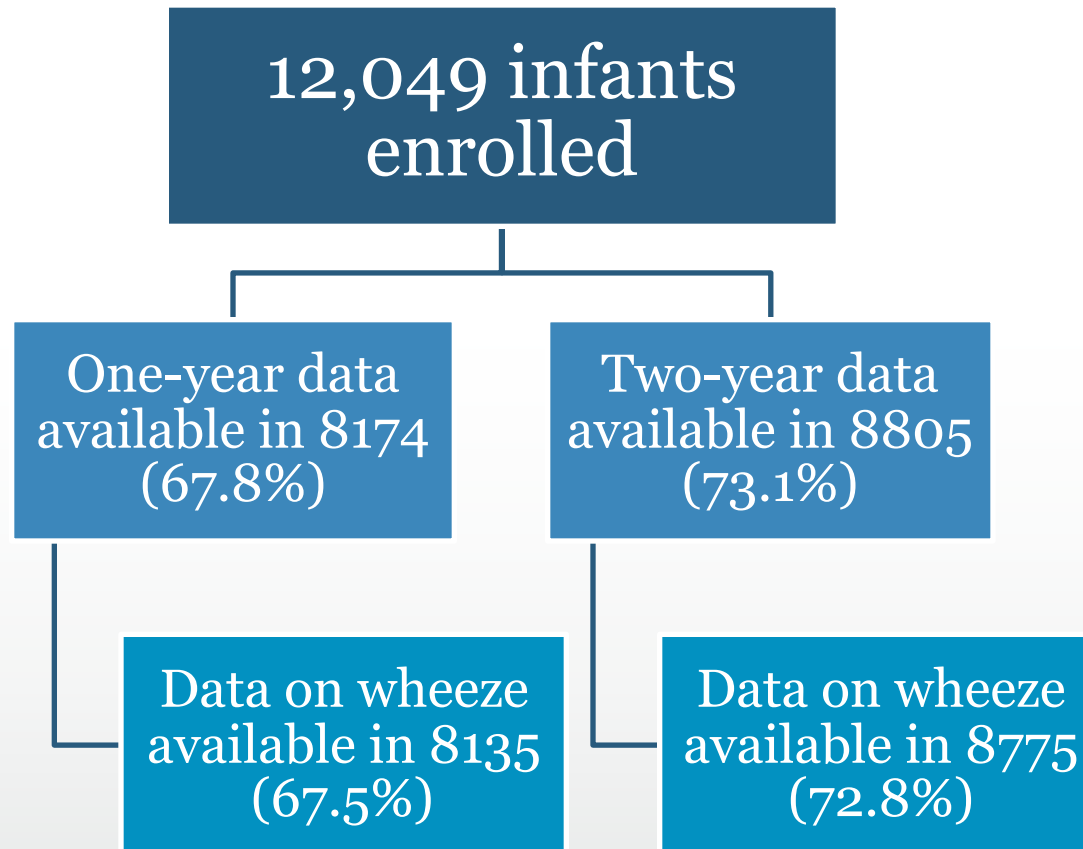
24-month questionnaire

In the last 12 months, has your child had wheezing or whistling in the chest when they did not have a cold?

- Primary outcome:
 - Wheeze in the second year of life
- Poisson regression analysis.



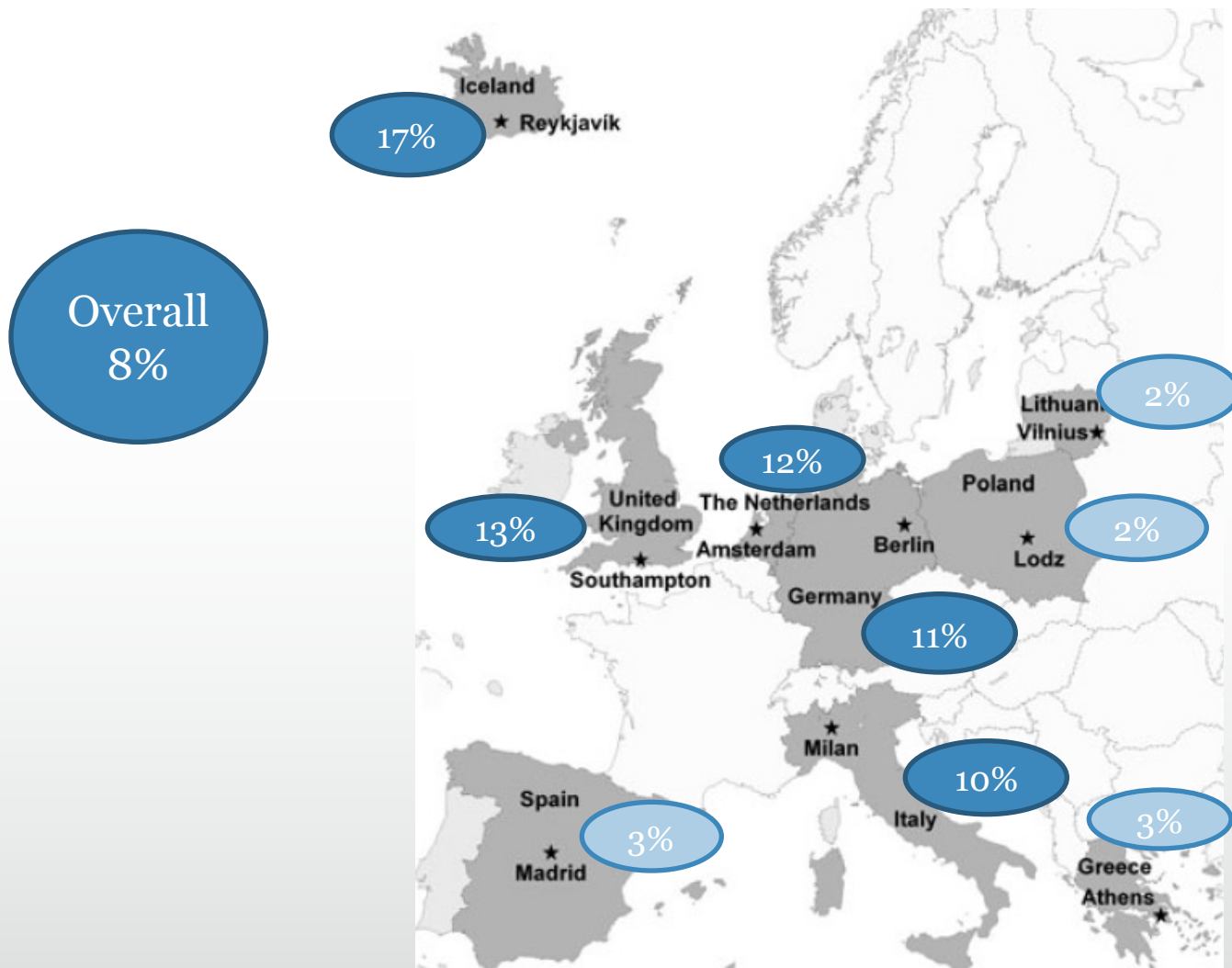
Results- Participants



Results- Demographics

	All centres	Highest	Lowest	p
Male gender %	51.4	52.6 Athens	50.1 Milan	0.987
Birth weight, kg mean (SD)	3.40 (0.51)	3.76 (0.51) Reykjavik	3.20 (0.46) Athens	<0.001
Caesarean section %	24.0	37.5 Lodz	2.5 Madrid	<0.001
Maternal allergic disease %	26.3	51.4 Southampton	5.9 Vilnius	<0.001
Maternal asthma %	9.4	22.8 Southampton	1.5 Vilnius	<0.001
Paternal allergic disease %	21.0	41.0 Southampton	2.8 Vilnius	<0.001
Paternal asthma %	7.2	19.4 Southampton	0.8 Vilnius	<0.001
Only basic education completed by mother %	18.2	27.2 Lodz	10.8 Berlin and Southampton	<0.001

Results- Prevalence of wheeze



Results- Exposures by centre

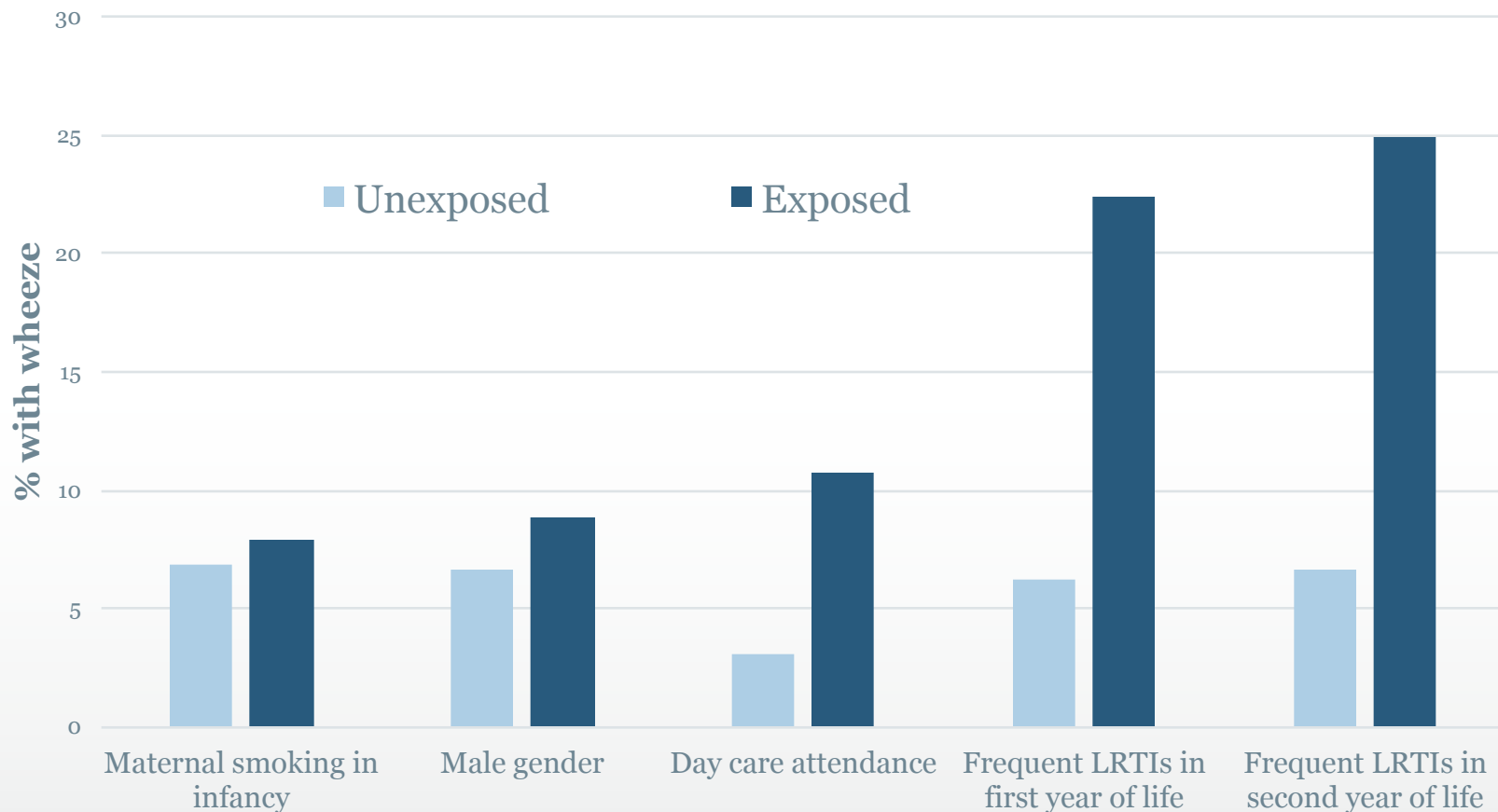
	All centres	Highest	Lowest	p
Food allergy %	1.3	3.0 <i>Southampton</i>	0.1 <i>Athens</i>	<0.001
Duration of breastfeeding, months mean (SD)	6.1 (3.90)	8.5 (3.46) <i>Reykjavik</i>	4.3 (3.28) <i>Athens</i>	<0.001
Overlap of breastfeeding/solids, months median (range)	0 (0-25.8)	3.2 (0-18.4) <i>Reykjavik</i>	0 (0-11.3) <i>Madrid</i>	<0.001
Smoking in pregnancy %	9.6	18.1 <i>Athens</i>	6.7 <i>Southampton</i>	<0.001
Maternal smoking in infancy %	15.9	33.3 <i>Athens</i>	6.3 <i>Southampton</i>	<0.001

Results- Exposures by centre

	All centres	Highest	Lowest	p
Day care attendance %	63.7	97.0 <i>Reykjavik</i>	18.9 <i>Athens</i>	<0.001
Frequent URTIs in year 1 %	55.5	91.2 <i>Reykjavik</i>	4.0 <i>Vilnius</i>	<0.001
Frequent URTIs in year 2 %	56.7	91.6 <i>Reykjavik</i>	3.4 <i>Vilnius</i>	<0.001
Frequent LRTIs in year 1 %	5.4	20.9 <i>Reykjavik</i>	0.3 <i>Vilnius</i>	<0.001
Frequent LRTIs in year 2 %	9.0	23.2 <i>Reykjavik</i>	1.0 <i>Lodz</i>	<0.001
Eczema	34.7	56.0 <i>Southampton</i>	4.9 <i>Vilnius</i>	<0.001

Frequent= quarterly or more

Results- Risk factors for wheeze



**aIRR [95% CI
(p-value) ***

1.62 [1.09-2.42]
(0.017)

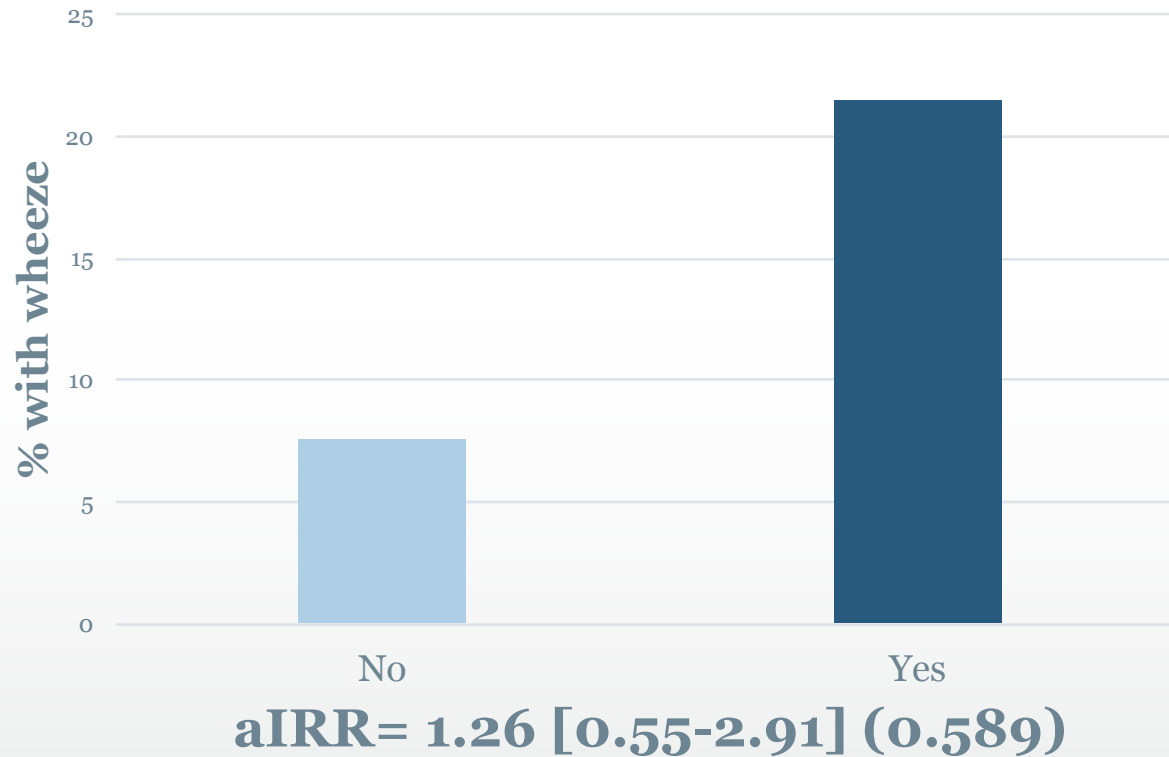
1.33 [1.03-1.70]
(0.027)

1.63 [1.08-2.45]
(0.020)

1.87 [1.33-2.64]
(<0.001)

2.50 [1.83-3.41]
(<0.001)

Results- Food Allergy



Results- Risk factors by centre

	Nordic	Maritime		Central European			Mediterranean
	Reykjavik	Southampton	Amsterdam	Berlin	Lodz	Vilnius	Madrid
Male gender	✓	✓	✓	✗	✗	✗	✗
Maternal smoking in infancy	✗	✓	✗	✗	✗	✗	✗
Day care attendance	✗	✗	✗	✓	✗	✓	✗
Frequent (≥quarterly) LRTIs in year 1	✓	✗		✗	✗	✓	✗
Frequent LRTIs in year 2	✓	✗	✗	✗	✓	—	✓

✓ = Significant in multivariable analysis ✗ = Not significant

Conclusions

- The prevalence of parent-reported wheeze in the first two years of life varies considerably across Europe.
- Lower respiratory tract infections, day care attendance, maternal smoking in infancy and gender are risk factors for early childhood wheeze.
- Additional factors are operating and may differ between countries.

Acknowledgements

- Professor Graham Roberts and Dr Kate Grimshaw.
- All of those involved in the EuroPrevall project.



S Sigurdardottir
M Clausen

A B Sprikkelman

R Dubakiene

A Munro
V Cornelius
ENC Mills

M Kowalski

T Keil
L Grabenhenreich
K Beyer

A Fiocchi

N Papadopoulos
P Xepapadaki

M Reche

Questions



Results- Risk factors for wheeze

	Wheeze in unexposed %	Wheeze in exposed %	Unadjusted IRR [95% CI] (p-value)	Adjusted IRR [95% CI] (p-value) *
Maternal smoking in infancy	6.9	7.9	1.15 [0.91-1.45] (0.237)	1.62 [1.09-2.42] (0.017)
Male gender	6.6	8.9	1.35 [1.16-1.58] (<0.001)	1.33 [1.03-1.70] (0.027)
Day care attendance	3.1	10.7	3.51 [2.82-4.38] (<0.001)	1.63 [1.08-2.45] (0.020)
Frequent LRTIs in year 1	6.2	22.4	3.60 [2.84-4.56] (<0.001)	1.87 [1.33-2.64] (<0.001)
Frequent LRTIs in year 2	6.6	24.9	3.77 [3.17-4.48] (<0.001)	2.50 [1.83-3.41] (<0.001)

* Adjusted for food allergy, ever breast fed, duration of breast feeding, age at introduction of first solids, overlap of breast feeding/solids, maternal smoking (during pregnancy and at one-year follow up), other household smokers, gender, gestation, birth weight, birth length, family history of allergic diseases and asthma, mould at home, pet dog, upper respiratory tract infections, eczema and study centre.

Results- Risk factors by centre

	Nordic	Maritime		Central European			Mediterranean
	Reykjavik	Southampton	Amsterdam	Berlin	Lodz	Vilnius	Madrid
n	829	494	569	1228	1084	1009	826
Male gender	1.45 [1.02-2.08] (0.040)	1.66 [1.00-2.76] (0.050)	3.17 [1.67-6.01] (<0.001)	1.72 [0.84-1.63] (0.346)	1.28 [0.45-3.65] (0.643)	2.00 [0.74-5.32] (0.167)	1.02 [0.46-2.25] (0.966)
Maternal smoking in infancy	1.08 [0.64-1.83] (0.776)	2.72 [1.29-5.77] (0.009)	1.46 [0.75-2.86] (0.267)	1.27 [0.84-1.94] (0.258)	2.38 [0.75-7.55] (0.141)	0.79 [0.11-5.99] (0.823)	1.66 [0.68-4.05] (0.261)
Day care attendance	1.30 [0.41-4.09] (0.656)	1.16 [0.69-1.95] (0.570)	1.71 [0.67-4.34] (0.258)	1.67 [1.01-2.77] (0.047)	1.91 [0.65-5.61] (0.237)	3.66 [1.47-9.13] (0.005)	0.69 [0.31-1.53] (0.365)
Frequent (≥quarterly) LRTIs in year 1	1.83 [1.28-2.65] (0.001)	1.85 [0.82-4.17] (0.138)	2.33 [0.56-9.63] (0.243)	1.30 [0.63-2.66] (0.478)	2.48 [0.32-19.18] (0.384)	24.9 [2.98-207.18] (0.003)	2.42 [0.86-6.80] (0.093)
Frequent LRTIs in year 2	2.74 [1.92-3.92] (<0.001)	1.07 [0.41-2.75] (0.896)	2.67 [0.65-11.15] (0.174)	1.29 [0.69-2.39] (0.421)	10.23 [1.34-78.33] (0.025)	-	11.83 [4.27-32.78] (<0.001)

Figures represent adjusted IRR [95% CIs] (p-value)