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*A World Federation of Allergy Asthma  
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# Nuts and Bolts of Allergy Skin Testing

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# *Allergy Skin Testing*

## Learning Objectives

- To recognize different techniques of allergy skin tests.
- Conditions in which skin test may help the diagnosis of allergy.
- Interpretation of tests and risk of reactions.
- Research tool.

# Skin Tests

## ➤ Percutaneous - Prick



## ➤ Intradermal



***Prick/puncture.*** A diluted allergen is applied with a prick or a puncture on the surface of the skin.

***Intradermal.*** Using a 26- to 30-gauge needle, a diluted allergen is injected immediately below the skin surface.

Skin tests: **fast results, in the office.**

Cost less than serum sIgE.

**Children** do not like this type of test.

Some meds. can interfere with the tests.

Hard to read in some people with **dark skin.**

Severe skin condition (eczema, dermatographism)

“The skill of the tester may affect the results”.

# Medications that affect SPT reactivity

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- H1 Anti-histamine
- H2 Anti-histamine
- Tricyclic Antidepressants
- Antiemetics
- Corticosteroids
- $\beta$ 2 blockers, MAO/ACE inhibitors ( $\uparrow$  reactivity)

# Allergy Skin Tests: A Matter of Interpretation

# Potential Risks of Non-Specialist Care

**Misinterpretation of test results**

**Overdiagnosis**

**Mismanagement**

**Overprescription of meds. and treatments**

**Costly and unnecessary allergen avoidance**





- + wheal < 2 mm, with  
erithema
- ++ wheal 2-5 mm
- +++ wheal > 5 mm
- ++++ pseudopods

# Prick skin test reactions to *D. pteronyssinus* extract in asthmatic children

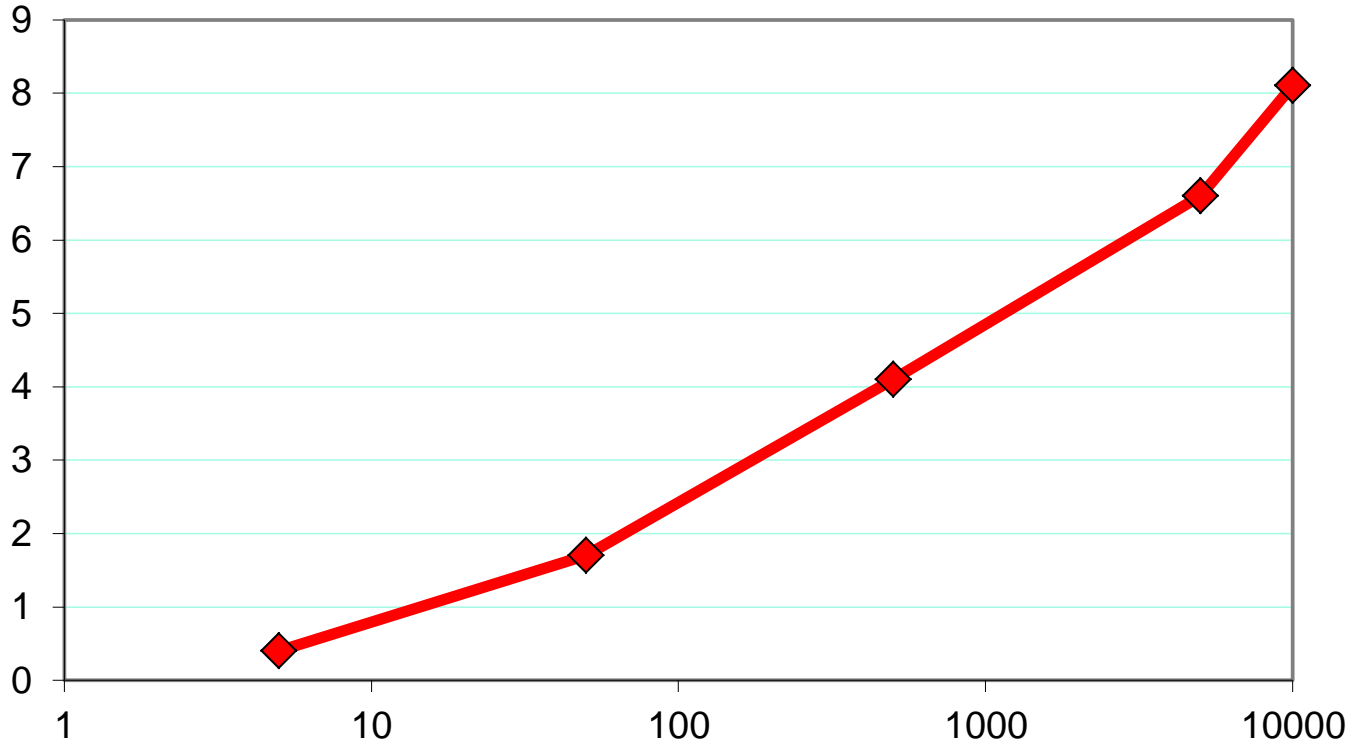
ANTÍGEN (AU)	WHEAL * (mm)	ERITHEMA * (mm)	++++ (%)	NEGATIVE (%)
10.000	8,1 ± 0,31	24,8 ± 0,53	95	0
5.000	6,6 ± 0,35	20,6 ± 0,94	64	0
500	4,1 ± 0,38	13,9 ± 1,11	10	1
50	1,7 ± 0,21	7,0 ± 1,18	0	33
5	0,4 ± 0,13	1,3 ± 0,56	0	81

\*  $\bar{X} \pm \text{SEM}$ ; n=42

# Greer Laboratories, USA



# Wheal diameters (mm)



*D. pteronyssinus* AU/mL

# Skin tests and severity of asthma

Variable	Mild (n=16)	Moderate (n=17)	Severe (n=8)	P*
Time of reaction (sec)	81.0±14.6	73.3±7.4	108±30.4	0.4235
Minimal conc (UA)	55.6±11.6	49.4±8.3	45.0±13.6	0.9093
Wheal diameter (mm)	6.1±0.4	6.7±0.5	7.1±0.3	0.1255

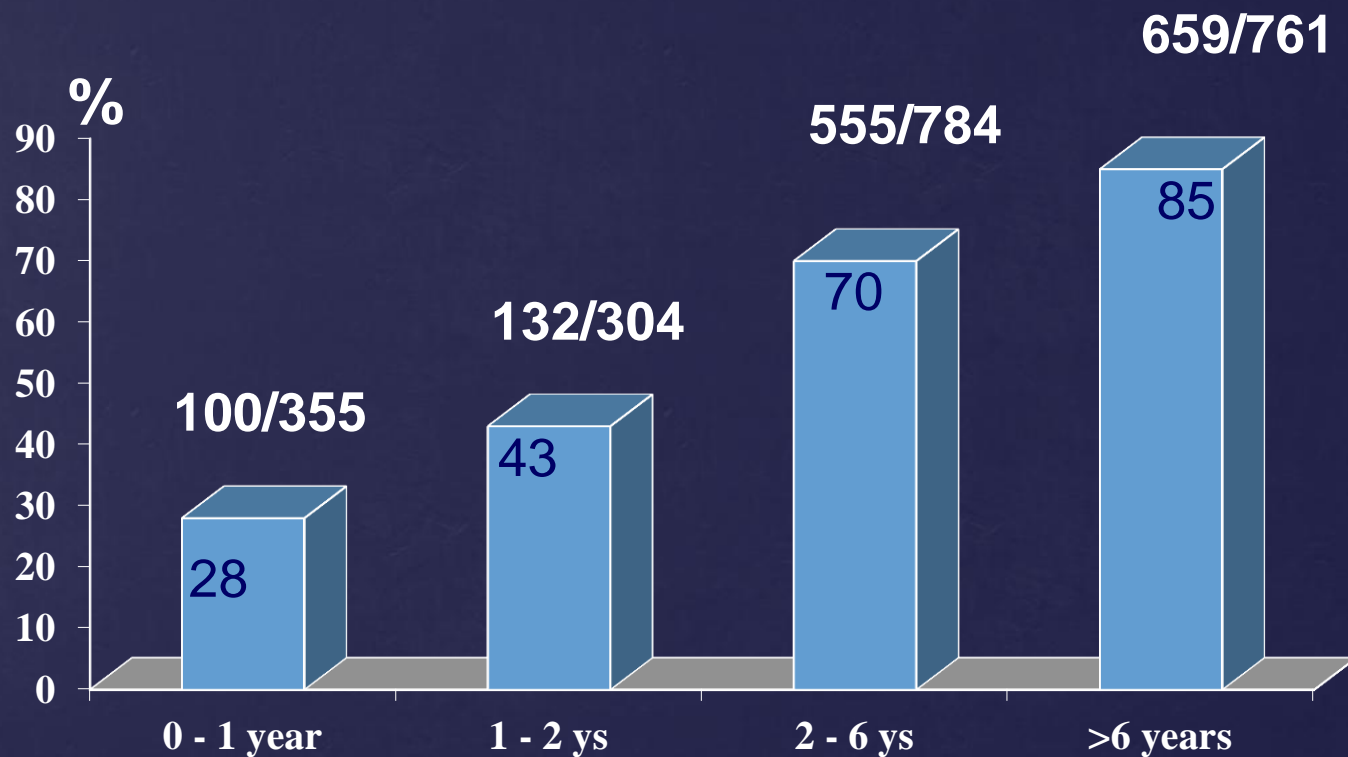
Mean±SEM

\*Non significant, Kruskal-Wallis test

# Sensitization to mites and pollen SPT in normal population

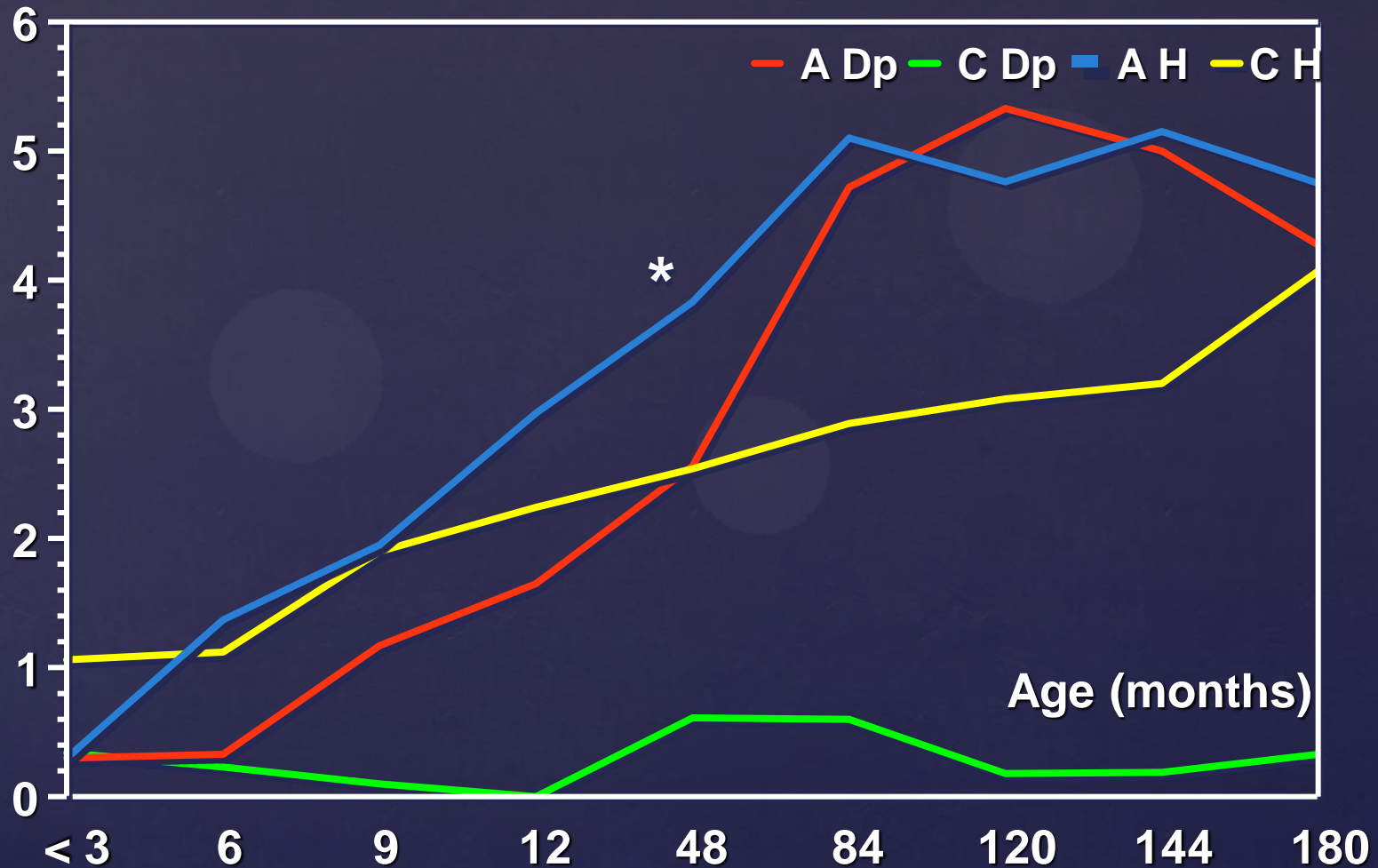
	Children N=3,271	Adults N=3,041	p
<i>D.pteronyssinus</i>	920 (28,1%)	815 (26,8%)	NS
Lolium	48 (1,5%)	102 (3,3%)	<0,001
Dp e Lolium	104 (3.2%)	370 (12,1%)	<0,001
<b>Total</b>	<b>1072 (32,8%)</b>	<b>1287 (42,2%)</b>	

# Skin prick test reactivity vs. age



# Skin tests in atopic and non-atopic children

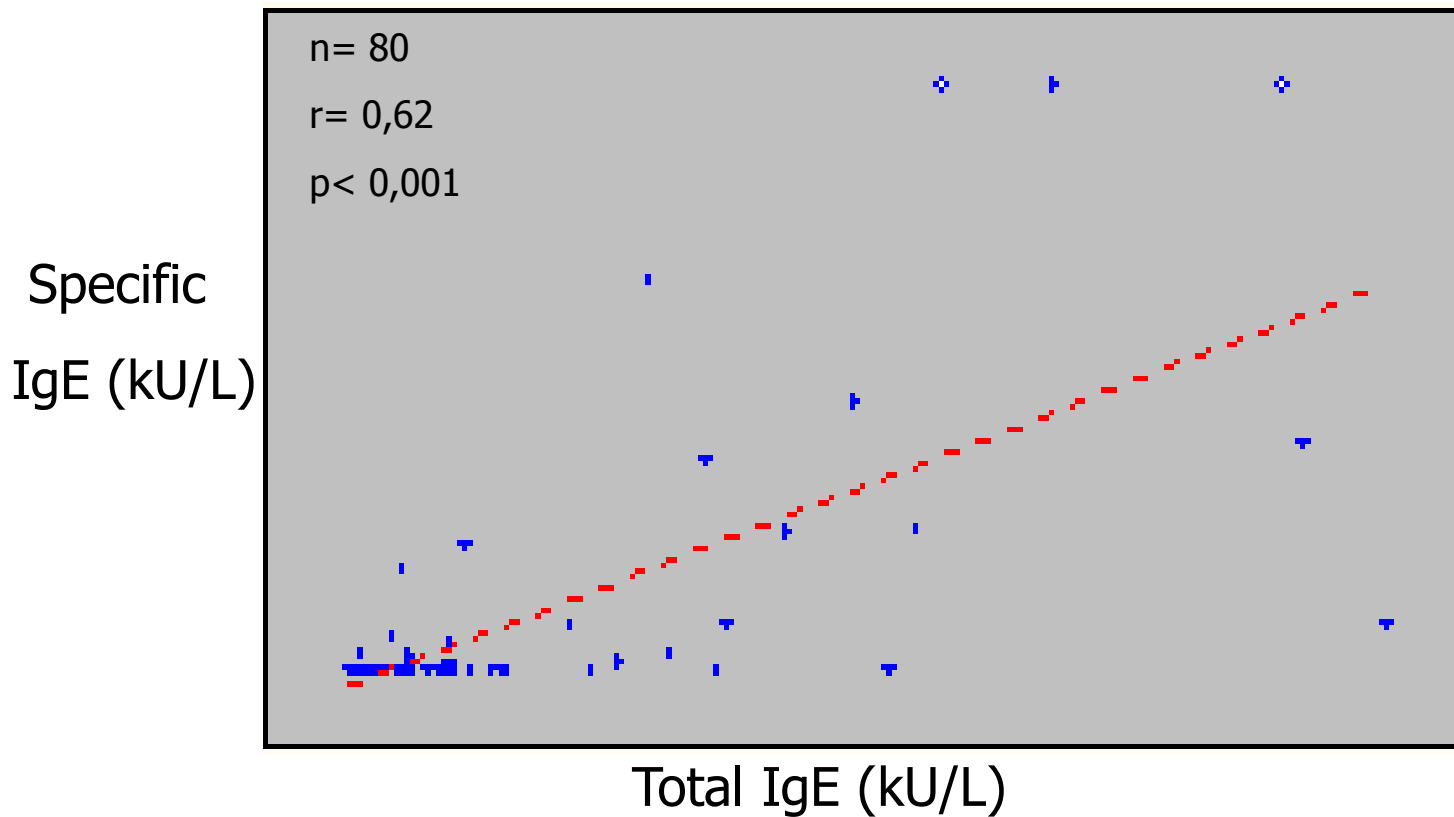
Wheal mean diameter (mm) X age



\*  $p < 0,05$

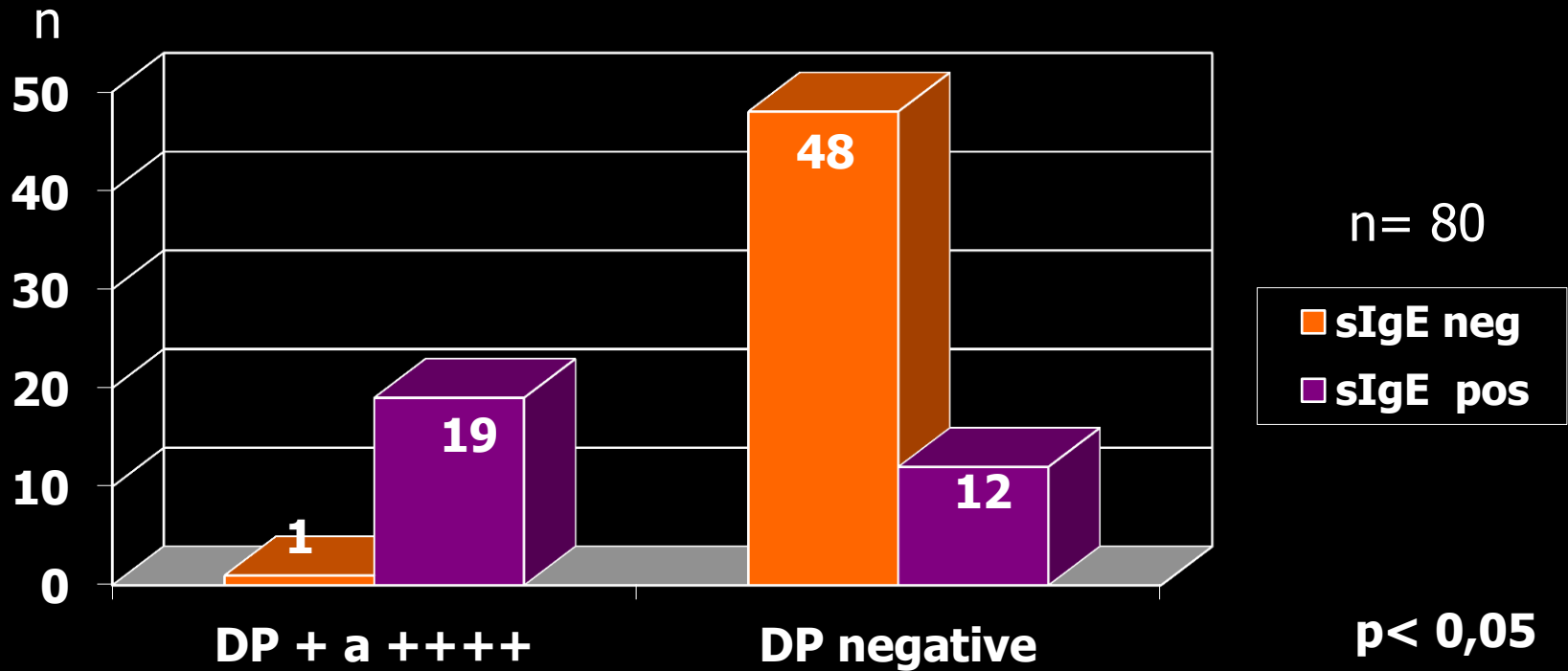
Halasz et al - J Investig Allergol Clin Immunol 7: 98-102, 1997

# Serum total IgE and specific IgE to *D. pteronyssinus*





# Skin test X Serum specific IgE



SPT – *D. pteronyssinus*

# 50% and 95% Predictive Value have been Established for Food Specific-IgE and SPT

TABLE II. Tests to assess the likelihood of obtaining a positive or negative OFC in children

Food	Serum food-IgE (kIU/L)*		SPT wheal (mm)*	
	~95% Positive	~50% Negative†	~95% Positive	~50% Negative†
Cow's milk	$\geq 15^{16}$ $\geq 5$ if younger than 1 year <sup>132</sup>	$\leq 2^{23}$	$\geq 8^{21}$	
Egg white	$\geq 7^{16}$ $\geq 2$ if younger than 2 years <sup>133</sup>	$\leq 2^{23}$	$\geq 7^{21}$	$\leq 3^{22}$
Peanut	$\geq 14^{16}$	$\leq 2$ with and $\leq 5$ without history of peanut reaction <sup>24</sup>	$\geq 8^{17,21}$	$\leq 3^{17}$
Fish	$\geq 20^{16}$			

Food specific-IgE measured with ImmunoCAP™ and SPT with lancet (ref 17 & 21,) and bifurcated needle (ref 22)

Nowak-WÄ et al, Work Group report: Oral food challenge testing. J Allergy Clin Immunol 2009; 123:S365-S83.

Anaphylaxis is also potentially triggered by allergen skin tests (especially intradermal tests)

# Systemic reactions to allergy skin tests

Retrospective study at the Mayo Clinic to identify patients who developed systemic reactions to skin tests

497,656 skin tests were performed : SPT 16,505 patients

- 6 patients experienced SRs. All had asthma.
- SPT SR rate was 15 or 23 reactions per 100,000 aeroallergen tests
- “It is noteworthy that there were no systemic reactions to skin tests for foods or venoms”
- **Conclusion: SR to skin tests was very low. SRs were mild and all patients recovered fully within 1 hour.**

Table 3. Types of Skin Test and Systemic Reaction Rates

Types of Skin Test	Patients Tested	Patients with SR*	Rates per 100,000†	CI (95%)
Latex	1316	2 or 3	152 or 228	18.4–549.0 or 47.0–666.2
Penicillin and antibiotics	1383	1	72.3	1.8–402.9
Aeroallergens	13218	2 or 3	15.1 or 22.7	4.7–66.3 or 1.8–54.7
Others‡	3394	0	0	0–108.7

# Thank you! Obrigado!



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