



Short-term effects of exposure to birch, grass and ragweed pollens on clinical symptoms of 200 patients suffering from pollinosis in France

Thibaudon M,

Clot B, Martin S, Segala C, Besancenot J, Caillaud D, Monnier S



5th ESA

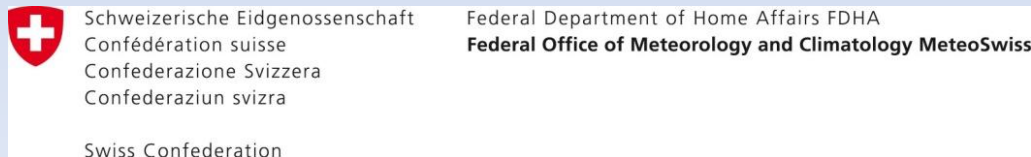
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Acknowledgments

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- the volunteers.
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Summary

- ✓ Aim of the study
- ✓ Materials and methods
- ✓ Results
- ✓ Conclusion

Aim of the study

➤ **State of the art :**

Epidemiological studies show an association between the presence of birch, grass and ragweed pollen in the air and the consumption of anti-allergic drugs and hospitalizations for asthma.

➤ **Aim of the study :**

The aim of the study was to show the relationships between birch, grass and ragweed pollen concentrations and intensity of symptoms in patients with hay fever, on a significant number of subjects, using adequate statistical tools.

Materials and methods (1)

3 panel studies were conducted :

- Allergy sufferers to birch pollen in 2010
- Allergy sufferers to grass pollen in 2010
- Allergy sufferers to ragweed pollen in 2009 and 2010

Exposure: Metrology and pollen data:

Daily birch, grass and ragweed pollen concentrations were obtained from the National Aerobiological Network Survey (RNSA).

Measurements were made with Hirst-type pollen traps (fig 1).

Pollen grains were identified and counted by trained analysts (fig 2).

Figure 1



Figure 2



Materials and methods (2)

➤ Health impact :

The patients were asked to complete a diary with ocular, nasal, and bronchial symptoms during the pollen seasons of ragweed, birch and grass.

They were asked to record their own symptoms each evening.

The severity of ocular, nasal and bronchial symptoms were recorded on scale from 0 to 3 (0=no symptoms, 1=light symptoms, 2=moderate symptoms, 3=severe symptoms).

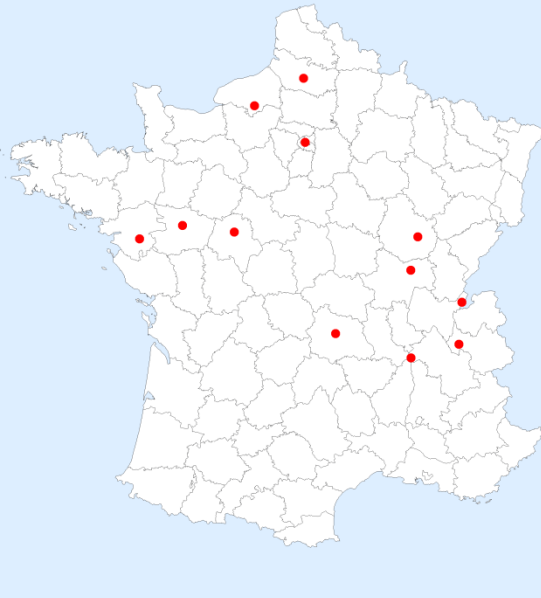
➤ Quality of life :

The quality of life was also a variable assessed by patients on a scale from 0 (bad quality of life) to 10 (good quality of life).

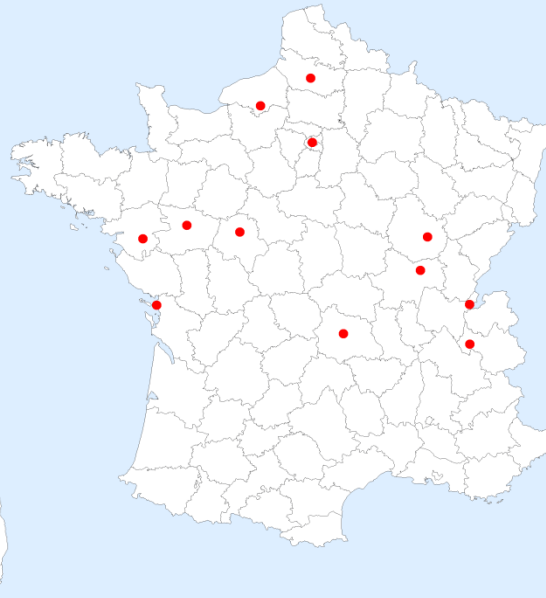
Materials and methods (3)

The patients selected for the study come from different cities of France and Switzerland :

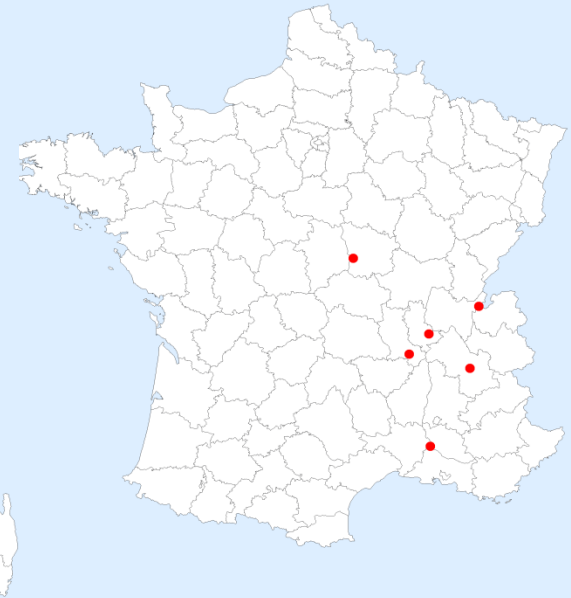
- For **birch** : Nantes, Angers, Tours, Paris, Amiens, Rouen, Dijon, Chalon sur Saône, Clermont Ferrand, Roussillon, Chambéry and Genève.
- For **grass** : Nantes, Angers, Tours, La Rochelle, Paris, Amiens, Rouen, Dijon, Chalon sur Saône, Clermont Ferrand, Chambéry and Genève.
- For **ragweed** : Avignon, Grenoble, Lyon, Saint-Etienne, Nevers, Genève.



(Map birch)



(Map grass)



(Map ragweed)

Socio-demographic characteristics

Panel	Birch panel 2010	Grass panel 2010	Ragweed panel 2009	Ragweed panel 2010
Number of patients	96	106	16	21
Women/men	50/46	65/41	22/8	
Age (average)	39.9	37.3	39.6	

Inclusion criteria

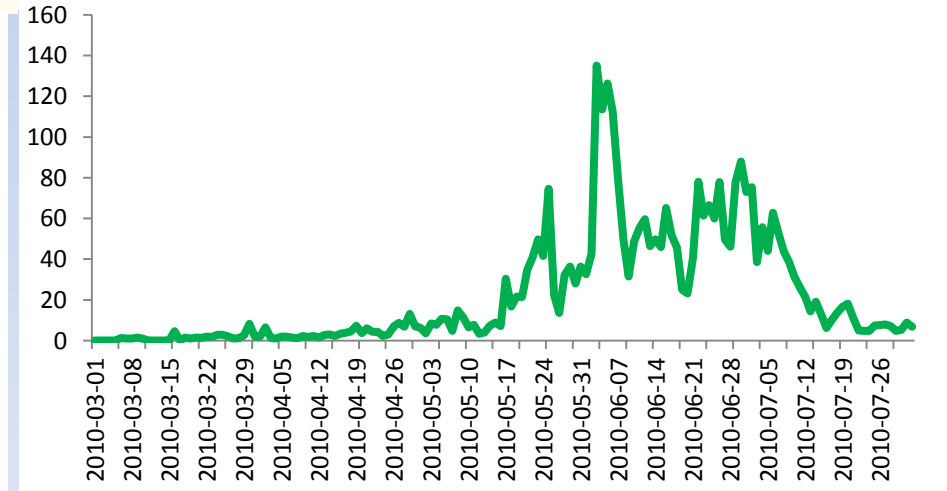
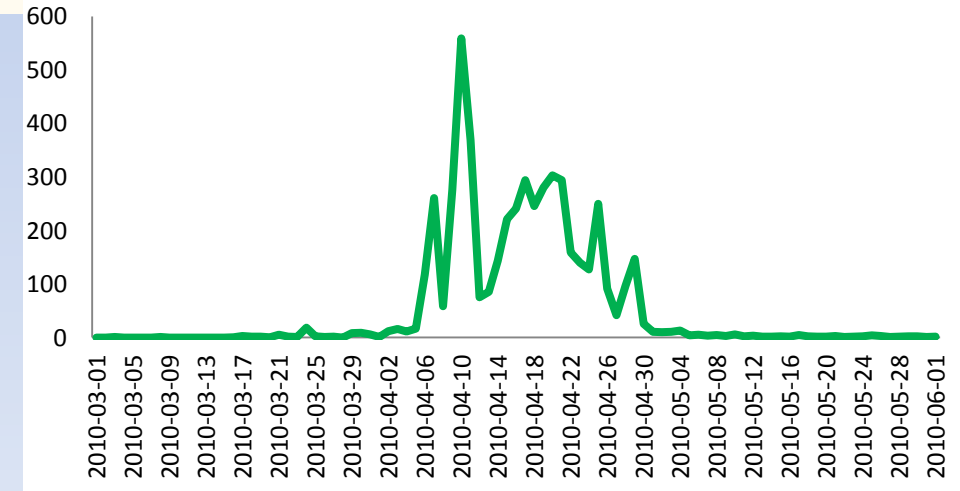
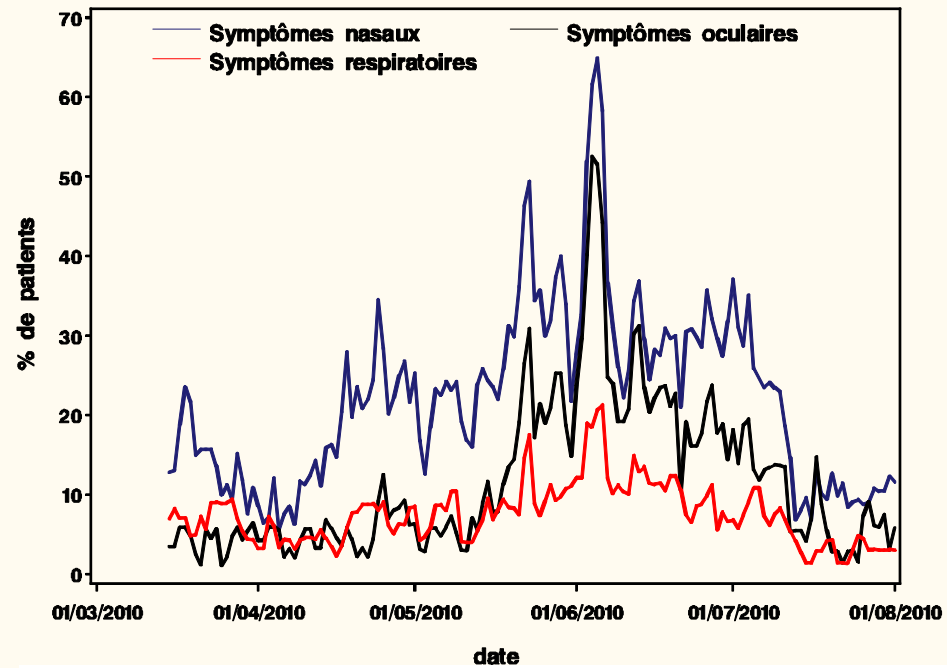
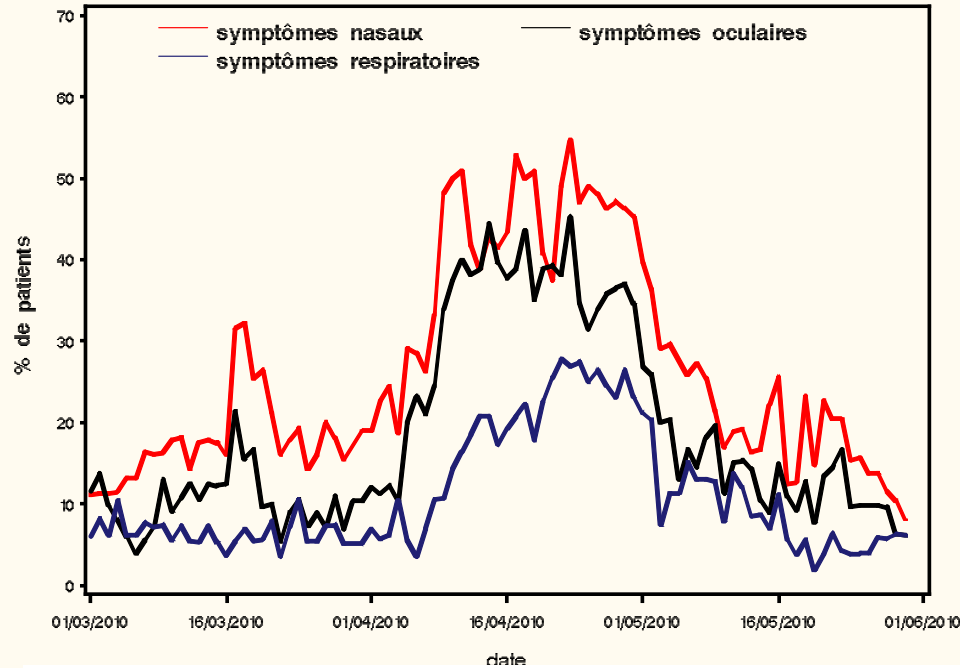
Birch panel 2010	Grass panel 2010	Ragweed panel 2009 and 2010
<ul style="list-style-type: none">- Aged over 18, with pollinosis symptomatic for at least 2 years.-Sensitization known in the patient file : skin tests and/or specific IgE to birch pollen.- Living and working within a radius of 30km around a RNSA pollen trap.	<ul style="list-style-type: none">- Aged over 18, with pollinosis symptomatic for at least 2 years.-Sensitization known in the patient file : skin tests and/or specific IgE to grass pollen.- Living and working within a radius of 30km around a RNSA pollen trap.	<ul style="list-style-type: none">- Aged over 18, with pollinosis symptomatic for at least 2 years.-Sensitization known in the patient file : skin tests and/or specific IgE to ragweed pollen.- Living and working within a radius of 30km around a RNSA pollen trap.

Exclusion criteria

Birch panel 2010	Grass panel 2010	Ragweed panel 2009 and 2010
<ul style="list-style-type: none"> - Patients with perennial rhino conjunctivitis. - Current or regular asthma. - Sensitization known in the patient file to animals allergens and suffering from symptoms related to these allergens. - Taking a treatment with corticosteroids at the time of inclusion. - Current desensitization to birch pollen that started before 2009. -Smoking 	<ul style="list-style-type: none"> - Patients with perennial rhino conjunctivitis. -Current or regular asthma. - Sensitization known in the patient file to one or more moulds. - Sensitization known in the patient file to one or several tree pollen. - Taking a treatment with corticosteroids at the time of inclusion. - Current desensitization to grass pollen that started before 2009. - Smoking 	<ul style="list-style-type: none"> - Patients with perennial rhino conjunctivitis. - Current or regular asthma. - Sensitization known in the patient file to animals allergens and suffering from symptoms related to these allergens. - Taking a treatment with corticosteroids at the time of inclusion. - Current desensitization to ragweed pollen that started before the year before inclusion. - Smoking

RESULTS

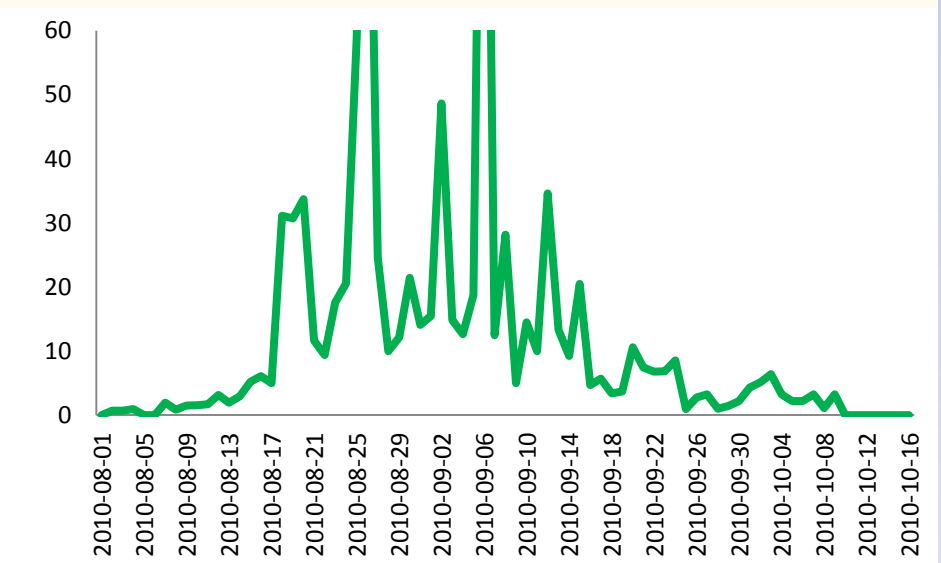
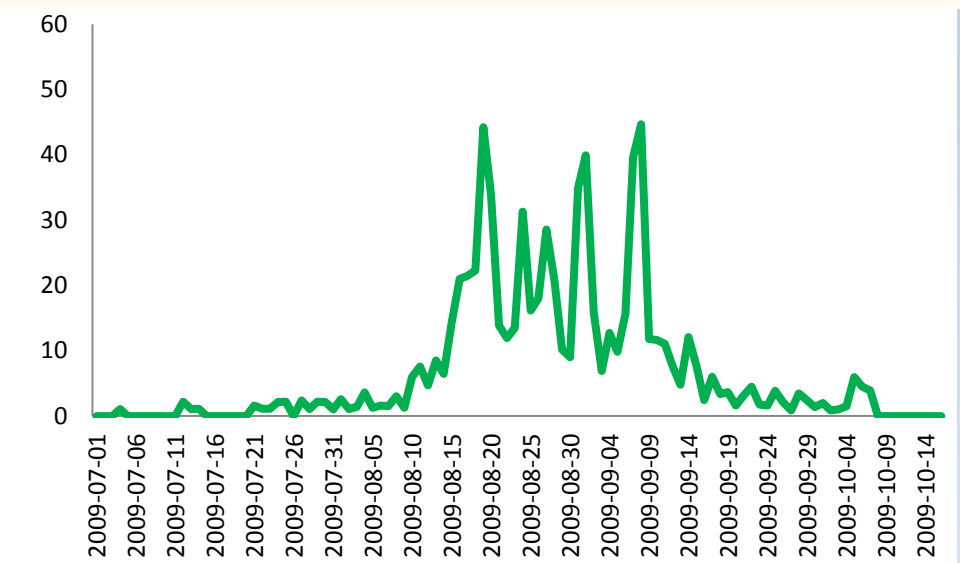
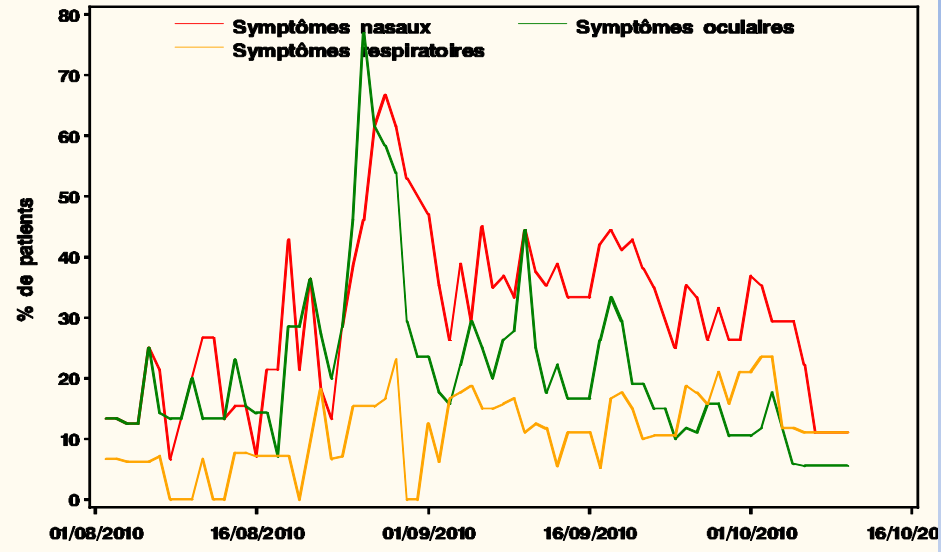
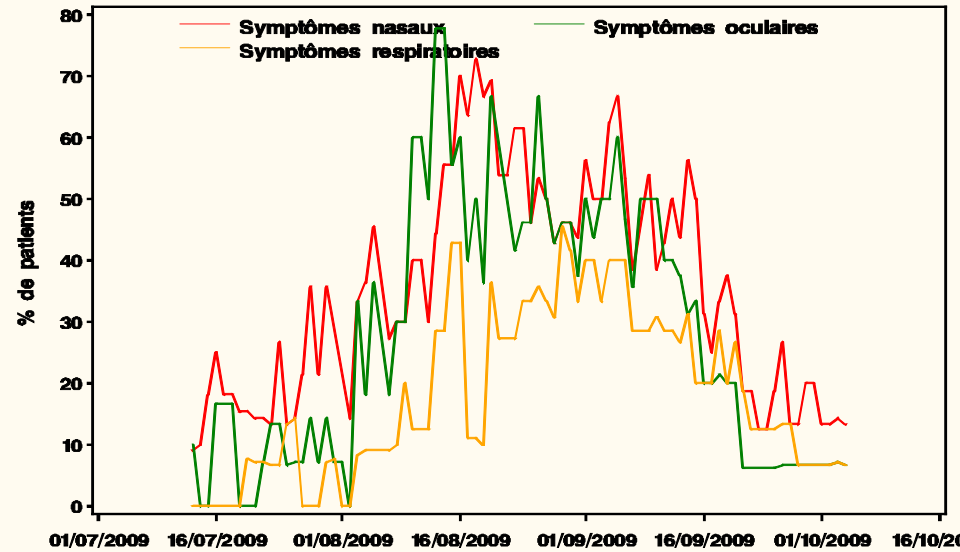
Results – Exposure – Birch and grass panels



(Birch 2010)

(Grass 2010)

Results – Exposure – Ragweed panel



(Ragweed 2009)

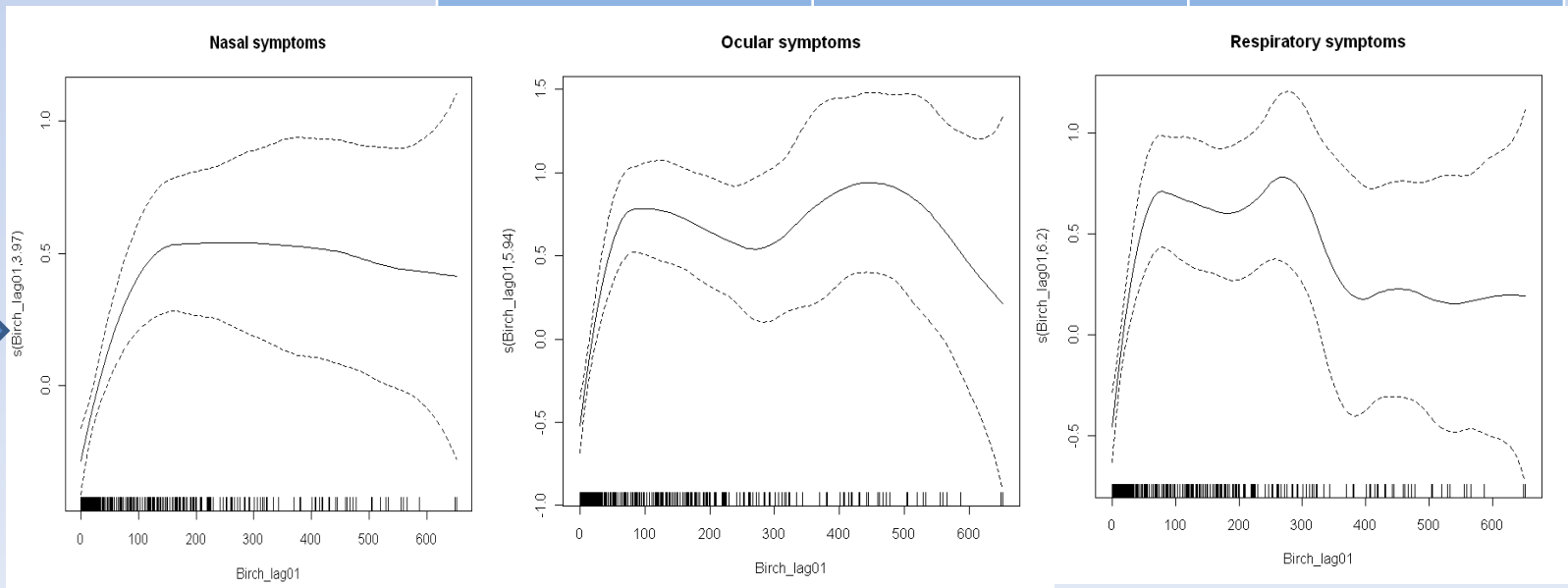
(Ragweed 2010)

Results – Health impact – Birch panel

Birch 2010

Table 1 shows that during the whole birch pollination, for each increase of 10 grains/m³, the percentage of patients with moderate to severe symptoms also increased (odds ratio, standard deviation.)

Table 1	Birch ≤ cut off OR (95%CI)	Birch > cut off OR (95%CI)
Nasal symptoms (cut off = 110)	2.01 (1.36-3.00)	0.99 (0.90-1.09)
Ocular symptoms (cut off = 70)	4.80 (2.14-10.80)	0.97 (0.87-1.07)
Bronchial symptoms (cut off = 70)	2.97 (1.30-6.75)	0.91(0.80-1.04)



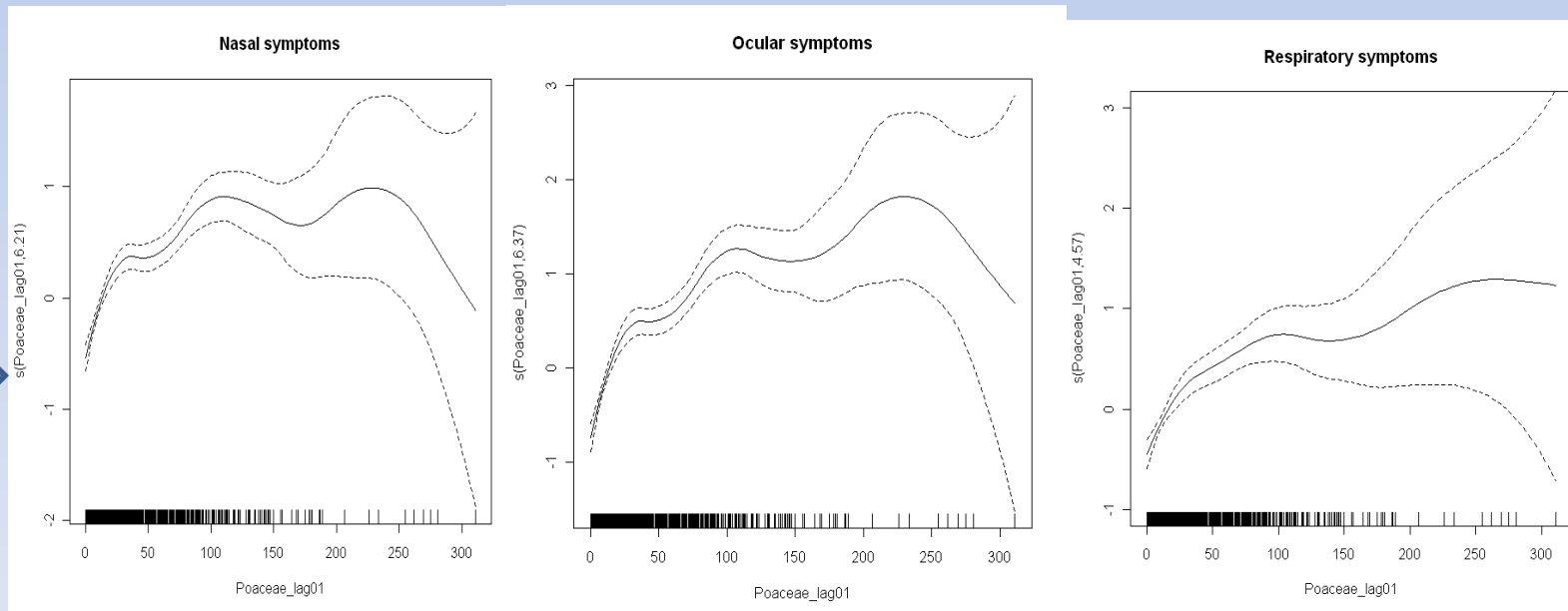
Results – Relations Pollen-symptoms – grass panel

Table 2 shows that the respiratory symptoms' OR for a 10 grain/m³ increase in Poaceae is significant (**1.03 [1.01-1.05]**).

And the equation models quantified significant nasal and ocular pollen-symptom relationships up to the saturation points of 80 and 90 grains/m³.

Beyond these cutoffs, ORs are close to 1 and not significant.

Table 2	Grasses \leq cut off OR (95%CI)	Grasses $>$ cut off OR (95%CI)
Nasal symptoms (cut off = 80)	1.06 (1.03-1.08)	0.998 (0.970-1.027)
Ocular symptoms (cut off = 90)	1.08 (1.05-1.12)	1.009 (0.969-1.050)
Bronchial symptoms (cut off = 0)	1.03 (1.01-1.05)	



These graphs present the shape of the pollens-symptoms relation from the GAMM models for respectively nasal, ocular and bronchial symptoms for the grass panel.

Results – Health impact – Ragweed panel

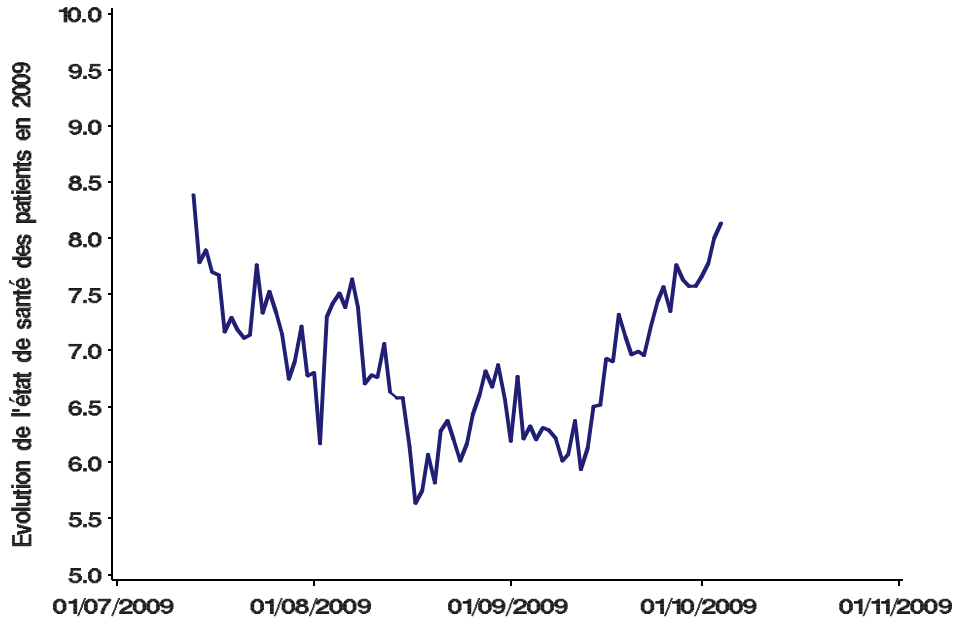
Symptoms/Years	2009	2010
Ocular symptoms	1.324	1.049
Respiratory symptoms	1.139	1.027
Nasal symptoms	1.426	1.247

In 2009, there was an average increase of **32.4%** in the prevalence of moderate to severe ocular symptoms and **13.9%** for respiratory symptoms and **42,6%** for nasal symptoms for an increase of **10** grains/m³ pollen.

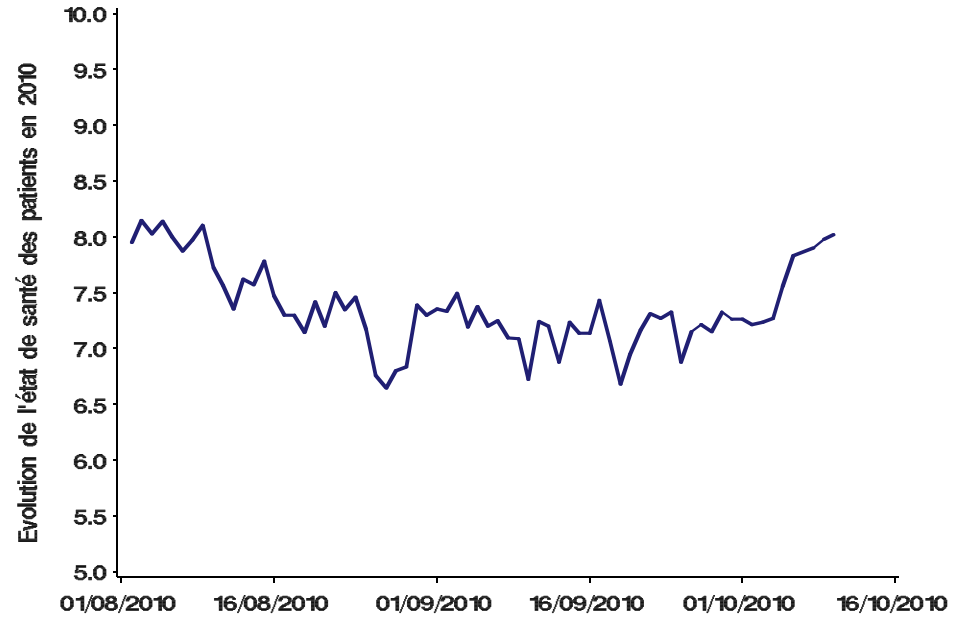
This increase was lower in 2010



Results – Quality of life – Ragweed panel



(Graph 1 : Quality of life in 2009)



(Graph 2 : quality of life in 2010)

For each increase of 10 grains/m³, the quality of life, measured on a scale of 0 to 10, decreased significantly (0.099 point in 2009 and 0.020 points in 2010).

There was a significant and negative relationship between quality of life and concentrations of ragweed pollen, and this relationship was stronger in 2009 (Graphs 1 and 2).

Conclusion

Conclusion Birch :

➤ The clinical response in patients sensitized to natural exposure of birch varies during the pollen season. There is a threshold followed by a linear relationship up to a saturation plateau. The dose-response relationship is nonlinear for nasal, ocular and respiratory symptoms with an increase of symptoms in relation to the increase of pollen followed by a plateau.

Conclusion grass :

➤ The clinical response in patients sensitized to grasses varies during the pollen season. With regard to nasal and ocular symptoms, there is a priming effect and co-priming early in the season without a threshold, then a linear response up to a plateau.

Conclusion ragweed :

➤ The increase of ragweed pollen causes a greater increase of ocular, nasal and respiratory symptoms in 2009 than in 2010. Quality of life deteriorates significantly when ragweed pollen increases.

To our knowledge, this is the first epidemiological study that enables the quantification between ragweed pollen and health effects.

One of the main strengths of this study is its statistical power, because of repeated measurements and is huge number of pollinosis patients (200).

The End

Thank you for your attention

