ALLERGY POTENCY FOR THE MAIN URBAN PLANTS

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RNSA

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Urban plants




Our health lies also in our parcs and gardens



www.vegetation-en-ville.org

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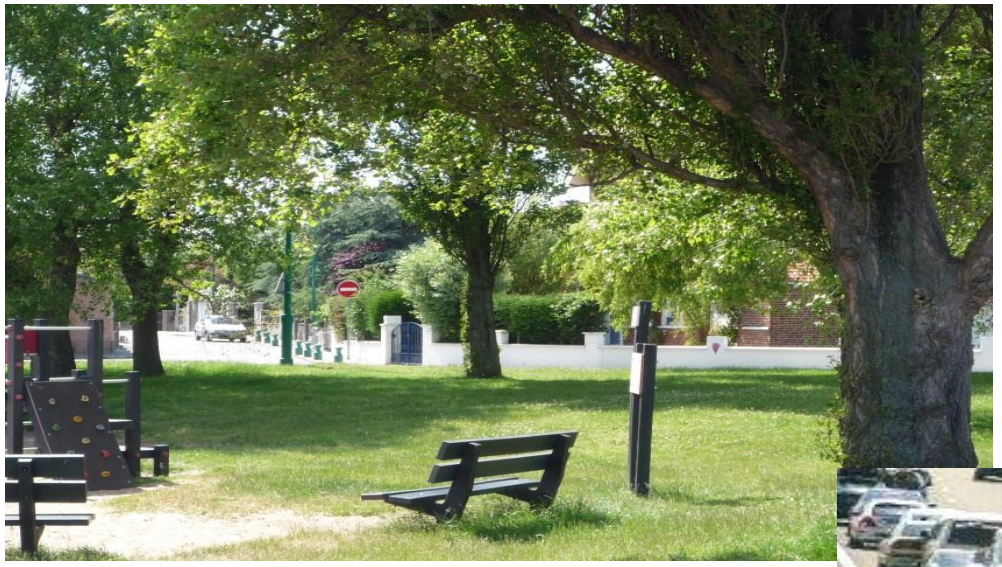
Urban Vegetation & Air Quality

Absorption of pollutants



Absorption of particulate pollutants

Effect of well-being
Fight against stress

Pollen/Pollution

The city is an environment conducive to the presence of pollutants in the air

Road traffic

Heating

http://happyfamilyhome.immo-facile.com

Human activities

- **Nitrogen oxydes, CO_2, COV**
- **Particles (PM2,5 PM10)**
- **ozone (O_3) precursors**
- **Nox, SO_2, CO**

Trees and pollution

Advantage :

Planting trees in the city would have a protective effect because they reduce the presence of pollutants in the air by filtering and absorbing pollutants, small fine dust and aerosols suspended in the air.

Disadvantages :

Urban pollution aggravates allergenicity of pollens by weakening the surface of the grains and allowing the exit of granules containing allergenic proteins. It also causes an increase in bronchial, nasal and ocular hyperresponsiveness, altering the threshold of sensitivity to pollens. Moreover, the introduction of trees in the city (cypress, birch, plane tree ...) contributes to the increase of respiratory allergies.

Moreover…

Other environmental aspects related to vegetation should be taken into account

Urban climate - greenhouse effect

Energy expenditure in buildings

We must also consider the health aspects linked to urban vegetation.

☺ *Physical and psychological well-being*

☹ *Allergies*

Vegetation has a cost :

In France, the average cost for a planted tree is 1250 euros

(Soil preparation, planting, maintenance)

Pauleit and *al*., 2002

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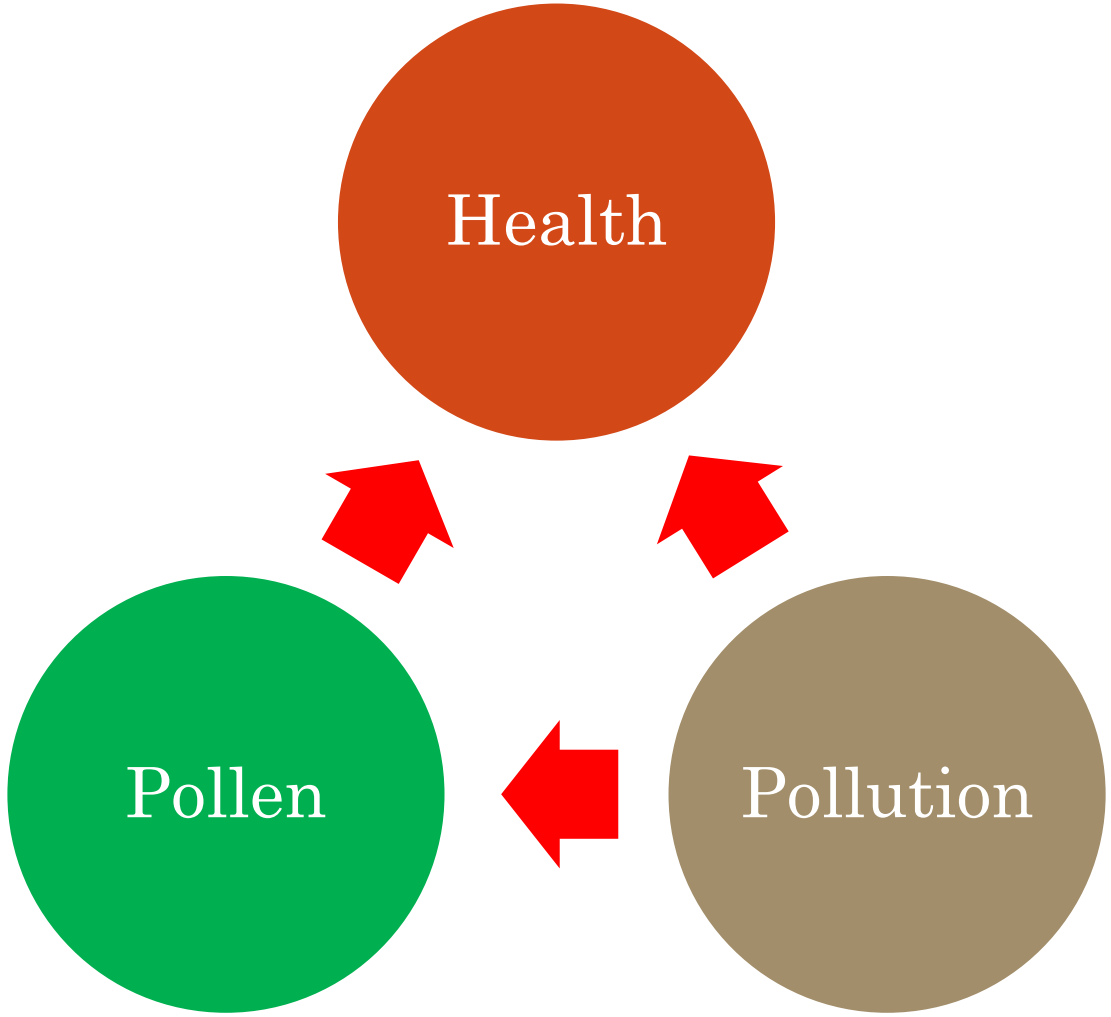
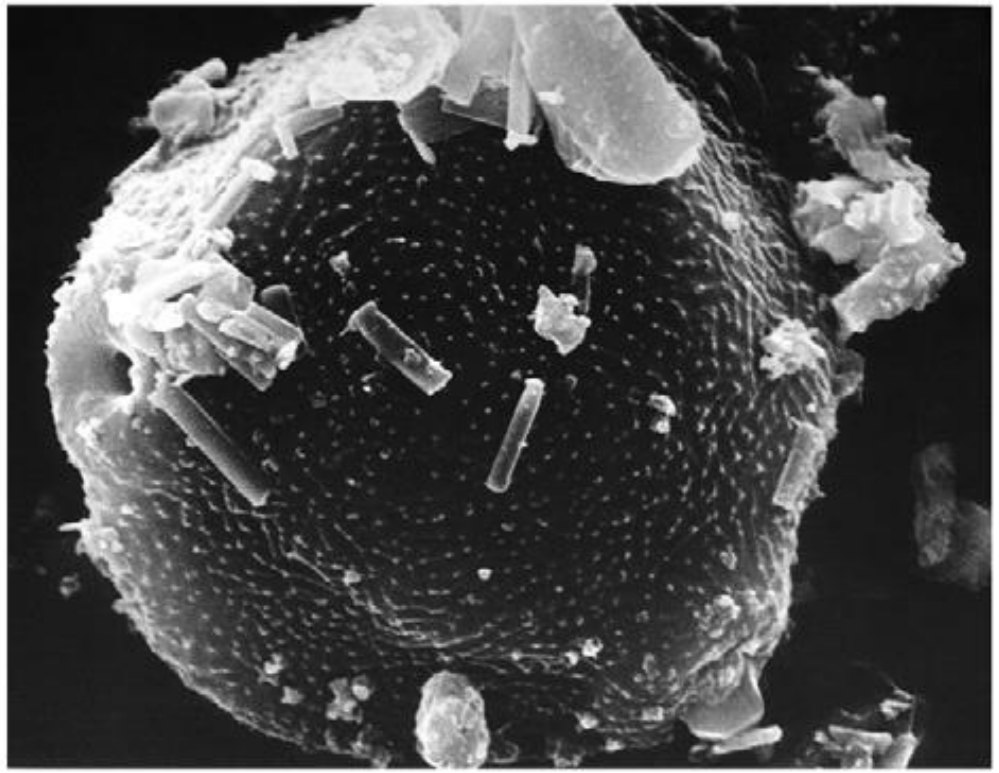
Pollution and pollen

- Pollutants (NO2, O3, PM10 et PM2.5) act:
  - By weakening the respiratory system
  - On the aeroallergens contained in the pollen grains
  - On the structure of pollen grains
  - On allergenicity of pollen grains



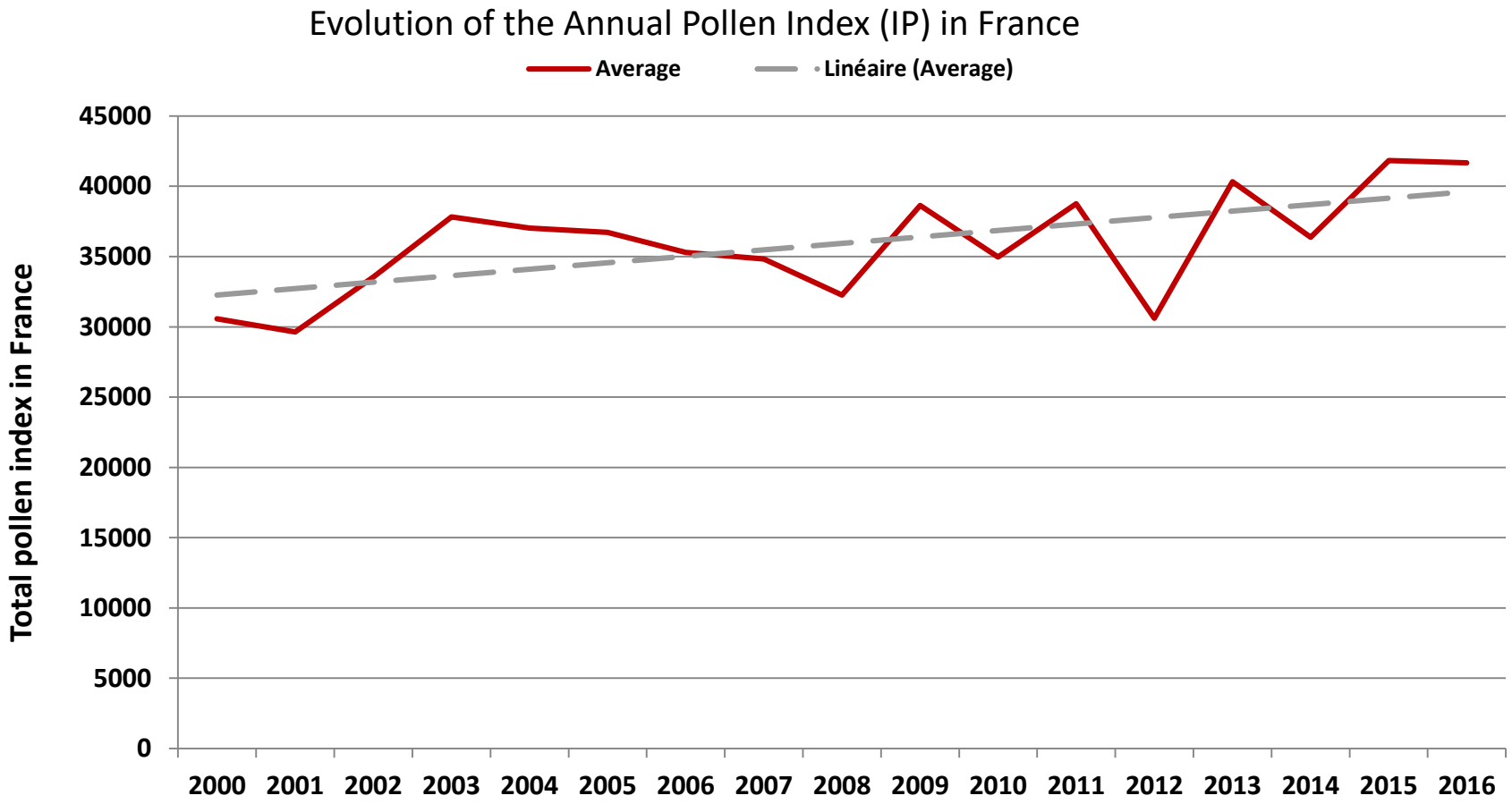
Birch pollen in the countryside



Birch pollen in town

H. BEHRENDT & W.M. BECKER, 2001 : *Curr Opin Immunol* 13, 709-715

Evolution of pollen quantities



Clinical data

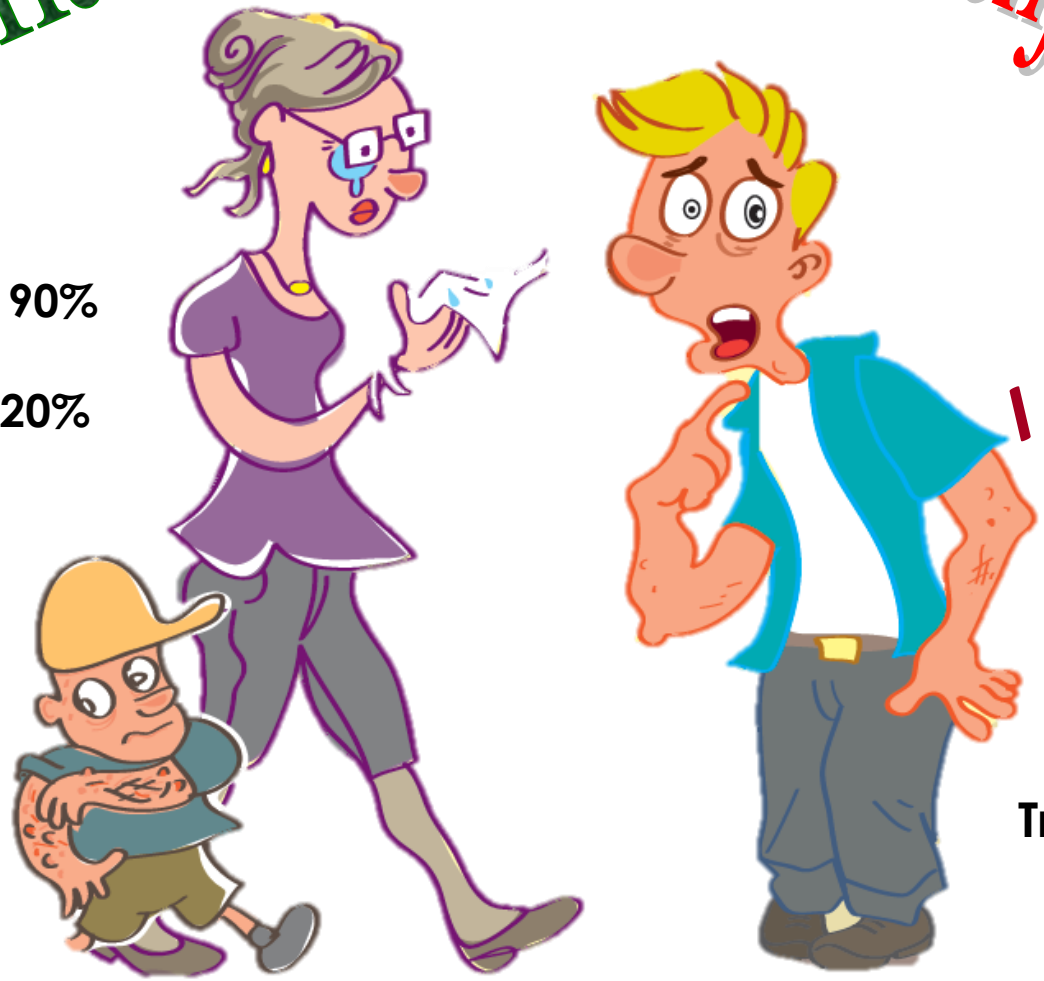
Pollen allergy

Asthma

rhinitis 90%

Urticaria and eczema 20%

I am Itchy



Conjonctivitis

I weep for Its Prick

conjonctivis 75%

I Cough

Tracheitis, asthma 50%

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Clinical report

- Clinical data :
  - Clinician network
  - More than 100 doctors

Clinical report

RNSA Clinical Report

RNSA - Clinical Report 2008			Dr.		Week 31 - City of	
Pollinic Symptoms	Yes ○	No ◉	Number of pollinoses	Evolution / previous week	Increase ○	Stagnation ◉	Decrease ○

Symptom Gravity	Null	Weak	Mean	Strong
Conjunctivitis	◉	○	○	○
Rhinitis	◉	○	○	○
Cough	◉	○	○	○
Asthma	◉	○	○	○
Cutaneous signs or other	◉	○	○	○

Pollen type (Optional)

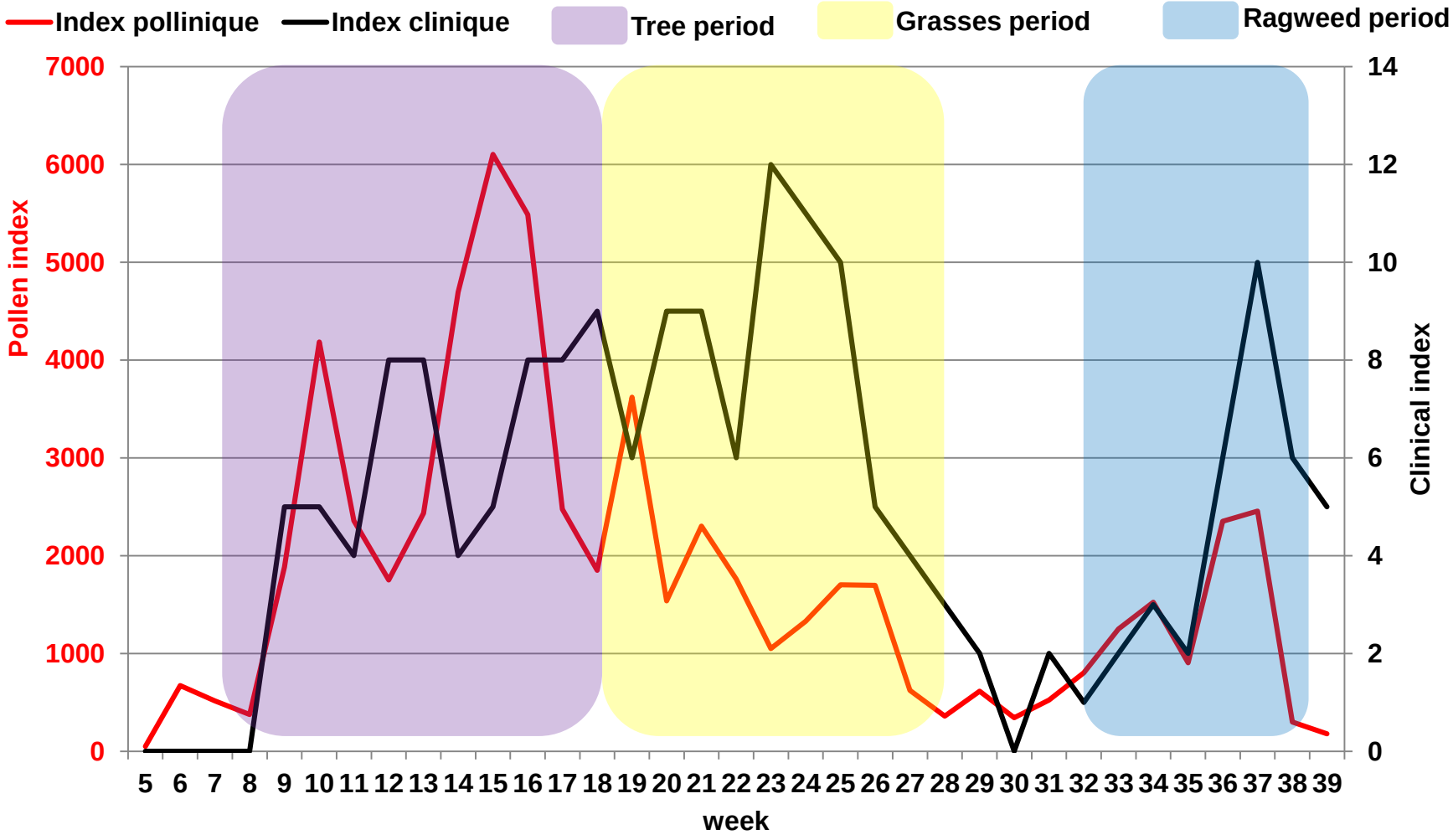
Observations (Optional)

Send the form

Please fill in all the obligatory fields

This report is sent by e-mail every week to doctors working with the RNSA to collect clinical data.

Health impact for one town : Lyon in 2015



Allergy potency

Difference between allergy potency and allergy risk

The **allergy potency** is specific to a pollen grain whatever the location while the **allergy risk** is a measure of health impact and depends on several factors such as the amount of pollen, the weather, the phenology, the symptoms observed by doctors…

Allergy potency of plants

- The allergy potency of a plant species is the ability of its pollen to cause an allergy to a significant part of the population
- The allergy potency can be:
  - **Low or negligible** : This means that a very large amount of pollen is needed to trigger an allergy and this applies only to the most sensitive people
  - **Moderate** : These species may be present locally to bring diversity into plantations, but they should not represent the majority of planted species
  - **High** : A few number of pollen is enough to cause an allergic reaction

Allergy potency of trees

Birch

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TREES		
Species	**Family**	**Allergy potency**
maple*	Aceraceae	Moderate
alder*	Betulaceae	high
birch*		high
hornbeam*		high
Charm-hops		Low or negligible
hazel*		High
baccharis	Asteraceae	Moderate
cade	Cupressaceae	High
common cypress		High
Arizona cypress		High
juniper		Low or negligible
thuja*		Low or negligible
locust*	Fabaceae	Low or negligible
chestnut-tree	Fagaceae	Low or negligible
oak*		Moderate
beech*		Moderate
walnut*	Juglandaceae	Low or negligible
paper mulberry	Moraceae	High
white mulberry		Low or negligible
ash*	Oleaceae	High
olive-tree		High
privet*		Moderate
pine*	Pinaceae	Low or negligible
plane-tree**	Platanaceae	Moderate **
poplar*	Salicaceae	Low or negligible
willow*		Moderate
yew	Taxaceae	Low or negligible
Japanese red-cedar	Taxodiaceae	High
linden*	Tiliaceae	Moderate
elm*	Ulmaceae	Low or negligible

* several species

** The pollen of the plane trees is weakly allergenic. On the other hand, the microneedles contained in the waders resulting from the degradation of the female heads of the previous year are very irritating.

Allergy potency of herbs

SPONTANEOUS GRASSES		
Species	**Family**	**Allergy potency**
chenopod*	Chenopodiaceae	Moderate
Burned soda *(prickly saltwort)*		Moderate
ragweed*	Asteraceae	High
mugwort*		High
daisy*		Low or negligible
dandelion*		Low or negligible
mercury*	Euphorbiaceae	Moderate
plantain*	Plantaginaceae	Moderate
grasses*	Poaceae	High
sorrel* (*Rumex*)	Polygonaceae	Moderate
neettle*	Urticaceae	Low or negligible
pellitory*		High
*several species		

ORNAMENTAL GRASSES		
Species	**Family**	**Allergy potency**
reed canary-grass	Poaceae	High
reed grass		Moderate
tufted hairgrass		High
sand ryegrass		Moderate
fescue*		High
oatgrass		High
hare's-tail		Moderate
giant feather grass		Moderate
*many species		

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Grasses

Ragweed

An example of what NOT to do

Source : Google map images

Thank you for your attention