

Ragweed pollen trend in Northern Italy (North-West Milan area) and its potential impact on public health



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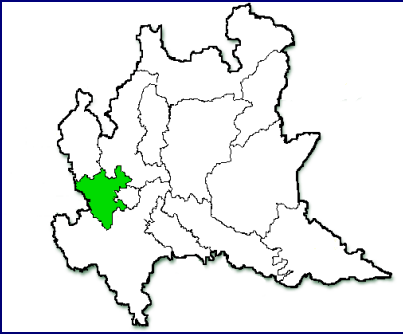
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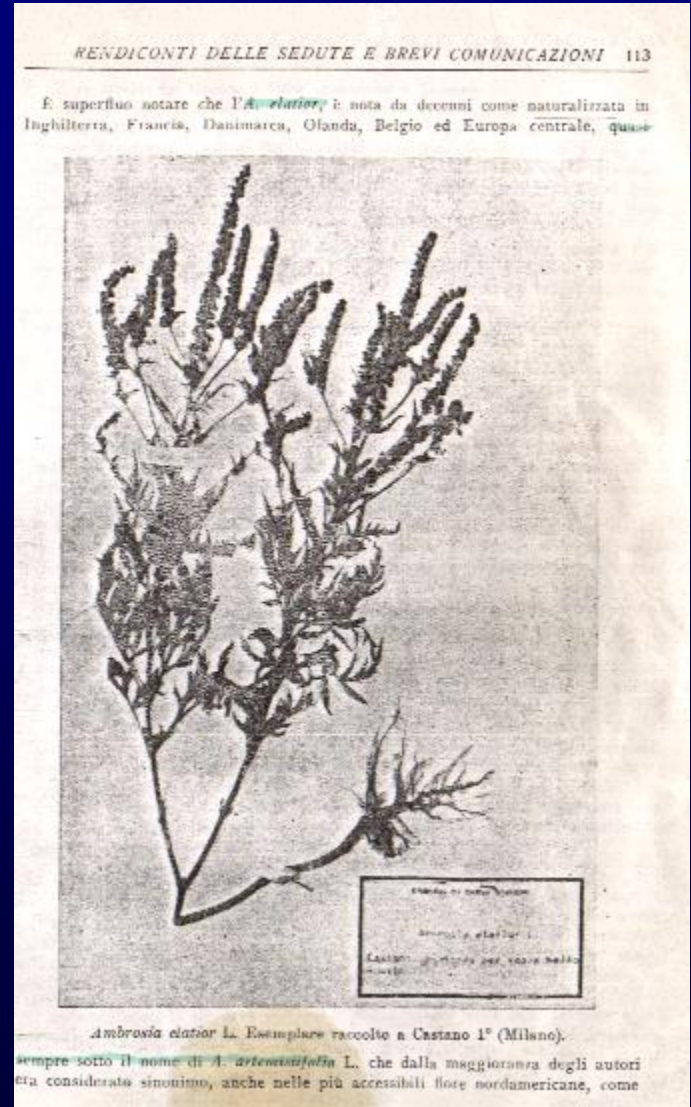
Background



The North-Western area of the Milan Province has been colonized by *Ambrosia artemisiifolia* since the 1940s

Ref. Stucchi C. *L'ambrosia elatior*. *Nuovo Giorn Bot Ital*, 1942, 112

(Bibliographic reference kindly provided by Dott. P. Bottero, Allergy Service Magenta Hospital)



Background

Clinical manifestations of ragweed allergy were frequently observed in allergy clinics located in this area **only** starting from the middle of the **1980s**

First report of ragweed allergy in Lombardy Region



Folia Allergol. Immunol. Clin. 37: 99-105, 1990

NOTE DI EPIDEMIOLOGIA

Pollinosi da *Ambrosia artemisifolia*
in provincia di Milano

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M. BRIVIO ***, C. NOVI *, C. ÖRTOLANI ***

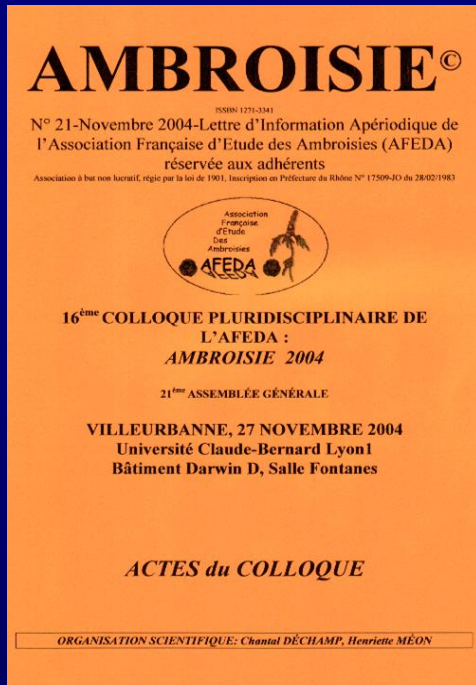
Background

Most recent epidemiological study:

- **14%** of the population sample examined was allergic to ragweed (sample: health care workers, 1373 subjects)

- **increase** of prevalence from **9.2%** in 1996 to **14%** in 2005

- **high percentage** of **asthma** (more than 40%) in ragweed allergic patients



Etude de prévalence de l'allergie due à l'ambrosie
dans la population générale adulte en province de Milan :
résultats préliminaires

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Prevalence and Clinical severity of Ragweed allergy in a Health care
population in Magenta town:

An epidemiological study on 1373 subjects

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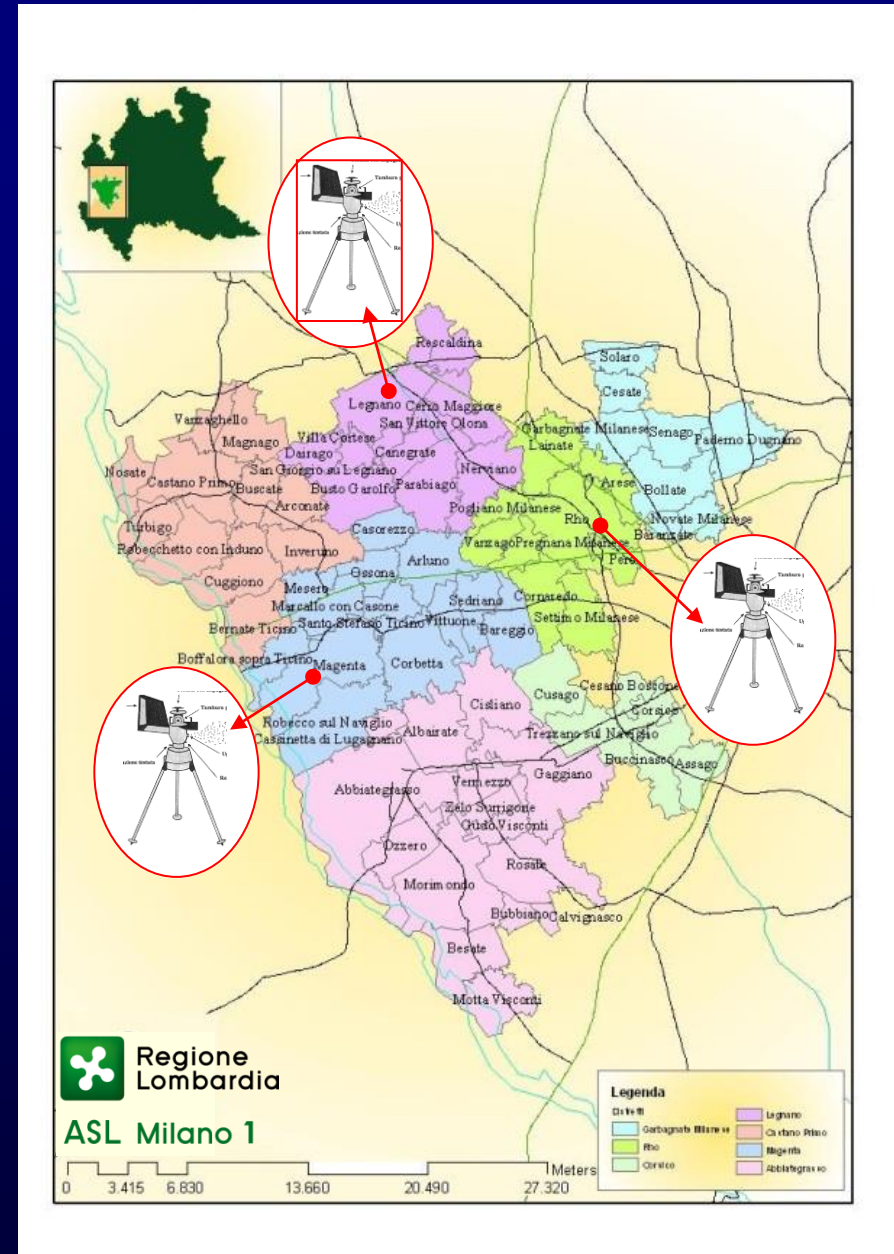
Aim

- **Analyze** the **data** obtained from aerobiological monitoring stations located in three towns in the North-Western Milan area
- **Assess** the **potential impact of ragweed pollen levels** on people who live in this area

Materials and Methods

Monitoring stations

- Legnano (L.), the oldest station: in function since 1995
- Rho (R.) and Magenta (M.): in function since 2000
- Ragweed pollens were sampled by a **Hirst volumetric trap** located on 3 building roof tops
- These stations belong to the Local Health Authority Milan 1 and are connected to the Italian Network Monitoring on Aerobiology (R.I.M.A.[®]-AIA).



Material and Methods

Counts and analysis

- **Pollen counts:** according to the standard methods of the Italian Aerobiology Association (AIA)
- **Data analysis**
 - Microsoft® Excel and Ministat statistical software release 1.1
 - significance of difference between SPI: **nonparametric statistical – Wilcoxon rank sum test ($p < 0.05$ significant)**
 - significance of trends: **nonparametric statistical – Cox and Stuart test ($p < 0.05$ significant).**

Material and Methods

Data analysis


- For each station and for every year:
 - Seasonal Pollen Index (**SPI**),
 - **start** and the **end** of **pollen season** and its **length** (*Galan et al. 1995*)
 - **daily maxima**
 - **number of days exceeding** the **clinical thresholds** (*Comtois 1988, Solomon 1984, Déchamp 2003*)
- Analyzing period:
 - since 2000 was analyzed in detail
 - since 1995 have been taken into account only for the trend of SPI.

Results - SPI

- M.: greater SPI than R. and L.

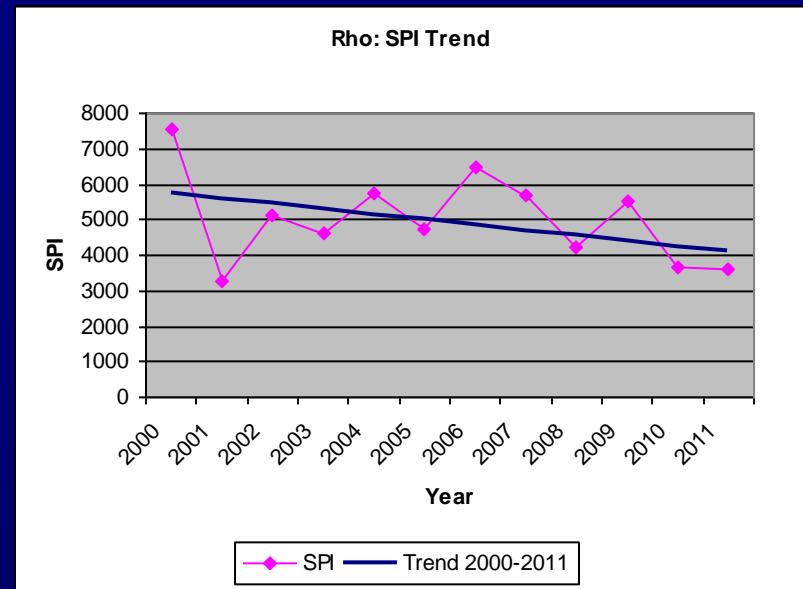
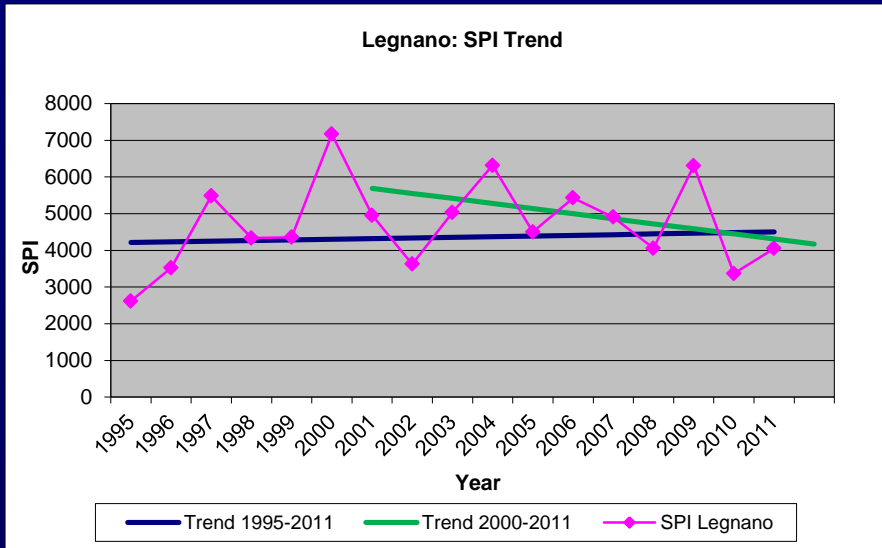
| Year | Legnano SPI | Rho SPI | Magenta SPI |
|----------------|---------------|---------------|---------------|
| 2000 | 7166 | 7562 | 6847 |
| 2001 | 4955 | 3245 | 3925 |
| 2002 | 3623 | 5122 | 5437 |
| 2003 | 5034 | 4612 | 6147 |
| 2004 | 6314 | 5720 | 7439 |
| 2005 | 4501 | 4706 | 5835 |
| 2006 | 5429 | 6489 | 5085 |
| 2007 | 4909 | 5675 | 7139 |
| 2008 | 4057 | 4243 | 6664 |
| 2009 | 6309 | 5527 | 7431 |
| 2010 | 3368 | 3643 | 6596 |
| 2011 | 4051 | 3633 | 6915 |
| Average | 4976,3 | 5014,8 | 6288,3 |
| Median | 4932 | 4914 | 6630 |

Wilcoxon nonparametric test:

L. vs. R. $p=0.8428$  L. and R. are similar;

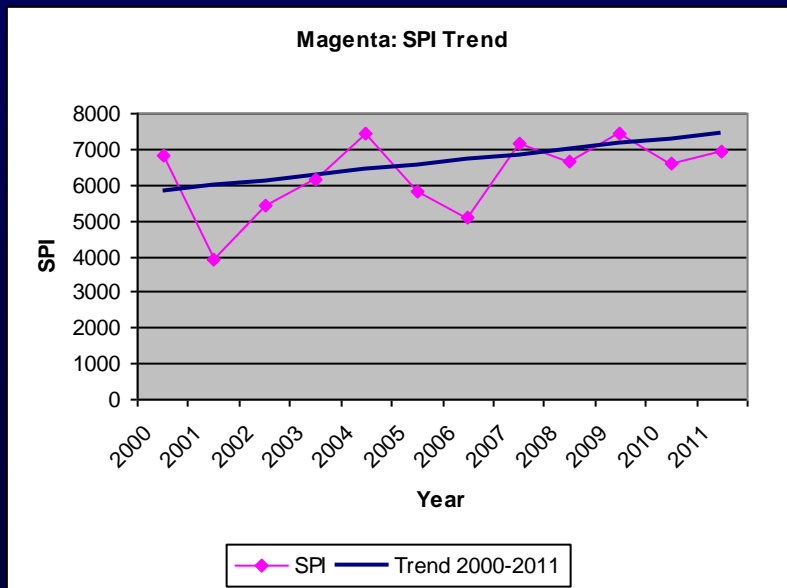
M. vs. $L \cup R$ $p=0.0035$  M. is different from $L \cup R$

Results - SPI

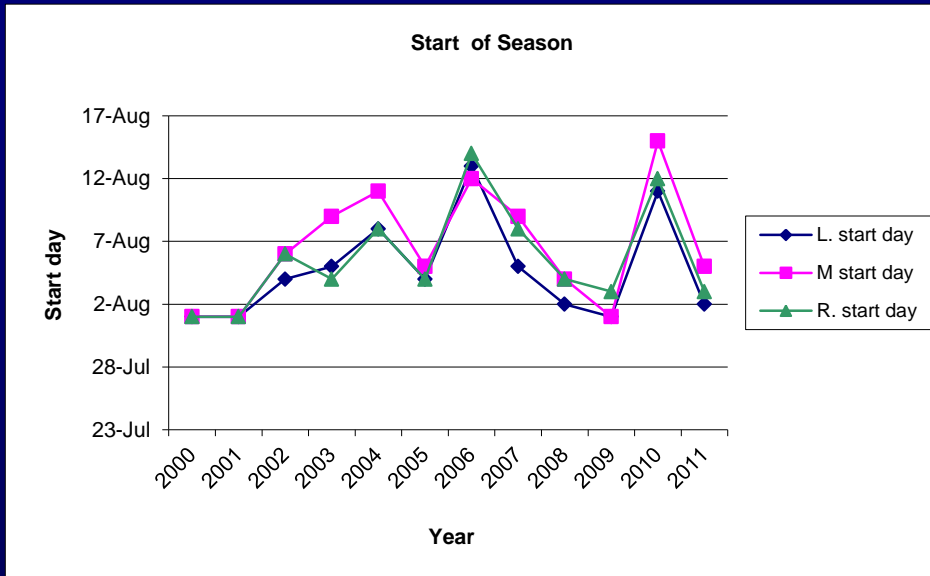


From 1995 to 2011: overall **no trend** for L. ($p=0.6$)

- but in detail: **increase** of SPI **up to year 2000**
- **since 2000**:
 - evident **decrease** in the SPI for L. and R., even if not significant ($p=0.3$ in both cases);
 - a **non significant slight increase** in the SPI for M. ($p=0.3$).



Results – Pollen Season

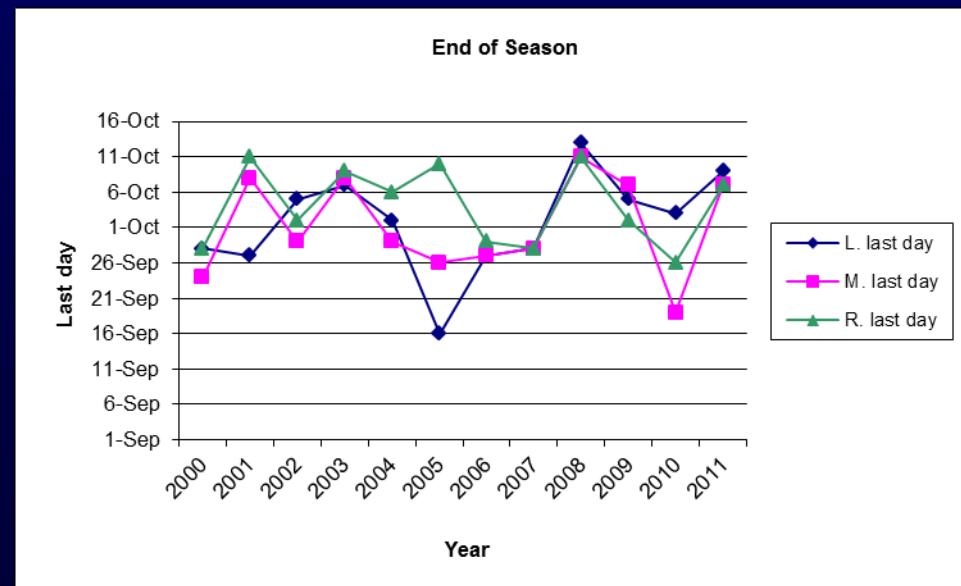


Start day of the main pollen season ranged:

- Aug. 2nd to Aug. 14th for L.
- Aug. 2nd to Aug. 16th for M.
- Aug. 2nd to Aug. 15th for R.

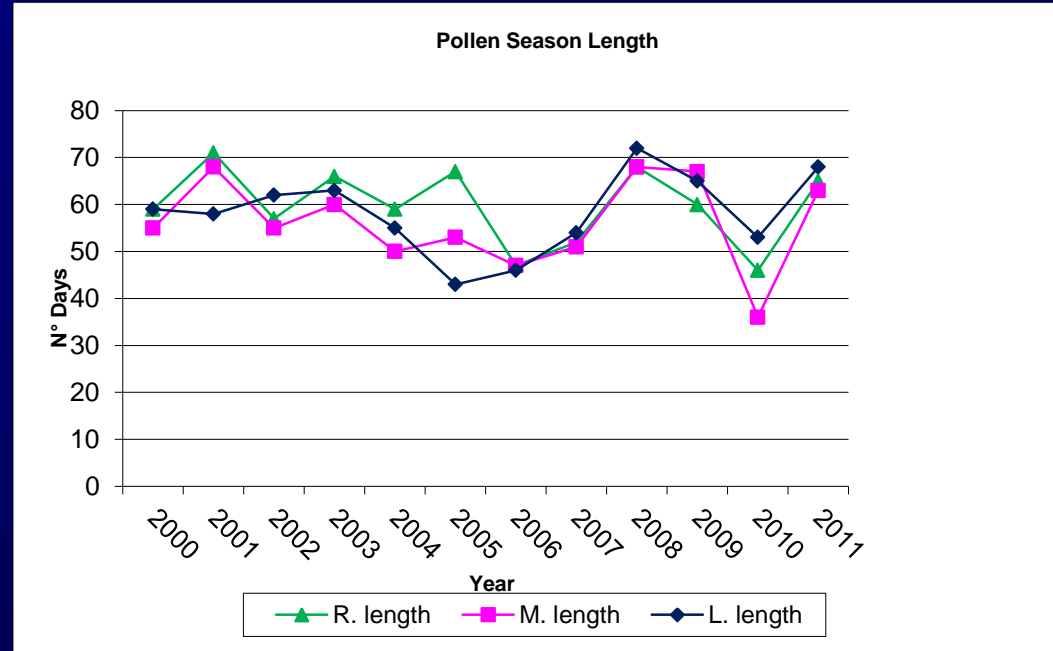
Last day of the main pollen season ranged:

- Sept. 16th to Oct. 13th for L.,
- Sept. 20th to Oct. 11th for M.
- Sept. 27th to Oct. 11th for R.



Results – Pollen Season

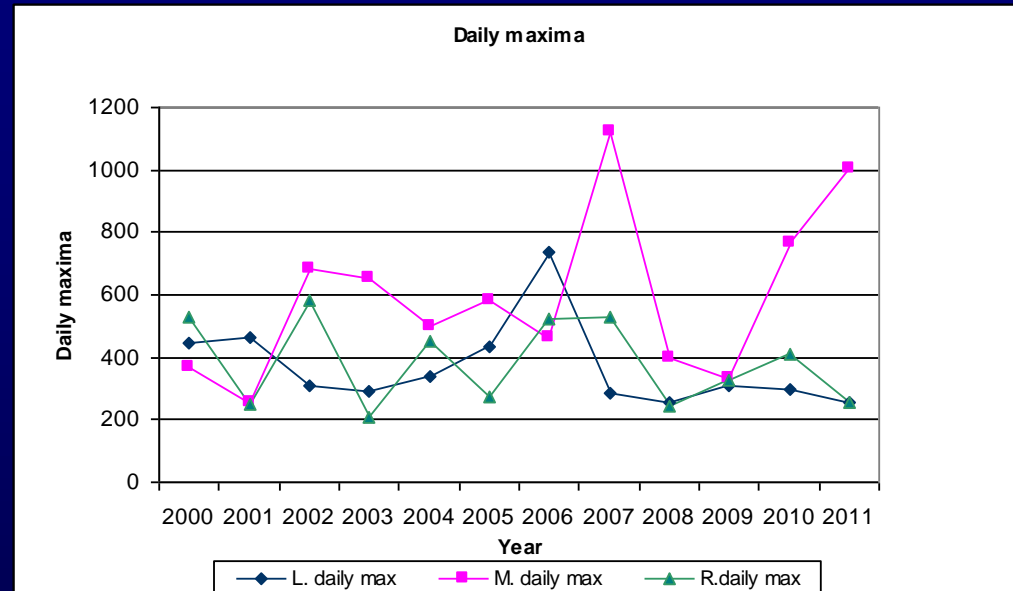
- **Length** of the main pollen season ranged
 - 43 - 72 days for L.
 - 36 - 68 days for M.
 - 46 - 71 days for R.
- A **similar length** of pollen season was observed, although **R.** showed a **longer main** pollen season, than **L.** and **M.**
- **No trend** was observed in the length of the main pollen season ($p=0.1$ for R. and $p=0.7$ for both L. and M.).



| | L. length | R. length | M. length |
|---------|--------------|--------------|--------------|
| Average | 58,17 | 59,75 | 56,08 |
| Median | 58,5 | 59,5 | 55 |

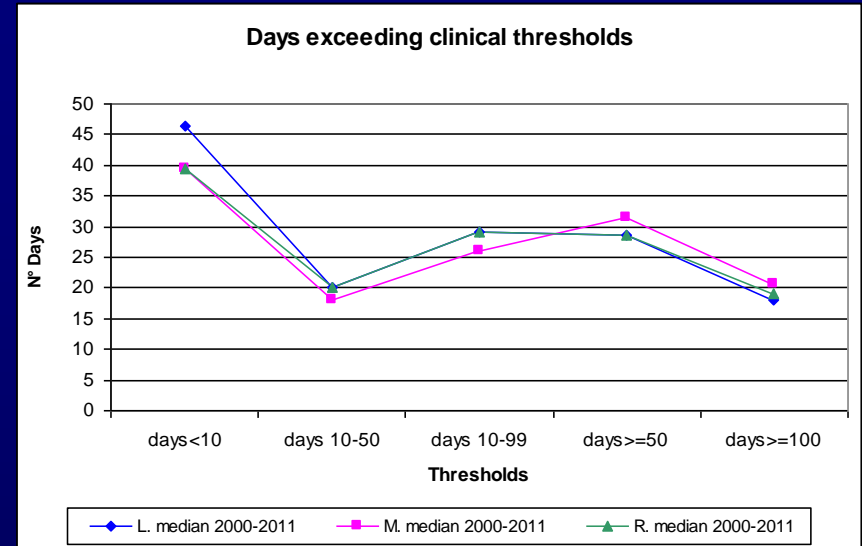
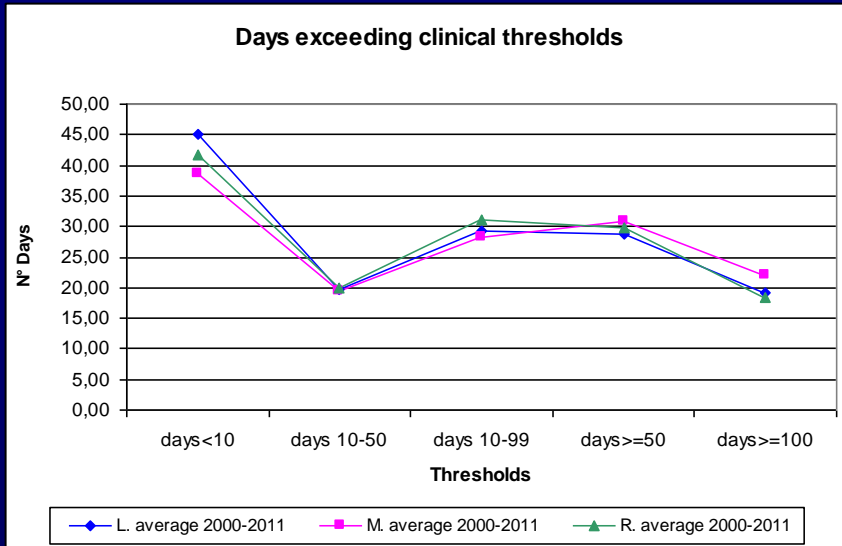
Results – Daily maxima

- Highest daily maxima:
 - M. 1125 p/m³ in 2007
 - L. 737 p/m³ in 2006
 - R. 585 p/m³ in 2002
- M. : higher daily maxima than R. and L.
- No trend was observed in the level of daily maxima (p= 0.3 in the three cases)



| | L. daily max | M. daily max | R. daily max |
|---------|-----------------|-----------------|-----------------|
| Average | 368 | 594 | 381 |
| Median | 309 | 540 | 367 |

Results – Days exceeding clinical thresholds



- **M.:** highest number of days exceeding both the two upper clinical thresholds of 50 p/m^3 ⁽¹⁾ (average=30.92 days, median=31.5 days) and of 100 p/m^3 ⁽²⁾ (average=22.0 days, median=20.5)
- **L. and R.:** slightly lower number of exceeding days
 - ⁽¹⁾ Between 10 and 50 grains/ m^3 : almost all patients with a ragweed allergic rhinitis are symptomatic
 - ⁽²⁾ >100 grains/ m^3 : invalidity allergic risk (intense pollinosis; 50% of patients show asthma)

Conclusions

- **M.** results the main polluted zone by ragweed in the North West Milan area:
 - greater SPI
 - non significant slight increase in the SPI trend
 - higher daily maxima
 - highest number of days exceeding both the two upper clinical thresholds of 50 p/m³ and 100 p/m³

Conclusions

- The **population** of the North-West Milan area, in particular who live in the **M. surroundings**, are **exposed for many days in the year to ragweed values far above the upper clinical thresholds**
- Parallel the estimated ragweed allergy prevalence is high
- These findings must be taken into consideration by politicians when making their choices

Conclusions

- Since 2000, perhaps due to efficiency of prevention measures adopted since 1999, a decrease in the SPI was observed for L. and R.
- Unfortunately, the data were insufficient to demonstrate that there is a statistical significant trend

Conclusions

The attention to ragweed must be kept high and further trials are required in order to monitor its diffusion.

Thanks for your attention!

