

# ***IL TURISMO TERAPEUTICO NELL'AREA CLIMATICO TERMAL E DELL'APPENNINO MOLISANO***

***The Role of the Air Pollution in the Chronic Obstructive Respiratory  
Diseases***

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# ■ NEW BASIS OF CLIMATOTHERAPY

Air pollution reduction and its impact on public health continually require the control of the pollution sources, the plan of observational studies and the organization of an efficient network of environmental control and a closer study of meteo-climatic factors. Chronic Obstructive Respiratory Diseases due to air pollution have become a social problem of widespread interest. Climatotherapy measures have been executed by means of a new simple electronic instrument measuring the Skin Electric Parameters, i.e. the set of human skin parameters that give an indirect measure of the health status of the patient.

# An European Project to relance climatotherapy?

The results of research in mountains of France, Swizerland, Italy, Ucraina, ecc. show that a climate marked by continuous windy weather, low humidity and high concentrations of negative ions with low concentrations of chemical pollutants (i.e. Pietracupa, Molise, Italy, Briançon France, Carpazi Ucraina, San Bernardino Switzerland ) reduce the need for health care for Chronic Obstructive Respiratory Disease in comparison with what happens in big cities such as Rome, Paris, Bruxelles ecc.

# Basis of the Project

- Relationship between the natural and anthropogenic environments where humans live: effects on the human health
- 25÷33% of human pathologies induced by physical-chemical environmental change
- Increasing of the dynamics bringing to meteo-pathies, traditionally linked to organism susceptibility and atmospheric factors

# Air Quality Evaluation

Studied through experimental measurements of pollutants (primary and secondary) for:

- furnishing a data set representative of atmospheric pollution processes for an efficient protection of population and environment
- supporting the respect and/or overcoming of air quality levels in an examined area
- investigating the air quality knowledge according the technical notes and the normative corpus
- evaluating the achievement of the pre-fixed objectives

# Sources, levels and effects on human health

| Pollutant       | Sources                                        | Acceptable level                          | Attention level                           | Alarm level                               | Effects on health                                                                           |
|-----------------|------------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------|
| SO <sub>2</sub> | Oil and petroleum combustion                   | 100 µg/m <sup>3</sup><br>(24-hrs average) | 250 µg/m <sup>3</sup><br>(24-hrs average) | 600 µg/m <sup>3</sup><br>(hourly average) | Increasing of mortality; increasing of hospitalization for respiratory treatment            |
| NO <sub>2</sub> | Autovehicular traffic and combustion plant     | 135 µg/m <sup>3</sup><br>(hourly average) | 200 µg/m <sup>3</sup><br>(hourly average) | 400 µg/m <sup>3</sup><br>(hourly average) | Increasing of mortality; increasing of hospitalization for respiratory treatment and asthma |
| CO              | Autovehicular traffic and petroleum combustion | 10 mg/m <sup>3</sup><br>(8-hrs average)   | 30 mg/m <sup>3</sup><br>(hourly average)  |                                           | Increasing of daily mortality; increasing of respiratory and cardio diseases                |
| Ozone           | Photochemical reactions                        | 130 µg/m <sup>3</sup><br>(hourly average) | 180 µg/m <sup>3</sup><br>(hourly average) | 360 µg/m <sup>3</sup><br>(hourly average) | Increasing of mortality; increasing of hospitalization for respiratory treatment            |
| PM10            | Autovehicular traffic                          | 40 µg/m <sup>3</sup><br>(hourly average)  |                                           |                                           | Increasing of mortality, especially for respiratory diseases                                |

# Why Molise?

The site  
Pietracupa  
about 75

This terr  
interestin  
excellent

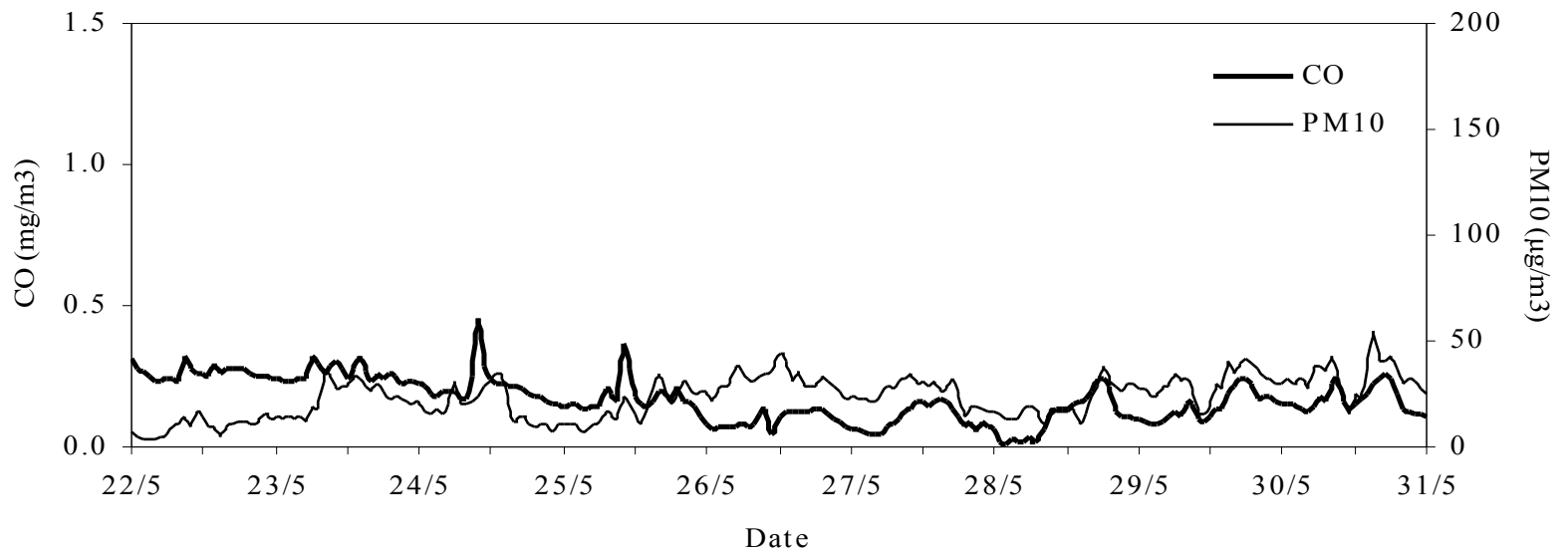
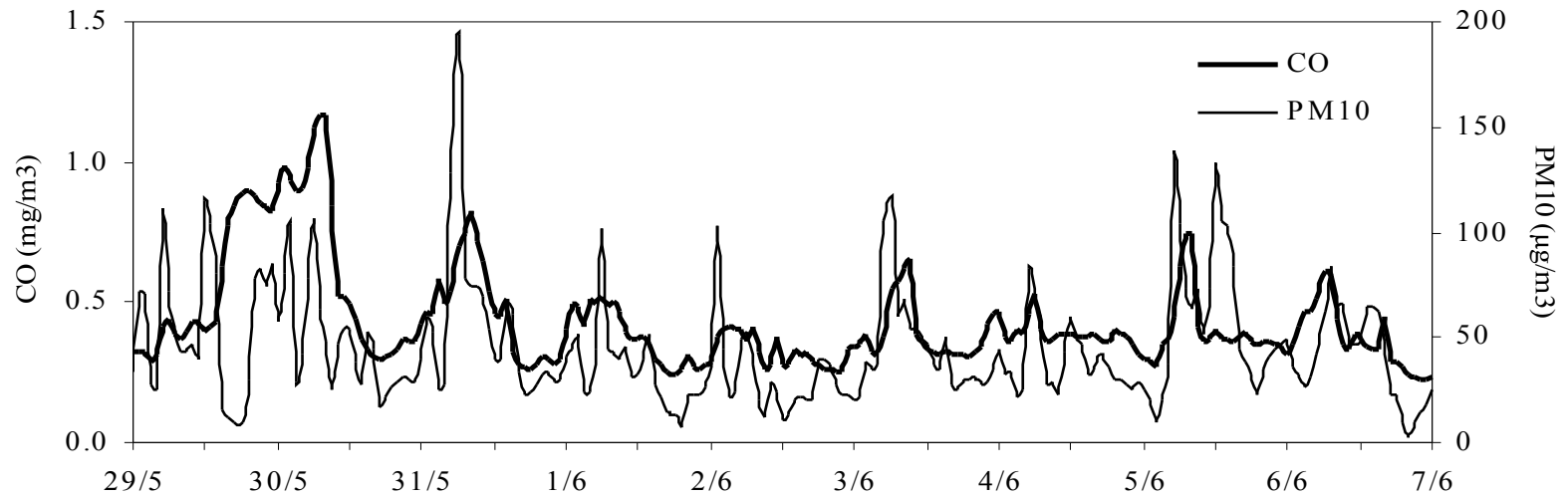


village,  
valley, at

ry for its  
air and



# CO vs PM<sub>10</sub> at Roma & Pietracupa



# What are the Meteoropathies?

They are pathologies influenced  
directly and significantly by  
atmospheric perturbations

# Classifications of Meteoropathies

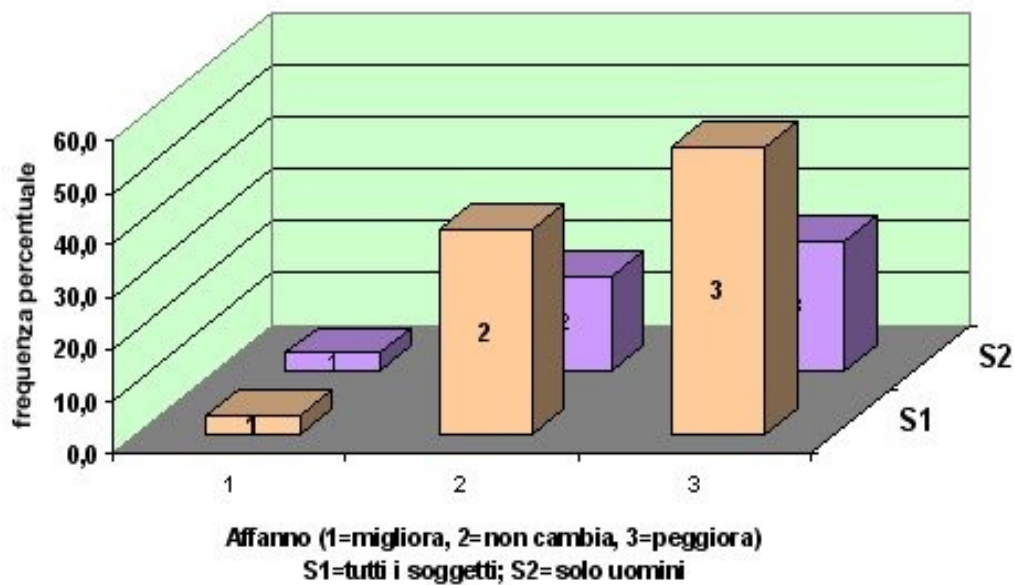
## ■ PRIMARY

not correlated to any basis pathology;  
regards the “meteo-sensitivity” character

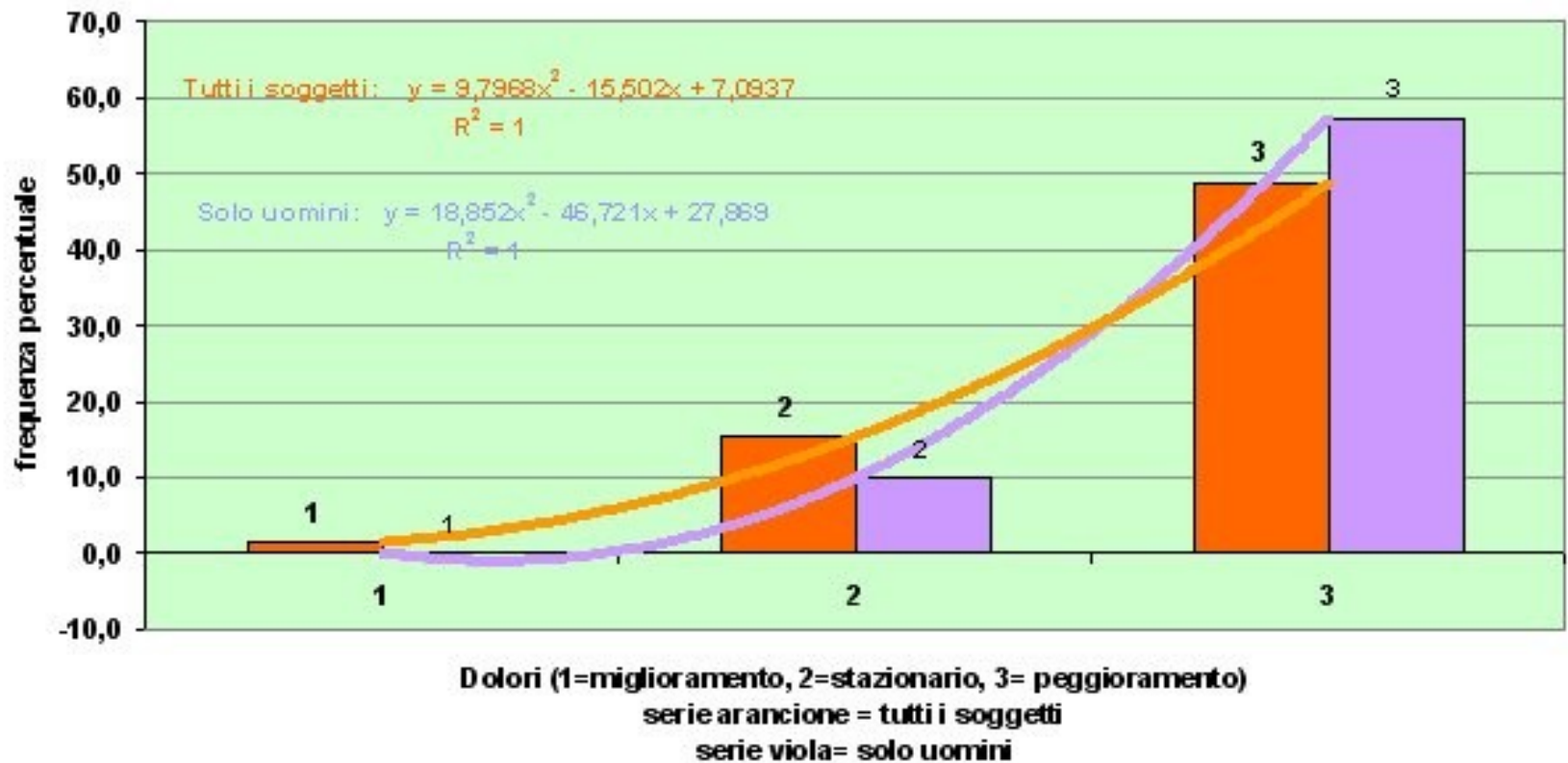
## ■ SECONDARY

represents the top of a basis pathology that  
sometimes is rheumatics or respiratory

# BREATHLESSNESS AND PERTURBATED WEATHER



# PAIN AND PERTURBATED WEATHER



# What are the Skin Electric Parameters?

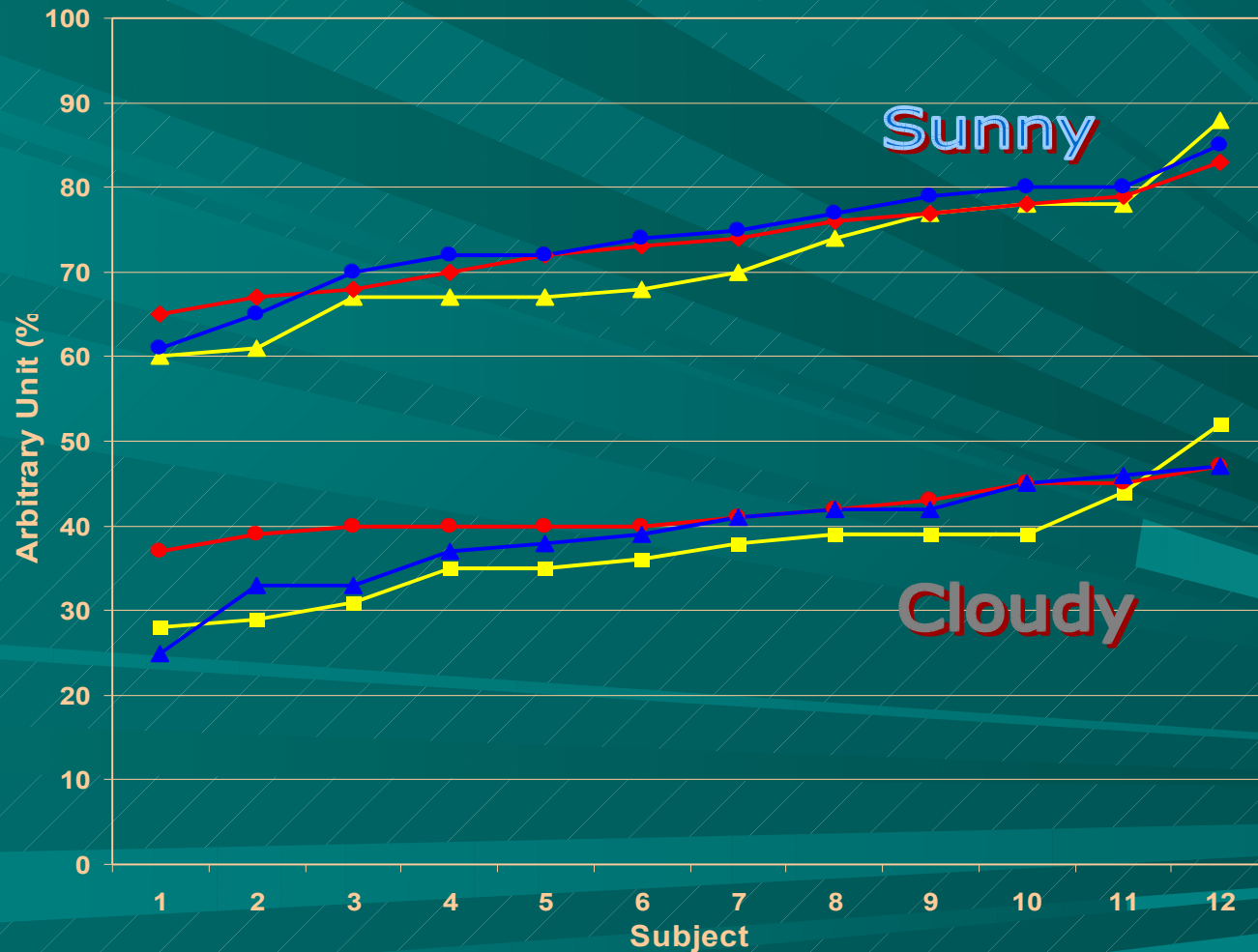
- SEPs are electrical values, detectable on the human cuticle through an ohmmeter analyzer based on a Winston bridge
- They give a measure or evaluation of the skin conductance or reduction due to the impact of radiofrequency on the skin
- These measures allow to evaluate the meteoropathies influenced exclusively by direct or indirect atmospheric factors

# The Ohm Law in Therapy and Biology

- Measures highlighted in subjects with meteoropathies and various pathologies, that the electrical resistance increased in physical electric circuits with a medium of about 43 scale unites of SEP corresponding to 130,000  $\Omega$ .  
“Normal” level of resistance is 95.000 Ohm = 50 us
- After the administration of a coherent therapy, we saw a resistance fall in medium at 39,000  $\Omega$  (70 us), with an improvement of bioelectric performance due to an increase of physical electric currents, in accordance with Ohm's law,  $I = V/R$
- Power in the biological system vary with  $W = V \times I$ , with functional correlations (performance status, immunological status, muscle power, pain, inflammation, allergy, dyspnea, etc.)

# The Skin Electric Parameters (SEP) in the Meteoropathies

## The Ohm Law on the SEP



| Ohm          | Valore US |
|--------------|-----------|
| 10 000       | 91        |
| 27 000       | 78        |
| 39000        | 70.5      |
| 47000        | 66.5      |
| <b>95000</b> | <b>50</b> |
| 100 000      | 48        |
| 130000       | 43        |
| 200000       | 32        |
| 220 000      | 29        |
| 300000       | 24        |
| 560 000      | 14        |
| 1000 000     | 8         |

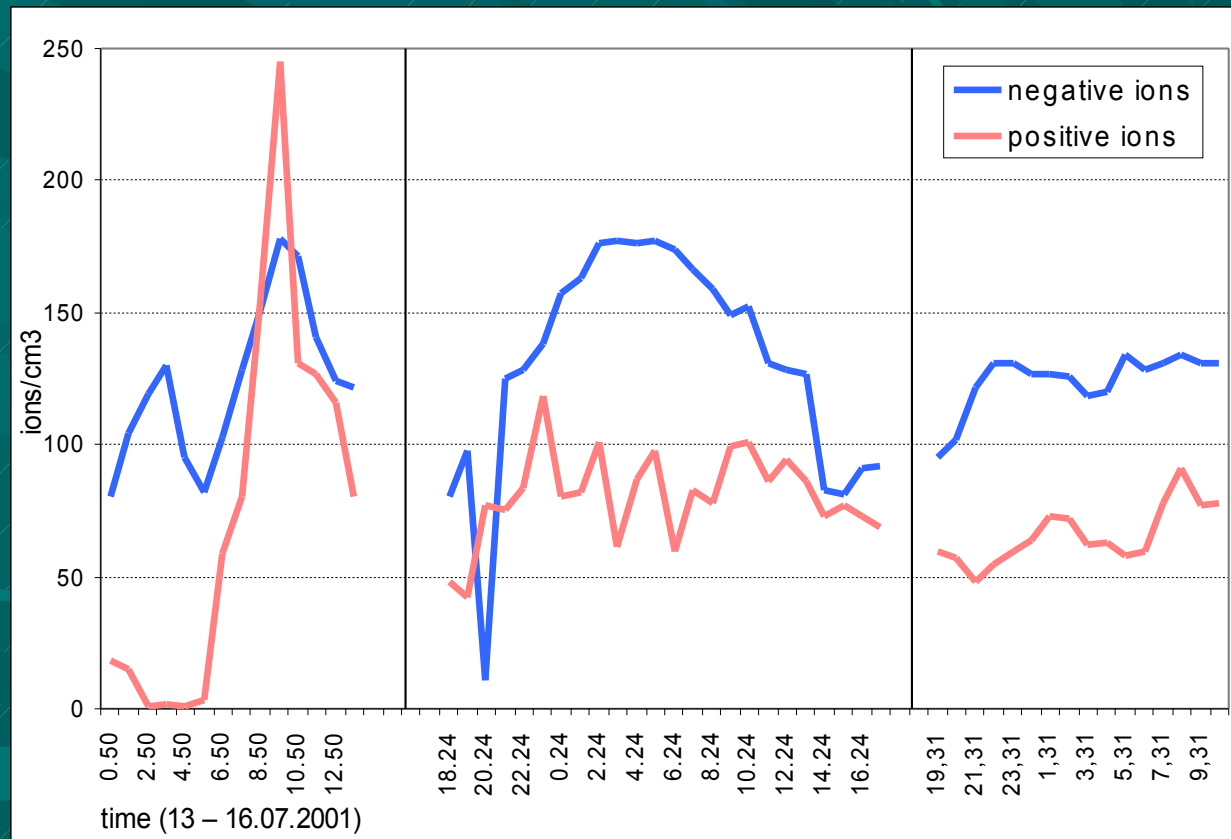
# Ions and Perception in Different Location

| Place                    | n <sup>-</sup> ions | n <sup>+</sup> ions | n <sup>-</sup> /n <sup>+</sup><br>ratio | Small<br>ions<br>(K $\geq$ 1)<br>% | Big<br>ions<br>(K<1)<br>% | Best (+++++)<br>and worst<br>(+)<br>perception |
|--------------------------|---------------------|---------------------|-----------------------------------------|------------------------------------|---------------------------|------------------------------------------------|
| Country, sun, sea, level | 306.7               | 251.6               | 1.21                                    | 88.0                               | 12.0                      | +++++                                          |
| Sea, quiet, no wind      | 436.7               | 354.4               | 1.23                                    | 84.7                               | 15.3                      | +++++                                          |
| Mountain 2000 m          | 560.3               | 602.5               | 0.92                                    | 92.0                               | 8.0                       | +++++                                          |
| Town street no traffic   | 120.5               | 108.7               | 1.10                                    | 66.0                               | 44.0                      | +++                                            |
| Town street traffic      | 30.8                | 150.4               | 0.20                                    | 25.0                               | 75.0                      | +                                              |
| Mean value               | 291.0               | 293.5               | 0.93                                    | 71.1                               | 28.9                      | +++++ (3.6)                                    |
| SD                       | ± 218.9             | ± 197.2             | ± 0.40                                  | ± 27.6                             | ± 28.4                    | ± + (1.6)                                      |

# AIR IONIZATION: another valuable parameter

P. Avino, V. De Lisio, M.V. Russo, L. Lepore, G. Quartieri, G. Ciccioiti, B. Messina, G. Monaco, G. Spagnoli, V.I. Valenzi, A. Fraioli:  
*Inquinamento atmosferico e ionizzazione in due siti dell'Italia centrale.*

G Ital Med Lav Erg 2004;26:4, pag 115-116 Suppl.



# L'Appennino Molisano come le Alpi francesi di Briançon e i Carpazi?

- Living in non-polluted areas, the benefits of a healthy climate in terms of an improvement in breathing and the reduction of bronchial hyperactivity may only in part be backed up by epidemic evidence. This portrays a reduced need for health care for chronic obstructive respiratory disease among the people resident in "Centro Molise" in comparison with those living in big cities like Rome. On the other hand, as shown above, efficacious means of control to reduce the levels of environmental pollutants would bring proportionate benefits, reducing the total mortality rate and respiratory and cardiovascular diseases. At the same time reduced social costs for medical care and loss of working hours due to pollution sicknesses provide further benefits

# Conclusions

- This is the first preliminary approach on correlation between air pollution and CORDs including the effects of climate therapy
- Absence of air pollution, high levels of negative ions: ideal places for implementing a project on climatic therapy (see Briançon, Matese, alto Molise, Carpazi, ecc)
- To deep clinical and epidemiologic studies in agreement with local, governmental and world organizations
- To use the monitoring network for the acquiring environmental data set
- To deep the complex mechanisms interesting for humans and environment (interaction between environment and biological system)

# Breve bibliografia

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# Mercati emergenti della salute

In Italia in Europa e in tutto il resto del Mondo esiste un settore delle élites economiche e culturali che si confronta con problemi metabolici e di efficienza a cui offrire risposte innovative e competitive nel campo della prevenzione e della cura di patologie croniche che disturbano gravemente la capacità produttiva e la qualità della vita in aree come la calcolosi renale, la gotta, disturbi respiratori allergie e quindi il performance status decisivo per la salute ed il successo nel lavoro e nei vari sport della vita.

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e benessere**

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*Strategie globali di wellness*

*grande clinica moderna*

**VERSO UN RIEQUILIBRIO TRA AREE URBANE  
E AREE RURALI E MONTANE**

# Mercati Potenziali del comprensorio Clinico Climatico Termale Molisano

- Mercato tradizionali (ricetta rossa)
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- Casagit
- Camera e Senato
- Assicurazioni sanitarie private
- Mercati europei
- Molisani nel mondo