


# *Controversies on Air Quality and Health: the Case of PM10*

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A stylized silhouette of a mountain range in shades of brown and tan, positioned at the bottom of the slide against a blue gradient background.

# Health Impacts PM10

- Both fine and coarse particles can accumulate in the respiratory system and are associated with numerous health effects. Coarse particles can aggravate respiratory conditions such as asthma. Exposure to fine particles is associated with several serious health effects, including premature death. Adverse health effects have been associated with exposures to PM over both short periods (such as a day) and longer periods (a year or more).
- When exposed to PM, people with existing heart or lung diseases—such as asthma, chronic obstructive pulmonary disease, congestive heart disease, or ischemic heart disease—are at increased risk of premature death or admission to hospitals or emergency rooms.



# Quality of the Air in USA

## Current PM10 Levels for Wasatch Front Areas

### PM10 Standard and Concentration Breakpoints( ug/m<sup>3</sup>)

0 - 54	55 – 154	155 – 254	255 or More
Good	Moderate	Unhealthy for Sensitive	Unhealthy

This Air Quality Index Report( AQI ) is prepared by the Utah Division of Air Quality for the Wasatch Front

**Monday Feb/26/2007**

**Current Air Pollution Conditions at:  
Concentration\***

**3:09 PM Highest Pollutant is**

**Salt Lake /Davis Counties**

**Good**

**for**

**PM10**

**16.00**

**ug/m<sup>3</sup>**



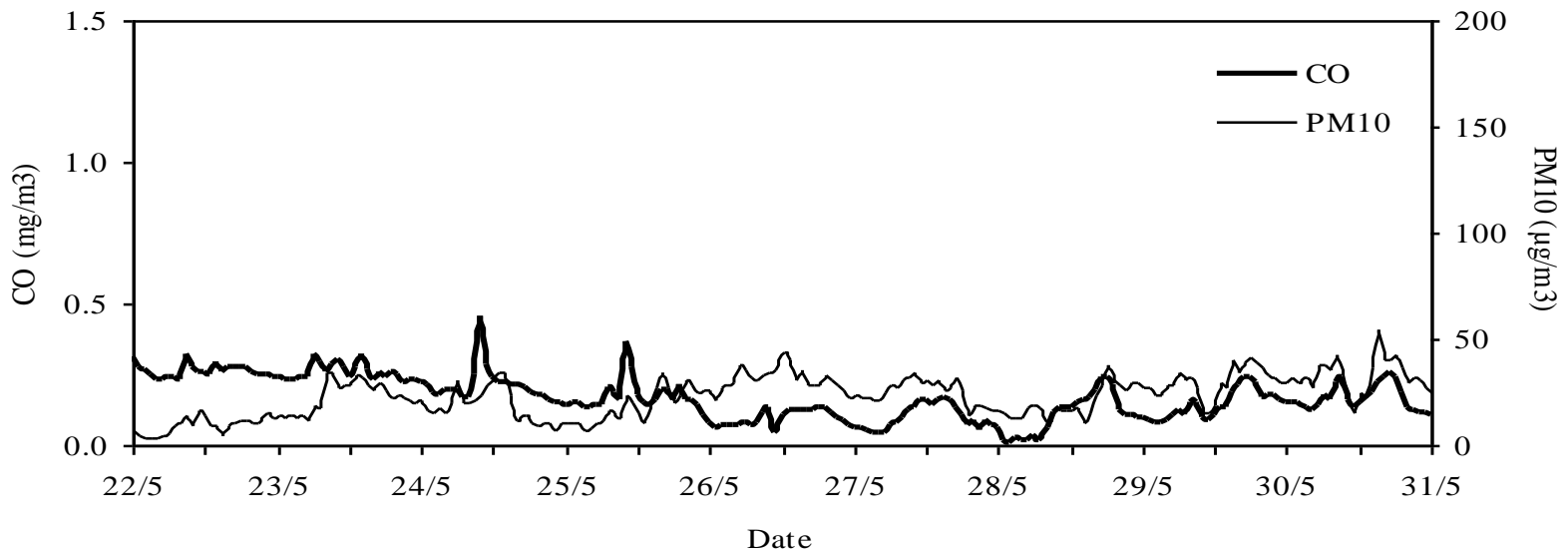
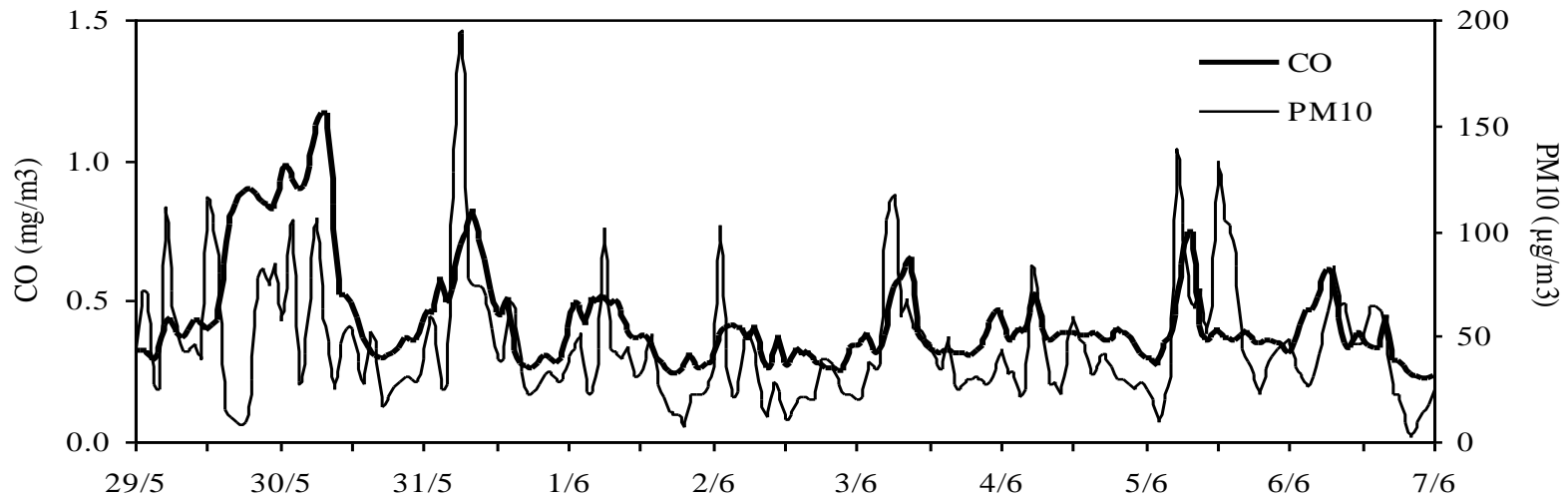
# Sorgenti, livelli ed effetti sulla salute di alcuni inquinanti

Inquinante	Sorgenti	Livello accettabile	Livello di attenzione	Livello di allarme	Effetti sulla salute
SO <sub>2</sub>	Combustione di oli e carbone grezzi e raffinati	100 µg/m <sup>3</sup> (media 24 ore)	250 µg/m <sup>3</sup> (media 24ore)	600 µg/m <sup>3</sup> (media orario)	Aumento in generale del tasso di mortalità; aumento del numero di ammissione agli ospedali per trattamenti respiratori.
NO <sub>2</sub>	Traffico stradale ed impianti di combustione	135 µg/m <sup>3</sup> (media oraria)	200 µg/m <sup>3</sup> (media oraria)	400 µg/m <sup>3</sup> (media oraria)	Aumento in generale del tasso di mortalità; aumento del numero di ammissione agli ospedali per malattie respiratorie ed asma.
CO	Traffico stradale e combustione del petrolio	10 mg/m <sup>3</sup> (media 8 ore)	30 mg/m <sup>3</sup> (media oraria)		Aumento del tasso di mortalità giornaliera; specificatamente per malattie respiratorie e cardiovascolari.
Ozono	Reazioni fotochimiche	130 µg/m <sup>3</sup> (media oraria )	180 µg/m <sup>3</sup> (media oraria)	360 µg/m <sup>3</sup> (media oraria)	Aumento del tasso di mortalità: aumento del numero di ammissioni agli ospedali per problemi respiratori.
PM10	Traffico stradale	40 µg/m <sup>3</sup> (media oraria )			Aumento del tasso di mortalità e specificatamente per i trattamenti respiratori.





# CO-PM10 a Roma e Pietracupa





# **In vivo and in vitro proinflammatory effects of particulate air pollution (PM10).**

**X Y Li, P S Gilmour, K Donaldson, and W MacNee**

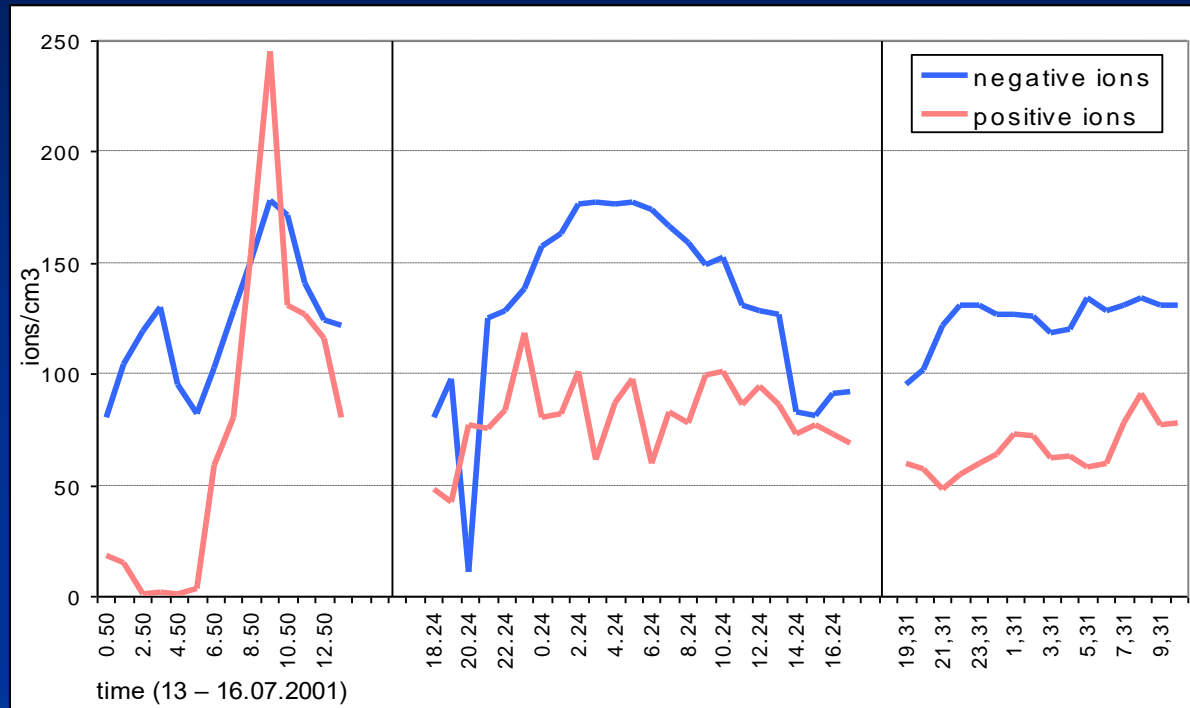
**Environ Health Perspect. 1997 September; 105(Suppl 5): 1279–1283**

**Unit of Respiratory Medicine, Napier University, Edinburgh, United Kingdom ■**

**Epidemiologic studies have reported associations between fine particulate air pollution, especially particles less than 10 mm in diameter (PM10), and the development of exacerbations of asthma and chronic obstructive pulmonary disease. However, the mechanism is unknown. We tested our hypothesis that PM10 induces oxidant stress, causing inflammation and injury to airway epithelium. We assessed the effects of intratracheal instillation of PM10 in rat lungs. These studies provide evidence that PM10 has free radical activity and causes lung inflammation and epithelial injury.**

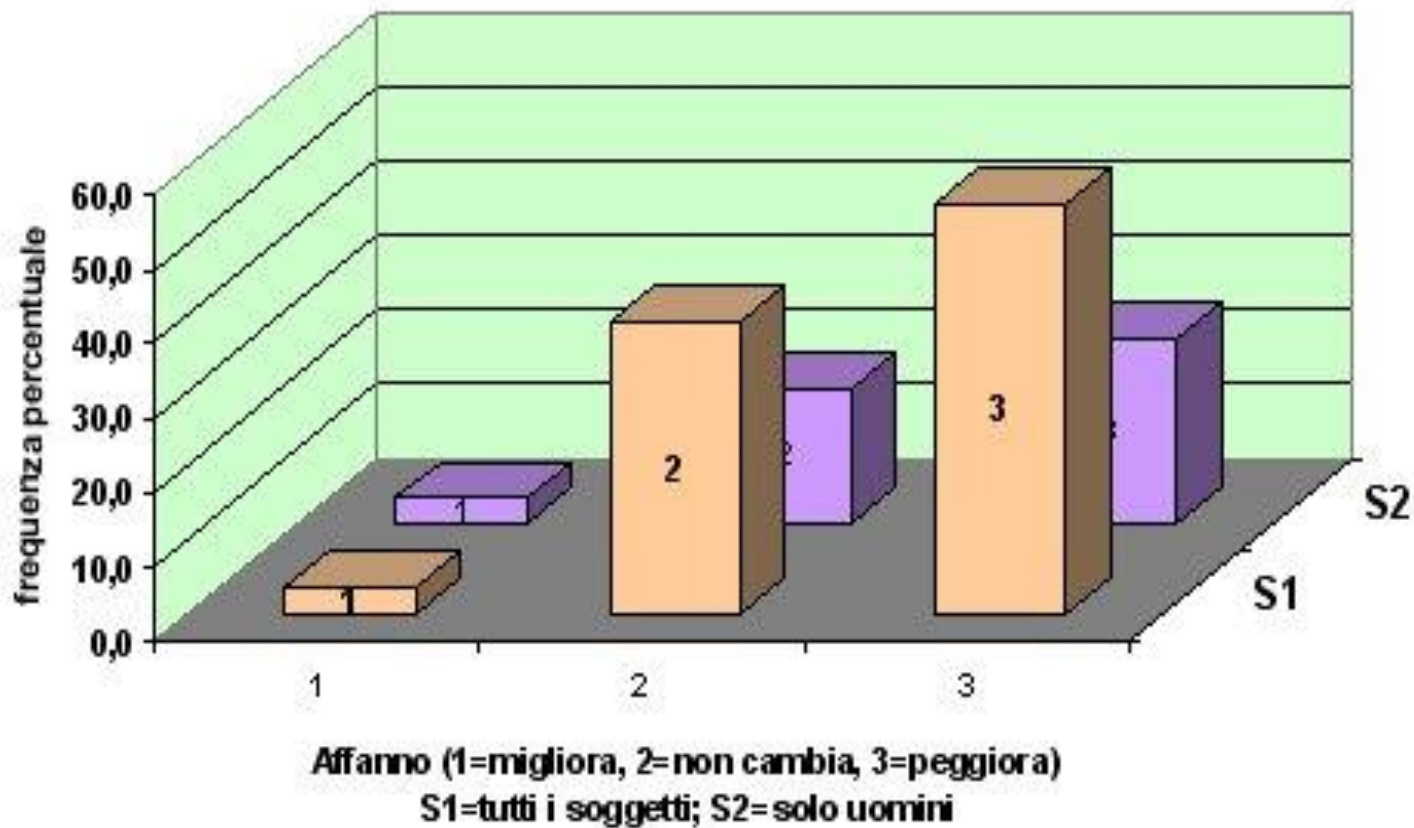


# Is the air ionization involved in PM10 Health Effects?



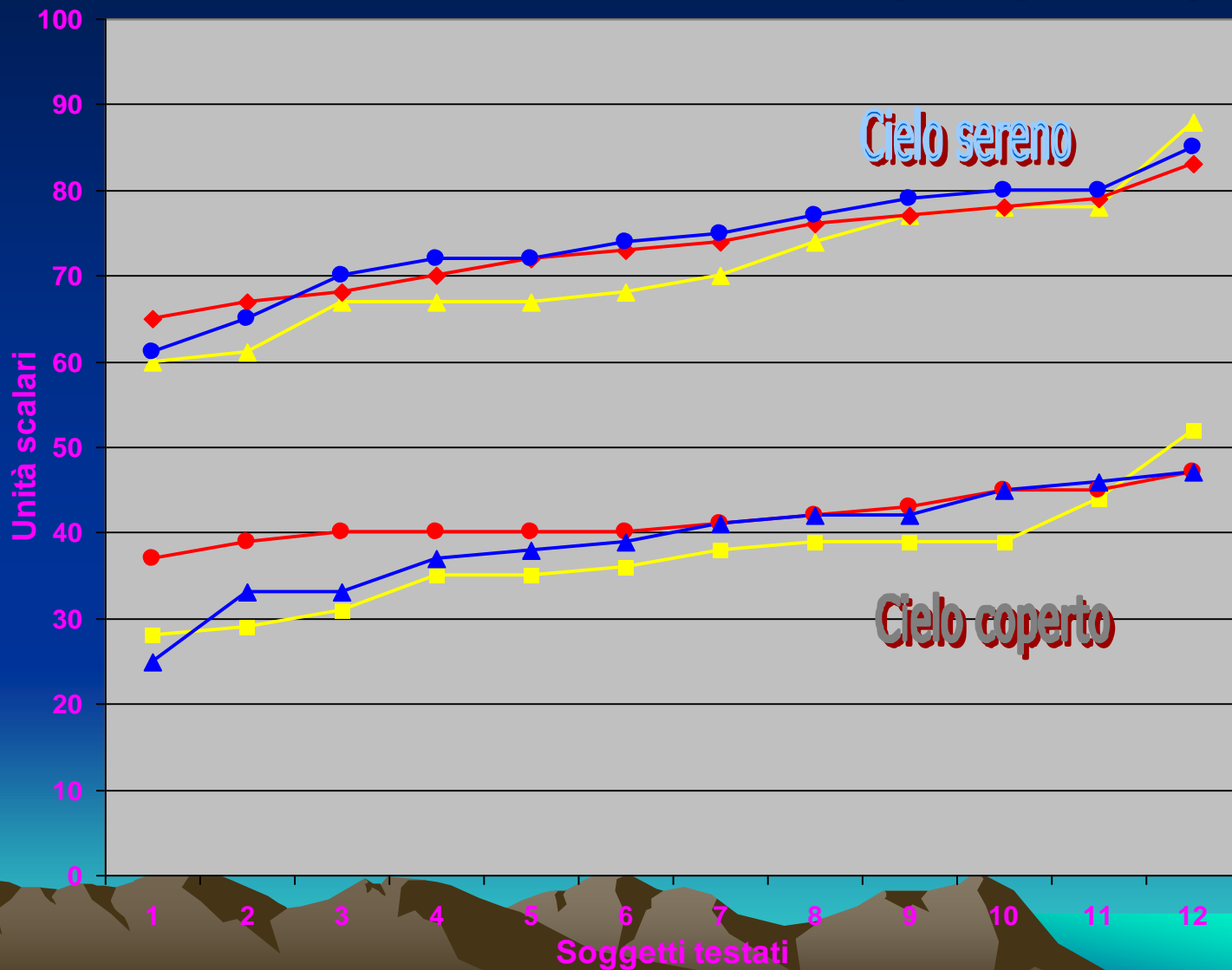


# And wheather changes?



# Study on Methopathy People

With Skin Electric Parameters (SEP) Analyzer



# On Old Way for the Health?

- The results of our work show that a climate marked by continual windy weather, by low humidity and high concentrations of negative ions with low concentrations of chemical pollutants (i.e. such as in Pietracupa; Molise, Italy) reduce the need for health care for chronic obstructive respiratory disease in comparison with the requirements placed in big cities like Rome



# Conclusions (1)

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 (2)

Although not sufficiently exhaustive to support the value of climatic therapy as an aid to the pharmacological approach in the prevention and cure of chronic obstructive respiratory diseases and the pathologies due to air pollution in general, these conditions provide a stimulating base for research projects to further investigate on the effective validity a climatic therapy, today.... that PM10 stop the car ....and the people...





# References

- **P. Avino, Vincenzo De Lisio, Marcello Grassi, Maria C. Lucchetta, Baldassare Messina, Giorgio Monaco, Luisa Petraccia, Giuseppe Quartieri, Rivka Rosentzweig, Sebastiano Spada, Vincenzo I. Valenzi** : Influence of air pollution on chronic obstructive respiratory disease: comparison between city Rome) and hillcountry environments and climates. *Annali di Chimica*,94,2004, 629-35. by Società chimica Italiana.
- **Valenzi VI, Palmieri S, Messina B.** Evoluzione del clima globale: possibili implicazioni per il Medio Sannio (Molise). *Clin. Term.*, 2003: 50,141-145.
- **, V. I. Valenzi, G. Monaco, B. Messina, A. Fraioli, M. Grassi, L. Petraccia, S. Palmieri, V. De Lisio, P. Avino:**Inquinamento atmosferico e affezioni respiratorie croniche. Atti del Convegno dell'Accademia dei Lincei 14-16 aprile 2004 "Ecosistema Roma".
- **Valenzi I. V. G. Quartieri, Monaco G., Grassi M., Pisani A., Petraccia L., Spada S., Cimaglia P., Messina B., Fraioli A.:** Il dolore nell'osteoartrite: influenze climatiche e loro valutazione con i SEP. Atti del 105° Congresso della Società Italiana di Medicina Interna. 23-26 ottobre 2004 Palermo.

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