3rd INTERNATIONAL CONGRESS ON ENVIRONMENTAL HEALTH 2014

PORTO, 24th to 26th SEPTEMBER 2014

PROCEEDINGS BOOK

EMERGING RISKS AND CHALLENGES ON ENVIRONMENT, HEALTH AND SAFETY

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PREFACE

"Letter from President of the Organising Committee of ICEH 2014 and Coordinator of the Scientific Area of Environmental Health of ESTSP-IPP"

Dear Colleagues,

On behalf of the Organising Committee, welcome to International Congress on Environmental Health 2014 to be held in the beautiful city of Porto, Portugal.

We would like to refer the auspices of the Environmental Health area of the Allied Health Sciences School of Polytechnic Institute of Porto by the organization of ICEH2014, promoting an excellent moment to scientific communities, both national and international participants. We are privileged this edition by the special participation as co-organizer of the European Agency for Safety and Health at Work (EU-OSHA) and as regular co-organizers, the Health schools of Lisbon, Coimbra and Beja.

This third edition addresses to **'Emerging risks and challenges for the environment, health and safety'** and intended as a guide to the various symposiums and workshops, to provide all present the most recent scientific and technological advances in the areas: Occupational Health and Toxicology; Exposure to Nanoparticles; Assessment and Risk Management; Occupational Safety; Exposure to Bioaerosols; Environment and Sustainability; Food Safety and Public Health.

We would like to thank all sponsors and the institutional sponsors, particularly the Porto City Council for facilities, the International Federation of Environmental Health, the Taylor & Francis Group, the National Focal Group for Health and Safety at work and the Polytechnic Institute of Porto.

We hope that this conference has a special impact, confirming the importance of research and training for prevention of risks on occupational health and environment.

Thanks, and enjoy the conference.

Manuela Vieira da Silva
President of the Organising Committee of the ICEH2014
Allied Health Sciences School of Polytechnic Institute of Porto

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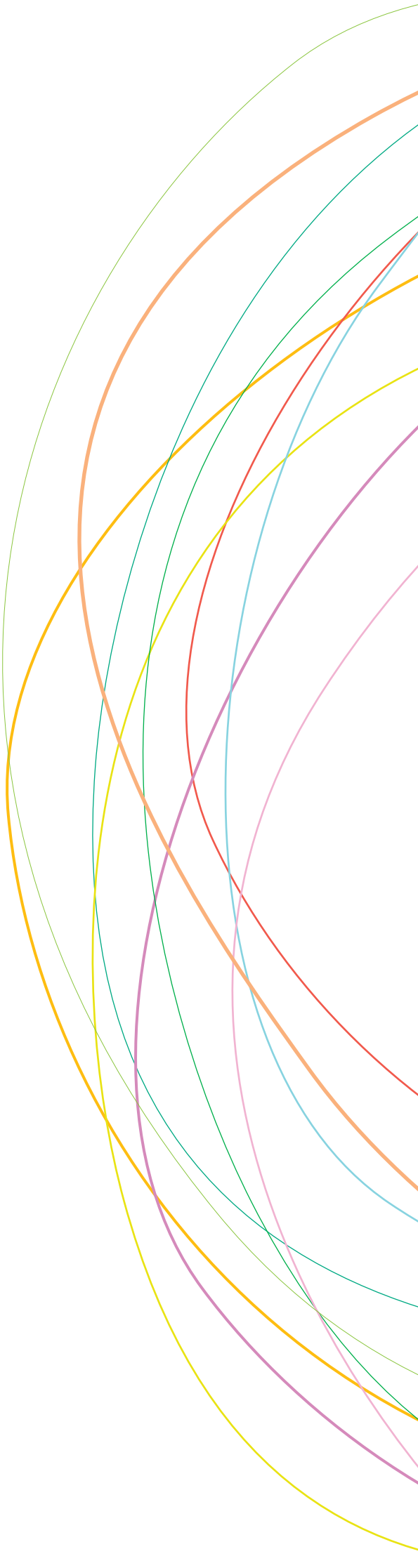

HUMAN HEALTH RISK AND PREVENTION

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HUMAN HEALTH RISK AND PREVENTION ABSTRACTS

Typification of respiratory diseases, exceedances of troposphere ozone and particulate matter (PM10) through latent class models

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INTRODUCTION:

The exposure to urban air pollutants continues to be a public health issue causing illness and death. Breathing small amounts of pollutants over many years is considered hazardous as well as breathing high concentrations of air pollutants. Traditionally measured pollutants are the fine particulates matter and tropospheric ozone. For these reasons, whenever the value of 180 g/m3 is exceeded, it is required to alert the population. There is currently no study made to assess the relationship between those pollutants and the frequency of respiratory diseases in the so called big Lisbon area of Amadora and Sintra which is the second highest density populated region in Portugal. The elder are the most susceptible to air pollution exposure and those with inflammatory disorders of the respiratory airways, such as asthma or severe bronchitis. Children are known as at greater risk because their lungs are still developing.

OBJECTIVES:

This work aims to study the relationship of the exceeding quantities occurred in the air pollutant (PM10) and tropospheric ozone (O3) in the Amadora and Sintra municipalities' inhabitants and the episodes of hospital admissions due to respiratory causes in all age groups. The data used relates to the period between 2004 and 2009.

MATERIALS AND METHODS:

We appealed to the records of Hospital Diagnostic Groups (GDH), which provided some data on the hospitalization for respiratory pathologies classified according to the Disease International Classification (ICD-9). We have analyzed this data of respiratory diseases occurred between the years 2004 and 2009, for users whose home is located in the municipalities of Amadora and Sintra and went to the three Hospitals from the National Health Service (NHS) - Central, West and North Lisbon Hospitals Centers, and one referral Hospital (Fernando da Fonseca). The data corresponding to GDH respiratory diseases were provided by the Central Administration of Health Services (ACSS) and the data relative to the two pollutants (ozone and particulates) were provided by the online database of Portuguese Environmental Agency, Department of Atmospheric Air Quality. The analysis was made for the complete years and all seasons. Concerning the optimal way to present research evidence for the episodes of hospital admissions due to respiratory causes, we argue that a simplified conceptual model is given by Latent Class Model multivariate statistical methods (Fonseca 2013a; Fonseca2013b; Fonseca 2008).

RESULTS AND DISCUSSION:

Regarding the referral Hospital our findings show that we have a cluster1 with 91 per cent of cases, characterized by PM10 (Mean) = 1.49, Ozone (Mean) = 0, and CID9: Acute respiratory infections; Pneumonia and influenza; other diseases of the respiratory tract; Pneumoconiosis and other pulmonary diseases. They

are aged up to 20 and more than 69 years old, months: January, February, March, April, May, October, November, December, years: 2004, 2007, 2008. A cluster 2 with 9 per cent of cases, with PM10 (Mean) = 1.93, Ozone (Mean) = 4.59, and CID9: Other respiratory diseases; chronic obstructive pulmonary disease and similar. They are aged between 20 and 69 years old, months: June, July, August, and September, years: 2005, 2006, 2009. Furthermore, we found that ozone is correlated with both PM10 and month, PM10 is correlated with CID9, parish and month. Regarding Hospital Centers, the results obtained by estimating latent class models shows that there are 3 groups of such cases, respectively with 52, 40 and 8 percent of cases. In group 1 are mostly individuals belonging to the age group up to39 years without a characteristic type of disease; they moved mostly to the Central Hospital in 2007, 2008 and 2009, in the months of April, May, September, November and December. Group 2 consists of 40% of individuals, mostly from the age group 40 to 44 years old and characterized by all the listed diseases; recorded the highest mean value of PM10 (3,248) and cases were seen mainly in North hospital in 2004, in the months of January, February, March and October, and mostly in the municipality of Amadora. Group 3 is mostly made up of cases with more than 44 years with other respiratory diseases and other respiratory diseases; there were higher values of ozone (average 4,012) and significant values of PM10 (average 1,986) and cases were seen mainly in the Western Hospital in 2005 and 2006, in the months of June, July and August, and mostly the county Sintra.

CONCLUSION:

From the results of referral Hospital, we may conclude that respiratory pathologies classified according to the Disease International Classification (CID-9) can be discriminate by PM10 and Ozone, age, month and year. Moreover we can conclude that CID-9 is correlated with PM10 and age. From the results of Hospital Centers, we may conclude that there is no relationship between ICD9 and PM10 values (p = 0.885) but there is a relationship between ICD9 and ozone values. Meanwhile, the months are related to ICD9 (p = 0.000). The relationship between age and ICD9 is statistically significant (p value =0.000).

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