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A MARKOV-BASED MODEL TO FORECAST EMERGENCY HOSPITAL ADMISSIONS DUE TO AIR POLLUTION: THE LENVIS PROJECT APPROACH

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Abstract

Several epidemiological studies proved pollutant levels and exposure may increase risk of morbidity and mortality, in particular for respiratory and cardiovascular diseases. However, performing a short term estimation of the hospital admissions due to air quality remains difficult even if crucial for a rational healthcare management. In this paper we present a Markov based approach aimed at estimating short term emergency hospital admission trends. This predictive model has been developed within the European project *Lenvis* (Local ENVironmental Services), a collaborative network of services able to retrieve and analyze heterogeneous and geographically dispersed data sources in order to deliver environment and health information. One of the services of *Lenvis* is the Health Impact Decision Support System (HIDSS) whose inferential engine is provided by a Markov-based model trained on real data related to pollutant levels and emergency hospital admissions in Milan, Italy. HIDSS has shown, in several use cases, its usefulness both for environment authorities and healthcare stakeholders.

Key words: air quality, emergency hospital admissions, environmental health, Markov models, short term forecasting

Received: October, 2011; *Revised final:* April, 2012; *Accepted:* May, 2012

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