

# EMERGENCY AMBULANCE DISPATCHES AND APPARENT TEMPERATURE: A TIME-SERIES ANALYSIS WITH DISTRIBUTED LAG NONLINEAR MODELS

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**Background and Aims:** To properly understand the full public health significance of heat-related health effects, as well as develop an effective surveillance system, it is important to investigate the impact of stressful meteorological conditions on non-fatal events. The objective of our study was to evaluate the exposure-response curve of ambulance dispatch data in relation to biometeorological conditions by using time series techniques.

**Methods:** Daily data of Emergency Ambulance Dispatches (EAD) for people aged 35 or older in the summer periods of 2002 to 2006 were collected for the chief towns of the Emilia-Romagna region. The city-specific relationship between daily EAD and increasing apparent temperature (AT), was explored using distributed lag nonlinear functions and then approximated by linear splines in Generalized Additive Models, controlling for air pollution, seasonality, long-term trend, holidays and weekends. The effects of high temperature on health were evaluated for all non-traumatic as well as for respiratory and cardiovascular disease. City-specific effects were then combined in fixed and random effects meta-analyses.

**Results:** DLNM showed a greater effect of AT on EAD in the current day. The delayed effects decreased with time. On the current day of exposure the percent change in EAD associated with every 1°C increase of mean AT between 25°C and 30 °C was 1.50% (95%CI:0.67,2.34) for non-traumatic disease and 2.90% (95%CI:0.65,5.20) for respiratory disease. The percent rise in risk was greater on days in which the mean AT exceeded 30°C (8.77%, 95%CI:5.87,11.75 for non-traumatic disease EAD). The risks increased with age and reached 12.04% for non-traumatic 75+ EAD compared to 5.63 % for those aged 35-64.

**Conclusions:** Time series analysis techniques have been adopted for the first time to investigate EAD data to evaluate risks associated with biometeorological discomfort. Our findings show a strong relationship at short lags between ambulance dispatches and biometeorological conditions.

## References:

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