



## **Weather and climate versus mortality from the 19th century onwards. The relevance of Franzini's pioneer research in Portugal.**

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M.M. Franzini was an engineer who was also actively involved in Politics (liberal party). He took a keen interest in Nature and Sciences, particularly in the “influence” of weather and climate on health and agriculture. Franzini started his observations in December 1815, by request of a physician; both scientists compiled existing mortality data from several Lisbon districts between 1837 and 1849. The peak of mortality occurred in the summer as opposed to what happened in the Northern European countries. According to Franzini, in summer, the less wealthy classes consumed damaged fruits, which induced serious gastric problems and fevers, and were exposed to “harmful gases” from the “swampy lands”. The only direct relationship that Franzini establishes is between the temperature and mortality.

We have extracted meteorological and mortality data mostly from periodic newspapers and we analyse Franzini's conclusions on climate-mortality relationships and compare the series with more recent mortality monthly rhythms. We conclude that there was actually a change in the seasonal rhythms of mortality over the last century. Towards the end of the 19th century the mortality values varied little throughout the year. During the 20th century the relative importance of mortality in the winter months increases. Notwithstanding this evolution, a second peak of mortality nearly always occurs during one of the summer months. Given the increased frequency of summer heat waves such peaks will tend to occur more frequently or become more significant. Furthermore we will show a recent research on mortality per civil parish in the Lisbon's region during the 2003 heat wave, focussing particularly on its great spatial variation and on the meteorological versus non-meteorological causes of the differences found.