Environmental Related Mortality Rates through Artificial Intelligence Tools

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Abstract : The association between elevated air pollution levels and extreme climate conditions (temperature, particulate matter, ozone levels, etc.) and mental consequences has been, recently, the focus of significant number of studies. It varies depending on the time of the year it occurs either during the hot period or cold periods but, specifically, when extreme air pollution and weather events are observed, e.g. air pollution episodes and persistent heatwaves. It also varies spatially due to different effects of air quality and climate extremes to human health when considering metropolitan or rural areas. An air pollutant concentration and a climate extreme are taking a different form of impact if the focus area is countryside or in the urban environment. In the built environment the climate extreme effects are driven through the formed microclimate which must be studied more efficiently. Variables such as biological, age groups etc may be implicated by different environmental factors such as increased air pollution/noise levels and overheating of buildings in comparison to rural areas. Gridded air quality and climate variables derived from the land surface observations network of West Macedonia in Greece will be analysed against mortality data in a spatial format in the region of West Macedonia. Artificial intelligence (AI) tools will be used for data correction and prediction of health deterioration with climatic conditions and air pollution at local scale. This would reveal the built environment implications against the countryside. The air pollution and climatic data have been collected from meteorological stations and span the period from 2000 to 2009. These will be projected against the mortality rates data in daily, monthly, seasonal and annual grids. The grids will be operated as AI-based warning models for decision makers in order to map the health conditions in rural and urban areas to ensure improved awareness of the healthcare system by taken into account the predicted changing climate conditions. Gridded data of climate conditions, air quality levels against mortality rates will be presented by AI-analysed gridded indicators of the implicated variables. An Al-based gridded warning platform at local scales is then developed for future system awareness platform for regional level.

Keywords : air quality, artificial inteligence, climatic conditions, mortality