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Calls Forecast for the Moscow Ambulance Service. The Impact of Weather Forecast

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We use the known statistics of the calls for the current and previous days to predict them for tomorrow and for the following days. We assume that this algorithm will work operatively, will cyclically update the available information and will move the horizon of the forecast.
Sure, the accuracy of such forecasts depends on their lead time, and from a choice of some group of diagnoses. For comparison we used the error of the inertial forecast (tomorrow there will be the same number of calls as today). Our technology has demonstrated accuracy that is approximately two times better compared to the inertial forecast.
We obtained the following result: the number of calls depends on the actual weather in the city as well as on its rate of change. We were interested in the accuracy of the forecast for 12-hour sum of the calls in real situations. We evaluate the impact of the meteorological errors [1] on the forecast errors of the number of Ambulance calls.
The weather and the Ambulance calls number both have seasonal tendencies. Therefore, if we have medical information from one city only, we should separate the impacts of such predictors as “annual variations in the number of calls” and “weather”. We need to consider the seasonal tendencies (associated, e. g. with the seasonal migration of the population) and the impact of the air temperature simultaneously, rather than sequentially.
We forecasted separately the number of calls with diagnoses of cardiovascular group, where it was demonstrated the advantage of the forecasting method, when we use the maximum daily air temperature as a predictor. We have a chance to evaluate statistically the influence of meteorological factors on the dynamics of medical problems. In some cases it may be useful for understanding of the physiology of disease and possible treatment options.
We can assimilate some personal archives of medical parameters for the individuals with concrete diseases and the relative meteorological archive. As a result we hope to evaluate how weather can influence the intensity of the disease. Thus, the knowledge of the weather forecast for several days will help us to predict a state of health. The person will be able to take some proactive actions to avoid the anticipated worsening of his health.

Literature

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