

Use of meteorological, environmental and spatial variables to predict drug use

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At certain times of the year it happens that some pharmacies run out of stock of certain drugs. This could be avoided if a predictive data mining models the relation between temperature, air quality and type of population served by the pharmacy. In this sense the literature contains many references to the relationship of these factors with certain pathologies and also with the use of specific drugs (Dawson et al. 2007. Oiamo et al. 2011, Donaldson et al. 2012,Tseng et al 2013).

This study is based on the number of patients that consume a specific drug in some pharmacies of Jaén, Andalusia, in southern Spain. In this case the consume of “Salbutamol” is the drug analysed. Algorithm techniques of data mining have been used to generate the predictive model using data from 2009 to 2014. These data consist of: number of dispensations of “Salbutamol”, maximum, medium and minimum temperature, humidity and rainfall, Pollution levels and Type of population that attends the Pharmacy.

Running the Minimun Description Length (MDL) algorithm the weight of the variables on the target attribute (table 1) are calculated, then we can see the relationship between the dispensation of “Salbutamol” and variables (1 represents the maximum ratio and 0 no relation).

From the statistical point of view also a relationship between the dispensation of “Salbutamol” and climatic and environmental factors is established.

Attribute		Ranking	Weight
Age	0-14	1	0,631
	15-24	1	0,581
	25-34	1	0,381
	35-44	1	0,331
	45-54	1	0,331
	55-64	1	0,331
	65-74	1	0,331
	75-84	1	0,331
Age >85		1	0,331
Month		3	0,164
Min temperature		4	0,152
Maxtemperature		5	0,046
Mean temperature		6	0,04
Bad air quality		7	0,007

Table 1. Weight of the variables with respect to the target attribute

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