



Estimates of the occurrence of meningitis cases from mathematical models based on climatic variables.

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This research aimed to establish relationships between climate and health, whereas changes in atmospheric weather cause or aggravate a tangle of symptoms, diseases and clinical changes in health, which is a result of the reactions of the human organism to weather. The objective of this study was to evaluate the influence of local climatic variables on the monthly incidence of meningitis in the city of Ponta Grossa, Parana, Brazil, from 2006 to 2011. To obtain the model coefficients of monthly incidence of meningitis, it was used the free software R. For this purpose, it was used the technique of multivariate linear regression analysis, in order to determine the highest level to which the climatological elements evaluated were able to demonstrate the correlation between the atmosphere and the incidence of this disease. It was found that for this locality in most months, good fits were obtained considering the regression coefficients (R^2), where models were based on monthly averages of air temperature, relative humidity and average total monthly rainfall. These models were able to justify widely the monthly incidence coefficients of meningitis, suggesting that changes in the monthly mean values of these climatic elements can contribute to estimated the number of cases of this disease. However, it is important to remember that health depends not only on environmental factors, but also on several other factors, such as genetic, nutritional and economic, for instance, which could explain part of the observed error in the model in a few months. Anyway, such mathematical models can be extremely useful if used to predict and anticipate future scenarios of possible illness resulting from climate changes.