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Title: Weather variables and emergency hospital visits for adult asthma exacerbations in Malta

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Body: Background: Asthma exacerbation requiring hospital treatment has been shown to exhibit seasonality in several studies Aim: To analyse the relationship between weather conditions and hospital visits with asthma in Malta. Methods: All Adults treated for asthma exacerbation in our accident & emergency department (ED) in 2010 were included retrospectively. Information on demographic variables was collected. Daily weather data including: temperature, barometric pressure, maximum % relative humidity, mean wind speed and precipitation; was obtained from the Meteorological office at Malta International Airport. Results: 328 adults received treatment for asthma exacerbation at the ED in 2010; 53% required admission. 70.4% were females. A high incidence of ED visits was observed during November, December and January, with the lowest incidence recorded in June and July. A significant association was found between age and number of ED visits ($p < 0.005$); with the most common being the 20-40 age group. The number of ED visits for asthma was positively correlated with: precipitation of rain 1 day ($p = 0.002$) and 2 days before ($p = 0.006$); and mean wind speed ($p = 0.035$). A significant negative correlation was detected between number of visits and maximum % relative humidity ($p = 0.004$), and barometric pressure ($p = 0.028$). However, no significant correlation was detected between number of visits and temperature. Conclusions: ED visits for asthma in Malta exhibit seasonality. These are associated with high mean wind speeds and high precipitation 1 and 2 days before presentation. These findings have important implications for developing an effective preventive strategy with increased vigilance during periods of increased risk.