About the possible influence of the weather on asthma episodes: St. Thomas University and surrounding communities.

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Introduction
Asthma is estimated to affect about 5% of adults and about 10% of children worldwide. Both, asthma prevalence, and mortality have increased considerably over the last ten years and it is forecast to be one of the most important respiratory and occupational lung diseases in the coming decade. Additionally, climatic and environmental changes occurring since the middle of the Twentieth Century as well as the aggravating pollution levels in megacities seem to exacerbate asthma episodes and number of hospitalizations. According to the latest estimates, in the U.S., the prevalence of asthma in children under 18 years ranges from 4.3 to 7%, while in children 2 - 5 years in around 5.6%. In Miami Dade County, where St. Thomas University is located, in 1998 the hospitalization rates were double the Healthy People 2010 objectives in every age group. Motivated by this existing situation, it was decided to begin a study aimed at identifying asthma patterns. These patterns are expected to include a gathering of weather and health information, and also, find for possible correlations between these data. It is noteworthy that St. Thomas University is surrounded by many communities with Hispanic and African - American composition predominantly. These minority groups are the one with the highest rates of asthma prevalence and severity. Then, in partnership with AWS Convergence Technologies (Weatherbug), a weather tracking station operating on campus 24/7 year round has recorded weather data for six years. A careful statistical analysis of these data is included in this presentation. Based on health information obtained from regional hospitals located in different areas of Miami Dade, some seasonal patterns of asthma as well as some possible indicators are discussed for further correlation analysis. Our results are compared with others obtained from different States within continental U.S. as well as over overseas.

Asthma Statistics Worldwide:
A brief overview
- # of people diagnosed: more than 150 M
- Europe: the # of cases has doubled
- USA: the # of cases has increased more than 60%
- India: between 15 and 20 M
- Africa: between 11 and 10% of population
- # of deaths yearly: around 100,000
- Miami Dade County: 7.1%. Middle and HS children were reported with asthma
- The # of hospitalizations due to asthma has doubled
- The # 1 cause of school absence and 35% of parents missed work

Seasonal variations in asthma reported cases: Preliminary results

Time Series of Weather Parameters for Miami Dade County Metropolitan Area

IESARA – Intelligent Expert System for Asthma Risk Analysis

Mathematical Modeling of the Asthma – Weather Connection

Microscopic mechanical description of breathing

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Conclusions
1. There is a clear seasonal pattern in asthma reported cases.
2. The major incidence seems to occur in highly populated cities in Florida.
3. There are direct and indirect forms on how the weather seems to affect people with asthma.
4. A mathematical model of the weather – breathing mechanism is needed to fully understand the obtained results.