

## Simple visualization techniques and statistical data analysis in prenatal diagnosis

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### Abstract

Pregnant women have always believed that an unpleasant event during her pregnancy - an accident, a shock, a great sadness - could lead to the birth of an imperfect child, or worse, a "monster" (Daston, Park, 1998; Duden, 1991). Since the 70s, the improvement of prenatal diagnosis (PND) changed this situation, since it is not more than vague apprehensions, but often the prediction of an event very precise. To determine the health and condition in a fetus or embryo before it is born, the rule of PND is crucial. By employing a variety of techniques, the aim of PND is to detect birth defects, abnormalities and other conditions, since without this knowledge there could be an inauspicious outcome for both, the fetus and the mother. In our work we consider the PND data base of administrative area of Santarém, Portugal, to study the differences between the various municipalities in the region and to try to identify the key factors that may contribute to the birth disorders. Visualization is crucial to understand very large data sets and, together with statistical analysis, enables to quickly screen compounds and to obtain greater insight on factors affecting properties. In this work simple visualization techniques are applied in order to explore data and to identify trends. Software R is used on the statistical data analysis, namely on time series representation and on tests for proportion comparisons, which are performed to identify the differences/similarities among municipalities and among years, aspiring to provide an improvement of the rules for decision support, prevention measures and medical action.

**Keywords** - Congenital Anomalies; Statistical models; Seasonality; Time Series.