



MORTALITY AND CLIMATE VARIABILITY AT THE NATIONAL HOSPITAL OF NIAMEY FROM 1988 TO 2008

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BACKGROUND

Reports

- According to specialists in public health, heat stroke corresponds to a rise of body's temperature of above 40 °C;
- It can happen very often with children, elderly, and athletes who do not offset the loss of water through transpiration;
- If it's not treated quickly, it can have serious consequences (high fever and loss of consciousness, vomiting, nausea, delirium and even convulsions) on human health and can even be fatal

Observations

- During the temperature outbreak that occurred between April and early May 2010 a lot of deaths had been recorded mostly children and elderly, at the national hospital of Niamey;
- On average 40 deaths were recorded each day during this heat wave witch peak could reach 45°C



HNN: Réanimation d'une patiente



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PURPOSE AND HYPOTHESIS

PURPOSE

The aim of our study is to examine the link between the number of deaths and the maximum temperature in order to develop a model that will serve as a tool of early warning related to extreme temperature at Niamey.

HYPOTHESIS

The heat waves recorded recently could have adverse effects on health. There's so a threshold of temperature above which one risk death.

MATERIALS AND METHODS

METHODS :

To conduct this study we used :

- daily cases of death from 1988 to 2008 counted only from the registers at the psychiatric Service due to the non computerization of the data for the whole National Hospital of Niamey.
- daily data of maximum temperature from 1988 to 2008 for Niamey station.

Monthly and annual climatologies, and anomalies of the maximum temperature where determined in order to analyze the seasonal and inannual variability with the monthly and annual total of death.

The maximum temperature that have prevailed in the different days of death, were identified and sorted in order to find the smallest value that will be considered as threshold of risk. It was later determined the number of times that this threshold is exceeded each month of each year throughout the study period.

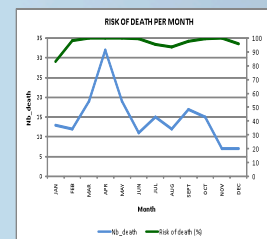
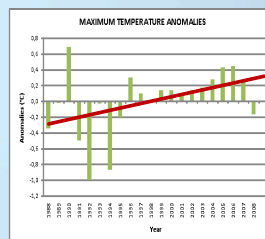
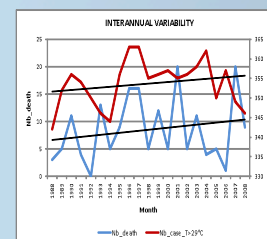
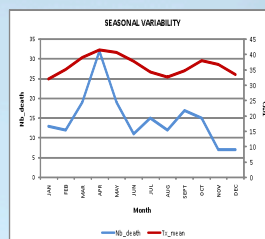
TOOLS :

IRI Library Database, for exporting data to needed format
EXCEL, for data processing
SYSTAT, for building the model

RESULTS

The analysis of the figures below shows that :

- the curves of the maximum temperature and the number of deaths evolve in the same way during the year (see Seasonal variability);
- anomalies are positive in recent years (see the maximum temperature anomalies)
- the threshold found is 29°C and the number of death increases with the number of cases that the maximum temperature is greater than that one each year of the study period (interannual variability)
- the percentage of maximum temperature greater the threshold varies also as same as the number of death in the year.



CONCLUSIONS

After the analysis of the figures above the following conclusions can be drawn :

- it's be coming hotter and hotter in the study period (see the maximum temperature anomalies)
- there is a link between the maximum temperature and the number of deaths trough the year (see Seasonal variability);
- the number of death of each month is link to the maximum temperature by the following linear regression : $Nb_death/month = -36.887 \times T_{max} + 1.424$ ($R \text{ multiple} = 0.656$, Standard error = 5.289)
- if data were available throughout the whole hospital, the risk of dying would be 100%, with threshold found, on February, March, April, May, June, October and number but with more emphasis in April and May of each year.

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