CASE STUDY DATASET 3:

DETERMINANTS OF THE VOLUME OF BROWN FAT IN HUMAN

Data Source:
Molecular Imaging Center at The University of Sherbrooke for providing the data

Objective

The objective of this analysis is to identify the factors determining the existence and the volume of brown fat in Humans.

Background

It is well known that brown fat allows some small animals to live in a cold environment. In humans, until recently it was believed that this fat was present only in newborns. However, recent technological advances have detected its presence in adults as well. This fat needs to be activated by a low ambient temperature to be detected by scanning as the cold exposure increases the prevalence, which varies considerably from a study to another. However, the importance of the factors determining the existence and the volume of the brown fat in adults are still to be investigated. The main purpose of the study is to examine the relationship between a number of factors and the presence and the volume of brown fat in a large cohort of cancer patients.

Research Question:

Build a model to predict the volume of brown fat by covariates.

Variables:

- Sex: sex of the patient (Female=1, Male=2).
- Diabetes: (No=0, Yes=1).
- Age: Age of the patient in years.
- Day: Day of the year.
- Month: Month of the exam.
- Ext_Temp: External Temperature.
- 2D_Temp: Average temperature of last 2 days.
- 3D_Temp: Average temperature of last 3 days.
- 7D_Temp: Average temperature of last 7 days.
- 1M_Temp: Average temperature of last month.
- Season: Spring=1, Summer=2, Automn=3, Winter=4.
- Duration_Sunshine: Sunshine duration.
- Weight: in Kgs
- Size: in cms.

- BMI: Body Mass index.
- Glycemia.
- Lean Body Weight.
- Cancer_Status: (No=0, Yes=1).
- Cancer_Type: (No=0, lung=1, digestive=2, Oto-Rhino-Laryngology=3, breast=4, gynaecological (female)=5, genital (male)=6, urothelial=7, kidney=8, brain=9, skin=10, thyroid=11, prostate=12, non-Hodgkin lymphoma=13, Hodgkin=14, Kaposi=15, Myeloma=16, Leukemia=17, other=18).
- TSH
- Total_Vol: Total volume of Brown Fat.