

## Faculty of Medicine



### MED2430 Eléments de statistiques médicales

[15h+15h exercises] 3 credits

**Teacher(s):** William D'Hoore, Annie Robert  
**Language:** French  
**Level:** Second cycle

#### Aims

To familiarize the student with the tools used to describe the frequency of health problems and their associated factors in human populations.

The student shall be able to describe a sample, to control the probability calculation applied to the strategy of diagnostic decision, to interpret a probability, to assess whether a sampling procedure is simple, to establish the operational characteristics of the basic estimators (average, deviation, proportions like prevalence, incidence, sensibility and specificity) in simple procedures for the calculation and interpretation of confidence intervals, to understand the steps of an hypothesis test.

#### Main themes

##### 1: Descriptive statistics

These methods allow summarising a sample of data in a few useful characteristics or estimates. Frequency distributions, density functions, distribution functions and parametric and non-parametric characteristics are studied in the samples.

##### 2: Probability calculation

According to the sample selection procedure, the probability calculation ensures the link between the population and its sample. The studied topics are the basic rules for total and conditional probability calculation, the quantification of events in a random variable with its probability distribution together with its operational characteristics (parameters). In particular, quantifications issued from experimental schemes generating binomial and normal laws will be studied thoroughly and applied to the diagnostic decision.

##### 3: Introduction to Statistical inference

To compare observations with issued hypothesis on a population parameter, the basic tools are the estimators and their characteristics. In simple sampling procedures, these tools allow inference based on confidence intervals.

#### Content and teaching methods

**Content:** 1- Tools set of descriptive statistics for a sample. 2- Probability calculation rules and Bayes reasoning applied to diagnostic procedure and to therapeutic choices based on causal analysis. 3- Probability calculation with normal distribution. 4- Bases of parametric inference with single dimension and applications to normative studies.

**Method:** The formation method is an apprenticeship by problems targeting the knowledge of statistics tools and their applications in health sciences problems. A lecture followed by a practical session, with the students divided in small groups and guided by an assistant, are held each week of the two first months of the academic year. The abstract tools are progressively extracted from a concrete application during the lecture and thereafter, problems requiring these tools are analysed during the practical sessions, using the student version of the statistical software SPSS. After each session, the student receives a health problem which he has to resolve for the next week. This resolution is evaluated. He can get personally the SPSS software version or use one in the computers room of the Faculty of Medicine.

**Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)****Pre-required:**

No pre-required knowledge is expected

**Evaluation:**

Two thirds of the evaluation is based on an examination with open books on the resolution of health sciences problems. The last third of the evaluation is assessed on the resolutions of the seven problems given on a regular basis to the student.

**Supporting tools:**

A reference book and an exercises book are available from the commencement of the formation. The student can acquire personally a Student SPSS software version (<http://eibr.adfi.ucl.ac.be/spss/spss.etudiants.html>) or can access it for free in the computers room of the Faculty of Medecine.

**Teaching team:**

Assistants lead 90 hours of practical exercises. There are 6 groups of 30 to 40 students per academic year. Two hours a week, the teachers and assistants will be available for explanations for the students who request it.

**Other credits in programs**

<b>ESP1PM</b>	Année d'études préparatoires au master en sciences de la santé publique (3 credits)	Mandatory
<b>ESP3DS/GH</b>	Diplôme d'études spécialisées en santé publique (Gestion hospitalière)	
<b>MD3DA/MO</b>	Diplôme d'études approfondies en sciences de la santé (sciences de la motricité) (3 credits)	Mandatory
<b>SBIM12BA</b>	Deuxième année de bachelier en sciences médicales (3 credits)	Mandatory
<b>SBIM1PM</b>	Année d'études préparatoires au master en sciences biomédicales (3 credits)	Mandatory
<b>SCOM21</b>	Première licence en sciences de la santé publique (Promotion de la santé, programmes et services de santé communautaire) (3 credits)	