Core set (population); selection, principle of statistical induction

Statistics

Statistics deals with the collection and analysis of mass observations and the results of repeated attempts. Divided into:

- **descriptive** : organization of files, their description and purposeful summarization.
- **inductive**: makes it possible to create scientifically justified general conclusions from empirical findings. It is built on the knowledge of probability theory

We can also divide human *thinking into deductive and inductive*. With **deductive** thinking, we create conclusions for individual cases from generally valid regularities. With **inductive** thinking, we start from the observation of individual cases and then generalize to a conclusion. The conclusions of inductive thinking are influenced by subjective attitudes and have limited validity.

Statistical induction

Statistical induction – a process by which, using statistical methods, we can create general conclusions whose degree of reliability can be objectively quantified. Their main task is to develop procedures for the objectification of reasoning. The core set and selection play a central role here.

A core set or population – is specified by the precise definition of its **elements** , which are either determined by naming or establishing an unambiguous rule for selection. Depending on the scope, we can divide it into finite (e.g. demographic files) or infinite (ideal, does not exist in reality).

We call the properties tracked on the elements **characters** , which are divided into:

- **qualitative**: *nominal* (can only be named) or *ordinal* (their values can be ordered by size)
- **quantitative**: *continuous* or *discrete*, we measure them on an interval scale, with either a variable onset or a fixed onset.

Selection - part of the elements of the basic set, on which we create a conclusion. In order for it to be possible to infer the entire base set, it must be *representative* – reflect the properties of the base set by its composition. Other selections are selective. Selection of elements based on our subjective opinion - **judgmental** selection. For statistical induction, we can only use selections made by some method of **random (probability) selection** , and these are:

simple random selection - by lottery technique, using tables of random numbers
mechanical (systematic) selection – is based on a certain predetermined arrangement of elements of the basic set. We select elements based on some selection step k (e.g. every third).
area (stratified) selection – if the basic set can be divided into areas that are homogeneous within, but heterogeneous among themselves.
group selection - when the basic set is very numerous - we select groups of elements that form natural or artificial groupings (e.g. family). The groups should be of equal size and the elements within the group diverse.
multi-level selection – is based on the existence of a certain hierarchical arrangement of elements of the basic set (e.g. cities – houses – households)

Links

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References

- Kolektiv aut.: Epidemiologie – výukové texty pro student 1. LF UK. Karolinum, Praha 2002, str. 70 -73

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