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# METHODS FOR ASSESSING THE RELIABILITY OF THE RESULTS OF A STATISTICAL STUDY

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- When calculating indicators, not all the general population is often used, but only some part of it (for example, in a selective study). It is necessary to evaluate the reliability of the results of the study. The measure of the reliability of the indicator is its error - the error of representativeness (representativeness)
- . The error shows how much the result obtained in a selective study differs from the result that could be obtained by a continuous examination of the entire population.

# Equipment of the lesson.

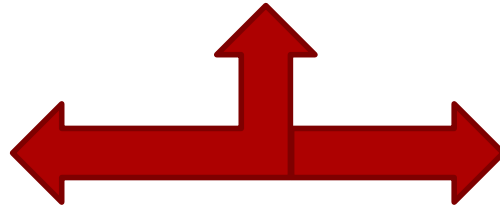
- Multimedia projector
- A laptop
- Visual material in the form of a multimedia presentation
- Personal Computer

- Taking into account that doctors, as a rule, carry out researches on selective sets, the theory of statistics allows using the mathematical apparatus (formulas) to transfer data from selective research to the general population.
- In this case, the doctor should be able not only to use the mathematical formula, but draw a conclusion, corresponding to each method of assessing the reliability of the data.

- Applying the method of assessing the reliability of the results of a study the researcher must be able to choose the correct method of this method.

# Among the methods for assessing reliability

*Nonparametric methods*



*Parametric methods*

- *Parametric methods* for assessing reliability are called -the application of which ***requires a compulsory knowledge*** of the law of distribution of the studied features in the aggregate and the calculation of their basic parameters.
- *Nonparametric methods* for assessing reliability are the application of which ***does not require knowledge*** of the law of distribution of the studied characteristics in the aggregate and the calculation of their basic parameters.

- In the final result, a certain numerical value is calculated, which is compared with the tabulated threshold values. The reliability criterion will be the result of comparing the obtained value and the tabulated value for a given number of observations (or degrees of freedom) and for a given level of error-free forecast.
- The average error in estimating the probability by the relative frequency found from the sample is defined as:

$$\mu = \sqrt{\frac{\omega(1-\omega)}{n}}.$$



- The average error in the mathematical expectation is determined by the formula:

$$\mu = \frac{\sigma}{\sqrt{n}},$$

where  $\sigma$  is the standard deviation;  
 $n$  is the number of observations.

- With the number of observations less than 30, the mathematical expectation error and the probability found by the sample are determined by the formulas:

$$\mu = \frac{\sigma}{\sqrt{n-1}} \quad \text{и} \quad \mu = \sqrt{\frac{\omega(1-\omega)}{n-1}}.$$

Typical errors allowed by researchers in applying the method of assessing the reliability of the difference in the results of the study.

- In assessing the reliability of the difference in the results of the study using the t criterion, it is often concluded that the results of the study are reliable (or unreliable). In fact, this method allows us to judge *only the reliability* (materiality) or *randomness* of the differences between the results of the study. With the obtained value of the criterion  $t < 2$ , it is often concluded that *it is necessary to increase the number of observations*. If the sample sets are representative, then one can not conclude that there is a need to increase the number of observations; in this case, the value of the criterion  $t < 2$  indicates a coincidence, the unreliability of the difference between the two compared results of the study.