BASIC STATISTICS IN MEDICAL PRACTICE

Pages with reference to book, From 77 To 78

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STATISTICAL DECISIONS

In actual practice we are required to make decisions about the population on the basis of sample information; such decisions are called statistical decisions[1]. For example on the basis of sample data collected, one wants to determine whether a new serum is really effective in curing a disease or one procedure is better than other. In order to reach at a decision on such matters we make assumptions whether they may or may not be true, called the statistical hypothesis. In many instances we formulate a statistical hypothesis with the sole aim of rejecting it and for this reason this is called Null hypothesis and generally denoted by Ho. In case the results observed differ markedly from those expected we would say that the observed differences are significant and would reject the hypothesis. These procedures which enable us to decide whether to acceptor reject a hypothesis, or which determine whether observed sample differs significantly from expected results is called test of hypothesis, Test of significance or Rule of decisions. Level of Significance Any decision to reject the null hypothesis carries with it a certain risk of being wrong. This risk is called the significance level of the test[2]. If we test at the 5% significance level we are taking a 5% chance of rejecting the null hypothesis when it is true. Naturally we want the significance level of the test to be small. The 5% significance level is very often used for statistical tests. A -statement such as “The difference is statistically significant at the 5% level “means that the null hypothesis was rejected at the 5% significance level.

The P Value

Many times the investigator will report the lowest significance level at which the null hypothesis could be rejected. This level is called the P value which expresses the probability that a difference as large as that we have observed would occur by chance alone. If we see the statement ‘P <0.01’ this means that the probability is very small that random variation alone accounts for the differences and we are willing to say that result is statistically significant. On the other hand, the statement "P>0.01" implies that the difference is not statistically significant, i.e., it could be accounted for by chance alone.

Clinical Significance versus Statistical Significance

It is important to remember that a label of statistical significance does not necessarily imply that the difference is significant from the clinician’s point of view. With large samples, very small differences that have little or no clinical importance may turn out to be statistically significant. The practical implications of any finding must be judged on grounds other than statistical grounds alone[2].

REFERENCES

1. Siddiqui, M.A. Role of Statistics in Medical Research, Pakistan Medical Research Council, Minhas House Annexe, PECHS, Karachi pp.51.
2. Morton. F.R. and Hebel, R.J. A Study Guide to Epidemiology and Biostatistics, University Park Press, 1979, Baltimore, Maryland 21201, pp. 74.