Summary of recent research 7

Science, Statistics

Topic: Application of Non-Parametric Tests Institution:

Course:

Application of the Signed Rank Test

McDonald, H. J. (2009) Wilcoxon Signed-Rank Test. A Handbook of Biological Statistics. (2nd Edition) < http://udel. edu/~mcdonald/statsignedrank. html> (McDonald 2009) seeks to demonstrate the use of the Wilcoxon signed rank test by drawing an example from (Leuresens 2004) in which researchers measured metal content in the wood of 13 poplar clones growing in a polluted area, once in August and once in November. Concentrations of aluminum (in micrograms of Al per gram of wood) then recorded. Two nominal variables: time of year and poplar clone, and one quantity variable were selected. Since the researchers could not establish through parametric means the distribution of the data, they applied the signed-rank test.

The variables for the study are:

Independent variable: time of year (August or November) and poplar clone (Balsam Spire, Beaupre, etc.)

Dependent variable: (micrograms of aluminum per gram of wood)

The data available for the study consisted of the clone types, and the different months during which the measurements were taken. The signed rank test was settled for since the distribution of the data sets could not be established using the normal parametric tests. The researchers avoided making assumptions on the data since they could not establish its distribution.

The difference in metal (aluminum) content in the wood was found to be significantly different from zero. The median change from August to

November (3. 1 micrograms Al/g wood) is significantly different from zero (W= 16, P= 0. 040) (McDonald 2009). By the difference in content being significant, it implies that there was significant variation in concentration between the times of the year when the two measurements were taken.

Reference List

Han, X. et al. (2011). Metabolomics in Early Alzheimer's Disease: Identification of Altered Plasma Sphingolipidome Using Shotgun Lipidomics. Lipidomics in Alzheimer's Disease. Vol 6. Issue 7. p. 7. McDonald, H. J. (2009) Wilcoxon Signed-Rank Test. A Handbook of Biological Statistics. (2nd Edition) < http://udel. edu/~mcdonald/statsignedrank. html> Nishiumi, S. et al. (2012). A Novel Serum Metabolomics-Based Diagnostic Approach for Colorectal Cancer. Metabolomics for Colorectal Cancer. Vol. 7, issue 7. p. 4. Plichta, S. B., Kelvin, E. Munros Statistical Methods for Health Care Research. Statistical Methods for Health Care Research. (6th edition). (2012). Smith, G. L. et al. (2012). Association Between Treatment With Brachytherapy vs Whole-Breast Irradiation and Subsequent Mastectomy, Complications, and Survival Among Older Women With Invasive Breast Cancer. The Journal of the American Medical Association. par 17.