Wiener Biometrische Sektion
der Internationalen Biometrischen Gesellschaft
Region Österreich – Schweiz

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Einladung zum

Biometrischen Kolloquium

am Donnerstag, 19. März 2009, um 15 Uhr (pünktlich)

im Seminarraum (Ebene 3, Raum 88.03.513) der
Besonderen Einrichtung für Medizinische Statistik und Informatik
(MSI) der Medizinischen Universität Wien
Spitalgasse 23, 1090 Wien

Es spricht Herr Prof. Dankmar Böhning (University of Reading) zum Thema:

Meta-Analysis of Diagnostic Studies
by Means of (S)ROC-Modelling
– a Profile-likelihood Approach based on the Lehmann-family

Wir freuen uns auf zahlreichen Besuch.

Thomas Lang
Präsident

Georg Heinze
Sekretär

Meta-Analysis of Diagnostic Studies by Means of (S)ROC-Modelling – a Profile-likelihood Approach based on the Lehmann-family

Dankmar Böhning
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University of Reading
Reading, UK

Sensitivity and specificity are well–known and well–accepted performance measures of discriminatory power for a diagnostic test. If the diagnostic test delivers a continuous or ordered categorical outcome, a cut-off value is used. In consequence, sensitivity and specificity are dependent on the choice of this threshold value - typically in an inverse order. Hence, specificities and sensitivities arising from different diagnostic studies are not comparable out-ruling a meta-analysis focusing on sensitivity and specificity. The talk will instead re-emphasize the importance and suitability of the receiver-operating-curve (ROC) which is also called summary receiver-operating-curve (SROC) in the context of meta-analysis of diagnostic studies and will suggest to model the SROC curve using the Lehmann-family. A further aspect is that inference concerned with the parameters involved in the Lehmann-model needs to be done appropriately and validly. The SROC-curve is conventionally set up using the sensitivity as vertical axis and 1-specificity as the horizontal axis. However, this setting is arbitrary and one could think of a SROC curve with specificity as vertical and 1-sensitivity as horizontal axis. The problem is that a conventional regression produces results which are dependent on the choice of the axis. This is similiar to the known result that regressing Y on X is not the same as regressing X on Y. We suggest a profile-likelihood approach which is invariant to the choice of the nuisance parameter (parameter estimates are identical independent of the fact if sensitivity or specificity is taken to be the nuisance parameter). Considerations are given to curvature–adjustments of the profile likelihood to achieve a variance estimator of the Lehmann family parameter. The talk ends with a perspective on how to incorporate unobserved heterogeneity into the modeling.