ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
ΤΜΗΜΑ ΣΤΑΤΙΣΤΙΚΗΣ

ΠΕΜΠΤΗ 29/5/2014
11:00 – 12:00

ΑΙΘΟΥΣΑ 607, 6ος ΟΡΟΦΟΣ,
ΚΤΙΡΙΟ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ
(ΕΥΕΛΠΙΔΩΝ & ΛΕΥΚΑΔΟΣ)

Φώτιος Σιάννης
Τμήμα Μαθηματικών
Πανεπιστήμιο Αθηνών

Meta-analysis of time-to-event end points

ΠΕΡΙΛΗΨΗ (ΣΤΑ ΑΓΓΛΙΚΑ)

The meta-analysis of time to event end points is of interest and in this talk some aspects will be discussed. Standard meta analysis is based naturally in the meta-analysis of log hazard ratios, since the proportional hazards model is by far the most prevalent way of analyzing such data. However, the proportionality assumption becomes a far more restrictive assumption when it is applied to a number of studies, for the sake of a meta-analysis. For that reason we have investigated the benefits of a meta-analysis that is based on percentile ratios rather than hazard ratios. This measure has a useful interpretation that can be appealing to clinicians and others who would like to utilize such methodology. The main complication in this approach is that percentiles are by construction associated and such association needs to be accounted somehow in the analysis. Multivariate meta-analysis could provide the needed tools in order to account for this association. We propose a new way of meta-analyzing associated data that have a clear and natural ordering. Percentile ratios can be seen as longitudinal data measured in "percentile time", that goes from zero to one. Thus, we have a number of independent studies providing a number of associated observations over (percentile) time, exactly in the same way longitudinal data do. In this way we can utilize known methodology for the analysis of longitudinal data in order to build the necessary modeling structures that are needed in order to summarize the information that comes from several studies and at the same time account for the association between observations. This can be seen as a two stage meta-analysis, where in the first stage data from each study can come from parametric, semi-parametric or non-parametric approaches. The second stage can be seen as a standard longitudinal data analysis based on the information provided in stage one. Association structures can also appear in the analysis of competing risk data as well. Thus, there is a great interest in exploring how studies with competing risks outcomes can be brought together in order to provide summary estimates for various quantities of interest. Such quantities may be the hazard or the cumulative incidence of all risks investigated in the studies, or just of a specific one, estimated under certain assumptions and based on various modelling approaches. Meta-analysis can be quite complex if the studies included vary in the risks considered, the focus of the research, and the chosen analytical approach. Therefore, as a starting point we consider a simple scenario for the meta-analysis of data with two acting competing risks, as a first step towards the development of a more comprehensive approach to this statistical problem.

ATHENS UNIVERSITY OF ECONOMICS & BUSINESS
DEPARTMENT OF STATISTICS

Thursday 29/5/2014
11:00 – 12:00

ROOM 607, 6th FLOOR,
POSTGRADUATE STUDIES BUILDING
(EVELPIDON & LEFKADOS)

Fotios Siannis
Department of Mathematics
University of Athens

Meta-analysis of time-to-event end points

ABSTRACT

The meta-analysis of time to event end points is of interest and in this talk some aspects will be discussed. Standard meta analysis is based naturally in the meta-analysis of log hazard ratios, since the proportional hazards model is by far the most prevalent way of analyzing such data. However, the proportionality assumption becomes a far more restrictive assumption when it is applied to a number of studies, for the sake of a meta-analysis. For that reason we have investigated the benefits of a meta-analysis that is based on percentile ratios rather than hazard ratios. This measure has a useful interpretation that can be appealing to clinicians and others who would like to utilize such methodology. The main complication in this approach is that percentiles are by construction associated and such association needs to be accounted somehow in the analysis. Multivariate meta-analysis could provide the needed tools in order to account for this association. We propose a new way of meta-analyzing associated data that have a clear and natural ordering. Percentile ratios can be seen as longitudinal data measured in "percentile time", that goes from zero to one. Thus, we have a number of independent studies providing a number of associated observations over (percentile) time, exactly in the same way longitudinal data do. In this way we can utilize known methodology for the analysis of longitudinal data in order to build the necessary modeling structures that are needed in order to summarize the information that comes from several studies and at the same time account for the association between observations. This can be seen as a two stage meta-analysis, where in the first stage data from each study can come from parametric, semi-parametric or non-parametric approaches. The second stage can be seen as a standard longitudinal data analysis based on the information provided in stage one. Association structures can also appear in the analysis of competing risk data as well. Thus, there is a great interest in exploring how studies with competing risks outcomes can be brought together in order to provide summary estimates for various quantities of interest. Such quantities may be the hazard or the cumulative incidence of all risks investigated in the studies, or just of a specific one, estimated under certain assumptions and based on various modelling approaches. Meta-analysis can be quite complex if the studies included vary in the risks considered, the focus of the research, and the chosen analytical approach. Therefore, as a starting point we consider a simple scenario for the meta-analysis of data with two acting competing risks, as a first step towards the development of a more comprehensive approach to this statistical problem.