LOGITSURV - A METHOD TO ESTIMATE RELATIVE RISKS FROM PREVALENCE STUDIES

Ekkehart Dietz and Ramona Scheufele

Department of Medical Statistics and Clinical Epidemiology, Charite-Universitätsmedizin Berlin, 10098 Berlin, Germany

If the influence of exposures on pathogenesis of a certain disease are studied, the most relevant object of observation is the intensity of transition from the disease-free state to the diseased state within the population considered. A comparison of this intensity in subpopulations, which are exposed differently leads to exposure effect measures.
An appropriate statistical measure for the exposure effect is the incidence density ratio (IDR), which is estimated from a cohort study, usually. Sometimes, however, it is desirable to get an estimate of relative risk of a disease from cross-sectional studies, because there is not yet a cohort study to the disease and the study factor of interest.
Because prevalence studies are less time-consuming and less expensive than cohort studies, they would be clearly preferable, if there was a possibility to obtain unbiased estimates of relative risk from such studies as well. In the literature, you can find several suggestions to use duration of the disease data. Most of them are based on a steady-state condition, which means constant incidence rate, constant recovery/death rate, and constant prevalence over time. Freeman & Hutchison (1986) provided an overview on estimates based on this assumption and the assumption that there is no heterogeneity of rates within the population considered. In order to enlarge the scope of this approach in case of heterogeneity, they suggested a stratified analysis, where the cases are classified by disease duration and all subjects are classified by age and/or other presumable confounder. In this presentation, a related but smarter method is considered. It is a combination of a logistic regression analysis of the prevalence study and an analysis of disease duration data based on an accelerated survival time model. Using data of the Saarland cancer registry and results of simulation experiments, it is shown, that this method provides sensible results even if the steady state assumption does not hold.

This research is supported by the German Research Foundation

References

Freeman, J, Hutchinson, GB.(1986) Prevalence, incidence and duration.
American Journal of Epidemiology 124: 134-149

Begg, CB, Gray, RJ. (1987) Methology for case-control studies with prevalent cases.
Biometrika 71(1): 91--195