Event History Analysis

CONCLUSION

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Book Title: Event History Analysis
Chapter Title: "CONCLUSION"
Pub. Date: 1984
Access Date: March 17, 2015
Publishing Company: SAGE Publications, Inc.
City: Thousand Oaks
Print ISBN: 9780803920552
Online ISBN: 9781412984195
DOI: http://dx.doi.org/10.4135/9781412984195.n8
Print pages: 66-67

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This monograph has focused on models in which the probability or hazard for the occurrence of events depends on one or more explanatory variables in a fashion that closely resembles multiple regression. Assuming that all relevant explanatory variables have been included, these models can usually be given a causal interpretation because the explanatory variables precede the event in time.[10]

Many biostatistical texts on survival analysis, especially those published before 1980, put considerable emphasis on “single-sample” methods, where the aim is to describe the distribution of event times, or on “two-sample” methods, where the aim is to compare two distributions of event times. The development of effective regression methods has rendered much of this material of limited value to social scientists, however. On one hand, the shape of the distribution can be very misleading unless one controls for sources of heterogeneity in the sample. On the other hand, statistical tests for comparing two distributions can be performed quite effectively within the regression framework by using a dummy explanatory variable.

Among the regression methods, the partial likelihood method with its associated models is clearly the most appealing approach. It can handle both continuous and discrete-time data with a single algorithm. It is much less restrictive than some of the more common parametric methods. Convenient and efficient programs are now widely available in standard statistical packages. And it can readily incorporate time-varying explanatory variables (although with greatly increased computational cost). For all these reasons, partial likelihood is a natural first choice in most situations.

[p. 66 ↓] There are two important limitations to the partial likelihood method, however. First, the dependence of the hazard on time is treated as a nuisance function that cancels out of the estimating equations. If the nature of this dependence is of interest in itself, it may be necessary to shift to a parametric model. Although some partial likelihood programs (e.g., BMDP2L) enable one to recover graphical estimates of the dependence on time, these are often inadequate to draw firm inferences.

The second limitation is that the proportional hazards model associated with the partial likelihood method does not include a disturbance term representing unobserved heterogeneity. In fact, Tuma (1982) has shown that partial likelihood will not accomodate any such disturbance term. When only unrepeated events are studied, it is not clear that this limitation is of any serious consequence. For repeated events, on the other hand, the inclusion of a disturbance term allows one to model dependence among repeated events for a single individual. Although the implications of such dependence have not been studied extensively, it would certainly be desirable to take it into account. Thus, those studying repeated events may want to consider some of the newer methods now being developed (Flinn and Heckman, 1982a, 1982b; Heckman and Singer, 1982).

One final note. The methods described in this monograph are practical, state-of-the-art approaches to the analysis of event histories. Nevertheless, one must keep in mind that event history analysis (by whatever name) is a rapidly expanding field to which a large number of people are contributing. It would be surprising indeed if many important new developments did not appear over the next several years. Since much of this literature is quite technical, the social scientist who wants to stay abreast of such developments may have to seek the advice of those who are actively involved in the field.

http://dx.doi.org/10.4135/9781412984195.n8