Statistical modelling of repeated and multivariate survival data

Wintrebert, C.M.A.

Bibliography

Aalen, O. O. (1978). Non parametric inference for a family of counting processes. *Annals of Statistics 6*, 701–726.

Aalen, O. O. (1988). Heterogeneity in survival analysis. *Statistics in Medicine 7*, 1121–1137.

Aalen, O. O. (1992). Modelling heterogeneity in survival analysis by the compound poisson distribution. *Annals of Applied Probability 4*(2), 951–972.

Abramowitz, M. and I. Stegun (1965). *Handbook of mathematical functions*. New-York: Dovers Publications.

Andersen, P., O. Borgan, R. Gill, and N. Keiding (1993). *Statistical models based on counting processes*. New-York: Springer-Verlag.

Andersen, P. K. (1985). Testing goodness-of-fit of Cox's regression and life model. *Biometrics 38*, 67–77.

Andersen, P. K., J. P. Klein, and M. Zhang (1999). Testing for centre effects in multi-centre survival studies: a Monte Carlo comparison of fixed and random effects tests. *Statistics in Medicine 18*, 1489–1500.

Ascione, R., B. C. Reeves, M. H. Chamberlain, A. K. Ghosh, K. H. Lim, and G. D. Angelini (2002). Predictors of stroke in the modern era of coronary artery bypass grafting: a case control study. *Annals of Thoracal Surgery 74*, 474–480.

Barlow, W. E. and R. L. Prentice (1988). Residuals for relative risk regression. *Biometrika 75*, 65–74.

Bennett, P. M. and I. P. F. Owens (2002). *Evolutionary Ecology of Birds: Life Histories, Matin Systems, and Extinction*. Oxford University Press: Broch. 272 pages.

Binder, D. A. (1992). Fitting Cox's proportional hazards models from survey data. *Biometrika 79*, 139–174.

Brand, F. N., W. B. Kannel, J. Evans, M. G. Larson, and P. A. Wolf (1998). Glucose intolerance, physical signs of peripheral artery disease, and risk of cardiovascular events: the Framingham Study. *American Heart Journal 136*(5), 919–927.

Breslow, N. (1972). Discussion on 'regression models and life tables' by D. R. Cox,. *Journal of the Royal Statistical Society, Series B 34*, 216–217.

Breslow, N. (1974). Covariance analysis of censored survival data. *Biometrics 30*, 89–100.

Cam, E., J. Hines, J. Monnat, J. Nichols, and E. Danchin (1998). Are nonbreeders prudent parents? The Kittiwake model. *Ecology 79*, 2917–2930.

Cam, E., W. A. Link, E. G. Cooch, J. Monnat, and E. Danchin (2002). Individual covariation in life-history traits: Seeing the trees despite the forest. *The American naturalist 159*. in press.

Cam, E. and J. Monnat (2000). Stratification based on reproductive success reveals contrasting patterns of age-related variation in demographic parameters in the Kittiwake. *Oikos 90*, 560–574.

CAPRIE Steering Committee (1996). A randomised, blinded, trial of clopidrogel versus aspirin in patients at risk of ischaemic events (CAPRIE). *The Lancet 348*, 1329–1339.

Caswell, H. (2001). *Matrix population models. Construction, analysis, and interpretation*. Sunderland, Massachusetts: Sinauer Associates.

Clayton, D. G. (1978). A model for association in bivariate life tables and its application in epidemiological studies of familial tendency in chronic disease incidence. *Biometrika 65*, 141–151.

Clayton, D. G. and J. Cuzick (1985). Multivariate generalizations of the proportional hazards model (with discussion). *J. R. Statist. Soc. A 148*, 82–117.

Commenges, D. and P. K. Andersen (1995). Score test of homogeneity for survival data. *Lifetime Data Analysis 1*, 145–160.

Commenges, D. and H. Jacqmin-Gadda (1997). Generalized score test of homogeneity based on correlated random effects models. *JRSS: serie B 59*(1), 157–171.

Congdon, P. (1995). Modelling frailty in area mortality. *Statistics in Medicine 14*, 1859–1874.

Conner, M. M. and G. C. White (1999). Effects of individual heterogeneity in estimating the persistence of small populations. *Natural Resource Modeling 12*, 109–127.

Cotter, G., C. P. Cannon, C. H. McCabe, Y. Michowitz, E. Kaluski, A. Charlesworth, O. Milo, J. Bentley, B. A, R. Krakover, R. Zimlichman, L. Reisin, A. Marmor, B. Lewis, Z. Vered, A. Caspi, E. Braunwald, and OPUS-TIMI 16 Investigators (2003). Prior peripheral arterial disease and cerebrovascular disease are independent predictors of adverse outcome in patients with acute coronary syndromes: are we doing enough? results from the orbofiban in patients with unstable coronary syndromes-thrombolysis in myocardial infarction (OPUS-TIMI) 16 study. *American Heart Journal 145*, 622–627.

Coulson, J. and C. Thomas (1985). *Differences in the breeding performance of individual kittiwake gulls, Rissa tridactyla (L.)*, pp. 489–503. Behavioural Ecology. Blackwell Scientific Publications, Oxford: R. M. Sibly and R. H. Smith.

Coulson, J. and R. Wooller (1976). Differential survival rates among breeding kittiwake gulls Rissa tridactyla(l.). *Journal of Animal Ecology 45*, 205–213.

Cox, D. R. (1972). Regression models and life tables (with discussion). *Journal of the Royal Statistical Society, Series B 34*, 187–220.

Cox, D. R. (1975). Partial likelihood. *Biometrika 62*, 269–276.

Dempster, A. P., N. Laird, and D. B. Rubin (1977). Maximum likelihood estimation from incomplete data using the EM algorithm. *J. R. Statist. Soc. B 39*, 1–38.

dos Santos, D. M., R. B. Davies, and B. Francis (1995). Nonparametric hazard versus nonparametric frailty distribution in modelling recurrence of breast cancer. *Journal of Statistical Planning and Inference 47*, 111–127.

Ducrocq, V. and G. Casella (1996). A bayesian analysis of mixed survival models. *Genet. Sel. Evol. 28*, 505–529.

Elbers, C. and G. Ridder (1982). True and spurious duration dependence: the identifiability of the proportional hazard model. *Review of Economic Studies XLIX*, 403–409.

Fleming, T. R. and D. P. Harrington (1991). *Counting processes and survival analysis*. New-York: Wiley.

GAUSS (2002). *Aptech systems Inc. GAUSS*. Maple Valley(WA).

Gelman, A. and D. B. Rubin (1992a). Inference from iterative simulation using multiple sequences (with discussion). *Statist. Sci. 7*, 457–511.

Gelman, A. and D. B. Rubin (1992b). *A single sequence from the Gibbs sampler gives a false sense of security*, Volume 4 of *Bayesian Statistics*. Oxford: Oxford University Press, J. M. Bernardo and J. O. Berger and A. P. Dawid and A. F. M. Smith. pp.625–631.

Grambsch, P. M., T. M. Therneau, and T. R. Fleming (1995). Diagnostic plots to reveal functional form for covariates in multiplicative intensity models. *Biometrics 51*, 1469–1482.

Grist, E. P. M. and S. des Clers (1999). Seasonal and genotypic influences on life-cycle synchronisation: further insights from annual squid. *Ecological Modelling 115*, 149–163.

Gusella, J. F., N. S. Wexler, P. M. Conneally, S. L. Naylor, M. A. Anderson, R. E. Tanzi, P. C. Watkins, K. Ottina, M. R. Wallace, A. Y. Sakaguchi, A. B. Young, I. Shouson, E. Bonilla, and J. B. Martin (1983). A polymorphic DNA marker genetically linked to Huntington's disease. *Nature 306*, 234–238.

Hankey, G. J. (2003). Long-term outcome after ischaemic stroke/transient ischaemic attack. *Cerebrovascular Disease*, 14–19.

Henderson, R., P. Diggle, and A. Dobson (2000). Joint modelling of longitudinal measurements and recurrent events. *Biostatistics 1*, 465–480.

Hogan, J. W. and N. M. Laird (1997). Model-based approaches to analysing incomplete longitudinal and failure time data. *Statistics in Medicine 16*, 259–272.

Holmes, D. J. and D. Sherry (1997). Selected approaches to using individual variation for understanding mammalian life history evolution. *Journal of Mammalogy 78*, 311–319.

Hougaard, P. (1984). Life table methods for heterogeneous populations: Distributions describing the heterogeneity. *Biometrika 71*, 75–83.

Hougaard, P. (1986a). A class of multivariate failure time distributions. *Biometrika 73*(b), 671–678.

Hougaard, P. (1986b). Survival models for heterogeneous populations derived from stable distributions. *Biometrika 73*(a), 387–396.

Hougaard, P. (1991). Modelling heterogeneity in survival data. *Journal of Applied Probability 28*, 695–701.

Hougaard, P. (2000). *Analysis of multivariate survival data*. New-York: Springer-Verlag.

Houwing-Duistermaat, J. J., B. H. F. Derkx, F. R. Rosendaal, and J. C. Houwelingen (1995). Testing familial aggregation. *Biometrics 51*, 1292–1301.

Huang, X. and R. A. Wolfe (2002). A frailty model for informative censoring. *Biometrics 58*(3), 510–520.

Hutter, C. M., M. A. Austin, and S. E. Humphries (2004). Familial hypercholesterolemia, peripheral arterial disease, and stroke: a HuGE minireview. *American Journal of Epidemiology 160*, 430–435.

Jorgensen, S. E. (1997). Editorial: ecological modelling in 100 volumes. *Ecological Modelling 100*, 1–4.

Kaplan, E. L. and P. Meier (1958). Non-parametric estimation from incomplete observations. *J. Am. Statist. Assoc. 53*, 457–481.

Keiding, N., P. K. Andersen, and J. P. Klein (1997). The role of frailty models and accelerated failure time models in describing heterogeneity due to omitted covariates. *Statistics in Medicine 16*, 215–224.

Klein, J. and M. Moeschberger (1997a). *Survival analysis,Techniques for censored and truncated data*. Statistics for biology and health. New-York: Springer-Verlag.

Klein, J. P. and M. L. Moeschberger (1997b). *Survival Analysis, techniques for censored and truncated data*. New York.

Korsgaard, I., P. Madsen, and J. Jensen (1998). Bayesian inference in the semi-parametric log normal frailty model using Gibbs sampling. *Genet. Sel. Evol. 30*, 241–256.

Korsgaard, I. R. and A. H. Andersen (1998). The additive genetic gamma frailty model. *Scand. J. Statist 25*, 255–269.

Li, H. (1999). The additive genetic gamma frailty model for linkage analysis of age-of-onset variation. *Annals of Human Genetics 63*, 455–468.

Li, H. (2002). An additive genetic gamma frailty model for linkage analysis of diseases with variable age of onset using nuclear families. *Life time Data Analysi 8*, 315–334.

Li, H. and E. Thompson (1997). Semi-parametric estimation of major gene and family-specific random effects for age at onset. *Biometrics 53*(1), 282–293.

Li, H. and X. Zhong (2002). Multivariate survival models induced by genetic frailties, with application to linkage analysis. *Biostatistics 3*, 57–75.

Linacre, N. A. and M. J. Keough (2003). Demographic effects of fragmentation in modular organisms: illustrated using the bryozoan Mucropetraliella ellerii (MacGillivray). *Ecological Modelling 170*, 61–71.

Lindeboom, M. and G. J. van der Berg (1994). Heterogeneity in models for bivariate survival: the importance of the mixing distribution. *J. R. Statist. Soc. B 56*(1), 49–60.

Link, W., E. Cam, J. Nichols, and E. Cooch (2002). Of bugs and birds: Markov Chain Monte Carlo for hierarchical modeling in wildlife research. *Journal of Wildlife management 66*(2), 277–291.

Littell, R., G. Milliken, W. Stroup, and R. Wolfinger (1996). *SAS system for mixed models*. Cary, NC: SAS Institute Inc.

Little, R. and D. Rubin (1987). *Statistical analysis with missing data*. New-York: Wiley.

Maat-Kievit, A., M. Losekoot, K. Zwinderman, M. V. van der Vlis, R. Belfroid, F. Lopez, G. J. van Ommen, M. Breuning, and R. Roos (2002). Predictability of age at onset in Huntington disease in the Dutch population. *Medicine 81*(4), 251–259.

Macdonald, M. E., J. P. Vonsattel, J. S. N. N. Couropmitree, L. A. Cupples, E. D. B. J. F. Gusella, and R. H. Myers (1999). Evidence for the Glu6 gene associated with younger onset age of Huntington's disease. *Neurology 53*, 1330–1332.

McGilchrist, C. A. and C. W. Aisbett (1991). Regression with frailty in survival analysis. *Biometrics 47*, 461–466.

Nance, M. A., V. Mathias-Hagen, G. B. M. J. Wick, and R. C. McGlennan (1999). Analysis of a very large trinucleotide repeat in a patient with juvenile Huntington's disease. *Neurology 52*, 392–394.

Nelson, W. (1969). Hazard plotting for incomplete failure data. *Journal of Qualitative Technology 1*, 27–52.

Nicoloff, A. D., L. M. Taylor, G. J. Sexton, R. A. Schuff, J. M. Edwards, R. A. Yeager, G. J. Landry, G. L. Moneta, J. M. Porter, and Homocysteine and Progression of Atherosclerosis Study Investigators (2002). Relationship between site of initial symptoms and subsequent progression of disease in a prospective study of atherosclerosis progression in patients receiving long-term treatment for symptomatic peripheral arterial disease. *Journal of Vascular Surgery 35*(1), 38–46.

Nikolsky, E., R. Mehran, G. D. Dangas, Z. Lasic, G. S. Mintz, M. Negoita, A. J. Lansky, G. W. Stone, I. Moussa, D. Iyer, Y. Na, J. W. Moses, and M. B. Leon (2004). Prognostic significance of cerebrovascular and peripheral arterial disease in patients having percutaneous coronary interventions. *American Journal of Cardiology 92*, 1536–1539.

Nisbet, I. and E. Cam (2002). Test for age-specificity in survival of common tern. *Journal of Applied Statistics 29*(1–4), 65–83.

Oakes, D. (1982a). A concordance test for independence in the presence of censoring. *Biometrics 38*, 451–455.

Oakes, D. (1982b). A model for association in bivariate survival data. *J. R. Statist. Soc. B 44*(3), 414–422.

Oakes, D. (1989). Bivariate survival models induced by frailties. *JASA 84*(406), 487–493.

Oli, M. K. (2003). Partial life cycle models: How good are they? *Ecological Modelling 169*, 313–325.

Olijhoek, J. K., Y. van der Graaf, J. D. Banga, A. Algra, T. J. Rabelink, and F. L. Visseren (2004). The metabolic syndrome is associated with advanced vascular damage in patients with coronary heart disease, stroke, peripheral arterial disease or abdominal aortic aneurysm. *European Heart Journal 25*, 342–348.

Paik, M., W.-Y. Tsai, and R. Ottman (1994). Multivariate survival analysis using piecewise gamma frailty. *Biometrics 50*, 975–988.

Pitt, W. C., P. W. Box, and F. F. Knowlton (2003). An individuals-based model of canid populations: modelling territoriality and social structures. *Ecological Modelling 166*, 109–121.

Pontier, D., P. Auger, R. B. de la Parra, and E. Sanchez (2000). The impact of behavorial plasticity at individual level on domestic cat population dynamics. *Ecological Modelling 133*, 117–124.

Press, W., S. Teukolsky, W. Vetterling, and B. Flannery (1992). *Numerical Recipes in C* (Second ed.). Cambridge: Cambridge University Press.

Ranen, N. G., O. C. Stine, M. H. Abbott, M. Sherr, A. Codori, M. L. Franz, N. I. Chao, A. S. Chung, N. Pleasant, C. Callahan, L. M. Kasch, M. Ghaffari, G. A. Chase, H. J. Kazazian, J. Brandt, E. Folstein, and C. A. Ross (1995). Anticipation and instability of IT-15 $(CAG)_n$ repeats in parent-offspring pairs with Huntington disease. *Am J Hum Genet 57*, 593–602.

Ripatti, S. and J. Palmgren (2000). Estimation of multivariate frailty models using penalized partial likelihood. *Biometrics 56*, 1016–1022.

Roeters van Lennep, J. E., H. T. Westerveld, and A. H. Zwinderman (2001). Differential effect of female gender on coronary artery disease and peripheral artery disease. Submitted.

Rosenblatt, A., R. R. Brinkman, K. Y. L. E. W. Almqvist, C. Y. Huang, M. Sherr, L. Franz, M. H. Abbott, M. R. Hayden, and C. A. Ross (2001). Familial influence on age of onset among siblings with Huntington disease. *American Journal of Medical Genetics (Neuropsychiatric Genetics) 105*, 399–403.

Salinger, D. H., J. J. Anderson, and O. S. Hamel (2003). 2003. *Ecological Modelling 166*, 287–294.

Schoenfeld, D. (1980). Chi-squared goodness-of-fit tests for the proportional hazards regression model. *Biometrika 67*, 145–153.

Service, P. M. (2000). Heterogeneity in individual mortality risk and its importance for evolutionary studies of senescence. *The American Naturalist 156*, 1–13.

Smits, J., J. D. Meester, M. C. Deng, H. H. Scheld, M. Hummel, F. Schoendube, A. Haverich, J. Vanhaecke, and J. van Houwelingen (2003). Mortality rates after heart transplantation: How to compare center-specific outcome data? *Transplantation 75 1*, 90–96.

Smits, J., J. van Houwelingen, J. D. Meester, S. le Cessie, G. Persijn, F. Claas, and U. Frei (2000). Permanent detrimental effect of non immunological factors on long-term renal graft survival. A parsimonious model of time-dependency. *Transplantation 70*, 317–323.

Spiegelhalter, D., A. Thomas, N. Best, and W. Gilks (1996). *BUGS 0.5, Bayesian inference using Gibbs sampling, Manual*. Cambridge.

Stearns, S. (1992). *The evolution of life histories*. New York: Oxford University Press.

Therneau, T. and P. Grambsch (2000). *Modeling survival data. Extending the Cox model.* New-York: Springer Verlag.

Thomas, C. and J. Coulson (1988). *Reproductive success*, pp. 251–262. The University of Chicago Press, Chicago: T.H. Clutton-Brock.

Thompson, E. A. (1986). *Pedigree Analysis in Human Genetics*. The Johns Hopkins University Press.

Tienderen, P. V. (1995). Life cycle trade offs in matrix population models. *Ecology 76*, 2482–2489.

Vaida, F. and R. Xu (2000). Proportional hazards model with random effects. *Statistics in Medicine 19*, 3309–3324.

Vaupel, J., K. Manton, and E. Stallard (1979). The impact of heterogeneity in individual frailty on the dynamics of mortality. *Demography 16*, 439–454.

Verweij, P. and J. van Houwelingen (1995). Time-dependent effects of fixed covariates in Cox regression. *Biometrics 51*, 1550–1556.

Verweij, P. J. M., H. C. van Houwelingen, and T. Stijnen (1998, dec). A goodness-of-fit test for Cox's proportional hazards model based on martingale residuals. *Biometrics 54*(4), 1517–1526.

Williams, B. K., J. Nichols, and M. Conroy (2002). *Analysis and management of animal populations*. San Diego, USA: Academic Press.

Wintrebert, C. M. A., H. Putter, A. H. Zwinderman, and J. C. van Houwelingen (2004). Centre-effects on survival after Bone Marrow Transplantation: Application of time-dependent frailty models. *Biometrical Journal 46*(5), 512–525.

Wulfsohn, M. S. and A. T. Tsiatis (1999). A joint model for survival and longitudinal data measured with error. *Biometrics 53*, 330–339.

Yashin, A. I. and I. A. Iachine (1999, March). What difference does the dependence between durations make? Insights for population studies of aging. *Life Time Data Analysis 5*(1), 5–22.

Yashin, A. I., J. W. Vaupel, and I. A. Iachine (1995). Correlated individual frailty: An advantageous approach to survival analysis of bivariate data. *Mathematical Population Studies 5*, 145–159.

Yusuf, S., S. Hawken, S. Ounpuu, T. Dans, A. Avezum, F. Lanas, M. McQueen, A. Budaj, P. Pais, J. Varigos, L. Lisheng, and INTERHEART Study Investigators (2004). Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the interheart study): case-control study. *The Lancet 364*, 937–952.

Zahl, P. H. (1997). Frailty modelling for the excess hazard. *Statistics in Medecine 16*, 1573–1585.

Curriculum Vitae

De auteur van dit proefschrift werd geboren op 1 maart 1973 in Montpellier, Frankrijk. Zij groeide op in de omgeving van Lodève, waar zij in 1991 op het Lycée Joseph Vallot het "Baccalauréat C"met specialisatie wiskunde, natuurkunde en biologie behaalde. Vanaf 1992 studeerde ze aan de "Université des Sciences"van Montpellier wiskunde, natuurkunde en scheikunde met als hoofdvak wiskunde. In 1994 specialiseerde ze zich in wiskunde, waarna ze in het studiejaar 1995-1996 dit vak studeerde in Amsterdam aan de UVA. In 1997 behaalde ze de maîtrise in wiskunde met bijvakken statistiek, quantum-mechanica en sterrenkunde bij de Universiteit van Montpellier. Ze koos ervoor zich toe te leggen op de statistiek, en behaalde in 1998 de DEA (Diplôme d'Etudes Approfondies) in de Biostatistiek aan dezelfde Universiteit. In dat jaar deed ze een onderzoekstage aan de CNRS die de basis is geweest van een paper gepubliceerd in Biometrics.
Vervolgens trad zij in januari 1999 als Assistent In Opleiding (AIO) in dienst bij de afdeling Medische Statistiek aan de Universiteit Leiden. Het onderzoek dat zij onder begeleiding van Prof. Dr. J. C. van Houwelingen en Prof. Dr. A. H. Zwinderman verrichtte, is weergegeven in dit proefschift.
Resultaten van haar promotie zijn gepresenteerd op internationale congressen van de Society for Clinical Biostatistics in Trento (2000) en in Stockholm (2001), en van de Biometric Society in Freiburg (2002), en bij conferenties van de Nederlandse Vereniging voor Statistiek in Rolduc (2003) en in Leiden (2004).
Sinds juli 2004 werkt de auteur als onderzoeker in de statistiek voor een onderneming.