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Statistical modelling of time-varying covariates for survival data

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List of Publications

Peer reviewed journal articles

- **M. Spreafico**, F. Gasperoni, G. Barbati *et al.* Adherence to Disease-Modifying Therapy in Patients Hospitalized for HF: Findings from a Community-Based Study. *American Journal of Cardiovascular Drugs*, 20:179–190, 2020.
- **M. Spreafico** and F. Ieva. Dynamic monitoring of the effects of adherence to medication on survival in heart failure patients: A joint modeling approach exploiting time-varying covariates. *Biometrical Journal*, 63(2):305–322, 2021.
- **M. Spreafico** and F. Ieva. Functional modeling of recurrent events on time-to-event processes. *Biometrical Journal*, 63(5):948–967, 2021.
- **M. Spreafico**, F. Ieva, F. Arlati *et al.* Novel longitudinal Multiple Overall Toxicity (MOTox) score to quantify adverse events experienced by patients during chemotherapy treatment: a retrospective analysis of the MRC BO06 trial in osteosarcoma. *BMJ Open*, 11(12):e053456, 2021.
- **M. Spreafico**, F. Ieva and M. Fiocco. Modelling time-varying covariates effect on survival via Functional Data Analysis: application to the MRC BO06 trial in osteosarcoma. *Statistical Methods & Applications*, 2022. <https://doi.org/10.1007/s10260-022-00647-0>
- **M. Spreafico**, F. Ieva and M. Fiocco. Longitudinal Latent Overall Toxicity (LO-Tox) profiles in osteosarcoma: a new taxonomy based on latent Markov models. arXiv:2107.12863, 2021. <https://arxiv.org/abs/2107.12863> [Submitted]
- **M. Spreafico**, C. Spitoni, C. Lancia *et al.* Causal effects of chemotherapy regimen intensity on survival outcome in osteosarcoma patients through Marginal Structural Cox Models, 2022. [Submitted]

Book chapters

- F. Ieva, **M. Spreafico** and D. Burba. *Modeling the Effect of Recurrent Events on Time-to-event Processes by Means of Functional Data*. In: G. Aneiros, I. Horová, M. Hušková and P. Vieu (eds) *Functional and High-Dimensional Statistics and Related Fields*. IWFOS 2020. Contributions to Statistics. Springer, Cham, 2020.

Conference proceedings

- **M. Spreafico**, F. Gasperoni, G. Barbati *et al.* *Target dosages and adherence to PolyPharmacy therapy: a case study based on a regional real-world HF community.* Atti del Congresso congiunto SISMEC & Associazione Alessandro Liberati – Network italiano Cochrane 2018 “Linee guida e percorsi diagnostico-terapeutici assistenziali (PDTA): metodi, aderenza e responsabilità”, May 2019, pp 29–34. ISBN: 9788894345612.
- **M. Spreafico** and F. Ieva. *Joint Models: a smart way to include functional data in healthcare analytics.* In: G. Arbia, S. Peluso, A. Pini and G. Rivellini (eds) Smart Statistics for Smart Applications – Book of Short Paper SIS2019, Pearson Italia, pp 1089–1094, June 2019. ISBN: 9788891915108.
- **M. Spreafico** and F. Ieva. *Investigating the role of Proteinuria in Renal Disease: a real-world clinical case study.* In: 40th Annual Conference of the International Society for Clinical Biostatistics – Book of Abstracts, pp 553–554, July 2019. ISBN: 9789461652874.
- **M. Spreafico** and F. Ieva. *Impact of time-dependent medication adherence on Heart Failure patients using a Joint Modelling framework.* In: Atti del X Congresso Nazionale SISMEC 2019 “Nuovi disegni nella ricerca clinica: la sfida della complessità tra etica e salute”, pp 193–197, March 2020. ISBN: 9788894345629.
- **M. Spreafico**, F. Ieva and M. Fiocco. *A functional approach to study the relationship between dynamic covariates and survival outcomes: an application to a randomized clinical trial on osteosarcoma.* In: A. Pollice, N. Salvati and F. Schirripa Spagnolo (eds) Book of Short Paper – SIS 2020, Pearson Italia, pp 727–732, 2020. ISBN: 9788891910776.
- **M. Spreafico**, F. Ieva and M. Fiocco. *Modelling longitudinal latent toxicity profiles evolution in osteosarcoma patients.* In: C. Perna, N. Salvati and F. Schirripa Spagnolo (eds) Book of Short Papers – SIS 2021, Pearson Italia, pp 566–571, 2021. ISBN: 9788891927361.
- **M. Spreafico** and F. Ieva. *Functional modelling of recurrent drug purchases and re-hospitalizations on survival in Heart Failure patients: a real-world case study.* In: Atti del XI Congresso Nazionale SISMEC 2021 “Dati, modelli, decisioni: metodi a servizio dell’organizzazione sanitaria nell’emergenza epidemiologica”, pp 112–114, 2021. ISBN: 9791280503244.
- M. A. Cassia, F. Ieva, **M. Spreafico** *et al.* Predire l’outcome nella nefrite lupica: il ruolo dell’andamento della proteinuria o della singola misurazione attraverso gli alberi di regressione. *Giornale Italiano di Nefrologia*, 38(S78):198–199, 2021.
- C. Gregorio, **M. Spreafico** and F. Ieva. *Optimal timing of bone-marrow transplant in myelodysplastic syndromes through multi-state modeling and microsimulation.* In: A. Balzanella, M. Bini, C. Cavicchia and R. Verde (eds) Book of Short Papers – SIS 2022, Pearson Italia, pp 1436–1441, 2022.

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Curriculum Vitae

Marta Spreafico was born on January 22nd 1993 in Bellano, Italy. She grew up in Forlì, where she got her diploma at the Liceo Scientifico Fulcieri Paulucci de Calboli in 2012.

She then started her bachelor in Mathematical Engineering at Politecnico di Milano (Italy), where she got her BSc degree in 2015 and continued her master studies with a major track in applied statistics. In 2016 she was Board member of the *AIM - Associazione Ingegneri Matematici* (Association of Mathematical Engineers). During her Master thesis period she also did an internship at *Indigo AI Srl*, where she worked on machine learning methods applied to natural language processing for conversational agents and chatbots. She completed both the internship and the MSc degree in Mathematical Engineering in April 2018.

Her master thesis project, followed by few months as graduate research fellow, marked the beginning of her research on biostatistics and statistical modelling for medical applications. She started her PhD at Politecnico di Milano in November 2018 and joined a co-tutelle program with Leiden University (The Netherlands) in July 2019, under the supervision of Dr. Francesca Ieva and Prof.dr. Marta Fiocco.

At Politecnico di Milano she has been teaching assistant in various courses of *Statistics* and *Biostatistics* and tutor for several projects in the course of *Applied Statistics*. She also co-supervised a MSc Thesis in Mathematical Engineering and was PhD Representative at the Department of Mathematics. In the last year of her PhD research she was lecturer for the *Analytics for Pharmacoepidemiology* course (Master in Business Analytics and Big Data) at POLIMI Graduate School of Management (Italy).

During the PhD research time, she presented her research at conferences and seminars in Italy, the Netherlands, Belgium, Poland (online), France (online), Latvia and the United Kingdom. She has also been involved in several collaborations with clinicians from the Cardiovascular Centre in Trieste, the Department of Health Sciences at the University of Milan, the Leiden University Medical Center, the Princess Máxima Center for Pediatric Oncology, the Humanitas Research hospital and Humanitas University.

At the time of writing she is lecturer for the *Mathematics for Statisticians* course (MSc in Statistics and Data Science) at Leiden University and she plans to continue her academic career.

