

## Elena Tanfani

Associate Professor

### EDUCATION AND TRAINING

March 2000

**Degree in Economics, cum laude**

University of Genova

May 2004

**PhD in Transport Economics – Dissertation: “MBPP and terminal efficiency: algorithms and solution heuristics”**

University of Genova

### PROFESSIONAL HISTORY

September 2006 – December 2021

**Researcher MATH-06/A Ricerca operativa**

University of Genova

January 2022-today

**Associate Professor MATH-06/A Ricerca operativa**

University of Genova

May 2023

**Awarded the National Scientific Qualification (ASN) for Full Professor MATH-06/A Ricerca operativa**

MIUR

### ACADEMIC APPOINTMENTS

A.Y. 2019/2020-today

**Deputy Coordinator of the Bachelor's Degree Program Maritime Science and Technology.**

DITEN – DIEC University of Genova

A.Y. 2022/2023

**Director of managerial training programs for executives of complex health organizations.**

AMAS – Accademia per il Management Sanitario

A.Y. 2015/2016 – A.Y. 2022/2023

**Member of the Program Committee.**

AMAS – Accademia per il Management Sanitario

## EXPERIENCE

### SEMINARS AND CONFERENCE ORGANIZATION

#### July 2022

Member of the Organizing Committee of the XLVIII Annual Conference ORAHS (Euro Working Group on Operations Research Applied to Health Services)  
Bergamo (Italy)

#### September 2019

Member of the Organizing Committee of the International ODS Conference (Optimization and Decision Science), XLIX Annual Meeting of the Italian Operations Research Society (AIRO).  
Genova (Italy)

#### July 2017

Co-stream organizer (with Michael Carter, John Blake e Peter Vanberkel) of the stream “Healthcare Management” – IFORS 2017 International Conference  
Québec City (Canada)

#### July 2016

Co-stream organizer (with a Evrim Didem Gunes e Stefan Nickel) of the stream “Healthcare Management” - EURO 2016 International Conference  
Poznań (Polonia)

#### July 2010

Member of the Organizing Committee of the XXXV Annual Conference ORAHS (Euro Working Group on Operations Research Applied to Health Services)  
Genova (Italy)

#### September 2007

Member of the Organizing Committee of the XXXVIII National Conference of the Italian Operations Research Society (AIRO).  
Genova (Italy)

#### June 2005

Member of the Organizing Committee of the X National Conference of the Italian Association of Health Economics (AIES).  
Genova (Italy)

### PARTECIPATION IN SCIENTIFIC AND PROGRAM COMMITTEES OF INTERNATIONAL CONFERENCES

#### 2011-2025

Member of the Scientific and Program Committees of numerous international conferences, including ODS 2025, 2019; ICORES 2024, 2023, 2022, 2021, 2020; SIMULTECH 2017, 2014, 2013, 2012, 2011; ECMS 2012, 2011; ORAHS 2022, 2013, 2011.

### TALKS AND ORGANIZED SESSIONS

#### 2002-2025

Speaker at over 40 international conferences (see details in the final sections of the CV). At many of these events, organized dedicated sessions on applications of Operations Research in healthcare including IFORS 2011, AIRO 2014, 2015, SIMULTECH 2011, 2012, 2013, 2014, 2015, EURO 2016, IFORS 2017, ODS 2019, 2022, 2023, 2024, 2025.

#### SCIENTIFIC RESPONSIBILITY FOR RESEARCH PROJECTS ACCEPTED FOR FUNDING ON THE BASIS OF COMPETITIVE CALLS INVOLVING PEER REVIEW

**2010-2015** Principal Investigator of the FIRB-Futuro in Ricerca project “Clinical Pathways: New Patient-Centered Organizational and Managerial Models.”

FIRB-MIUR

**2012-2013** “Optimization of Patient Logistics Processes in Operating Rooms.” Research project funded by the Bambino Gesù Pediatric Hospital, Vatican City.

**2009-2011** Work Package Co-Leader in the project “Evaluation of Genetic Pathways in Prenatal Risk Assessment.”

Regione Emilia Romagna.

**2010** Scientific Coordinator of the project “Decision Support Methods for Modeling Clinical Pathways in Thyroid Surgery.”

University of Genova.

**2006-2007** Work Package Co-Leader of the project "SWALIS: Surgical Waiting List Information System-Waiting Lists for surgical procedures".

Ministero sanità – Regione Liguria

#### EDITORSHIP OR PARTICIPATION IN EDITORIAL BOARDS OF JOURNALS, PUBLISHING SERIES, BOOKS AND REVISION ACTIVITIES

**2022** Editorial board member of Soft Computing journal

**2025** Co-Guest Editor of the special issue “Advancing Smart Health and Biomedical Research with Artificial Intelligence Algorithms” – *Algorithms* journal

**2021** Co-Guest Editor of the special issue “Optimization in Machine Learning” - *Soft Computing* journal.

**2013** Co-Guest Editor of the special issue “Operations Research for health care delivery” - *Computers & Operations Research* journal.

**2012** Co-Editor of the series "Advanced decision making methods applied to Health Services" - *Springer International Series of Operations Research and Management Science*.

**Since 2006** Reviewer for the following international journals: European Journal of Operational Research, Annals of Operations Research, Computers & Operations Research, Decision Support System, Flexible Services and Manufacturing, Health Care Management Science, IMA Journal of the Operational Research Society, Journal of Management Mathematics, International Journal of Information Technology & Decision Making, International Journal of Health Management and Information (IJHMI), International Transaction of Operations Research, Maritime Economics and Logistics, OR for Health, Soft Computing.

#### TECHNOLOGY TRANSFER AND INDUSTRY COLLABORATIONS

**2019-2021** Collaboration in the implementation of interventions supporting healthcare personnel in driving change and innovation processes, in the following projects:

- RSA Project: Prevention and management of the COVID-19 emergency in Ligurian extra-hospital residential facilities (Alisa, delibera 360/2020)
- The Contribution of Healthcare Professions to the Implementation of Organizational Care Models: Methodologies and tools

- Healthcare Profession Coordinators as a Strategic Role for Change and Innovation in the Regional Health System (Alisa, 2019)
  - Lean Organization of the Cardio-Thoracic-Vascular Department (DICATOV), San Martino Polyclinic (2019)
  - New Hemato-Oncology Center at San Martino Hospital, Genoa (June 2018 – March 2019)
- 2008-2012** Experimental activities following the research project funded by the Italian Ministry of Health (Ex Art. 12) entitled “SWALIS: Surgical Waiting List Info System – Surgical Waiting Lists: Experimentation of Management Systems.” Focus: impact assessment of alternative waiting-list prioritization algorithms and validation of the SWALIS model. The pilot implementation carried out within a surgical operative unit at San Martino Hospital in Genoa enabled the seamless progression from Research/Academia → Validation → Technology Transfer → Product/Industry. Today, the SWALIS model is a registered trademark, marketed by SurgiQ (<http://www.surgiq.com/it/>), based in Genova with a UK branch.

#### OTHER EXPERIENCES

**2023-today** Co-chair (with Giuliana Carello – POLIMI) of the Health thematic section of the Italian Operations Research Society (AIRO).

**2025-today** Member of the Board of the EURO Working Group on Operations Research Applied to Health Services (ORAHs).

## PUBLICATIONS

#### JOURNAL ARTICLES (SCOPUS/WOS)

- [1] Sciomachen A., Tanfani E. (2003). The Master Bay Plan problem: a resolution method based on its connection to the three-dimensional bin packing problem. *IMA, Journal of Management Mathematics*, 14, 3, 251-269.
- [2] Ambrosino D., Sciomachen A., Tanfani E. (2004). Stowing a containership: The Master Bay Plan problem. *Transportation Research A*, 38, 81-89.
- [3] Sciomachen A., Tanfani E., Testi A. (2005). Simulation Models for optimal schedules of operating theatres. *International Journal of Simulation*, 6, 12/13, 26-34.
- [4] Ambrosino D., Sciomachen A., Tanfani E. (2006). A decomposition heuristics for the containership stowage problem. *Journal of Heuristics*, 12 (3), 211-233.
- [5] Sciomachen A., Tanfani E. (2007). A 3D-BPP approach for optimising stowage plans and terminal productivity. *European Journal of Operational Research*, 183 (3), 1433-1446.
- [6] Testi A., Tanfani E., Torre G.C. (2007). A three phase approach for operating theatre schedules. *Health Care Management Science*, 10, 163-172.
- [7] Testi A., Tanfani E., Valente R., Ansaldo G., Torre G.C. (2008). Prioritising surgical waiting list. *Journal of Evaluation in Clinical Practice*, 14 (1), 59-64.
- [8] Tanfani E., Testi A. (2009). Tactical and Operational Decisions for Operating Room Planning: Efficiency and Welfare Implications. *Health Care Management Science*, 12, 363-373.

- [9] Testi A., Tanfani E., Fato M., Porro I., Valente R. (2009). A web-based system to manage elective waiting lists: efficiency and equity issues. *International Journal of Healthcare Technology and Management*, 10 (4/5), 277-288.
- [10] Valente R., Testi A., Tanfani E., Fato M., Porro I., Santori G., Santo M., Ansaldo G.L., Torre G.C. (2009). A model to prioritize access to elective surgery on the base of clinical urgency and waiting time. *BMC, Health Services Research*, 9 (1).
- [11] Tanfani E., Testi A. (2010). A pre-assignment heuristic algorithm for the Master Surgical Schedule Problem (MSSP). *Annals of Operations Research*, 178 (1), 105-119.
- [12] Tanfani E., Testi A., Alvarez R. (2010). Operating Room Planning considering stochastic surgery durations. *International Journal of Health Management and Information (IJHMI)*, 1(2), 167-183.
- [13] Testi A., Fareed N., Ozcan Y.A., Tanfani E. (2013). Assessment of physician performance for diabetes: a bias-corrected data envelopment analysis model. *Quality in Primary Care*, 21 (6), 345-357.
- [14] Aringhieri R., Landa P., Soriano P., Tànfani E., Testi A. (2015). A two level metaheuristic for the operating room scheduling and assignment problem. *Computers & Operations Research*, 54, 21-34.
- [15] Aringhieri R., Landa P., Tànfani E., (2015). Assigning surgery cases to operating rooms: A VNS approach for leveling ward beds occupancies. *Electronic Notes in Discrete Mathematics*, 47, 173-180.
- [16] Addis, B., Carello, G., Grosso, A., Lanzarone, E., Mattia, S., Tànfani, E. (2015). Handling uncertainty in health care management using the cardinality-constrained approach: Advantages and remarks. *Operations Research for Health Care*, 4, 1-4.
- [17] Barbagallo S., Corradi L., de Ville de Goyet J., Iannucci M., Porro I., Rosso N., Tanfani E., Testi A. (2015). Optimization and planning of operating theatre activities: an original definition of pathways and process modeling. *BMC Medical Informatics and Decision Making*, 15(1):38.
- [18] Addis B., Carello G., Grosso A., Tànfani E. (2016). Operating room scheduling and rescheduling: a rolling horizon approach. *Flexible Services and Manufacturing Journal*, 28 (1-2): 206-232.
- [19] Aringhieri R., Landa P., Soriano P., Tànfani E., Testi A. (2016). A hybrid optimization algorithm for surgeries scheduling. *Operations Research for Health Care*, 8: 103-114.
- [20] Gasparini R., Landa P., Amicizia D., Icardi G., Ricciardi W., de Waure C., Tanfani E., Bonanni P., Lucioni C., Testi A., Panatto D. (2016). Vaccinating Italian infants with a new multicomponent vaccine (Bexsero®) against meningococcal B disease: A cost-effectiveness analysis. *Vaccines and Immunotherapeutics*, 12 (8), 2148-2161.
- [21] Ozcan Y.A., Tànfani E., Testi A. (2017). Improving the performance of surgery-based clinical pathways: a simulation-optimization approach. *Health Care Management Science*, 20, 1-15.
- [22] Sonnessa M., Tanfani E., Testi A. (2017). An agent-based simulation model to evaluate alternative co-payment scenarios for contributing to health systems financing. *Journal of the Operational Research Society*. 68 (5), 591-604.
- [23] Bruzzi, S., Landa, P., Tànfani, E., Testi, A. (2018). Conceptual modelling of the flow of frail elderly through acute-care hospitals: An evidence-based management approach. *Management Decision*, 56(10), 2101-2124.
- [24] Landa P., Sonnessa M., Tanfani E., Testi A. (2018). Multiobjective bed management considering emergency and elective patient flows. *International Transactions in Operational Research*, 25(1), 91-110.

- [25] Resta, M., Sonnessa, M., Tànfani, E., Testi, A. (2018). Unsupervised neural networks for clustering emergent patient flows. *Operations Research for Health Care*, 18, 41-51.
- [26] Carello, G., Landa, P., Tànfani, E., Testi, A. (2022). Master chemotherapy planning and clinicians rostering in a hospital outpatient cancer centre. *Central European Journal of Operations Research*, 30, 159–187.
- [27] Landa, P., Lalonde, J.D., Bergeron, F., Kassim, S.A., Côté, A., Gartner, J.B., Tanfani, E., Resta, M. (2023). Impact of primary health care reforms in Quebec Health Care System: a systematic literature review protocol. *BMJ Open*, 13 (7).
- [28] Alderighi S., Landa P., Tànfani E., Testi A. (2024). Assessing the Impact of Patient Characteristics on Genetic Clinical Pathways: A Regression Approach. *Algorithms*, 17 (2), 75.
- [29] Addis B., Carello G., Tànfani E., (2024). Evaluating the Impact of the Level of Robustness in Operating Room Scheduling Problems. *Healthcare*, 12 (20), 1-34.

#### EDITORIALS (SCOPUS/WOS)

- [30] Tanfani E., Testi A. (2012). Advanced decision making methods applied to Health Services, Springer, International Series of Operations Research and Management Science 173. Curatela.
- [31] Aringhieri R., Tànfani E., Testi A. (2013). Operations Research for Health Care Delivery. *Computers and Operations Research*, 40 (9), 2165-2166. (Editorial)
- [32] Sanguineti M., Tanfani E. (2021). Special Issue Optimization for Machine Learning Guest Editorial. *Soft Computing*, 25(19), pp. 12565-12567.

#### BOOK CHAPTERS (SCOPUS/WOS)

- [33] Tanfani E., Testi A. (2012). A decision support tool to analyze Clinical Pathways in hospital. In “Advanced decision making methods applied to Health Services” – Series on Operations Research and Management Science, pp. 191-211, Vol. 173. Tanfani E. and Testi A. Editor, Springer-Verlang, Milano. ISBN:9788847023208.
- [34] Ozcan YA Tanfani E., Testi A. (2013). Project Management Approach to Implement Clinical Pathways: An Example for Thyroid Treatment. In “Operations Research and Health Care Policy”, – Series on Operations Research and Management Science, pp. 91-104, Vol. 190. Zaric G. Editor, Springer, Newton, MA. ISBN 9781461465065
- [35] Sonnessa M., Tànfani E., Testi A. (2015). Evaluating the Introduction of Deductibles in the Health Insurance System. In *Agent-based Models of the Economy: From Theories to Applications*, pp. 131-145. In Boero et al. Editors, Palgrave Macmillan, New York. ISBN:9781137339805.
- [36] Landa P., Resta M., Tànfani E., Testi A. (2023). Advances in Modelling Hospital Medical Wards. In *Intelligent Systems Reference Library*, 228, pp. 171 – 183. Springer Nature. ISSN:18684394.
- [37] Landa P., Gartner J.-B., Haren M., Lemaire C., Abasse K.S., Paquet C., Bergeron F., Tànfani E., Côté A. (2023). An Overview of Benefits and Limitations of the Process Model Notation Applied for Modeling Patient Healthcare Trajectory, In *AIRO Springer Series*, 10, pp. 19 – 33.



- [38] Tanfani E., Testi A. (2010). Improving surgery department performance via Simulation and Optimization. Proceedings of the IEEE Workshop on Health Care Management, Venezia, Italy. DOI:10.1109/WHCM.2010.5441255
- [39] Valente R., Testi A., Tanfani E., Fato M., Porro I., Santo M., Santori G., Ansaldo G.L., Torre G.C. (2010). Efficiency and priority in planning surgical sessions by using the SWALIS model. Proceedings of the IEEE Workshop on Health Care Management, Venezia, Italy. DOI: 10.1109/WHCM14953.2010
- [40] Ozcan Y., Tànfani E., Testi A. (2011). A Simulation-based Modelling Framework to deal with Clinical Pathways. Proceedings of the 2011 Winter Simulation Conference. S. Jain, R.R. Creasey, J. Himmelspach, K.P. White, and M. Fu, eds., pp. 1190-1201. ISBN: 978-1-4577-2106-9.
- [41] Ambrosino D., Tanfani E. (2012). An integrated simulation and optimization approach for seaside terminal operations . Proceedings of the 26th European Conference on Modelling and Simulation (ECMS). Klaus Troitzsch, Mohring, Ulf Lotzmann, eds, pp. 602-609. May 29-31, 2012, Koblenza – Germany. ISBN: 9780956494443.
- [42] Testi A., Sonnessa M., Tanfani E. (2012). How to Build an Agent-based Model to Assess the Impact of Co-payment for Health Services. Proceedings of the 2nd International Conference on Simulation and Modeling Methodologies, Technologies and Applications, pp. 556-563. ISBN: 978-989-8565-20-4.
- [43] Ambrosino D., Tanfani E. (2012). An integrated simulation and optimization approach for seaside terminal operations . Proceedings of the 26th European Conference on Modelling and Simulation (ECMS). Klaus Troitzsch, Mohring, Ulf Lotzmann, eds, pp. 602-609. May 29-31, 2012, Koblenza – Germany. ISBN: 9780956494443.
- [44] Landa P., Tanfani E., Testi A. (2013). Simulation and Optimization for Bed Re-organization at a Surgery Department. Proceedings of the 3rd International Conference on Simulation and Modeling Methodologies, Technologies and Applications, pp. 584-594. ISBN 9789898565693.
- [45] Addis B., Carello G., Tànfani E. (2014). A Robust Optimization Approach for the Operating Room Planning Problem with Uncertain Surgery Duration. Proceedings of the International Conference on Health Care Systems Engineering. Series: Springer Proceedings in Mathematics & Statistics, pp. 175-190. Vol. 61. Springer, New York. ISBN 978-3-319-01847-8
- [46] Landa P., Sonnessa M., Tanfani E., Testi A. (2014). A Discrete Event Simulation Model to Support Bed Management. Proceedings of the 4th International Conference on Simulation and Modeling Methodologies, Technologies and Applications, pp. 901-912. ISBN: 978-989-758-038-3.
- [47] Landa P., Sonnessa M., Tànfani E., Testi A. (2015). Managing Emergent Patient Flow to Inpatient Wards: A Discrete Event Simulation Approach. In Advances in Intelligent Systems and Computing, (special volume, selected papers from the International Conference on Simulation and Modeling Methodologies, Technologies and Applications, SIMULTECH 2014). Chapter 17, pp. 333-350. Editors: Obaidat M.S., Ören T., Kacprzyk J., Filipe J. Springer Verlag. ISBN: 978-331926469-1.
- [48] Landa P., Sonnessa M., Tànfani E., Testi A. (2016). System dynamics modelling of emergent and elective patient flows. In Springer Proceedings in Mathematics and Statistics, Matta A., Li J., Vandaele N.J., Guinet A., Sahin E. (Eds.), Springer, New York. Volume 169, 179 – 191.

ISBN: 978-331935130-8.

- [49] Landa P., Sonnessa M., Resta M., Tànfani E., Testi A. (2017). A Hybrid Simulation Approach to Analyse Patient Boarding in Emergency Departments. In Springer Proceedings in Mathematics and Statistics, Springer, New York. Volume 210, 133 – 144. ISBN 978-331966145-2.
- [50] Landa P., Tanfani E., Testi A. (2017). A comparative study for cost-utility analysis methods: An application to a case study on multicomponent vaccine against Meningococcal B Disease. . Proceedings of the 7th International Conference on Simulation and Modeling Methodologies, Technologies and Applications, pp. 163-170. ISBN 978-989758265-3.
- [51] Landa P., La Regina M., Tanfani E., Orlandini F., Campanini M., Fontanella A., Manfellotto D., Testi A. (2020). Modelling Hospital Medical Wards to Address Patient Complexity: A Case-Based Simulation-Optimization Approach. In Springer Proceedings in Mathematics and Statistics, Vol. 316, pp. 25-39. ISBN: 978-303039693-0.

#### NATIONAL JOURNAL

- [52] Tanfani E., Testi A. (2004). Liste di attesa: Problemi aperti. Politiche sanitarie, 5, 1, 16-26.
- [53] Testi A., Ivaldi E., Tanfani E., Tomassi M.F., Zappavigna D. (2005). Una valutazione dell'impatto dell'investimento in ICT: il caso della Regione Liguria, ASI (Agenzia Sanitaria Italiana), 6, 15-19.
- [54] Sciomachen A., Tanfani E. (2007). Valutazione dell'impatto dei piani di stivaggio sull'efficienza di un terminal contenitori. In Trasporti e L'Europa. Politiche, infrastrutture, concorrenza.(Vol.1), Franco Angeli, pp. 125-153. ISBN: 9788846481634.
- [55] Fato M., Gallo D., Porro I., Tanfani E., Testi A. (2008). La valutazione del carico assistenziale per patologia: il caso dello scompenso cardiaco nella Asl genovese. Mecosan, 66, 57-68.
- [56] Valente R., Fato M., Testi A., Porro I., Tanfani E., Santo M., Ansaldo G.L., Torre G.C. (2007). SWALIS: A computer-aided prioritisation model to access elective surgery. Nuove Tecnologie in Medicina, 1, 45-47.

#### NATIONAL BOOK CHAPTERS

- [57] Tanfani E., Testi A. (2004). L'appropriatezza "temporale" delle prestazioni sanitarie. In Rapporto sanità 2004, Il Mulino, pp. 121-148.
- [58] Testi A., Tanfani E. (2007). Indicatori di appropriatezza temporale (liste di attesa per ricoveri chirurgici di elezione). In Rapporto Osservasalute 2007. Prex Ed., pp. 370-374.
- [59] Tanfani E., Testi A., Ansaldo G.L., Torre G.C., Valente R. (2008). Utilizzo della simulazione ad eventi discreti a supporto della razionalizzazione delle liste di attesa in sanità. In Scienza delle decisioni in Italia: applicazioni della ricerca operativa a problemi aziendali. Curato da Giovanni Felici e Anna Sciomachen, ECIG Ed., Genova, pp.49-62.