



Thesis Project Form

Title (tentative): Artificial Intelligence in Healthcare Systems: Clinical Impact, Economic Evaluation, and Policy Implications

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Description

Motivation and application domain

The increasing burden of cardiovascular diseases, combined with an aging population in the Liguria region, demands more efficient healthcare models. Traditional management is often reactive and costly; therefore, AI offers a strategic lever to shift toward proactive, cost-effective care.

The application domain of this thesis focuses on the integration of Artificial Intelligence within the healthcare infrastructure of the Liguria Region. The research scope encompasses the analysis of administrative and clinical datasets to optimize patient management pathways, moving from traditional hospital-based care to AI-enhanced remote monitoring. The domain also extends to improve both patient survival rates and the economic sustainability of the regional healthcare system.

General objectives and main activities

The objective of this thesis is to analyse the role and potential impact of artificial intelligence in digital cardiology, with particular attention to its clinical, organizational and economic implications. The research will first provide a review of the main applications of AI in healthcare and cardiology, including AI-based ECG analysis, predictive models for cardiovascular diseases and remote monitoring systems. The study will then examine the regulatory framework governing healthcare data and AI technologies in Europe. A specific focus will be dedicated to the Ligurian healthcare system, analysing the current level of adoption of AI technologies in regional healthcare institutions. Finally, the thesis will include a case study of the IRCCS Policlinico San Martino, with an analysis of available data and an evaluation of the potential economic and organizational impact of AI-based solutions in cardiology

Training Objectives (technical/analytical tools, experimental methodologies)

Analytical tools: Use of statistical software for data preparation, data cleaning, management of large healthcare datasets, and preliminary descriptive and inferential statistical analyses.

Experimental methodologies: Understanding and application of Health Technology Assessment (HTA) principles, including evaluation of clinical effectiveness, cost-effectiveness, and organizational impact of healthcare interventions.

Data Governance: Managing administrative healthcare flows and clinical registries within a regional institutional framework, ensuring data quality, regulatory compliance, and proper integration between different healthcare information systems.

Research and evaluation skills: Development of competencies in study design, interpretation of health data, and critical appraisal of scientific evidence to support evidence-based decision making in healthcare policy and management, with particular attention to the translation of research findings into health policies and regulatory frameworks guiding healthcare planning and resource allocation

Place(s) where the thesis work will be carried out:

Maximum number of students: 1