

3 year PhD Position on “Analysis of European National Health data to better understand the outcomes of patients with vascular diseases”

Context & Motivations: Accounting for around 18 million deaths per year, cardiovascular diseases (CVDs) are the leading cause of mortality worldwide. Although women usually have a lower incidence and prevalence of CVDs than men, a number of clinical studies have demonstrated that women may have poorer prognosis following acute cardiovascular events. However, the impact of sex on the outcomes is still poorly understood, with heterogeneous results reported in the literature.

Efforts to generate real world evidence have rapidly pointed to the utmost importance for collaboration between institutions and countries to collect, analyze and report reliable and representative data to build guidelines for clinical practice. With that aim in mind, European networks for collaboration on clinical and administrative vascular national registries have been created. However, there is a critical need to move forward and develop new methods to help analysing national health data, link data from European registries to improve evidence generation.

The project AI-EuroVasc aims to develop methods to enhance the analysis of the outcomes of patients with vascular diseases from the French National Health data and to link data with other European registries.

PhD Topics: The objective of the PhD is to analyze and develop methods to better understand the outcomes of patients who underwent repair for peripheral artery disease. Data will be extracted from the French National Health Insurance Information System over a 10-year retrospective period (around 250 000 patients). Standard statistical analysis will be used and serve as reference to analyze group differences and investigate the impact of sex on the outcomes of patients. AI-derived methods (Neural Multi-Task Logistic Regression, Survival Tree, Random Survival Forest) will be developed, tested and compared to the gold standard to analyze survival and identify sub-group differences. Predictive factors of the outcomes of patients will then be investigated using logistic regression and ML algorithms. The models obtained will be validated in other European datasets and/or improved using federated learning.

Localisation : This 3-year PhD position will be supervised by [Dr Hervé Delingette](#) within the [Epione research team](#) at Inria in Sophia Antipolis, France in close collaboration with [Dr Juliette Raffort-Lareyre](#) and [Dr Laurent Bailly](#) at the University Hospital of Nice.

Required Competences

- Master degree and experience in statistical learning is required
- Solid programming and IT skills are necessary (R, SAS, Python, C++, bash scripting, version control systems).
- Strong communication abilities

Contact Persons:

Please send a resume and motivation letter to:

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