

Exploring Causal Approaches to Detect and Quantify Determinants of Adherence to Continuous Positive Airway Pressure Treatment in Obstructive Sleep Apnea Syndrome

This internship focuses on the causal analysis of a health dataset.

Obstructive sleep apnea syndrome (OSAS) is a chronic, multiorgan disease with heterogeneous presentation. Continuous positive airway pressure (CPAP) therapy is the first-line treatment for OSAS. In France, 1.8 million patients are treated with CPAP, but 15% of patients refuse the device at the time of diagnosis, and the treatment discontinuation rate at 3 years is 50%.

Research targeting predictive factors for CPAP adherence has mainly focused on clinical data. Social, socioeconomic, and psychological approaches—particularly health literacy, defined as the ability to access and understand health information—are less studied, despite the clear link between poor understanding of medical information and treatment adherence. There is therefore a lack of knowledge about individual determinants of CPAP adherence, beyond clinical factors, to improve the individual management of patients diagnosed with OSAS.

The SOCIO-SAS study collected clinical and socioeconomic information from patients newly treated with CPAP, with follow-up on their adherence status at 6 months (adherent or non-adherent to treatment).

Internship Objectives

1. Identify which social or clinical determinants are associated with treatment adherence at 6 months: use causal discovery algorithms to understand underlying relationships and uncover concepts with cluster-DAG causal discovery.
2. Quantify the effects of different social or clinical determinants using the ATE estimator, and extensions adapted to cluster-DAGs.

Profile

We are looking for a student trained in machine learning and motivated by health applications. Experience in causality will be a plus.

Required Skills

- Mastery of statistical approaches for data analysis
- Good knowledge of R and/or Python
- Proficiency in scientific English (written and oral)
- Organizational and synthesis skills
- Strong communication and teamwork skills
- Interest in health applications

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