

Post-doctoral researcher position (18 months) in Tours, France



Description of the position:

The INSERM SPHERE Unit U1246 is part of both the Universities of Tours and Nantes and aims to contribute to high-quality research in methods on patient-centered outcomes and health research. Our scientific goals aim at strengthening the methods in patient-centered health research from a pluridisciplinary perspective involving biostatistics, public health, clinical disciplines (addictology, dermatology, general practice, nephrology), pharmacology, health psychology, and health economics.

The SPHERE Unit consisted of 9 professors, 8 associate professors and 15 permanent supporting personnel including hospital practitioners, secretaries and research engineers. Non-permanent staff included 2 ATERs, 1 secretary, 2 post-doctoral fellows, and 4 engineers under contract. 20 PhD students are supervised in the SPHERE unit.

To learn more about our team, visit our website at <https://sphere-inserm.fr/en>

We are looking for a scientific staff member to join our team and engage in our research project QUARTET.

Summary of the project:

Cluster randomised trials (CRTs) are trials in which intact social units, such as hospitals, medical practices or communities, are randomized to intervention or control conditions while outcomes are then assessed on individuals within such clusters. The use of CRTs to evaluate clinical and public health interventions has been rising in recent years.

In CRTs, outcomes assessed on individuals from a given cluster are correlated. This clustering has to be taken into account at the planning stage, leading to an increased sample size to reach the same power as a comparable individually randomized trial. Analysis methods of a CRT must also account for the correlated nature of the outcomes within clusters. When reporting the results of a CRT, a measure of intracluster correlation should be reported, usually the intracluster correlation coefficient.

Most of the developments to quantify and account for clustering in the analysis of CRTs have considered continuous or binary outcomes (Eldridge et al. 2009). Conversely, limited methods and recommendations are available for time-to-event (TTE) outcomes, which measure the time from the beginning of an observation period to an event of interest. In practice, TTE outcomes in CRTs are often inappropriately analysed, by treating them either as clustered binary outcomes or as TTE outcomes but ignoring correlation (Caille et al. 2021). The performance of existing analysis methods for correlated TTE outcomes has not been compared in the context of CRTs and the intracluster correlation coefficient (or any other measure of intracluster correlation) for TTE outcomes has not been clearly defined.

The main objective of the present position is to identify or develop appropriate methods of estimating the degree of clustering for TTE outcomes.

First, we will search the methodological and statistical literature to identify all available methods to measure clustering in TTE data. Where gaps are identified, we will develop novel methods appropriate for CRTs. Existing and novel methods will be compared by simulation. This part of the project will consist of both theoretical work to develop new methods as well as computer simulation to evaluate methods. Finally, real data from three CRTs (for which we already have the agreement from the scientific coordinators) will be used to illustrate our findings.

Ease of use of the selected methods and ease of interpretation of the results produced by these methods will be evaluated by surveying a panel of clinicians and statisticians. We will use a Delphi method to reach consensus. The objective of this innovative step is to balance statistical properties with ease of use and ease of interpretation in the development of final guidelines on optimal measures of clustering. Recommended methods will be implemented in user-friendly R packages to be available to the wider scientific community.

References:

Eldridge SM, Ukoumunne OC, Carlin JB. The Intra-Cluster Correlation Coefficient in Cluster Randomized Trials: A Review of Definitions. *Int Stat Rev.* 1 déc 2009;77(3):378-94.

Caille A, Tavernier E, Taljaard M, Desmée S. Methodological review showed that time-to-event outcomes are often inadequately handled in cluster randomized trials. *J Clin Epidemiol.* 10 févr 2021;134:125-37.

Your tasks:

The post-doctoral researcher will work specifically on measures of clustering for time-to-event outcomes in cluster randomised trials. This will include analytical developments and simulation studies.

The position can include teaching activity and a master's thesis supervision.

The position will be based in the office space of the SPHERE unit in the teaching hospital of Tours. The applicant will have his/her own desk with an adequately powered computer.

The position will be open until filled. In order to receive full consideration, applications should be submitted by September 1st, 2021. The starting date is flexible, but no later than Spring 2022.

Requirements:

Please be sure to highlight your strengths pertaining to the following elements to help us in accurately evaluating your application.

- Completion of a PhD in a relevant discipline (e.g. biostatistics, medical statistics, bioinformatics)
- Advanced programming skills in the statistical software program R
- Strong knowledge in written and spoken English

Desirable project-specific elements

- Experience in statistical methods for cluster randomised trials or any other situation with correlated data
- Experience in survival analysis
- Scientific writing skills as demonstrated by prior research publication
- Experience in simulation studies

How to apply:

Please send all application documents (cover letter, curriculum vitae, etc.) to agnes.caille@med.univ-tours.fr

Do not hesitate to ask content related questions to
Dr Agnès Caille agnes.caille@med.univ-tours.fr

