



Programa formatiu en *Computational Biophysics*

TFG proposal

Epidemiological studies using real-world data

Epidemiology is a branch of medicine that studies how diseases and health-related events spread and impact populations. It plays a crucial role in public health by identifying patterns, causes, and risk factors for various health outcomes. Nowadays, epidemiology increasingly relies on **real-world data**, particularly electronic health records (e.g., hospital records, or primary care records) to inform research and public health decision-making.

Within the Health Data Sciences Research group, we are actively engaged in a range of national and international studies exploring the **use and effect of drugs, devices, and vaccines for the prevention and treatment of human disease under 'real world' conditions**. Our research is mainly focused on epidemiological studies, such as comparing the (beneficial and harmful) effects of vaccines, or to test and improve the existing statistical methods for the study of safety and effectiveness of drugs. However, we also prioritize the standardization of analytical pipelines, addressing the multifaceted challenges that often arise. Our preferred tool for conducting these tasks is R.

We are looking for someone that is **eager to learn how to apply mathematical tools to address complex epidemiological and public health questions**. We are also seeking someone with great communication skills, both in writing and verbally, who can effectively communicate research results. Additionally, we value the ability to work collaboratively in a multi-disciplinary team, and with special interest in academia and research. No previous experience in R is required, and the candidate **should be willing to travel to the United Kingdom** to perform this project.

Project details:

Only one applicant will be selected but we have two different projects:

1. To conduct an epidemiological study (the focus will be the epidemiological results). The study could be of different types: (1) descriptive epidemiology of multiple diseases, and the use of medicinal products; (2) comparison of beneficial and harmful effects of medicinal products; (3) use, safety and effectiveness of vaccines and medicines.

Similar studies: <https://www.medrxiv.org/content/10.1101/2023.06.28.23291997v1>
<https://assets.researchsquare.com/files/rs-3209943/v1/40c7ed6d-ed3-4831-8435-7ac5d70562fb.pdf?c=1690783448>

2. To program an R package that standardises and provides tools to perform epidemiological studies.

Similar studies: <https://onlinelibrary.wiley.com/doi/10.1002/pds.5717>

We aim that any of the studies conducted in the group ends as a scientific publication.

The host research group on Health Data Sciences (University of Oxford) will provide **training for the epidemiological basic concepts** needed to conduct this project.



Supervisors and host research groups:

- Dr. Martí Catala Sabate (University of Oxford), Prof. Daniel Prieto-Alhambra (University of Oxford),
<https://www.ndorms.ox.ac.uk/research/Musculoskeletal-Pharmacoepidemiology>
- Dr. Clara Prats (BIOCOM-SC, UPC)
<https://biocomsc.upc.edu/en>

Recent publications: <https://www.ndorms.ox.ac.uk/team/daniel-prieto-alhambra>

Requirements:

- Near completion of the undergraduate degree program.
- Knowledge in programming, engineering, statistics, and mathematics.
- Capability to manage own research and administrative activities, within guidelines provided by senior colleagues.
- Gather, analyse, and present scientific data from a variety of sources.

Practical information:

Financial opportunities: The group will support the candidate to apply to European and UK grants to cover the stay. Health Data Sciences group will cover the accommodation of the candidate for a period of 5 months (February to June 2024).

Application: Send your CV and motivation letter to: marti.catalasabate@ndorms.ox.ac.uk clara.prats@upc.edu and daniel.prietoalhambra@ndorms.ox.ac.uk **before November 10th 2023**. Interview for this position will be conducted during November.

Location: Botnar Research Centre, Windmill Road, OX37LD, Oxford, United Kingdom // Escola d'Enginyeria Agroalimentària i Biosistemes de Barcelona, Campus del Baix Llobregat, Castelldefels (Barcelona).

Further information: You can contact Marta Alcalde (marta.alcaldeherraiz@ndorms.ox.ac.uk) and Núria Mercadé (nmercade@idiapjgol.org), former students in the program, to ask for more details.