



Programa formatiu en *Computational Biophysics*

TFG proposal

Epidemiological studies using real-world data

Epidemiology is a branch of medicine that studies the spread and impact of diseases and health-related events on 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 at the **University of Oxford**, we are actively engaged in a range of national and international studies that explore the use and effects **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 testing and improving the existing statistical methods for the study of the 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 who is **eager to learn how to apply mathematical tools to address complex epidemiological and public health questions**. We are also seeking someone with excellent 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 a 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 on 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: [10.1016/S2213-2600\(23\)00414-9](https://doi.org/10.1016/S2213-2600(23)00414-9) <https://doi.org/10.1136/heartjnl-2023-323483> <https://doi.org/10.1038/s41467-024-53623-5>
2. To program an R package that standardizes and provides tools to perform epidemiological studies. Similar studies: <https://onlinelibrary.wiley.com/doi/10.1002/pds.5717>

We aim for any of the studies conducted in the group to be published as a scientific paper.

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 Català Sabaté (University of Oxford), Dr. Anna Saura Lazaro (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, analyze, and present scientific data from a variety of sources.

Practical information:

Financial opportunities: Funding cannot be guaranteed at this stage; however, the group will support the candidate in applying for European and UK grants to cover the stay.

Application: Send your CV and motivation letter to: marti.catalasabate@ndorms.ox.ac.uk, clara.prats@upc.edu and anna.sauralazaro@ndorms.ox.ac.uk **before November 14th 2025**.

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 Aina Sanchez Parada (ainasanchezparada@gmail.com), a former student in the program, to ask for more details.