Joseph O'Reilly PhD

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Overview

I am a data focused research epidemiologist and phylogenetecist with a strong background in **Bayesian inference**, **large data analytics**, and informative **data visualisation**. The quality of my work is reflected in the **20+ peer-reviewed articles** I have published over my career which have accrued **over 800 citations**. I hold a **PhD in Bayesian phylogenetic methods** and I have **over 4 years of postdoctoral employment** experience. I am interested in applying my statistical and computational skills to large, complex datasets to obtain novel insights to inform decision making. My versatility and ability to **learn quickly and adapt** is reflected in my successful career transition from earth sciences to epidemiology. I am now looking for an opportunity to apply my strong skill set and extensive analytical experience in a new field.

Skills And Experience

Statistical Inference – Comprehensive knowledge of **phylogenetic** methods; Extensive experience of **Bayesian inferential methods**; Generalised linear **mixed models**; Bayesian **hierarchical regression** with **Stan**, **brms**, and **rstan**; Causal analysis; Clinical **prediction modelling**; Generalised additive models; General **epidemiological methods**; Markov chain Monte Carlo diagnostics; Survival and **time-to-event modelling**; **Joint modelling** of longitudinal and event data; Random forests for classification

Computing and Data Science – Highly proficient with **R** in large dataset contexts (**>9 years experience**); Experienced in the use of national level **electronic healthcare record data** and industrial **clinical trial datasets**; Querying large relational databases with **SQL**; **bash**; Adept at using **High-Performance Computing** resources and **parallel R**; Experience of **interfacing R and C++** to improve computing speed; Probabilistic programming in **Stan**; Version control with **git** and **SVN**; Writing multi-language pipelines to simulate and analyse large quantities of data; Experienced with Windows, UNIX, and Linux systems; remote working using **ssh** and VNC

Communication – Excellent oral and written skills; Oral presentation of research at global conferences; Reporting research findings in high impact journal publications; Collaboration in small and large teams in international projects involving **academic, clinical, and industrial partners**; Concise explanation of technical concepts for the general public through **interaction with the media**; Adept at creating high-quality data visualisations with **ggplot2** and related R packages; Experienced with **Rmarkdown** for dynamic report generation and reproducible workflow

Employment

2019 – Present *(Edinburgh, UK)*
Biostatistician/Epidemiologist
University of Edinburgh – Institute of Genetics And Cancer
- Designing and performing statistical analyses using NHS Scotland electronic healthcare data and industry clinical trial data as part of the EU funded hypo-RESOLVE project
- Collaborating with academic, clinical, and industrial partners to devise and perform novel analyses
- Extensive use of R for data harmonisation, analysis, and dynamic report generation
- Use of MySQL and Oracle SQL to interact with large relational databases
- Development of clinical prediction models
- Causal analysis using hierarchical Bayesian modelling
- Publication of policy influencing articles in high impact peer-reviewed journals
- Oral presentation of work at both domestic and international conferences
- Communicating research findings to the media

2017 – 2019 *(Bristol, UK)*
NERC Postdoctoral Research Associate
University of Bristol – School of Earth Sciences
- Developed and delivered a statistical methods workshop for NIGPAS (Nanjing, China)
- Guest lecturer for multiple post-graduate courses at The University of Bristol and at the Palaeontological Association annual meeting
- Supervisor of both Masters and PhD student projects
- Publication of multiple articles in high impact peer-reviewed journals
- Contributed to the FossilSim R package available on CRAN
- Six month sabbatical at The Natural History Museum (London, UK) working as a postdoctoral research associate in Plant systematics

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Education

2013 – 2017 *(Bristol, UK)*

PhD in Bayesian Phylogenetic Methods

University of Bristol – School of Earth Sciences
- Supervision of several Masters by research projects
- Publication of several high-impact articles
- Presentation of work at multiple international conferences
- Thesis – *"The Estimation of Phylogeny and Evolutionary Timescales Using Molecular and Morphological Data"*

2009 -2012 *(Hull, UK)*

1st Class Bsc (*hons*) in Biology

University of Hull - Department of Biological and Marine Sciences
- Recipient of the "Vicky Dickinson Award For Outstanding Undergraduate Dissertation"
- Dissertation - *"Positive Selection in HOXD13 and the Evolution of the Opposable Thumb"*

Selected Achievements And Outputs

2021

Published Research Article

"Rising Rates and Widening Socioeconomic Disparities in Diabetic Ketoacidosis in Type 1 Diabetes in Scotland: A Nationwide   Retrospective Cohort Observational Study".

O'Reilly, J.E., et. al., 2021. Diabetes Care.
- Applied Bayesian hierarchical models to estimate the association of clinical risk factors with diabetic ketoacidosis outcomes
- Analysed electronic healthcare record data from NHS Scotland and death certificate data from National Records of Scotland
- Demonstrated a previously unidentified increase in hospital admissions over the study period
- Findings have been featured in several national media outlets and discussed on BBC Radio Scotland

2020

Published Research Article

"Time trends in deaths before age 50 years in people with type 1 diabetes: a nationwide analysis from Scotland 2004–2017".

O'Reilly, J.E., et. al., 2020. Diabetologia 63, 1626–1636.
- Leveraged national level electronic healthcare record data over a 14 year study period to identify patterns in mortality
- Collaboration with academic and clinical colleagues
- Referenced in The Scottish Government's *"Diabetes Improvement Plan"* policy document

2019 - Present

International Cross-Disciplinary Collaboration In Data Analytics

"Hypo-RESOLVE: Hypoglycaemia – Redefining SOLutions for better liVEs".

Innovative Medicines Initiative 2 Joint Undertaking (JU) under grant agreement No 777460
- Data analyst as part of a €26.8 Million EU funded project involving clinical, industry, and academic expertise and collaboration
- Designed and performed statistical analyses using clinical trial data provided by Novo Nordisk, Sanofi, Eli Lilly, and Abbott
- Involved in the process of harmonising disparate clinical trial data formats into a single pooled database for analysis
- Collaborated with clinical and industry colleagues to construct the final data set
- Created annual technical reports on the state of the available data, its suitability for analysis, and preliminary statistical results

2018

Statistical Methods Workshop Delivery

"Workshop on Molecular Palaeobiology: Phylogeny and Divergence Time Estimation".

NIGPAS – Chinese Academy of Sciences, Nanjing, China, 2018
- Travelled to Nanjing, China as part of a delegation from The University of Bristol
- Developed a successful 3 day workshop programme of talks and programming practical exercises
- Taught cutting edge phylogenetic and statistical methods
- Gave lectures and supervised practical exercises over three days

2015

Published Research Article

"Dating tips for divergence-time estimation".

O'Reilly, J.E., et. al., 2015. Trends In Genetics 31, 637–650.
- Cited by over 100 other per-reviewed articles
- Published in a high-impact journal
- Content had a strong impact on method choice and approach to Bayesian inference in phylogenetics