

PROFESSOR JENNIFER KAYE ROGERS, B.SC. (HONS), M.SC., PH.D., CSTAT, AFHEA

Unit 2
2A Bollo Lane
London
W4 5LE

Email address: jennifer.rogers@phastar.com
LinkedIn: www.linkedin.com/in/jkrogers
Twitter: @StatsJen
Website: www.jenniferrogers.co.uk

EMPLOYMENT HISTORY

Head of Statistical Research, PHASTAR, August 2019 – Present

- Liaising with current and potential clients, delivering statistical consultancy as and when required
- Working alongside business development staff, providing technical expertise, representing the company at client meetings, inputting into bids, bid strategies and bid/no-bid decisions, and responding to requests-for-information
- Providing technical leadership, guidance and direction to statistical consultants at PHASTAR
- Leading statistical research activities, resulting in published papers, as well as presentations and posters at conferences
- Communicating externally with the media

Director of Statistical Consultancy Services and Associate Professor of Statistics, University of Oxford, Department of Statistics, July 2016 – August 2019

- Directing and managing end-to-end provision of the Department's consultancy activities, including client liaison, contract negotiations, statistical analysis, delivery of results, and offering training courses in statistics
- Managing the strategic direction of statistical consultancy services
- Undertaking statistical research leading to publications in peer reviewed journals and presentations at conferences
- Teaching undergraduate and postgraduate degree modules

Post-Doctoral Research Fellow, University of Oxford, Department of Statistics, September 2015 – July 2016

- Held a NIHR Post-Doctoral Fellowship titled "Analysis of Recurrent Events in Clinical Trials"
- Total value of award approximately £250,000
- Carried out teaching of tutorial classes to undergraduate and postgraduate students

Lecturer, London School of Hygiene and Tropical Medicine, Department of Medical Statistics, October 2013 – September 2015

- Held a NIHR Post-Doctoral Fellowship titled "Analysis of Recurrent Events in Clinical Trials"
- Total value of award approximately £250,000
- Teaching postgraduate degree modules

Research Fellow, London School of Hygiene and Tropical Medicine, Department of Medical Statistics, May 2011 – October 2013

- Undertaking statistical research leading to publications in peer reviewed journals and presentations at conferences
- Teaching postgraduate degree modules

HIGHER EDUCATION AND PROFESSIONAL QUALIFICATIONS

Ph.D. Statistics: Statistical Models for Censored Point Processes with Cure Fractions, University of Warwick (supervised by Professor Jane Hutton), 2011

M.Sc. Statistics (Distinction), Lancaster University, 2007

B.Sc. (Hons) Mathematics with Statistics (First Class), Lancaster University, 2006

CStat, Chartered Statistician, Royal Statistical Society, 2017

AFHEA, Associate Fellow of the Higher Education Academy, 2016

GradStat, Graduate Statistician, Royal Statistical Society, 2006

CONSULTANCY ROLES

My consultancy roles to date have been wide reaching but have predominantly focussed on clinical trial research. I have been involved in the design of several clinical trials, advising pharmaceutical companies on the choice of primary endpoint and analysis method. I have also carried out sample size calculations and simulation studies to aid in trial design, as well as economic analyses of trial data to assist in the approval of interventions. Other work that I have carried out includes looking at claimants for a legal case, developing a global predictor for dengue fever, carrying out a financial forecasting analysis and examining the current prevalence and treatment of the disease amyloidosis.

MEMBERSHIP OF SOCIETIES

Royal Statistical Society

International Biometrics Society

John Snow Society

RESEARCH

My research is generally focussed on statistical methodology, with applications of statistics to health care. My main area of research to date has been on the development and application of novel statistical methods for the analysis of large-scale clinical trials. My work often requires multi-disciplinary collaboration and I have a number of joint publications. My principal theoretical interests are survival analysis and the analysis of recurrent events with a particular interest in joint modelling strategies that combine the two. I have national and international research networks and have consulted for pharmaceutical companies in the design of a number of major clinical trials. My major medical collaborations have been in cardiovascular disease and in epilepsy.

My Ph.D. thesis focussed on the analysis of epilepsy data that were in the form of a pre-randomisation event count and multiple post-randomisation survival times with cure rates. In studies of epilepsy, information on patients' seizure rates prior to randomisation is often underutilised. I developed methodology that allowed pre-randomisation seizure rates and times to first and second seizure to be jointly modelled with common random effects (frailty). This model assumes that each patient has an underlying constant seizure rate and that post-randomisation seizure rates are modified relative to baseline seizure rates and treatment policy. We extended our methodology further to allow for the inclusion of cure rates. Collaborating with leading neurologists, this work has had substantial impact in the analysis of different seizure types. I also developed the associated software routines in R for the new methodology.

Whilst at the LSHTM, my research focussed on cardiovascular (CV) disease. Composite outcomes are frequently adopted as primary endpoints in clinical trials as they consider fatal and non-fatal consequences of the disease under study and lead to higher event rates. In this setting, analysis of time to first event is suboptimal for a chronic disease such as heart failure (HF), characterised by recurrent hospitalisations, because information on repeats is ignored. Analysing all repeat events within patients more accurately estimates the effect of treatment on the true burden of disease. This is an active and important area of research and in summer 2013 this work led to a successful application for a 3-year NIHR Post-Doctoral Fellowship. Collaborating with leading cardiologists, we have published reanalyses of data from major clinical trials in HF that examine the effect of treatment on recurrent HF hospitalisations. We have also compared existing methods for analysing data on repeat hospitalisations, using data from major trials in heart failure. An increase in HF hospitalisations is associated with a worsening condition and a subsequent elevated risk of CV death. I proposed a simple strategy for incorporating CV death into analyses of recurrent HF hospitalisations by treating the incidence of CV death as an additional event in the recurrent event process and then adopting the usual analysis strategies. This method has been well received and has been adopted as the primary outcome in the PARAGON-HF clinical trial, through my consultancy with Novartis. Methods for analysing recurrent event data in the presence of dependent censoring have also been investigated using joint modelling strategies. Joint frailty models assume that recurrent HF hospitalisations and time to death (or CV death) are conditionally independent given a latent variable and allow distinct treatment effects to be estimated for each of the processes, whilst taking into account the association between the two. Following this work, consultancy with Celladon has resulted in the joint frailty model being the primary analysis in the CUPID Phase 2b clinical trial. Whilst at the LSHTM, I also built ties with the Medical Research Council Clinical Trials Unit, focussing on the suitability of the Cox proportional-hazards model versus models that relax the proportional-hazards assumption.

I joined the University of Oxford in September 2015, where I completed the final year of my Fellowship before taking on the role of Director of Statistical Consultancy Services. Whilst in this role, I have continued to maintain relationships with my cardiovascular collaborators as well as building collaborative links within Oxford. I continue to actively carry out research in the field of recurrent events analysis, but have also carried out analyses for a number of datasets examining primary sclerosing cholangitis. These have been observational studies examining factors which may affect a number of different outcomes in this area.

I was a named investigator on a MRC Biomedical Catalyst: Developmental Pathway Funding Scheme examining a biomarker classifier for oropharyngeal cancer (OPC) (throat cancer). Adding surgery may improve outcomes for those patients most at risk of recurrence, but may also result in increased complications and poorer function - including swallowing/eating and speech - as well as increased cost. Currently, there are no markers to guide treatment selection, therefore the decision whether or not to operate is made according to clinician preference and patient choice. The classifier categorises patients into 'low-risk' or 'high-risk' subgroups from the combined analysis of 4 factors. This funding also includes the financing of a post-doctoral post within the Department.

Recently, my research has considered method agreement analysis, focussing on the Bland-Altman plot. The number of trials using the Bland-Altman as a primary analysis is on the up, but an examination of some of these studies in more detail shows that this methodology is often misused, and sample size calculations not properly considered.

RESEARCH FUNDING

MRC Biomedical Catalyst: Developmental Pathway Funding Scheme (DPFS), "Validating the PredicTR treatment response classifier for oropharyngeal cancer (PredicTR 2)", 1 November 2018 – 2020. Total value of award approximately £800,000

NIHR Post-Doctoral Fellowship, "Analysis of Recurrent Events in Clinical Trials", 1 September 2013 – 2016. Total value of award approximately £250,000.

EPSRC Doctoral Training Award, 2007 – 2011, covering Ph.D. tuition fees and maintenance. Total value of award approximately £65,000.

EPSRC Studentship, 2006, covering M.Sc. tuition fees and maintenance. Total value of studentship approximately £15,500.

APPOINTMENTS

British Science Association

President, British Science Association Mathematical Sciences Section, 2018

Royal Statistical Society

Vice President (External Affairs), 2017 – 2021

Executive Committee, 2017 – 2021

Research Section Council Rep, 2016 – 2017

Royal Statistical Society Council, 2015 – 2021

Honorary Officer for Meetings and Conferences, 2015 – 2017

Guy Lecturer, 2014

President's Nominating Committee, 2013

Committee Member, Young Statistician's Section, 2012 – 2015

Committee Member, West Midlands Section, 2009 – 2011

SELECTED INVITED CONFERENCES

Inserm workshop: Recent advances in statistical analysis of survival data, Bordeaux, 2020

Workshop on Statistical Modelling of Multivariate Longitudinal and Survival Data in Medical Research, University of Cape Town, 2019

CEN-ISBS Conference, 2017

PSI Conference, 2016

9th Annual Advamed/FDA Medical Device and Diagnostics Statistical Issues, 2016

Joint Statistical Meeting, 2015

PSI Conference, 2014

50th Gregynog Statistical Conference, 2014

European Society of Cardiology Congress, 2012

FDA/Industry Statistics Conference, 2011

TEACHING

Whilst working in academia, I undertook a range of teaching roles including:

- Undergraduate level:
 - Generalised Linear Models, University of Oxford. Module leader including delivery of lectures, preparation of problem sheets, setting, and marking of the assessed practical assignment and the setting of exam questions.
 - Computational Statistics, University of Oxford. Module leader including delivery of lectures, preparation of problem sheets, setting, and marking of the assessed practical assignment and the setting of exam questions.
 - Statistical Lifetime Models, University of Oxford. Class tutor for problem classes.
 - Probability and Design of Experiments, University of Warwick. I led the tutorial classes and provided teaching support respectively for the problem classes that accompanied the lectures.
- Postgraduate level:
 - Generalised Linear Models, University of Oxford. Module leader including delivery of lectures, preparation of problem sheets, setting, and marking of the assessed practical assignment and the setting of exam questions.
 - Computational Statistics, University of Oxford. Module leader including delivery of lectures, preparation of problem sheets, setting, and marking of the assessed practical assignment and the setting of exam questions.
 - Probability, LSHTM. Module leader including writing the module notes, lecture preparation and delivery, setting and first marking of the assignment and setting the exam question.
 - Survival Analysis and Advanced Statistical Modelling, LSHTM. I provided teaching support for the problem classes that accompanied the lectures and presented solutions to the questions set.
- Personal and academic tutoring: I was personal tutor to students enrolled on the M.Sc. Medical statistics at the LSHTM. This role consisted of giving general guidance relating to academic work, providing pastoral care where necessary, aiding with exam preparation through marking of past papers and the supervision and marking of summer projects.
- Short course delivery
 - Clinical Trials Short Course, June 2013, 2014 and 2015, LSHTM: Statistical Issues for Analysis and Reporting.
 - Introduction to Statistics, January 2019, University of Oxford: delivery of a weeklong short course.

CONFERENCE ORGANISATION

Royal Statistical Society International Conference 2016, Manchester

Royal Statistical Society International Conference 2015, Exeter

UseR!, The R User Conference 2011, University of Warwick

33rd Research Students' Conference in Probability and Statistics 2010, University of Warwick

TECHNICAL SKILLS

I am highly computer and Internet literate, and adept with programs such as Word, Excel and PowerPoint. I am proficient in using mathematically oriented analytical programs such as R and Latex and have experience of Python, STATA and SAS.

PROFESSIONAL DEVELOPMENT

Taking Stock, University of Oxford, Summer 2018

Springboard, University of Oxford, Spring 2018

Developing Management Skills, University of Oxford, Spring 2018.

Post Graduate Certificate in Learning and Teaching, LSHTM, July 2015

Advanced Stata, University of Bristol, May 2015

MSc Project Supervision, LSHTM, May 2015

Introduction to Stata, University of Bristol, January 2015

Media Training for Experts, Inside Edge Media Training, October 2014

Consultancy Skills, Royal Statistical Society, October 2008, University of Warwick

Academy for Ph.D. Training in Statistics:

- Statistical Computing and Statistical Inference, December 2007, University of Warwick
- Statistical Asymptotics and Statistical Modelling, April 2008, University of Oxford
- Computationally-Intensive Statistical Methods and Stochastic Processes, July 2008, University of Bristol
- Non-parametric Smoothing and Spatial and Longitudinal Data Analysis, September 2008, University of Glasgow.

MEDIA INTERACTIONS AND PUBLIC ENGAGEMENT

I regularly appear on TV and radio talking about statistics and its role in Society and responding to news stories in the press. Some of my more notable appearances include BBC Radio 4's More or Less, BBC Watchdog, Curious Cases of Rutherford and Fry, as well as the Today Programme, BBC Radio 5 Live and BBC World at One. I presented a segment in series 42 of BBC Watchdog called "Best or Worst", taking a different industry each week and ranking the companies within it. I have also been an expert statistician for the Channel 4 Dispatches programmes: 'How the Rich Get Richer', and 'Is Britain Full?', ITV's 'Mystery Map', and the BBC's 'Long Live Britain'.

I can also be regularly found presenting in schools, pubs and on stage. My presentations focus on statistical significance, uncertainty and chance, communicating risk, and issues surrounding correlation versus causation. I am a regular speaker for Maths Inspiration, one of the biggest maths enrichment programmes for teenagers in the UK. My involvement with Maths Inspiration has also taken me to Sydney, Melbourne and New York, including joining the National Theatre's Curious Incident of the Dog in the Nighttime world tour. I am also regularly invited to present at festivals and conferences with the Advanced Mathematics Support Programme, Maths in Action and the Institute of Mathematics and its Applications. I have also appeared in Robin Ince's Cosmic Shambles.

PUBLICATIONS

Peer Reviewed Articles in Journals

1. K.V. Bunting, R.P. Steeds, L.T. Slater, **J.K. Rogers**, G.V. Gkoutos, and D. Kotecha. Assessing and improving the reproducibility of echocardiography: a practical guide. *Journal of the American Society of Echocardiography* 2019; 32(12):1505-1515. DOI: 10.1016/j.echo.2019.08.015.
2. K.D. Lynch, R.W. Chapman, S. Keshav, A.J. Montano-Loza, A.L. Mason, A.E. Kremer, M. Vetter, M. Krijger, C.Y. Ponsioen, P. Trivedi, G. Hirschfield, C. Schramm, C. Heng Liu, C.L. Bowlus, D.J. Estes, D. Pratt, C. Hedin, A. Bergquist, A.C. Vries, C.J. Woude, L. Yu, D.N. Assis, J. Boyer, H. Ytting, E. Hallibasic, M. Trauner, H. Marschall, L.M. Daretti, M. Marzoni, K.K. Yimam, N. Perin, A. Floreani, B. Beretta-Piccoli, **J.K. Rogers**, International Primary Sclerosing Cholangitis Study Group (IPSCSG), and C. Levy. Effects of Vedolizumab in Patients with Primary Sclerosing Cholangitis and Inflammatory Bowel Diseases. *Clinical Gastroenterology and Hepatology* 2019; DOI: 10.1016/j.cgh.2019.05.013.
3. P. Royston, B Choodari-Oskoei, M.K.B. Parmar, and **J.K. Rogers**. Combined test versus logrank/Cox test in 50 randomised trials. *Trials* 2019; 20(1): 172. DOI: 10.1186/s13063-019-3251-5.
4. B.R.H. Sturrock, **J.K. Rogers**, R. Sadler, B. Ferry, C.A. Roberts, R.W. Chapman, and K.D. Williamson. Anti-gp210 and anti-sp100 antibody status and ursodeoxycholic acid response in primary biliary cholangitis. *Journal of Gastroenterology and Hepatology Research* 2018; 7(6): 2741-2747. DOI: 10.17554/j.issn.2224-3992.2018.07.797.
5. L. Shen, P.S. Jhund, U.M. Mogensen, L. Køber, B. Claggett, **J.K. Rogers**, and J.J.V. McMurray. Re-Examination of the BEST Trial Using Composite Outcomes, Including Emergency Department Visits. *JACC: Heart Failure* 2017; 5(8): 591-599. DOI: 10.1016/j.jchf.2017.04.005.
6. **J.K. Rogers**, A.Yaroshinsk, S.J. Pocock, D. Stokar, and J. Pogoda. Analysis of recurrent events with in the presence of informative censoring: Application of the joint frailty model. *Statistics in Medicine* 2016; 35(13):2195-2205. DOI: 10.1002/sim.6853.
7. **J.K. Rogers**, A. Kielhorn, J.S. Borer I. Ford, and S.J. Pocock. Effect of ivabradine on numbers needed to treat for the prevention of recurrent hospitalizations in heart failure patients. *Current Medical Research & Opinion* 2015; 31(10):1903-1909. DOI: 10.1185/03007995.2015.1080155.
8. **J.K. Rogers**, P.S. Jhund, A.C. Perez M. Böhm, J.G. Cleland, L. Gullestad, J. Kjekshus, D.J. Veldhuisen, J. Wikstrand, H. Wedel, J.J.V. McMurray, and S.J. Pocock. Effect of Rosuvastatin on Repeat Heart Failure Hospitalizations: The CORONA Trial (Controlled Rosuvastatin Multinational Trial in Heart Failure). *Journal of the American College of Cardiology: Heart Failure* 2014; 2(3):289-297. DOI: 10.1016/j.jchf.2013.12.007.
9. **J.K. Rogers**, S.J. Pocock, J.J.V. McMurray, C.B. Granger, E.L. Michelson, J. Östergren, M.A. Pfeffer, S.D. Solomon, K. Swedberg, and S. Yusuf. Analysing recurrent hospitalisations in heart failure: a review of statistical methodology, with application to CHARM-Preserved. *European Journal of Heart Failure* 2014; 16:33-40. DOI: 10.1002/ejhf.29.
10. **J.K. Rogers** and J.L. Hutton. Comparing treatment policies in early epilepsy through the joint modelling of pre-randomisation event rates and multiple post-randomisation survival times. *Journal of Applied Statistics* 2013; 40(3):546-562. DOI: 10.1080/02664763.2012.748720.
11. **J.K. Rogers**, J.J.V. McMurray, S.J. Pocock F. Zannad, H. Krum, D.J. Veldhuisen, K. Swedberg, H. Shi, J. Vincent, and B. Pitt. Eplerenone in Patients with Systolic Heart Failure and Mild Symptoms: Analysis of the Repeat Hospitalizations. *Circulation* 2012; 126(19):2317-2323. DOI: 10.1161/CIRCULATIONAHA.112.110536.
12. **J.K. Rogers**, J.L. Hutton, A.G. Marson, and D.W. Chadwick. Assessing the risk of subsequent tonic-clonic seizures in patients with a history of minor seizures. *Journal of Neurology Neurosurgery and Psychiatry* 2012; 83:803-809. DOI: 10.1136/jnnp-2011-300917.

Working Papers; Under Review

13. T Hadfield, M.S. Ali, **J.K. Rogers**, S Khalid, and D Prieto-Alhambra. Bias and Balance Associated With The Use Of Different Machine Learning Algorithms in Propensity Score Estimation: A Simulation Study. *Submitted to the American Journal of Epidemiology*.

Other Published Output

J.K. Rogers. Just what is out problem with numbers? Oxford Science Blog. (Available from: <http://www.ox.ac.uk/news/science-blog/just-what-our-problem-numbers>).

J.K. Rogers. How "random" is Ryanair's seating allocation? Significance. (Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1740-9713.2017.01069.x/full>).

J.K. Rogers. Luck of the withdrawal. Significance. (Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1740-9713.2016.00957.x/pdf>).

J.K. Rogers. Is my bacon sandwich going to give me cancer? Statistics Views (Available from: <http://www.statisticsviews.com/details/feature/8704781/Is-my-bacon-sandwich-going-to-give-me-cancer.html>).

J.K. Rogers. Statistics and Biology - a match made in heaven? Royal Society of Biology Blog (Available from: <http://blog.rsb.org.uk/statistics-and-biology/>).

J.K. Rogers. How can we remedy the gender imbalance in maths and stats? StatsLife (Available from: <http://www.statslife.org.uk/opinion/2389-how-can-we-remedy-the-gender-imbalance-in-maths-and-stats>).

J.K. Rogers. Number Needed to Treat for Recurrent Events – Event- or Patient-Based? Statistics Views, Wiley (Available from: <http://www.statisticsviews.com/details/feature/8092601/Number-Needed-to-Treat-for-Recurrent-Events--Event--or-Patient-Based.html>).

J.K. Rogers. Speed cameras, causality and chance. Statistics Views, Wiley (Available from: <http://www.statisticsviews.com/details/feature/7497691/Speed-Cameras-Causality-and-Chance.html>)

J.K. Rogers. Will Ebola change the future of clinical trials? Statistics Views (Available from: <http://www.statisticsviews.com/details/feature/7089401/Will-Ebola-change-the-future-of-clinical-trials.html>).

J.K. Rogers. Does evidence matter? Statistics Views, Wiley (Available from: <http://www.statisticsviews.com/details/feature/6236051/Does-evidence-matter.html>)

J.K. Rogers. Open data should also be about cutting red tape for research. StatsLife (Available from: <http://www.statslife.org.uk/opinion/1255-open-data-should-also-be-about-cutting-red-tape-research>). **J.K. Rogers.** Recurrent events analysis, not so straightforward! Statistics Views, Wiley (Available from: <http://www.statisticsviews.com/details/feature/5786631/Recurrent-events-analysis-not-so-straightforward.html>).

J.K. Rogers. Statisticians Essential to Success of Clinical Trials. International Year of Statistics (Available from: www.statistics2013.org/2013/05/27/statisticians-essential-to-success-of-clinical-trials/).

J.K. Rogers, J.L. Hutton and K. Hemming. Joint modelling of event counts and survival times. Centre for Research in Statistical Methodology, University of Warwick (Available from: <http://www2.warwick.ac.uk/fac/sci/statistics/crism/research/paper09-44>).