

Conference Directory

RSS International Conference 2023

FOR ALL STATISTICIANS AND DATA SCIENTISTS

HARROGATE - 4-7 September 2023

ALL WELCOME

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RSS International Conference

A **WELCOMING** and **INCLUSIVE** event
for all statisticians and data scientists

A polite reminder to all:

- Be courteous and respectful
- Be professional
- Be kind to others

The RSS does not tolerate harassment of conference participants in any form.



rss.org.uk/conduct



Welcome

It is my greatest pleasure to welcome you to the Royal Statistical Society's International Conference 2023 in Harrogate on behalf of the RSS Conferences & Events Board.

I hope you enjoy the great line-up of keynote speakers and the various contributed and invited sessions including poster presentations, rapid-fire talks, and workshops covering all things related to big and complex data. These include artificial intelligence, machine learning, and environmental statistics; all currently in the spotlight with devastating images from around the globe of burning villages and towns, flooding, and the implications of artificial intelligence on humanity. You will also hear about the role of statistics in: evidence based public health policies, business and financial decisions, and understanding crimes. Our sessions also cover professional development, statistical storytelling, visualisation and communication of data.

We will kick start the conference with an interactive session with Sir Ian Diamond, the UK National Statistician, who will be in conversation with Dr Johanna Hutchinson, former Director of Analytics & Data Science at the UK Health Security Agency. Sir Ian will be conversing with Johanna about his career highlights, his reflections on the Government Statistical Service's response to the Covid pandemic, and his vision for the future of the Government Statistical Service. There is also an opportunity for you to ask Sir Ian questions. This will then be followed by a welcome reception on level 5 of the convention centre.

We will be wrapping up the conference on Thursday with a dinner at the historic Royal Hall, which boasts over 120 years of experience in hosting events, and do not forget to join us for our awards ceremony and reception on Tuesday.

In addition to exploring the various cutting-edge statistics and data science topics across the three days of the conference, this is your chance to widen your network and connect with colleagues from across the globe and share knowledge and experiences to further our discipline and its impact on society. However, do not forget to make the most of your stay by exploring Harrogate and its surrounding designated areas of outstanding natural beauty, and nearby cities of York and Leeds which are a short train ride away.

A special thanks goes to Paul Gentry and his team for bringing so many of us from across the world to talk about data and statistics.



Prof. Mona Kanaan
Programme Chair
RSS 2023 Conference

General event information

Badges

Conference attendees are asked to always wear their badges and lanyards while at the conference.

Lost badges will be replaced at the discretion of the conference organisers. A replacement fee may be charged.

Cloakroom

A staffed cloakroom will be available in the foyer of Entrance 1. This will be open each day at the following times:

The Society accepts no responsibility for any items which may be lost or damaged.

MONDAY 4 SEPTEMBER	15:00-19:30	
TUESDAY 5 SEPTEMBER	8:00-12:00	16:00-20:00
WEDNESDAY 6 SEPTEMBER	8:00-12:00	15:30-19:30
THURSDAY 7 SEPTEMBER	8:00-12:00	14:30-18:30

Conduct policy

The Society operates an event conduct policy and requires attendees to always adhere to the policy while in the conference and its associated events. The full text of the policy can be found at rss.org.uk/conduct.

Conference app

The conference app is where you can view the most up to date information about the conference programme, plan your conference diary, message other attendees, submit feedback and questions

A link with login details will be sent by email to all attendees in advance of conference – the email will come from 'VenulQ' (please check your junk/spam folders).

Daytime catering

Lunch as well as tea/coffee at the start of the day, the mid-morning break and the mid-afternoon break is provided as part of your conference fee. All refreshments will be served in Hall D on level 4.

There may be queues for refreshments, especially at lunchtime, so we do ask you to be patient and stagger your arrival at the serving points wherever possible.

Dietary requirements

For those attendees who have notified the organisers of special dietary requirements* please ask a member of catering staff when collecting your lunch.

For the conference dinner please collect a place card on arrival at the Royal Hall.

The conference organisers have tried to cater for all dietary requirements for lunches and the conference dinner, however it is not always possible to provide dietary options for the other evening social events. If you are concerned about this, please contact the RSS conference team.

** There will be vegetarian options provided at lunchtime which do not require any special arrangements. .*

Evening social events

There are no tickets for these events, however, please only attend if you have booked as we are only catering for the number of people booked.

Exhibition

Please make time to visit our exhibitors.

The exhibitors' stands are in Hall D alongside the catering area. This area will be open at the following times:

TUESDAY 5 SEPTEMBER	8.30AM – 8.00PM
WEDNESDAY 6 SEPTEMBER	8.30AM – 5.30PM
THURSDAY 7 SEPTEMBER	8.30AM – 3.30PM

Local information

Information about the local area and amenities can be found on the venue website: www.harrogateconventioncentre.co.uk/visitors

For local bus and rail information, local planning guides and directions around town visit openharrogate.co.uk.

Mobile phones

We ask that you switch your mobile phones and other hand-held devices to silent when you are in sessions.

Photography and filming sessions

The Society will have a photographer taking photographs in many sessions and at social events. The Society may use photographs taken in conference reports, publications and in future publicity materials. If you would prefer your photograph not to be used in this way, please contact the Head of Conferences & Events.

Please note that the Society is filming some invited sessions, the recordings of which will then be made available on the Society's YouTube channel.

Poster presentations

Posters will be on display in Hall D throughout the conference. The poster reception on Tuesday evening will provide an opportunity to speak with the authors –the final list of posters being presented will be available on the conference app and in the venue.

Presentation desk

For speakers wishing to submit or amend their presentations during the conference and for poster presenters registering their poster the presentation desk is located by Entrance 1 on level 4.

Registration desk

The conference registration desk can be found on the ground floor as you enter the venue at Entrance 1

The Registration desk will be open at the following times:

MONDAY 4 SEPTEMBER	3.00PM – 6.30PM
TUESDAY 5 SEPTEMBER	8.00AM – 6.30PM
WEDNESDAY 6 SEPTEMBER	8.30AM – 5.30PM
THURSDAY 7 SEPTEMBER	8.30AM – 3.30PM

Session locations

Plenary sessions will be held in the Auditorium on level 6. All other sessions will be held in one of the conference rooms in the Queens Suite with professional development workshops also taking place in the Branham Suite in the Crowne Plaza hotel.

ALL sessions are open to all attendees registered to attend on the relevant day (unless otherwise stated).

Stewards and staff

RSS stewards (in RSS polo shirts) and RSS staff members (identified by their badges) will be happy to assist you throughout the conference.

Timings for presentations

The following timings for presentations will **normally** apply:

- **Keynote talks:** 30-45 minutes **plus** time for questions and discussion
- **Invited talks:** 20-30 minutes **plus** time for questions and discussion
- **Contributed talks:** 20 minutes **including** time for questions and discussion
- **Rapid-fire talks:** 5 minutes with **no** questions or discussion.

Visitor discounts

The venue works with local partners to offer conference attendees exclusive discounts around Harrogate. To redeem offers simply show your delegate badge along with your Visitor Discount Card which is available from the venue. More information can be found here: <https://www.harrogateconventioncentre.co.uk/visitors/visitor-discount-offers>

WiFi access

Free wifi is available in the venue. Look for '**Venue Wifi**' on your connections list, connect and accept the terms & conditions – no username or passwords required.

Please note this will not be suitable for large downloads or streaming.

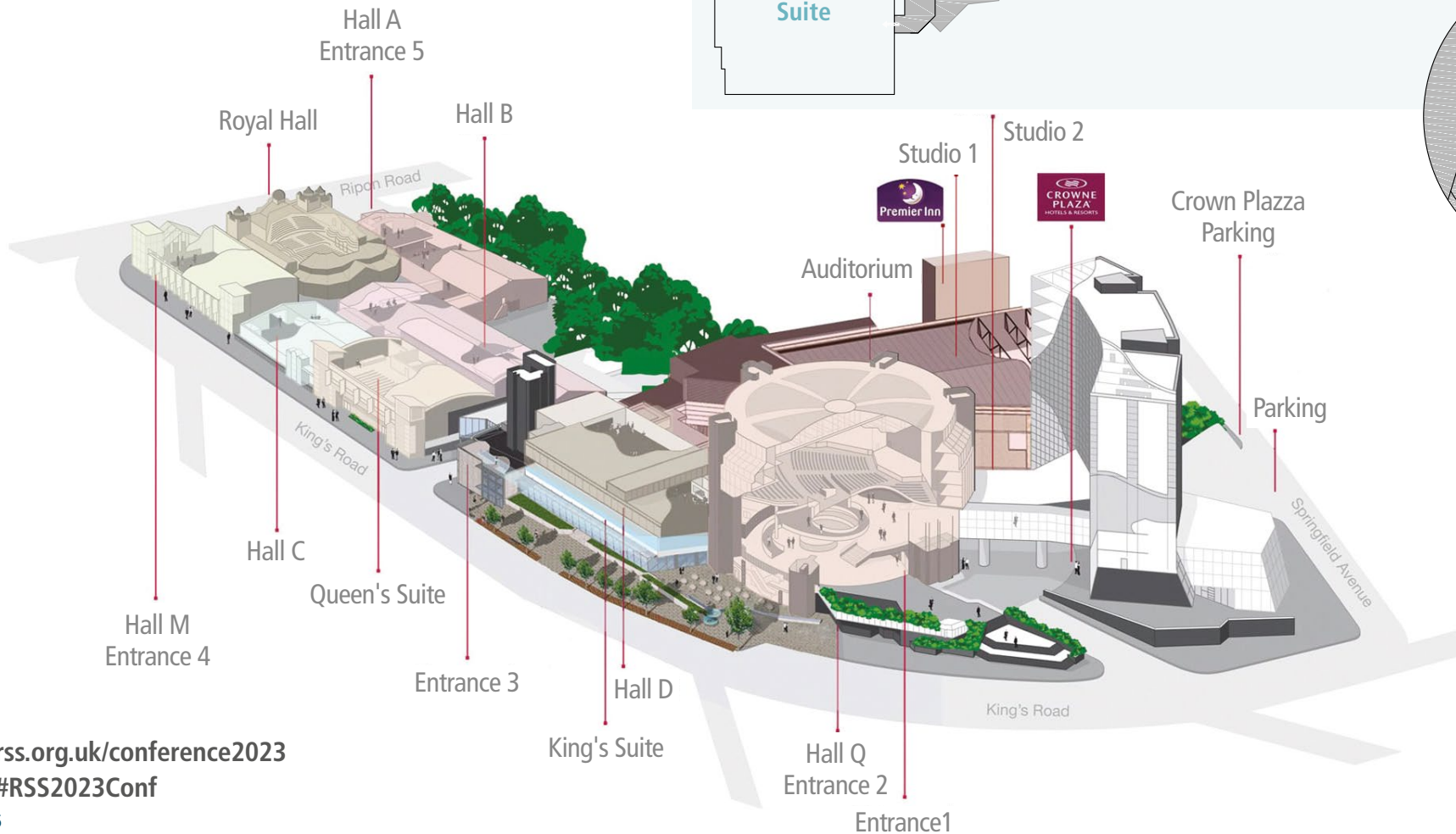
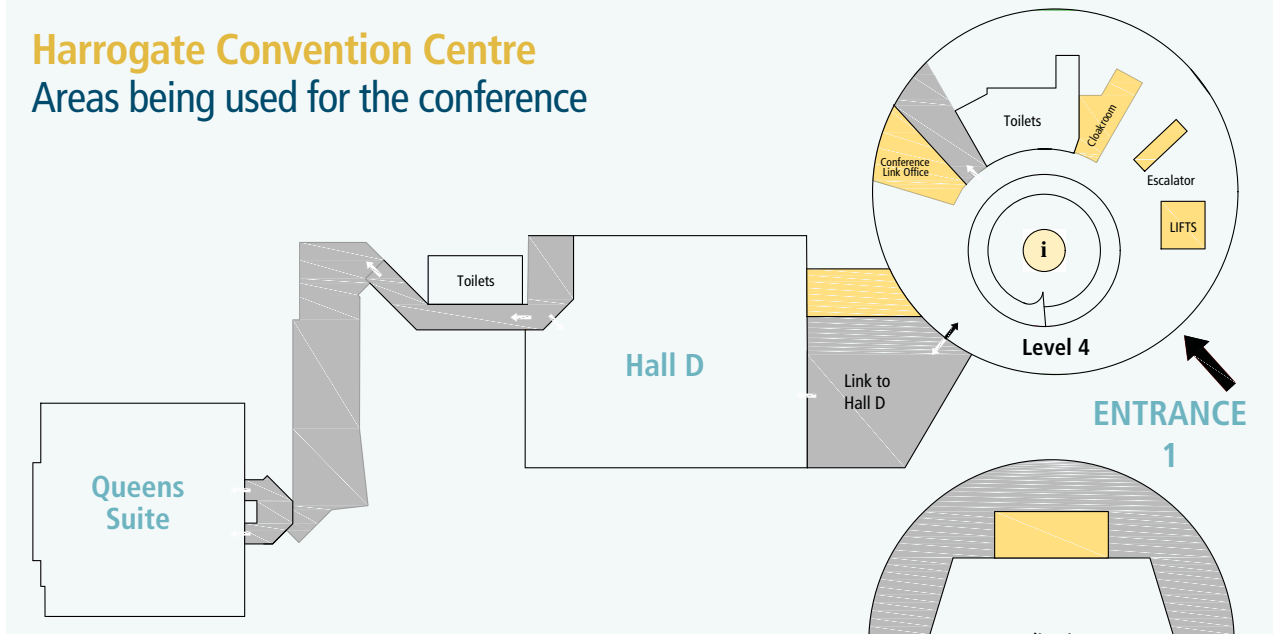
X (Twitter)

You can follow the conference on Twitter: **RSSAnnualConf** please use the hashtag **#RSS2023Conf**



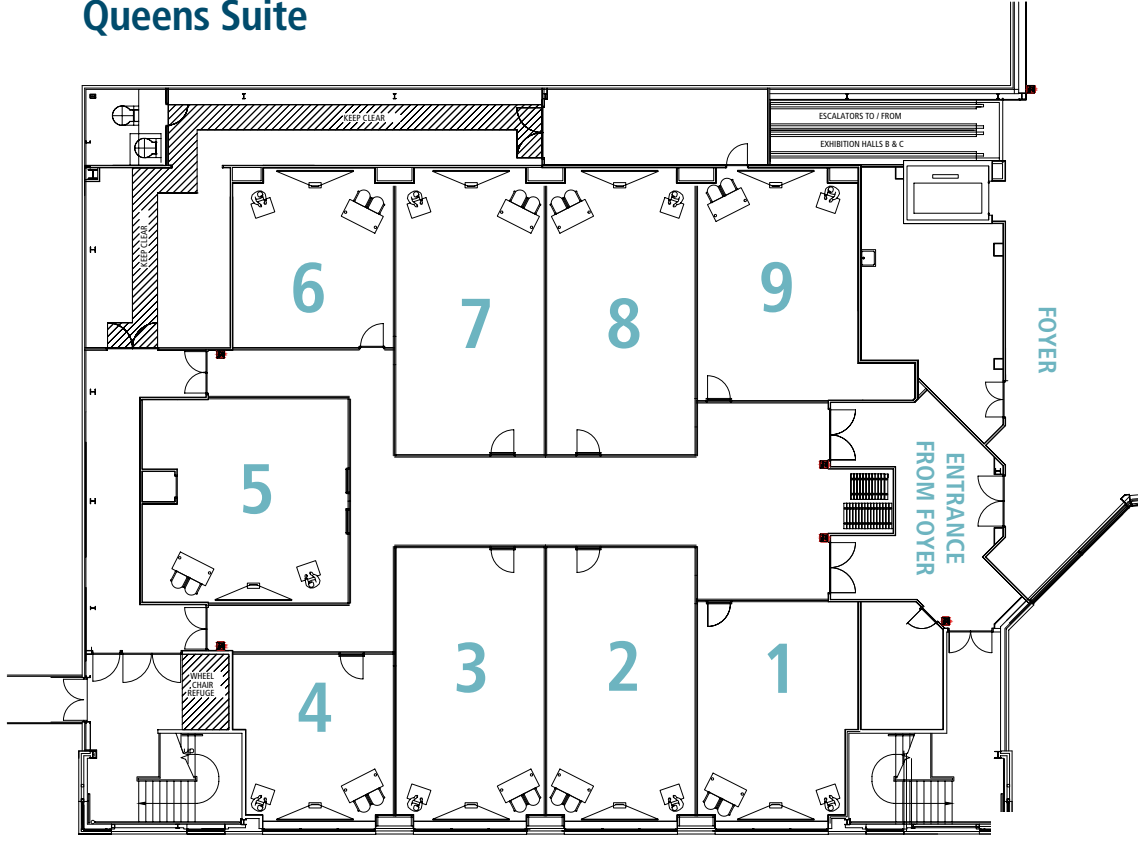
Venue Plans

Harrogate Convention Centre Areas being used for the conference

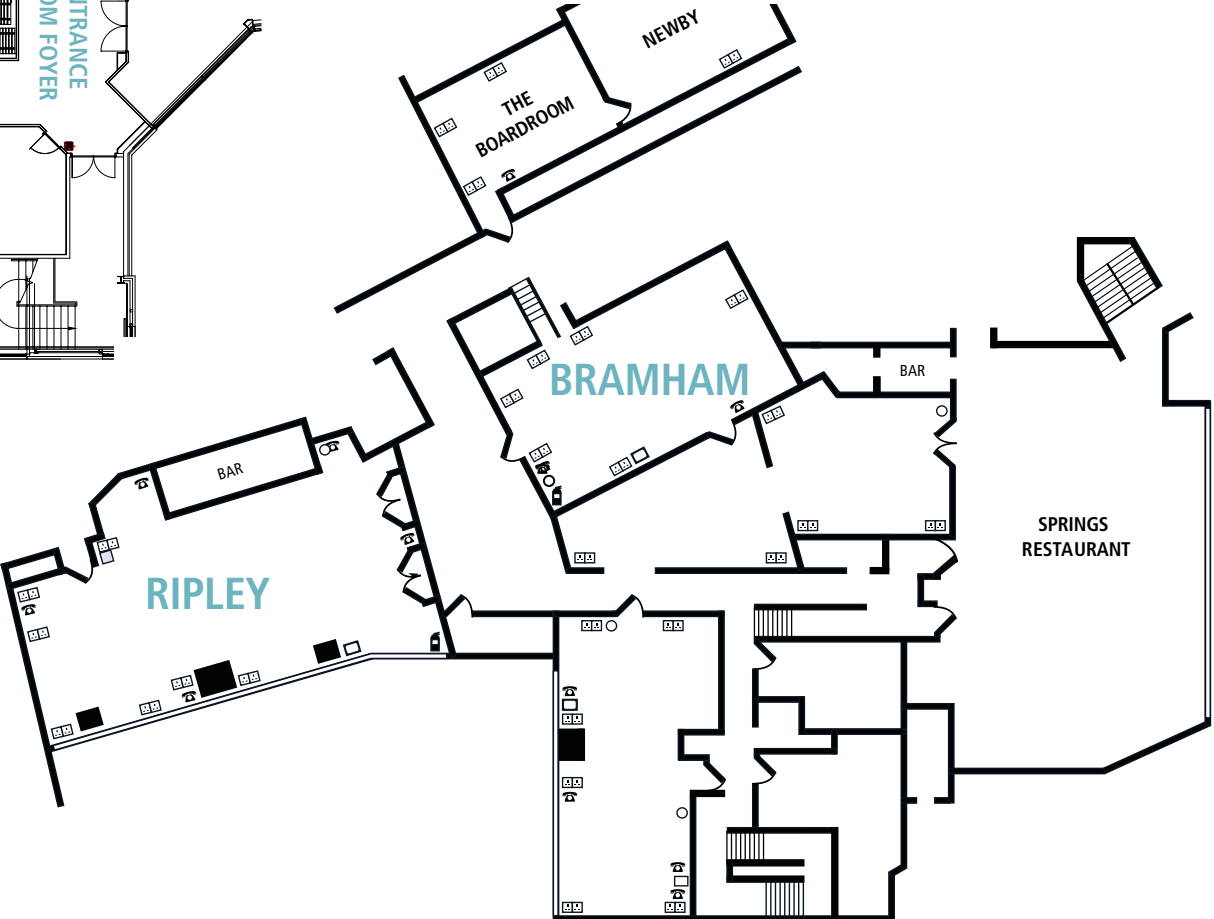


Harrogate Convention Centre
Queens Suite

HARROGATE
4-7 September 2023



Crowne Plaza
Branham and Ripley Suites
(first floor)



Exhibitors at RSS 2023 Conference

2 Chapman & Hall/CRC Press

Chapman & Hall/CRC, an imprint of Taylor & Francis Group, is a leading publisher of Statistics and Data Science books. Our list is associated with quality, and our expert authors include world-renowned researchers and lecturers. We have a number of well-regarded book series, including the internationally recognized Texts in Statistical Science Series, R Series, and our new and very popular Data Science Series. Please visit our display in the exhibit hall to browse our latest titles.



3 Jumping Rivers

Jumping Rivers has delivered quality data insights from day 1. Based in Newcastle and founded in 2016, the company is bringing a fresh approach to the world of data analytics. Our trainers and consultants come with over 100 years combined experience in R, Python, Stan, Scala and other programming languages. We have worked with some of the largest (and smallest) companies in the world.



4 International Journal of Population Data Science

Sponsors of the Medical Statistics stream

The International Journal of Population Data Science (IJPDS) is a gold open-access, peer-reviewed journal focussing on the science pertaining to large population data. Under the guidance of our highly skilled international HYPERLINK "<https://ijpds.org/editorial-board>" Editorial Board, it publishes articles on all aspects of research, development and evaluation connected with data about people and populations such as technological advances in data storage and management; architectures and infrastructures; legal and regulatory issues; ethical, legal and societal implications (ELSI); privacy-protection methodologies; data and linkage quality; analytical advances; accessing distributed data; linking to emerging/complex data types; using big data; outcomes-based research; epidemiology; service evaluations; public involvement and engagement; capacity building; and delivering and measuring impact.

We are delighted to support the RSS Conference, and our sponsorship of the Medical Statistics stream perfectly aligns with IJPDS' research publishing and dissemination activities.

<https://ijpds.org/index>
@IJPDS



7 UK Data Service

Sponsors of the early career researchers workshop

Funded by the Economic and Social Research Council, we curate the UK's largest collection of economic, population and social research data. Free at the point of service for non-commercial use and with over 47,000 registered users from 146 countries, we are firmly established as pioneers in providing training and access to data for teaching, learning and public benefit (Source: UK Data Service Annual Report, 1 April 2020 – 31 March 2022).



8 Office for National Statistics

Population and migration statistics underpin decisions and policies right across our society and economy at national and local levels and for different communities. It is therefore vital they keep up with society's changing needs.

The Office for National Statistics has launched a public consultation on its proposals for a new approach to population and migration statistics.

Find out more about their proposals and how to complete the consultation by visiting their stand at the RSS Conference.



9 Cambridge University Press

We make sure academics can access high-quality, digitally interconnected materials that enhance understanding and the global impact of research. Our Cambridge University Press imprint publishes more than 380 peer-reviewed academic journals and thousands of books for research and higher education.



10 InterWorks

InterWorks is a people-focused tech consultancy delivering premier service and expertise in collaboration with strategic partners. Our clients trust us to guide them toward the best solutions to maximize their data. We empower people at every step of the analytics experience, from management and storage to communicating insights with visualization.



11 & 14 Royal Statistical Society

Come and see us at the RSS Membership stand to discover how joining the RSS community can work for you and your professional development. All non-members can benefit from a 10% discount for a year on fellow membership – exclusive to conference attendees only. Speak to a member of staff on the stand for more information on how to apply. Don't forget to get your caricature done too!

We will also be holding drop-in sessions at the stand on specific topics – visit the stand for further information or keep an eye out for announcements online.



12 Oxford University Press

Oxford University Press advances knowledge and learning. We are a department of the University of Oxford and share the objective of excellence in research, scholarship, and education by publishing worldwide. Since 2023 we have been the publisher of the RSS journal series.



13 RSS Sections and Local groups The network that works for you!

Join us at the membership stand where we will have a drop-in session answering your questions about what a section and local group does and how you can make the most of networking and volunteering. If you would like to get involved with a section and local group but not sure how to, this is the perfect chance to meet Amirah Chaudry, Member Support Manager at the RSS, who can offer you guidance on how you can make the most of this opportunity.



Sponsors

Timberlake

Sponsors of the Welcome Reception

Timberlake is a global brand with over forty years of experience and expertise as a supplier of statistical, econometric and forecasting software packages; the delivery of quality training courses; and a consultancy service provider. We provide a total solution to our diverse range of clients across the fields of statistics, econometrics, forecasting, quantitative and qualitative research, epidemiology, finance, political and social sciences as well as data visualisation.

Our vision is to be a world class provider of cutting edge statistical, econometric and operational research software and training solutions. Investment in our core values and staff is fundamental to our success. We support all of our customers to be the best in class of their field, globally.

timberlake

Mathematics

Sponsors of the Awards & Poster Reception

Mathematics (ISSN 2227-7390) is a peer-reviewed, open access journal which provides an advanced forum for studies related to mathematics, and is published semimonthly online by MDPI. It aims exclusively toward the publication of high-quality reviews, research articles and communications in all areas of pure and applied mathematics. It received its 2022 Impact Factor of 2.4 (SCIE) and CiteScore of 3.5 (Scopus), currently ranking in the first quartile (Q1) in its JCR and Scopus category.



PHASTAR

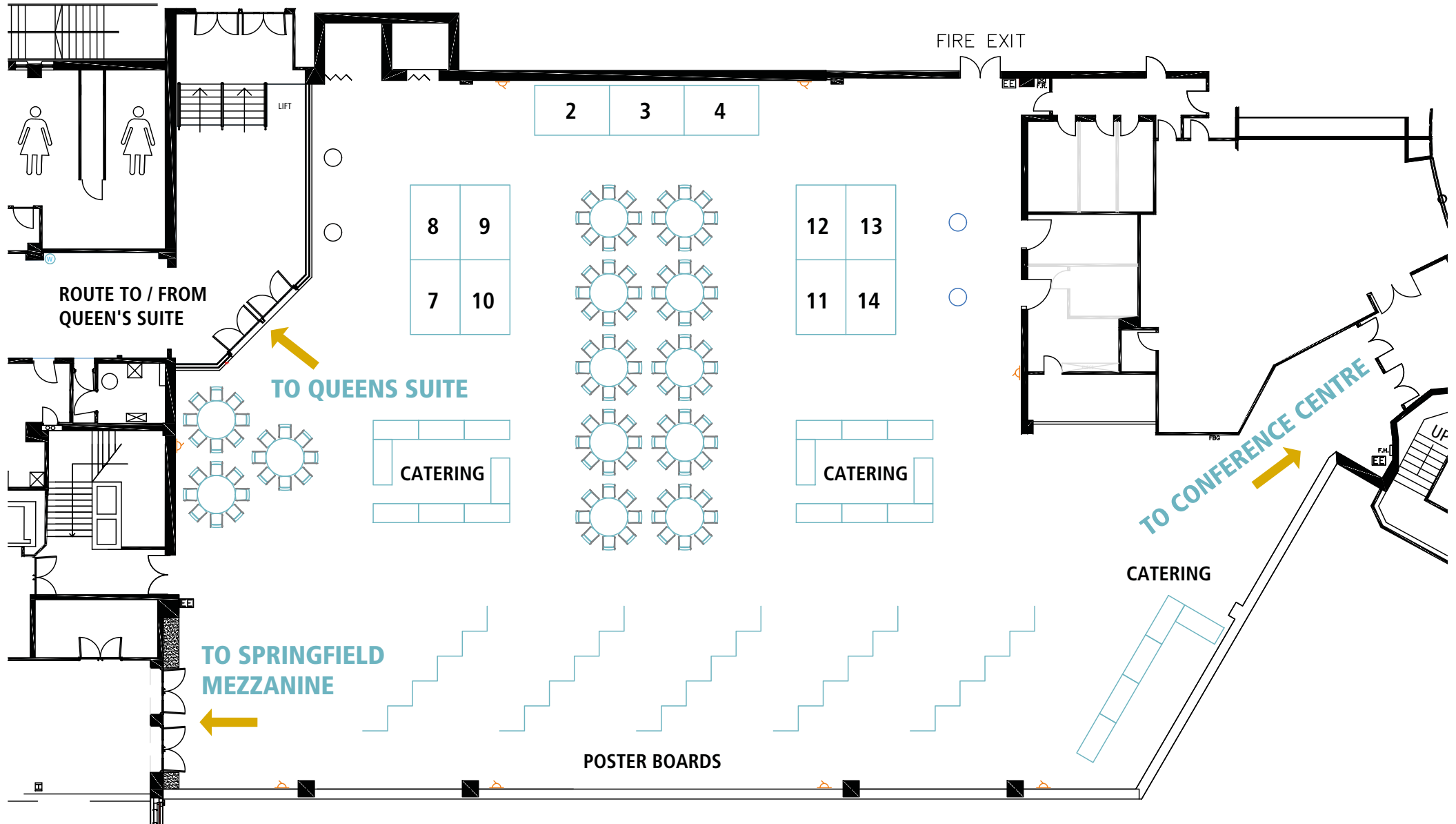
Sponsors of the Young Statisticians' Quiz Night

PHASTAR is a specialist biometrics contract research organization offering statistical consulting, clinical trial reporting, data management and data science services by providing expert consultants and managing and delivering in-house projects, FSP-style arrangements and preferred partnerships.













Exhibitor Plan - Hall D

HARROGATE
4-7 September 2023









Full Programme

All conference sessions are organised in streams. For ease of reference each stream is represented by a colour in the programme:

	Applications in Business, Industry & Finance
	Break
	Communicating & Teaching Statistics
	Data Science
	Environmental & Spatial Statistics
	Invite only
	Medical Statistics
	Methods & Theory
	Networking
	Official Statistics & Public Policy

Sponsored by IJPDS



	Other
	Other Applications of Statistics
	Plenary
	Professional Development
	Rapid Fire
	Social & Wellbeing Statistics
	Prize winners

The programme is correct at time of going to print –
Any last minute changes will be available via the online programme
and the conference app.

<https://tinyurl.com/RSS2023conference>

Day 1 Monday 4 September

13:00 - 17:00

Professional Development

Pre-conference workshop for early career researchers

Ripley Suite, Crowne Plaza

This workshop is for pre-booked attendees only.

Organised by RSS Young Statisticians Section

Sponsored by



17:15 - 18:30

Plenary

Welcome to conference followed by Keynote 1:

Auditorium

In conversation with Sir Ian Diamond, UK National Statistician

Johanna Hutchinson will lead a discussion with Sir Ian, talking about his career highlights, his reflections on the Government Statistical Service (GSS)'s response to the COVID pandemic, and his vision for the future of the GSS. He'll also take questions from the audience in this interactive session to kick-off this year's conference.

18:30 - 19:30

Networking

Welcome Reception

Level 5

Sponsored by

timberlake

Day 2 Tuesday 5 September

08:30 – 09:00

Refreshment break

Hall D

09:00 – 10:00

Other

RSS Prize winners: Best presentations from RSC 2022

Queens Suite 1

Hear the prize winning presentations from the 2022 Research Students' Conference (RSC) in Probability and Statistics.

Automated extreme value threshold selection and uncertainty for induced seismicity

Conor Murphy - Lancaster University, UK

Using service statistics to inform modern contraceptive prevalence estimates for all women of reproductive age

Shauna Mooney - Maynooth University, Ireland

TBC

Dominic Grainger – University of Sheffield

Organised by Jake Emmerson for RSS Young Statisticians Section

Professional Development

How to do it all: advice from female statisticians

Branham Suite, Crowne Plaza

This session promotes practical advice from women in statistics and data science. We discuss issues such as how to achieve a work-life balance, how to identify opportunities available when returning from a career break, how to explore flexible working arrangements, and other issues that statisticians and data scientists may face in their day-to-day lives.

Panel members:

Sophie Carr

Deborah Ashby

Claire Griffiths

Organised by Joy Leahy & Teresa Lee for RSS Young Statisticians Section

Applications in Business, Industry & Finance

Contributed: Global economy, trade execution and the skills shortage

Queens Suite 4

The Quest for Optimal Trade Execution: Statistical Models vs Reinforcement Learning

Isaac Tonkin - Bond University, Gold Coast, Australia

Computers and Machinery in an Advanced Economy with Skills Shortage: The Moderating Role of Firm Size

Karl Matikonis - Queen's University Belfast, UK

The Impact of Mobile Devices on Individual Traders' Responses to

News Sentiment: Evidence from Early Adopters

He He - Bangor University, UK

Environmental & Spatial Statistics

Contributed: Temporal dynamics and dependence in environmental data

Queens Suite 6

Quantifying invasive pest dynamics through inference of a two-node epidemic network model: the case of the oak processionary moth in London

Laura E Wadkin - Newcastle University, UK

Temporal assessment of heatwaves using Cox proportional hazards

Jason M West - Bureau of Meteorology, Brisbane, Australia

covXtreme: open-source software for modelling extreme environment data sets

Ross Towe - Shell, London, UK

Day 2 Tuesday 5 September

09:00 – 10:00

Medical Statistics

Contributed: Population-level data

Queens Suite 2

Modelling diseases with nested structures and delayed reporting using a hierarchical framework.

Alba Halliday - University of Glasgow, UK

Impact of record source on multimorbidity measurement and mortality associations: comparison study of 2.3 million individuals in Welsh National Health Service

Clare E MacRae - University of Edinburgh, UK

Nonlinear isocaloric substitution analysis: An example using the UK Biobank prospective cohort study

Frederick K Ho - University of Glasgow, UK

Methods & Theory

Contributed: Statistical testing

Queens Suite 3

Asymptotic Invariance for Statistical Testing

Adam B Kashlak - University of Alberta, Edmonton, Canada

Nonparametric Predictive Inference for Reproducibility Probability of Statistical Hypothesis Tests

Tahani Coolen-Maturi - Durham University, UK

Efficient nonparametric two-sample testing for univariate data

Dean A Bodenham - Imperial College London, UK

Methods & Theory

Contributed: Inference for networks and time series data

Queens Suite 7

GNAR-edge model: A network autoregressive model for networks with time-varying edge weights

Anastasia Mantziou - The Alan Turing Institute, London, UK

Latent Space approaches for multivariate count time series data'

Hardeep Kaur - University College Dublin, Ireland

Bias-reducing penalisation for the Whittle likelihood

Francesca Papagni - Free University of Bozen, Bolzano, Italy

Official Statistics & Public Policy

Contributed: Migration

Queens Suite 8

Estimating temporary international migration in the UK

Melissa Randall - Office for National Statistics, Titchfield, UK

A Hierarchical Bayesian Model for Estimating European Migration Flows

Peter WF Smith - University of Southampton, UK

Admin-based population and migration estimates and the Dynamic Population Model (DPM)

Louisa Blackwell - Office for National Statistics, Titchfield, UK

Other Applications of Statistics

Contributed: University recruitment, fixed fine penalties and clustering functional data

Queens Suite 5

Modal Clustering of Functional Data - A Nonparametric Approach

Adhiraj Mandal - University of Glasgow, UK

Beyond Partygate: Risks and vulnerabilities of those fined during the COVID-19 pandemic

Victoria Gorton - University of Edinburgh, UK

Benchmarking student recruitment in English universities

Rob Gandy - Liverpool John Moores University, UK

Social & Wellbeing Statistics

Contributed: Impact of Covid

Queens Suite 9

Temporal patterns in children's physical activity after lockdown, compared to pre-pandemic

Ruth Salway - University of Bristol, UK

Modelling mental health trajectories during the COVID-19 pandemic using the Understanding Society data

Glenna Nightingale - University of Edinburgh, United Kingdom.

From Words to Votes: How Political Speeches During COVID-19 Influence Public Opinion?

Gustaw Kempa - Maastricht University, Maastricht, MSc Student, Netherlands

Day 2 Tuesday 5 September

10:10 – 11:10

Plenary

Keynote 2 - Advancing Analysis of Complex Structured Data -- Kendall meets Fisher (-Rao)

Auditorium

Anuj Srivastava - Florida State University, USA

Progress in imaging and storage technology has made cameras, scanners, and video sensors our primary data sources. The wealth of image and video data has revolutionized fields like biometrics, medical diagnostics, bioinformatics, manufacturing, and autonomous navigation. However, dealing with such vast and complex data presents unique challenges, requiring the removal of irrelevant variables to focus on essential structures. This talk explores the convergence of diverse past ideas into a comprehensive approach to handling structured data. It highlights contributions from Kendall's statistical techniques for shape analysis, the Fisher-Rao metric for "information geometry" and its invariance, Grenander's deformable-template approach for moderating complexity, and Silverman and Ramsay's functional analysis for curve data. Recent research has integrated these insights into an ambitious agenda for representing, modelling, and analyzing various data types, leading to significant successes in real-world examples, including COVID data analysis, neuroimaging, computer vision, industrial engineering, and 3D genome analysis.

11:10 – 11:40

Refreshment break

Hall D

11:40 – 13:00

Applications in Business, Industry & Finance

Defence based statistical analyses of the past, present and future

Queens Suite 4

Some statistical analyses developed for the defence industries are now a mainstay for other industries. Do current defence specific analytical problems and their solutions have more to contribute to statistics and economics.

A brief history of statistical aspects of the appraisal of Safety and Suitability for Service of weapons

Sam Ellis - Ellis & Boscawen Associates, Ripon, UK

Some historical developments in multivariate acceptance sampling and its incorporation into Defence Standards - with defence and civilian applications.

John Bermudez - BAE Systems (Land UK), Newport, UK, &

Kevin Stone - WTS, Bristol, UK

Ministry of Defence: Inflation and its impact on defence spending has changed how we contract, estimate and forecast

Jonathan Mcconville & Karen Salmon - Ministry of Defence, UK

The statistics of AI and Autonomy, are we learning from what has gone before

Phillippa Spencer OBE - DSTL

Organised by Mike Hicks

Applications in Business, Industry & Finance

FinTech and Economic Modelling

Queens Suite 6

transformation and adoption via Industry 4.0 and 'Fintech' services. On the other hand, navigating wicked problems driven by a series of global factors impacting financial systems.

This session includes talks related to the study the FinTech and application of Machine Learning in the financial field and evolution of the Fintech industry. It brings together academic and industry experts to discuss their understanding of Fintech from data scientist or social scientist perspectives. This session will encourage networking between professional and academic areas and inform the recent development of the industry and the practical issues people care about within the ecosystem.

Zero-Knowledge Proofs: The Future of Privacy Preservation in Web3
Ning Wang - University of Oxford, UK

Know Your Customer: Balancing innovation and regulation for financial inclusion

Karen Elliott - University of Birmingham, UK

Evolution of Regional FinTech Ecosystems Across the UK
Julian Wells - Whitecap Consulting, UK

Organised by Jia Shao for RSS Finance & Economics Section

Session sponsored by Data Transformation Innovation Institute (DTII), Cardiff University

Day 2 Tuesday 5 September

11:40 – 13:00

Communicating & Teaching Statistics

Best Practices for Data Visualisation: How to make data outputs more readable, accessible, and impactful

Auditorium

The Royal Statistical Society (RSS) has published a new guide, “Best Practices for Data Visualisation”, containing insights, advice, and examples (with code) to make data outputs more readable, accessible, and impactful. The guide is written primarily for contributors to Royal Statistical Society publications – including Significance magazine, the Journal of the Royal Statistical Society Series A, and Real World Data Science – but the information and advice within is also of broad relevance and use for any data visualisation task.

In the first half of this conference session, authors Andreas Krause, Nicola Rennie, and Brian Tarran will introduce the guide and its key recommendations, and there will be a short demo of how to use the new {RSSthemes} R package. For the second half of the session, attendees will be invited to share feedback with the authors, propose ideas, and start developing new and expanded sections of the guide. Attendees will be shown how to work with the guide’s source files and collaborate via GitHub, so feel free to bring along a laptop and become a contributor!

For more information, see rss.org.uk/datavisguide

Organised by Brian Tarran for Significance Magazine, Journal of the Royal Statistical Society Series A, and RSS Real World Data Science

Data Science

How to avoid becoming an ornamental data scientist

Queens Suite 8

The RSS Data Science and AI Section have toured the country asking practitioners and companies about their hopes and fears about a career in data science and AI. In this session we outline how to become efficient, effective and ethical in your application of the statistical and algorithmic tools of the trade. Most importantly, we set out how to avoid becoming an ornamental data scientist, employed to imply a company is data driven.

Organised by Will Browne for RSS Data Science & AI Section

Environmental & Spatial Statistics

Challenges in multivariate and spatial extremes for environmental applications

Queens Suite 5

Extreme events such as heat waves, high tides, soil contamination, environmental pollution, wildfires, and high sea surface temperatures arise due to physical processes or human intervention and are multivariate and/or spatial in extent. These low-probability events usually lead to the biggest socioeconomic, human health and environmental impacts. Modelling, predicting and quantifying risks associated with these events are the main goals of Extreme Value Theory (EVT).

This session will showcase diverse applied and theoretical contributions associated with three challenges in multivariate and spatial extremes, namely, statistics of extremes for unreplicated spatial domains, consistent estimation of extremal dependence features in bivariate extremes, and machine learning for climate extremes.

Estimating the limiting shape of bivariate scaled sample clouds for self-consistent inference of extremal dependence properties
Emma S Simpson - University College London, UK

Statistical Deep-Learning for Spatiotemporal Extremes
Raphael Huser - KAUST, Thuwal, Saudi Arabia

Modelling heavy metal soil contamination: An exploration of Extreme Value Theory for unreplicated spatial applications
Daniela Cuba - University of Glasgow, UK

Organised by Daniela Castro-Camilo for RSS Environmental Statistics Section

rss.org.uk/conference2023

[#RSS2023Conf](https://twitter.com/RSS2023Conf)

Day 2 Tuesday 5 September

Medical Statistics

Linked data for health analysis

Queens Suite 3

With the growing requirement to provide rapid analysis to support our understanding of population level health, linked data is becoming increasingly important. Data linkage allows analysts to bring together data sets and produce statistics and models which provide a detailed picture of the health within communities, providing valuable insights for population health management. Aside from the health benefits, unitising linked data to inform research and policy outcomes has potential to result in significant cost savings to delivery of outputs. In this session we will highlight some trailblazing population level linkage projects across the UK and demonstrate the impact these have had answering policy-relevant questions.

The Public Health Data Asset: a unique data source to inform policy and improve health

Vahé Nafilyan - Office for National Statistics

Using the Population Health Data Assess to assess population health outcomes in England

TBC - Office for National Statistics

Population Data Science: Using data to support research & impact on services and people

Ashley Akbari - Health Data Research UK Wales

Using linked health data to investigate the impacts of sub optimal covid vaccination

Chris Robertson - University of Strathclyde

Organised by Vahé Nafilyan & Isobel Ward for the Office for National Statistics

Methods & Theory

Recent developments in Nonparametric modal statistics

Queens Suite 2

Mean, median, and mode are three of most commonly and popularly used location measures and focus on different population characteristics. Each quantity has its own merit and complements each other. Built on the ideas of mean and median, mean regression and median regression are extensively investigated and popularly used to model the relationship between a dependent variable Y and covariates X . However, the research about the regression model built on the idea of mode is rather limited and has not received enough attention that it deserves partly due to its computational difficulty. Modal regression can complement mean/median regression and provide some other useful information that existing regression models might miss, especially for multimodal dataset or skewed. Modal regression can also be utilized as an alternative tool to achieve robust estimators. In this paper session, several authors who have built and developed new nonparametric modal regression related models will present their papers. Due to the wide applicability and the reliability of the modal regression models, this organized session can promote the applications of statistical methods and benefit scientists and researchers who want to analyze skewed or truncated data in fields that include economics, social sciences, marketing, medical studies, public health, biology, agriculture, and beyond.

Speakers:

Jeffrey S Racine - University of McMaster, Canada

Tao Wang - University of Victoria, Canada

Weixin Yao - University of California Riverside, USA

Yen-Chi Chen - University of Washington, USA

Organised by Tao Wang, University of Victoria, Canada

Official Statistics & Public Policy

Transforming the UK Travel and Tourism Statistics

Queens Suite 7

Following recommendations by the Office for Statistical Regulation in 2019, the Office for National Statistics conducted a review of their Travel and Tourism statistics with the view of transforming how those statistics are being produced to better meet the users' needs.

In this session, we will present the journey taken since the start of the travel and tourism statistics review. The session will focus on the transformations required to go from producing official statistics based solely on surveys to using a mix of administrative and third-party data. The speakers will cover the methodological challenges of deriving estimates from multiple sources, designing and combining surveys from different populations to derive single estimates or using innovative data science methods to improve spatial and temporal granularities. Importantly the team will share their journey through transforming an official statistic, highlighting the challenges faces and solutions found to meet the needs of our diverse users.

Overview of the transformation of the travel and tourism statistics programme

Dean Fletcher – Office for National Statistics, UK

Adapting the International Passenger Survey (IPS)

Katie Davies – Office for National Statistics, UK

Building on the GB Tourism Survey

Gareth Clews – Office for National Statistics, UK

Comparison across NISRA, Civil Service Aviation Authority and the IPS data

Andrew Arnott – Office for National Statistics, UK

The use of administrative data methods in the production of travel and tourism statistics will also be covered.

Organised by Camille Szymaragd Harrison for RSS Official Statistics Section

Day 2 Tuesday 5 September

11:40 – 13:00

Other Applications of Statistics

Energy, Sustainability and Statistics

Queens Suite 1

Significant recent global events have made us all very aware of where our energy comes from, the price it costs, and the amount we use. It is now critical that economies rapidly move towards more sustainable, green and cheap energy sources and build infrastructure that produces and supplies our future energy needs. Statistics has an ever-increasing role to play in energy, be it demand forecasting, infrastructure management, data driven energy policy, or sustainability in the nuclear industry. This session will explore state of the art statistical methods and as well as open research problems in this application area, one that has such a profound impact on all our day to day lives.

Supporting sustainability in the Nuclear Industry
Carolyn Pyke - National Nuclear Laboratory

Adaptive Methods for Short-Term Electricity Load Forecasting During COVID-19 Lockdown in France
Yannig Goud - EDF, France

Predictive analytics in low-carbon electricity systems
Jethro Browell - University of Glasgow:

Organised by Ed Cohen, Ayse Ulgen & Etienne Roesch

Professional Development

Debugging deciphered

Branham Suite, Crowne Plaza

The workshop will include four sections with hands-on examples in each section that participants can engage with in real-time.

We often write functions or modularise our codes to integrate a complex protocol with multiple steps. In this process, we use the outputs from one function as inputs to another function and execute the entire pipeline sequentially. While working in a team with multiple levels of contributions, it is unlikely that the complete pipeline will work seamlessly at the first instance.

This workshop will demonstrate the approach to debugging R script, primarily focussing on semantic errors. Using bite-sized examples, we will first discuss the fundamental building block of the R function: function arguments, global and local environments, and other essential function components. In the second section, we will investigate key R debugging tools like traceback, debug and browser and venture into the detective work to identify the bugs. The third section will extend the techniques to debug base R functions and functions in pre-installed R packages. In the final section, we will illustrate the application of similar principles in debugging Python scripts.

Participants are expected to be familiar with either R or Python. The principles of debugging and associated tools are similar in both programming environments; however, the workshop will mainly focus on R, with examples provided for both R and Python.

All instructions to install necessary programs and tutorial materials will be available online before the session.

Participants can follow and run scripts on their laptops during the workshop session.

Organiser & presenter: Mintu Nath - University of Aberdeen

Social & Wellbeing Statistics

Well-being statistics and their application to public policy

Queens Suite 9

This session will include a series of presentations showcasing the ONS's work in the well-being space and how this shapes and informs public policy. This will include updates on improvements to our existing statistical work and publications as well as new developments and novel methods to support emerging policy and the Department for Levelling Up and Housing Communities' (DLUHC) Levelling Up Missions & Metrics. Presentations will be followed by a panel discussion touching on progress made, lessons learnt and next steps to continue improving our data collection, dissemination, analysis, and interpretation of well-being statistics to inform social policy and provide Statistics for the Public Good.

Speakers:

Liz McKeown – Office for National Statistics

Eleanor Rees – Office for National Statistics

TBC - DLUHC

Jen Wallace - Carnegie UK

Robin Fry - North of Tyne Combined Authority

Organised by Rachel Joiner & Bella Beynon for the Office for National Statistics

13:00 – 14:00

Lunch

Hall D

Day 2 Tuesday 5 September

13:00 – 13:50

Networking

Young Statisticians Reception

Springfield mezzanine (off Hall D)

Come and meet the RSS Young Statisticians' Section and other statisticians over lunch.

Everyone welcome, of all ages, backgrounds and experiences!

13:20 – 13:50

Other

Your guide on how to complete a successful Honours and Award nomination - Honours Workshop

Queens Suite 6

The RSS will be hosting a workshop on how to write up a successful nomination form for RSS Honours and Awards. The workshop will have a member from the Honours Committee who will share tips and tricks and what the committee looks for in a successful nomination form. There will also be a tips and trick from a candidate who has written a successful nomination form.

Organised by Amirah Chaudry for RSS Honours Committee

14:00 – 15:20

Applications in Business, Industry & Finance

Statistical Engineering

Queens Suite 4

This session will draw together statisticians and engineers to explore the work of the Special Interest Group through rapid presentations followed by a panel discussion, drawing questions from the audience. By holding this session, we aim to increase the voice of statistics and encourage more groups both within and outside of the Royal Statistical Society to engage with engineers and technicians on the use of statistics.

Model-based Statistical Engineering for Digital Twins
Ron A Bates - Rolls-Royce plc, UK

Engineering Robustness - a brief history and future developments.
Tim Davis - UK

Reliability assessment of complex networks using strategically selected landmark nodes
Manuel Herrera - University of Cambridge, UK

Wicked problems need wicked models
Lesley Walls – University of Strathclyde, UK

Organised by Peter Keen for the RSS Statistical Engineering Special Interest Group

Communicating & Teaching Statistics

Statistical Anxiety: What is it, how do we measure it and what does this mean for our teaching?

Queens Suite 8

The session will give an overview of Statistical Anxiety, the measurement scales used and the problems associated with these scales. In addition the session will explore what teaching strategies can be used to address statistical anxiety.

Welcome to the jungle: Are statistics and mathematics anxiety measures tapping the same construct?
Jenny Terry – The University of Sussex

Statistics anxiety in online and distance learning
Carol Calvert – The Open University

Understanding and addressing stats anxiety
Ellen Marshall – Sheffield Hallam University

Organised by Rachel Hilliam, Andy Field & Craig Alexander for RSS Teaching Statistics Section



Day 2 Tuesday 5 September

14:00 – 15:20

Data Science

Surrogate-assisted uncertainty quantification of complex computer models

Queens Suite 7

Today, computer-based simulation models are widely employed in different scientific fields to aid our understanding of physical phenomena ranging from climate change to the response to COVID-19. A model is not a perfect representation of the real-world though, due to e.g., simplifying assumptions, missing physics, etc. Such discrepancy is dominated by uncertainties which can significantly influence the quality of model predictions. Uncertainty quantification (UQ) is a recent interdisciplinary science and is concerned with the characterisation, propagating, and reducing uncertainties in numerical models. UQ consists of techniques such as calibration, uncertainty and sensitivity analysis which help people in the process of decision making. However, conducting UQ analysis naively requires a huge number of model runs which is not affordable if the simulation is computationally expensive. One way to alleviate the computational burden is to approximate the complex computer code by a fast-to-evaluate surrogate model. Surrogates provide a statistical representation of computer models and are trained using a limited number of model evaluations. This topic session aims to highlight new research directions in surrogate-based UQ. The session provides an overview of UQ for numerical models followed by several talks addressing novel methods recently developed to tackle important problems in this area.

Bayesian Inverse Problems, Gaussian Processes and Markov chain Monte Carlo

Tianming Bai - University of Edinburgh, UK

From Linked Gaussian Process to Deep Gaussian Process Surrogates, and Back

Deyu Ming - University College London, UK

Gaussian process surrogate modelling and Bayesian inference of computer experiments of infrastructure earthwork deterioration

Aleksandra Svalova - Newcastle University, UK

Organised by Hossein Mohammadi & Ben Swallow

Environmental & Spatial Statistics

Analytics for Digital Earth

Auditorium

“Digital earth” is the name given to the vision of creating an interactive digital replica of the earth and using that to explore and understand relationships between the environment and society. The RSS Mardia Prize funded Analytics for Digital Earth project looks at how we can use analytics to understand the interaction between the physical, environmental, and social systems in the digital earth can help us understand the impact of the decisions we make and inform future policies. This session will discuss the key concepts around designing and analysing environmental digital twins, using two important examples to demonstrate these principals.

An Introduction to Analytics for Digital Earth

Claire Miller - University of Glasgow

Dynamic virtual ecosystems as a tool for detecting responses of biodiversity to environmental and land-use change

Richard Reeve - University of Glasgow

Assessing the probability of asset failure in extreme weather events across infrastructure networks via the CreDo digital twin

Kevin Wilson - Newcastle University

A summary of the Analytics for Digital Earth workshops

Vinny Davies - University of Glasgow

Organised by the Statistics and Data Analytics Group, University of Glasgow

Environmental & Spatial Statistics

Statistical modelling of environmental risks: waves, rainstorms and landslides

Queens Suite 5

Environmental risks are ubiquitous and growing in response to climate change. This session will cover three important and prevalent examples - waves, rainstorms and landslides - where a wide variety of novel statistical models can be used to reveal new insights from large observational datasets.

Statistical-based landslide hazard assessment: current challenges and opportunities

Daniela Castro-Camilo - University of Glasgow, UK

On trend estimation and testing with application to extreme rainfall

Claudia Neves - King's College London, UK

Storms and waves in the ocean: how to effectively capture rapidly-changing model parameters

Adam Sykulski - Imperial College London, UK

Organised by Adam Sykulski for RSS Environmental Statistics Section

Day 2 Tuesday 5 September

Medical Statistics

The old-new science of excess mortality

Queens Suite 3

Covid-19 has brought to the forefront the issue of excess mortality, which is an old concept that traces back to the establishment of demography, statistics and epidemiology as academic disciplines. Excess mortality necessitates the usage of official statistics or surveys as well as statistical and demographical knowledge and methods.

The panel will discuss recent developments, challenges, guidelines and communication methods in the field. Both in the context of Covid-19 and other possible applications such as climate change, conflict and more.

Panel members will include:

Lone Simonsen - Roskilde University

Prabhat Jha - University of Toronto

Sondre Solstad - The Economist

Oliver Watson - Imperial College London

Organised by Ariel Karlinsky, Hebrew University

Methods & Theory

Papers from the RSS Journals: Network analysis

Queens Suite 2

Network analysis is a powerful tool for understanding the structure and function of complex systems. It can be used to study a wide range of systems, including social networks, transportation networks, and biological networks.

The three papers specially selected by the joint editors of each series of the journal provide a chance to explore and illustrate how researchers are using tools to identify patterns and trends in the relationships between the entities in a network and understand how these relationships influence the behaviour of the system as a whole, using helpful applications where relevant.

Disentangling positive and negative partisanship in social media interactions using a coevolving latent space network with attractors model

Xiaojing Zhu - Boston University, USA

Identifying the latent space geometry of network models through analysis of curvature

Tyler McCormick - University of Washington, Seattle, USA

Multiscale null hypothesis testing for network-valued data: Analysis of brain networks of patients with autism

Alessia Pini - Università Cattolica del Sacro Cuore, Milan, Italy,

Aymeric Stamm - J. Leray, UMR CNRS, Nantes, France, &

Simone Vantini - Politecnico di Milano, Milan, Italy

Organised by Judith Shorten, RSS Journals Manager

Other Applications of Statistics

Innovative uses of statistics and data science

Queens Suite 1

Conflict Forecast

Christopher Rauh - University of Cambridge

Predicting the impacts of earthquakes on a global scale

Hamish Patten - International Federation of Red Cross and Red Crescent Societies (IFRC), & University of Oxford

Monitoring and predicting population displacements from mobile phone usage data

Galina Veres - Flowminder Foundation

Organised by Phil Crook for RSS International Development Section

Professional Development

Making Maps! Visualising spatial data in R

Branham Suite, Crowne Plaza

Maps can be a powerful way to communicate your research to wider audiences. Traditionally, you would need to use a specific geographic information system (GIS) tool for mapping. R is now a widely used open source software platform for working with spatial data thanks to its powerful analysis and visualisation packages.

In this workshop, you'll learn the fundamentals of working with geospatial data in R. You'll create high-quality, informative maps - that look great too!

If you want to participate in the exercises, please bring a laptop to the session. There is no need to install anything in advance. Some basic prior knowledge is helpful but not essential for attending this session.

Organised and presented by Rhian Davies for Jumping Rivers

Day 2 Tuesday 5 September

14:00 – 15:20

Social Statistics

Measuring Child Well Being before and after Covid: Data, measurement issues and outcomes

Queens Suite 9

Using Data from the UK Data Service to Measure Children's Well-Being
Alle Bloom - UK Data Service

Measuring Well-Being in Early Childhood Using Linked Hospital and Education Data

Katie Harron - University College London

Measuring School Readiness and Inequalities in Child Development in England

Ana Morales - University of Sheffield

Children's Well-Being in Scotland

Patricio Troncoso - University of Glasgow

Education Outcomes and Disadvantage Gaps in the UK

Emily Hunt - Education Policy Institute

Findings from the #BeeWell Programme: Measuring Young People's Wellbeing in Greater Manchester

Devi Khanna - University of Manchester

Organised by Kingsley Purdam, University of Manchester

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[#RSS2023Conf](https://twitter.com/RSS2023Conf)

22

15:30 – 16:20

Rapid-fire sessions

All Queens Suite Rooms

The following talks are expected to be presented – the final listing and allocation to rooms will be available on the online programme and the conference app.

Estimating prevalence of opiate and crack cocaine use in England
Abdelmajid Djennad - UK Health Security Agency, London, UK

Defining a control group to identify "at-risk" populations using electronic health records

Emma Pritchard - University of Oxford, UK

Investigating the influence of vaccine dose and prior M.tb exposure on antigen-specific T cell responses using Generalized Linear Mixed Models

Kelly A Williams - University of Cape Town, South Africa

Who is the greatest? A Bayesian analysis of one-day international male cricketers

Pete Philipson - Newcastle University, UK

Nonparametric detection of changepoint in financial data: A kernel-based approach

Archi Roy - Indian Institute of Science Education and Research, Pune, India

K-prototype clustering to identify patterns using the Covid-19 data hub
Ayse Ulgen - Nottingham Trent University, UK, & Girne American University, Karmi, Cyprus

ChatGPT: Navigating the next frontier of evidence synthesis

Kunaal Dhingra - All India Institute of Medical Sciences, New Delhi, India

From A to Xbox: A Data Scientist career in Games

Emmanuelle Rodrigues Nunes - Microsoft, Reading, UK

Using Data Science tools and techniques in partnership with Lean Six Sigma

John C English - GSK, London, UK

The classification of heart disease indicator data: a k nearest neighbor (KNN) approach

Serifat Adedamola Folorunso - Teesside University, Middlesbrough, UK

Assessing causality in 10 year analysis of reducing stillbirth rates in England

Oliver Hugh - Perinatal Institute, Birmingham, UK

Use of Microsoft Power BI to display pregnancy related performance statistics within NHS trusts

Oliver Hugh - Perinatal Institute, Birmingham, UK

A better targeted shrinkage estimator for multivariate random variables

John D Lamb - University of Aberdeen, UK

A Spatial Point Process Model for the Analysis of Glaucoma

Jonathan Henderson - Queen's University, Belfast, UK

Dickey-Fuller type test for Moving Average Unit Root

Ryota Yabe - Shinshu University, Nagano, Japan

Egg, sperm and embryo donation: Assessing the impact of policy decisions on patients and donors

Elliot N Bridges - Human Fertilisation and Embryology Authority, London, UK

Modelling biodiversity and land use in Great Britain: an online tool for the policy maker and the public

Owen M Nicholas - University College London, UK

Mathematics anxiety and its impact on learning experience of statistics and research methods

Meena Mehta Kotecha - London School of Economics (LSE), UK

A consistent way to define p-values

Paul Wilson - University of Wolverhampton, UK

A comparative evaluation of covariate adjustment in current practice and simulation studies in the biomedical literature

Jacqueline Y Thompson - University of Birmingham, UK

Day 2 Tuesday 5 September

Two-stage imputation of systematic missing effect modifiers in prospective meta-analysis of individual time-to-event outcomes
Nicola Orsini - Karolinska Institutet, Stockholm, Sweden

Approximate Bayesian algorithm for tensor robust PCA using relative entropy
Andrej Srakar - Institute for Economic Research, Ljubljana, & University of Ljubljana, Slovenia

Statistics in the online gaming world: how to keep calm and carry on
Aleksandrs Gehsbargs - Product Madness, London, UK

An introduction to programming a patient level simulation (PLS) in R for health technology assessment
Joe W. E. Moss - York Health Economics Consortium, UK

Statistical assessment of the war in Ukraine since 2022
Timothy M Hill - UK

Using Digital Trace Data to Generate Representative Estimates of Disease Prevalence [COVID-19 Infections] in Belgian Municipalities
Dishani Sen - KU Leuven, Belgium - & Roberto Cerina - Maastricht University, Netherlands

Differentials in key health risk factors between five post-war generational cohorts of working age, England
Madhavi Bajekal - UCL, London, UK

Data wrangling recipes in R: software online resources structured around the workflow to prepare data for analysis
Hilary Watt - Imperial College, London, UK

Accelerating and enhancing the generation of socioeconomic data to inform forced displacement policy and response
Patrick M Brock - World Bank UNHCR Joint Data Center, Copenhagen, Denmark

Fusing areal and point level data to map childhood vaccination coverage
Chigozie Edson Utazi - University of Southampton, UK

An external validation of the Kidney Donor Risk Index in the UK transplant population in the presence of semi-competing events
Stephanie Riley - University of Plymouth, UK

Creating new visualisations using User Centred Design: The development of the mental health services monthly statistics time series Power BI
David Fisher - NHS England, Leeds, UK

Develop automated exceedance detection algorithm for emerging infectious disease threats
Jiao Song - Public Health Wales, Cardiff, UK

A multilevel spatial model to assess the relationship between local identity and swing to the Conservative Party in the 2019 UK general election
Kevin Horan - Maynooth University, Ireland

The Missing Data: understanding complex datasets, identifying and recovering "lost" data.
Tom Poupart - NHS England, Leeds, UK

The role of ordering in Causal Inference
Kai Z The - UCL, London, UK

An illustration and comparison of three methods for predicting cumulative live birth in couples having in vitro fertilisation treatment
David J McLernon - University of Aberdeen, UK

The Financial Impact of War on Cryptocurrencies
Stephen Chan - American University of Sharjah, UAE

Empirical analysis of illicit transaction on Blockchain network
Yuanyuan Zhang - University of Manchester, UK

Impact of the COVID-19 Pandemic on the Predictability of Credit Default Swap Spreads of US Companies
Kirill Romanyuk - HSE University, St Petersburg, Russian Federation

Inference in Medical Cost Effectiveness Analysis with Heavy Tailed Data.
Eduardo Fe - University of Manchester, UK

Explaining Mathematical and Data Science Related Techniques for Wider Audiences
Vicky J Crockett - QA Ltd, London, UK

Sequential Detection of Emergent Anomalies in Functional Data
Edward Austin - Lancaster University, UK

A new age-period-cohort model for mortality projections in the UK: analysis of the model and its sensitivity to changing circumstances.
Gauthier Dulout - Office for National Statistics, London, UK

A Novel Approach to Spatially Indexed Functional Data Analysis
Luke A Barratt - DPMMS, University of Cambridge, UK

Assessing reliability of binary measurements under different assumptions by extending the intraclass correlation coefficient
Andrew Trigg - Bayer plc, Reading, UK

Long-term inequality measurement - Dealing with multidimensionality, uncertainty and responsibility
Simon G Haastert - University of Münster, Germany

Regime Switching Models for the Outbreak Detection of Epidemics
Jordan J. Hood - Lancaster University, UK

Anchoring follow-up in trials of surgical interventions: Current practice and recommendations for future trials
Ines Rombach - University of Sheffield, UK

Scalable Diagnosis Prediction from Electronic Health Records using Disease Code Embeddings and Bidirectional Recurrent Neural Networks
Robert Grout - Accenture, London, UK

Application of chemometrics and machine learning methods to herb and spice fraud detection.
Stephanie Beck - Bia-Analytical, Belfast, UK

Day 2 Tuesday 5 September

16:20 – 16:50

Refreshment break

Hall D

16:50 – 17:50

Plenary

Keynote 3: Champion (President's Invited) Lecture - A tour through evidence based public health policy, communication of data and the role(s) of the scientist

Auditorium

Christina Pagel – University College London, UK

Throughout the Covid-19 pandemic I ended up doing a lot of analysis of many different types of Covid data from the UK and elsewhere and then communicating that data to the public, through online live briefings, print and broadcast media and Twitter. In this talk I will: reflect on the system level policy challenges that I have observed and where data and statistics helped or did not; what I have learned about communication of science across different media; and how I have made sense of my role as a scientist and communicator.

17:50 – 18:15

Plenary

Royal Statistical Society Awards Ceremony

Auditorium

Each year the Society awards medals and prizes to people who have made outstanding contributions to the development of statistics.

During this ceremony the Society President Andrew Garrett will welcome this year's recipients to receive their medals and prizes.

The list of recipients can be viewed here.

<https://rss.org.uk/news-publication/news-publications/2023/general-news/announcing-our-honours-recipients-for-2023/>

18:15 – 20:00

Networking

Awards & Poster Reception

Hall D

Sponsored by



Celebrate the success of the award winners and take the opportunity to view this year's poster presentations and chat to the presenters.

At the time of going to print the following posters were due to be presented – please refer to the online programme and the conference app for the latest list.

Timely Predictions of Capital Flow Episodes

Shaoni Nandi - King's College London, UK & Reserve Bank of India, Mumbai, India

Fanning out of earnings profiles

Friederike Schmal - University of Münster, Germany

Teaching confidence intervals: strategies designed to enhance conceptual understand and to guard against the most serious misconceptions

Hilary Watt - Imperial College, London, UK

Improving taxa abundance estimations between similar species and its impact on metagenomics analyses

Elizabeth Y Yuu - Hasso Plattner Institute, Potsdam, Germany

How to Publish a Statistics Book

Rob Calver - Taylor & Francis Group, Oxford, UK

High Dimensional Functional Data Analysis via Algebraic Geometry

Leonard Mushunje - Columbia University, New York, USA

Progressing Analytical Quality Assurance within a Government Department

Helen Pennington - Home Office, London, UK

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Bayesian design and analysis of two-arm cluster randomised trials using assurance

Kevin J Wilson - Newcastle University, UK

Functional Data Analysis for Time-varying Networks

Puchong Paophan - University of Leeds, UK

Aircraft noise exposure effects on Diabetes, Obesity, and Waist circumference: long-term analysis in the UK Biobank cohort, 2006-2022

Glory O Atilola - Imperial College London, UK

Locally adaptive Bayesian modelling for medical image reconstruction

Muyang Zhang - University of Leeds, UK

Towards Advanced Image Processing: A Multidimensional Analysis Framework via 3D Deep Learning

MD Abu Sufian - University of Leicester, UK

Spatial statistical analysis for large biological 3D datasets

Chang Liu - Maynooth University, Ireland

Quantile-parameterized priors and posterior passing

Dmytro Perepolkin - Lund University, Sweden

Fast Estimation for Generalised Joint Models of Survival and Multivariate Longitudinal Data

James Murray - Newcastle University, UK

Stop. Search. Decide. Act. How can we evaluate screening policies?

Jane L Hutton - The University of Warwick, Coventry, UK

Advancing Functional Linear Mixed-Effects Regression Models for Complex Data via Variational Bayes Approximation

Azizur Rahman - University of Manitoba, & Government of Manitoba, Winnipeg, Canada, and Jahangirnagar University, Dhaka, Bangladesh.

Projecting Spanish fertility at Regional level: A Hierarchical Bayesian Approach

José Rafael Caro-Barrera - University of Córdoba, Spain

A Generalization of the Correlated Random Effects for non-ignorable missingness

Hanadi Alzahrani - University of Glasgow, UK

Multiple testing in genomic sequences using Hamming distance

Joonsung Kang - Gangneung-Wonju National University, Republic of Korea

Bayesian meta-analysis for evaluating treatment effectiveness in biomarker subgroups using trials of mixed patient populations

Lorna Wheaton - University of Leicester, UK

How extreme? Contextualising the December 2022 freeze-thaw event for the UK water sector.

Isabel Rushby - Met Office, Exeter, UK

Systematic review protocol: Association of immunosuppressive agents with malignancy following kidney transplantation

Josh L Gray - Plymouth University, UK

Learning Bayesian network classifier structures from right censored data: a simulation study.

Alexander Rudge - University of Bath, UK

Sensitivity Analysis of the chest wall marker placement for a 3D motion capture-based method of diagnosing breathing pattern disorder.

Nayani Adhikari - Loughborough University, UK

Counterfactuals for Subjective Wellbeing Panel Data: Integrated Application of Statistical Ensemble and Machine Learning Methods

Jerry Chen - University of Cambridge, UK

Cardiovascular and bone health outcomes in elderly subclinical hypothyroid patients: a systematic review and meta-analysis.

Mia Holley - University of Sunderland, UK

Facilitating academia-industry collaborations to enhance health data science research and education

Yinghui Wei - University of Plymouth, UK

Association of age at first birth and hypertension among females: Some evidence from India

Sachin Kumar - University of Aberdeen, UK

Improved parameter estimates for power calculations in education trials.

Akansha Singh - Durham University, UK

Metformin-induced vitamin B12 deficiency: A genome-wide association study using the UK Biobank

Faye D Baldwin - University of Liverpool, UK

Meta-analysis: ancillarity properties of old and newer methods

Richard J Stevens - University of Oxford, UK

Bayesian multilevel M-spline hazard functions in survival analysis: application to kidney transplantation

Lingling Zhang - University of Plymouth, UK

Reducing Mathematics Anxiety by Enhancing Mathematical Resilience – A Mindset Intervention.

Meena Mehta Kotecha - LSE, London, UK

Assessing regional variation and time trends in incidence of major lower extremity amputation in England

Anna Meffen - University of Leicester, UK

Survival Extrapolation for Cost-Effectiveness Analyses of Oncology Treatments using Multi-State Models

Joseph E Price - Lancaster University, UK

Simulation Studies in Practice: Addressing the Communication Challenges to Facilitate Effective Collaboration with Scientific Colleagues

Karen L Smith - ICON plc, Reading, UK

Joint Modelling of Survival and Longitudinal Stroke Data with Missing Values

Rachel A Appleton - Lancaster University, UK

An influence network construction from a discrete time-series of count data generated by a multi-dimensional Hawkes process

Naratip Santitissadeekorn - University of Surrey, Guildford, UK

An unsupervised approach to understanding the underlying structure in cloud optical thickness data

Michael Eastman - Met Office, Exeter, UK

Modelling student exam performance through latent class analysis

Paul Edwards & Sarah Jackson - STFC Hartree Centre, Daresbury, UK

Assessing agreement between self-reported difficulties in vision and clinically measured visual impairment among those aged ≥ 50 : a multi-country analysis

Anita Jeyam - Sightsavers, Haywards Heath, UK

Unleashing Online Experimentation Success: Statistical Solutions for Overcoming Challenges and Achieving Reliable Results

Hesty Dewi Maria Siagian - The University of Sheffield, UK

Simulation Study on the Impact of an increase in Late Patient Drop Out in a Long Term Study

Marion Procter & Faye Samy - Frontier Science (Scotland) Ltd, UK

Determining the relationship between the presence of vegetation and the spread of canine visceral leishmaniasis in Camaçari, Bahia State, Northeastern Brazil

Freya N Clark - Lancaster University, UK

The Relationship Between Undergraduate Students' Mathematics

Anxiety and Motivation to Learn Mathematics: A Mixed Method Study
Meena Mehta Kotecha - The London School of Economics and Political Science, UK

Design and Analysis of Diagnostic Accuracy Studies for Multiplex Tests

Cameron J Williams - Newcastle University, UK

Generative Modeling of Extremes with Normalizing Flows

Yan Gong - Imperial College London, UK

Methodologies for the emulation of target trials using observational data: a systematic review

Faye D Baldwin - University of Liverpool, UK

Utility of Cardiovascular Risk Scores in Identifying Coronary Artery Disease in Observation-Zone-Patients with Chest Pain.

Daniel Perez Vicencio - University of Edinburgh, UK

Food labelling. An experiment to assess consumer choices

Constanza Avalos - University of Manchester, UK

The use of routinely collected data for RCTs

Alice-Maria Toader - University of Liverpool, UK

Optimal diagnostic threshold selection in two-group classification with ordinal outcomes using nonparametric predictive inference

Abdulmajeed A Alharbi - Durham University, UK & King Saud University, Riyadh, Saudi Arabia

Patterns in access to and care received from NHS dental practices in England

Caroline Keef - NHS England, Leeds, UK

Accommodating changes in small area boundaries into spatio-temporal health models

Luisa A Parkinson - University of Edinburgh, UK

Enhancing Metabolomics Research with Zero-Inflated Factor Analysis: A Novel Approach for Analyzing Non-Quantified Measurements in Anthocyanin Studies

Diego Alejandro Tovar-Rios - Center for Age-Related Medicine, Stavanger, & University of Stavanger, Norway

A difference in difference method for multiple areas and years to evaluate badger culling to reduce bovine tuberculosis in English cattle
Colin P.D. Birch - APHA, Weybridge, UK

The Impact of Food Insecurity, Household Wealth, and Maternal Education on the Optimal Number of Cluster of Malaria, Anaemia, and Malnutrition among children

Phillips Edomwonyi Obasohan - University of Sheffield, UK & Niger State Polytechnic, Nigeria

Infinite-dimensional information geometry for statistics

Masayuki Henmi - The Institute of Statistical Mathematics, Tokyo, Japan

Modelling Cause-Specific Mortality Probabilities: An Application of Multinomial Logistic Regression

Daniel Cernin - University of Southampton, UK

Using Digital Trace Data to Generate Representative Estimates of Disease Prevalence [COVID-19 Infections] in Belgian Municipalities
Dishani Sen - KU Leuven, Belgium - & Roberto Cerina - Maastricht University, Netherlands

Statistical assessment of the war in Ukraine since 2022

Timothy M Hill - UK

An introduction to programming a patient level simulation (PLS) in R for health technology assessment

Joe W. E. Moss - York Health Economics Consortium, UK

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Andrew Trigg - Bayer plc, Reading, UK

Long-term inequality measurement - Dealing with multidimensionality, uncertainty and responsibility

Simon G Haastert - University of Münster, Germany

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Anchoring follow-up in trials of surgical interventions: Current practice and recommendations for future trials
Ines Rombach - University of Sheffield, UK

Scalable Diagnosis Prediction from Electronic Health Records using Disease Code Embeddings and Bidirectional Recurrent Neural Networks
Robert Grout - Accenture, London, UK

Application of chemometrics and machine learning methods to herb and spice fraud detection.
Stephanie Beck - Bia-Analytical, Belfast, K

Poster prizes have been sponsored by:

1st Prize

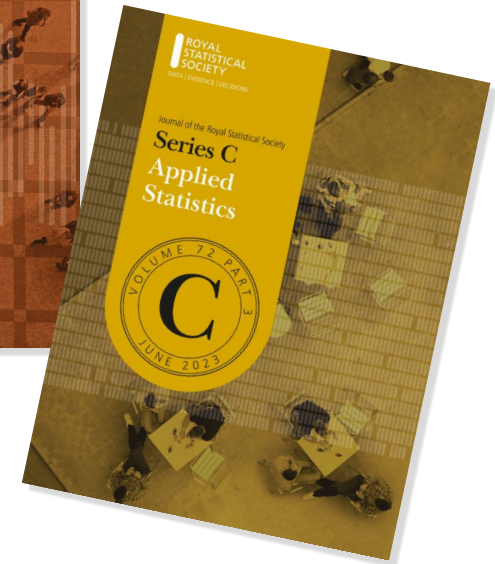
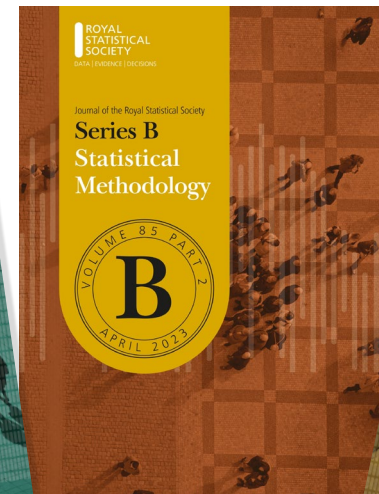
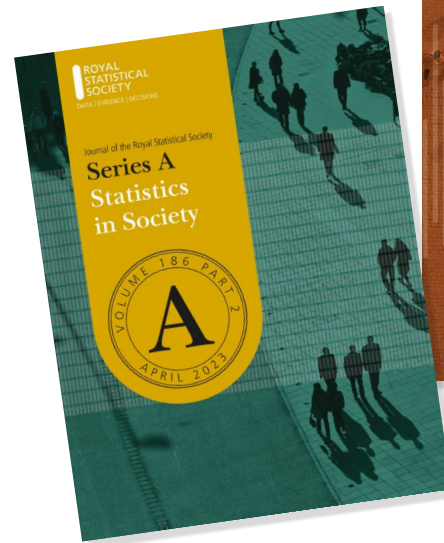


2nd & 3rd prizes



Winners will be announced at the conference dinner.

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Day 3 Wednesday 6 September

08:30 – 09:00

Refreshment Break

Hall D

09:00 – 10:20

Applications in Business, Industry & Finance

Knowledge Transfer Partnerships: Applications of Statistics in Business

Queens Suite 6

This session will present the new statistical work being undertaken in businesses as part of Knowledge Transfer Partnerships (KTPs). These partnerships between universities and businesses aim to help academic expertise find its way into the business world, to help solve a novel, real world business problem.

Scene understanding for virtual live sports advertising: challenges and solution

Vivek Singh - Oxford Brookes University, & KTP Associate, Supponor, UK

Creating better social value for evidence based decision making in sustainable places

Cara Mulholland - University of Reading, & Stantec, Manchester, UK

Data engineering for project cost prediction in the construction industry

Rithwik Shetty – Gleeds & University of Nottingham, UK

Organised by Neil Spencer for RSS Business & Industrial Section

Communicating & Teaching Statistics

Statistics and the so-called "reproducibility crisis"

Auditorium

The stark realisation that scientific results do not always readily replicate has led some to investigate the root causes of the so-called "reproducibility crisis". Such self-critical appraisal, in academic disciplines like Psychology and Neuroscience, typically highlight statistical issues, like inadequate statistical designs, as well as poor computational training; problems that are only likely to worsen as data grow larger, become more widely shared, and advanced techniques are imported from fields of engineering, like machine learning.

The session aims to raise awareness of the wide range of issues related to statistics in the reproducibility crisis, where these issues sit in what is a systemic problem, consequences and discuss solutions. In collaboration with the UK Reproducibility Network (<https://ukrn.org>), we are proposing the organisation of a dedicated working group within the RSS to support members, sections and projects. We will use the discussion part of the session to establish priorities.

Speakers:

Etienne Roesch (Chair) - Secretary of RSS Emerging Applications Section, University of Reading & UK Reproducibility Network

Andrew Garrett - RSS President

Altea Lorenzo - RSS Council

Jil Matheson - UK Committee on Research Integrity

Gabriela Gomes - University of Strathclyde

Organised by Etienne Roesch for RSS Emerging Applications Section and Tom King for RSS Data Ethics and Governance Section

Communicating & Teaching Statistics

Activities to reach a broader audience: RSS Ambassadors' tips for communicating statistics

Queens Suite 4

Science communication is important. It allows us to raise awareness, build knowledge, fight misinformation, and make science accessible and interesting to the wider public and non-statistical audiences. However, talking about your work, research, or statistics in general to non-statisticians definitely doesn't come naturally to everyone. Luckily, the RSS Statistics Ambassadors are on hand to help you develop and practice your science communication skills to reach a broader audience.

The RSS Statistical Ambassadors have been trained to engage in science communication and engage with statistical discussions with the media, schools and wider public. In this interactive session, the ambassadors will provide advice and top tips, and get you involved in activities to build and practice your science communication skills.

Organised by Lucy Teece for RSS Statistical Ambassadors

rss.org.uk/conference2023

[#RSS2023Conf](https://twitter.com/RSS2023Conf)

Data Science

Evaluating AI: How data science and statistics can shape the UK's AI strategy

Queens Suite 8

The launch of ChatGPT less than a year ago is a milestone moment in the story of artificial intelligence. Overnight, large language models were transformed from research projects into consumer products, now used by hundreds of millions each month. The capabilities are impressive, the productivity gains undeniable. But, what of the downsides? These are issues societies, governments, and individuals are now starting to reckon with.

In March 2023, the UK government published a white paper promising a “pro-innovation approach” to AI regulation, while also acknowledging the risks AI poses to “people’s privacy, their human rights or their safety” and “concerns about the fairness of using AI tools to make decisions which impact people’s lives”. The Royal Statistical Society, in response, has called for investment in a centre for AI evaluation methodology, arguing that users of AI systems should be able to judge the trustworthiness of claims made by AI companies as well as the outputs of their systems.

What should AI evaluation look like? How will it work in practice? What metrics are most important, and – crucially – who gets to decide this? Join us for a special panel debate at the RSS International Conference 2023, where these questions, and more, will be discussed.

Organised by Brian Tarran for realworlddatascience.net

Medical Statistics

Electronic health records - a good target?

Queens Suite 3

Nearly 90% of hospitals in England are now using electronic systems to support their health care, including detailed electronic health records which capture information about a patients’ care during their hospital stay, all clinical observations and all treatment received. This rich source of data provides amazing opportunities for research. Currently accessing the data is not straightforward and many aspects of infrastructure for accessing the data and reporting guidelines are not yet suitable for EHR based research. These systems need to be streamlined and fit for purpose. In order to ensure that results and associated inferences/conclusions are taken seriously our research needs to be robust and use appropriate causal approaches.

In this session speakers will provide useful summaries of different approaches, as well as explore the challenges and opportunities of working with data from EHRs. We will provide a series of short activities between the talks and the panel discussion to enable participants to think about questions for the panel discussion. The session will conclude with a panel discussion where speakers will answer questions from delegates about the different, but possibly complementary approaches.

Panning for gold - Introduction to challenges and opportunities of research with data from EHRs in UK Hospitals

Kate Honeyford

Iterative Research with EHRs

Paul Expert

Target Trials – causal research with EHRs

Nick Latimer

Short workshop activity - facilitated by Dr Honeyford

Panel Discussion – How do we move towards high quality research using EHRs?

Organised by Kate Honeyford & Ceire Costelloe for RSS Medical Section

Methods & Theory

An introduction to expert knowledge elicitation

Queens Suite 2

The elicitation of judgements from experts to define probability distributions is widely used across science, engineering and medicine; to form prior distributions for Bayesian analysis, to express the knowledge, and uncertainty, of an individual or group for uncertainty quantification, decision support, prediction or risk assessment. One key application of elicitation is as an assessment of the uncertainty on the input parameters to a model, to allow assessment of the uncertainty on a set of model outputs.

In this session, four speakers will introduce concepts, principles, and methods for structured elicitation of the knowledge of experts to define a subjective probability distribution. They will cover how to elicit the judgements of a single expert, how to combine the knowledge of a group of experts and the resources available to help statisticians (and others) to plan and conduct an expert knowledge elicitation themselves.

This session will be followed by the session “Applications of Expert Knowledge Elicitation”.

Essentials of expert knowledge elicitation
John Paul Gosling - Durham University, UK

A guide for developing a protocol for Expert Knowledge Elicitation
Ullrika Sahlin - Lund University, Sweden

A Comparison of Aggregation Methods for Elicitation
Cameron Williams - Newcastle University, UK

Organised by Kevin Wilson, Newcastle University

Day 3 Wednesday 6 September

09:00 – 10:20

Official Statistics & Public Policy

Recognising excellence in official and non-official statistics

Queens Suite 7

As statisticians both in and outside of government have faced an unprecedented demand for data over the last few years, it has never been more important to celebrate and award good practice. In this session, co-chaired by Sir Robert Chote (chair, UK Statistics Authority) and Ed Humpherson (director general, Office for Statistics Regulation), you will hear from the 2023 winning teams for the Champion Award for Excellence in Official Statistics and the Trustworthiness, Quality & Value Award and from the award sponsors, UKSA and OSR on what they look for in a winning project.

Our 2023 Champion winners, the Department for Education school census statistics team will discuss “The pupil attendance data journey - from termly to daily data; how we got here, what we publish and what we've learned.” which looked to combat the unknowns around pupil attendance - an ongoing issue since the pandemic.

Fable Data, our TQV winners will outline the work that has gone into their ‘Data for good programme’ - providing pro bono granular datasets for government bodies, academics and national statistical offices, to be available for research and policymaking for the creation of new economic indicators.

Organised by Mags Wiley, Royal Statistical Society

Other Applications of Statistics

Women's World Cup 2023 predictive analysis competition winners

Queens Suite 9

To celebrate FIFA Women's World Cup 2023, the RSS Statistics in Sport Section ran an open competition to predict the outcomes of each match. The goal of the competition was for teams or individuals to make probabilistic predictions of the outcome of all matches in the tournament. Predictions were made for all possible matches before the start of the tournament. The two entries with the best log-score, along with a third entry chosen by the judging panel based on the methodology used, will present their work in this session. This will be followed by a panel discussion with the competition winners and Milt Mavrakakis from Smartodds, the sponsors of the competition.

Organised by Jessica Hargreaves for RSS Statistics in Sport Section

Other Applications of Statistics

Statistics and the Law: challenges and opportunities

Queens Suite 1

We aim to highlight the opportunities for statisticians to participate in the world of law. The talks in this session will be of general interest to a wide range of conference participants, with an emphasis on the following three things. Firstly, the opportunities for statisticians to get themselves involved in academic research in law. Secondly, examining the potential for statistical experts to have input into court cases (with due regard to the controversies of the past). Thirdly, critiquing the impact of various projects that have promoted statistical competence within the law.

The general theme of the session is optimism about the opportunities for statisticians to contribute to research about statistics and the law.

Statistics in the legal academic literature: opportunities to collaborate in generating and reviewing legal research

Ian Hunt - University of Tasmania

Pseudo-mathematics?

The Hon. Mr Justice Mostyn - Royal Courts of Justice

Data First: Harnessing the potential and unblocking the challenges of linking administrative data across the justice system

Georgina Eaton and Kylie Hill - Ministry of Justice

Followed by a roundtable discussion

Panellists:

Ian Hunt

Nicholas Mostyn

Georgina Eaton,

Kylie Hill

Jane Hutton

Discussion addressing several questions and issues posed (via mail) from key researchers in the field of statistics and the law. And a chance for the panel to answer questions from the floor.

Organised by Jane Hutton and Ian Hunt for RSS Statistics and the Law Section

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Day 3 Wednesday 6 September

Professional Development

Secrets for securing research funding

Branham Suite, Crowne Plaza

Securing funding for your research work is a crucial skill for researchers.

Writing applications is just the tip of the iceberg – many soft skills and actions are needed (such as identifying suitable funding opportunities, assessing your likelihood of success) in order to write an efficient and effective funding application.

This session will set out key considerations for Early Career Researchers (ECRs) in relation to securing funding for your research and help you to develop and implement your own research funding strategy.

Organised by Zexun Chen and Joy Leahy for RSS Young Statisticians Section

09:00 – 12:00

Environmental & Spatial Statistics

Using R for Bayesian Spatial and Spatio-temporal health modelling (workshop)

Queens Suite 5

R is commonly used now for advanced Biostatistical applications. Bayesian spatial and spatio-temporal modeling of health data is an important topic which can be addressed using tools in R. This course is designed for those who want to cover mapping methods, and the use of a variety of software and variants in application to small area health data. The course will include theoretical input, covering selected Bayesian spatial models, but also practical elements and participants will be involved in hands-on in the use of R, and Nimble, in disease mapping applications. Both spatial as well as simple space-time modelling will be covered. Examples will range over county level respiratory cancer incidence (spatial and spatio-temporal) and Covid-19 space-time modeling. The course would be suitable for those with some R experience, but who have limited experience of spatial modeling in health applications.

Organised and presented by Andrew B Lawson, Department of Public Health Sciences, Medical University of South Carolina, USA & Usher Institute, College of Medicine, University of Edinburgh, UK

10:20 – 10:50

Refreshment break

Hall D

10:50 – 11:50

Professional Development

Statisticians for Society

Branham Suite, Crowne Plaza

In this session, speakers will cover details of the Statisticians for Society initiative, in addition to new opportunities within the scheme. You will also hear about volunteering internationally from one of our international members.

Organised by Emma Lawford for Statisticians for Society

Applications in Business, Industry & Finance

Contributed: Modelling of sustainable products and risk management

Queens Suite 6

Leak detection for hydrogen gas: atmospheric dispersion and optimal sensor placement

Rakesh Paleja - Shell Research, London, UK - & Matthew J Jones - Shell Research, Amsterdam, Netherlands

Project Risk Management Modelling and Statistics

Michael Bond - IRIS Intelligence, Bath, UK

Enhancing Sustainability in Foam Mattress Production: A Circular Economy Approach using Design of Experiments and Linear Modelling
Stephanie J Lucas - Shell, London, UK

Day 3 Wednesday 6 September

10:50 – 11:50

Communicating & Teaching Statistics

Contributed: Interactive Teaching of Statistics

Queens Suite 1

Teaching statistics interactively with webR
Nicola Rennie - Lancaster University, UK

An interactive application to motivate statistical thinking in frequentists and Bayesian inferential frameworks
Mintu Nath - University of Aberdeen, UK

Comparing Student Evaluations of Hybrid (i.e., Online + Face-to-Face), Online, and Face-to-Face Short Courses in Statistics
Chibueze Emmanuel Ogbonnaya - University College London, UK

Data Science

Contributed: Health applications of Data Science

Queens Suite 9

Machine learning in epidemiology: what the COVID-19 pandemic taught us.
Roger Morbey - UKHSA, Birmingham, UK

Accessing and analysing large primary care data
Erin Barker - York Health Economic Consortium, UK

Standardization over disease risk score versus propensity score for confounding control when using random forests for model fitting
Yi Li - McGill University, Montreal, Canada

Medical Statistics

Contributed: Time-to-event

Queens Suite 2

survextrap: a new model and software for flexible and transparent extrapolation of survival data to inform health policy
Christopher H Jackson - MRC Biostatistics Unit, University of Cambridge, UK

Cutting the Gordian knot: Partitioned analysis of self-controlled case series studies of non-rare recurrent events
Kenneth Menglin Lee - Duke-NUS Medical School, Singapore

Multiple State Analysis, a clustering approach to Multiple Time-to-Event Data: Application to multimorbidity associated with Stroke
Marc Delord - King's College London, UK

Medical Statistics

Contributed: Missingness and under-representation

Queens Suite 3

Conditional quantile imputation for systematically missing discrete predictors in individual participants data meta-analysis
Robert Thiesmeier - Karolinska Institutet, Stockholm, Sweden

Handling Missing Values in Healthcare Settings
Ali A Septiandri - University College London, & Nokia Bell Labs, Cambridge, UK

Shining a gender lens on medical statistics
Mark Woodward - Imperial College London, UK & UNSW, Sydney, Australia

Methods & Theory

Contributed: Design and inference with unobserved confounding

Queens Suite 8

Joint mixed-effects models for causal inference under contextual confounding in network-based observational studies
Vanessa McNealis - McGill University, Montréal, Canada

Design Sensitivity and Its Implications for Weighted Observational Studies
Samuel D Pimentel - University of California, Berkeley, USA

On Sparsity in Staged Trees and Chain Event Graphs
Conor Hughes - University of Warwick, Coventry, UK

Official Statistics & Public Policy

Contributed: International perspectives

Queens Suite 7

Estimation of daily smoking prevalence for disaggregated statistical areas in Australia
Alice Richardson - Australian National University, Canberra, Australia

Estimating the population size of drunk-drivers in Poland using heterogeneous one-inflation and hurdle-like approach in single source capture-recapture studies
Piotr Tomasz Chlebicki - Adam Mickiewicz University, Poznań, Poland

Official statistics that serve the public good
Sofi Nickson - Office for Statistics Regulation, Newport, UK

Day 3 Wednesday 6 September

Other Applications of Statistics

Contributed: Football: Players, referees and home advantage Queens Suite 4

Robust Mixed Effects Models for Longitudinal Data: Modelling Football Players' Heart Rate Over Time

Melanie V E Campbell - Queen's University, Belfast, UK

Yellow fever: an investigation into referee consistency in the 'Big 5' European football men's leagues using a bivariate Bayesian Conway-Maxwell-Poisson model

Pete Philipson - Newcastle University, UK

Is the home advantage constant? Investigating football's home advantage using varying coefficient models
Jessica Hargreaves - University of York, UK

12:00 – 13:00

Plenary

Keynote 4 - Significance Lecture

Auditorium

Mihaela van der Schaar – University of Cambridge

13:00 – 14:00

Lunch break

Hall D

13:00 – 13:30

Other

Royal Statistical Society Annual General Meeting

Queens Suite 9

The Annual General Meeting is a key opportunity for members to review the Society's activities, finances and governance arrangements.

Non-RSS members are welcome to attend, but only RSS Fellows have the right to vote.

Lunch provided.

14:00 – 15:20

Communicating & Teaching Statistics

Got a "minute"? The case for good metadata in public statistics dissemination

Queens Suite 4

ONS Digital Publishing's Data Service has a track record of supporting complicated dashboards on diverse topics using highly structured data with open standards where data is the API as part of cross-government initiatives.

Our speakers will cover the journey to highly structured data to improve analysis and dissemination:

- **Ross Bowen**, Service Owner of ONS Digital Publishing Data Service, will explore the crucial role of standards for interoperability in the data landscape, and discover the key strategies for inclusive collaboration with data producers on a journey towards seamless integration and innovation.
- **Eileen Crone**, Principal Statistician at NISRA's Dissemination Branch, will discuss NISRA's journey to a single dissemination management system for NISRA, which allows many types of users to access, view and download NISRA data in human and machine readable formats.
- **Rebecca Wattiau**, Head of Coordination for ONS Environment Division, will share how data interchange within departments is no more complex than interdepartmental data sharing, and how adopting these standards cleared the way for the UK Government Climate Change portal's continued success at communicating key climate change analysis from many stakeholders.

Organised by Andrew Fergusson, Office for National Statistics Digital Publishing



Day 3 Wednesday 6 September

14:00 – 15:20

Data Science

Getting your work to work

Queens Suite 3

“Well, it worked on my computer!”, sounds familiar, doesn’t it?

Perhaps you’re looking to publish your first paper and need code to go alongside the publication, or need to deploy a model in the cloud for use at work. Either way, your code needs to be correct and your analysis should be reproducible.

Whether you’re looking to start improving the reproducibility of your work or looking to hone your skills, our panel will share their experiences of how they got their work to actually work.

Taking the stress out of your code mess

Rhian Davies - Jumping Rivers, Newcastle upon Tyne, UK

Getting Your Work to Work in Academia (and Beyond)

Zak Varty - Imperial College London, UK

TBC

Tania Allard - Quansight Labs

Organised by Jack Kennedy & Ryan Jessop for RSS Young Statisticians Section

Environmental & Spatial Statistics

Latest advances in spatial and spatio-temporal modelling of climate and environmental sensitive diseases risk

Queens Suite 6

The aim of this session is to gather experts working in the field of spatial statistics in the context of environmental epidemiology/health, to develop networks and disseminate important new findings on spatial and spatiotemporal modelling of climate and environmental-sensitive diseases.

Statistical climate reconstruction modelling in the EUSTACE project

Finn Lindgren - The University of Edinburgh, UK

Non-separable spatio-temporal models for disease mapping

Elias T Krainski - KAUST, Thuwal, Saudi Arabia

Emulating and aggregating GPs with PriorVAE and π VAE: deep generative models to enable scalable MCMC inference and define a novel stochastic process

Seth R Flaxman - Oxford, UK

TBC

Elizaveta Semenova – Oxford, UK

Organised by Ines Henriques-Cadby, Universities of Manchester and Sheffield, & Olatunji Johnson, University of Manchester

Medical Statistics

Statistics for Real World Evidence in Health

Auditorium

Estimating the impact of the COVID-19 pandemic on cardiovascular disease prevention and corresponding geographical inequalities in England: value and limitations of small area statistics.

Alex Castanon - LCP Health Analytics

Estimating heterogeneous treatment effects from RCT and observational data using Gaussian Processes

Brieuc Lehmann - University College London

Office for Statistics Regulation’s (OSR’s) work on communicating uncertainty in official statistics

Ed Humpherson - OSR

Addressing bias quantitatively in real world data studies from planning to execution

Christen Gray - AstraZeneca

Organised by Mei Sum Chan, LCP Health Analytics

Day 3 Wednesday 6 September

Methods & Theory

Making better use of MCMC samples

Queens Suite 2

Most computational workflows for Bayesian inference focus on sampling, with less attention paid to how samples are actually used. Sample averages converge slowly, necessitating long runs of algorithms such as MCMC. However, more efficient post-processing methods can turn even a small set of approximate samples into an accurate approximation of posterior expected quantities of interest. This session showcases the state-of-the-art in post-processing methodology, including a live demo of the Stein Thinning software package for optimal thinning of MCMC output (stein-thinning.org, available in R and Python).

Optimal Thinning of MCMC Output

Marina Riabiz - King's College London, UK

Control Variates from Stein's Method

Francois-Xavier Briol - University College London, UK

Gradient Free Post-Processing of MCMC

Matthew Fisher - Newcastle University, UK

Software Demo

Marina Riabiz

Organised by Chris Oates for RSS Computational Statistics & Machine Learning Section

Other Applications of Statistics

Applications of expert knowledge elicitation

Queens Suite 7

The elicitation of judgements from experts to define probability distributions is widely used across science, engineering and medicine; to form prior distributions for Bayesian analysis, to express the knowledge, and uncertainty, of an individual or group for uncertainty quantification, decision support, prediction or risk assessment. One key application of elicitation is as an assessment of the uncertainty on the input parameters to a model, to allow assessment of the uncertainty on a set of model outputs.

In this session, four speakers will describe applications of eliciting knowledge from experts to tackle real-world problems. The applications will span predictions of students completing courses, the reliability of highly engineered products in design and development and decision support for digital archives.

This session will follow on from the session "An Introduction to Expert Knowledge Elicitation".

Speakers:

Martine Barons - University of Warwick, UK

Fadlalla Elfadaly - Open University, UK

John Quigley & Lesley Walls - University of Strathclyde, UK

Jeremy Oakley - University of Sheffield, UK

Organised by Kevin Wilson, Newcastle University

Professional Development

Statistical advice in academia

Branham Suite, Crowne Plaza

This session aims to bring together applied statisticians who perform the role of consultants within an academic environment.

It will highlight both the challenges that are faced, that are unique to academia, as well as the rewards of being at the forefront of academic research.

We will strive to showcase the various roles that an academic consultant plays in the realm of academia and how that experience can shape best practice.

The idea behind the session is to illustrate this alternative consultancy related job that has so much to offer.

Introducing clinical researchers to reproducible research principles
Penny S Reynolds - University of Florida, Gainesville, USA

My summer in the trauma ward - An applied statistician's reflections on their first foray into "light touch" biostatistical consulting.

Darren L Dahly - University College Cork, Ireland

Our journey through the establishment of OxUSC (lessons learnt and discussion points)

Cora L Mezger & Mariagrazia Zottoli - University of Oxford, UK

TBC

Sara Hilditch – University of Sheffield

Organised by Penny Reynolds, University of Florida, and Cora Mezger, Maria Christodoulou & Mariagrazia Zottoli, OxUSC

Day 3 Wednesday 6 September

14:00 – 15:20

Social & Wellbeing Statistics

Inclusivity by design - embedding the Inclusive Data Taskforce recommendations into UK data and evidence

Queens Suite 1

The National Statistician convened the Inclusive Data Taskforce in 2020 to recommend how best to make a step-change in the inclusivity of UK data and evidence. In October 2021 they produced their report which made 46 recommendations aimed at improving inclusivity across the statistical system. This session will provide an overview of the IDTF, their ambitious blueprint for improving inclusivity of UK data and evidence, and how we're taking a system-wide approach to implementing their ideas. Each speaker will outline the work they have undertaken to address a particular aspect of inclusivity. Attendees will be invited to discuss, structured through a series of thought-provoking questions, how we can drive forwards and embed inclusivity in UK data and evidence, from the design of research through to data collection, analysis and dissemination, ensuring sustainable change is achieved.

Speakers:

Sarah Wood - Office National Statistics, Newport, UK

Richard Laux - Cabinet Office Equality Hub, London, UK

Darren Stillwell - Cabinet Office Equality Hub, London, UK

Becky Fry - Office National Statistics, Newport, UK

Organised by Donna Phillips for RSS Official Statistics Section

15:20 – 15:50

Refreshment Break

Hall D

15:50 – 16:50

Other

Statistical storytelling: Significance prize winners

Queens Suite 8

Finalists of the 2023 Statistical Excellence Award for Early-Career Writing.

Robyn Goldsmith

James Jackson

Kenneth Menglin Lee

A special session in which the three finalists of the Statistical Excellence Award for Early Career Writing 2023 competition will deliver presentations based on their articles.

Organised by Jake Emmerson for RSS Young Statisticians Section and Anna Britten for Significance Magazine

Professional Development

Working as a statistician or a data scientist in an international organisation

Branham Suite, Crowne Plaza

Panel discussion exploring the benefits and pitfalls of working for an international organisation.

- Steven Vale - consultant statistician, formerly with ONS, OECD, Eurostat and the UN
- Deborah Hardoon - Poverty and Inequality Lead, Development Initiatives
- Paddy Brock - Senior Data Scientist, Joint Center on Forced Displacement

Organised by Phil Crook for RSS International Development Section and Daniela Cuba for RSS Young Statisticians Section

Applications in Business, Industry & Finance

Contributed: Time series applications and reporting the gender pay gap

Queens Suite 1

Statistical Inference with Estimated Nearest Covariance Matrix with Applications in Time Series and Finance

WenJing Cai - McGill University, Montreal, Canada

Time-series evidence on the influence of the choice of seasonal adjustment method on forecasting accuracy

Robert M. Kunst - Institute for Advanced Studies & University of Vienna, Austria

Heterogenous causal effects of mandatory gender pay gap reporting on gender discrimination in United Kingdom

Andrej Srakar - Institute for Economic Research, Ljubljana, Slovenia

Day 3 Wednesday 6 September

Communicating & Teaching Statistics

Contributed: Breaking Down Barriers

Queens Suite 2

"I don't want to be doing mental gymnastics to work out what the numbers mean": focus group findings on the understanding of England road safety rates.

Nikolaos Adamidis - National Highways, Manchester, UK

Breaking Down Barriers: Exploring the issues students face when learning statistics and potential solutions

Chelsi Slotten - Sage Publishing, London, UK

Challenging traditional approaches in medical education for the evaluation of diagnostic tests: What could possibly go wrong?

Margaret MacDougall - University of Edinburgh, UK

Data Science

Contributed: Using complex big data - real world case studies

Queens Suite 3

Does Big Data need a Big Room?

Kate Honeyford - Institute of Cancer Research, London, UK

Data at your fingertips: how the Integrated Data Service is helping to promote collaboration and efficient decision-making in the UK

Key Words

Dominic Hale - Office for National Statistics, Newport, UK

Modelling student exam performance through latent class analysis

Tom Quilter - Pinpoint Learning, Warrington, UK - & Benjamin

Mawdsley - STFC Hartree Centre, Daresbury, UK

Environmental & Spatial Statistics

Contributed: Spatio-temporal inference in dynamic aquatic environments

Queens Suite 5

Predicting water quality patterns in a river from satellite data, using functional data and kriging approaches

Craig J Wilkie - University of Glasgow, UK

Expert elicitation to identify and quantify the effect of several potential strategic conservation measures for selected seabird species.

Anastasia Frantsuzova - BioSS, Edinburgh, UK

The practicalities of estimating the effect of climate change on extreme values of ocean storm severity

Philip Jonathan - Lancaster University, & Shell Research Ltd, London, UK

Medical Statistics

Contributed: Prediction

Queens Suite 4

A systematic review of clinical prediction models for transition to psychosis in individuals meeting At Risk Mental State criteria

Alexandra Hunt - University of Liverpool, UK

Automated coding of suicidal ideation in emergency department presentations: balancing interpretability and performance

James Todd - Bond University, Gold Coast, Australia

Joint modelling of longitudinal and time-to-event data with heterogeneous random effect and skew normal error term

Olaniyi Mathew Olayiwola - Federal University of Agriculture, Abeokuta, Nigeria

Methods & Theory

Contributed: Modelling complex data

Queens Suite 6

Discovering differentially methylated regions using a beta hidden Markov model (BHMM)

Koyel Majumdar - University College Dublin, Ireland

Ensemble survival models for censored data

Elena Ballante - University of Pavia, & IRCCS Mondino Foundation, Pavia, Italy

Finite-sample exact prediction bands for functional data

Simone Vantini - Politecnico di Milano, Italy

Official Statistics & Public Policy

Contributed: Census and population

Queens Suite 7

Using Census data to derive a new area-based measure of deprivation

Tej Nathwani - Jisc, Cheltenham, UK

Comparing the 2021 Census to administrative data to better understand the population estimation challenge

Elizabeth Pereira - Office for National Statistics, Titchfield, UK

Day 3 Wednesday 6 September

15:50 – 16:50

Social & Wellbeing Statistics

Contributed: Crime and vulnerability

Queens Suite 9

Spatio-temporal crime analysis and the impact of COVID-19 on hot spots

Ben Moews - University of Edinburgh, UK

Domestic abuse cases in family courts: What more do we learn from data linkage

Ludivine Garside - University of Bristol, UK

Risk Factors, Risk Assessment Strategies and the Plight of Women and Children in Compromised and Vulnerable Regions in Nigeria

Polycarp E. Chigbu - University of Nigeria, Nsukka, Nigeria

17:00 – 19:00

Plenary

Keynote 5 - Discussion Meeting: Probabilistic and statistical aspects of machine learning

Auditorium

Paper 1: 'Automatic Change-Point Detection in Time Series via Deep Learning'.

Authors:

Jie Li - London School of Economics and Political Science

Paul Fearnhead - Lancaster University

Piotr Fryzlewicz - London School of Economics and Political Science

Tengyao Wang - London School of Economics and Political Science

Paper 2: 'From Denoising Diffusions to Denoising Markov Models'.

Authors:

Joe Benton - University of Oxford

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Organized by the RSS Discussion Meetings Committee, Computational Statistics & Machine Learning Section and Applied Probability Section

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Day 4 Thursday 7 September

08:30 – 09:00

Refreshment break

Level 4/ Hall D

09:00 – 10:00

Professional Development

How to help students develop statistical consultancy skills - ideas and experiences

Branham Suite, Crowne Plaza

While statistical consultancy is a career option considered by many students enrolled in a statistics degree or graduate programme, not all universities have a clear approach on how to transfer the key skills of a statistical consultant to students.

This session provides a platform for panellists to share their experiences, lessons learned and plans on various formats of teaching consultancy skills and engaging students in consultancy projects.

Panellists:

John Addy - Rothamsted Research

Serveh Sharifi - University of Edinburgh

Philip Sedgwick - St. George's, University of London

Jessica Hargreaves - University of York

Maria Christodoulou - University of Oxford

The session will be moderated by Dr. Cora Mezger

Organised by Penny Reynolds, University of Florida, and Cora Mezger, Maria Christodoulou & Mariagrazia Zottoli, OxUSC

Other Applications of Statistics

Contributed: Method applications for specific situations

Queens Suite 4

A consensus score to combine inferences from multiple centres
Hamed Haseli Mashhadi - European Bioinformatics Institute, Cambridge, United Kingdom

A Stata package for Cluster Weighted Modeling
Daniele Spinelli - University of Milano Bicocca, Italy

nonprobsvy - an R package for statistical inference with non-probability samples

Łukasz Chrostowski - Adam Mickiewicz University, Poznań, Poland

Data Science

Contributed: Modelling large scale complex human behaviour data

Queens Suite 1

Fake-News Spread Index: Leveraging the 'Wisdom of the Crowds' and MrP to make Representative Inference
François t'Serstevens - Maastricht University, Netherlands.

Machine learning for the causal analysis of panel data
Paul Clarke - University of Essex, Colchester, UK

Extracting skills in online job advertisements: using NLP tools to labour skills assessment

Gianni Anelli - University of Warwick, Coventry, UK

Environmental & Spatial Statistics

Contributed: Regression methods in complex spatio-temporal applications

Queens Suite 5

Computationally efficient inference for localised spatial smoothing of big data using anisotropic basis functions and penalised regression fitting

Duncan P Lee - University of Glasgow, UK

Infill asymptotics for logistic regression estimators for spatio-temporal point processes

Changqing Lu - University of Twente, Enschede, Netherlands.

A trans-dimensional MCMC algorithm to estimate the parameters of a nonhomogeneous Poisson model with change-points: an application to Mexico City data

Eliane R. Rodrigues - Universidad Nacional Autonoma de Mexico, Mexico City, Researcher, Mexico

Day 4 Thursday 7 September

Medical Statistics

Contributed: Genetics

Queens Suite 2

A Bayesian method for estimating gene-level polygenicity under the framework of transcriptome-wide association study (TWAS)

Arunabha Majumdar - Indian Institute of Technology Hyderabad, India.

Combining pathogen genetics and patient records for real-time detection of nosocomial transmission

David J Pascall - MRC Biostatistics Unit, University of Cambridge, UK

Statistical inference for genealogical histories based on succinct tree sequences

Zhendong Huang - The University of Melbourne, Australia

Medical Statistics

Contributed: Methods comparison

Queens Suite 3

A comparison of two classic and two newer methods for meta-analysis

Richard J Stevens - University of Oxford, UK

Comparing Analysis Method Implementations in Software (CAMIS):

An open source repository to document differences in statistical methodology across software

Lyn Taylor - PAREXEL, Sheffield, UK

Issues with the R-squared measure on test data for the evaluation of polygenic prediction models

Christian Staerk - University of Bonn, Germany.

Methods & Theory

Contributed: Model Selection

Queens Suite 6

Meta-Model Selection for Sequential Inference and Decision-making

Parnian Kassraie - ETH Zurich, Switzerland

Approximate Selective Inference For Adaptive Lasso, Adaptive Elastic Net and Group Lasso

Sarah Pirene - ORStat, Leuven, Belgium

Automatic architecture selection for hierarchical mixture of experts models

Nema Dean - University of Glasgow, UK

Official Statistics & Public Policy

Contributed: Fertility data & GP Patient Surveys

Queens Suite 7

Projecting UK Subnational Fertility using Bayesian Generalized Additive Models

Joanne Ellison - University of Southampton, UK

Creating a user-focused fertility treatment dashboard using 30 years of data

Abigail Ng - Human Fertilisation and Embryology Authority, London, UK

Factorial experiments in survey methodology: learnings from the GP Patient Survey

Ben Brewer, Vicki Bolton - Ipsos, London, UK

Official Statistics & Public Policy

Contributed: Responding to topical issues

Queens Suite 8

Helping everyone understand the cost of living through statistics

Emily Hopson - ONS, Newport, UK

The Energy Intensity of the Consumer Prices Index: 2022

Stefan Ubovic - Office for National Statistics, Newport, UK

The ONS rapid response to the Ukrainian crisis: Experiences and impact on Ukrainian arrivals and their sponsors

Ed Pyle, Klara Valentova, Shannan Child - Office for National Statistics, UK

Social Statistics & Wellbeing Statistics

Contributed: Coping with incomplete information

Queens Suite 9

Using linked cohort study data to help address residual confounding in analyses of administrative data

Richard J Silverwood - University College London, UK

Multiple Systems Estimation in the Presence of Censored Cells

Ruth King - University of Edinburgh, UK

The Persistence of Income Reporting Errors in Household Survey Data

Iva V. Tasseva - London School of Economics and Political Science, UK

Day 4 Thursday 7 September

10:10 – 11:10

Plenary

Keynote 6: 2023 Barnett Lecture: Exascale Geostatistics for Environmental Data Science

Auditorium

Marc G. Genton - King Abdullah University of Science and Technology (KAUST), Saudi Arabia

Environmental data science relies on some fundamental problems such as: 1) Spatial Gaussian likelihood inference; 2) Spatial kriging; 3) Gaussian random field simulations; 4) Multivariate Gaussian probabilities; and 5) Robust inference for spatial data. These problems develop into very challenging tasks when the number of spatial locations grows large. Moreover, they are the cornerstone of more sophisticated procedures involving non-Gaussian distributions, multivariate random fields, or space-time processes. Parallel computing becomes necessary for avoiding computational and memory restrictions associated with large-scale environmental data science applications. In this lecture, I will explain how high-performance computing can provide solutions to the aforementioned problems using tile-based linear algebra, tile low-rank approximations, as well as multi- and mixed-precision computational statistics. I will introduce ExaGeoStat, and its R version ExaGeoStatR, a powerful software that can perform exascale (10^{18} flops/s) geostatistics by exploiting the power of existing parallel computing hardware systems, such as shared-memory, possibly equipped with GPUs, and distributed-memory systems, i.e., supercomputers. I will then describe how ExaGeoStat can be used to design competitions on spatial statistics for large datasets and to benchmark new methods developed by statisticians and data scientists for large-scale environmental data science.

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#RSS2023Conf

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11:10 – 11:40

Refreshment break

Hall D

11:40 – 13:00

Applications in Business, Industry & Finance

Better Decisions, Judgements and Measurements - assessing the noise resulting from bias and inconsistency

Queens Suite 8

This presentation will review the existing procedures widely used in inter-laboratory trials and in measurement systems analysis. It will be suggested that some features of these approaches can be adapted to facilitate the planning and data analysis in noise audits.

Roland Caulcutt (Independent Statistical Consultant) will introduce the topic and then invite the audience to carry out a practical exercise in which they give their judgement on a series of questions involving measurement judgement.

The data will be collected automatically using data input from mobile phones and/or laptops. The data will be collated and analysed. Roland will then present the results of the data collection in a series of graphs and discuss the implications of noise and variation related to reproducibility and repeatability in the answers.

Roland will lead a discussion with the audience about the implications of these variations in decision making in a number of applications including law and finance.

Organised by Shirley Coleman for RSS Quality Improvement Section

Communicating & Teaching Statistics

Being more than average: statistical literacy and a lifetime of education

Queens Suite 1

The school curriculum in mathematics has changed dramatically over the last decade, with statistics playing a more prominent role. Despite this welcome advance, statistics still has an image problem and this has a knock-on effect on statistical literacy. Going further, some UK universities struggle to recruit UK students for statistics-orientated degrees, and many organisations are battling to fill data-orientated roles.

In other countries, statistics is not suffering from the same image crisis. What is it that turns our young people away from statistics? How can we support teachers to engage their students in statistics? What can we learn from the success of its close cousin, data science? How can the forming Academy for Mathematical Sciences to raise the voice of statisticians and mathematicians?

In this session we will hear from a diverse range of people involved across all areas of statistical education and statistical literacy and look forwards to how we can encourage more people to engage with and develop a love of statistics.

Expanding the reach of statistical education - what is the role of Academy for Mathematical Sciences?

Sophie Carr and **Nira Chamberlain**

How UCAS data is shaping UK education policy?

Ben Jordan - UCAS

Cultivating tall poppies - experiences volunteering in a "Gifted and Talented" programme

Craig Anderson - University of Glasgow

Panel session: Lessons that Teaching Statistics can teach us

Organised by Sophie Carr & Elinor Jones for RSS Education and Policy Advisory Group

Day 4 Thursday 7 September

Data Science

GitHub: Version control for research, teaching and industry

Queens Suite 7

Open-source coding practises are becoming an integral part of software and model development in all applications of data science. GitHub, via Git, provides a friendly way of understanding and maintaining version control-based code and models such that they can have a wider and meaningful impact. In this session, we will discuss how GitHub can be used to develop models and applications more effectively across teaching, research, and industry. We discuss how good version control practises can be introduced and how to stop modern day statistics continuing to fall behind on modern open-source practises prevalent in machine learning and data science.

An Introduction to GitHub and Version Control
Robin Long - Lancaster University

GitHub in Teaching
Craig Alexander - University of Glasgow

GitHub in Research
Rebecca Killick - Lancaster University

GitHub in Industry
Wayne Jones - Shell

Discussion Panel: **Craig Alexander**, **Vinny Davies**, **Andrew Elliott** (University of Glasgow), **Wayne Jones** (Shell), **Rebecca Killick** & **Robin Long** (Lancaster University)

Organised by **Craig Alexander**, **Vinny Davies**, **Andrew Elliott** & **David McArthur**, University of Glasgow

Environmental & Spatial Statistics

Statistical challenges and opportunities for modern agricultural and environmental research

Auditorium

We aim to fly the flag of agricultural statistics, broadly conceived. The talks in this session will be of general interest to a wide range of conference participants, with an emphasis on the following three things. Firstly, the heritage and continuing value of agricultural statistics per se. Secondly, the relevance of agricultural statistics to environmental research. Thirdly, realistic optimism about future data-sets and analysis opportunities.

A UK Network for Statistical Expertise in the Agricultural, Biological and Environmental Sciences
Andrew Mead - Rothamsted Research

Why agricultural and environmental research still need statisticians
R. A. Bailey - University of St Andrews

Computing on the LMM: (1) AI REML estimation with big data using a multi-frontal sparse direct solver, and (2) generating A-optimal categorical designs. (co-authored with David Butler)
B. R. Cullis - University of Wollongong

Using the haystack to find the needle: the importance of statistical rigour in a world of big data
Katharine Preedy - Biomathematics & Statistics Scotland

Challenges of Continuous Monitoring in Agricultural Systems
Sarah Brocklehurst - Biomathematics & Statistics Scotland

Examples from the field
Ian Hunt - University of Tasmania

Organised by **Ian Hunt** (University of Tasmania and **Iain McKendrick** (BioSS)

Medical Statistics

Global health estimates: methodological considerations, gaps and opportunities

Queens Suite 3

Comparable national, regional and global estimates are important for many health indicators. These are used to set priorities and track progress towards global targets such as the Sustainable Development Goals (SDG). It is important that the statistical methods used to generate these estimates are rigorous and transparent including both data processing and modelling approaches.

Global estimates are usually informed by national data from routine data systems or nationally representative periodic surveys and research studies. However, issues such as data gaps and reliability of estimates from different data sources are common and require innovative statistical approaches to address potential biases.

In this session, we aim to use the examples of low birthweight and preterm births estimates with WHO/UNICEF that addresses these common issues. We will discuss application of the Guidelines for Accurate and Transparent Health Estimates Reporting (GATHER) statement for global estimation transparency, data quality and the modelling of low birthweight and preterm births using a Hierarchical Bayesian Logistic regression framework. A discussion on how to address gaps in data availability, data quality, and reporting for multi-country data improvement and opportunities are welcome.

Organised and presented by **Eric Ohuma**, **Ellen Bradley**, **Yemi Okwaraji** & **Hannah Blencowe**, all at LSHTM

Day 4 Thursday 7 September

11:40 – 13:00

Methods & Theory

Recent developments in local differential privacy analysis

Queens Suite 2

Challenges of Statistical Estimation and Learning in Non-interactive Local Privacy Model
Di Wang - KAUST

Unified Lower bounds for statistical estimation under information constraints
Jayadev Acharya - Cornell

On robustness and local differential privacy
Mengchu Li - University of Warwick

Organised by Yi Yu for the Institute of Mathematical Statistics

Social & Wellbeing Statistics

Data visualisation and modelling to inform public health intelligence in Scotland

Queens Suite 9

Government policies should be underpinned by evidence-based decision making, and this goal is ever more accessible in the current data rich climate. This session gives an insight into the use of data visualisation and modelling tools that are delivering evidence for public health policy in Scotland. The three speakers work in different areas of Public Health Scotland, and this session will discuss how data are being used to inform policy on vaccination strategies, predicting patient demand for services, and the geographical variations in health across the country.

Vaccine uptake, effect and safety based on a population cohort in Scotland

Chris Robertson - University of Strathclyde and Public Health Scotland

Modelling the 'whole' health and social care system using discrete event simulation

Robyn Munro - Public Health Scotland

Storytelling – utilising the power of the story map to harness change
Andrew Gasiorowski – Public Health Scotland

Assessing the effectiveness of HPV vaccination using data linkage
Kim Kavanagh - University of Strathclyde

Organised by Duncan Lee, University of Glasgow

Professional Development

Librarians will hate you: create information from data with one simple step

Queens Suite 5

Participants will be shown the power of linked data: mashing up data from different domains (e.g. climate change, economics, transport, and demography) using linked data. The users will see how to create a useful Generalised Linear Model directly from a linked data package using the CSV-W standard, and how data are treated correctly because the metadata is respected and machine readable.

Participants will be shown the various ways to create linked data for use in ONS's Data Services backed by a python library called csvcubed. Data formatting, metadata capture, and commands are covered. Once the outputs are explained, users will explore their data through automated visualisation workbooks, and machine learning.

Organised on behalf of Office for National Statistics Digital Publishing Data Service and presented by Andrew Fergusson, Lead Data Scientist, Abdul Kasim, Data Scientist, Sarah Johnson, Software Engineer



Day 4 Thursday 7 September

Professional Development

Implementing Data Analytics at Scale with a Data Mesh

Branham Suite, Crowne Plaza

As a statistician or data scientist, do you find yourself spending much of your time hunting for data that resides in some obscure corner of your organization? Do you often find yourself grappling with diverse file types, inconsistent formats and incomplete data, instead of focusing on actual data analysis?

Data Mesh is an innovative architecture that decentralises data domains, improving access and management. It moves away from traditional centralised data lakes and warehouses, introducing a domain-oriented perspective that enhances discovery, improves data quality, and boosts agility.

In this workshop, we'll look at how the Data Mesh architecture works, addressing both its benefits and challenges. Together, we'll look at what kind of organisations can benefit the most from a Data Mesh approach, how it can fit into a broader data strategy, and some practical steps to get started.

Organised & presented by Mike Oldroyd, Interworks

13:00 – 14:00

Lunch

Hall D

14:00 – 15:00

Communicating & Teaching Statistics

Contributed: Applied Statistics Training

Queens Suite 1

All of Statistics in an Hour (or two): Supporting postgraduate projects/ dissertations

Neil Spencer - University of Hertfordshire, UK

Successes, failures and lessons learned from developing Data Analytics programs within Business Schools in multiple countries, one of which won a national award

Adrian Gepp - Bangor University, UK / Bond University, Gold Coast, Australia

Adapting statistics education to the flourishing market for self-paced learning

Dean Langan - University College London, UK

Data Science

Contributed: Advanced classification and clustering methods

Queens Suite 4

TSignal Detection in Particle Physics using a Classifier Decorrelated through Optimal Transport

Purvasha Chakravarti - University College London, UK

Classification trees based on distance measures and discriminant functions

Yijun Fu - University of Leeds, UK

Nonparametric and parametric clustering methods for multivariate functional data with application to urban transition stage's data.

Minzhen Xie - University of Leeds, UK

Environmental & Spatial Statistics

Contributed: Statistics for environmental health

Queens Suite 5

COVID-19 vaccine fatigue in Scotland: How do the trends in attrition rates for the second and third doses differ by age, sex, and council area?

Robin Muegge - University of Glasgow, UK

A spatial-epidemiological model to predict the benefit from introducing an emergency transport system in LMICs

Katie E Scandrett, Richard Lilford - University of Birmingham, UK

Analyzing mental health of young and old age groups: A Bayesian shared component spatial modelling approach

Jane Law - University of Waterloo, Canada

Medical Statistics

Contributed: Clinical trials

Queens Suite 2

Sample size calculation and evaluation of progression criteria in pilot and feasibility studies: a new app (SS-PROGRESS)

Gareth McCray, Martyn Lewis, Kieran Bromley - Keele University, Stoke-on-Trent, UK

Generating recommendations for design, analysis and interpretation of patient-reported outcomes for cancer clinical trials: Progress from SISAQOL-IMI

Kim Cocks - Adelphi Values, Bollington, UK

Decentralised Clinical Trials and Digital Health Technologies - Opportunities and Statistical Challenges from the Industry Perspective

Rosemary A Abbott - ICON plc, Reading, UK

Day 4 Thursday 7 September

14:00 – 15:00

Medical Statistics

Contributed: Longitudinal

Queens Suite 3

Longitudinal Analysis of Multivariate Responses from the Health Sciences

Francesca Little - University of Cape Town, South Africa

Spatio-Temporal Functional Principal Component Analysis for Longitudinal Images

Sonia Dembowska - University of Leeds, UK

Modelling Individual Variation in Metabolomics Data using Bayesian Generalised Mixed Models

Shubbham Gupta - University College Dublin, Ireland

Methods & Theory

Contributed: Statistical modelling

Queens Suite 6

Optimal simulation-based sample size calculations for complex multilevel models

William J Browne - University of Bristol, UK

Reducing multicollinearity in GLMs with categorical covariates

Gilbert MacKenzie - University of Limerick, Ireland

Variable selection for a contaminated mixture of normals classification model

Jorge Alfredo Sanchez-Gomez - University of Glasgow, UK

Methods & Theory

Contributed: Statistical theory and inference

Queens Suite 7

More powerful universal post-selection inference

Daniel Garcia Rasines - Imperial College London, UK

On the behaviour of posterior probabilities with additional data:

Monotonicity and nonmonotonicity, asymptotic rates, log-concavity, and Turán's inequality

Yosef Rinott - The Hebrew University, Jerusalem, Israel

Anomaly Detection Across Referentials: A Rank-Based Higher Criticism Approach

Ivo V. Stoepker - Eindhoven University of Technology, & TRI-DSA, Eindhoven, Netherlands

Official Statistics & Public Policy

Contributed: Inflation

Queens Suite 8

ONS consumer price inflation statistics: our transformation journey

Helen Sands - ONS, Newport, UK

Global Inflation: 1970 to 2022

Stefan Ubovic - Office for National Statistics, UK

Smoke and Mirrors - what is a fair measure of inflation?

Tony Dent, Better Stats, London, UK, & Philip Smith, Opinionium, London, UK

Social & Wellbeing Statistics

Contributed: Estimation in Social Statistics

Queens Suite 9

Analysis of Adapted Stepped-Wedge Cluster Randomized Trial for Parenting-Intervention Programme in Botswana

Heiletjé MM van Zyl - University of Cape Town, South Africa

Chronic pain estimates and the impact of bias in older adult cohort studies

Eva Ryan - University of Limerick, Ireland

Social Statistics Transformation: Producing ethnicity statistics from administrative data

Alex Mylles - Office for National Statistics, Newport, UK

15:00 – 15:20

Refreshment break

Hall B

Day 4 Thursday 7 September

15:20 – 16:40

Applications in Business, Industry & Finance

Battling causality vs correlation - a quality improvement approach

Queens Suite 3

Erroneous attribution of causation when correlation is observed leads to misunderstandings which can result in disastrous errors and missed opportunities.

In this session we will explore some case studies and make recommendations for quality improvement.

Speakers:

Blaise Egan

Roland Caulcutt

Jonathan Smyth Renshaw

Organised by Shirley Coleman for RSS Quality Improvement Section

Communicating & Teaching Statistics

Communicating ONS Economic Statistics to the general public

Queens Suite 5

Over the past five years, a series of research projects have been undertaken related to the public's understanding of ONS's economic statistics. This work has been funded by the Economic Statistics Centre of Excellence (ESCOE)

This session will present the main findings and recommendations from the following four projects:

- Public Understanding of Economics and Economic Statistics, using focus groups and surveys.
- What can Economists Learn from Public Perspectives on the Economy and Economic Statistics?, bringing economists and statisticians together with the public in workshops.
- Presenting labour market statistics to the general public, designing and testing different versions of the ONS labour market release, through experimental surveys to test comprehension, engagement and trust.
- Media reporting of labour market statistics, using content analysis and interviews with journalists

This will be followed by a discussion.

Speakers:

Johnny Runge, former Principal Researcher, National Institute for Economic and Social Research (NIESR)

Nida Broughton, Director of Economic Policy at the Behavioural Insights Team (BIT)

Ed Humpherson, DG Office for Statistical Regulation

Rupal Patel, Senior Economic Advisor, Bank of England and co-author of 'Can't We Just Print More Money'

Organised by Mike Hughes for RSS National Statistics Advisory Group

Data Science

Best practices for the analysis and visualisation of Google Trends data

Queens Suite 8

Studies using Google Trends data have increased exponentially since 2009, but many studies lack rigour and reflect a poor understanding of the nature of the data. This session will address key aspects of best practice methodology for Google Trends research, focusing on the distinction between data obtained from the Google Trends website vs data obtained via the Google Trends extended for health API, the necessity of adequate sampling of data, appropriate methods for keyword selection, and visualisation and analysis of the data.

N of 1: Why just one sample of Google Trends may not be enough
Jacques Raubenheimer, The University of Sydney

Let's look at what people actually ask Google—methods for sufficient keyword selection in Google Trends research
Amaryllis Mavragani, Sterling University (TBC)

On visualising event sequences and Google Trends data
Daniel Archambault, Swansea University

Gett the recipe right: What to include (and what to avoid) for good Google Trends studies
Akshaya Srikanth Bhagavathula, University of Arkansas

Organised by Jacques Raubenheimer, University of Sydney

Day 4 Thursday 7 September

15:20 – 16:40

Methods & Theory

Structured covariance matrices

Queens Suite 2

Covariance matrices and their inverses arise throughout classical multivariate analysis, almost always as nuisance parameters to be estimated. Structural assumptions seem inevitable to restrain estimation error in high-dimensional settings, but the resulting statistical guarantees are only relevant if the assumptions made are satisfied to an adequate order of approximation. This session will explore this theme from several perspectives.

Speakers:

Karthik Bharath – University of Nottingham

Degui Li – University of York

Heather Battey - Imperial College London

Organised by Heather Battey

Official Statistics & Public Policy

Data-led economic and financial regulation

Queens Suite 9

Economic and financial regulators have often been at the forefront of using new statistical methods within government, especially as they oversee inherently quantitative areas. However, that is not without its perils, particularly in terms of the ethics of using, acquiring, governing, and relying on data for decision-making. Further, these regulators need to consider carefully how the firms they oversee think about and action the same issues themselves. This session will attend to these issues, both in their technical and practical aspects, drawing on speakers from both the regulators themselves and academia.

Accelerating responsible and ethical innovation through Regulatory Technology

Marvin Tewarrie - Prudential Regulation Authority

TBC

Daniel Bogiatzis-Gibbons - Financial Conduct Authority

Data-led economic and financial regulation

Edmund Towers - Financial Conduct Authority

Sustainable, Accurate, Fair and Explainable Artificial Intelligence in Finance

Paolo Giudici - University of Pavia

Organised by Daniel Bogiatzis-Gibbons for RSS Data Ethics & Governance Section

Other Other Applications of Statistics

Data detectives: using statistics to understand crime

Queens Suite 1

Criminal activities are recorded and each crime becomes a statistic; crime scenes are laced with evidence, leaving behind a trail of data to be analysed.

Come join us at the scene to hear how statistical thinking is utilised to solve, analyse and prevent crime.

Expected Returns to Crime and Crime Location

Nils Braakmann - Newcastle University

Detecting (the level of) crime by cross-examining data

Ruth King - University of Edinburgh

Organised by Jack Kennedy & Daniela Cuba for RSS Young Statisticians Section and Amy Wilson for RSS Statistics and the Law Section

Professional Development

Getting your work published and maximising its impact

Branham Suite, Crowne Plaza

Are you looking to get your work published? Or do you want to raise the profile of your published work? The session, jointly organised with Oxford University Press, will provide valuable advice for writing journal and magazine articles, give an overview of article review processes, and explore available self-promotional tools to raise the visibility of your work or research.

Organised by Zexun Chen for RSS Young Statisticians Section

Day 4 Thursday 7 September

Professional Development

Learn from my mistakes: career advice from highly successful statisticians

Auditorium

Join us to hear career tales from some of the most prominent statisticians today.

They didn't get to where they are today without making a few mistakes along the way. In this session, a panel of highly successful statisticians share with us their career highs, lows and mistakes made.

Let's learn from the mistakes of others. After all, we can't live long enough to make all the mistakes ourselves!

Panel members:

Fiona Steele

Scott Heald

Marc Genton

Organised by Joy Leahy for RSS Young Statisticians Section

Social & Wellbeing Statistics

Developing and improving the way ONS produces sub-national estimates

Queens Suite 7

There has been an increase in public demand for more timely, higher frequency and more granular subnational estimates of economic activity, reflecting the interest in better understanding the wider trends and performances of regional economies. Historically, this has been a statistical challenge for national statistical institutes given the conceptual and practical challenges in the process of collecting information at the local level.

In recent years, we have transformed the production of our estimates of subnational activity, particularly estimates of gross value added (GVA), improving their timeliness, frequency, and granularity.

As part of our ongoing commitment to continuously improve the accuracy and reliability of our statistics, the ONS has been undertaking a full method review of Quarterly Regional gross domestic product (GDP) with a view to better understand, and improve coherence with, other data sources. Subsequently, ONS has published data using a new method which also constrains to national totals.

These quarterly regional estimates are just an element of the development with further work on the productivity and towns analysis that use these data and outputs and how these can be linked together to provide an overarching and cohesive picture at the sub-national level.

In addition, given the interest in having more timely estimates, we have recently developed model-based nowcasts of regional GVA as part of research carried out by the Economic Statistics Centre of Excellence (ESCoE). These are produced only eight weeks after the reference period for the 12 International Territorial Level (ITL)1 regions – there are no other available regional estimates at this time.

This presentation will outline this work and key outputs together with some of the future plans for the development of sub-national estimates and how we are involving users on the development, dissemination and understanding of these various statistics.

Organised by Jon Gough, Office for National Statistics

16:50 – 17:50

Plenary

Keynote 7: Fiona Steele - Multilevel Models for Dyadic Data

Auditorium

Fiona Steele - London School of Economics

Dyadic data allow the study of relationships between pairs of individuals, or other units such as organisations and countries. In their simplest form, individuals belong to only one dyad and each dyad contributes a bivariate response, for example measures of each individual's health or perception of their relationship. However dyadic data often have a more complex structure: individuals may belong to multiple dyads, the data on each individual may be multivariate or longitudinal, and individuals or dyads may be clustered. Multilevel models offer a flexible way of analysing complex dyadic data. In this talk, we consider random effects models for longitudinal, multivariate and clustered dyadic data. Some recent developments are described with two applications to dyadic data on families. The first example is a study of exchanges of support between parents and adult children, while the second uses intensive longitudinal data from a round-robin design to study the dynamics of interactions between pairs of family members as they work together on a task.

17:50 – 18:00

Plenary

Close of conference

Auditorium

19:30 – 23:59

Networking

Conference dinner

Royal Hall

Thank you to those responsible for organising the conference:

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Mags Wiley (reporting & social media)

Sonia Scriven (registration team)

Judith Shorten (Discussion Meeting)

Stuart McKendrick and fellow staff at the Royal Statistical Society.

Also, thanks to volunteers for their help with stewarding:

Sara Hilditch Melanie Campbell

Jake Emmerson Daniela Cuba

James Grant Srshti Putcha

Dario Domingo Nidhi Tilala

Picket Munkombwe

Production

Richard Gray for photography
www.rugfoot.com

Phil Sutton at Cavendish Design for design and production
www.cavendishdesign.co.uk

Andrew Mills and his team at Glenton Media for AV planning and support

Paul Creaser and team at VenulQ for the conference app

Venues

Kamil De Lehenstein-Bronka, Laura Warren, Joshua Hague, Katherine Mansfield and their teams at the Harrogate Convention Centre and Royal Hall.

Ellie Rolph and the team at Crowne Plaza Harrogate.

Magdalen Smith, Cheryl Brunwin and colleagues at First Choice Conferences & Events for venue sourcing, site visit coordination, and for the accommodation booking service.

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