

# RSS International Conference

**MANCHESTER AND ONLINE**  
6-9 September 2021

## Conference Directory

FOR ALL STATISTICIANS AND DATA SCIENTISTS  
**ALL WELCOME**

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Visit: [rss.org.uk/conference2021](https://rss.org.uk/conference2021)  
#RSS2021Conf @RSSAnnualConf



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# Welcome

## **I'd like to warmly welcome you all to Manchester for the 2021 RSS conference.**

The RSS conference was last in Manchester only 5 years ago - although after the events of the past 18-24 months, that feels like a long time ago, and the world is now a very different place! That is reflected in the configuration of the 2021 conference, which will be the first 'blended' RSS conference: while many delegates are joining in person, others will be joining online from around the world. I hope that this will add an exciting new dimension to this conference and to those in the future, and that we can achieve the 'best of both worlds'.

For those joining in person, this will no doubt be a welcome gathering after so many months of remote work. With covid in mind, social activities will mostly be taking place within Manchester Central - however we are fortunate to have such a fantastic, large and iconic venue to explore over the coming days. Manchester Central was originally a major railway hub, and its arched roof and station clock are instantly recognisable. Please do, however, take the chance to explore Manchester while you are here.

There will, of course, be the usual stellar line-up of keynotes, invited and contributed talks. Many of those will be available for those

joining remotely, through our online platform at the same time as they are delivered face-to-face. We have a huge range of covid-19 sessions, and our professional development stream will run throughout covering topics such as visualisations, peer reviewing, and getting into statistical consultancy.

So, whether you are in Manchester or online, I hope you learn a lot, form new collaborations and friendships, and above all have a great time.



**Matthew Sperrin**

Programme Chair, RSS 2021

# 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.

## Bag search

Every visitor to Manchester Central may have their bags searched at the entrance. We therefore ask you to consider keeping bags and possessions to a minimum to minimise the time it takes to search and gain access to the event. When planning your arrival to the venue, we suggest you allow some extra time for the bag search.

## Catering

Lunch as well as tea/coffee at the mid-morning break and the mid-afternoon break is provided as part of your conference fee. Lunch will be served in a box to minimise contact. All refreshments will be served in the Exchange Hall. 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.

## Cloakroom

A staffed cloakroom will be available in the Exchange Lower Foyer next to the entrance and bag check. This will be open each day during the hours of the conference programme. The Society accepts no responsibility for any items which may be lost or damaged.

## Conference App

The conference platform is where you can message other attendees both at the in-person and online conference, submit questions for livestreamed sessions and is also where on-demand recordings will be available. Go to <https://virt-us.app/e/rss-international-conference-2021/> or use the QR code on your conference badge.

## 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 box.

The conference organisers have tried to cater for all dietary requirements for lunches, however it is not always possible to provide dietary options for the 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. .*

## Exhibition

Please make time to visit our exhibitors. The exhibitors' stands are located in the Exchange Hall alongside the catering area. This area will be open at the following times:

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**TUESDAY 7 SEPTEMBER 8.30AM – 8.00PM**

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**WEDNESDAY 8 SEPTEMBER 8.30AM – 5.30PM**

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**THURSDAY 9 SEPTEMBER 8.30AM – 3.30PM**

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Please note that not all stands will be present on all days of the conference.

## Meeting conduct

The Society operates a meeting conduct policy and requires attendees to adhere to the policy at all times while in the conference and its associated events. The full text of the policy can be found on the conference website.

## 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 conference manager.

Please note that the Society is livestreaming some sessions to the conference platform – the recordings of which will then be made available. These sessions are indicated in the programme.

## Poster presentations

Posters will be on display in the Exchange Hall 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 from the conference platform 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 on the Exchange Upper Foyer behind the lift.

## Registration desk

The conference registration desk can be found on the left-hand side (as you enter) of the Exchange Upper Foyer. The Registration desk will open at the following times:

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**MONDAY 6 SEPTEMBER 3.00PM – 6.30PM**

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**TUESDAY 7 SEPTEMBER 8.00AM – 6.30PM**

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**WEDNESDAY 8 SEPTEMBER 8.30AM – 6.00PM**

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**THURSDAY 9 SEPTEMBER 8.30AM – 3.30PM**

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## Session locations

Plenary sessions will be held in the Exchange Auditorium. All other sessions will be held in one of the Exchange Rooms 1-11 on the 1st floor.

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

## Social events

If you have booked to attend one of the evening social events this will be indicated on your conference badge. 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.

## 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

## Twitter

You can follow the conference on Twitter: **RSSAnnualConf** please use the hashtag **#RSS2021Conf**

## WiFi access

Free wifi is available in the venue. Connect to the **MCCC** wireless network. The portal page should load automatically. If not, just open your web browser. Click Login to Manchester Central's Free Wi-Fi. Enter your information and read the terms and conditions. Once confirmed, you will be connected.

## Covid and Conference

### Venue

Manchester Central are working in line with the government's All Secure Standard for delivering events during this time, this includes:

- Hand sanitiser stations located around the venue
- Increased cleaning and sanitising of spaces and touchpoints

Full information at <https://www.manchestercentral.co.uk/your-venue-safety>

### Masks

We ask that you wear a mask while at the conference, with the exception of when eating or drinking.

Please be considerate of others and bear in mind that some people are unable to wear masks for medical reasons.

### Social distancing

Other than in the main auditorium we are not reducing the capacities in the meeting rooms, however there should be ample space in each room to maintain distance from other attendees.

When queuing for registration, catering etc please be considerate and keep a distance where possible from other attendees.

### Testing and Tracing

We **do not** require attendees to show evidence of vaccination or to take tests. However, we will ask you scan into the NHS Covid app on arrival each day.

If you are experiencing Covid symptoms (<https://www.nhs.uk/conditions/coronavirus-covid-19/symptoms/>), please do not enter the venue. If you start to experience symptoms during the conference, please let a member of the RSS staff or Manchester Central staff know immediately.



# Exhibitors at RSS 2021 Conference



## 1 Royal Statistical Society

Come along to the RSS stand and chat to our friendly Membership team about your professional development and how to get recognition for your statistical qualifications and experience by becoming a professional member with the society. Find out about volunteering opportunities, how to join a Section or Local Group and how to network with a community of just over 10,000 members.

If you are an employer looking to get your team professionally awarded, you can also come and chat with the team about corporate membership and the generous discounts on offer to both you and your staff.



## 2 Autotrader

Powered by tech made possible by people.

We're proud of our people-centred culture, which, combined with our tech and data expertise, makes us one of the UK's leading companies.

Our purpose is to drive change together responsibly. We aim to improve the process of buying and selling vehicles in the UK by continually evolving the ecosystem to provide a better experience for consumers, retailers and manufacturers alike.



## 3 Timberlake

Timberlake is a global brand with forty years of experience and expertise as a supplier of statistical, econometric and forecasting software packages; delivering quality training courses; and consultancy. We provide a total solution to those in statistics, econometrics, forecasting, epidemiology, finance, political and social sciences as well as data visualisation.

Timberlake are the official distributor of Stata software in the UK. Stata is a complete, integrated software package that provides all your data science needs—data manipulation, visualization, statistics, and automated reporting.



## 4 Exploristics

Exploristics provides world-class analytics and specialised software products and services for early-stage clinical research within life science organisations. We strive to address the emerging analytics needs of the Pharmaceutical Industry, providing statistical consultancy and developing a unique range of computer modelling software products for medical research. Exploristics has an experienced team of statisticians and programmers who can support biostatistics, computer modelling, complex data visualisation, design and analysis of clinical trials, precision medicine and real-world data analytics.



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STATISTICAL  
SOCIETY  
DATA | EVIDENCE | DECISIONS



# RSS International Conference 2022

**FOR ALL STATISTICIANS  
AND DATA SCIENTISTS.  
ALL WELCOME**

The 2022 Conference will take place in the city of Aberdeen on the North east coast of Scotland. Aberdeen is known as the 'Granite City' for its stunning granite buildings and monuments, and it's first university was founded in 1495.

The conference will once again feature top keynote speakers, invited and contributed talks, poster presentations and professional development workshops.

We are currently calling for proposals for invited topic sessions - see the website for full details.

When registration opens attendees at this year's conference will receive an additional 10% discount for a limited period.

Registration will open shortly [rss.org.uk/conference2022](https://rss.org.uk/conference2022)



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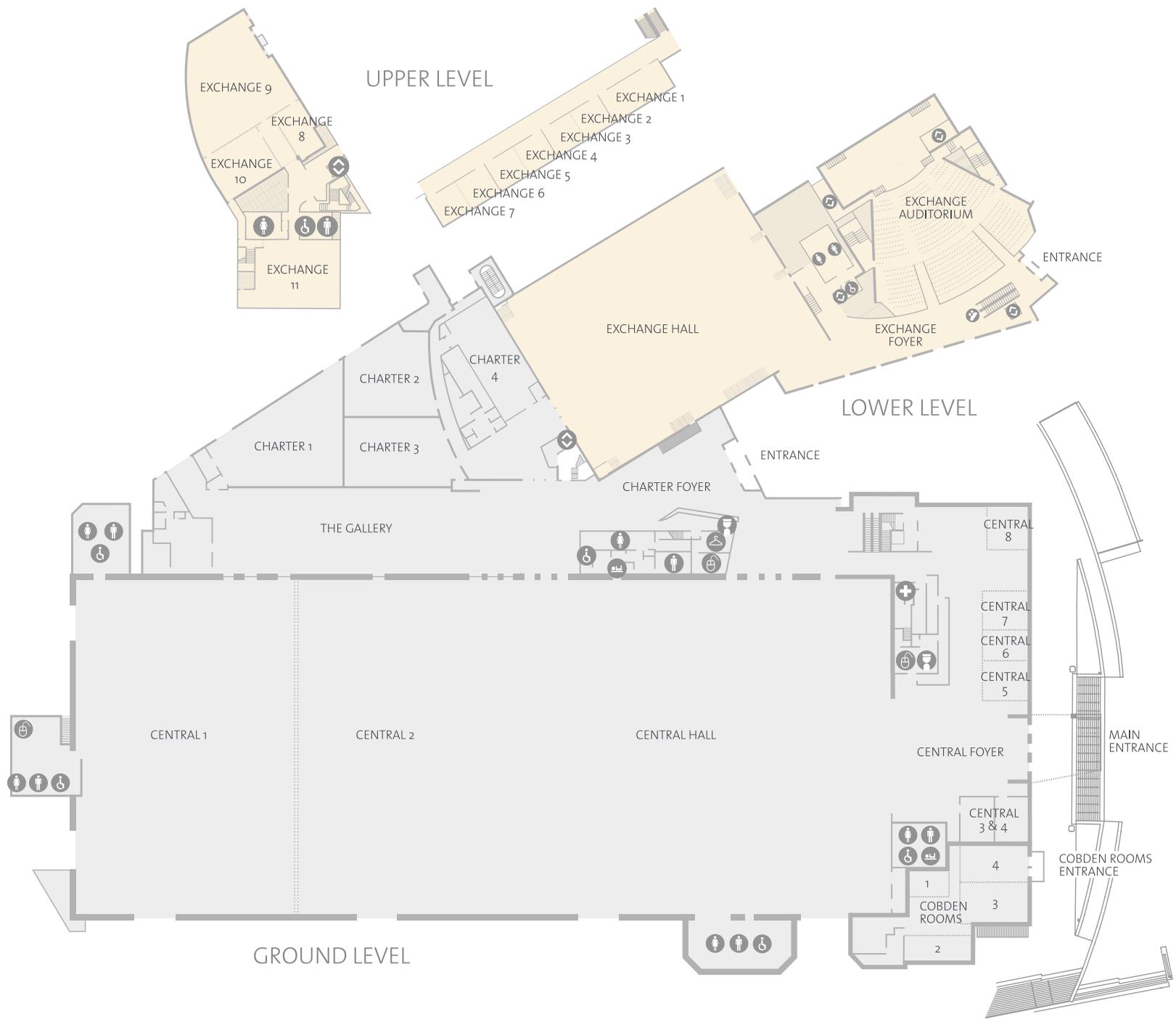
For more details visit: [rss.org.uk/conference2022](https://rss.org.uk/conference2022)

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# Venue Plan

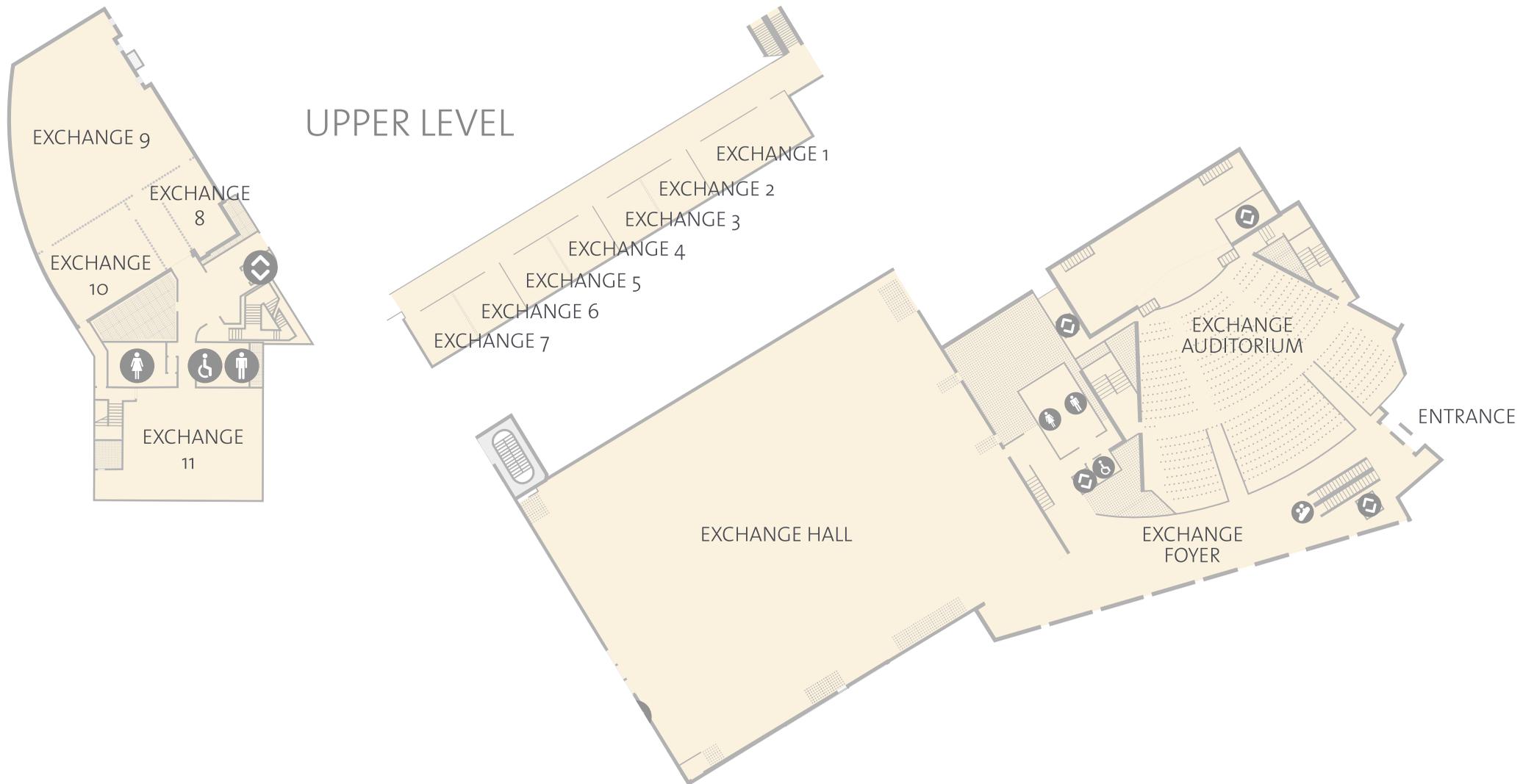
## Key

-    TOILETS
-  ORGANISERS' OFFICE
-  FIRST AID
-  ESCALATORS
-  LIFT
-  CONCIERGE
-  CLOAKROOM
-  BABY CHANGE



# Conference Space

**MANCHESTER**  
**AND ONLINE**  
6-9 September 2021



# Full Programme

All conference sessions are organised in streams.

For ease of reference each stream is represented by a colour in the programme:

	Applications of Statistics		Methods & Theory
	Break		Networking
	Business, Industry & Finance		Official Statistics & Public Policy
	Communicating & Teaching Statistics		Other
	Data Science		Plenary
	Environmental & Spatial Statistics		Professional Development
	Invite only		Rapid Fire
	Medical Statistics		Social Statistics

**PLEASE NOTE:** Due to current circumstances the programme is subject to last minute changes and withdrawals - please check the online programme for the latest situation.

<https://app.oxfordabstracts.com/events/1880/program-app/program>



# Day 1 Monday 6 September

13:00 - 17:00

Early career statisticians pre-conference workshop

## Exchange 9

Organised by the RSS Young Statisticians Section  
(additional registration fee required)

17:30 - 18:45

## Plenary

### Welcome to Conference & Keynote 1

### Exchange Auditorium/ Livestream

#### RSS and the Pandemic

Statistics have played an important role both in our understanding of the coronavirus pandemic, and our attempts to fight it.

Throughout the pandemic, the Royal Statistical Society has sought to highlight ways in which statistics, data and evidence could be better used and communicated to improve the government's response to the pandemic.

**Deborah Ashby** and **Sheila Bird** from the Society's Working Group on Diagnostic Tests, **Simon Briscoe** from the RSS Covid-19 taskforce and RSS Statistical Ambassador **Anthony Masters** will reflect on the Society's work around Covid-19.

18:45 - 20:30

## Networking

Welcome Reception

## Exchange Upper Foyer

Kindly sponsored by



# Day 2 Tuesday 7 September

08:30 – 09:00

## Invite only

Breakfast reception for RSS Sections & Groups

## Exchange 9

Hosted by Blaise Egan (RSS Honorary Officer for Sections and Local Groups), this networking session aims to bring together members from RSS section and group committees to meet and connect at the RSS Conference.

Please note this event is by invite-only

09:00 – 10:00

## Applications of Statistics

Contributed: Addressing missing data

## Exchange 1

Log-F(1,1) penalization when data are missing at random  
**Muna Salim AL-Shaabi** - Sultan Qaboos University, Muscat, Oman

Much Ado About Almost Nothing - Statistical Methods for Dealing with Limited Data  
**Stephen W. Looney** - Augusta University, USA

Causal inference-informed re-analysis to gain insights into factors associated with drop-out from weight-loss programmes  
**Ridda Ali** - Leeds Institute for Data Analytics/Faculty of Environment/Faculty of Medicine and Health, University of Leeds, UK

## Environmental & Spatial Statistics

Contributed: Non-stationary spatial statistics

## Exchange 2-3

Modelling the frequency domain behaviour of ocean waves  
**Jake Grainger** - Lancaster University, UK

Impact of global warming on rainfall: A Spatio-temporal study  
**Soudeep Deb** - Indian Institute of Management, Bangalore, India

Boundary effects on Voronoi-based lifting scheme for spatial data analysis  
**Fatih Gezer** - University of Leeds, UK

## Medical Statistics

Contributed: New approaches in sample size calculation

## Exchange 4-5

Bayesian sample size calculations for diagnostic accuracy studies  
**Kevin Wilson** - Newcastle University, UK

Guidelines for Sample Size Calculation under Competing Risks Survival data in Gs-design  
**Mohammad Anamul Haque** - Department of Statistical Sciences, University of Padova, Italy

Bayesian Hierarchical Modelling of the Intracluster Correlation Coefficient for Trial Sample Size Estimation  
**Svetlana V Tishkovskaya** - University of Central Lancashire, Preston, UK

# Day 2 Tuesday 7 September

## Medical Statistics

### Contributed: Predictive modelling

#### Exchange 6-7

Developing Multivariate (multi-outcome) Clinical Prediction Models for Multiple Binary Outcomes

Glen Martin - University of Manchester, UK

Prediction of centre activations for patient recruitment in multicentre clinical trials.

Aris Perperoglou - AstraZeneca, Cambridge, UK & Newcastle University, UK

Comparison of predictive modelling methods for prediction of adverse outcomes of pre-eclampsia

Tunde Csoban - University of Strathclyde, Glasgow, UK

## Data Science

### Contributed: New methods in data science

#### Exchange 8

Creating synthetic identifier data to evaluate data linkage methods

Katie Harron - UCL, UK

Supervised classification using binary trees and generalized linear models

Lorena León - CIRAD & IMAG, University of Montpellier, France.

Guided data analysis using information-theoretic statistics

Stephen Watts - The University of Manchester, UK

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[#RSS2021Conf](https://twitter.com/RSS2021Conf)

## Methods & Theory

### Contributed: Methods inspired by Covid-19

#### Exchange 10

Models for predicting international migration flows to and from the UK during the COVID-19 pandemic

Duncan Elliott - ONS, UK

Assessing the effectiveness of test trace & isolation compared to control by randomizing patients to different diagnostic testing strategies

Huw Llewelyn - Aberystwyth University, UK

What lies ahead - learning the potential function, with application to forecasting of COVID infection numbers

Dalia Chakrabarty - Brunel University London, UK

## Methods & Theory

### Contributed: Variable selection

#### Exchange 11

Best Subset Selection via a Simple Bernoulli Sampling Method

Xiyu Jiao - Nuffield College, University of Oxford, UK

Followed by

## Official Statistics & Public Policy

### Contributed: Examples from across UK official statistics

#### Exchange 11

Estimating variation in child mortality rates at the small area level in England and Wales between 2006 and 2014

Owen Nicholas - University College London, UK

Everything you ever wanted to know about Value for Money at the National Audit Office but were afraid to ask  
Laura Cole, Stephen Jobling - National Audit Office, UK

## 10:10 – 11:10

### Plenary

#### Keynote 2 - Barnett Lecture

#### Exchange Auditorium/ Livestream

How to tune your simulator

Jonty Rougier - 2021 Barnett Award winner

Many environmental processes are transformative; e.g., heavy rainfall on the Brecons is transformed into flooding in Hereford. Such transformations are modelled by computer simulators of the underlying processes. These simulators contain parameters which must be tuned, usually to time-series from historical events. The ubiquitous practice is to minimize the sum of squared deviations, possibly scaled by measurement error. I explain and show how this practice can be improved by modelling the simulator's limitations, and using Bayesian optimization.

## 11:10 – 11:40

### Refreshment break

#### Exchange Hall

# Day 2 Tuesday 7 September

11:40 – 13:00

## Methods & Theory

Missing data in the era of big data

### Exchange Auditorium/ Livestream

Organised by Camille Szmaragd Harrison & Richard Tomsett for RSS Computational Statistics and Machine Learning Section

Dark Data - why what we don't know matters  
**David Hand** - Imperial College, London, UK

Optimal design of experiments in the presence of missing outcome values  
**Robin Mitra** - Cardiff University, UK

Less data, more physics: using dynamical equations to accelerate learning from small or patchy datasets  
**Levente Klein** - IBM, USA

## Medical Statistics

STRATOS initiative - on various issues in multivariable model building

### Exchange 11

Organised by Aris Perperoglou on behalf of the STrengthening Analytical Thinking for Observational Studies (STRATOS) initiative

Causal inference for survival outcomes: a censored edition  
**Bianca De Stavola** - UCL, UK

Selected challenges in multivariable regression modeling of survival data  
**Michal Abrahamowicz** - McGill University, Montreal, Canada

Combining variable selection and shrinkage to derive a multivariable regression model  
**Willi Sauerbrei** - Institute of Medical Biometry and Statistics, University of Freiburg, Germany

Strengthening simulation studies in statistical research  
**Tim Morris** - MRC Clinical Trials Unit at UCL, UK

## Business, Industry & Finance

Statistical engineering

### Exchange 1

Organised by Sophie Carr & Tim Davis for RSS/IMechE working group on Statistical Engineering

To illustrate progress in the collaboration between RSS and IMechE and the wider use of statistics in engineering.

Statistical Engineering: Interpreting sensor outputs  
**Peter Keen** - Keen Marine

The Statistical Finite Element Method  
**Mark Girolami** - The Turing Institute

Data modelling and robust design in statistical engineering  
**Ron Bates** - Rolls Royce Aero

Statistics for competitive advantage  
**Andrew Bradley** - Institution of Mechanical Engineers

# Day 2 Tuesday 7 September

## Communicating & Teaching Statistics

### Contagious disease statistics and misinterpretation of COVID dynamics and data

#### Exchange 10

Organised by Salma Ayis for RSS Medical Section

Reflection on data reporting and misinterpretation of COVID-19 statistics

Salma Ayis - Kings College London, UK

Issues on fatality risks, data delays and dynamics of infectious disease, "COVID-19" example

Adam Kucharski - LSHTM, UK

## Data Science

### Confessions of a Data Scientist

#### Online

Organised by Louisa Nolan & Richard Pugh for RSS Data Science Section

What's your worst mistake as a data scientist?  
What have you learned from it?

We will be asking data scientists from across the public, private and academic sectors about their worst mistakes in data science. From these, we will select common themes and topics, and create a crowd-sourced compilation of the deadliest sins of data science. These will be presented to our panel, for a live, interactive discussion in front of the audience.

"He who covers his transgressions will not prosper, but whoever confesses and forsakes them will obtain mercy."  
Proverbs 28:1

[rss.org.uk/conference2021](https://rss.org.uk/conference2021)

[#RSS2021Conf](https://twitter.com/RSS2021Conf)

We will of course guarantee the anonymity of any people or institutions involved in the confessions.

Panel members will include:

Rayid Ghani, Giuseppe Sollazzo and Martin Goodson (TBC)

Chair: Louisa Nolan

## Environmental & Spatial Statistics

### Spatiotemporal modelling of environmental and climate data

#### Online

Organised by Adam Sykulski for RSS Environmental Statistics Section

We will discuss statistical aspects of modelling climate and environmental data, with a focus on spatiotemporal modelling. We have a range of expert speakers on topics including oceanography, hydrology and ecology.

Understanding water resource usage using sensors and satellites

Marian Scott - University of Glasgow, UK

Multivariate spatial dependence of extreme winds and seas in the North East Atlantic from satellite scatterometry and hindcasts

Phil Jonathan - Lancaster University and Shell, UK

Spatio-temporal modelling of vegetation dynamics using data from multiple sources

Pete Henrys - UK Centre for Ecology & Hydrology

## Official Statistics & Public Policy

### Delivering census outputs

#### Online

Organised by members of the Census Outputs & Dissemination team at the UK Office for National Statistics

The session will introduce a variety of aspects of how the Office for National Statistics (ONS) is delivering the benefits of the census.

Chair: Callum Foster, Business Lead - Census Outputs and Dissemination, ONS, UK

Presentations will include:

Innovation in statistical disclosure control methods, allowing a flexible approach to the dissemination of Census 2021 data

Callum Foster and Keith Spicer - ONS, UK

Census analysis proposals

Ed Morgan - Head of Census Analysis Co-ordination, ONS, UK

Data visualisation

Rob Fry - Head of Data Visualisation, ONS, UK

The session will end with a panel discussion and audience Q&A.

# Day 2 Tuesday 7 September

13:30 – 14:00

Break

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Lunch

Exchange Hall

13:00 – 13:45

Networking

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Young Statisticians Reception

Exchange 9

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

Everyone welcome, of all ages, backgrounds and experiences!

13:10 – 13:50

Invite only

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Meeting with Section and Special Interest Group representatives

Exchange 8

Blaise Egan (RSS Honorary Officer for Sections and Local Groups) will meet with Section and Special Interest Group representatives for a discussion on current and future activities at the Society.

14:00 – 15:20

Methods & Theory

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Representing and quantifying uncertainty in complex systems

Exchange Auditorium/ Livestream

Organised by Jeremie Houssineau

How big was that huge volcanic eruption which happened 90 thousand years ago?

Jonty Rougier - UK

On the role of kernel selection and deep GPs in UQ for complex systems with application to climate models  
Lachlan Astfalck – University of Leeds, UK

How deterministic uncertainty can reduce the risk of misspecification in complex systems?

Jeremie Houssineau – University of Warwick, UK

14:00 – 15:20

Applications of Statistics

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Women's sport - the statistics supporting success

Exchange 11/ Livestream

Organised by Bev Hale for RSS Statistics in Sport Section

Women's sport is more visible in the media than ever before and British teams are making a mark on the world stage. England netball are currently ranked third in the world, women's football is more visible in the media with the English team reaching the semi-finals of the 2019 FIFA women's world cup and England ranked second in the world for T20 cricket.

How does the use of statistics contribute to these successes by informing policy making and performance enhancement?

Speakers:

Naomi Datson - University of Chichester, UK

Sarah Needham-Beck - University of Chichester, UK

Lucy Onyeforo - Dorsey & Whitney LLP, New York, USA (ex GB bobsleigh athlete)

Data Science

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Artificial Intelligence - or is it?

Exchange 1

Organised by Marie Oldfield

We have already seen the progression through Statistics to data science, but now we see the progression to AI. So what is AI. Are the machines really coming to get us?

In this session we start with a talk about AI, is it what it really seems or is it an illusion. What are the ethical issues surrounding AI and how are they currently being addressed. We then take time to discuss and explore ethics and their implementation, as well as our visions for the future.

Panellists:

Marie Oldfield, Allison Gardner, Richard Saldanha, Rebecca Bridger

# Day 2 Tuesday 7 September

## Communicating & Teaching Statistics

### Joy of teaching statistics to non-specialists

#### Exchange 2-3

Organised by Meena Mehta Kotecha

Teaching statistics to non-specialists can be a challenge but it can also be an exciting, pleasing and a fulfilling experience.

Insights into students' perspectives

**Meena Mehta Kotecha** - London School of Economics and Political Science, UK

From statistophobia to statistophilia: teaching politics and international relations students to love numbers

**Helen Williams** - University of Nottingham, UK

How to turn your question into an equation - and make sense of the answer!

**Elizabeth Liddle** - University of Nottingham, UK

Followed by panel discussion

## Medical Statistics

### Modelling local Covid-19 data in Manchester

#### Exchange 10

Organised by Antonia Marsden for RSS Manchester Local Group

This session will cover various aspects of statistical modelling undertaken to monitor the rapidly evolving COVID-19 pandemic. The focus will be on the Manchester region, one of the worst-hit areas in the UK. The work has been presented to SAGE and its subgroups, as well as local decision makers. The session will discuss challenges in the analysis of social care and hospital data and forecasting.

#### Speakers:

**Ian Hall** - University of Manchester

**Francesca Scarabel** - University of Manchester

**Christopher Overton** - University of Manchester

## Official Statistics & Public Policy

### UK data science as a global public good

#### Online

Organised by Emily Poskett & Louisa Nolan on behalf of RSS International Development (IDS) and Data Science (DSS) Sections

To share the collaborative work of ONS and FCDO on data science for international development with the RSS community, especially the RSS data science community (though the RSS Data Science Section committee), and generate a discussion across communities of practice through the medium of the RSS, considering differences in approaches and practices between the public and private sectors, different parts of government, and UK-based and international work with a view to sharing relevant insights to inform future work.

#### Speakers:

**Tom Wilkinson** - ONS Data Science Campus, FCDO Hub, UK

**Claire Melamed** - CEO, Global Partnership for Sustainable Development Data, UK

**Ivan Murenzi** - Deputy Director General for the National Institute of Statistics of Rwanda (NISR)

**Tim Harris** - FCDO, UK (TBC)

**Chair: Emily Poskett** - ONS International Development Team & IDS Committee

# Day 2 Tuesday 7 September

14:00 – 15:20

## Social Statistics

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### Data quality in probability-based online panels

#### Online

Organised by Olga Maslovskaya & Carina Cornesse for RSS Social Statistics Section

Investigation of nonresponse bias and representativeness in the first cross-national probability based online panel (CRONOS)

**Olga Maslovskaya** - University of Southampton, UK

Evaluating data quality in the UK NatCen probability-based online panel

**Olga Maslovskaya** - University of Southampton, UK

Investigating multiple aspects of data quality across ten German probability-based and nonprobability online panels  
Carina Cornesse - University of Mannheim, Germany

Integrating Probability and Nonprobability Surveys to Improve Estimation and Reduce Costs

**Joseph Sakshaug** - Institute for Employment Research, Nuremberg, Germany.

## Professional Development

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### Interactive visualisation

#### Online

Organised by Sritika Chowdhury for the RSS Young Statisticians Section

This session will provide a 30-minute crash course on the basics of interactive visualisation presented by Joe Russell from Mango Solutions. The rest of the session will have the prize winners Uche Mbaka and Bhaduri Moinak from the YSS Interactive Visual competition present their interactive apps and an opportunity to ask plenty of questions!

15:50 – 16:50

## Refreshment break

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### Exchange Hall

15:50 – 16:50

## Professional Development

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### Statisticians for Society - lessons learned and new perspectives

#### Exchange 11/ Livestream

Organised by Amaka Nwagbara for Statisticians in Society Scoping Committee

Statisticians for Society was created by the Royal Statistical Society (RSS) to connect charitable organisations with professional statisticians who can provide expert help with collecting, analysing and presenting data.

Following a successful two-year pilot, the RSS has been awarded new funding in 2020 to continue the programme for another five years. In this session, speakers will share their experiences working on the programme at various stages. You will hear about lessons learned, contributions volunteers have made, how you can get involved and our plans for the new phase.

Delivering Statisticians for Society – the journey so far  
**Rob Mastrodomenico** - chair of Statisticians for Society

How can we best count street-connected children worldwide?

**Sarah Barry** - University of Strathclyde

Data on Hearing Loss in Wales

**Alan Jackson**

Panel discussion and Q&A

In addition to the speakers, the panel will include:

**Neil Spencer**, member of the Statisticians for Society Scoping Committee

**Andy Sutherland**, member of the Statisticians for Society Review Panel

# Day 2 Tuesday 7 September

## Professional Development

**Professional pathways and competencies: A new look for professional membership at the RSS**

### Exchange 9

Organised by Ricky McGowan for RSS Professional Affairs Committee

The Royal Statistical Society (RSS) has recently seen its biggest change to its professional membership offering in over 10 years with the introduction of a new competency based framework, new accreditation standards, a competency route for GradStat and a new professional title; Data Analyst. As RSS Vice-President for Professional Affairs, Rachel Hilliam will be leading a session aimed at explaining why these changes were introduced and how you can identify as to where you may be within the new framework and how you can progress through the new professional pathway.

## Applications of Statistics

**Stats+Stories/ ASA and Significance: Live Online at RSS 2021**

### Online

Organised by Brian Tarran for Significance

The format of this session will be a "live podcast", to be recorded and released as part of the ongoing Significance and Stats and Stories partnership. John Bailer and Rosemary Pennington (Stats and Stories) and Brian Tarran (Significance) will co-host a panel discussion, featuring two guests, based on current events/current affairs.

[rss.org.uk/conference2021](https://rss.org.uk/conference2021)

[#RSS2021Conf](https://twitter.com/RSS2021Conf)

15:50 – 16:50

## Rapid-Fire talk sessions

**Exchange 1, Exchange 2-3, Exchange 4-5, Exchange 6-7 and Exchange 10**

**The following talks are expected to be presented – the final listing and allocation of talks to rooms will be available on the online programme and the information board in the venue.**

**Modelling Covid-19 Pandemic**

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

**Smooth Ridge model from computer experiments**

Asma Farid - Queen Mary University of London, UK

**How balance and sample size impact bias in the estimation of causal treatment effect: A simulation study**

Andreas Markoulidakis - Cardiff University, UK

**Evolution Strategies (ES) as an alternative to Reinforcement Learning (RL)**

Emmanuelle Rodrigues Nunes - University of Reading, UK

**The Breast Cancer Epidemic**

Patrick Carroll - PAPRI, London, UK

**Modelling of Patients Enrollment at the Adult Antiretroviral Treatment Clinic Using SARIMA Model Approach**

Iyabode Favour Oyenuga - The Polytechnic, Ibadan, Nigeria

**Reproducibly estimating drug exposure from free-text prescriptions**

David Selby - Centre for Epidemiology Versus Arthritis, University of Manchester, UK

**A Multilevel Mixed-Effect Ordinal Logistic Regression Analysis of Multi-morbidity among Children 6-59 months of Age in Nigeria**

Phillips Edomwonyi Obasohan - School of Health and Related Research (SchARR), University of Sheffield, UK & Niger State Polytechnics, Nigeria

**The Disproportionate Effect of Covid-19 Impact on Women in the Workforce: A Data Literate Response**

Tatjana Kecojevic - Sister Analyst, Belgrade, founder and director, Serbia

**Computer Vision for Social Good**

Thomas Y Chen - Academy for Mathematics, Science, and Engineering, Rockaway, USA

**How can statistics help foodbanks understand the need for their services?**

Sophie Carr - Bays Consulting, UK

**Fused inverse-normal method for integrated differential expression analysis of RNA-seq data**

Birbal Prasad - Teesside University, UK

**Is it ART? An Application of TransCelerate's Modernization of Statistical Analytics (MSA)**

**Framework for Assessing Accuracy, Reproducibility, and Traceability**

Andy York - UCB, Blackwater, UK

**The Application of Feature Selection Methods in the Prediction of Permeability for Polydimethylsiloxane (PDMS) Membranes**

Yi Sun - University of Hertfordshire, UK

# Day 2 Tuesday 7 September

Common misconceptions for online statistics teaching  
Eirini Koutoumanou - UCL, UK

Improving Power by Conditioning in Genetic Association Studies

Mahfuzur Rahman Khokan - Open University, UK

Will machine learning techniques replace traditional numerical modelling in the sciences? A case study in meteorology

Thomas Y Chen - Academy for Mathematics, Science, and Engineering, Rockaway, USA

Using Categorical Data Analysis to evaluate the influx of job seekers in the EU/UK during coronavirus pandemic

Joel Chiadikobi Nwaubani - University of Macedonia, Thessaloniki, Greece

Bayesian multi-state modelling of incomplete chronic disease data for health impact models

Christopher Jackson - MRC Biostatistics Unit, University of Cambridge, UK

A p-Value Free FDR Controlling Approach for High Dimensional Variable Selection

Arkaprabha Ganguli - Michigan State University, USA

Multi-Resolution Bayesian Hypothesis Testing for High Dimensional Data

Anirban Samaddar - Michigan State University, USA

Bayesian Approach to Machine Learning; An application to modeling outcomes of HIV Differentiated Care Model in Kenya

Collins Ojwang Odhiambo - Johns Hopkins University and Medicine, Baltimore, USA & Strathmore University, Nairobi, Kenya

Two-way Sparse Network Inference for Count Data  
Miss Sijia Li - University of Leeds, UK

Health-related Quality of Life among Children/ Adolescent Living with HIV/AIDS in Lagos State Using Non-parametric Statistical Method

Abideen Olurotimi Salako & Oluwatosin Olaseni Odubela - Nigerian Institute of Medical Research, Lagos, Nigeria

The impossible survey - collecting data in a conflict zone

Joanne McFadden - Foreign Commonwealth and Development Office, Glasgow, UK

The relationship between cognitive and psychosocial disability and learning outcome: A quantitative study of primary school children in North West Syria

Grace Anyaegbu, Caroline Carney - Foreign Commonwealth and Development Office, Glasgow, UK

Modelling the Behaviour of Fin Whales Using Hidden Markov Models

Valentin Popov - University of St Andrews, UK

Exploring sciatica outcomes using RCT and spinal registry data

Lukas Staudt - University of Liverpool, UK

Innovative Study Combining Digital Patient Generated Data with Health Records to Improve the Understanding of Back Pain

Eleanor Ralphs - IQVIA, London, UK

The mismeasure of cognitive confrontations

Philippe Chassy - University of Liverpool, UK

The impact of measurement error and sparse outcome data on treatment effect estimation

when using Propensity Score methods in electronic healthcare records

Jane Burnell - University of Central Lancashire, Preston, UK

Combining the quantile and cumulative distribution functions: A new family of distributions on  $[0, 1]$

Chibueze Emmanuel Ogbonnaya - University College London, UK

Multi-view data visualisation, clustering and classification via multi-SNE and S-multi-SNE

Theodoulos Rodosthenous - Imperial College London, UK

Unpaid carers' mental wellbeing in Wales: a quantile regression study

Jiao Song - Public Health Wales, Cardiff, UK

A generalised ROC curve

Paolo Giudici & Emanuela Raffinetti - University of Pavia, Italy



# Day 2 Tuesday 7 September

17:00 – 17:55

Plenary

## Keynote 3 - Campion (President's Invited) Lecture Exchange Auditorium/ Livestream

Veridical Data Science: the practice of responsible data analysis and decision-making  
Bin Yu - University of California at Berkeley

"A.I. is like nuclear energy -- both promising and dangerous" -- Bill Gates, 2019.

Data Science is a pillar of A.I. and has driven most of recent cutting-edge discoveries in biomedical research. In practice, Data Science has a life cycle (DSL) that includes problem formulation, data collection, data cleaning, modeling, result interpretation and the drawing of conclusions. Human judgement calls are ubiquitous at every step of this process, e.g., in choosing data cleaning methods, predictive algorithms and data perturbations. Such judgment calls are often responsible for the "dangers" of A.I. To maximally mitigate these dangers, we developed a framework based on three core principles: Predictability, Computability and Stability (PCS). Through a workflow and documentation (in R Markdown or Jupyter Notebook) that allows one to manage the whole DSL, the PCS framework unifies, streamlines and expands on the best practices of machine learning and statistics -- bringing us a step forward towards veridical Data Science.

In this lecture, we will illustrate the PCS framework through the development of iterative random forests for predictive and stable non-linear interaction discovery and that of epiTree, a pipeline to discover epistasis interactions from genomics data.

18:00 – 18:30

Plenary

## Royal Statistical Society Awards Ceremony Exchange Auditorium/ Livestream

Every 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 Sylvia Richardson will welcome this year's recipients to receive their medals and prizes.

Details about this year's winners can be found here:  
<https://rss.org.uk/news-publication/news-publications/2021/general-news/announcing-our-honours-recipients-for-2021/>



18:30 – 20:00

Networking

## Poster reception Exchange Hall

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

For a list of the poster being presented please refer to the online conference programme or the information board at the venue

[rss.org.uk/conference2021](https://rss.org.uk/conference2021)  
#RSS2021Conf

# Day 3 Wednesday 8 September

09:00 – 10:20

## Environmental & Spatial Statistics

Papers from the Journal of the Royal Statistical Society

### Exchange Auditorium/ Livestream

Organised by Judith Shorten on behalf of the Journal Series Editors

In view of the continuous debate on 'climate change' and extreme weather events, the papers have the common theme of 'environmental impacts' in the applications that they consider to illustrate advances in statistical techniques.

**Series A:** How does the temperature vary over time?

Evidence on the stationary and fractal nature of temperature fluctuations

John Dagsvik - Statistics Norway

**Series B:** Multivariate type G Matérn stochastic partial differential equation random fields

David Bolin - KAUST, Saudi Arabia

**Series C:** Modelling the spatial extent and severity of extreme European windstorms

Paul Sharkey - Cervest, London, UK

## Applications of Statistics

### Challenges of the Covid-19 pandemic

#### Exchange 11/ Livestream

Organised by RSS Emerging Applications Section

This session aims to provide an overview of some of the key statistical and methodological issues that were faced when responding to the initial stages of the Covid19 pandemic. The panel discussion will begin with an overview of a selection of the statistical and methodological problems that emerged whilst responding to the Covid19 pandemic. Discussants will describe approaches taken to meet these challenges.

Panellists:

John Aston - University of Cambridge

Christl Donnelly - University of Oxford

Gioavanna Jona Lasinio - Sapienza University of Rome

Chris Robertson - University of Strathclyde

## Social Statistics

### Measurement error in the social sciences: estimation and correction

#### Exchange 1

Organised by Alexandru Cernat for RSS Social Statistics Section

One of the key challenges for the quantitative social sciences is to measure complex concepts related to human behaviours, values and attitudes. While these are essential building blocks of social science theory they are difficult to collect and analyse due to the pervasive problem of measurement error. This, in turn, threatens the reliability and validity of our measures and leads to biases in statistical estimates. In this session we will discuss the latest advances in the statistical estimation and correction of measurement error in survey research.

Understanding change in time of measurement error using Longitudinal Multitrait Multierror  
Alexandru Cernat - University of Manchester, UK

Consistent estimates for categorical data based on a mix of administrative data sources and surveys  
Laura Boeschoten - Utrecht University, Netherlands

The Impact of Measurement Error in Models Using Police Recorded Crime Rates  
Jose Pina Sanchez - University of Leeds, UK

Measurement Quality in Probability and Nonprobability Online Panels  
Joseph Sakshaug - Institute for Employment Research, Nuremberg, Germany

## Business, Industry & Finance

### Statistics solutions for business & industry - diverse case studies

#### Exchange 2-3

Organised by Matthew Linsley for Newcastle University Solve

This session will explore some of the significant and wide ranging benefits achieved from statistics applications within diverse fields such as transport, gas utilities, biotechnology, medical applications and safety. Bayesian statistics, time series analysis, Design of Experiments and reliability analyses approaches will be featured. Each case study will be described through the presentation of the problem, underpinning statistics theory, the application and benefits achieved.

Speakers:

Matthew Linsley - Newcastle University Solve manager

Sara Hilditch - Director, Statistical Services Unit, The University of Sheffield

Neil Spencer - Director of Statistical Services and Consultancy Unit, University of Hertfordshire

# Day 3 Wednesday 8 September

09:00 – 10:20

Data Science

**Making better decisions based on simulation**

## Exchange 8

Organised by Omar McCarthy for RSS Quality Improvement Section

An introduction on the importance of data/understanding variability and the role it plays in being able to simulate real life supply chains and production systems.

The ranging types of business questions and scenarios that can be answered through the application of discrete event simulation, particularly in this current uncertain environment of COVID-19; through experimenting different ideas without disruption or enormous costs

A hands on introductory session on how to start building simple models to address some of the types of areas including Health and Safety, Sustainability, Supply Chain Optimisation, Production Systems Design, and Engineering and Capital Investments.

**Speakers:**

**Erik Flores** - KTH University, Sweden

**Jonathan Smyth-Renshaw** - Jonathan Smyth-Renshaw & Associates Limited

Professional Development

**Data wrangling and visualisation using the tidyverse in R**

## Exchange 9

This workshop will cover the basics of the tidyverse – a collection of packages in R which can be used to import, tidy, transform and visualise data. The workshop will centre around a live coding demonstration using tidyverse functions which tackles a realistic, ‘messy’ dataset, ending with visualisations and a dataset ready for statistical analysis. The session is suitable both for people with minimal experience in R, and for more experienced users who have yet to explore what the tidyverse has to offer. All material will be made available to attendees after the workshop to go through in their own time.

**Presenters:**

**Samuel Langton** - Netherlands Institute for the Study of Crime and Law Enforcement.

**Ioana Macoveciuc** - University of Manchester

**Nathan Khadaroo-McCheyne** - University of Manchester

Official Statistics & Public Policy

**Automating Official Statistics**

## Exchange 10

Organised by David Matz for RSS Official Statistics Section

Automation in official statistics provides opportunities to improve efficiency of regular production tasks, improving resilience and enabling statisticians to spend less time on routine tasks. Whilst not a new idea, it has had renewed focus in recent years.

The session will include presentations from UK's official statistics system. Attendees will learn about the opportunities and risks that need to be managed when automating statistical processes and be able to learn best practice from those who have been through the process.

**Speakers:**

**Michael Hodge** - Office for Statistics Regulation, UK

**Anna Price** - Office for Statistics Regulation, UK

**Alexander Newton** - Office for National Statistics, UK

**Arthur Turrell** – Office for National Statistics, UK

# Day 3 Wednesday 8 September

## Communicating & Teaching Statistics

**RSS Prize winners: Statistical excellence award for early career writing 2021**

### Online

Organised by Significance & RSS Young Statisticians Section

Significance magazine and the RSS Young Statisticians Section invite you to join this special session of conference, celebrating the 2021 finalists of the Statistical Excellence Award for Early Career Writing. Hear talks based on the shortlisted articles and take part in the discussion that follows to find out more about the competition and what's required to craft a successful entry.

Pietro, Precipitation and Perseverance: extracurricular writing when you should really be working on that grant  
**Conner Jackson** - University of Colorado Anschutz Medical Campus

We're not getting any younger! Or should that be older?  
**Nicola Rennie** - Lancaster University

Title TBC

**Anna Beukenhorst** - Harvard University and University of Manchester

## 10:20 – 10:50

### Refreshment break

## Exchange Hall

## 10:50 – 11:50

### Professional Development

**Reviewing for a clinical journal - improving stats in medicine one paper at a time**

### Exchange 11/ Livestream

Organised by RSS Medical Section (from an original proposal by Irene Stratton)

The quality of statistics in medical journals has been criticised for many years. Some of us review regularly and would like to share our experiences, try to encourage you to review for medical/health journals and look at other ways of being involved in raising the quality of papers.

#### Speakers:

**Irene Stratton** - University of Southampton, UK

**Richard Stevens** - University of Oxford, UK

**Mona Kanaan** - University of York, UK

**Catey Bunce** - The Royal Marsden NHS, London, UK

**Sarah Nevitt** - University of Liverpool, UK

### Methods & Theory

**Contributed: Non-parametric methods & theory**

### Exchange 1

Fully data-driven non-parametric estimation of Toeplitz covariance matrices

**Karolina Klockmann** - University of Vienna, Austria

Whittle Estimation of the Hurst Exponent, and Related Nonparametric Statistics, with Applications to Financial and Health Data

**Keerati Suibkitwanchai** - Lancaster University, UK

Endogeneity in Modal Regression

**Tao Wang** - University of California, Riverside, USA

## Environmental & Spatial Statistics

**Contributed: Spatial epidemiology and air quality**

### Exchange 2-3

Where are the missed tuberculosis cases in Bangladesh? Finding gaps in routine surveillance activities by linking prevalence survey and case notification data  
**Adrien Allorant** - University of Washington, & Institute for Health Metrics and Evaluation, Seattle, USA

Bayesian spatio-temporal modeling of malaria risk in Rwanda

**Muhammed Semakula** - Rwanda Biomedical Center, Kigali, Rwanda; Hasselt University, Belgium & University of Rwanda, Kigali, Rwanda

An application of a multi-dimensional non-homogeneous Markov chain of order K to jointly study ozone and PM10 exceedances in Mexico City

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

## Social Statistics

**Contributed: Measuring social behaviour**

### Exchange 4-5

Allowing for unemployment in productivity measurement  
**Rob Gandy** - Liverpool John Moores University, UK

Re-examining how people discount future money in behavioural economics studies

**Kenneth Lim** - IBM UK

# Day 3 Wednesday 8 September

10:50 – 11:50

## Applications of Statistics

Contributed: Network analysis

### Exchange 6

On community structure validation in real networks  
**Luisa Cutillo** - University of Leeds, UK

Modelling Rare Events in an Adaptive Cluster Sampling Design with Heterogeneity among Networks and within the Network Units

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

## Medical Statistics

Contributed: Study design

### Exchange 7

Average Causal Effect Estimation for High-Dimensional Spatial Treatments: Radiotherapy Simulation Study  
**Alexander Jenkins** - The University of Manchester, UK

The UK Research study into Ethnicity and COVID-19 outcomes in Healthcare workers (UK-REACH): A UK-wide data linkage cohort study.

**Lucy Teece** - University of Leicester, UK

Strong Orthogonal Arrays and Orthogonal Array-Based Latin Hypercube Designs for Planning Experiments: A Method for Improving Study Design in Biomedical Research

**Kazeem Adewale Osulale** - Nigerian Institute of Medical Research, Lagos, Nigeria & University of Ibadan, Nigeria.

## Professional Development

Shaping the Profession of Data Science by the Alliance of Data Science Professionals

### Exchange 9

The Alliance of Data Science Professionals was created with the goal shaping professional standards within data science. Since the start of 2020 the Alliance has been working collaboratively to develop standards and competencies for both academic institutes & practitioners that will allow individuals to gain recognition for good data science skills and training without the requirement of signing up to another learned society.

We would now like to present to you how the Alliance aims to achieve its goal and also provide you with an opportunity to ask questions and provide feedback to the developing process.

This work has gained support from Government with it being referenced in the National Data Strategy and it also has full support of key stakeholders including the CEO's and Presidents of their societies. Members of the Alliance include: The British Computing Society (BCS), The Operational Research (OR) Society, Institute of Mathematics & its Applications (IMA), The Royal Academy of Engineers (RAEng), The National Physical Laboratory (NPL), The Alan Turing Institute and has the additional support from the Royal Society.

#### Speakers:

**Ricky McGowan** - Head of Professional Standards & Accreditation, Royal Statistical Society, UK

**Rachel Hilliam** - Vice-President, Professional Affairs, Royal Statistical Society, & Open University, UK

## Official Statistics & Public Policy

Contributed: Innovative ways of working in official statistics

### Exchange 10

Developing a data linkage service for informing policy-driven research in Scotland

**Cecilia Macintyre** - Scottish Government, Edinburgh, UK

Software engineering in government research? See what happens next! Reproducible Analytical Pipelines (RAP) is digital transformation for public sector analysis  
**Alexander Newton** - Office for National Statistics, London, UK

Real time indicators: Opportunities, challenges and next steps for national statistical institutes

**Grant Fitzner** - Office for National Statistics, London, UK

# Day 3 Wednesday 8 September

12:00 – 12:50

Plenary

## Keynote 4 - Significance: Statistical literacy and the Media

### Exchange Auditorium/ Livestream

Every day, most of us will read or watch something in the news that is based on statistics in some way. Sometimes it'll be obvious - 'X people develop cancer every year' - and sometimes less obvious - 'How smartphones destroyed a generation'. Statistics are an immensely powerful tool for understanding the world; the best tool we have. But in the wrong hands, they can be dangerous.

From cherry-picking numbers to simply mixing up percentages and percentage points, journalists are not usually renowned for their numeracy - preferring stylish prose to statistical knowhow. This is not to say they are the only ones at fault: academics, governments and the education system all have a part to play.

Following the publication of their new book, How To Read Numbers, David and Tom Chivers explore why the media is often so bad at statistics, and what, if anything, can be done about it.

12:50 – 13:30

Plenary

## Annual General Meeting of the Royal Statistical Society

### Exchange Auditorium

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

As part of the meeting, Society President, Sylvia Richardson and Chief Executive, Stian Westlake, will speak about the Society's work over the last year. These presentations will include an outline of: the activities of the RSS Covid-19 Taskforce; developments in our work on Data Science; and what we are doing to promote Equality, Diversity and Inclusion.

Members will also be asked to either approve or amend:

- The 2020 Annual Report and Financial Statements
- The recommended member subscription rates for 2022
- The re-appointment of the Society's auditors

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

Agenda papers can be found on the Society's website

13:00 – 14:20

Lunch break

### Exchange Hall

13:10 – 13:50

Invite only

## Meeting with Local Group representatives

### Exchange 8

Blaise Egan (RSS Honorary Officer for Sections and Local Groups) will meet with Local Group representatives for a discussion on current and future activities at the Society.

14:20 – 15:40

Medical Statistics

## Addressing statistical and epidemiological issues in global health

### Exchange Auditorium/ Livestream

Organised by RSS International Development & Medical Sections

In this session, we will describe the latest progress and challenges in epidemiological research on diseases in low and middle-income countries carried out by the MRC-funded International Statistics and Epidemiology Group. Talks will cover the use of state-of-the-art statistical techniques to tackle real-world public health problems, using examples of cluster-randomised trials, Ebola, and arboviruses such as Zika and yellow fever.

Addressing statistical and epidemiological issues in global health: The MRC International Statistics and Epidemiology Group

**Emily Webb** - London School of Hygiene and Tropical Medicine, UK

Addressing non-adherence in cluster randomised trials using instrumental variable-based methods  
**Schadrac Agbla** - University of Liverpool, UK

# Day 3 Wednesday 8 September

Real-time analysis and visualization of municipality-level COVID-19 data in Brazil to track disparities in impact across the country

**Paul Mee** - London School of Hygiene and Tropical Medicine, UK

Title TBC

**Tansy Edwards** - London School of Hygiene and Tropical Medicine, UK

## Communicating & Teaching Statistics

### Research informed interventions

#### Exchange 11/ Livestream

Organised by **Meena Mehta Kotecha**

The first presentation is about research on mathematics anxiety (MA) reported by university students, how it impacts their engagement with statistics courses that entail mathematical applications. This research is underpinned by an overarching theoretical framework that combined sociological and psychological perspectives. Its aim was to help students tackle MA.

The second presentation will describe simple steps that teachers can take to improve student motivation and engagement with short video tutorials designed to support teaching of specific concepts in statistics, based on focus group evaluation with undergraduate students from a range of disciplines.

What can statistics educators learn from social sciences?

**Meena Mehta Kotecha** - The University of Cambridge & LSE, UK

Teaching Statistics to Non-Specialists: Putting the Why on the Map

**Lindsey Compton** - The University of Birmingham, UK

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## Other

### Women in British Statistics after Florence Nightingale

#### Exchange 1

Organised by **Alison Macfarlane** for the History of Statistics Section

Florence Nightingale was elected to the Statistical Society in 1858 but women have been a continuing presence in British statistics only since the 1890s. One of the first women to have a career in statistics was Clara Collet (1860-1948) who became a government statistician in 1892 after working with Charles Booth and continued statistical activities, including membership of RSS Council after retirement in 1920. Women participated in the expansion in statistical careers from the Second World War to the end of the 20th century, particularly with the creation in 1941 of the Wartime Social Survey, later known as the Government Social Survey.

Women on the British statistical scene 1890-1960

**John Aldrich** - University of Southampton, UK

Clara Collet, 1860-1948, an early woman working statistician

**Alison Macfarlane** - City University, London, UK

Women in social survey official statistics, from 1941 to the end of the 20th century

**Joy Dobbs**

## Applications of Statistics

### Euro 2020 predictive analysis competition winners

#### Exchange 2-3

Organised by **Iain Gourlay** for RSS Statistics in Sport Section

To celebrate the Euro 2020 football tournament (played in 2021), the RSS Statistics in Sport Section ran an open competition to predict the outcomes of each game. The goal of the competition was for teams or individuals to make probabilistic predictions of the outcome of every game in the Euro 2020 tournament. Entrants were free to use any data they thought useful, provided it was publicly available, including data scraped from public websites. Predictions were made for all group games and every possible knockout game before the start of the competition. 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.

# Day 3 Wednesday 8 September

## Methods & Theory

### Networks as object data

#### Exchange 4-5

Organised by Simon Preston

Network data are arising increasingly in diverse applications, and in many applications it is natural to treat the network as the statistical 'unit' of observation. Statistical methodology for this type of data has been underdeveloped but seen exciting progress very recently. This session brings together three speakers driving that progress.

Manifold valued data analysis of samples of networks, with applications in corpus linguistics

**Katie Severn** - University of Nottingham, UK

Assessing competitive balance in the English Premier League for over forty seasons using a stochastic block model

**Nial Friel** - University College Dublin, Ireland

Hypothesis testing for network data: from Frechet's beautiful insight to the hard problem of choosing a metric

**Cedric Ginestet** - King's College London, UK

## Professional Development

### Getting your work published and maximising its impact

#### Exchange 9

Organised by RSS Young Statisticians Section and Wiley

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 Wiley, 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.

#### Speakers:

**Bianca De Stavola** - Joint Editor of the Journal of the RSS, Series A

**Stephen Raywood** - Senior Journals Publishing Manager, Wiley

**Lucy Teece** - Research Fellow, University of Leicester, UK

**Francisco Rowe** - Senior Lecturer, University of Liverpool, UK

**Brian Tarran** - Editor, Significance Magazine

## Data Science

### RSS-Turing Institute COVID-19 collaboration – research and directions

#### Exchange 10

Organised by Mark Briers, Chris Holmes, Sylvia Richardson and Peter Diggle

Statistical and mathematical models are a crucial component in understanding the state and evolution of the COVID-19 pandemic, and for assisting decision makers with the evidence needed to:

- inform and support local and national actions to respond effectively to actual or expected increases in infection levels;
- efficiently manage and deploy resources across the NHS Test and Trace programme, for example to prioritise testing capacity;
- effectively target communications and non-pharmaceutical interventions to local areas expected to be at increased risk of high incidence and prevalence.

The Alan Turing Institute and the RSS are partnering on this programme of work to support the Joint Biosecurity Centre (JBC), which is part of NHS Test and Trace, based at the Department for Health and Social Care, by providing an independent source of statistical and mathematical modelling and machine learning expertise to address policy-relevant research questions. This session will provide an overview of the research outputs published to date, and a summary of the future research directions.

# Day 3 Wednesday 8 September

14:20 – 15:40

**Business, Industry & Finance**

**NLP for financial decision making**

**Online**

Organised by Anju Kambadur (Bloomberg LP)

Overview of Financial Decision Making

**Anju Kambadur** - Bloomberg LP (NYC), USA

The Role of Knowledge Graphs in Finance

**Ridho Reinanda** - Bloomberg LP (LDN), UK

Financial entity detection

**Daniel Preotiuc-Pietro** - Bloomberg LP (NYC), USA

Extracting market signals from Text

**Hao Zhang** - Bloomberg LP (NYC), USA

On-Demand Clustering and Summarization

**Josh Bambrick** - Bloomberg LP (LDN), UK

Future research directions

**Anju Kambadur** - Bloomberg LP (NYC), USA

**Communicating & Teaching Statistics**

**Teaching statistics to non-specialists in a pandemic setting: opportunities and challenges**

**Online**

Organised by Margaret MacDougall for RSS Teaching Statistics Special Interest Group

Necessity as the mother of invention: Interactivity and partnership in the teaching of statistics to medical students

**Margaret MacDougall** - University of Edinburgh, UK

Teaching statistics to psychology and education Masters students: A blended learning approach

**William Browne** - University of Bristol, UK

Introduction to data science, for all, online

**Mine Cetinkaya-Rundel** - Duke University and R Studio, Inc, USA

Attendees will have the opportunity to engage in dialogue and raise questions with the speakers as a panel.

**Environmental & Spatial Statistics**

**The role of statistics in decision-making at the landscape scale**

**Online**

Organised by Eleni Matechou for RSS Environmental Statistics Section

Landscapes are continuously changing, either naturally or because of human intervention. It is important to understand these changes, their short- and long-term effects and the associated risks, and to make decisions on the need and way to stop or reverse changes when required. This session will demonstrate how statistics are currently used to inform decision-making at the landscape scale, with pollinators, animal populations, air pollution and droughts as case studies and will highlight emerging statistical challenges within landscape decision-making, specifically around assimilating data from both numeric and non-numeric perspectives.

**Speakers:**

**Mark Brewer** - Bioss, Aberdeen, UK

**Richard Everitt** - University of Warwick, UK

**Emma Gardner** - University of Reading, UK

**Cassy Stevens** - Lancaster University, UK

# Day 3 Wednesday 8 September

15:40 – 16:10

Refreshment break

## Exchange Hall

16:10 – 17:10

Applications of Statistics

Contributed: Causal inference applications

### Exchange 1

Causal inference for discrimination: An analysis of NYPD stop-and-frisk decisions

Sunil Kumar - King's College London, UK

Making sense of lifespan - the longevity of sporting legends  
Leslie Mayhew - The Business School City University, London, & International Longevity Centre UK, London, UK

Effect of education on attitude towards domestic violence in Nigeria: an exploration using Propensity score analysis  
Olanrewaju Davies Eniade - Department of Epidemiology and Medical Statistics, University of Ibadan, Nigeria & Adeleke University, Nigeria

Environmental & Spatial Statistics

Contributed: Population health

### Exchange 2-3

Estimating the number of houses in Scotland with internal lead piping

Gail Robertson - University of Edinburgh, UK

Modelling children's emotional and behavioural difficulties at individual level within a spatiotemporal geography  
Samantha Ofili - University of Strathclyde, UK

The global impact of consumption of livestock products on the prevalence of undernourishment: A Spatial Regression Analysis

Rishita Chakraborty - Banaras Hindu University, Varanasi, India

Communicating & Teaching Statistics

Contributed: Developments in teaching statistics

### Exchange 4-5

Creating encounters with real world social data: Insights and resources from UK Data Service work with schools  
Jennifer Buckley - University of Manchester (UK Data Service), UK

What secondary school children can teach us about creating better graphs  
Lucy Teece - University of Leicester, UK

How to teach the "world beyond  $p < 0.05$ " to non-statisticians  
Peter Martin - University College London, UK

Medical Statistics

Contributed: Meta-analyses

### Exchange 6-7

Keele Toolbox for Individual Participant Data Meta-Analyses  
Joie Ensor - Keele University, UK

Comparison of meta-analysis methods to synthesise data from multiple diagnostic tests  
Athena Sheppard - University of Leicester, UK

Business, Industry & Finance

Contributed: Finances and standards

### Exchange 8

Effects of connectivity on challenges in SME access to finance  
Jake Ansell & Antonia Gieschen - University of Edinburgh, UK

Applications of statistical methods in standardization  
Sam Ellis - BSI, Chair of SS/5, and Ellis & Boscawen Associates Ltd, UK

Forecasting Aggregate Household Consumption and Aggregate Income: A Simulation-Based Model Selection Approach  
Robert Kunst - Institute for Advanced Studies, Vienna, & University of Vienna, Austria

# Day 3 Wednesday 8 September

## Professional Development

### Get involved in the RSS

#### Exchange 10

Organised by RSS Young Statisticians Section

Join us to find out how statisticians of all ages (from the young to the most experienced) have been volunteering for the RSS and their associated initiatives. There are always opportunities to Get Involved with the RSS.

## Professional Development

### Wikipedia edit-a-thon: Women and underrepresented minorities in statistics & data science

#### Exchange 9

Organised by Altea Lorenzo-Arribas, Maria Dunbar & Cecilia Lanata Briones for RSS History of Statistics and Young Statisticians Sections

Following the initial YSS Wikipedia edit-a-thon in November 2020, this workshop aims to continue filling the gaps in Wikipedia pages dedicated to women and underrepresented minorities in statistics and data science.

The introduction to the workshop will highlight the main issues found in the underreporting of minority figureheads in statistics and data science in Wikipedia.

This introduction will be followed by a talk on practical hints and tips to start editing pages on Wikipedia, including rules and standards.

[rss.org.uk/conference2021](https://rss.org.uk/conference2021)

[#RSS2021Conf](https://twitter.com/RSS2021Conf)

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Participants will have the opportunity to edit a selection of profiles for which they will be provided with trustworthy references to extract information from.

Ann Randall: the Statistical Contributions of an African American Government Girl in the National Institutes of Health  
**Aura Wharton-Beck** - University of St Thomas, Minnesota, USA

This workshop is open to all. No experience in Wikipedia editing is required.

## Methods & Theory

### Contributed: Networks

#### Exchange 11

Online network monitoring  
**Anna Malinovskaya** - Leibniz University, Hannover, Germany

Bayesian Nonparametric Mixtures of Exponential Random Graph Models for Ensembles of Networks  
**Sa Ren** - University of Kent, UK

Univariate Archimedean copula based network modelling  
**Victory Idowu** - University College London, UK

17:15 – 19:15

## Plenary

### Keynote 5 - Discussion Meeting: Statistical aspects of the Covid-19 pandemic

#### Exchange Auditorium/ Livestream

**Paper 1:** Modelling the COVID-19 infection trajectory: a piecewise linear quantile regression  
**F Jiang** - Fudan University, Shanghai, China  
**Z Zhao** - University of Notre Dame, Indiana, USA  
**X Shao** - University of Illinois, Urbana-Champaign, USA

**Paper 2:** Quantifying the economic response to COVID-19 mitigations and death rates via forecasting Purchasing Managers' Indices using Generalised Network Autoregressive models with exogenous variables  
**G Nason & J Wei** - Imperial College London, UK

**Paper 3:** Small Data, Big Time - A retrospect of the first weeks of COVID-19  
**Q Zhao** - Statistical Laboratory, University of Cambridge, UK

# Day 4 Thursday 9 September

09:00 – 10:00

## Medical Statistics

**Contributed: Bioinformatics**

### Exchange 1

Machine learning for gene expression biomarker detection in Alzheimer's disease

**Jack Kelly** - University of Manchester, UK

Multidimensional Analysis of Immune Responses to Identify Biomarkers of Recent Mycobacterium Tuberculosis Infection

**Tessa Lloyd** - University of Cape Town, South Africa & QIAGEN, Manchester, UK

Analysing women's health during pregnancy using molecular level "omics" data.

**Natalia Dygas** - University of Strathclyde, UK

## Environmental & Spatial Statistics

**Contributed: Soil and crop modelling**

### Exchange 2-3

Spatial Bayesian Geo-Additive Models for Compositional Data. A Case Study of Soil Texture Mapping in the Basque Country

**Joaquín Martínez-Minaya** - Basque Center for Applied Mathematics (BCAM), Bilbao, Spain

Building a crop map from the ground up and novel steps forward in crop yield predictions

**Christina Coakley & Stephen Smith** - Scottish Government, Edinburgh, UK

Wavelet methods to understand the effects of soil pollution on the plant circadian clock

**Jessica Hargreaves** - University of York, UK

## Medical Statistics

**Contributed: Missing data**

### Exchange 4-5

'I was too fat.' Is the lost data more important than the lost pounds? Exploring missing data using chain event graphs.

**Jane Hutton** - The University of Warwick, UK

Inconsistencies in handling missing data across stages of prediction modelling: a review of methods used

**Antonia Tsvetanova** - Centre for Health Informatics, University of Manchester, UK

Target Trial Emulation and Missing Eligibility Data: A study of Palivizumab for child respiratory illness

**Daniel Tompsett** - Institute of Child Health, London, UK

## Methods & Theory

**Contributed: Advances in Bayesian modelling**

### Exchange 6-7

Combining chains of Bayesian models with Markov melding

**Andrew Manderson** - MRC Biostatistics Unit, Cambridge, & The Alan Turing Institute, London, UK

Fast Reversible Jumps for Big Datasets using Stochastic Gradients

**Kieran Richards** - Durham University, UK

Bayesian Causal Mediation Analysis with Stan – A g-formula approach

**Belay Birlie Yimer** - University of Manchester, UK

## Social Statistics

**Contributed: Innovations, controversies and challenges**

### Exchange 8

Tales of Statistical Significance Under a True Null Hypothesis

**Eugene Komaroff** - Keiser University Graduate School, Fort Lauderdale, USA

Enid Charles, socialist, feminist demographer and her analysis of the timing of birth

**Alison Macfarlane** - City University, London, UK

## Professional Development

**Soft skills for statisticians**

### Exchange 9

Join this workshop session which deep dives on one topic around you and your universe: how you can keep track with the help of a mentor, how you can work best with your team, how you can make it happen, project management's biggest pain point or which extra power you should enhance the most.

By using role-playing, simulation exercises and quiz games, you will be immerse into the experience of mentorship, team spirit, conflict resolution, meetings' management and the power of negotiation.

**Presenter:**

**Aura Popa** - The Statistical Company

# Day 4 Thursday 9 September

## Applications of Statistics

Contributed: The spread and impact of Covid-19

### Exchange 10

Forecasting the impact of COVID-19 on future road casualties on the Strategic Road Network  
Sritika Chowdhury - TRL, Wokingham, UK

Spatial assessment of disease surveillance during the first wave of the COVID-19 pandemic

Florence Tydeman - University of Strathclyde, Glasgow, UK

A Spatio-temporal statistical model to analyze COVID-19 spread in the USA

Siddharth Rawat - Indian Institute of Management, Bangalore, India

## Professional Development

Machine Learning with Python and Stata

### Online

Organised by Timberlake Consultants

Presenter:

Giovanni Cerulli

10:10 – 11:10

## Plenary

Keynote 6 - Eric Tchetgen Tchetgen

### Exchange Auditorium/ Livestream

Eric is the Luddy Family President's Distinguished Professor and Professor of Statistics from the Wharton School, University of Pennsylvania

11:10 – 11:40

Refreshment Break

### Exchange Hall

11:40 – 13:00

Data Science

How women are breaking barriers in data science

### Exchange Auditorium/ Livestream

Organised by Hira Naveed for RSS Official Statistics Section

Let's celebrate and get inspired by all the wonderful things that women from a range of fields, backgrounds and stages of their career are doing in Data Science and Statistics. It will be empowering to get insights from their successful career journeys thus far, whether they are early career or been in the field for a while, they all have a story of passion to be told. This session will be valuable for women studying and working in the field of statistics and data science and will be a space to increase visibility of these women and their work and learn from the careers of these women. More and more women are working with data and the diversity of these inspirational women needs to be celebrated.

Speakers:

Sophie Carr - Mathematician and Founder & Director of Bays Consulting Ltd, UK

Johanna Hutchinson - Director of Data and Data Science at the Joint Biosecurity Centre, a part of NHS Test & Trace, Department of Health and Social Care, UK

Carola-Bibiane Schönlieb - Professor of Applied Mathematics, University of Cambridge, UK

Eugenie Hunsicker - Senior Lecturer in Pure Mathematics, Loughborough University, UK

Cornelia Schaurecker - Global Group Director Big Data and AI, Vodafone Group

## Social Statistics

New developments on latent variable modelling and applications to survey data

### Exchange 11/ Livestream

Organised by Yunxiao Chen

Psychometrics meets algorithmics: Understanding response processes in assessments via graph-based data clustering  
Steffi Pohl - Freie Universität Berlin

A flexible class of Latent Variable Models

Camilo Cardenas-Hurtado - London School of Economics:

A continuous-time dynamic choice measurement model for problem-solving process data

Yunxiao Chen - London School of Economics

## Environmental & Spatial Statistics

Showcase: advances in visualisation in spatial and environmental statistics

### Exchange 1

Organised by Ben Swallow on behalf of RSS Environmental Statistics Section

Visualisation is increasingly being recognised as an important area underpinning applied statistics and environmental and spatial statistics in particular are areas that lend themselves well to exciting developments in the theory and application of visualisation methods. This session will highlight some of the novel developments in spatial and environmental statistical visualisation, including the underpinning concepts of data visualisation, method development, and in the software used to generate them.

Presentations will include:

Communicating biodiversity trends: What is wanted vs what is happening.

Charlie Outhwaite - University College London, UK

# Day 4 Thursday 9 September

11:40 – 13:00

## Communicating & Teaching Statistics

### RSS Statistical Ambassadors Showcase

#### Exchange 2-3

Organised by Lucy Teece for RSS Statistical Ambassadors

The RSS Statistical Ambassadors have been selected and trained by the Society to improve their skills and confidence in talking about statistics in public. Through social media, speaking engagements, and working with television producers and journalists they have contributed statistical insights to conversations about issues of interest to the public. In this session, the Statistical Ambassadors will showcase their work and discuss the opportunities and challenges around meaningful statistical engagement with the public.

## Professional Development

### Careers in statistical consultancy

#### Exchange 9

Organised by Holly Jones for RSS Young Statisticians Section

Statistical consultants supply expert advice, deliver statistical analysis, and provide training to individuals, organisations and businesses. There are many different types of consulting, each with benefits and difficulties. While this variety may encourage many into the field, it can also make the leap into consultancy seem daunting for young statisticians.

Our panel of early-career consultants are on hand to share their experiences, give advice, and demystify the process of starting out as a statistical consultant.

Panel members:

Katie Severn - University of Nottingham  
Rob Mastrodomenico - ALCHEMAX ANALYTICS  
Andrew Hodges - Arke Ltd  
Aura Popa - The Statistical Company  
Tom Liptrot - Ortom  
Charlotte Leysen - contracting data scientist and data analyst

## Official Statistics & Public Policy

### Monitoring the Covid pandemic

#### Exchange 10

Organised by David Beckett, Scott Heald and Alison Macfarlane on behalf of RSS Official Statistics Section

Over the past 18 months, the RSS Official Statistics Section has worked with a working group convened by the Health Statistics User Group to put on webinars to present specific work being done in ONS and the devolved administrations to monitor specific aspects of the COVID pandemic. This aim of this proposed conference session is to reflect across the board on challenges which have arisen

Speakers:

Scott Heald - Public Health Scotland  
Clare Griffiths - Public Health England  
Stephanie Howarth - Welsh Government  
Mary Gregory - Office for Statistics Regulation

13:00 – 14:00

## Lunch Break

### Exchange Hall

14:00 – 15:00

## Medical Statistics

### Contributed: Clinical trials

#### Exchange 1

Using Bayesian decision theory in sequential clinical trials: results from the EcoNomics of Adaptive Clinical Trials (ENACT) project

Martin Forster - University of Bologna, Italy & University of York, UK

Puvan Tharmanathan - University of York, UK

Charlie Welch - University of York, UK

On the link between post-data severity evaluations and percentiles of the sampling distribution

Nicola Orsini - Karolinska Institutet, Stockholm, Sweden

When Factorial Design Randomized Control Trials are no plain sailing

Ioana Marian - University of Oxford, UK

## Environmental & Spatial Statistics

### Contributed: Hierarchical and latent environmental statistics

#### Exchange 2-3

Nonstationary Nearest Neighbor Gaussian Process: hierarchical model architecture and MCMC sampling  
Sébastien Coube-Sisquille - Université de Pau et des Pays de l'Adour, France

Joint Species Distribution Modelling with HMSC: Community matters

Oscar Rodriguez de Rivera - University of Kent, UK

Bayesian space-time gap filling for inference on extreme hot-spots: an application to Red Sea surface temperatures  
Daniela Castro-Camilo - University of Glasgow, UK

# Day 4 Thursday 9 September

## Data Science

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**Contributed: Workflows in data science**

### Exchange 4-5

The 4P's of Successful Data Science: People, Patterns, Process and Products

**Andy McMahon** - NatWest Group, Edinburgh, UK

Generating Data on Pathogen Tropisms from Published Literature

**Liam Brierley** - Department of Health Data Science, University of Liverpool, UK

An end-to-end Data Science workflow for building scalable and performant data enrichment APIs in Open Banking

**Alex Spanos** - TrueLayer, London, UK

## Social Statistics

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**Contributed: Gauging the public voice**

### Exchange 6

Post-election predictors in the 2020 US Presidential Election  
**Timothy Martyn Hill** - UK

Public attitudes towards data-driven responses to the COVID-19 pandemic: A Public Perceptions and Expectations Study

**Guangquan Li** - Northumbria University, Newcastle upon Tyne, UK

Survey data quality when recruitment is done with text messages

**Ioannis Andreadis** - Aristotle University, Thessaloniki, Greece

## Applications of Statistics

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**Contributed: Applications to transport**

### Exchange 7

Analysing the causal effect of London cycle superhighways on traffic congestion

**Prajamitra Bhuyan** - Imperial College London & The Alan Turing Institute, London, UK

Statistical Modelling of Road Traffic KSI Accidents and Casualties in Great Britain based on STATS19 Database

**Mohammad M R Sheikh** - Kingston University London, UK

## Methods & Theory

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**Contributed: Further methods & theory**

### Exchange 8

Design of Experiments for Autoregressive Networks  
**Ben Parker** - Brunel University, London, UK

Generalized infinite factorization models  
**Lorenzo Schiavon** - Department of Statistical Sciences, University of Padova, Italy

Accurate directional inference in Gaussian graphical models  
**Claudia Di Caterina** - Free University of Bozen-Bolzano, Italy & University of Toronto, Canada

## Official Statistics & Public Policy

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**Contributed: Official Statistics during the Covid pandemic**

### Exchange 10

UK COVID-19 dashboard: the challenges of providing a daily high demand service

**Clare Griffiths** - Public Health England, London, UK

Monitoring the pandemic – The COVID-19 Infection Survey

**Esther Sutherland** - Office for National Statistics, Southampton, UK

Estimating the international migration in an unpredictable time

**Nicky Rogers** - ONS, Titchfield, UK

**15:00 – 15:20**

**Refreshment Break**

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### Exchange Hall

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[#RSS2021Conf](https://twitter.com/RSS2021Conf)

# Day 4 Thursday 9 September

15:20 – 16:40

## Business, Industry & Finance

**Knowledge Transfer - collaborations between academia and business through Knowledge Transfer Partnerships (KTPs)**

### Exchange 11/ Livestream

Organised by Neil Spencer for the RSS Business & Industrial Section

This session will be a showcase, giving examples of Knowledge Transfer Partnerships (KTPs) that have statistical content. These KTPs involve partnerships between Universities and businesses to help academic expertise find its way into the business world.

Quantifying Measurement Uncertainty in the food and beverage metal packaging industry

**Ahmed Khafaga** - Coventry University, & Sencon UK Ltd, Droitwich, UK

Gesture recognition system using Machine Learning, a KTP project

**Ying Liu** - University of Leicester, & Tangi0 Ltd, London, UK

The application of choice modelling techniques to quantify subconscious priorities in the decision-making process

**Aedan Beatty** - CARD Group, Belfast, & Queen's University Belfast, UK

## Social Statistics

### Political statistics: 2020 US Presidential election

#### Exchange 1

Organised by Timothy Martyn Hill

Session on the subject of 2020 US Presidential Election, covering statistical methods, notable elements and related statistics.

Forecasting the 2020 Election: what went wrong with the polls

**Michael Lewis-Beck** - University of Iowa, USA

**Natalie Jackson** - PRRI, Washington DC, USA

The Timeline of US Presidential Elections: The 2020 Case in Historical Perspective

**Christopher Wlezien** - University of Texas at Austin, USA

Statistical forecasting for the 2020 US presidential election

**John Fry** - University of Bradford, UK

Ideology and Attitudes In The 2020 Presidential Election: Exploring Patterns From Survey Data

**Royce Carroll** - University of Essex, Colchester, UK

## Medical Statistics

### Novel advances in Bayesian Health Economics

#### Exchange 2-3

Organised by Nathan Green for the RSS Medical Section

This session will highlight novel statistical methods for undertaking HTA, including Bayesian survival analysis in the presence of missing data and evidence synthesis of individual and aggregate level data for network meta-analysis and dynamic modelling.

Statistical Developments in the Calculation of Value of Information

**Anna Heath** - University of Toronto, Canada

Causal inference analyses to estimate comparative effectiveness of treatments

**Nick Latimer** - University of Sheffield, UK

Decision curve analysis for personalised treatment choice between multiple options

**Konstantina Chalkou** - University of Bern, Switzerland

# Day 4 Thursday 9 September

## Applications of Statistics

### Disgusting statistics

#### Exchange 4-5

Organised by Maria Dunbar & Emily Granger for RSS Young Statisticians Section

Join us to explore and celebrate the icky, gross, and disgusting!

While the world of statistics is often neat, orderly and precise the world we live in is not! We investigate the use of statistics to examine “yucky” topics, such as: “how clean is your takeaway?”, fluids, waste, wounds, and diseases, etc. As well as delving into the psychology of disgust, and why some of us are more likely to get grossed out than others.

This session will cover topics that would not be appropriate to discuss during dinner.

#### Speakers:

Tilly Collins - Imperial College London, UK  
Simone Schnall - University of Cambridge, UK  
Helena Stage - University of Manchester, UK  
Aura Popa - The Statistical Company, UK

## Professional Development

### Don't Panic! The Ambassadors guide to Communicating Statistics

#### Exchange 9

Organised by Anthony Masters for the RSS Statistical Ambassadors

The RSS Statistical Ambassadors have been selected and trained to give statistical advice and training to the media, schools, and wider public. This group session will include a number of exercises to stretch attendees' communication skills. The Ambassadors will provide advice to enable attendees to communicate complex statistical ideas, including their own research, in plain language for the general public. The session aims to help statisticians prepare to give insightful comments, whether written, on radio or in television interviews.

## Communicating & Teaching Statistics

### STEM Showcase

#### Exchange 10

Organised by RSS Young Statisticians Section

The session will present examples of engaging statistical activities that have been developed, tested and successfully used in schools and at science festivals to inspire the next generation of statisticians.

It will be relevant to new and experienced STEM ambassadors and/or statisticians volunteering in schools or with the general public.

## Data Science

### Visualisation and visual analytics

#### Online

Organised by Nick Holliman and members of #VizTIG the Alan Turing Institute Visualization Interest Group

Visualization is an essential tool in the analytics process and the communication of statistical results. This session will present snapshots of current research-led visualization work in the United Kingdom.

Visualising contact tracing models for policy making  
**Cagatay Turkey** - Warwick University, UK

vizent: a new library for uncertainty visualization  
**Lucy McLaughlin** - Newcastle University, UK

Communicating experiments and their results using data driven storytelling  
**Benjamin Bach**

Visualizing data quality  
**Roy Ruddle** - Leeds University, UK

Q&A on the future challenges for statistical visualization  
**Nick Holliman** - Newcastle University, UK

# Day 4 Thursday 9 September

## Methods & Theory

### Bayesian theory and methods for complex models

#### Online

Organised by Veera Baladandayuthapani

The central theme of this session is on harnessing flexibility offered by the Bayesian paradigm in quantifying uncertainty on complex models for data, possibly collected under complex designs. This session brings together three leading experts in the field and the range of topics covered include causal analyses, discrete time series and spatio-temporal data with substantive application in diverse areas such as clinical trials, infectious disease and pandemic modelling. A discussion will ensue covering some common threads and future directions.

Causal modelling to evaluate surrogate endpoints using Bayesian estimation techniques

**Jeremy Taylor** - University of Michigan, USA

Bayesian Hawkes: Modelling and Applications of Hawkes Processes

**Kerrie Mengersen** - Queensland University of Technology, Australia

On Bayesian Learning Frameworks in Spatial-Temporal Mechanistic Systems: Viral Pandemics and Beyond

**Sudipto Banerjee** - University of California, Los Angeles, USA

Discussant:

**Veera Baladandayuthapani** - University of Michigan, USA

16:50 – 17:50

Plenary

#### Keynote 7: Melinda Mills

#### Exchange Auditorium/ Livestream

Melinda Mills MBE, FBA is director of the Leverhulme Centre for Demographic Science at the University of Oxford

17:50 – 18:00

Plenary

#### Close of conference

#### Exchange Auditorium/ Livestream

RSS 2021 Conference draws to a close and the baton is handed to the organisers of RSS 2022 Conference in Aberdeen

18:00 – 19:00

Networking

#### Conference farewell drinks

#### Exchange Upper Foyer

Unfortunately it has not been possible to hold the traditional conference dinner to end the conference but we invite you to stay for a drink to bid farewell to Manchester



# Thank you to those responsible for organising the conference:

## Members of the RSS Conferences & Events Programme Board

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**Scott Heald** (Public Health Scotland)

Vice-Chair (2021 Programme Chair):

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**Karthik Bharath** (University of Nottingham/Research Section)

**David Beckett** (Office for National Statistics)

**Mark Briers** (Royal Mail/RSS Council)

**Rhian Daniel** (University of Cardiff)

**Ryan Jessop** (YNAP/Young Statisticians Section)

**David Hoyle** (Dunn Humby/Manchester Local Group)

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**Mel Lewis** (Office for National Statistics)

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**Ben Swallow** (University of Glasgow/Environmental Statistics Section)

**Christopher Yau** (University of Manchester/ Turing Institute)

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**Brian Tarran** (podcasting & reporting)

**Sara McDonnell** (reporting & social media)

**Mags Wiley** (reporting & social media)

**Judith Shorten** (Discussion Meeting)

**Stuart McKendrick, Atrima Khastgir** and fellow staff at the Royal Statistical Society.

Also thanks to the volunteers for their help with stewarding:

**Sara Hilditch**                      **Lucy Teece**

**Sritika Chowdhury**              **Emily Granger**

**Altea Lorenzo-Arribas**      **Rob Mastrodomenico**

**Katie Arundell**                      **Joe Schofield**

**Naseerah Akooji**                      **Jack Kennedy**

**Juhi Gupta**                              **Celina Gehringer**

## Production

**Richard Gray** for photography  
([www.rugfoot.com](http://www.rugfoot.com))

**Phil Sutton** at Cavendish Design for design  
([cavendishdesign.co.uk](http://cavendishdesign.co.uk))

**Jennifer Jenkins, Dan Brown, Mel White, Mel Underwood** and colleagues at Worldspan  
([www.worldspan.co.uk/](http://www.worldspan.co.uk/))

**Nikki Urquhart** and colleagues at Sterling Event Group

## Venues

**Sarah Copas, Rosie Jacques** and colleagues at Manchester Central.

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





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