# Government Statistical Service Conference 2019

## Sheraton Grand Hotel and Spa, Edinburgh
### 1st and 2nd October 2019

GSS Conference 2019: Our Statistics, Today's Issues

*Official Event Partner:*

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SOLUTIONS

#GSSConf2019

**Foreword**

**Francesca Parrott and Michael Cole, Conference Committee Co-Chairs**

Welcome

As the co-chairs of this year's organising Committee we are honoured to welcome you to Edinburgh. We have a packed agenda over the next two days, inspired by this beautiful city.

This year's conference, titled "Our Statistics, Today's Issues", aims to unpick how the work we all do informs policy and decision making on the important issues of society now and in the future.

We encourage you to learn from the wide-ranging talks on offer from our GSS colleagues, our sponsors and external data professionals. The conference is an important opportunity to strengthen your professional network; we hope you will seize that opportunity, meet with colleagues and exhibitors and create new connections. We hope you will be inspired while at the conference, taking back what you have learned to your departments to continue the great work of the GSS.
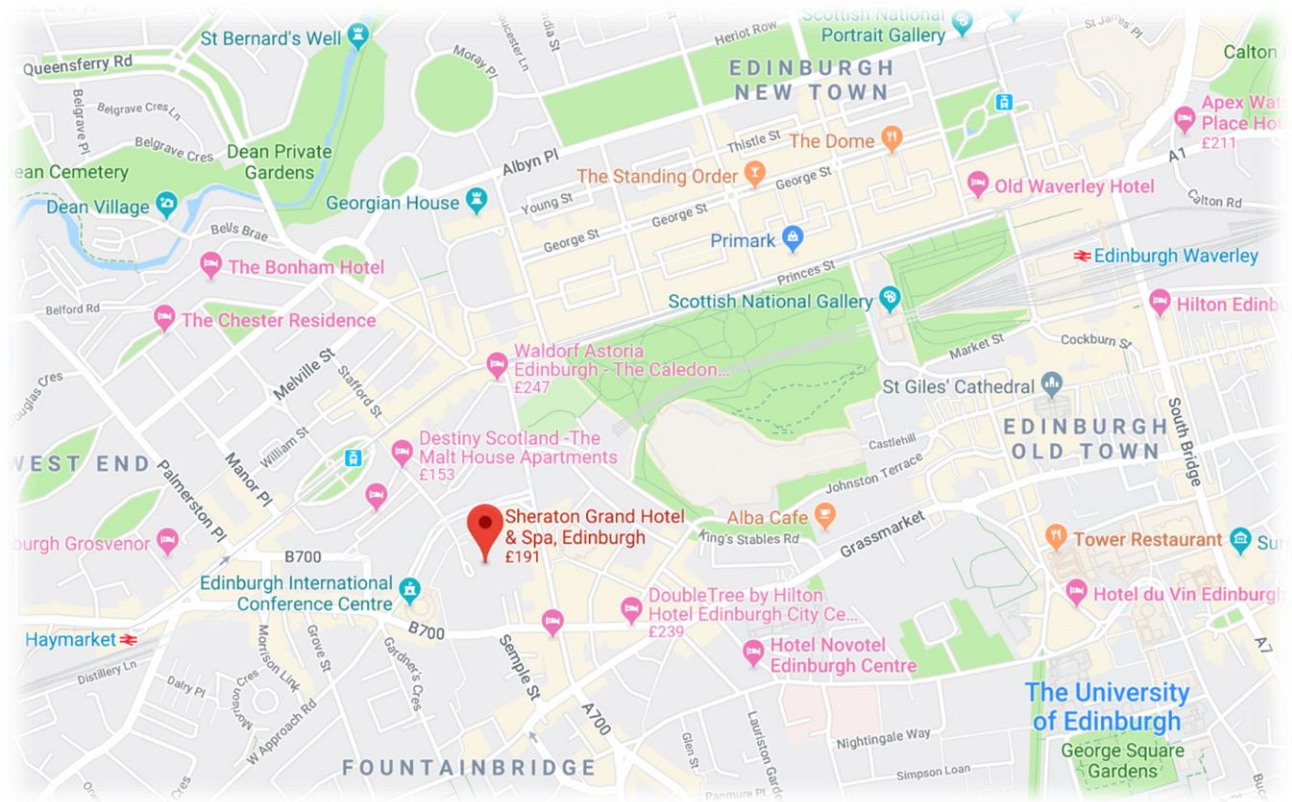
Enjoy the conference!

Francesca & Michael

## Venue Details

Conference venue: Sheraton Grand Hotel and Spa, Edinburgh,
1 Festival Square, Edinburgh, EH3 9SR.

The venue is a 10-15-minute walk from Edinburgh Haymarket train station and a 20-25-minute walk from Edinburgh Waverley train station.

## General Information

### *Badges*
Conference attendees are asked to wear their badges and lanyards at all times while in the conference. They contain important information such as your parallel session allocation and your table number for the evening dinner.

### *Dietary Requirements*
For those attendees who have notified the organisers of dietary requirements, the conference organisers have made arrangements for the lunch and evening meals. If there are any extra requirements needed, please contact a member of the Conference Committee.

### *Getting Help*
If you need help with anything during the conference, just grab a member of the Conference Committee – We're wearing matching blue t-shirts so should be easy to find!

### *Luggage*
A luggage store will be available for use. If you need access, please talk to a member of staff or a Conference Committee member.

### *Mobile Phones*
We ask that you switch your mobile phones and other hand held devices to silent when you are in the sessions. If you need to respond to emails or make any calls, please use the registration area.

### *Session Locations*
Keynote sessions will be held in the Edinburgh Suite.
Parallel sessions will be held in either the Edinburgh Suite, Melville Suite, Glamis Suite Braemar Suite or the Private Dining Room (accessed through the Sheraton One Square Restaurant). All of these are on Level 1.
The parallel sessions that you have been assigned are printed on your lanyard, we ask that all delegates attend their assigned parallel sessions (assignments were based on preferences provided on the delegate forms) to ensure rooms are not overcrowded.

### *Wi-Fi Access*
You will find information on how to access the Wi-Fi on the rolling slides in the Edinburgh Suite in-between speeches and also at the Registration desk. Please contact a member of the Conference Committee if you need help accessing the Wi-Fi.

| DAY 1 – 1st October 2019 | | | |
|---|---|---|---|
| **9:30 – 10:45** | **The Atrium** | **Registration** | |
| **10:45 – 10:55** | **Edinburgh Suite** | **Welcome and Opening Remarks** | |
| **10:55 – 11:15** | **Edinburgh Suite** | **Iain Bell (Deputy National Statistician)** | |
| **11:15 – 12:00** | **Edinburgh Suite** | **Keynote Speaker: John Curtice** | |
| **12:00 – 12:15** | **The Atrium** | **Break** | |
| **12:15 – 13:15** | **Parallel Session 1** | | |
| | **1.1 Edinburgh Suite** | Inspecting the Police: Using Evidence and analysis to drive improvement | Hannah Husband and Francesca Allerton (HMICFRS) |
| | | Homelessness: A policy priority across the UK but no consistent UK definition. How the GSS are overcoming this to improve user understanding of statistical comparability. | Catherine Davies and Tony Wilkins (ONS) |
| | **1.2 Private Dining Room** (13:00 finish) | Around the World with Government Data | ESRI (Gold Sponsor) |
| | **1.3 Melville Suite** | Regression modelling to understand the relationship between ethnicity and school exclusions | Louise Freebrey (DfE) |
| | | Dependent on Dover? Estimating and visualising the value of EU trade by UK port of entry for consumer goods | Jonathan Lewis (BEIS) |
| | **1.4 Braemar Suite** (13:00 finish) | A Welsh Brexit: Understanding geographical vulnerabilities | Ann Humble & Stephanie Howarth (WG) |
| | **1.5 Glamis Suite** (13:00 finish) | Health & Care Statistics in Scotland | Scott Heald (ISD Scotland) |
| **13:15 – 14:15** | **The Atrium** | **Lunch** | |

| DAY 1 – 1st October 2019 continued | | | | |
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| | **Parallel Session 2** | | | |
| **14:15 – 15:00** | **2.1 Edinburgh Suite** | Starting AI and ML offers significant benefits – but how do we ensure explainability? | | Mango (Official event partner) |
| | **2.2 Glamis Suite** | Starting the conversation: how Ofsted uses data to improve the quality of education | | Jason Bradbury (Ofsted) |
| | **2.3 Braemar Suite** | Fair Work Measurement Framework & Survey | | Ludmila Kopaskova (SG) |
| | **2.4 Melville Suite** | Operational Earthquake Forecasting | | Ian Main (University of Edinburgh) |
| | **2.5 Private Dining Room** | DFID: Doing data and statistics for development | | Paula McLeod (DfID) |
| **15:00 – 15:15** | **The Atrium** | **Break** | | |
| **15:15 – 15:25** | **Edinburgh Suite** | **Official Event Partner** | | |
| **15:25 – 16:30** | **Edinburgh Suite** | **Panel Session: Using Big Data & AI for Government** | | |
| **16:30** | **Edinburgh Suite** | **Close** | | |

| DAY 1 Evening – 1st October 2019 | | |
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| **18:00 – 18:45** | **The Atrium** | **Drinks Reception** |
| **18:45 onwards** | **Edinburgh Suite** | **Presentation of the GSS Awards Evening Dinner** |

| DAY 2 – 2nd October 2019 | | | |
|---|---|---|---|
| 9:30 – 10:00 | **The Atrium** | **Arrive** | |
| 10:00 – 10:45 | **Edinburgh Suite** | **Keynote Speaker: Hetan Shah** | |
| 10:45 – 11:30 | **Parallel Session 3** | | |
| | **3.1 Edinburgh Suite** | Interactive visualisation solutions | Jumping Rivers (Gold Sponsor) |
| | **3.2 Glamis Suite** | Building a Data Science Campus in Rwanda | Emily Poskett & Ceri Regan (ONS) |
| | **3.3 Melville Suite** | Using data to inform and evaluate public health policy in Scotland | Mark Robinson (NHS Health Scotland) |
| | **3.4 Braemar Suite** | Gender profiles in UK and worldwide patenting: An analysis of female inventorship | Pauline Beck & Christopher Harrison (IPO) |
| | **3.5 Private Dining Room** | Improved evidence to support EU Exit | Jane Naylor & Amelia Ash (DExEU) |
| 11:30 – 11:45 | **The Atrium** | **Break** | |
| 11:45 – 12:45 | **Parallel Session 4** | | |
| | **4.1 Melville Suite** | Beyond the silo: How cross-government collaborative working is informing the Adult Social Care policy debate<br><br>Understanding Consumer Vulnerability in the Communications Markets | Jason Snowden, Sarah Liley & Angus Gibson (DHSC/NHSD/MHCLG)<br><br>Grainne Murphy & Donna Phillips (OFCOM) |
| | **4.2 Glamis Suite (12:30 finish)** | Why the Civil Service leads the way, but does not realise it | SAS (Gold Sponsor) |
| | **4.3 Edinburgh Suite** | Using a 'life expectancy decomposition' method to understand the drivers of change in life expectancy over time, and of inequality in life expectancy.<br><br>Enabling ethically appropriate uses of data for research and statistics for the public good | Emma Parker & Leigh Dowd (PHE)<br><br>Emily Mason-Apps (UKSA) |
| | **4.4 Private Dining Room (12:30 finish)** | Data Quality: Do the public even care? | Fiona Shepherd (HO) |
| | **4.5 Braemar Suite (12:30 finish)** | Energy Use Over the Last 70 Years; What it has told us and how methods have changed. | Warren Evans (BEIS) |
| 12:45 – 13:45 | **The Atrium** | **Lunch** | |

| DAY 2 – 2nd October 2019 continued | | | |
|---|---|---|---|
| | **Parallel Session 5** | | |
| **13:45 – 14:30** | **5.1**<br>**Edinburgh Suite** | What to Expect When You're Not Expecting: The Novichok Chronicles | Victoria Cox and Philippa Spencer (DSTL) |
| | **5.2**<br>**Private Dining Room** | The Gender Data Gap | Elizabeth Gray (Fast Stream) |
| | **5.3**<br>**Braemar Suite** | Finding an Impactful Government Career using R, Power BI and Web-scraping | Tobias Jolly (CO) |
| | **5.4**<br>**Melville Suite** | The Indices of Deprivation in the UK 2019: Methods, Data and Policy impact | Bowie Penney, Elizabeth Frazer & Samantha Collins (MHCLG/SG/WG) |
| | **5.5**<br>**Glamis Suite** | Using Machine Learning to Analyse Text Data in Defence | Alexandra Pop (MoD) |
| **14:30 – 14:45** | **The Atrium** | **Break** | |
| **14:45 – 15:30** | **Edinburgh Suite** | **Keynote Speaker: Gillian Docherty** | |
| **15:30** | **Edinburgh Suite** | **Close** | |

Mango Solutions takes a very pragmatic approach to embedding data science at the heart of decision-making. By empowering organisations to make informed decisions using data science and advanced analytics, we ensure organisations have a clear understanding of the outcomes they can expect, the skills and resources they will need and the challenges they are likely to encounter.

## Gold Sponsors for GSS Conference 2019

SAS is a trusted analytics powerhouse for organizations seeking immediate value from data, with varying AI and analytical solutions, deployed in a way which suits you, together with broad industry knowledge we can help you discover insights from your data and make sense of it all. Identify what's working and fix what isn't. Make more intelligent decisions. And drive relevant change. sas.com





Esri is the global market leader in GIS. Since 1969, Esri has helped customers unlock the full potential of data to improve operational and business results. Deployed in more than 350,000 organisations including the world's largest cities, national governments, 75% of the Fortune 500, colleges and universities around the world.

Jumping Rivers is a leading provider of bespoke training and consultancy in both R & Python. Our training courses have been recognised by the Royal Statistical Society and our trainers have been certified by RStudio. As one of only seven RStudio Full Service Certified Partners, we have a variety of plans for managing RStudio products. From on-demand support to full care plans. If R or Python is crucial to your organisation, we can help.



## Bronze Sponsors for GSS Conference 2019

## GSS Awards



The first GSS Awards will be held on the first evening of this year's conference. The awards will recognise and celebrate the excellent work being done across the GSS. There will be four awards presented to teams from across the GSS in the categories of:

- Collaboration
- Methods
- Communication
- Impact

### *Nominees*

Details of the Award nominees can be found on the following two pages.

### *Judging Panel*

The Awards were judged by the following expert panel:

- Siobhan Carey: Head of Profession for Statistics, NISRA
- Robert Cuffe: Head of Statistics, BBC
- Ed Humpherson: Director General for Regulation, UKSA
- Neil McIvor: Head of Profession for Statistics, DfE
- Julie Stanborough: Head of Best Practice & Impact Division, ONS

### *Awards Presentation*

The Awards will be presented by Iain Bell (Deputy National Statistician) before the evening dinner. Please ensure you are seated by 18:45.

*Collaboration*

This award recognises collaboration between teams, departments and/or external organisations/researchers to deliver a statistical output or project. The short-listed nominations for this award are:

| Title of nomination<br>Team<br>*Department* | Main contact |
|---|---|
| **Pioneering statistical partnerships in developing countries**<br>International Development Team<br>*Office for National Statistics* | nicholas.palmer@ons.gov.uk |
| **Measuring the mental health of children and young people in England**<br>Mental Health of Children and Young People Survey Team<br>*NHS Digital, Office for National Statistics, NatCen Social Research, YouthInMind and Professor Tamsin Ford at University of Exeter* | a.neave@nhs.net |
| **Collaboration to provide a better evidence base for users of international migration statistics**<br>Centre for International Migration, Office for National Statistics and Migration Statistics, Migration and Border Analysis, Home Office Analysis and Insight<br>*Office for National Statistics and Home Office* | nicola.rogers@ons.gov.uk |
| **Reproducible Analytical Pipelines**<br>RAP Champions<br>*Cross-Government* | martin.ralphs@ons.gov.uk |

*Methods*

This award recognises innovation in methods of data collection, statistical analysis and data science. The short-listed nominations for this award are:

| Title of nomination<br>Team<br>*Department* | Main contact |
|---|---|
| **Adjustments for changes in severity reporting in road accidents statistics**<br>Road Safety Statistics team in collaboration with Methodology Advisory Service<br>*Department for Transport in collaboration with Office for National Statistics* | delphine.robineau@dft.gov.uk |
| **Understanding influences on public perception**<br>Internal Communications and Data Science Team<br>*Ministry of Housing, Communities and Local Government* | peter.hufton@communities.gov.uk |
| **Reproducible Analytical Pipeline**<br>Quality Indicators Team<br>*NHS National Services Scotland* | robyn.munro@nhs.net |
| **Synthetic Data: Everyone's VAE-GAN**<br>Data Management and Strategic Development<br>*NHS National Services Scotland* | euan.gardner@nhs.net |

## Communication

This award recognises clear and successful presentation and dissemination of statistics using commentary, visualisations, interactives, social media etc. The short-listed nominations for this award are:

| Title of nomination<br>Team<br>*Department* | Main contact |
|---|---|
| **Explore Education Statistics**<br>Statistics Modernisation Team<br>*Department for Education* | laura.selby@education.gov.uk |
| **Interactive visualisations of GCSE and A level grade outcomes in England**<br>Data and Analytics<br>*Office of Qualifications and Examinations Regulation* | Stephen.Rhead@ofqual.gov.uk |
| **Innovative Communication of Automation**<br>Policy Evidence and Analysis Team (PEAT), and Digital Content Team<br>*Office for National Statistics* | andrea.lacey@ons.gov.uk |
| **Putting users at the heart of statistical bulletins**<br>Content design<br>*Office for National Statistics* | Kieran.Forde@ons.gov.uk |
| **Improving the communication of statistics at National Records of Scotland**<br>Statistical Promotion and Analysis Team<br>*National Records Scotland* | esther.roughsedge@nrscotland.gov.uk |

## Impact

This award recognises statistics which have been impactful through use, influenced decisions made by policy-makers, politicians or the public and/or have contributed to public debate. The short-listed nominations for this award are:

| Title of nomination<br>Team<br>*Department* | Main contact |
|---|---|
| **Recent trends in mortality in England**<br>Population Health Analysis<br>*Public Health England* | allan.baker@phe.gov.uk |
| **Preparing estimates of housing need for Wales (2018-based) to meet user need**<br>Housing Need statistics team<br>*Welsh Government* | Melanie.Brown004@gov.wales |
| **Improving the experiences of disabled people on the rail network**<br>Information & Analysis<br>*Office of Rail and Road* | chris.casanovas@orr.gov.uk |
| **Road networks through a new lense**<br>Network Condition and Geography team<br>*Department for Transport* | Sarah.Lasher@dft.gov.uk |

## Keynote Speakers

### John Curtice

Sir John Curtice is a Professor of Politics at Strathclyde University in Glasgow, a Senior Research Fellow at NatCen Social Research and a Senior Fellow of the ESRC's 'The UK in a Changing Europe' initiative. He has written extensively about voting behaviour in elections and referendums in the UK, as well as on British political and social attitudes more generally. He has been a co-editor of NatCen's annual British Social Attitudes reports series for over twenty years, and is a regular contributor to British and international media coverage of politics in the UK. John is Chief Commentator at two websites, whatscotlandthinks.org and whatukthinks.org/eu, that provide a comprehensive collection of materials on public attitudes towards how Scotland should be governed, and the UK's relationship with the EU. He is a Fellow of the British Academy, the Royal Society of Edinburgh and the Academy of the Social Sciences and is an Honorary Fellow of the Royal Statistical Society.

### Hetan Shah

Hetan is the executive director of the Royal Statistical Society, a membership body that has a vision of a world with data at the heart of understanding and decision-making. He is deputy chair of the Ada Lovelace Institute, which seeks to promote data and Artificial Intelligence (AI) that work for people and society. He is a visiting professor at the Policy Institute of King's College London and chair of the Friends Provident Foundation, a grant-making trust. He is a member of a number of advisory boards including for the Office for National Statistics Data Science Campus, the Science Media Centre and the National Lottery Community Fund. He has also been a member of the Social Metrics Commission, chaired by Baroness Philippa Stroud, which recommended new ways of measuring poverty in the UK.

## Keynote Speakers continued

### Gillian Docherty

Gillian Docherty is the chief executive of The Data Lab, an innovation centre with a mission of maximising the value from data for Scotland. The Data Lab facilitates partnerships between industry and academia, supporting data science and AI projects as well as funding and running ground-breaking education programmes. Gillian is passionate about the opportunities for using data to drive economic and social benefits. Formerly of IBM, she is a visiting professor at Robert Gordon University, a TED speaker and was named Digital Leader 2018 for the UK. She was named CEO of the year at the Digital Technology Awards 2017 and was also in the UK's top ten most influential people in data according to DataIQ. She is on the Board of Glasgow Chamber of Commerce, a trustee of BeYonder Involve Charity and an Industry advisor to Previse. She has a degree in Computing Science from the University of Glasgow, an honorary doctorate from Robert Gordon University and is married with a daughter.

### Panel Session

The theme of this year's panel session is "The uses of 'Big Data' and Artificial Intelligence across government". This session will bring together a variety of perspectives, including academics, Civil Servants and industry professionals. Panel members are:

- **Ed Humperson**, Director General for Regulation at the UK Statistics Authority, who has previously worked on strategy and regulation for the National Audit Office.
- **Kevin Fletcher**, Chief Data Officer at HMRC, who has previous experience on working on tax analysis and economic policy at the National Treasury of South Africa.
- **Dr Zeynep Engin**, Founder of Data for Policy, and Senior Research Associate at the Urban Dynamics Laboratory at UCL and Principal Investigator for the GovTech Lab.
- A **representative from the Alan Turing Institute's Public Policy Programme** which works with policy makers on data-driven solutions to public services.

**Parallel Sessions**

| DAY 1 – 1st October 2019 | |
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| **Parallel Session 1** | |
| 1.1<br>Edinburgh Suite | **Inspecting the Police: Using evidence and analysis to drive improvement.**<br>**Hannah Husband & Francesca Allerton (Her Majesty's Inspectorate of Constabulary and Fire & Rescue Services)**<br>HMICFRS are responsible for independently assessing the efficiency and effectiveness of police forces, in the public interest. Our evidence is gathered through inspections on ten key areas of policing, including the quality of investigations and protecting vulnerable people. It is then used to drive improvements in the services that the police provide to the public, to make everyone safer.<br>To improve efficiency and reduce the burden of inspection activity on police forces, we decided to use the evidence we have on each force to reduce the volume of fieldwork and "boots on the ground" inspections carried out. However, this needed to be balanced against the risk to the public.<br>We will present the approach our analysts developed. This risk-based approach uses a decision tree to determine which areas present sufficient risk to the public and therefore require inspection, whilst imposing a more proportionate demand on police forces to make the inspection process more efficient. The approach uses a mixture of 'hard' data (e.g. previous inspection grades, and performance data collected from forces) and 'soft' data (e.g. expert reports identifying areas of concern).<br>We will discuss the results of this approach, the obstacles we faced and how we overcame them, and how we are looking to develop it further for future inspection cycles. We intend to draw in additional intelligence from a range of sources (e.g. external bodies, media sources) to create a broader, more accurate picture of police performance. This will help the inspections team to direct inspection activity in the most efficient and risk-targeted way. |
| 1.1 cont.<br>Edinburgh Suite | **Homelessness: a policy priority across the UK, but no consistent UK definition. How the GSS are overcoming this to improve user understanding of statistical comparability**<br>**Catherine Davies & Tony Wilkins (Office for National Statistics)**<br>What is the issue? Homelessness is a high-profile policy area. People want to compare the scale of the problem across the UK, but this is more complicated than you might think, in part as it is a devolved matter. Homelessness data is often collected through administrative systems which were built using definitions based on each UK country's legislation and therefore data are not directly comparable. As a result, |

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| | comparisons cannot easily be made at a country or local level, whilst UK statistics do not even exist.<br><br>What could be the solution? The GSS Harmonisation Team have consulted users and producers of statistics across the UK to develop recommendations to improve user understanding of the comparability of UK homelessness statistics. The GSS Strategy Delivery Team have used the harmonisation work as a basis to compare official homelessness statistics across the UK with an aim to begin building a UK-wide picture of homelessness and to discuss potential areas of coherence and comparability within currently available data.<br><br>In this presentation we will talk about how the differences in devolved homelessness legislation across the UK influence the data collection and the challenges of engaging with a diverse collection of stakeholders across government, devolved administrations, third sector organisations and academia. We will discuss how the development of enhanced guidance and a conceptual framework aim to improve user understanding of the comparability of UK homelessness statistics and see what stories about UK homelessness we can still tell even with imperfectly comparable data. |
| 1.2<br>Private Dining Room | **Around the World with Government Data**<br>**ESRI (Gold sponsor)**<br>This session will bring together stories from across the world that shows government data in action, informing the debate and improving outcomes for citizens, by equipping the users with the tools to understand and visualise the data on which to make informed decisions.<br><br>To achieve this requires access to and sharing of robust and authoritative data to support cross government collaboration and empowerment of citizens to contribute to public debate and decision making about the places and subjects that matter to their communities. |
| 1.3<br>Melville Suite | **Regression modelling to understand the relationship between ethnicity and school exclusions**<br>**Louise Freebrey (Department for Education)**<br>The rate of school exclusions (pupils being 'expelled') had been decreasing since 2006/07 (when comparable records began), but then from 2013/14, we started to see increases each year. We know that pupils who are expelled are some of the most vulnerable children in our society – many have special educational needs, are from deprived areas, or receive support from social workers – so increasing trends are a widespread cause for concern.<br><br>We also know that there are differences in exclusion rates between different ethnic groups, with some groups being considerably more likely to be excluded than others. So, with the backdrop of rising exclusion rates and differences in likelihood of exclusion for different |

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| | ethnic groups, the DfE announced the Timpson review of school exclusions in March 2018. This session will explain the data development, and the regression analysis undertaken to understand the relationship between pupil characteristics and school exclusions. The presentation will discuss the main results and interpretation of the work, the methodological challenges (including rarity of events – less than 7,000 permanent exclusions a year – and endogeneity) and the identified solutions. The main innovative solutions identified and applied were the use of time lags in a panel data structure and unusual control variables (such as peer exclusion rates). |
| | The presentation will also explain how we worked collaboratively with other analysts, policy leads, the review lead and Ministers to ensure the findings (and limitations) were clearly understood ahead of the landmark publication of the Timpson review in May 2019. |
| 1.3 cont. Melville Suite | **Dependent on Dover? Estimating and visualising the value of EU trade by UK port of entry for consumer goods.** |
| | **Jonathan Lewis (Department for Business, Energy and Industrial Strategy)** |
| | If a UK port were to suddenly become unusable, what is the most optimal route a container of Radio equipment from Germany would take instead to export its products to the UK. What is the value of all Toys entering Dover from Calais, and from which countries and EU ports did they originate? |
| | These are the questions this project aims to answer, by developing a model that combines Economic and Statistical techniques to estimate the most optimal routes for products for over 20 EU directives, from every European Country, into the UK. We combined these probabilities with existing HMRC data to produce a Trade Mapper, estimating how much trade is likely to arrive into each UK port for each type of product. The model estimates which types of goods prioritise time over cost and vice-versa in deciding the most optimal route. A beta value was trained to optimise the sensitivity to using alternative routes on the final output. This evidence base doesn't yet exist, and could be very useful in understanding our trade flows with the EU post Brexit. It can for instance predict the most likely alternative route to Dover in the event of disruption at Dover port. An interactive Transport Mapper dashboard has been developed which will allow policy makers to view those ports with the highest estimation of trade by product, along with the country of origin and which EU port it arrived from. This Dashboard will be live at the presentation to showcase the work. |
| 1.4 Braemar Suite | **A Welsh Brexit: Understanding geographical vulnerabilities** |
| | **Ann Humble & Stephanie Howarth (Welsh Government)** |
| | The aim of the geographical vulnerabilities project is to understand the spatial implications of Brexit, initially in the context of a no deal |

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| | scenario, in order to inform the development of the Welsh Government's policy response. It grew out of modelling the impact of three Brexit scenarios on agriculture, including on employment and the environment. Following demand for similar analysis for other sectors, we used both academic research and official statistics to identify areas of Wales with a high reliance on vulnerable economic sectors. |
| | Additionally, data such as the Welsh Index of Multiple Deprivation and facilities for re- or up-skilling were overlaid on this base risk map to understand the potential resilience of communities and their capacity to cope with changes in employment as a result of Brexit. The potential differential impacts by age, gender and Welsh language were also assessed. |
| | The project has been presented extensively across the Welsh and the UK governments (including to Ministers) and with external stakeholders. Presenting the analysis in the form of maps has proven highly engaging and the response to these presentations has enabled the project to grow iteratively. As such, the work has become truly cross-departmental and aims to combine a predominately economic analysis of the impact of Brexit with an awareness of the interrelated impact on areas such as education, employability, social care, health and Welsh language. |
| 1.5 <br> Glamis Suite | **Health & Care Statistics in Scotland** <br> **Scott Heald (Information Services Division Scotland)** <br> Scotland has some of the best health and care data in the world. Come along and find out about the work of the 350+ analysts/statisticians in ISD (NHS Scotland's statistics division), how we support the health and care system in Scotland, and our work on official statistics. Find out about: <br> • the work of ISD, including our growing number of statisticians based locally in NHS Boards and local authorities to support the use of data and intelligence within local multi-disciplinary teams <br> • our work to modernise our cancer registry, including the use of "virtual data techniques" and the development of an intelligence service to support clinicians and managers to deliver cancer services; <br> • new work we've been doing in the social care space, including our exploratory work to link social care and health data to illustrate variation in pathways of care. <br> • our programme to transform our official statistics, moving away from a world of Excel and Pdfs to a world of dashboards and interactive content, co-designed with users. <br> • our use of the Reproducible Analytical Pipeline (RAP) across the organisation, showcasing some of the publications which have been through this process, and our plans to cascade across the whole organisation in the next 3 years. |

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| | • our development of synthetic data to support researcher access to data |
| **Parallel Session 2** | |
| 2.1<br>Edinburgh Suite | **AI and ML offers significant benefits – but how do we ensure explainability?**<br>**Mango (Official event partner)**<br>Machine Learning has seen an unprecedented development over the last decade and offers a great promise of solving various predictive problems at scale. However, the most accurate models are often black-box - they do not provide an explanation as to why they made a particular decision.<br>Such uncertainty is undesirable from a technical, legal & ethical perspective - allowing bias in key, high-scale decisions such as medical diagnosis, promotions and recruitment, even sentence parole. To maintain trust in model predictions it is crucial to have access to a model's interpretable explanations.<br>In this presentation, Dean Wood, Principal Data Scientist at Mango Solutions will discuss:<br>• the pitfalls of trusting models based on their accuracy alone, and how bias can be unintentionally built in<br>• how this can be avoided and how you can use improved explainability to build trust in any advanced analysis<br>About the Speaker<br>Dean Wood is a Principal Data Scientist at Mango Solutions. Dean has a huge breadth of experience gained working across both the public and commercial sector. This work has covered many areas including healthcare with the NHS and Engineering from within a multi-national company. With the growth in Data Analytics and a growing desire for organisations to become data driven, Dean has gained particular experience in helping organisations on this journey including maintaining the confidence of non-technical senior leaders in ever more complex analytical solutions. |
| 2.2<br>Glamis Suite | **Starting the conversation: how Ofsted uses data to improve the quality of education**<br>**Jason Bradbury (Office for Standards in Education, Children's Services and Skills)**<br>Ofsted sits at the forefront of shaping education, early years and social care policy, acting as a force for improvement through inspection and regulation. Data and evidence are at the heart of our work, using real statistics such as modelling and significance/inference testing to help inspectors and policy makers focus on the right conversations at the right time. By reimagining our use of data, we're helping to raise standards and improve lives for children across England. Across Ofsted, we have worked to create a culture that uses evidence and |

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| | research to drive our policies and inspection, encouraging debate and engaging with the sector and parent/carer/provider community to drive ongoing improvement. Our conference presentation will talk through the tools and techniques we use to risk assess providers, inform inspection/regulation and identify providers with unusual movements in their data. We will also share our most recent data science work, data visualisation techniques and our plans to develop new knowledge through collaboration across government and with academia. "Data is the start of the conversation" is our mantra, so – please come along and let's talk. |
| 2.3<br>Braemar Suite | **Fair Work Measurement Framework & Survey**<br>**Ludmila Kopaskova (Scottish Government)**<br>This session will discuss how to influence decision making through data and measurement, and introduce the tool and measurement framework. The Fair Work Convention has been in place since April 2015 and acts as an independent advisory body to Scottish Ministers. The Convention's vision is that, by 2025, people in Scotland will have a world-leading working life where fair work drives success, wellbeing and prosperity for individuals, businesses, organisations and society. Fair work is defined as work that offers all individuals an effective voice, opportunity, security, fulfilment and respect. In order to help assess if Scotland is on track to become a fair work nation by 2025, keep track of improvements across all aspects of fair work and identify if any demographic groups significantly lack in fair work the Convention developed a Measurement Framework. The Framework translates theory of fair work into practical terms. It overlaps with the NPF, Scottish Labour Market Strategy and Inclusive Growth Strategy so making sure that all data is adequate but still meaningful and understandable to all stakeholders has been crucial. It consists of 40 indicators and uses data from the Labour Force Survey, Annual Population Survey, Annual Survey of Hours and Earnings, Family Resource Survey and Scottish Health Survey. However, there still are gaps in fair work data. To overcome this, the Convention designed an online self-assessment tool for employees. Through a visual tool, employees will be able to assess how their work is fair and receive advice on what they can do to improve it, but it will also collect data & provide a comprehensive picture of workplace practices in Scotland and beyond. We're hoping that the self-assessment tool will help us overcome the problem of low response rates to online surveys, while keeping the costs low. |
| 2.4<br>Melville Suite | **Operational Earthquake Forecasting**<br>**Ian Main (University of Edinburgh)**<br>The magnitude 6.3 L'Aquila earthquake occurred in the region of Abruzzo, in central Italy, on 6 April 2009. Some 308 people are known to have died, most in a single student dormitory. Subsequently, six |

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| | public officials were tried for manslaughter for "false reassurance", and "an assessment of the risks that was incomplete, inept, unsuitable, and criminally mistaken".  To address some of the issues raised in risk assessment and communication, the Italian government convened an International commission on Operational Earthquake Forecasting for Civil protection, who presented their main findings and recommendations to Italian Civil Protection, the press and public in L'Aquila itself in 2011*.  As a consequence, operational earthquake forecasting capabilities are now in place in California, New Zealand and Japan, as well as Italy. A current EU Horizon 2020 project has just been funded to extend this to Southern Europe. |
| | This presentation will outline some of the issues raised in statistical seismology as a basis for risk assessment and communication, notably the high background earthquake hazard in Abruzzo, the common occurrence of swarm-type extended sequences in Italy, the self-exciting point process (epidemic-type) models currently used to forecast earthquake occurrence at different magnitudes, and the associated uncertainties involved in data assimilation and prospective forecasting, as well as how one might communicate the associated risks. As a result of a few decades of effort, statistical seismologists can be confident that we cannot yet predict individual earthquakes, but we can build resilience by designing suitable infrastructure, and, while absolute probabilities remain low during earthquake sequences, we can provide high gains in probability during periods of elevated hazard. *Jordan, T., Y. Chen, P. Gasparini, R. Madariaga, I. Main, W. Marzocchi, G. Papadopoulos, G. Sobolev, K. Yamaoka & J. Zschau (2011). Operational earthquake forecasting: State of Knowledge and Guidelines for Utilization. Annals of Geophysics, 54(4), 361-391. doi:10.4401/ag-5350 |
| 2.5 Private Dining Room | **DFID: Doing data and statistics for development** **Paula McLeod (Department for International Development)** The Department for International Development has a global footprint, employing approximately 70 GSG statisticians living and working from Afghanistan to Zimbabwe. DFID's largest office is in East Kilbride where over 30 statisticians lead on meeting the data and statistical needs of – for accountability, communications and decision making across the "5 P's" of sustainable development: people planet, prosperity, peace and partnerships. In this session we will explore the statistical footprint of DFID – covering country offices activities: capacity building, programme and partner reporting, and independent monitoring in complex contexts; through to the work done by our central teams in producing our National Statistics publication – Statistics on International Development. |

| | You will gain an insight in to DFID and how the core skills of a GSG statistician translates in to sustainable, and equitable, international development. |
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| **DAY 2 – 2ˢᵗ October 2019** | |
| **Parallel Session 3** | |
| 3.1<br>Edinburgh Suite | **Interactive visualisation solutions**<br>**Jumping Rivers (Gold Sponsor)**<br>We discuss some of the data challenges and interactive visualisation solutions that we have developed in collaboration with government organisations, and companies from all sectors.  This includes interactive mapping, dynamic reporting, and real-time dashboards.<br>The Environment Agency's Catchment Data Explorer is a public facing web tool that assists in exploring and accessing water environment information.  We enhance pubic engagement and access to key information with the Water Body Explorer through a focus on simple navigation, user customisation, and direct links to underlying data for evidencing reports.<br>For identifying and reducing service outages we provide information rich, mobile applications for utility companies.  To improve customer communication, we provide a real-time dashboard and on-site incident management tools. To provide both in-house and public reporting we have developed several bespoke web-based data exploration tools. We achieve this by building upon in-house knowledge and expertise, engaging with end-users through focused user groups, and transforming messy data into useful information. |
| 3.2<br>Glamis Suite | **Building a Data Science Campus in Rwanda**<br>**Emily Poskett & Ceri Regan (Office for National Statistics)**<br>The ONS international development team and the Data Science Campus has been supporting the National Institute of Statistics in Rwanda (NISR) in their ambition to be the first NSO in Africa to develop its own data science campus.<br>We have been supporting them in a range of areas including: establishing appropriate legal and policy environment for data sharing, developing a data science capability strategy, recruitment, training, undertaking joint projects, and advising on ICT procurement. This presentation will give an on the ground perspective, and summarise the challenges and lessons learnt, and the relevance for us working in the UK. |
| 3.3<br>Melville Suite | **Using data to inform and evaluate public health policy in Scotland**<br>**Mark Robinson (NHS Health Scotland)**<br>NHS Health Scotland is a national health improvement agency working to reduce health inequalities and improve health in Scotland. Its main roles include: providing evidence of what works to reduce health inequalities; working across different sectors in Scotland to put this |

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| | evidence into action; and supporting national and local policy makers to design and evaluate interventions that help build a fairer, healthier Scotland. The purpose of this presentation is to share reflections on the science and art of using data and statistics to influence public policy by drawing on learning from several high profile projects from across the organisation.<br><br>These will include: 1) the Monitoring and Evaluating Scotland's Alcohol Strategy work programme, which incorporates the evaluation of minimum unit pricing; 2) the Scottish Burden of Disease (SBoD) project, which uses a wide range of data sources to quantify the contribution that different diseases and injuries make to the total burden of disease in Scotland, both nationally and locally; 3) the investigation into recent patterns in life expectancy and mortality trends; and 4) the Informing Interventions to reduce health Inequalities (Triple I) project, which uses epidemiological modelling to compare the impact of different interventions on mortality and hospital admissions in Scotland. |
| 3.4<br>Braemar Suite | **Gender profiles in UK and worldwide patenting: An analysis of female inventorship**<br><br>**Pauline Beck & Christopher Harrison (Intellectual Property Office)**<br>The UK Government has been inspiring girls and women to study and build careers in STEM fields – science, technology, engineering and mathematics. While educational diversity statistics are comprehensive, in industry, however, the statistics primarily rely on 'inputs' data such as the number of women employed. Very little data is available on the 'outputs' of work undertaken by women within STEM industries, but it is of great importance to governments and policymakers to understand the underrepresentation of women within science and technology. Whilst absolute patent counts do not give a direct measure of innovation, they can be used to provide a measurable 'output' of STEM industries to analyse the inventor demographic, to understand how inventor gender influences the patent system. This study by Intellectual Property Office uses baseline name-gender datasets, fusing them with published patents data from the EPO Worldwide Patent Statistics database. It is now possible, with a high degree of confidence, to infer gender from inventor name data and provide statistical analysis about the patenting activity of female inventors. This study shows that in 1980 under 4% of patent applications were filed by women. Although this figure has increased, the overall percentage of women innovators and inventors remains low. Internationally, France, (12.8%), Russia (15.7%) and Korea (18.1%) all out-perform the UK (7%). Originally published in 2016, this research will be refreshed in summer 2019: the results provide quantitative data to back up anecdotal evidence about female |

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| | inventors within the IP industry, providing a sound basis for future evidence-based policy. |
| 3.5<br>Private Dining Room | **Improved evidence to support EU Exit**<br>**Jane Naylor & Amelia Ash (Department for Exiting the European Union)**<br>EU exit is the most important issue facing our country and our Government at this time and it is therefore key that Ministers, negotiators and policy makers have access to the best analytical evidence possible to inform their decision making. The Department for Exiting the EU (DExEU) is responsible for coordinating this analysis across all Government departments and it is essential that this programme of work has access to the best data sources possible, that the use of data is consistent across departments and initiatives to fill data gaps are coordinated across teams.<br>This presentation will provide an overview of the EU Exit data strategy that has been led by statisticians in DExEU to ensure that this happens. Illustrative examples will be provided of how we have worked across departments to:<br>- develop a data catalogue of key data sources for EU Exit analysis to ensure consistent understanding of the strengths and limitations of each source and hence their use across projects<br>- identify data gaps around Northern Ireland trade and explore innovative options for filling these gaps<br>- manage the risks around the impact of EU Exit on official statistics and identify alternative data sources that could be used as early indicators of trends in official statistics in the event of a no deal<br>We will also highlight areas where further work is required to manage the issues but also realise the data opportunities that EU Exit may bring. |
| **Parallel Session 4** | |
| 4.1<br>Melville Suite | **Beyond the silo: How cross-government collaborative working is informing the Adult Social Care policy debate**<br>**Jason Snowden, Sarah Liley & Angus Gibson (Department of Health and Social Care /National Health Service Digital/ Ministry of Housing, Communities and Local Government)**<br>With over £17bn of spend and close to 2 million requests for support per year, Adult social care (ASC) matters. It is no surprise that decisions over how that money is spent attracts scrutiny and, as statisticians, we have to make sure these decisions are based upon a common understanding of the data. The Code of Practice we follow requires that we deliver 'Trustworthiness', 'Quality' and 'Value' in our work and some ASC finance data was falling short of these expectations. To rectify this, we formed a cross-government working group to align the national and local reporting of ASC expenditure, |

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| 4.1 cont.<br>Melville Suite | including the reconciliation of expenditure data and the treatment of the integrated health and social care 'Better Care Fund'. With representation from DHSC, MHCLG, NHS Digital and NHS England, this represents a big step forward in collaborative working in this field. With funding for social care so often in the headlines, it is important that everyone is clear about current levels of expenditure, where they are funded from and their data sources and our work has already had an impact. Reports from commentators such as the NAO and the IFS now use the same figures for ASC expenditure that our departments use.<br>We would like to talk to you about the benefits and lessons we have learned from the experience of coordination across four large organisations, discussing how things were reported in 2015/16 and how they have improved since, including plans for this year's reports.<br><br>**Understanding Consumer Vulnerability in the Communications Markets**<br><br>**Grainne Murphy & Donna Phillips (Office of Communications)**<br>Ofcom's duty is to make communications work for everyone, and to do that we must understand how vulnerable consumers are being served by the communications markets. A consumer might be vulnerable due to their age, financial status, disability or life circumstances. However, vulnerability is tough to understand and equally difficult to measure in research. Initially Ofcom's research focused on analysing survey results by demographic characteristics such as age, socio-economic group and disability. Whilst this is valuable research, it is limited in terms of getting to the nuanced nature of vulnerability. For example, if those with a visual impairment are less likely to have a smartphone (53% vs 81%), is it mostly because of their disability, or is it primarily led by their age?<br>We are improving our research and analysis techniques to pick apart these nuances. We have developed a financial vulnerability scale which factors in a respondent's working status, income and household size. We have also focused on answering key research questions related to vulnerability. For example, who is finding it hardest to afford communications services, such as broadband, telephony and post? The 16-24-year olds, not the over 74's (17% vs 2%). We are also carrying out regression analysis to understand what the driving factors are behind key issues for vulnerable consumers, and to understand the interplay between consumers' demographic characteristics. I will be talking through our previous findings in this field and presenting the new analysis methodology and how this improves our understanding of consumer vulnerability. |
| 4.2<br>Glamis Suite | **Why the Civil Service leads the way, but does not realise it**<br>**SAS (Gold Sponsor)**<br>Data Science is the engine behind many businesses today and the |

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| | statistician is at the forefront of this.  It is not a new phenomenon for government - as it is many businesses - a wealth of data has always been collected by government, but this data set consistently grows – so how will a 21st Century statistician role evolve to cope with the increasing demand and help make steps forward for the transformation the government desires; In this session we will cover;<br>- Civil service leads the way<br>- The developing role of the data scientist<br>- The world evolving around data science<br>- Is AI an opportunity or threat<br>- Data and insight driven decisions<br>- Shaping the future of policy making<br>Speaker: Chris Gallagher, Public Sector AI lead, SAS UK |
| 4.3<br>Edinburgh Suite | **Using a 'life expectancy decomposition' method to understand the drivers of change in life expectancy over time, and of inequality in life expectancy.**<br>**Emma Parker & Leigh Dowd (Public Health England)**<br>Since 2011, there has been a slowdown in the rate of improvement in life expectancy in England. There are also wide inequalities in life expectancy and in 2015-17 the gap in life expectancy between the most and least deprived areas of England was 9.4 years for males and 7.4 years for females. To further understand these life expectancy trends and inequalities, we undertook a 'life expectancy decomposition' analysis.  This analysis quantified the contribution of different age bands and causes of death to changes in life expectancy over time, and to inequalities in life expectancy.<br>Results from this analysis were published in the PHE Health Profile for England 2018. The results showed that reductions in mortality from heart disease and stroke have historically driven improvements in life expectancy. However, a slowdown in improvement in mortality rates from these causes has had a large impact on the trend in life expectancy, making this a key area for action. The main drivers of inequalities in life expectancy within England are higher mortality rates from heart disease, lung cancer and chronic lower respiratory diseases in the most deprived areas. At local level, however, there is variation in the drivers of inequality in life expectancy. To provide this information for all local authorities we have recently updated the Segment Tool. The tool has been redeveloped as an R shiny app, allowing users to more easily interact with the data and charts, and identify the key areas for action in their location. |
| 4.3 cont.<br>Edinburgh Suite | **Enabling ethically appropriate uses of data for research and statistics for the public good**<br>**Emily Mason-Apps (United Kingdom Statistics Authority)**<br>Recent advances in technology, skills and legislation provide us with |

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| | a wealth of new opportunities to access and use data to produce new insights and statistics which have real value for the country. In maximising the research and statistical uses of these new opportunities, it is important that we do not just consider what now can be done with data; it is equally important that we consider what should be done. We will present the innovative approach that the UK Statistics Authority has taken to establish a robust, efficient and transparent ethical governance process to enable us to consider 'the should'. This approach aims to provide the National Statistician with assurance that the uses of data across ONS, the Government Statistical Service and, where appropriate, the wider research community, are ethically appropriate and for the public good. We will focus on some of the developments that underpin this approach, including: the establishment of an independent expert committee that provides transparent external advice and challenge on the use of data for research and statistical purposes; and the recently updated ethics self-assessment tool that enables researchers and statisticians to consider the ethics of their work at an early stage in the life course of a project, encouraging a culture of 'ethics by design'. |
| 4.4<br><br>Private Dining Room | **Data Quality: Do the public even care?**<br>**Fiona Shepherd (Home Office)**<br>Statistics often have a big impact on public debate and can form the basis of people's opinions. Government statistics cannot always provide a definitive answer, but our estimates are often accepted as fact.<br>With so much trust placed in our statistics, it is vital that our publications are as accurate as possible in order for the GSS to play a central role in public debate. We, as statisticians, have to make the right judgements about definitions, methods, and the strengths and limitations of the data we work with to ensure our statistics are robust and reliable.<br>Using the first release of statistics on police use of force, I will be looking at the judgements we made during the statistical production process and the impacts these have had on the final version of the published statistics, and associated media coverage |
| 4.5<br><br>Braemar Suite | **Energy Use Over the Last 70 Years; What it has told us and how methods have changed.**<br>**Warren Evans (Department for Business, Energy and Industrial Strategy)**<br>Climate change is the greatest environmental challenge humanity has ever faced and has never been more in focus with the recent commitment to fully decarbonise the energy system by 2050, aiming to reach net zero emissions. But what do we know about how our energy system has grown and transformed in recent decades?  How will we |

know whether the policies to support the government's ambitions are being successful?

This summer, BEIS published the 70th edition of the Digest of UK Energy Statistics, showing not only how energy is supplied into the UK now but providing a long-term look into our past to understand what has changed over the last 70 years. The Digest offers a unique history of how energy has transformed in the UK and reflects the work of 'generations' of statisticians developing the evidence to keep abreast of a rapidly changing world.

This talk will cover how energy in the UK has changed as we moved from coal, through the growth of petroleum, gas and nuclear, to recent surges in renewable energy. It will explore the interconnectedness of the world's energy system by noting how energy has been increasingly traded with other countries. We will also outline the statistical challenges involved in moving – for instance - from counting the number of pit ponies used in collieries to quantifying the amount of energy that has comes from the sun and the wind, and the challenges of maintaining the long-term evidence base in a rapidly developing policy environment.

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| **Parallel Session 5** | |
| 5.1 <br> Edinburgh Suite | **What to Expect When You're Not Expecting, The Novichok Chronicles** <br> **Victoria Cox & Philippa Spencer (Defence Science and Technology Laboratory)** <br> The "Skripal Incident" presented an interesting statistical challenge of how to assure the level of cleanliness of a contaminated site while still maintaining a practical level of sampling and decontamination. Further to the scientific rigour required, public perception of the levels had to be considered and assured. Another challenge was translating the statistical approaches into fit for purpose military plans. <br> This talk walks through the statistical sampling process and methods used, under operational conditions, that enabled the confidence of the scientific and policy community to allow public sites back to use. The talk will also highlight lessons identified and gaps in sampling methodology. <br> As a result of our work, we received a CSA commendation as well as letters of thanks from Wiltshire county council. The statistical rigour that was required as well as pragmatic approaches to a complex situation demonstrated that statistics can be applied in real time, for operational and public impact. |
| 5.2 <br> Private Dining Room | **The Gender Data Gap** <br> **Elizabeth Gray (Fast Stream)** <br> Recently a body of a Viking warrior, originally thought to be male, was found to be female. The body was originally classified in a time where |

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| | it was unheard of for women to fight or carry weapons and so when the archaeologists discovered the remains buried with status symbols: two shields, a sword, an axe, a battle knife, armour piercing arrows, a spear, and two horses, they naturally assumed it was male.<br><br>Such misidentification has been rampant across history, but there are many modern consequences of this. One consequence is the idea that if it is suitable for men - particularly white men - it is suitable for everyone. This assumption is actually deadly to many women and those that do not fin the natural white male mould. This is most apparent when it comes to car crashes. When a woman is involved in a car crash, she is 47% more likely to be seriously injured due to the fact many car makers use only male crash dummies that don't take into account the average female height, weight, and differing bone density. From brick size and body armour, to room temperature and space suits, all these add up to a large gap in data and in provision when it comes to women and it is our job as statisticians to help close this and make sure we identify and root out data that is out of date and unrepresentative. |
| 5.3<br>Braemar Suite | **Finding an impactful government career using R, Power BI and web-scraping**<br>**Tobias Jolly (Cabinet Office)**<br>The High Impact Policy Engine (HIPE) is a cross-government project helping civil servants to maximise the impact of their careers. As part of the HIPE team, I developed the HIPE jobs app after noticing the lack of features on Civil Service Jobs that would allow civil servants to find jobs working on issues that they care about. The focus in developing the app was therefore to provide a way for civil servants to make more informed career decisions, and plan career moves which allow them to have more impact. The data source I identified to do this was the Civil Service Jobs website. This is a standard website made up of connected pages showing jobs data in semi-structured html.<br><br>For the past year I have been using R to web-scrape job information (grade location, role type etc.) and full job descriptions from Civil Service Jobs, and search these jobs for keywords relevant to different areas of impact (climate change, poverty etc.). There are now over 100,000 adverts in my Power BI data model.<br><br>I developed a front end in Power BI which is viewable at the above link. The app allows users to interrogate current and historical job adverts to make evidence based and higher impact career decisions. >13,000 searches have been made with the tool so far. This talk will discuss the challenges of finding impactful roles in government, the process of developing this tool, as well as the technical aspects of web-scraping and building a Power BI model. |
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| **5.4**<br>Melville Suite | **The Indices of Deprivation in the UK 2019: methods, data and policy impact**<br>**Bowie Penney, Elizabeth Frazer & Samantha Collins (Ministry of Housing, Communities and Local Government /Scottish Government/Welsh Government)**<br>The indices of multiple deprivation have a long-standing reputation as a rich, robust and detailed resource drawn predominantly from administrative data sources across Government. The English, Welsh and Scottish indices are used by respective Governments and stakeholders as the standard measure of deprivation at small area level in the UK, covering income, employment, health, education, access to services, crime and the living and physical environment. As a resource, the indices constitute a key component of the evidence base across a wide array of analytical work – from community integration projects and models for public service funding allocation to policies for improving local areas, highlighting inequalities, such as in life expectancy, and identifying how these might be addressed. At a local level, the indices also provide a clear and accessible tool to assess relative deprivation at a variety of geographic scales, enabling local stakeholders to identify community priorities for improvement and work with communities to generate local solutions.<br>In this session, colleagues from England, Wales and Scotland will give an overview of the indices of deprivation across the UK, the analytical framework and methodology which sit behind them, how they can and should not be used, an in-depth look into what the data show, and the tools developed to help users make best use of the available evidence to inform decision making. Speakers will also present the key features of hot-off-the-press or soon to be released updated indices, with all currently set to publish in 2019, and facilitate discussion on recent developments. |
| **5.5**<br>Glamis Suite | **Using Machine Learning to analyse text data in Defence**<br>**Alexandra Pop (Ministry of Defence)**<br>Artificial intelligence is no longer an abstract field, but one that can enable businesses to work smarter and faster, doing more with significantly less. This presentation will demonstrate the application of machine learning techniques on text data collected by the Military Aviation Authority (MAA). The ability to draw meaningful insights from this data is essential to inform decision makers of potential risks in Defence, bring more evidence about readily identified risks, and do so in a smarter, and efficient manner. The MAA uses the Air Safety Information Management System (ASIMS), a web-based application that supports the reporting, management and analysis of air safety occurrences, investigations and recommendations. With an average of 1,000 reports submitted a month, and most of the data collected in free |

| | text format, drawing meaningful statistical insights using ASIMS has been limited over the years. |
| | This changed in 2018 when we began working with an outside company to create a software which has the capability of ingesting the text data and provide data analytics outputs. This capability can help the MAA mitigate risk more effectively. The methods I will cover mainly align to Natural Language Processing and include: text clustering, anomaly detection, text classification, and sentiment analysis. |

**With many thanks to all our speakers at GSS Conference 2019.**

## Conference blog

You can find our official blog for the GSS Conference at
https://gss.civilservice.gov.uk/events/government-statistical-service-gss-conference-2019/
We have been posting in the run up to the conference, and will be posting during and after the conference too!

## Conference twitter feed

For tweets about the conference, see the official GSS Twitter account (@UKGSS). If you send any tweets about the conference, please use the hashtag #GSSConf2019.

## Slack

The GSS Slack network has a dedicated #GSSConference2019 channel so you can begin to network with colleagues across departments before the day. The conference team will also be using Slack to post communications throughout the 2 days of the conference to ensure that everything runs as smoothly as possible.

To join the conversation:
- Go to the GSS Slack log in page.
- Register for an account using your Government email address.
- Once logged in open the list of "Channels" (using the "+" icon) on the left hand side.
- Choose #gssconference2019 and you're in!

We appreciate some departments' IT restrictions will mean being unable to join from a work PC, but hopefully you can still get involved using a mobile device.

## Conference Committee members

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Francesca Parrott, Department for Environment, Food and Rural Affairs

Michael Cole, National Health Service, Business Services Authority

*Venue team*

Jess Maddison, Department for Work and Pensions

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*Sponsorship team*

Amila Said, Her Majesty's Revenue and Customs

Pooja Ramnarain, Ministry of Defence

*With thanks to Alison Eve and Michael Wilmott at ONS for their contribution to this year's conference.*

**Each GSS conference is organised by a cross-government group of volunteers. Organising the conference is a great way to meet other statisticians and to make a positive contribution to the GSS community. If you want to help organise next year's conference, calls for volunteers will be going out in December, so keep checking the GSS website!**

**Notes**