

Newsletter: The latest news, views, and announcements



Message from the Co-Chairs



- Professor Dawn Teare, University of Newcastle
- Dr Catey Bunce, Royal Marsden NHS Foundation Trust

Please find information regarding some excellent events our network facilitated this year. We are truly grateful to everyone who has contributed. We have been amazed at the innovative ideas coming from our members and would encourage you to join us and help us in our efforts to speed up statistical translation from methodology into practise for the benefit of patients and public throughout health and social care.

Mission of the NIHR Statistics Group

- To drive two-way translation between statistical methodology and applied research in health and social care.
- Translating between statistical methodology and statistical application in NIHR research.
- To ensure the most appropriate methods are brought into research practice by creating networks for statisticians, clinicians, scientists and patients to collaborate throughout health and social care.

INSIDE

Early Career Morning 2021

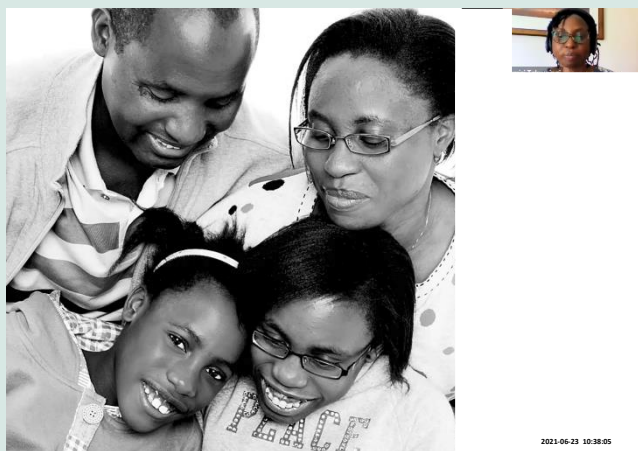
Insight into career talks by Professor Yemisi Takwoingi and Dr Munya Dimairo.

Fifth Annual Conference

Theme: statistical literacy and research integrity with an emphasis on data visualisation.

Acknowledgements

Celebrating the people who contributed to the success of the conference.



• Snapshot taken from Professor Yemisi Takwoingi's career talk

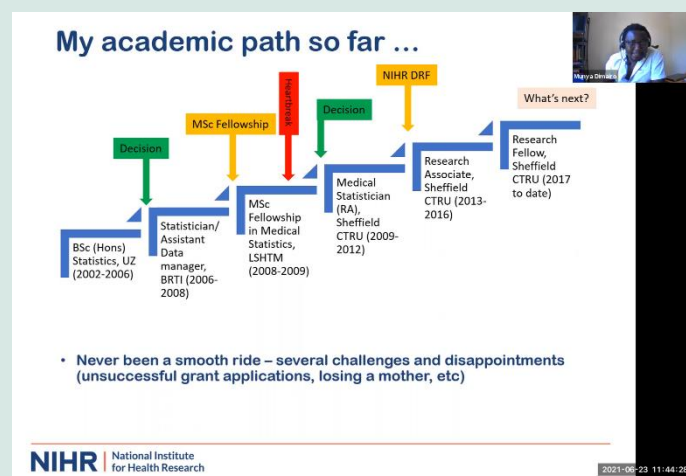
Early Career Morning 2021

The Early Career Morning (facilitated by Sam Leary and Jen Lewis) preceded the conference on 23 June 2021. This included some interactive discussions on challenges facing early career statisticians such as knowledge of the career paths available, understanding which specific skills are required for furthering careers, and identifying PhD/supervisors.

The Career Development Group have prioritised activities/events that they will organise to address issues identified in this session.

Guest speakers Professor Yemisi Takwoingi and Dr Munya Dimairo kindly joined the morning and gave inspiring and insightful career talks into their career journeys as statisticians.

Their talks touched upon the hardships and successes of their personal experiences and provided early career statisticians with valuable advice.



• Snapshot taken from Dr Munya Dimairo's career talk

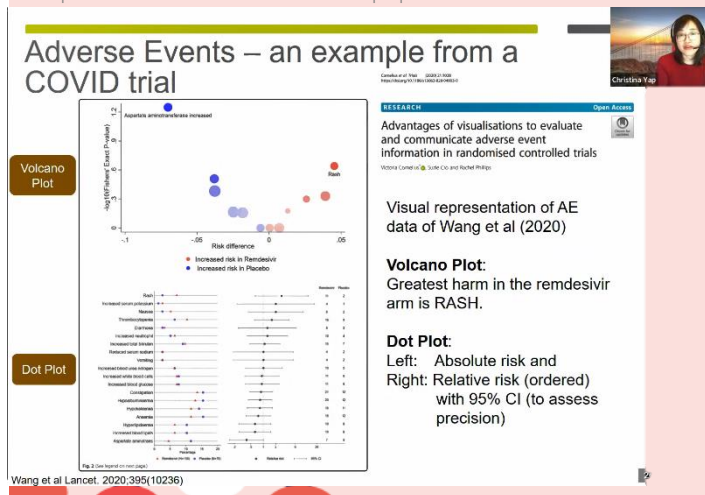
Fifth Annual Conference

With over 150 registered participants, the NIHR Statistics Group Fifth Annual Conference took place online for the second year in the form of four main sessions, fifteen breakout sessions and "quick fire" poster sessions held over two days (24-25 June 2021). This year's conference theme was statistical literacy and research integrity with an emphasis on data visualisation. This marked a belated celebration of Florence Nightingale's Bicentenary. Whilst many are aware of Florence Nightingale as a pioneer of modern nursing, less may be aware that she is an inspirational female leader of applied medical statistics. She was the first female member of the Royal Statistical Society and the fact that this happened during Victorian England is remarkable. Florence Nightingale was inspirational in her ability to communicate statistical concepts to those without statistical training – a challenge that many applied medical statisticians are familiar with. She used data visualisation and saw that whilst tables of numbers spoke to her (and many other statisticians) these may need to be translated using data visualisation for better understanding by those without statistical training.



We today are unable to speak to Florence Nightingale about the inspiration of her iconic polar area chart but someone that we can speak to is **Professor Martin Bland**. He is well known for a chart that is readily cited throughout medicine – the Bland Altman plot. We invited Martin to present at the conference and tell us how he came up with this simple concept that can speak volumes. We were delighted by his talk on the 'Agreement between two methods of medical measurement' and his special message about Professor Doug Altman – another inspirational applied medical statistician.

- Snapshot taken from Professor Christina Yap's presentation



Making a picture worth a thousand words: applications in clinical trials

Professor Christina Yap (The Institute of Cancer Research) presented a thought evoking talk on the importance of using a good picture to communicate data clearly, efficiently, and effectively. Christina talked through the most common figures used in published clinical trials and gave advice on how to improve the message intended for the target audience. It is important to ensure all figures are accompanied by informative figure legends and to view data visualisation as a combination of both art and science, as it requires not only statistics and computing skills but also design skills.

Reporting of research findings in the mainstream press

Jo Knight, Kelly Heys and Fran Biggin

This session featured a short presentation about headlines and research, followed by group discussions. The main points were focused on how to influence how statistics are reported in the press; advice on contributing to press releases; and using statistical knowledge to educate and influence collaborators on the limitations and implications of research. Some tips from the session included:

- Creating a clear author statement that is 'proofread' by lay people before release to the press.
- Using guidelines such as those suggested by Bodemer, Nicolai, et al. "Do the media provide transparent health information? A cross-cultural comparison of public information about the HPV vaccine." Vaccine 30.25 (2012): 3747-3756.

What studies are needed to provide evidence for adoption of AI technology for imaging within the NHS?

Sue Mallett, NIHR Statistics Imaging Group

Discussions focused on how evaluation of AI tools in imaging is mostly evaluation of diagnostic or monitoring tests. Fryback and Thornbury 1991 provides a good framework for evaluation. Literature on evaluation of Computer assisted detection (CAD) studies dating to 2000-2020 is relevant. Key issues raised how evaluation of AI in patients who would have test in clinical practice is important for understanding performance in terms of diagnosis, patient management and patient outcomes. Also understanding how the AI fits into existing diagnostic practice is critical.

Challenges of quantitative research in social care

Amritpal Rehill, Bo Hu and Ann-Marie Towers

The aim of this session was to understand challenges faced by researchers in social care and how these, and the experience of doing research, might differ or mirror those faced by researchers in health research. The joys and challenges of research in social care are similar to those in health services and public health research. But some issues can be particularly problematic because of the nature of social care. Presentations focused on the attrition bias; and self- versus proxy-reporting.

Strengthening the methodology of reporting guidelines and improving the reporting of statistical methods

Michael Schluskel and Derrick Bennett

The session was focused on evaluating the methodological robustness of reporting guidelines in the EQUATOR Network library and plans to revise and extend the Statistical Analyses and Methods in the Published Literature (SAMPL) guidelines. Some aspects considered in the reporting guidelines included authorship and use of development groups, conduct of a systematic review during development and the use of a consensus process.

Developing personas using machine learning clustering techniques to support the understanding of populations and inform action

Andrew James Williams, Kath Magure, Tamaryn Menneer and Tim Walker

The session provided an overview of the persona development process using k-prototype clustering analysis, triangulation of sensor and qualitative data and community engagement. Personas are frequently used in practice as part of market research or user-centred design, including health service development. Clustering techniques are available for various types of data to reduce bias in persona development. The resulting personas are accessible ways for people to interact with the data.

Use of trial data by statisticians for clinical trial monitoring and assessing protocol deviations

Sharon Love, Andrew Davis and Amy Kirkwood

Presentations discussed how central monitoring is done to mitigate risks to trial participants and ensure trial integrity. It uses centrally collected data to identify issues with trial conduct. A programmatic approach can identify protocol deviations that have not been reported by sites, captured at data entry etc. and can help to automate the process. Central monitoring is helpful, but more work is needed to assess what is/ is not picked up by it. This should be considered when designing trial databases.

Randomisation and blinding in clinical trials

Cydney Bruce and Mais Iflaifel

Researchers at NCTU presented their research looking at developing guidance and recommendations for methods for randomisation and blinding of statisticians in randomised trials. Key points included: (Randomisation) the trade-off between unpredictability and balance; polarised opinions on appropriate use of minimisation/stratification; and the growing desire for balance for 'balance's sake'. For the blinding of statisticians there is wide variation in practice and little empirical evidence to guide; the current recommendations are not risk proportionate.



The NIHR Incubators

Professor Anne Maree Keenan (University of Leeds) gave an insightful look into the NIHR Incubators that were derived from the NIHR Strategic Review of Training report undertaken in 2017. Anne Maree shared that the Incubators have been developed to address the specific needs of an area or community where there are considered to be issues in academic capacity development. They aim to bring communities together to provide targeted career development support and encourage early career interest in target disciplines to build identifiable communities. The NIHR Incubators are led by experts in the field and supported by the NIHR Academy.



• Snapshot taken from Professor Anne Maree Keenan's presentation

Preparing a trial application with an adaptive design

Thomas Jaki, Pavel Mozgunov, Thomas Burnett

Discussions centred around adaptive designs and how they allow for more flexibility in a clinical trial and facilitate more efficient decision-making. Designing an adaptive trial can take time and resources at early stages (of the trial planning) that will pay off later on. One of the challenges is to communicate a complex design to trial's clinicians and funders. Close collaboration between the clinical and statistical teams (both CTU's and [external] methodologists) is key to a successful and meaningful adaptive trial.

Challenges facing mid and later career statisticians

Sam Leary and Gordon Prescott [on behalf of the NIHR Statistics Career Development Group]

This session focused on identifying challenges for mid-later career statisticians including: lack of respect by NHS/collaborators on research grants; lack of time for research/grant applications; isolation; danger of career stagnation if staying at one institution. Possible solutions identified included: encouraging managers to allow attendance and allow funding for NIHR events, continuing to facilitate mentoring/networking (at both junior and senior level), and development of leadership training. In addition, NIHR group members should actively seek opportunities to enhance their visibility.

Using routine data to obtain comparative effectiveness estimates by emulating a target trial

NIHR Statistics routine data group

This presentation focused on introducing the Target Trial framework: emulating a target trial using routinely collected data to estimate comparative treatment effectiveness when RCTs are not possible or practical. Emulating a target trial can help researchers identify and avoid unnecessary biases and provide a clear means for articulating the trade-offs that may be needed to make in observational studies. However, we cannot always emulate an ideal trial because of the data available and its quality. Part of the statistician's role is to reflect on these trade-offs and weigh whether these compromises are possible or whether revised questions and/or data are required.

Some different kinds of looking

Helping others to see

- ✓ Complex methods can be baffling to other statisticians, let alone those without statistical training
- ✓ Need to present visually and in text/numbers clearly so that others can **see** what the data are saying
- ✓ Want to encourage people to ask questions and not feel foolish – we want to be transparent and take people with us.....



- Snapshot taken from Professor Janet Peacock's presentation

Statistical thinking before analysis - learning from just looking at data

Professor Janet Peacock (Dartmouth College) impactfully challenged statisticians to really look at their data and spoke of the different forms of doing so. Janet provided insight into the dangers of not looking at data which could lead to data error, unexpected distributions, missed implications of how the data was collected and an overall misinterpretation of results can ensue. Looking can mean different things and it is critical to ensure data is being looked at to help oneself see but also to help others see. Making good practice of this can avoid unnecessary delays with data analysis and instils good habits. Janet also gave a reminder that both simple and complex analyses are often needed, especially when presenting data to non-statistician collaborators. Simple summaries and plots are an effective way of showing how complex method results make sense – it is all about statistical thinking!

Poster Session

Congratulations to poster prize winner Grace Young, Marcus Drake, Athene Lane, Chris Metcalfe and Amanda Lewis on their poster:

Using patient-reported outcomes to learn more about the treatment pathway; findings from the UPSTREAM trial

Recommendations for visualising the drug harm profile in Randomised Control Trials: a consensus

Rachel Phillips, Victoria Cornelius, Suzie Cro and Graham Wheeler

This session focused on reviewing AE visualisations and forming a consensus group to determine those that researchers including statisticians and clinicians find most useful. Lots of plots have been suggested in the literature for different types of data. The consensus group were able to recommend 1-2 plots per data type, except for multiple time-to-event outcomes, which is an area of future work. Some recommendations included the dot plot, stacked bar chart and separate bar chart for binary events/counts.

Data integration of multiple routinely collected healthcare datasets

Maria Elstad, Abdel Douiri, James Doidge and Alex Hacker

These talks focused on linkage quality assessment; challenges in linking primary and secondary care data with an example in stroke; and challenges in Event Linkage in China Kadoorie Biobank. Discussions arose around dealing with the same variable from multiple datasets; validating the data; and the potential of a new working group for 'Data linkage'.

Between-site comparisons: statisticians talk about their websites

Richard Hooper

Key points from this presentation suggested that building a website is easy as tools are widely available, it provides transferable skills, and is a way to promote one's work. It can also build communities and disseminate good practice. However, it is important to think about funds - although registration and hosting costs are modest, and to consider pros and cons of university web-hosting. Planning for longevity is challenging but investing in the time will produce great results.

An overview of benefit-risk assessments

Nikki Totton, Prof Steven Julious and Ruth Owen

This presentation focused on providing an introduction with examples of how benefit-risk assessments could be implemented into future research and demonstrated their importance in decision making. The talks covered the meaning behind benefit-risk assessments, benefit-risk during Covid-19, and Individualised benefit-risk.

Visualising ophthalmic data - welcome to the multilayer complexity

Prof Mario Cortina-Borja, Dr Siegfried Wagner and Dr Dipesh Patel

The session covered an overview of the process of visualisations and complexities of ophthalmic data, followed by practical advice on how to communicate visualisations and two case studies. Visualisations can bring data to life and swiftly convey information to others. Creating an effective visualisation is a delicate balancing act between form and function. The key components are having an interesting question with a relevant purpose; appropriate data that are correctly analysed and interpreted; and a clear, clean visual design to communicate the message to the intended audience. Data visualisation points of view, software, resources, tips and tricks including common pitfalls were considered and further debated in the group discussion.

Acknowledgements

A special thanks to: The Conference Organising Committee 2021

Martyn Lewis, Saleema Rex, Fang Gaosmith, Sam Leary, Andy Vail, Catey Bunce, Rachel Finapiri, Amanda Wilson and Dawn Teare.

All presenters and attendees for making the NIHR Statistics Group Fifth Annual Conference a big success!

If you would like to be involved in the organising of next year's conference or the NIHR Statistics Group in any capacity, please get in touch.