STATS MATTERS & EVENTS

11 April 2024

This week the UK Office for National Statistics published various aspects of demographics and social trends in England and Wales based on the findings of the 2021 census. While the figures are UK based, they still make for interesting reading.

The key points can be broken down as follows:

Employment and Education:

Women tend to start full-time work later than men, with the proportion of women in full-time work falling below half by age 31. More women than men have been attending university since the late 1990s, which may contribute to women entering full-time work later.

Living Arrangements:

The age at which people leave their family homes has increased from 21 years in 2011 to 24 years in 2021. More men than women live with their parents, with 61% of adults living with parents being men in 2021.

Family and Fertility:

The average age of women having their first baby has steadily increased since the 1970s, from 23 in 1970 to 29 in 2020. Fertility rates have decreased, with the total fertility rate dropping from 2.4 children per woman in 1970 to 1.5 children in 2022.

Marriage and Homeownership:

The median age at first marriage has been increasing, with opposite-sex couples marrying at a median age of 32 for men and 30 for women in 2020.

Homeownership has increased in age, with more than half of people owning their own home by age 36 in 2022, up from age 32 in 2004.

Earnings and Gender Pay Gap:

Women's hourly wage is consistently lower than men's across all ages over 20, with women's median earnings peaking at age 42 compared to age 47 for men. The gender pay gap has decreased, with women's hourly earnings being 14% lower than men's in 2023 compared to 20% in 2013.

Unpaid Care and Retirement:

People in their 50s are more likely to provide unpaid care, with the proportion of people providing unpaid care decreasing from 13% in 2011 to 10% in 2021.

The average retirement age has increased, with women's retirement age rising from 61 in 2011 to 66 in 2021 due to changes in state pension age.

Life Expectancy:

Women reaching retirement age at 66 years can anticipate an average lifespan extending to 87, while men of the same age can expect to live until around 85. At 66, women have a 5.5% probability of reaching 100 years old, contrasting with a 3.1% likelihood for men.

Are you interested in knowing your own life expectancy? The [comprehensive report](#) can even help with that: Use the life expectancy calculator provided and find out. My number is 87. What's yours?

[Marie-Louise Rankin](#)
Executive Officer

Read newsletter in your [browser](#)

In this newsletter:

Winner of the 2023 Tjanpi Award for Best Student Paper in Environmental Statistics

2023 Tjanpi Award for Best Student Paper in Environmental Statistics Goes To…

Congratulations to Matthew Sainsbury-Dale, winner of the 2023 [Tjanpi Award](#) for best student paper in environmental statistics for his paper titled "Likelihood-Free Parameter Estimation with Neural Bayes Estimators" [published recently in the American Statistician](#), which explains how to use neural networks to construct fast, likelihood-free approximate Bayes estimators.

The Tjanpi Award is sponsored by the SSA Environmental Statistics Section and comes with a cash prize of $500 and an invitation to present at the next Australian Statistical Conference. Matthew recently submitted his PhD thesis at the University of Wollongong, supervised by Andrew Zammit-Mangion and Noel Cressie.

All submissions this year were of an excellent standard, in particular, an Honorary Mention was given to Ben Maslen for his submission "How many sites? Methods to assist design decisions when collecting multivariate data in ecology", [published last year in Methods in Ecology and Evolution](#). Ben is in the third year of his PhD at UNSW Sydney, supervised by David Warton and Gordana Popovic and Dadong Wang (CSIRO/Data61).

We look forward to seeing Matthew and Ben in action at the next ASC!

March meeting of the South Australian Branch

The March meeting of the South Australian Branch started with the Branch AGM and was followed by two short talks by biostatisticians who are located at the South Australian Health and Medical Research Institute. Kylie Lange presented part of her PhD research on the topic of designing and analysing partially clustered trials with continuous outcomes. Aline Kunnel spoke on her PhD topic of model selection for high dimensional genomic data. The SA Branch provided Kylie and Aline financial support for their registration to the 2023 Australian Statistical Conference to present their PhD research. Kylie and Aline gave short talks after the Annual General Meeting of the SA Branch in March.

Kylie discussed how many clinical trials involve partially clustered data, where some observations belong to a cluster and others are considered independent. She distinguished four types of clustered designs for clinical trials, with the design types varying in relation to whether the clusters exist prior to randomisation and the strategy for randomisation of units belonging to the same cluster. Example scenarios of pre-existing clusters are multiple births in neonatal trials and observations from the pair of eyes of an individual. Partially-clustered designs with pre-existing clusters have received limited attention in the literature and these designs have been the focus of Kylie's research.

Two options for the analysis of partially-clustered trials are generalised estimating equations (GEEs) and mixed models. The goals of Kylie's research were to (1) compare the performance of these two analysis approaches, and (2) determine whether the existing sample size formulas which are based on GEEs also provide appropriate power if the analysis is via mixed effects models.

Kylie described the design of her detailed simulation study which considered scenarios combining four variables: intra-cluster correlation (ICC), proportion of units within a cluster, treatment effect size and the strategy for randomisation of units in the same cluster. The analysis only considered clusters of size 2, though she is currently working on extending the work to larger cluster sizes.

The conclusion from the analysis is that both GEEs and mixed models perform well in most common partially-clustered trial settings. She identified some scenarios (e.g. using the individual or balanced randomisation strategies and the ICC is high) when caution is needed under both the GEE with an exchangeable working correlation structure and mixed model approaches. Kylie can be contacted at kylie.lange@adelaide.edu.au.

Aline's talk concerned the general problem of identifying suitable models when

the number of candidate predictor variables is large compared to the number of observations. This is a standard scenario for the analysis of gene expression data, and a common strategy is to apply variable selection methods like LASSO which provide a single model. The hypercube method recently developed by Cox & Battey is an alternative method which assesses combinations of predictors through many simple models. The method provides a set of models which explain the data well.

Aline's research has investigated an extension to the hypercube approach which accounts for strong correlation structures present in gene expression data. The hypercube approach assesses predictors by fitting suitable low-dimensional models several times to each predictor, each time alongside a different set of other predictors. A random process allocates predictors to the hypercube cells to determine the set of other predictors which feature in each of the models. This random allocation introduces a degree of instability in the hypercube method. The extension seeks to reduce this instability by repeating the hypercube process multiple times with different cell allocations at each repetition. The predictors which are consistently selected across the repetitions are chosen.

Aline compared the predictive power of the extended hypercube method with regularisation methods to real-world data on genes related to sepsis. For this data the extension was effective in removing dependence on the initial cell randomisation, and the identified models had predictive power comparable to the LASSO. If you would like further information on this work, Aline can be contacted at aline.kunnel@sahmri.com.

Julian Whiting,
SA Branch
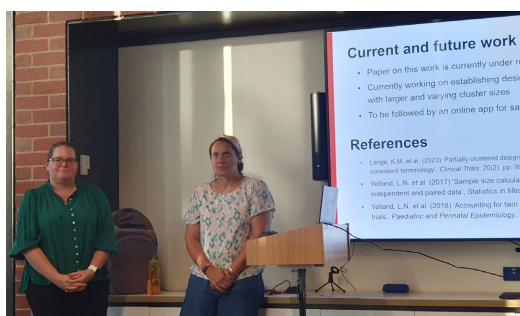
Kylie Lange (with former President of the SA Branch, Barbara Toson)

Aline Kunnel

Science Meets Parliament 2024 - Report Michael Dymock
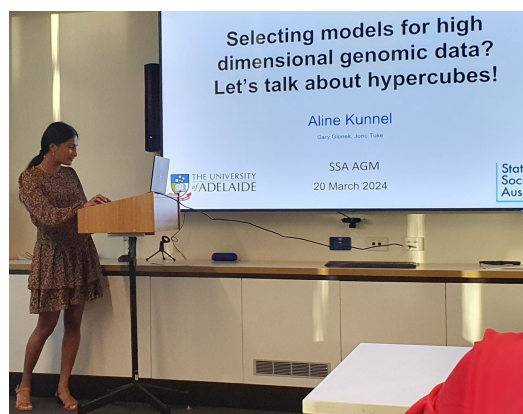
This is the second part of a two-part series. We started last week with Lucy Conran's report about her experience at [Science Meets Parliament](#) (SmP) 2024. As was mentioned then, SSA selects one or two members each year to attend "Science Meets Parliament", Science and Technology Australia's signature event for facilitating deep engagement between the STEM sector and policymakers.This year's successful candidates were Lucy Conran and Michael Dymock.

Read Michael's report here:

Alongside Lucy, I represented SSA at Science Meets Parliament 2024. It was an enlightening event, showcasing the inner workings of science policy at the national level with a series of expert sessions on all things science and politics. At the Gala dinner, attendees were strategically seated with like-minded fellow scientists and parliamentarians to maximise the networking opportunities. Networking, in general, was the highlight of the experience, with every single attendee energetically sharing their work and listening to others', making the most of the opportunity.

My small group meeting was with Dr Gordon Reid from NSW. A very impressive parliamentarian who still finds time to work emergency department shifts most weeks! We spoke about the role statistics plays in medical research and its influence on appropriately summarising evidence for and against proposed health policies. It was a pleasure meeting scientists from across Australia – especially the ones that were enthused to speak with a statistician (which were most!). There was a time where this would have surprised me, but I am starting to learn that most scientists are in fact in awe of statisticians (for better or worse) and certainly appreciate the work we do. We should embrace this respect and continue to share our work and experiences at every opportunity.

Michael Dymock
WA Branch

SSA Privacy Policy

The privacy policy on the SSA website was recently updated to now include a referral to the Wild Apricot/Personify privacy policy which underwent some minor changes at the end of last year.

The SSA Privacy Policy is available [here](#).

The Wild Apricot/Personify Privacy Policy is available [here](#).

Latest edition of Significance out now

Sharing statistical stories with the world at large – be that through a book, a talk, a social media post or the pages of your favourite statistics and data science magazine – can be extremely difficult. No matter how riveting and relevant those stories. Common parlance and complex mathematics are not easy bedfellows. You can't assume everyone's keeping up, but instinctively feel dumbing down is wrong. How do you strike the right balance, get your story noticed and make your voice heard?

In this issue, we bring you the experiences and advice of three people we think are great at communicating stats to broad audiences, each in their own distinct way. We hope they'll inspire you in capturing your own audiences.

We're also excited to launch our new, regular series Bad Stats, in which, each issue, we'll share salutary lessons from the world of statistics.

May 2024 issue highlights:

The R number

The second in our six-part series by Gavin Freeguard on the evolution and usefulness of the pandemic's famous epidemiological tool

What is data science?

The burning question, inspected through a statistical lens

The thirteenth floor

Buildings in New York City often don't have a thirteenth floor

– superstition, or something else?

Show and tell: stats communication special

Hear from three skilled stats communicators about their work

and how they get through to their audiences

The philosophy of statistics

Understanding the philosophical foundation of probability and statistics

Bad stats

A new regular series revisiting well-known statistical screw-ups

Access the digital version of *Significance* through your membership portal. Print issues will be mailed to subscribers soon.

CSIRO survey on Australians' attitudes toward the renewable energy transition

Just yesterday, the CSIRO released the results of the most comprehensive survey of Australians' attitudes toward the renewable energy transition. The survey involved over 6,700 participants across all states and territories and explored various aspects, including attitudes toward renewable energy infrastructure like solar and wind farms as well as transmission lines.

Key findings revealed that most Australians prioritise affordability, energy self-

reliance and emissions reduction in the energy transition, with differing opinions on the pace and extent of change. While many support the transition, opinions vary, especially among those living near existing or proposed renewable energy developments. Solar farms generally had high acceptance, while attitudes toward wind farms and transmission lines varied. Overall, communities seek transparent information about renewable energy projects and their impacts on the environment and individuals.

Bayesian inference: challenges, perspectives, and prospects

Theme issue compiled and edited by Christian P. Robert, Judith Rousseau and Michael I. Jordan

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Bayesian inference: challenges, perspectives, and prospects

The following *Philosophical Transactions A* issue has been widely read and downloaded: **Bayesian inference: challenges, perspectives, and prospects** compiled and edited by Christian P. Robert, Judith Rousseau and Michael I. Jordan and the articles can be accessed directly [here](#).

You can purchase the print issue at the reduced price of £40 per issue by contacting sales@royalsociety.org.

Australian Academy of Science 2025 awards and funding opportunities

The Australian Academy of Science offers two types of opportunities for scientists. Its honorific awards recognise outstanding contributions to the advancement of science across the career spectrum. The Academy's funding opportunities support scientists to undertake research projects as well as travel and lectures at a national and international level.

Hannan Medal

The Hannan Medal is a career award that recognises outstanding research in any of the fields of statistical science, pure mathematics, applied mathematics and computational mathematics and is made in one of those three areas in turn at two-yearly intervals. The 2025 Hannan Medal is in **statistical science**. It honours the contribution to time series analysis of the late Professor E J Hannan, FAA, Professor of Statistics at the Research School of Social Sciences of the Australian National University. The award recognises achievement and excellence over an entire career. Notable recipients include Professor Alan Welsh FAA FAustMS, Professor Mathai Varghese FAA FAustMS, and many others.

Thomas Ranken Lyle Medal

The Thomas Ranken Lyle Medal is a career award that commemorates the contribution of Sir Thomas Ranken Lyle, FRS, to Australian science and industry generally and in particular to his own fields of physics and mathematics. The purpose of the medal is to recognise outstanding achievement by a scientist in Australia for research in mathematics or physics. The award recognises achievement and excellence over an entire career and is awarded once every two years. Notable recipients include Professor Chennupati Jagadish AC FAA FTSE, Emeritus Professor Cheryl Praeger AC FAA, and many others.

Moran Medal

The Moran Medal recognises the contributions to science of the late P.A.P. Moran, FAA FRS. Its purpose is to recognise outstanding research by scientists up to 10 years post-PhD in the calendar year of nomination, except in the case of significant interruptions to a research career, in one or more of

the fields of applied probability, biometrics, mathematical genetics, psychometrics and statistics. The award is normally made every two years.

Christopher Heyde Medal

The [Christopher Heyde Medal](#) honours the contributions to mathematics by the late Professor Christopher Charles Heyde AM, DSc, Hon DSc (Syd), FAA, FASSA. Professor Heyde was the Foundation Dean of the School of Mathematical Sciences at the Australian National University, and Professor Emeritus of Statistics at Columbia University, New York. The award's purpose is to recognise outstanding research in the mathematical sciences by researchers up to 10 years post PhD in the calendar year of nomination, except in the case of significant interruptions to a research career. In recognition of Professor Heyde's broad interests in the mathematical sciences the award is offered in different fields which rotate each year. The 2025 Christopher Heyde Medal is in pure mathematics, applied, computational and financial mathematics.

Anyone can nominate. Find out [how to nominate a scientist for an honorific award](#).

The deadline for the 2025 round of nominations is **11:59 PM (AEST) on 1 May 2024**. Contact awards@science.org.au if you have any questions about the awards program or click [here](#).

From previous newsletters

News from SSA's Bayesian Section

The [SSA Bayes committee](#) is putting out a call out for activity suggestions. The committee is currently planning webinars, sessions at external conferences and student travel scholarships for 2024. What else would you like to see or attend as a member of the section? Please fill in this [Google Form](#) with your ideas. Looking forward to reading all about them!

Expressions of interest - Bayes on the Beach 2025 or 2026

The Bayesian Section of the SSA is looking for expressions of interest (EOIs) to organise the next instalment of "Bayes on the Beach", which is slated to take place in 2025 or 2026. This is a national meeting of Bayesian statisticians that normally features around 70 attendees and is held at a beachside location.

The deadline for sending an EOI is 31 May 2024. Your EOI should be 1-2

pages and should include the following information.

- The planned venue, which should allow for accommodation in the vicinity at a range of prices.

- Potential dates.

- The names of the conference chair(s) and at least some committee members.

The Bayesian section of the SSA will select the top 2-3 EOIs, which will then be asked to send a full proposal detailing the budget.

Please send your EOI with title "Bayes on the Beach EOI" to the section co-chair Leah South, whom you can also contact if you have any questions.

Election of Executive Members

Members are advised that the Executive positions of Secretary and Treasurer will become vacant at the Society's Central Council Annual General Meeting in 2024.

Members of SSA are invited to submit nominations for the two positions to be vacated. Nominations must be in writing and signed by the nominator(s), and must be accompanied by a written and signed statement from the nominee accepting the nomination. Nominations should be submitted to the SSA President (president@statsoc.org.au) or to a Branch President before 1 May 2024.

Doug Shaw, Secretary

SSA Events

Statistical Consulting Network Monthly Meet-Up

26 April 2024, 12:30 PM – 1:30 PM AEST, held online

Come along with your thinking cap, maybe a problem, and some lunch!

The Statistical Consulting Network invites you to their monthly meet-up, a virtual lunchtime meeting where statisticians help each other out with problems that they aren't sure how to deal with. This virtual meeting is held on Zoom at

lunchtime on the last Friday of each month, 12:30-1:30 PM (AEST). We start each meet-up with announcements, or occasionally a special topic discussion, then discuss problems that attendees have brought along with them.

We also have a Slack workspace where members of the consulting network can communicate between meetings, or post problems or relevant materials they would like to discuss during a meeting.

<u>Zoom link</u>

Password: 660145

<u>Slack Workspace link</u>

Early Career & Student Statisticians Conference 18th - 21st November 2024

Join us for the biennial Early Career & Student Statisticians Conference (ECSSC). Organised by the ECSS Network of SSA and SECS Network of NZSA, this event offers invaluable insights and networking opportunities.

This year, we're excited to host local hubs in Perth, WA, Hobart,Tasmania and New Zealand, as well as a livestream option. Don't miss out on this incredible experience!

Important Dates:

- 1 July 2024: Call for abstracts
- 15 July 2024: Registrations open
- 26 July 2024: Deadline for abstract submission

Please note that these dates might be adjusted as the conference approaches. Bookmark the [event website](#).

Also participate in our Logo Competition: Design the official conference logo for a chance to win a free registration to the conference! Submit your logo to events@statsoc.org.au.

Other events

ACSPRI (Australian Consortium for Social and Political Research Incorporated) courses

ACSPRI offer a range of short courses, (from 1-5 days) in social science methods. Our courses cover a range of topics including:

- introductory to advanced qualitative research and analysis techniques;
- introductory to advanced quantitative statistics, including data analysis using specific software packages (R, Python, Stata, SPSS, AMOS and Mplus etc);
- social data science including machine learning, deep learning, network and text analysis
- survey design and analysis;
- interviewing techniques.

ACSPRI's longer intensive courses are being offered in the **2024 Winter Program** from June 24 to July 12. You can find the list of courses being offered below.

Enrol before May 15 to take advantage of our early-bird discount.

If you have any questions about any of our courses or ACSPRI membership, please contact us on 03 8376 6496 or you can email us at info@acspri.org.au.

32nd Population Census Conference on "New Data Sources and Technologies for the Next Round Censuses"

Ulaanbaatar, Mongolia, 20-22 August 2024

The 32nd Population Census Conference, co-hosted by the Association of National Census and Statistics Directors of America, Asia and the Pacific (ANCSDAAP) and the National Statistics Office of Mongolia (NSO Mongolia) will be held in Ulaanbaatar, Mongolia, from 20-22 August 2024.

With the theme "New Data Sources and Technologies for the Next Round Censuses", this conference aims to foster discussions and collaborations concerning innovative technologies, data collection, processing, and the dissemination of census and statistical information related to global populations and their characteristics. You are invited invite to share your valuable insights and experiences on population census by participating in this event.

The registration fee is US$130 per person for those who register by the deadline of 14 **June 2024**. To register, visit the conference website.

Current Vacancies in SSA's Career Centre

[Sydney Horizon Educators (Faculty of Medicine and Health)-School of Public Health Lecturer (Education Focused)](#)

New South Wales

The University of Sydney

Full time continuing academic Lecturer Education ...

[Statistician- Centre for Primary Health Care Equity (CPHCE), Faculty of Medicine & Health](#)

New South Wales

University of New South Wales

Employment Type:Part Time- 21 hours per week ...

[View All Jobs](#)