The Statistical Society of Australia
News

SSAI

In this issue

TERRY SPEED AWARDED THE 2013 PRIME MINISTER'S PRIZE FOR SCIENCE

Statistician and SSAI member Professor Terry Speed, from Melbourne's Walter and Eliza Hall Institute, received the 2013 Prime Minister's Prize for Science for his influential work using mathematics and statistics to help biologists understand human health and disease.

The Prime Minister's Prize for Science is Australia's highest accolade for excellence in science research. The Prime Minister presented this year's award to Terry at a celebratory dinner in late October at Parliament House. This is the first time this prestigious award has honoured a statistician or mathematician and the award to Terry recognises how important our discipline is to science.

Terry works in bioinformatics, a relatively new branch of science that combines maths, statistics and computer science to solve complex biological problems. During his 44-year career, he has developed mathematical and statistical tools that enable biologists to make sense of the vast amounts of information generated by rapidly advancing genetic technologies.

Bioinformatics has made it possible to look at hundreds of genes in a DNA sequence at once to understand the genetic changes involved in complicated diseases such as cancers, and is integral to the genomics revolution that is driving the sequencing of whole genomes in ever decreasing times. Terry has developed tools to identify genes that are responsible for different traits, diseases or cancers by sifting through these enormous volumes of data.

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Terry Speed

December 2013
Issue 145

SSAI

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Subscriptions

The Newsletter of the Statistical Society of Australia is supplied free to all members of the society. Any others wishing to subscribe to the newsletter may do so at an annual cost of A$30.00 for an issue of four numbers.

Advertising

Advertising will be carried in the Newsletter on any matters which the Editors feel are of interest to the members of the Society.
For details ofadvertising rates, etc. contact the SSAI Executive Officer at eo@statsoc.org.au

DEADLINE FOR NEXT NEWSLETTER
10 February 2014

EDITORIAL

This is the last issue of the newsletter for 2013, and so the last issue in both the International Year of Statistics and the year for the Mathematics of Planet Earth. We hope that you have been able to attend some of the special events organized this year, and that the profile of statistics has been raised as a result.

The profile of statistics has certainly taken a leap up in the Australian media since our last issue. Not only has statistician John Croucher been awarded the Prime Minister's Award for Australian University Teacher of the Year, but Terry Speed has been awarded the Prime Minister's Prize for Science. It must be a very long time since the research and teaching efforts of statisticians have been recognized in this way simultaneously, and we hope that you can use this coincidence to gain some more visibility and recognition for the role of statistics in your work or other activities. "The Romance of Numbers" (http://www.youtube.com/watch?v=wNkakkgWzyI) is one of the ways in which John is reaching out to secondary school students to inspire them to study statistics.

Some secondary students have been working hard on the Australian Statistics project Competition (ASPC), sponsored by the SSAI and run by the Australian mathematics trust. Winners will be announced soon (keep an eye on http://www.amt.edu.au/statscomp/) and we hope to bring you further details of winning entries in the New Year.

And as the year draws to a close, the National Committee for Mathematical Sciences has been working hard on the Decadal Plan for the Mathematical Sciences. Their website indicates that the Steering Committee will be identifying major strategic actions and recommendations in August, ready for a workshop on 9 December 2013 in Melbourne. The SSAI submission to the committee includes six really strong issues for the Steering Committee to consider, including the need to recognize and support the broad professional community of statisticians in the Decadal Plan, and the role of professional societies such as SSAI itself. There are also submissions government agencies such as DSTO and CSIRO, other professional bodies such as the Royal College of Pathologists of Australasia and the Australian Association of Mathematics Teachers; universities such as the ANU; and individuals.

Finally, the Editors would like to take this opportunity to wish all Society members a happy Christmas, and a pleasant New Year. We would also like to thank all those who have contributed to the newsletter, whether by writing reports, taking photos or providing feedback. Thank you also to the organisations who have supported the activities of the Statistical Society and its members – your input into successful Society activities is much appreciated. In particular, we would like to thank the ABS for hosting the SSAI office in ABS House in Canberra.

Alice Richardson

and **Michael Adena**

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Chaturi Bhaskaran
u4681540@gmail.com
http://www.statsoc.org.au/about-young-stats.htm

Further contact details for Society Secretaries and Section Chairs can be obtained by contacting the Society on (02) 6251 3647

EVENTS

33RD WORKSHOP ON BAYESIAN INFERENCE AND MAXIMUM ENTROPY METHODS IN SCIENCE AND ENGINEERING ("MAXENT 2013")

15 - 20 December 2013, Canberra

12TH INTERNATIONAL CONFERENCE ON DATA ENVELOPMENT ANALYSIS

14-17 April 2014, Kuala Lumpur, Malaysia

4TH ANNUAL INTERNATIONAL CONFERENCE ON OPERATIONS RESEARCH AND STATISTICS (ORS 2014)

28-29 April 2014, Phuket, Thailand

34THINTERNATIONAL SYMPOSIUM ON FORECASTING – ECONOMIC FORECASTING: PAST, PRESENT AND FUTURE

29 June- 2 July 2014, Rotterdam, The Netherlands

FOURTH BIENNIAL INTERNATIONAL STATISTICAL ECOLOGY CONFERENCE (ISEC2014)

1-4 July 2014, Montpellier France

AUSTRALIAN STATISTICAL CONFERENCE (ASC2014)/IMS ANNUAL MEETING

7-10 July 2014, Sydney

ISBA 2014 - TWELTH WORLD MEETING OF ISBA

14-18 July 2014, Cancun, Mexico

> Continued from page 1

Read the full citation for the award, which includes several fascinating stories from Terry's rich and varied career.

Watch the video which was made to introduce Terry at the ceremony.

Terry in a dinner suit? See the formal photo

and Terry being interviewed on The Project (about 23 minutes in).

There has been plenty of press, including interest from outside Australia.

Terry said it was a great honour to receive the Prime Minister's Prize for Science. "Australia is full of many amazing and talented researchers, so it is humbling to be recognised in this way," he said. "Science is a collaborative effort and I would like to thank the many students, postdocs and colleagues that have supported me throughout my career. In addition, I would like to thank my wife, Sally, whose love and support over the past 50 years has enabled me to pursue my research with passion."

Walter and Eliza Hall Institute director Professor Doug Hilton said he was delighted Professor Speed's global contributions to bioinformatics and biology had been recognised by the Australian Government. "Terry is a champion for statistics and bioinformatics, and has been instrumental in educating the next generation of bioinformaticians. Not only is his scientific acumen first-class, he is a compassionate mentor and a true leader, demonstrated by his strong support for gender equality."

The 2013 Prime Minister's Prize for Science is the latest in a string of awards for Terry. In May, he was elected a Fellow of the Royal Society, UK, while in 2012 he was the recipient of the Victoria Prize for Science and Innovation and won the Thomas Reuters Citation Award in Biochemistry and Molecular Biology for being the most cited Australian researcher in that field for the past decade. He also received the inaugural National Health and Medical Research Council (NHMRC) Achievement Award for Excellence in Health and Medical Research in 2007, an NHMRC Fellowship in 2009 and an Australian Government Centenary Medal in 2001.

LOOKING FOR A JOB?

For a listing of current statistical vacancies in Australia and New Zealand visit:

http://www.statsci.org/jobs

Do you have a job to advertise on the website?

Email a position description to eo@statsoc.org.au. Listing is free!

PRESIDENT'S COLUMN

Celebrating Our Succsses

John Henstridge

Kendall and Stuart understood the problem of the public image of statistics in their quoting of K.A.C. Manderville's novel[1], *The Undoing of Lamia Gurdleneck*:

> "You haven't told me yet," said Lady Nuttal, "what it is your fiancé does for a living."
>
> "He's a statistician," replied Lamia, with an annoying sense of being on the defensive.
>
> Lady Nuttal was obviously taken aback. It had not occurred to her that statisticians entered into normal social relationships. The species, she would have surmised, was perpetuated in some collateral manner, like mules.
>
> "But Aunt Sara, it's a very interesting profession," said Lamia warmly.
>
> "I don't doubt it," said her aunt, who obviously doubted it very much. "To express anything important in mere figures is so plainly impossible that there must be endless scope for well-paid advice on the how to do it. But don't you think that life with a statistician would be rather, shall we say, humdrum?" Lamia was silent. She felt reluctant to discuss the surprising depth of emotional possibility which she had discovered below Edward's numerical veneer.
>
> "It's not the figures themselves," she said finally. "**It's what you do with them that matters**." [My emphasis.]

The public image depends upon what we as statisticians "do with the figures".

In this Newsletter we celebrate the success of Terry Speed in winning the pre-eminent Prime Minister's Science Prize and congratulate him on his achievement. Terry's recognition is in many respects recognition of **what he has done with the figures** – solving important problems for our society, locally and globally. This work brings statistics and statisticians to public notice because it is both the very best scientific work and is understandable in its benefits. And the Prime Minister's Science Prize provides the machinery for getting the message out.

As statisticians we can rightly pride ourselves in the relevance and practicality of what we do. Statistical conferences are very different from mathematical conferences, in that as well as the mathematical content statistical conferences have immediate human applications. The Australian Statistical Conferences have sessions ranging from the highly theoretical through to the problems of statistical practice, and in my own experience I recall speaking at a conference on Statistics and Human Rights. I believe we have many stories to tell and successes to celebrate.

We need to do more to publicise these achievements of statistics that benefit the wider community. Some other professions such as medical research do this well and then receive public support for their work.

This Newsletter we celebrate Terry Speed. Last Newsletter, we celebrated two statisticians winning medals at the Australian Academy of Science – Matt Wand receiving the Hannan Medal and Aurore Delaigle the Moran Medal.

The challenge is what will we celebrate in the future Newsletters. I would like to hear from members what we should be celebrating. And as a Society, we need to improve the machinery for getting the message out.

John Henstridge
john@daa.com.au

[1]K.A.C. Manderville is believed by many to be a contemporary of Oscar Wilde. Despite his much smaller body of work that has survived, he was clearly strongly influenced by Wilde.

2013 Prime Minister's Award for Australian University Teacher of the Year

Professor John Croucher

MACQUARIE UNIVERSITY

Professor John Croucher received his 2013 Award for Teaching Excellence in the Law, Economics, Business and Related Studies category.

For more than 35 years, Professor John Croucher has been a leading statistician and educator with an international reputation for excellence and innovation, demonstrating sustained, deep and productive engagement with his area of expertise, his teaching and his students. Embracing a philosophy of making statistics relevant and transformative, John is a national and international multi-award winner for his superior learning, innovation, teaching skills, community outreach and research. He is also a prolific author and much of his work is directed to the improvement of learning and teaching at all levels, inspiring students to make a difference in their business and life. He was awarded the prestigious Distinguished Alumni Award from Macquarie University for bringing scientific methods, not only to thousands of students, but to more than one million readers of his weekly newspaper column *Number Crunch*. He is regularly sought after by business for his outstanding presentations and in 2009 voluntarily instigated a community outreach program for the indigenous students in Papua New Guinea where he designed and lectured in a creative pioneer MBA degree. For his exceptional achievements John was made a Visiting Professor at the University of London and awarded an honorary PhD by the Divine Word University in Papua New Guinea for his 'outstanding contribution to the development of humanity'.

Australian Statistical Conference in conjunction with the Institute of Mathematical Statistics Annual Meeting

ASC-IMS 2014 CONFERENCE

7 – 10 July 2014
Australian Technology Park, Sydney

PROGRAM UPDATE

www.asc-ims2014.com

On behalf of the Statistical Society of Australia and the Institute of Mathematical Statistics, the organising committee invites you to register in the joint Australian Statistical Conference/IMS Annual meeting, to be held 7–10 July 2014 in Sydney, Australia.

Delegates from all areas of statistics will join with world class Australian and International statisticians and mathematicians to develop, network and share their knowledge and expertise. In 2014 the Statistical Society of Australia will hold its biennial ASC in conjunction with the IMS Annual meeting. The Conference will provide opportunities for presentations on a wide range of topics and recognises the role that statistics plays in all aspects of modern life.

KEYNOTE SPEAKERS

ASC Keynote Speakers

James Brown, University of Southampton
Adrian Baddeley, University of Western Australia
Sheila Bird, Cambridge University
Rob Tibshirani, Stanford University

IMS Keynote Speakers:

Thomas G. Kurtz, University of Wisconsin-Madison
Peter Donnelly, University of Oxford
Terry Lyons, University of Oxford
Nina Gantert, Technische Universität München
Martin Hairer, University of Warwick
Timo Seppalainen, University of Wisconsin-Madison
Matthew Stephens, University of Chicago
Harrison Zhou, Yale University

MARK THE KEY DATE IN YOUR DIARY:

Early Bird Deadline:
28 FEBRUARY 2014

The conference objectives are to:

- Attract world class statisticians to share their knowledge and expertise
- Inform delegates about new work and developments in statistics, probability and mathematical statistics
- Provide an opportunity for professionals from all of these aforementioned areas to network, present and discuss ideas

Topics of interest include but are not limited to: spatial statistics, Bayesian statistics, computational and asymptotic statistics, sample surveys, methodology for official statistics, stochastic/statistical modelling, biostatistics, multivariate statistics, probability, mathematical statistics, econometrics and financial statistics.

The venue for this meeting is the Australian Technology Park in Sydney.

On behalf of the Program Committee and the Local Organizing Committee, we invite you to join us in Sydney for this exciting scientific event. Your participation will ensure that the 2014 ASC-IMS Conference will be a memorable meeting.

CALL FOR PROPOSALS

You are invited to submit an abstract for consideration for a contributed oral or poster presentation.

As this conference is a joint meeting between the Statistical Society of Australia and the Institute of Mathematical Statistics, an extensive and wide-ranging program will be available. As benefiting an event of this size, with approximately 12 Keynote presentations and 6 parallel streams, a large portion of the program will be by invitation. However, a substantial part of the program will be set aside for contributed presentations, both oral and poster. While there is no restriction on the topic or number of contributed presentations, the number of oral presentations is by nature limited. We encourage participants to submit their abstracts from May 2013.

ADDRESS FOR COMMUNICATIONS

Conference Managers

arinex pty limited
ABN 28 000 386 676

ASC-IMS 2014
Conference Managers
Address:
Level 10, 51 Druitt St,
Sydney NSW 2000, Australia
Ph: +61 2 9265 0700
Fax: +61 2 9267 5643
Email: asc-ims2014@arinex.com.au
Website: www.asc-ims2014.com

Visit the website for further updates: www.asc-ims2014.com

ELECTION OF EXECUTIVE MEMBERS

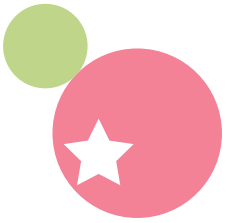
Members are advised that the Executive positions of Vice- President (President Elect), Secretary and Treasurer will become vacant at the Society's Central Council Annual General Meeting in 2014.

The SSAI Rules provide for a Nominating Committee, consisting of the current Executive and the Branch Presidents, to solicit nominations and submit a list of nominees to Central Council. Should an election be required, Central Council will then arrange a ballot of all financial members of the Society.

Members of SSAI are invited to submit nominations for the three 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 SSAI President (John Henstridge) or to a Branch President before 31st January, 2014.

Doug Shaw
Secretary



SOCIETY AWARDS

The Society awards a gold medal, the Pitman Medal, at most once annually, in recognition of outstanding achievement in, and contribution to, the discipline of Statistics. Honorary Life Membership honours outstanding contribution to the profession and the Society, while a Society Service Award may be awarded to a Society member in recognition of sustained and significant service to the Society.

An Awards Committee, chaired by the President of the Society, makes recommendations to the Society's Central Council as to appropriate Award recipients. Pitman Medals and Honorary Life Memberships are usually announced at the Society's Conference.

Members of the Society are encouraged to propose suitable recipients of the Pitman Medal, Honorary Life Membership or a Society Service Award. Suggestions, with brief supporting information, should be emailed to the President, John Henstridge, as Chair of the Awards Committee.

Doug Shaw
Secretary

SEEKING MATHEMATICIANS - YOUR INVITATION TO HELP THE NEXT GENERATION

What a difference a Mathematicians in Schools partnership can make…

Scientists and Mathematicians in Schools is a national program creating and supporting unique, flexible and ongoing partnerships. These partnerships between teachers and mathematicians across Australia are having an impact on the next generation. We have many primary and secondary school teachers in Victoria who would like to welcome a mathematician into their classrooms.

A little about the program

How it works: Individual mathematicians are partnered with individual teachers in ongoing, professional partnerships.

Activities: Each partnership is flexible, unique and voluntary - the mathematician and teacher decide how they will work together taking account of workloads, the mathematician's expertise, and the requirements of the teacher and class. This allows partners to develop their own style and may include hands-on activities, presentations, demonstrations, mentoring, emailing and video conferencing.

Time commitment: No fixed or minimum hours – it's up to the mathematician and teacher to decide how to collaborate. Mathematicians may visit the school once or twice a year, a couple of times a term, or once a week or month. Other partnerships utilise ICT (email and video conferencing) almost exclusively and have little face to face interaction.

Skills/experience required: Generally a Bachelor's degree in a mathematics related field and currently working in a profession where maths is a major component of your work (including PhD candidates) is required. It includes research mathematicians, engineers, cryptographers, IT professionals, accountants, surveyors, biometricians and statisticians, amongst others.

Available teachers: A map of teachers interested in establishing Mathematicians in Schools partnerships is available on our website at www.scientistsinschools.edu.au/scientists/unmatched.htm<http://www.scientistsinschools.edu.au/scientists/unmatched.htm>.

You can nominate one of these teachers to be partnered with, but are also welcome to nominate a region/school/teacher of your choosing and we will aim to facilitate a partnership for you.

We have teachers waiting for you now!

For more information and to register now, visit www.mathematiciansinschools.edu.au<http://www.mathematiciansinschools.edu.au>.

If you have any questions, contact
Gill Lunniss, Scientists and Mathematicians in Schools Project Officer in Victoria, on sis.vic@csiro.au<mailto:sis.vic@csiro.au> or 03 9252 6502.

CALL FOR SHORT COURSES

Do you have a full-day, or two-day short course you would like to present in conjunction with the Statistical Society of Australia in 2014?

We are looking for people to present short courses on statistical topics of interest as part of the SSAI continuing professional development program.

The SSAI will assist in the planning, marketing and conduct of the short courses.

Proposals will be accepted through to 20th December 2013.

Note: Any use or focus on software for courses should only be to highlight the application or technique, and not to promote or sell software.

Short Course Proposal

Information (Required for your proposal to be considered)

Presenter(s) Name

Affliation

Email

The information you provide will be used by the SSAI CPD Committee to assess the proposal and determine suitability in SSAI promotional and registration materials.

Title:

About the Instructor (Biography):

Outline, objectives and a brief Description of the Short Course:

Proposals should be submitted to the SSAI Executive Officer: eo@statsoc.org.au

NIASRA
NATIONAL INSTITUTE FOR APPLIED STATISTICS RESEARCH AUSTRALIA

UNIVERSITY OF WOLLONGONG

SPATIO-TEMPORAL STATISTICAL MODELLING

A short course presented by Peter J. Diggle (Lancaster U.) and Noel A. Cressie (NIASRA, UOW)

Monday and Tuesday (am), 3 - 4 February 2014
University of Wollongong Campus

Overview

In pursuit of the "why" question, science often comes across the "where" and "when" questions. Good data collection involves a protocol that specifies where (i.e., spatial locations) and when (i.e., temporal instants) the measurements were taken. This course offers an intermediate-level introduction to spatio-temporal statistical modelling.

The Course

This 1.5-day course considers a systematic approach to key quantitative techniques for the analysis of spatio-temporal data, with a particular emphasis on hierarchical (empirical and Bayesian) statistical modelling. Illustrative real-world examples will be presented throughout the course. Topics include:

- Exploratory analysis: point process, geostatistical, and lattice data
- Empirical/mechanistic models for point process data; case studies
- Dynamical/descriptive models for geostatistical and lattice data; hierarchical statistical models; predictive inference; case studies
- Combining point process, geostatistical, and lattice data: Towards a synthesis

Participants will receive a printed copy of the slides used in the presentations. No text is required but references and examples will be drawn from Peter J. Diggle, Statistical Analysis of Spatial and Spatio-Temporal Point Patterns, 3rd edn. (CRC Press, 2014) and from Noel Cressie and Christopher K. Wikle, Statistics for Spatio-Temporal Data (Wiley, 2011). There will be no computer-lab sessions but software sources will be given.

Target Audience

This course is aimed at researchers and students with Bachelor's-level probability and statistical inference, and a good understanding of matrix algebra is assumed.

Support

This workshop is being presented with the support of the Statistical Society of Australia Inc. and the Commonwealth Scientific and Industrial Research Organisation.

> Continued on next page

SSAI Statistical Society of Australia Inc.

CSIRO

Celebrate INTERNATIONAL YEAR OF STATISTICS

The Instructors

Peter Diggle is currently a distinguished university professor in the Lancaster University Medical School and a professor in the Department of Epidemiology and Population Health, University of Liverpool. He also holds adjunct positions at Yale, Johns Hopkins, and Columbia Universities. His main methodological interests are in spatial statistics, longitudinal data analysis, and environmental epidemiology, motivated by applications in the biomedical, clinical, and health sciences. He has authored several books on spatial statistics, longitudinal data analysis, and other topics. Peter has received the Royal Statistical Society's Guy Medal in Silver and is President-Elect of the Society.

Noel Cressie is Distinguished Professor in the National Institute for Applied Statistics Research Australia and School of Mathematics and Applied Statistics at the University of Wollongong. He has visiting positions at NASA's Jet Propulsion Laboratory and the Department of Statistics, University of Missouri. His interests are in the statistical modelling and analysis of spatio-temporal data particularly in applications to environmental data. He is the author of three books including Statistics for Spatio-Temporal Data by Noel Cressie and Christopher K. Wikle (Wiley, 2011). Noel is a Fellow of the American Statistical Association and of the Institute of Mathematical Statistics. Among other awards, in 2009 he received the COPSS Fisher Award and Lectureship.

Fees and Information

Course:	Spatio-Temporal Statistical Modelling
Fee:	$700
SSAI Members:	$600
Students:	$400
Location:	University of Wollongong, Building 11
Duration:	
Monday 3 Feb:	Registration 9-10am; course from 10:15am to 5:00pm
Tuesday 4 Feb:	Course from 9:00am to 12:30pm

Morning and afternoon coffee/tea and a sandwich lunch on both days are included in the course fee. To register and for further information visit the NIASRA website at niasra.uow.edu.au

Places are limited and registrations will be processed as they are received.

Other StatsWeek Events at UOW

5th ASEARC Conference: Statistical Collaboration

Tuesday (pm) and Wednesday, 4-5 February 2014
Free for ASEARC Institutions' Staff and Students
$220 ($180 SSAI Members or Students)

Nonparametric Statistical Methods, a short course presented by Olivier Thas

Thursday and Friday, 6-7 February 2014
$700 ($600 SSAI Members, $400 Students)

To register and for further information visit the NIASRA website at niasra.uow.edu.au

35% SSAI Member Discount Promotion with Wiley

The SSAI members receive a special discount of 35% on online purchases with Wiley or Wiley-Blackwell (http://www.wiley.com/statistics). This offer excludes school books.

WILEY Publishers Since 1807

To activate this benefit, please go to http://au.wiley.com/WileyCDA/Section/id-410891.html.

Register on the SSAI/Wiley Landing Page and from then on you can purchase Wiley books at the 35% discount *without use of a Promotional Code*. For those members outside of Australia and New Zealand, please use the Promo Code SDP92 at checkout to activate the discount. Members who registered on the Wiley site before the SSAI link was available may encounter problems when trying to get the discount. To get the new discount these members unfortunately need to register using another email address.

Toll free phone (from within Australia only) 1800 777 474
Toll free phone (from New Zealand only) 0800 448 200
Other overseas phone + 61 7 33548455

E-mail: custservice@johnwiley.com.au

SSAI GOLDEN JUBILEE TRAVEL GRANT

to provide overseas travel funds to SSAI student members, who can prove consecutive SSAI membership for a minimum of two years.

Last year the SSAI introduced a travel grant that offers limited travel funds to assist *student members* of the SSAI to attend overseas conferences at which they present a paper or poster.

A maximum of $1000 is available per application, limited to a single trip during the course of the student's studies. Students will not be supported in their first year of study and will have had to be members of the Society for at least 2 years prior to the application deadline. Applications are required to be lodged in advance of travelling. In exceptional circumstances an application can be for post-conference support, but the application will then have to be made within 1 month of returning and the 2 year mandatory membership period prior to departure must still be met. Exceptional circumstances are limited to unforeseeable student out of pocket expenses arising from other funding sources not fulfilling their obligation or changes to the trip that could not have been avoided.

A complete application will consist of

- Information on the conference and its importance to student's work (2-3 lines)
- Details of the paper/s/poster student wants to present at the conference
- A list of other funds sought or promised, including student's home institution
- Student's out of pocket expenses expected
- Any other supporting material student feels is necessary
- A letter of support SIGNED by one of student's supervisors AND student's Departmental Head
- Student's CV

The application deadline is 31 March 2014.

If successful the student member is required to produce original receipts for amounts of equal or greater value than the grant. These receipts will be returned to the student marked with how much has been reimbursed. The student will therefore still be able to use the receipts for proof of attendance or to claim any funding shortfall from other organisations. The student member will also need to supply a report of his or her involvement in the conference to be published in the SSAI newsletter. This report should confirm the actual travel details and papers presented.

Recipients of the grant are asked to acknowledge the SSAI's support in the presentations and in any published version of the paper.

One travel grant is available per year. Assuming that more than one application will be received per year, either the Executive Committee or a special committee would help with the selection process.

For more information or to apply, please contact the SSAI Office eo@statsoc.org.

With this travel grant program the SSAI seeks to underline its objective to further the study, application and good practice of statistical theory and methods in all branches of learning and enterprise. It has been implemented to confirm to members that the SSAI is willing to support student statisticians and their budding careers.

OUR INSURANCE GIVES YOUR BUSINESS A CRITICAL BIAS

As the appointed Insurance Brokers to the SSAI we are proud to offer their members a truly unique Professional Indemnity Insurance Policy: one that will cover your particular requirements perfectly and save you money.

As the preferred Professional Indemnity Insurance Broker for SSAI and it's Members we have brokered an exclusive arrangement with Chubb Insurance Australia Ltd, who are a market leader in specialty insurance coverages, which are uniquely designed for specific industries.

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SSAI Statistical Society of Australia Inc.

UNDERWRITTEN BY: CHUBB

INSURANCE ADVISERNET

FROM THE SSAI OFFICE

Marie-Louise Rankin

2013 is coming to an end quickly and what a busy year it has been. I spent the greater part of it project managing the new SSAI website and was very excited when it was launched last month. I would like to take this opportunity to thank all those involved with the preparations for and the design of the new website as well as the members of SSAI for their patience and support during the transition.

I am sure that over the next few weeks you will notice minor things here and there on the website that will need changing or adjusting. Please feel free to highlight any issues to the SSAI office and they will be attended to straight away. Obviously even the most perfect website is never finished but always a work in progress as it is updated and improved constantly.

The new website features a "community" hub for members only. This is where you can post comments or questions and start discussions with other member statisticians. Imagine it as a kind of Facebook page for statisticians. I hope you will put this facility to good use! The more discussions are going on there, the more interesting the website will be. Down the track we may decide to publish the most interesting contributions in this newsletter.

You will have noticed that the logins to the new website have changed. Thankfully we can now say good-bye to the cumbersome five or eight digit username. Your username is now your primary email address and when logging in the first time you will be asked to set up a new password. Please let me know if you are having any difficulties and I will do my best to assist you.

While I did focus on the website this year, it was not the only thing I worked on.

In October I was given the opportunity to participate in the 2013 Leadership Symposium organised by the Australasian Society of Association Executives. For two days I attended talks on a wide array of subjects – starting from tips on strategic planning for associations over to the ins and outs of social media to the importance of learning what professional concerns keep members awake at night.

Out of these thoughts was born the idea of creating a second webinar series aimed at our younger members - but actually of interest to anybody looking to change jobs. I have just returned to the office from a meeting with HorizonOne Recruitment (http://www.horizonone.com.au), my favourite Canberra recruitment agency. HorizonOne have agreed to provide our members with information on how to write CVs, how to address selection criteria, how to prepare for a job interview and much more. We will do this via webinar so that members have the opportunity to ask questions at the end of each presentation. I hope that many of our members will get a lot out of this series and I am looking forward to your feedback.

Down the track I would like to introduce a resume proof reading service, but I still need to think a bit more about how to do this. If you have any thoughts on this, please contact me!

> Continued on next page

For our regular webinar series with statisticians as presenters the SSAI is looking for a coordinator. This coordinator will make contact with potential speakers, sort our dates and times for each presentation, and once this has been decided, the SSAI will provide the office support, invite members, set up the event with Citrix and test the technology prior to the event. It should not be too arduous a role. If you would like to take this on, and if you think you have what it takes to persuade potential speakers that they want to do this, please email me.

SSAI would not be what it is without the many volunteers putting in so much of their time. Thank you to all of you. Today I'd like to thank Chen Fan of the VIC Branch especially, for having agreed to do an analysis of our membership database for the Executive Committee. Chen has only joined SSAI in October so it's great to see a new member immediately engaged in the Society.

The SSAI Office will be closed between 19 December and 5 January and then again between 16 January and 4 February. The best way to contact me between those times will be by email, because I will be working from home some of those days. The joys of parenthood and school holidays!

May you all enjoy the best of times over the holiday season and have a good start into 2014!

Marie-Louise Rankin

NSW BRANCH

August Meeting: Victor Solo

Most of us have heard of functional Magnetic Resonance Imaging, but I suspect few have investigated what it actually does or what the statistical problems are. At our August meeting, Professor Victor Solo from University of NSW School of Electrical Engineering and Telecommunications gave us insights into the power and potential of fMRI and some of the statistical challenges.

The biggest conference looking at fMRI and related technologies is "Human Brain Mapping", attended each year by about 5000 scientists. Since its beginnings in 1995, 20% of the papers at that conference have been methodological – many requiring complex statistical analysis and showing that statistical methods are an enabling methodology for neuroimaging. However, few statisticians go to the conference or contribute to the methodological development.

Many see understanding the brain as "the last frontier" and fMRI is an important tool. Magnetic Resonance Imaging (MRI) was developed into a reliable modality in the 1980's. Its advantage was that it provided new insights into the body's structure, particularly soft tissue, without side effects. Brain studies generally image the Blood Oxygen-Level Dependent (BOLD) effect – neural activity causes increased (local) demand for oxygen and this causes the local changes in magnetic susceptibility, which are what is imaged.

The ability to collect an image each second (or so) made it possible to investigate the brain dynamically to learn about brain function – for example, the sensory and motor systems. To interpret the data, linear time invariant models have proved to be a reasonable first approximation for investigating both forward problems (modelling the response of the brain to a stimulus) and inverse problems (from image sequences can we infer what the subject is looking at?)

Important techniques that Victor mentioned include penalised principal components methods and the analysis of eigen time series and eigen images. Victor's summary was that (i) fMRI has revolutionized cognitive neuroscience (ii) a statistician working in the field needs to learn "a lot of neuroscience" to collaborate effectively, (iii) over the last decade particularly, statisticians have made their presence felt with some of them receiving widespread recognition in the neuroimaging community and (iv) there remain many sophisticated (statistical) research problems.

Murray Cameron

September Meeting: Sam Woolford

The NSW Branch welcomed Prof. Sam Woolford from Bentley University for our September meeting. His talk was titled 'The Opportunities for Business Analytics'.

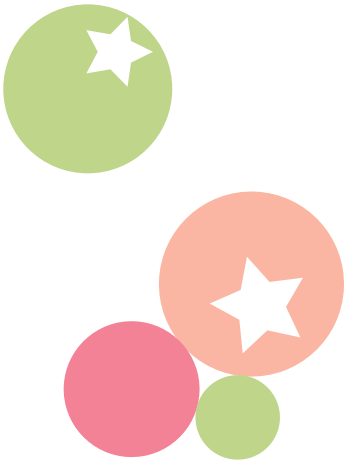
There was an exploration of the potential of analytics through a compelling case study of gas leaks in New York City. This highlighted the capability of statistical methods in providing solutions to situations where complex stakeholder arrangements exist – the instance of New York gas leaks involved government authorities, trade unions and internal management. The vast array of methods that could be applied in this instance was certainly eye-opening.

Another point of discussion was the changing role of statisticians today when many in the applied space are making the move to analytics. The forecasted under-supply of analytic skills moving forward may open up a vast array of opportunities for those with statistical skills.

The talk was followed with dinner, drinks an insightful discussion on what the future may hold for statistician of tomorrow.

We thank Sam for his talk, and look forward to having him back again soon.

Ryan Defina



The SSAI wishes to apologise for the generality of the newsletter photo's description on page 25 of the September 2013 issue. The "guest" in the photograph is Dr Robert Mellor, member of SSAI since 1964.

SA BRANCH

August Meeting

Weighting or Raked Weights – Adjustment for non-response bias in population surveys.

The speaker for the August meeting of the SA branch was Associate Professor Anne Taylor, who is head of Population Research & Outcome Studies (PROS), Discipline of Medicine, University of Adelaide. The PROS group includes 15 epidemiologists, survey methodologists and statisticians, and its core business is the monitoring and surveillance of population health and chronic disease epidemiology. High-quality information from population health surveys is used to inform policy, programs and health services which promote and protect the health and well-being of the South Australian population.

PROS has a number of active ongoing projects using methodologies such as Computer Assisted Telephone Interviewing (CATI) alone; a mix of CATI and Biomedical measurements; and face-to-face interviews. In her talk Anne discussed analysis of the South Australian Monitoring and Surveillance System (SAMSS).

Anne compared the 'cell weighting' and 'raking' strategies to adjust for non-coverage and non-response, which can be particularly high in telephone surveys. It is often found that males, younger and metropolitan people are under-represented relative to females, older and country people.

The 'cell weighting' technique assigns weights to each survey respondent to ensure the weighted sample has the same distribution as the population for cells defined by the cross-classification of particular demographic characteristics. SAMSS data were weighted by area (metro, country), ten-year age groups, sex and probability of selection within the household (number of people in household), using Census or Estimated Residential Population figures from the Australian Bureau of Statistics. Cell weighting has limitations when dealing with small sample sizes since some cells can have small or zero sample units.

Raking has been used since 1940. It can be thought of as 'smoothing the soil' – an iterative process working back and forth in two perpendicular directions. The mathematical weighting procedure was described where survey margin totals are manipulated to match with control totals obtained from alternative sources (e.g. the Census). As the iterative process proceeds the data are gradually adjusted to fit margin totals.

Anne discussed the issue of choosing the margin variables to use with the raking procedure.

In an example using SAMSS data, raking was applied for age, sex, area of residence, household size, dwelling status, country of birth, marital status, education level and employment status. The results of raking in SAMSS depend on a number of assumptions. Data initially are raked on essential socio-economic variables (age, sex, area of residence) and then other variables are added progressively. A number of tables were presented of the effects of weighting and raking on various variables in a hypothetical health service. The cell weighting and raking results were often different (some statistically) and both were different from the unweighted results.

The raking exercise identified that lower socio-economic households (who might have increased risk factors) often were missing from or under-represented in SAMSS data. The addition of raking variables led to a reduction in non-response bias from this group.

The final message from Associate Professor Taylor was that careful analysis and presentation of survey data are required and that telephone surveys are not dead.

Wayne Clapton

September Meeting

Random walks, Rank tests and R packages

At the September meeting of the SA Branch of the Statistical Society, Dr Olena Kravchuk from the University of Adelaide gave a talk on her research interest in the theory and practical applications of rank tests for heavy-tail distributions. In particular, building on the efficiency of rank-estimators, Olena has proven the log-normality of the maximum likelihood estimator of scale for the Cauchy distribution (CommStat, 41(20): 3621-3632).

Olena Kravchuk & Richard Woodman (SA Branch President)

A common recommendation in introductory statistics courses for biologists is, "if one wants to compare the means, but the data does not behave normally, one should use a nonparametric test, e.g. Mann-Whitney rank test, instead of the t-test". Practitioners following this recommendation should be aware that the distribution-free property of rank tests only holds under their null hypotheses and the efficiency of rank procedures is governed by the data distribution.

Olena gave an overview of typical tests' hypotheses: randomness, symmetry, independence and uniformity (random blocks) and concentrated her discussion on the hypothesis of randomness. The critical function of a randomised rank test only depends on the vector of ranks R, whose observed permutations have equal probabilities under the null hypothesis of randomness; rank tests may be obtained as a sub-class of permutation tests. The Neyman-Pearson lemma assures the existence of a most powerful test among rank tests and thus justifies the importance of studying this class of tests.

Efficiencies of the ranks procedures are often compared using the Pitman relative efficiency principle. Olena pointed out that Hodges & Lehman (1955) showed that, for any continuous density, the asymptotic relative (Pitman) efficiency of Wilcoxon sum-rank test in comparison to the t-test is always greater than 86.4%. She explained that this argument is often used for choosing the Wilcoxon test against the t-test. Olena stressed that this does not imply however, that the efficiency of the Wilcoxon test relative to a most powerful test for a particular distribution is high.

Olena introduced a random-walk visualisation of rank procedures and demonstrated the behaviour of Hajek's random walks under the alternatives of location and scale. There is practical appeal of such a visualisation as a tool for statistical data diagnostics and interpretation of rank tests. Olena gave examples of rank estimators associated with distributions of various tail weights, ranging from Cauchy-like through normal-like to uniform-like. Under the alternate hypothesis of shift, the distribution of the test statistic depends on the design and test choice (i.e. one can change "power" and "shift"). The non-null asymptotic distribution of a linear rank statistic is a functional of the random walk, which depends on the actual data distributions and the score-generator of the test chosen. Importantly, Olena explained the danger of implementing

the "automatic" computational approach to constructing rank procedures, which may lead, for example, to rank estimators being not (Pitman) consistent.

The main point of Olena's talk is that one has to pay attention to the choice of the score-generator for a rank test. A recommendation when the sample size is reasonably large is a visual examination of the random walk (with the expected trend corresponding to the score-generator of a test chosen plotted as well).

Paul Sutcliffe

October Meeting

Statistical Science: A Tale of Two Unknowns

The SA Branch was honoured to have Noel Cressie, Distinguished Professor from National Institute for Applied Statistics Research Australia (NIASRA) at the University of Wollongong to give the seventh E.A. Cornish Memorial Lecture at the October meeting. Science wants to answer the "Why" question and, in its pursuit, it often comes across the "Where" and "When" questions. Good data collection involves a protocol that specifies where (i.e., spatial locations) and when (i.e., temporal instants) the measurements were taken. Hence, it is possible to think about uncertainties in science as being partly explained by spatial variability and temporal variability. Noel explained that R. A. Fisher was very aware of spatial dependence in field trials and imposed an external process of randomisation to deal with it. Alf Cornish was an early statistical scientist and advanced Fisher's ideas in Australian biometrics research. While Alf Cornish started as an applied statistician, towards the end of his career he became interested in technical aspects of multivariate analysis.

Noel provided a thought-provoking talk weaving a tale of two unknowns. He commented that, despite the attention given to contrasting the frequentist and Bayesian paradigms, a more important contrast is inference based on marginal versus conditional distributions. A general framework for statistical modelling is that there is an underlying process Y about which we observe data Z and, in the "tale of two unknowns," Y is one of the unknowns. Noel encouraged those present to become hierarchical statistical modellers by making inference on Y from the conditional probability distribution $Pr(Y \mid Z)$, which he referred to as the predictive distribution. To infer the science process based on the data (Z), Bayes' Theorem shows that this conditional distribution is proportional to the product of the data model ($Pr(Z \mid Y)$) and the process model ($Pr(Y)$). Generally, the data and process models are described using parameters θ (the other unknown). The difference between Bayesian Hierarchical Modelling and Empirical Hierarchical Modelling is that the former assigns a distribution on θ, and inferences about both θ and Y are made from the posterior distribution, $Pr(Y,q| Z)$.

One of the key points Noel made was that Statistics is the science of uncertainty, and he suggested that statisticians should be playing a greater role in decision-making. Often statisticians back off from the decision-making process, leaving it solely to policy-makers. By using expected posterior loss (from Decision Theory), statisticians could quantify the consequences of making different, competing decisions.

Using a simple agricultural experiment with treatments effects and plot effects, Noel showed how data, process, and parameters looked from a hierarchical-modelling point of view and asked the question – where did Y go in the classical biometrical models of Fisher and Cornish? At this point, Noel posed the thought that if he had Alf Cornish and Ronald Fisher with him in a room, he would try to convince them that a hierarchical statistical model was appropriate. Noel thought that they would have found the Rev T. Bayes' work highly relevant to their own, if they had recognised "the other unknown," namely Y. In agricultural experiments, the plot effects are spatial effects that Fisher knew about ("patches in close proximity are commonly more alike" - cf Fisher, 1935, *The Design of Experiments*). Fisher used randomisation to remove the spatial effects: he was clearly more worried about bias than losing the spatial dependence. In essence, he took Y out of the picture (where the spatial dependence resides) and therefore concentrated on Z and θ.

Noel Cressie

In fact, Y returns if we condition on the treatment-to-plot randomised assignments, which are an additional source of data. Hence, by using a hierarchical statistical model, we can make counterfactual inference on things that we did not observe, such as the yield obtained by applying treatment j' to plot i (when in fact treatment j was randomly assigned to plot i). By ignoring Y, Fisher lost the opportunity to estimate the treatment effects more efficiently (Grondona and Cressie, 1991, *Technometrics*) and to make counterfactual inferences.

In his concluding remarks, Noel noted that the twenty-first century has massive datasets and huge problems (in energy, climate, finance, food security, etc.) that would benefit from using a hierarchical modelling approach.

The SA Branch would like to thank Noel for his talk, and a number of members took the opportunity to join Noel for dinner at the Jasmin Indian Restaurant after the meeting.

Paul Sutcliffe

Pre-meeting

VIC BRANCH

Dancing with Hippos

How can we open the minds of non-fact driven people to our data-driven practices?

This is the ambitious question Kendra Vant, a senior analytics professional with Insight Solutions, Deloitte, tackled for our August branch meeting.

As the amount of data available to us increases there is an increasing challenge to use such data to inform 'hippos' or the Highest Paid Person's Opinion. This may be the opinions of key stakeholders in a business but applies equally to the opinions of anyone in senior positions, including decision-makers within government or universities.

Kendra began by admitting that businesses have existed long before the advent of formal data analysis, surviving on other bases for decision-making. Typically, the highest paid person has been put in this position because of their history of success in informed decision-making. However, our aim as statisticians is to encourage such decision-makers to augment these decisions with facts generated from data, confident that this can result in even stronger performance. This aim is not what Kendra sees as lacking but rather our approach at achieving it.

Kendra Vant

We have all experienced situations where our attempts to introduce data-based decision making have been unsuccessful; where the communication of statistical ideas has evaded us. While it is easy to blame the ignorance of our listeners, Kendra challenged us to take responsibility for the way we communicate our techniques and findings. Mathematics is a precise and beautiful language but the truth is that many in our society have been conditioned to believe they will not understand it, even smart, educated and successful people. It is a challenge to champion data-based decision making in such circumstances, but a challenge worth undertaking. Some of the reasons Kendra highlighted included the chance to impact upon the world via issues of climate change and healthcare reform, as well as more personal motivations such to promote our own job security and prospects beyond narrow technical tracks.

Having convinced us of the nobility of the task, the practical challenge of how to go about it becomes essential. Kendra outlined several approaches.

The first challenge is to **know the business**. We need to understand the context of our work before we can appreciate its potential impact. This includes **using their language**. Even when some statistical concepts are present in an industry they may not go by the same names and much of the time they are absent completely.

The next challenge is to **be more engaging**; to present things in a compelling way. We have all experienced presenters we would willingly hear from again and again. A guiding principle of those with success in this area is to be as simple as possible and only as complex as necessary.

Another key aspect highlighted by Kendra was the need to take advantage of **pre-attentive processing**. There are some things that our eyes find easy to interpret such as colours and linear lengths, which can be used to capitalise on short attention spans. She commended the work of Edward Tufte in this area. This also includes visual hygiene such as **rounding appropriately**.

Kendra follows the general principle of **leaving out the maths**, not as an excuse to fudge results but motivated by a high level of confidence in the quality of the techniques. We need to give up the mystique our mathematical language brings and fill the gap with our newly developed understanding of the context. This may involve making mistakes along the way but results in listeners who are comfortable and appreciative. Good examples of successful application of this principle are the books CEOs read, like the works of Nassim Nicholas Taleb, Thomas Daveport and Nate Silver.

Recognising the value in **pre-wiring** was also a key feature of Kendra's approach. This includes both sitting down with those involved early in the process as well as making the most of informal opportunities to promote our ideas. A relevant mentor can also be a huge help.

And of course, you need to **repeat yourself**.

And of course, you need to **repeat yourself**. There is greater risk in under-communication than over-communication.

Some concern arose in the question time about the ethics of glossing over the details and therefore avoiding scrutiny. Personally, Kendra shared that she has never been motivated to mislead because she knows she is most effective when she has genuine confidence in the results and there is always the risk that someone may eventually expose inappropriate practice. The truth is that a 'hippo' is going to be informed by a range of sources—with varying degrees of robustness—so even a simple presentation of results can have an important impact.

A different focus to our usual branch seminars, Kendra practised what she preached with a compelling and informative presentation.

Sandy Clarke

September Meeting

For the Victorian branch's September meeting, we had our annual Young Statisticians Showcase, where we invited three young statisticians to give short talks at our monthly meeting.

First up we had Huachun Zou who presented work from his recently completed doctoral thesis on Human papillomavirus (HPV) among teenage men who have sex with men (MSM). HPV is an infection which can lead to anal cancer and morbidity, and is particularly prevalent amongst MSM. The aim of the study was to gain an understanding of risk factors for HPV, and to guide vaccination strategy. Strong correlations were found for various risk factors such as, number of partners, and level of sexual experience. The findings suggested that the best vaccination strategy would be a universal (opt-in) vaccination program for school age boys, at an age before sexual activity commences for maximal prevention, a policy that is now currently in place in Australia.

Kristal Yeung was our second speaker for the night and gave a talk about links between problem gambling and psychological distress. Using a longitudinal survey with a sample of 15000 people followed yearly for three years, Kristal aimed to answer two key questions: Do people with gambling problems have a higher risk of developing psychological distress, and, do people with psychological distress have a higher risk of developing gambling problems? Formulating a Poisson regression model to estimate incidence rates Kristal found that problem gamblers had 7 fold higher risk to develop psychological distress than non-problem gamblers. On the other hand though, there was no evidence to suggest that psychological distress would increase the risks of developing gambling problems.

In a different note to finish off the night, we had Christina Ghobadi from Project Stat Consultants who gave us an insight into some of the experiences, trials and tribulations she's encountered as a young statistician in industry. Christina started not with the traditional mathematics and statistics degree, but with a psychology major, before she realised that (obviously) statistics is actually the best major for her, and went on to complete a masters in applied statistics. From there she moved into the business world, where she would often find herself as a lone ranger, being the only statistician in her department. Through extensive networking and hard work, Christina has managed to convince many in business that there is great power and utility in statistics. The take home message was, as long as you're able to create a story with data, then there are businesses out there that can use you.

Han Liang Gan

September Meeting

On 29th October 2013 the annual Belz Lecture was presented by **Dr Ian White** from the British Medical Research Council's Biostatistics Unit in Cambridge.

Ian has been a Program Leader at the MRC's BSU since 2001, and previously held faculty positions at the Department of Epidemiology and Public Health at University College London, and in the Medical Statistics Unit at the London School of Hygiene and Tropical Medicine.

In his presentation titled "Synthesizing a Medical Literature" Ian described the methodology behind the burgeoning field of meta-analysis, which involves the statistical summary and pooling of results from set of studies addressing the same research question. Meta-analysis is used widely in medicine, clinical sciences, epidemiology and public health for synthesizing the results of randomised trials evaluating a novel treatment or some other intervention.


Ian White

Where there are gaps in the literature, for example, when there is no direct or "head-to-head" comparison of two treatments, statisticians can use indirect comparisons to evaluate one treatment against the other using data from randomised trials comparing each of the treatments to a third intervention. Increasingly, however, there is a need for a comparison of a possibly large set of interventions in order to decide which of them is the best. This has led to the field of **network meta-analysis**, which seeks to combine all the evidence for multiple treatments – indirect and direct – in order to get the best estimates of the value of all the interventions.

Ian argued that using all of the data comes at the cost of needing to assess whether the evidence is consistent (e.g. does the indirect evidence agree with the direct evidence), and provides statistical challenges in formulating and fitting models that allow for both between-study heterogeneity and inconsistency of treatment effects. He talked extensively about the assumptions required to perform network meta-analysis and the statistical models used to test these assumptions, highlighting these methods with examples of trials for smoking cessation and thrombolytics drugs. The talk concluded with an outline of some potentially controversial topics that arise with heterogeneous or inconsistent networks (i) what data to extract from published trials and are these data sufficient for analysis; (ii) when the "common heterogeneity" model fails; (iii) how to define and allow for consistency; (iv) how best to fit models and estimate parameters; and (v) ranking treatments.

After Ian's presentation the speaker and guests retired to University House for the Annual Dinner. Ian is visiting Melbourne at the invitation of the NHMRC-funded Victorian Centre for Applied Biostatistics – "ViCbiostat" – which has organized a number of other speaking engagements for him at the University of Melbourne, Monash University and the Murdoch Childrens Research Institute.

Lyle Gurrin

WA BRANCH

August Meeting

The talk on the evening of 13th August was given by Mario D'Antuono (currently the outgoing Vice-President and former President of the Australasian Region International Biometric Society), and what an evening it was. Mario presented some work on fitting the 3-parameter asymmetric Laplace distribution to the mass-distribution of grain, sieved through various sieve-sizes, from samples of wheat collected from plots in agronomy trials by the Western Australia Department of Agriculture and Food. The wheat industry is worth over $2billion to the State of Western Australia, and farmers are penalised if the grain-size in their bins have a large proportion of screenings or small grains less than a threshold.

the August meeting article was from Berwin Turlach, the

September article from Brenton Clarke and the October article from Thomas Lawrance

The work detailed the extension of the work by Fieller et al (1992, Applied Statistics, pp 127-146). Based on a FORTRAN program (hands up who remembers FORTRAN; and who remembers that a good FORTRAN programmer can program FORTRAN in any language?) developed by Fieller and his colleagues, Mario developed an R package called BMAS soon on the CRAN. BMAS is an acronym for "Biometrical methods for the agricultural sciences: the 5Rs" which is an e-book being written by Mario. Recent work on using actual single grain kernel characterisation has enabled a more efficient estimation of the parameters in the fitting of the asymmetric Laplace distribution. Technological gains in the industry are leading to improvements in the statistical methodology. As Mario puts it: the more you can see, the more you can do with the data! The characterisation of wheat varieties with parameters from the asymmetric Laplace distribution will help researchers and farmers evaluate the performance of varieties under various seasons, and hence help to choose good varieties robust to minimising the proportion of small grains.

After the seminar, a wonderful crowd of 22 people attend Steve's Fine Food and Wine bar to celebrate the presenter's birthday. Some members thought it was a great idea for members to present talks on their birthdays! It helped to make the night a celebration of SSAI and IBS members in Western Australia. Furthermore, Mario, as Chair of the Local Organising and Scientific Programme Committees for the forthcoming Biometrics by the Canals in Mandurah, December 1-5, 2013, urged all SSAI members especially those residing in Western Australia to support the IBS in this region to help make this a great local and regional event.

Berwin Turlach

Mario D'Antuono, celebrating SSAI, IBS and his birthday all on the same night!

October Meeting

At the October meeting, former SSAI WA Brach President Dr Rohan Sadler, now senior scientist at Astron Environmental Services, presented a seminar on "Ecological Dreams: Regulation, Statistics and Information Delivery". This talk explained the role of statisticians in the field of environmental consultancy for local and global mining, oil and gas concerns (resource extraction).

There are three phases to resource extraction project: Approvals, Operations and Closure. Each phase has its own set of regulatory and hence monitoring requirements. The Approvals phase involves examining the potential effects on flora and fauna. This includes mapping the abundance and diversity of flora and fauna, and determining probabilities of occurrence of species of conservation significance. The key objective of the Operations phase is to ensure that the resource extraction operation has no undue impact beyond the footprint declared during the Approvals phase. This objective is met via compliance monitoring, including calculating the probability of observing animal species, weed surveys (e.g. where weed sprayers have to spray more or less than average) and monitoring plant health and changes to plant coverage. The Closure phase involves ensuring that the declared footprint is rehabilitated to a 'functioning' level. All phases require data to be collected and analysed. Data collection methods including visual estimators, use of hand-held devices such as Global Navigation Satellite Systems (GNSS), animal traps, weather stations, time-lapsed photography and remotely sensed imagery such as aerial photography. Both probability-based and design-based sampling methods are used.

Rohan discussed several case studies, including an analysis of the amount of yearly inflow into Perth's dams, which showed a decrease of at least 50% in the last 50 years. Finally, Rohan remarked that statistics is a key tool in transforming data into information useable by managers, however as data is becoming increasingly complex, a higher level of information management and delivery is required to achieve this. Regulation, which can be determined by statistical capability, is increasingly sophisticated and as such will demand more advanced statistical tools and thinking in the future.

Thomas Lawrance

Western Australia 10th September 2013

The inaugural Frank Hansford-Miller Lecture was presented by Dr Janet Godolphin of the University of Surrey who spoke on "Criteria for Design Selection which Protect Against the Effects of Observation Loss". Branch President Anna Munday introduced the speaker with a recounting of the exploits of one Frank Hansford-Miller in the Statistics Society and asked Dr Brenton Clarke, Chair of the Frank Hansford-Miller Fellowship Committee, to present the Frank Hansford-Miller 2013 medal to Janet, who was suitably touched. A sample of the life and works of Frank Hansford-Miller is gleaned by referring to an interview with Frank published on the front cover of the November 2002 issue of the SSAI Newsletter. See http://www.statsoc.org.au/objectlibrary/109?filename=2002 Nov - newsletter101.pdf

Frank passed away in 2008. The Frank Hansford-Miller Fellow is appointed once every two years, following a generous bequest.

Janet spoke about design selection, noting that in many cases, a design was chosen expecting there would be no observation loss. She noted that statistical packages gave little information or warning about consequences when there was unavailability of an observation. She also stated it would be useful to have information of missing data on candidate designs as a useful aid when selecting designs for experimentation. Beginning with a lattice design from Rosemary Bailey's (2008) book, in chapter 11, she illustrated assuming 3 row blocks and 3 column blocks that one could set up a contrast between treatments 1,2,3 and treatments 4,5,6 with an estimator variance $6^*\xi$ where ξ is the stratum variance. But with one missing observation it was noted that the best one could do was find an estimate with variance $\frac{21}{2}\xi$.

Janet then turned attention to 3 replicates of a 2^3 experimental design with eight rows as incomplete blocks and three columns as complete blocks with treatments A, B, C. To illustrate she chose a design comprising 3 consecutive columns of the standard cyclic 8×8 Latin square. In this design all the factorial effects A, B, AB, C, AC, BC, ABC are estimable, with an Estimable Space Orthogonal Contrast (ESOC) being a vector of one's. However with just two missing observations analysis by the statistical package, MiniTab, identifies a rank deficiency. Here the ESOC now has dimension 2 with an extra basis vector

Dr Janet Godolphin, after being presented with the inaugural Frank Hansford-Miller Medal, with Chair of the Frank Hansford-Miller Fellowship Committee, Dr Brenton Clarke, and WA Branch President, Anna Munday.

Photo courtesy of Mario D'Antuono.

V2 which is not orthogonal to the contrast vector corresponding to any of the factorial effects, whereupon no factorial effects are estimable. Janet pointed out that there are in fact 8 Rank Reducing Observation Sets (RROS's) of size 2 for which none of the factorial effects, A, B, AB, C, AC, BC, ABC is estimable. An alternative design was considered, comprising 3 non-consecutive columns of the standard 8x8 Latin square. This design had better properties with no RROS's of size 2. There were however 16 RROS's, each consisting of 3 observations for which the loss of observations in a set had the consequence that none of the aforesaid factorial effects are estimable. However with a judicious choice of design, it was demonstrated that an experiment couldbe constructed with no such RROS's of size 3. The question is posed: is it possible to salvage the first design by making the assumption that the ABC interaction is negligible? It transpires that, since the contrast vector corresponding to the factorial effect ABC is not orthogonal to any V2 induced by the loss of a RROS of size 2, with the additional assumption the remaining 6 factorial effects are estimable on the loss of any two observations. However, it was noted that it was not possible to salvage all designs with small RROS's in this way. In particular, a design for which the contrast vector for factorial effect ABC is orthogonal to a V2 induced by a small RROS cannot be rescued by this technique.

To summarise, it is recommended that practitioners make themselves aware of the likelihood of losing observations and of the size of the smallest RROS's before embarking on experimentation with a particular design.

Brenton Clarke

Relevant Publications:
Bailey, R A (2008) Design of Comparative Experiments, Cambridge University Press.
Godolphin, J D (2004) Appl Statist, 53, 133-147
Godolphin, J D (2006) C.S.D.A., 51, 1862-1874
Godolphin, J D and Warren, HT (2011) J.S.P.I., 141, 3498-3505