



STATISTICAL SOCIETY OF AUSTRALIA INCORPORATED
NEWSLETTER



December 2010
 Number 133

2010 Belz Lecture — Data based public debate — Why aren't we at the centre of it?

IN THIS ISSUE

2010 Belz Lecture — Data based public debate — why aren't we at the centre of it?.....	1
Editorial.....	2
President's message.....	3
2010 Belz Lecture cont.....	5
Hat-stat challenge.....	6
Outstanding woman in technology 7	
SSAI member selected for Fulbright Program.....	11
Overseas statisticians visiting Australia.....	12
Application for membership form	13
Renewal of membership form.....	14
World Statistics Day 20 October 2010.....	15
World Statistics Day Indigenous Census Poster.....	16-17
World Statistics Day Interview with Peter Harper.....	18
Come one, come all! — Statistical education.....	19
Recent successes and future vision — Biostatistics section.....	20
Catch-up on recent activity — Bayesian statistics section.....	21
Branch News.....	22
Backpage — Public lecture 8 December 2010.....	32



Andrew Jaspan (left), Editor-in-Chief (2004 – 2008) of *The Age*, discusses Chris Lloyd's Belz Lecture with Chris (right).

The Annual Belz Lecture of the Victorian Branch was given by Professor Chris Lloyd, from the Melbourne Business School, at the University of Melbourne on 14 October. The Maurice H. Belz Lecture is an annual lecture, established by the Statistical Society to honour the work of Professor Belz in establishing and advancing the science of statistics in Australia. Maurice Belz was the Foundation Professor of Statistics at The University of Melbourne (1955 – 1963).

Chris' talk titled "Data based public debate — Why aren't we at the centre of it?" attracted a large audience and diverse audience including students, academics, journalists and the general public. Chris' accessible and erudite presentation stimulated interesting questions and comments from many in the audience. Chris raised important questions for the all members of the SSAI. Chris has provided a summary of his lecture.

Data based public debate — Why aren't we at the centre of it?

There are plenty of public intellectuals that are prominent in commenting on issues that directly inform public policy. The best known are probably Tim Flannery and Peter Singer. Another is Ross Garnaut who is routinely asked for comment on any issues that relate to climate change and resource rent taxes. Historians Henry Reynolds, Keith Windshuttle and Robert Manne are well-known for their internecine battles that have become milestones in the so-called history wars. Andrew Leigh (now the federal member for Fraser) and Joshua Gans are economists who write opinion pieces or appear on ABC radio on a weekly basis. There is not a single academic statistician or data analysts that contributes regularly to public debate. Why?

First, I wanted to point out that not all public policy issues are ones where expert academics will carry the day. >> pg5



September

Editorial



PO Box 213, Belconnen ACT 2616
We are located on the ground floor of
ABS House, room GN 311.
Phone 02 6251 3647
Fax 02 6251 0204
Email eo@statsoc.org.au
Website www.statsoc.org.au

EDITORS

Alice Richardson

School of ISE,
University of Canberra

Michael Adena

Datalytics

CORRESPONDENCE

Please direct all editorial
correspondence to Alice Richardson
Email eo@statsoc.org.au

DISCLAIMER

The views of contributors to this
Newsletter should not be attributed to
the Statistical Society of Australia, Inc.

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 of
advertising rates, etc.

Contact the SSAI Executive Officer at
eo@statsoc.org.au

DEADLINE FOR NEXT ISSUE:
10 February 2011



Alice Richardson.

Many of you will be reading this newsletter in hard copy at the Australian Statistical Conference in Perth. The Society is grateful to Datalytics for sponsoring the production of the printed copies. They and the Editors hope that the conference, including both technical and social aspects, is a success for all involved.

The final newsletter for 2010 reflects just a selection of the fantastic talks, workshops, conferences and dinners that Society members enjoy as part of their local Branch, or as part of the many Sections that the Society supports. If the range of activities that took place in the last part of 2010 sounds exciting and you'd like to be part of the action

in 2011, you'll find a membership form elsewhere in this newsletter. Welcome (in advance) to the Statistical Society of Australia!

Whether in hard copy or electronically, this appearance of this issue also marks the approach of Christmas. 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 entering competitions. 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 *Michael Adena*

Alice Richardson
Editor

Michael Adena
Editor

CONFERENCES

International Biometrics Conference
5–10 December 2010, Florianopolis, Brazil
<http://www.tibs.org/Interior.aspx>

Australian Statistical Conference 2010
6–10 December 2010, Perth, WA
<http://www.promaco.com.au/2010/asc/index.htm>

International Conference on Recent
Developments in Statistics, Applied
Econometrics and Forecasting
27–28 December, Allahabad University,
Allahabad, India
Contact: Kuldeep Kumar
Email: kkumar@bond.edu.au or
Anoop Chaturvedi Email: anoopchaturvedi@gmail.com

Mapping Global Change
23–25 March 2011 in Enschede, The
Netherlands
<http://www.spatialstatisticsconference.com/>
Australasian Applied Statistics Conference
(GenStat and ASReml)
(formerly Australasian GenStat Conference)
12–15 July 2011, Palm Cove, North
Queensland, Australia
Contact: Carole.Wright@deedi.qld.gov.au,
Conference Secretary

ICIAM 2011—Seventh International
Congress on Industrial and Applied
Mathematics
18–22 July 2011, Vancouver, Canada
<http://www.iciam2011.com>

58th Session of the International Statistical
Institute
21–26 August 2011, Dublin, Ireland
<http://www.isi2011.ie/>

Biometrics by the Chiamo Blowhole
4–8 December 2011
"The Sebel Harbourside" in Kiama, NSW
More information to follow.

Biometrics Society Australasian Region
meeting
December 2011
<http://www.biometrics.org.au/conferences.html>

8th World Congress in Probability and
Statistics (jointly organised by the Bernoulli
Society and IMS)
9–14 July 2012, Istanbul, Turkey

<http://www.worldcong2012.org>
Australian Statistical Conference 2012
9–12 July 2012, Adelaide, SA
More information to follow.

Remember the ISBA 10th World Meeting / 9th
Valencia International Meeting on Bayesian
Statistics incorporating the ISBA 10 / Valencia
9 Student Video Competition? The conference
was from 3–8 June 2010 in Benidorm, Spain.
If you go to <http://www.bayesian.org/events/isba2010/viedo.html> you can watch some of
the videos made by the eight finalists.

President's Message

Dear Members

Say hello at ASC 2010

As I write this message, the Australian Statistical Conference in Fremantle is almost upon us. I realise that not everyone can attend, but I really do hope to meet many of you at the conference. The scientific program looks really good, the social activities will be great, and the company of others with an interest in statistics always leads to stimulating and delightful discussion and debate. Over the last couple of years the support for the society from the membership, as individuals and as a group, has really made a difference to our future prospects. I would like to take this gathering as an opportunity to have a chat with you, and hear your thoughts about where the society should head over the next few years. If you are at the ASC, catch up over a coffee or a meal, and share your thoughts. Please feel encouraged to introduce yourself if we haven't met, or to say hello again if we have. If you can't make the conference, I'm always open to ideas if you want to send an email.

Take the plunge, and volunteer to do something in the society

The rest of this newsletter gives you a small sample of the wide variety of activity in which the society, through its members, is engaged. The underlying theme is "you are more than welcome to participate" if you'd like to. Although there is some self-interest in this (many hands make light work), my real reason for encouraging you to consider becoming "active" as a member of the society is the sense of fulfilment it can give.

If you are interested but not sure how much effort is involved, or what to do, just ask. You don't have to do everything, just what you are interested in and able to do. And there is plenty of opportunity to learn about how the society works, and what you can contribute as you go. Even a little bit helps make a difference.

A taste of what the society is doing

What follows is a selection of the issues the Executive Committee discussed at its last meeting. My aim is to give you a flavour of the variety of issues where the SSAI through its members is active, not a comprehensive record of the meeting.

Young Statisticians

Frank Liu from the Young Statisticians Group updated us about the plans being made for the YSG events at the ASC, and the planning for the YS conference next year (and the pleasingly large number of young statisticians who had expressed interest in helping prepare that conference).

Branches

Alan Branford brought us up to date on what the branches are doing, and how the phone meetings sharing ideas between branches which he convenes are developing.

Sections

We spent some time discussing what the Executive Committee and the SSAI office could do to help the SSAI Sections become more active. Some sections are operating well, while in other cases there are challenges linking the section members together. It seems that sections where several people share the role of chairing the section find it easier to keep ideas moving forward. Ian Marschner has agreed to be co-opted to the Executive Committee, to provide a channel for section chairs and the executive to communicate, and to convene phone meetings between different sections to share ideas.

Institutional membership

Murray Cameron provided a discussion paper about developing an institutional membership program. We agreed that the focus of this initiative should be on developing links with the institutions, and how the SSAI could help forge links and communication channels between prospective institutional members and individual members, rather than as a fund raising venture. There is a proposal to convene a meeting with potential institutional members next year to develop the idea further.

Membership, workshops and services to members

This institutional membership conversation was set in the wider context of membership drives and some of the services that the SSAI provides. Teresa Dickinson did some work on this earlier this year, with branch membership officers, supporting lots of work that Marie-Louise Rankin from the SSAI office does. Paul Sutcliffe provided a brief update on the workshop program, and how plans for 2011 are developing and evolving from the >>

SSAI EXECUTIVE COMMITTEE

Central Council:

President: Geoff Lee
Secretary: Dr Doug Shaw
secretary@statsoc.org.au

BRANCH PRESIDENTS AND BRANCH SECRETARIES

Canberra

President: Veronica Boero-Rodriguez
Secretary: Dr Ray Lindsay
secretary.actbranch@statsoc.org.au

New South Wales

President: Richard Gerlach
Secretary: Dr Boris Choy
Boris.choy@uts.edu.au

Queensland

President: Helen Johnson
Secretary: Helen Thompson
helen.thompson@qut.edu.au

South Australia

President: Paul Sutcliffe
Secretary: Alanna Sutcliffe
Alanna.sutcliffe@dabs.gov.au

Victoria

President: Dr Ian Gordon
Secretary: Dr Sue Finch
sfinch@unimelb.edu.au

Western Australia

President: Rohan Sadler
Secretary: Prudence Thompson
prudence@daa.com.au

SECTION CHAIRS

Bayesian Statistics

Scott Sisson
Scott.sisson@unsw.edu.au

Environmental Statistics

Ross Darnell
Ross.Darnell@csiro.au

Social Sciences

Michele Haynes
m.haynes@uq.edu.au

Statistical Education (co-chairs)

Michael Martin
Michael.martin@anu.edu.au

Peter Howley
Peter.howley@newcastle.edu.au

Surveys and Management

Veronica Rodriguez
president.actbranch@statsoc.org.au

Biostatistics (co-chairs)

Mark Griffin
m.griffin@uq.edu.au
Ian Marschner
ian.marschner@efs.mq.edu.au

Young Statisticians' Network

Frank Liu
frank.liu@anu.edu.au

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



President's Message cont.

very necessary fund-raising focus to a wider consideration of what the SSAI can offer members.

Journal and newsletter

The editorial aspects of the journal are working well, and are in safe hands so we did not spend much time discussing this. Mervyn Silvapulle takes the lead on this aspect of the SSAI work in the executive. The executive spent some time considering how we can better organise the joint management of the journal with the NZSA, in a way which better reflects the intent of the collaborative approach, but also fulfills our executive obligations to manage the financial aspects of the journal. A fair bit of work had been done over the last few years on developing a joint venture agreement, but the financial issues arising from ASC 2008 have led us to shelve this idea. We also discussed our understanding of some concerns NZSA have expressed about the way capitation fees have been set, and their input into the process. Doug Shaw has looked into the SSAI constitution and advised us about the issues we must consider as we develop options.

Conferences

The main topic was the arrangements for upcoming ASC in Fremantle. As agreed earlier in the year the executive (and the local committee) are monitoring financial arrangements closely. Brenton Clarke provided an update on behalf of Jane Speijers, chair of the local organising committee. Our main focus though was on the operational arrangements. This included plans for an open session about "Improving Statistics in Australia". Michael Martin and Peter Howley from the Statistics Education section have recently agreed to work with the ASC local organising committee and the OZCOTS organisers on developing this session. I encourage you attend this session, and contribute your thoughts to how best the SSAI can contribute to the future of statistics in Australia. The lobbying and advisory work, reported on in previous newsletters, about the new school curriculum are still progressing. (There's yet another group of SSAI members working hard on this).

Paul Sutcliffe gave a brief update about early planning for ASC 2012 in Adelaide, and agreed to draw together an update to existing material about 'best practice' for organising that William Dunsmuir had worked on, so it can be shared with Richard Gerlach who has agreed to lead the committee for the ASC 2014. Gary Glonek is the program chair for ASC 2012, and Scott Sisson is the program chair for 2014.

Accreditation

The executive considered some routine recommendations from the Accreditation committee. Three members of the committee - John Henstridge, Michael Adena, and Alan Welsh - have recently completed their term of office and I would like to publicly thank them. They have all made a big contribution. John has chaired the committee for quite a while and deserves double thanks.

Other business

Under other business we covered some other important issues.

AMSI (the Australian Mathematical Sciences Institute) is putting forward a proposal for a co-funded centre for the mathematical sciences. This concept has been under development for a while, and we discussed how SSAI might support this bid. A recent review of AMSI (which sought input from the SSAI as well as many others) recommended acting on this quickly. I recently participated in a meeting between AMSI (represented by Geoff Prince) and the ARC. Nalini Joshi, outgoing President of the Australian Mathematics Society, was also there. We all agreed on the importance of encouraging increased funding for statistics and mathematics research and education in Australia, and how important it was to work together speak to government with a "single voice" if we are to succeed.

In my report to the AGM I mentioned the SSAI strategic direction about promoting statistics in the media. At that time I suggested we might put this on the backburner for a while. However since then I learnt that Chris Lloyd was giving the 2010 Belz lecture on exactly that topic. Cutting a long story short, Chris has agreed to look into what the SSAI might do on this front.

In case you missed it, World Statistics Day was on 20 October 2010. This was an opportunity to celebrate our profession, and the wide variety of ways we can and do contribute to Australia, and society more generally.

Mark Griffin is developing a proposal to the American Statistical Society for a special interest group titled the "Friends of the Asia Pacific". You may have read about it on the ANZSTAT list. SSAI is supporting the submission.

Conclusion

I haven't covered everything the society is doing (for example, I haven't even touched on the activities organised by your local branch). You may have noticed I'm naming some of the many SSAI members who are actually working on a particular issue on behalf of us all. I hesitated about doing this - not because these folk don't deserve the recognition, very much the opposite - but because there are so many people in the society who are also contributing, and I worried about not naming them. In the end I decided this was poor logic and went ahead. If I've missed anyone (I'm certain to have) please accept my apologies!

I hope this has given you some sense of the wide range of activities the SSAI and its members are working on.

I'm writing this in late October, but by the time you see it the Christmas season will be just around the corner, so I'll finish by wishing you all a happy and safe Christmas, and all the best for the New Year.

Geoff Lee ■



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 ee@statsoc.org.au | Listing is free!

2010 Belz Lecture cont.

Data based
public debate cont.



Professor
Chris Lloyd

There is no way that an expert can convince you logically that gay marriage should be legalized. This is a value judgment. Public issues differ in many ways but one critical dimension is the extent to which they depend on objective and quantifiable facts rather than subjective values. Peter Singer mainly lives down the value-laden end of the spectrum. Experts like him can still make a big contribution to debate on value dependent issues but their contribution is not decisive.

At the other extreme are issues which depend critically on objective and quantifiable facts, usually embodied in a set of numbers. Their final decision may also depend on values but only after you know the numbers. The empirical evidence may be biased in various ways and perhaps cannot be taken at face value. This is where statisticians (and econometricians who currently inhabit this public space) can be immensely helpful. Once the facts have been objectively assessed, public debate can move on to values and trade offs.

I thought I would list a few examples of where objective, expert assessment could have been very helpful to public discourse.

Did Rudd's stimulus work?

The Rudd government spent about b\$10.4 in discretionary stimulus spending in 2009. Many other countries also applied stimulus packages of varying size. So the question becomes *Did those countries that applied larger stimuli see a better economic outcome, after adjusting for other relevant variables?*

Treasury had a go at this question and used IMF data on stimulus and GDP growth to produce a significant regression for 11 countries including Australia, in their 2010 budget statement papers #2. The selection of these 11 countries was criticised by an RMIT economist and treasury were publically accused of selective use of statistics and data snooping.

Statisticians would have a lot to add to this debate. We could use cluster analysis or other methods to select peer countries for Australia, we could include control variables

in the regression and, most importantly, we could try to stand above the adversarial political environment that the issue was discussed in.

How many died in Iraq?

In 2006, a study published in the *Lancet* estimated that 655,000 people in Iraq were dead who would not have been dead if the war had not been prosecuted. Not surprisingly, the issue was immediately politicised. The gory details of the sampling and methodology used were never going to get a full airing in the media, so it degenerated into a "who do you believe" issue.

Casualties in war zones are difficult to count because of the chaos on the ground and the lack of centralised government infrastructure. The *Lancet* study used a sampling method known as multi-stage cluster sampling. They used a log-linear model to estimate the excess number of deaths. If this is not an issue where statistical experts could contribute to public debate, then I don't know what is.

I had a close look at the *Lancet* paper myself and find that it is lacking in important, indeed to my mind essential, detail. The exact protocol for selecting the cluster of houses is not given and bearing in mind the potential for contamination and bias of reported deaths this is a huge issue. The details of the statistical model fitted are also lacking, though I am advised by people in this area that the severe space restrictions imposed in large prestigious journals means that minor details like *how you analysed the data* (!) are often omitted. On the basis of about a full day of reading and thinking, I came to the view that the paper should not have been published without much more detail. For an issue of this import, the *Lancet* should just devote a few more pages of their journal! That is not to say the 655,000 figure was wrong, or that the research was necessarily unsound. But the published paper was not sufficiently transparent that it could be properly assessed by the peer community (or by me).

The population of Australia

This is an issue that is of continuing interest. About 10 years ago Peter Costello

was telling us we need to have more babies while in the most recent election both parties were saying they wanted a smaller population (though neither had a credible plan to achieve this). The issues with population are (1) total population and its effect on infrastructure and the natural environment, (2) the age distribution and how it affects GDP per head, and (3) cultural diversity.

You would think that demographic projections would be uncontroversial enough that the facts could be on the public table and there would be some consequent consistency on public policy and discourse. For the Belz lecture, I ran a few projections of my own. I am not convinced that statisticians should get into the third issue of cultural diversity. It is too difficult to measure (apart from silly measures such as the mean number of Australian ancestors people have) and whether you consider diversity a good thing, a bad thing, or something that is optimised in the middle, which is mainly a value judgment.

So I just focused on total population and various age dependency ratios. I measure dependency ratios in terms of an equivalent retirement age (ERA) to maintain ratios at 2010 levels (which I think might be novel?). At the end of the day, I came up with three propositions which I think all demographers would confirm and which have some pretty obvious implications.

First, the population is set to age drastically over the next 30 years. This is a consequence of having fertility rates of 3.5 post-war and then changing to fertility rates lower than 2. It is largely *inevitable*, and we would be better off debating how we are going to cope. Encouraging later retirement and savings rates are pretty obvious starters. Second, to the extent that we can affect the number of workers per elderly person, either higher fertility or migration is equally effective. And we can only reduce the ERA from 73 (which is where it will be in 2050 with zero population growth) to maybe around 71. Thirdly, if one includes the youngest age group of 0-15 as dependents as well as the retired, then the ERA can be somewhat reduced by a combination of lower fertility rates and higher immigration. The reason is that fertility injects babies into the population who have to be fed and



Statistical expressions

Hat-stat challenge

2010 Belz Lecture cont.

educated for 15 years whereas immigrants tend to be overwhelmingly in the more productive age ranges. Low fertility and high immigration was pretty much where we were 10 years ago before politicians started suggesting that the aging population was a problem that could be fixed.

There were several other public issues that I could have discussed in the talk but didn't. Did Howard's gun buy-back have an effect on homicide and suicide rates? How should we measure the performance of schools? Does prison reduce crime? How much of the falling road toll is due to random breath testing. Should the legal limit be further reduced or have we already hit diminishing returns? And let's not forget that endangered polar bear in the room: climate change.

How can we be involved?

There is nothing to stop individuals becoming regular media contributors on statistical issues, in the same way that Andrew Leigh and Joshua Gans do. The problem is that there is no incentive to do so, especially for young academics. Andrew Leigh was able to rise to ANU Professor based on innovative and careful empirical econometrics. I do not believe that statisticians can do the same. There is a cultural bias in the academy against applied as opposed to methodological research.

I wonder then whether we might consider setting up some kind of panel of experts. The advantages of this are (1) the authority of a panel. The public are already familiar with letters signed by panels of experts. The idea is that the political biases in such statements have been largely excised through the process of getting unanimous panel agreement; (2) closely related to this is that critical analysis from many heads is likely to lead to a more reliable assessment than that of an individual. Personally, I would be pretty nervous about publically pronouncing on the Iraq body count without the robust input of my peers. (3) The workload can also be spread across several people. I envisage that perhaps one member of the panel would write the report, and then have it critically examined by the others.

Professor Chris Lloyd



1



2



3



4



5



6

The six hats pictured are all related to a statistical expression, some directly, some more indirectly. For example, the first one is lamb-dahat.

Your first challenge is to work out what statistical expressions the other hats are referring to.

Your second challenge is to send in a photo of another statistical hat!

We look forward to your entries: email eo@statsoc.org.au by 10 February 2011.



Outstanding woman in technology

ICT
2010 Award



Dr Bronwyn Harch receiving the ICT Outstanding Woman in Technology 2010 award.

In September CSIRO's Dr Bronwyn Harch received Queensland's ICT Outstanding Woman in Technology 2010 award.

This award recognises her outstanding achievements in embedding informatics into agri-environmental research. Agri-environmental informatics provides a robust knowledge, information and architectures base that underpins monitoring of the complex systems in landscapes, reporting their 'health' status, making predictions and assessing risks.

Her informatics-based projects are within large multidisciplinary landscape-based studies. These include South East Queensland Healthy Waterways, Port Phillip Bay dredging, water quality monitoring in the Great Barrier Reef catchments and lagoon, monitoring the territorial waters of Hong Kong and adapting monitoring regimes for SEQ's dams.

As Deputy Director of the Sustainable Agriculture Flagship, Bronwyn uses informatics and ICT research to enhance the productivity of Australia's agricultural and forest land while reducing their greenhouse gas emissions. She began her career in CSIRO in Adelaide 1995 as a postdoctoral fellow in environmental statistics, rising to Deputy Chief of CSIRO's division of Mathematics, Informatics and Statistics.

Bronwyn is renowned for her passion and mentoring of staff through their personal development in the mathematics, informatics and statistical sciences. She is currently a member of the Accreditation Committee of the Statistical Society of Australia.

Queensland's Women in Technology awards focus on identifying women who are leaders who set the standard to follow and have a commitment to continuous career development. ■

MASA

Model Assisted Statistics and Applications
An International Journal

Editor-in-Chief: Sarjinder Singh
Co-Editor-in-Chief: Stan Lipovetsky
Managing Editor: Stephen Horn
Treasure: Sylvia R. Valdes

Welcomes to:
Sampling, Econometrics, Bayesian Statistics, Time Series, Design of Experiments, Multivariate Analysis

www.iospress.nl

Thinking Statistically

Elephants Go to School

A UNIQUE TEXTBOOK

By
Sariinder Singh

Reviews:
Collins Carbno, *Technometrics*,
2007, 49(4), 496
Marcin Kozak, *Statistics in
Transition*, 2006, 7(6), 1407-9.

A new way to learn statistics using pictures, jokes, and tales.

A lot of learning with fun through 651 pages.

**Forewords by
David Robinson
and
Stephen Horn**

**Good for all ages
+ Good for all libraries
+ Good for all majors
+ Good for all schools
+ Good for you too**

PLEASE HAVE A LOOK



Kendall/Hunt Publishing/Company 4050
Westmark Drive, P.O. Box 1840 Dubuque
Iowa 52004-1840, U.S.A.
www.kendallhunt.com



Industry Internship & Lecture Tour



AMSI Industry Internship Program

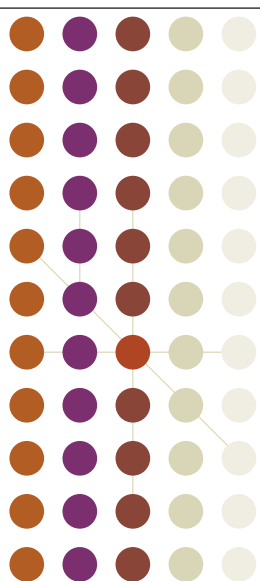
- industry experience
- access to hi-end expertise
- new capability, insight & solutions
- recruitment opportunities
- funding support

AMSI industry interns wanted

Each year the Australian Mathematical Sciences Institute (AMSI) offers thirty industry placements to post-graduate or post-doctoral fellows from AMSI member institutions.

Interns and an academic mentor typically work on industry projects that require high-level analytical skills for 4 or 5-months. We provide interns with funding of up to \$15,000 for a 5-month placement. Placements are open to individuals with well-developed quantitative analytical skills.

Apply online at www.amsi.org.au/internships.php or e-mail: enquiries@amsi.org.au

2010 AMSI/SSAI Lecturer Professor Denise Lievesley

(King's College London, UK)

Prof. Lievesley will undertake a lecture tour around AMSI member universities following the Australian Statistical Conference, where she will be speaking.

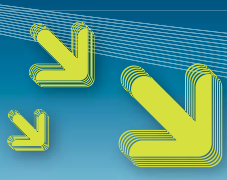
Prof. Lievesley will talk in the following areas:

- building trust in national statistics
- values in statistical agencies
- sharing and archiving research data
- getting data used
- the power of comparative data
- the role of an international statistician

Visit our website for more info:

www.amsi.org.au/lievesley.php



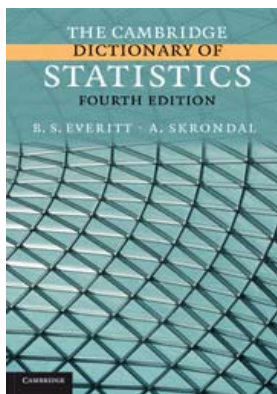


CAMBRIDGE

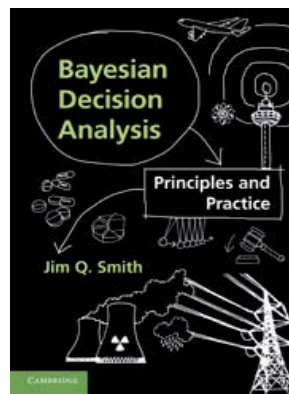
New Statistics books from Cambridge

SAVE 20% off these Statistics titles AND other selected titles until January 31, 2011!

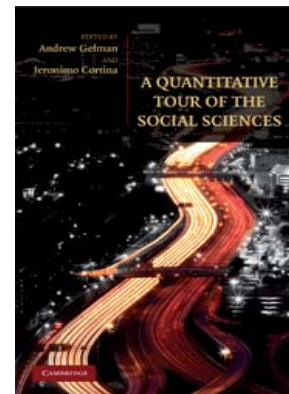
Use code **STATS10** when shopping online at www.cambridge.edu.au



NOW \$75.96 RRP: \$94.95



NOW \$63.96 RRP: \$79.95



NOW \$47.96 RRP: \$59.95

How to Order;

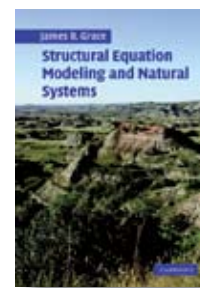
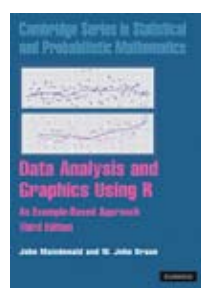
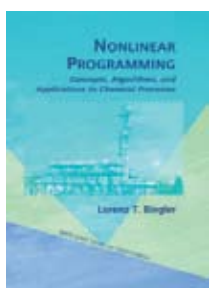
1. ORDER SECURELY ONLINE before January 31, 2011 by going to www.cambridge.edu.au/STATS10

Enter the promotion code **STATS10** when prompted at the checkout, and discounted prices will load automatically

OR

2. Contact us either by email or phone: Rose Johnstone (03) 8671 1405 rjohnstone@cambridge.edu.au

Go to www.cambridge.edu.au/stats10 for a full list of discounted titles



For a full list of discounted titles visit www.cambridge.edu.au/stats10

SSAI Member Selected for Fulbright Program

Specialist
Roster Candidate 

Department of US Defense Education Activity (DoDEA) alumnus Dr. Gregory Fant has been named a Fulbright Specialist Roster Candidate for a five-year term beginning in 2011. Fant graduated from Hahn American High School at Hahn Air Force Base (now, de-activated) in Germany. He is currently a Federal Civil Servant, serving as a Supervisory Health Scientist and the Deputy Director, Division of Science and Policy, HIV/AIDS Bureau, Health Resources and Services Administration (HRSA), Department of Health and Human Services. Since 1997, Fant has worked in various agencies including the Department of Defense, the Department of Commerce, and the Department of Health and Human Services. Fant also worked at Walter Reed Army Medical Center as a Medical Statistician and at HRSA as a Health Statistician in solid organ transplantation and in HIV/AIDS care and treatment. Fant is also an Adjunct Associate Professor at George Mason University where he teaches statistical methods to doctoral and master's degree students in political science and public administration.

Fant is one of over 400 U.S. faculty and professionals who will travel abroad through the Fulbright Specialist Program. This program, created to complement the traditional, year-long Fulbright Scholar Program, provides short-term, collaborative, two-to-six-week projects at higher education institutions in over 100 countries worldwide. Fant's areas of expertise for the Fulbright Specialist Program include Global/Public Health (including epidemiology and statistics) and Public Administration.

"I applied to the Fulbright Specialist Program earlier this year after returning from a weeklong visit to Cairo, in early December 2009," said Fant. While exploring the sites of Coptic Cairo, he noticed a sign on the side of a building in the area identifying it as the site of a USAID project on behalf of the Egyptian and US Governments. "Surely," Fant said, "the Fulbright Program is, also, a viable option



Dr. Gregory Fant

for an individual to help others around the world." Fant is interested in using the Fulbright Specialist Program to develop a process whereby public health evidence can be collected and used to plan and implement a health promotion or disease prevention program among those at-risk for HIV or another disease.

As he waits for his country-match, Fant considers, "It might be nice to return to Cairo as a Fulbright Specialist and work with Egyptian university professors and public health graduate students who would, as part of their degree course work, facilitate an evidence-based, health promotion or disease prevention program in cooperation with community leaders and those persons at-risk."

Selection as a Fulbright Specialist is the result of a peer review process; the peer review process is highly competitive. Application to the program is open to US faculty and professionals who apply through the Council for International Exchange of Scholars which administers the program on behalf of the Department of State.

Fulbright Specialist activities focus on strengthening and developing the needs of higher education institutions and do not fund personal research. Eligible activities

include teacher training, short-term lecturing, conducting seminars, special conferences or workshops, as well as collaborating on curriculum planning, institutional and/or faculty development.

The Fulbright Program, conceived by and named for US Senator J. William Fulbright and established by Congress in 1946, is the US Government's flagship international exchange effort to promote peaceful understanding between the United States and other countries around the world through the exchange of persons, knowledge, and skills. ■

25% Discount on Wiley Publications!

The SSAI is delighted to announce that we can now offer our members a special discount of 25% on online purchases with Wiley or Wiley-Blackwell (<http://www.wiley.com/statistics>). To receive this discount, please order your books by telephone and quote the code SSA25.

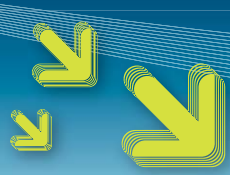
Toll free phone 1800 777 474
(from within Australia only)

Toll free phone 0800 448 200
(from New Zealand only)

Other overseas phone + 61 7 33548455

E-mail: custservice@johnwiley.com.au

 WILEY-BLACKWELL



On the SSAI
website

Overseas Statisticians visiting Australia

The screenshot shows the SSAI website interface. At the top left is the SSAI logo with the text 'Statistical Society of Australia Inc.'. To the right is a 'MEMBER LOGIN AREA' with input fields for 'member #' and 'password', and buttons for 'LOGIN' and 'RECOVER PASSWORD'. Below the login area is a photo of a man in a blue shirt. On the left side, there is a navigation menu with links: HOME, ABOUT US, MEMBERSHIP, SECTIONS, BRANCHES, EVENTS, PROFESSIONAL ACCREDITATION, YOUNG STATISTICIANS, PUBLICATIONS, RESOURCES, and CONTACT US. At the bottom of the menu are 'SEARCH' and 'REGISTER FOR EVENTS ALERTS' buttons. The main content area is titled 'Resources' and features a sub-section 'Overseas Statisticians visiting Australia' with a date 'December 2010/Western Australia'. It lists five visitors: Professor Noel Cressie (The Ohio State University, USA), Professor Persi Diaconis (Stanford University, USA), Professor Denise Lievesley (Kings College, London), Professor Delia North (University of Kwa-Zulu Natal, South Africa), and Professor Chris Wild (University of Auckland, NZ), and Dr Alan M. Zaslavsky (Harvard University, USA). A paragraph below the list explains the purpose of the database and provides contact information for the SSAI office.

We have created an “Overseas Visitors” page on the SSAI website (<http://www.statsoc.org.au/OverseasVisitors>). The aim of this page is to provide a public database with the names of overseas visitors, giving other organisations the opportunity to benefit from the visit as well. If you or your organisation think that they would like to work with one of the visitors listed on the website, simply send an email to the SSAI office, explaining the details of your proposal, and the office will forward your email to the visitor in question.

If you know of statistical experts from overseas planning a visit to your organisation, please advise the SSAI by sending an email containing the name, details and travel dates of the visitor to eo@statsoc.org.au. We would also need the visitor’s email address (not to be published on the website), so that we can ask for his or her permission to put their name up, as well as the name and details of a contact person in Australia. ●



SSAI

Forums

for the exchange of statistical information and ideas

Opportunities

through professional meetings and workshops

Professional Accreditation

through a rigorous accreditation process

Publications

include Australian and New Zealand Journal of Statistics and the SSAI Newsletter

Networking

with likeminded professionals

Visit us online at www.statsoc.org.auApplication for Membership Statistical Society of Australia Inc
Application for Membership

ABN: 82853491081

Contact Information

Title: _____ First name: _____ Last Name: _____

Address for correspondence: _____

State: _____ Postcode: _____

Phone: (____) _____ Fax: (____) _____

Email address: _____

Monthly meeting notices will be sent to the nominated email address.

Type of Membership: Full Student (please attach details of enrolment) RetiredEmployment affiliation: Private Government Academic Retired Unemployed**Declaration**I hereby apply for membership of the Statistical Society of Australia Inc. I declare that the information provided on this application is correct. If elected to membership, I agree to abide by the rules of the Statistical Society of Australia Inc. I give/do not give (delete one) permission for the above details to be published in a directory of the members of the Statistical Society of Australia Inc.

Signed: _____ Date: _____

Special Interest Sections

Please circle the number corresponding to those sections you would like to join and receive information about.

- | | | |
|--|--------------------------|--------------------------------------|
| 1. Surveys and Management | 2. Statistical Computing | 3. Statistics in the Social Sciences |
| 4. Statistics in the Biological Sciences | 5. Statistical Education | 6. Industrial Statistics |
| 7. Young Statisticians | 8. Bayesian Statistics | 9. Environmental Statistics |

Payment Details—Tax Invoice (on completion)

Please make cheques payable to 'Statistical Society of Australia Inc.' If you wish to make payment by credit please provide card details below.

Card type: MasterCard VISA

Card number: _____ Expiry date: ____/____/____ Amount*: \$ _____

Cardholder name: _____ Signature: _____

*Full membership: \$225.00 (incl. hardcopy of Journal)

Full membership: \$220.00 (online version of Journal only)

Retired & Transitional* membership: \$115.00 (incl. hardcopy of Journal)

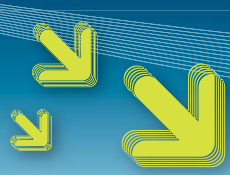
Retired & Transitional* membership: \$110.00 (online version of Journal only)

Student membership: \$20.00 (only online version of Journal)

AStat Annual Fee: \$44.00

All fees include GST. *Transitional membership is only available to graduates who have been student members and applies only for the first year of employment.

2011Please forward this form with payment to:
The Executive Officer
Statistical Society of Australia
PO Box 213
BELCONNEN ACT 2616
Or if paying by credit card, fax to
(02) 6251 0204



Renewal of Membership

Statistical Society of Australia Inc Membership Renewal 2011



ABN: 82853491081

Contact Information

Title: _____ First name: _____ Last Name: _____

Address for correspondence: _____

State: _____ Postcode: _____

Phone: (____) _____ Fax: (____) _____

Email address: _____
Monthly meeting notices will be sent to the nominated email address.

Type of Membership: Full Student (please attach details of enrolment) Retired

Employment affiliation: Private Government Academic Retired Unemployed

Declaration
 I hereby apply for membership of the Statistical Society of Australia Inc. I declare that the information provided on this application is correct. If elected to membership, I agree to abide by the rules of the Statistical Society of Australia Inc. I give/do not give (delete one) permission for the above details to be published in a directory of the members of the Statistical Society of Australia Inc.

Signed: _____ Date: _____

Special Interest Sections

Please circle the number corresponding to those sections you would like to join and receive information about.

- | | | |
|--|--------------------------|--------------------------------------|
| 1. Surveys and Management | 2. Statistical Computing | 3. Statistics in the Social Sciences |
| 4. Statistics in the Biological Sciences | 5. Statistical Education | 6. Industrial Statistics |
| 7. Young Statisticians | 8. Bayesian Statistics | 9. Environmental Statistics |

Payment Details—Tax Invoice (on completion)

Please make cheques payable to 'Statistical Society of Australia Inc.' If you wish to make payment by credit please provide card details below.

Card type: Mastercard VISA Cheque

Card number: _____ Expiry date: ____/____/____ Amount*: \$ _____

Cardholder name: _____ Signature: _____

*Full membership: \$225.00 (incl. hardcopy of Journal)
 Full membership: \$220.00 (online version of Journal only)
 Retired & Transitional[#] membership: \$115.00 (incl. hardcopy of Journal)
 Retired & Transitional[#] membership: \$110.00 (online version of Journal only)
 Student membership: \$20.00 (only online version of Journal)
 AStat Annual Fee: \$44.00

All fees include GST.

[#] Transitional membership is **only** available to graduates who have been student members and applies only for the first year of employment.

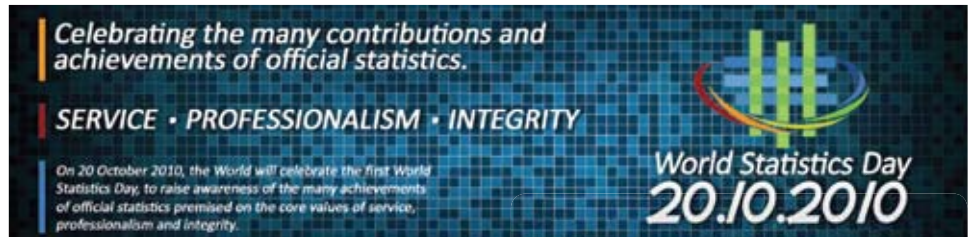
2011

Please forward this form with payment to:
 The Executive Officer
 Statistical Society of Australia
 PO Box 213
 BELCONNEN ACT 2616
 Or if paying by credit card, fax to
 (02) 6251 0204

WORLD STATISTICS DAY

20 October 2010

From the Australian
Bureau of Statistics



The United Nations General Assembly proclaimed the first observance of World Statistics Day to recognise the importance of statistics in shaping societies on 20 October, 2010.

The Australian Bureau of Statistics has joined the rest of the UN countries in celebrating this very important day by acknowledging the dedication of statistical experts in the production of updated and timely information, and for their commitment to service, integrity, and professionalism in providing Australia with reliable and impartial information about the most important aspects of society.

Statistics as the science of collection, organisation and interpretation of data has been developing since the 16th century, a period which coincided with the emergence of nation-states. Statistical thinking at the time evolved around the need for demographic and economic information on which to base the incipient policies being developed. The concept of statistics broadened widely in the 19th century to include collection and analysis of data in general, mainly based on the evolution of probability theory. The 20th century was characterised by the introduction of computers building up possibilities, never before imagined, to undertake large scale statistical computation making possible the development of new methods impractical to perform manually.

Since these early stages, five hundred years have passed until now, when the contribution of statistics is being acknowledged worldwide. In the information technology era, statistics permeate all spheres of life. They are the basis for governmental, business and organisational decision making.

Statistics are being recognised as an essential tool for further economic and social development and also for sustainability of the planet. The 21st century will be remembered for the increasing need and development



Celebration in Western Australia: left to right Erwin Swasbrook, Department for Planning and Infrastructure, Michael Tindall Regional Director WA Office, Winthrop Professor Richard Weller.

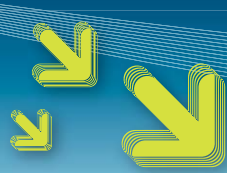
of environmental statistics, which more and more will tend to be developed in partnerships between countries.

Globalisation has not only impacted the way we collect and analyse data, but has also created the need for harmonised and comparable data on crucial aspects affecting human lives all over the world. Today statistics are in the base of most decision making with relation to policies, programs and the required budgets to fulfil set goals. One example of the current application of statistics for people's benefit has been the measuring and follow-up of the Millennium Development Goals (MDG) established by the United Nations in the year 2000 with the aim of eradicating poverty and hunger in the world by the year 2015. For development to succeed, data collection and statistical analysis of poverty levels, access to education and the incidence of disease, are crucial.

On this first World statistics Day, the Australian Bureau of Statistics would also like to acknowledge and thank the people of Australia for their willingness to provide information about their lives, households and businesses. It is largely due to the participation of Australian citizens that our national statistics are of such high quality and provide information essential to our national progress. ■



Paul Jelfs (top) and Richard Weller, Guest Speakers at WA Celebrations



Celebrating the many achievements of official statistics

SERVICE • PROFESSIONALISM • INTEGRITY

On 20 October 2010, the World will celebrate the first World awareness of the many achievements of official statistics pre of service, professionalism and integrity.

CHILDRENS HEALTH

There are a number of positive findings in relation to maternal health and factors affecting childhood development including high rates of breastfeeding and physical activity among Aboriginal and Torres Strait Islander children:

- In 2008, the majority of birth-mothers of Indigenous children aged 0-3 years (87%) had regular check-ups while pregnant (at least one every two months).
- According to the 2008 National Aboriginal and Torres Strait Islander Social Survey, three-quarters (76%) of Indigenous children aged 0-3 years had been breastfed.
- Three out of every four Indigenous children aged 4-14 years (74%) were physically active for at least 60 minutes everyday, though the proportion was higher for those who lived in remote areas (84%).
- The proportion of children aged 0-14 years who lived in a household where members usually smoked inside the house decreased from 29% in 2004-05, to 21% in 2008.
- Most Indigenous children aged 0-14 years brushed their teeth at least once a day (71%). However, 25% of children aged 10-14 years had a tooth or teeth filled because of dental decay and 20% of children aged 5-9 years had experienced dental decay.
- Eye or sight problems and ear or hearing problems were experienced by 7% and 9% of Indigenous children aged 0-14 years respectively in 2008.



Political Map of the World, April 2008



DEMOGRAPHIC, SOCIAL AND ECONOMIC CHARACTERISTICS

The Aboriginal and Torres Strait Islander population comprises around 2.5% of the Australian population and is relatively young:

- In 2008, the Total Fertility Rate (TFR) for Indigenous females was estimated to be 2.52 babies per woman, compared with 1.97 babies per woman for all Australian females.

Indigenous Australians have lower life expectancy than non-Indigenous Australians:

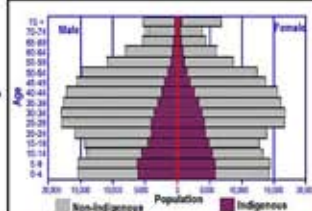
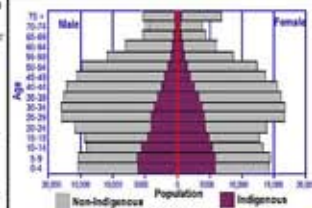
- Life expectancy at birth for Indigenous males is estimated to be 67.2 years, compared with non-Indigenous males at 78.7 years.
- Life expectancy at birth for Indigenous females is estimated to be 72.9 years, compared with non-Indigenous females at 82.6 years.

Aboriginal and Torres Strait Islander language and culture is strong:

- In 2008, 19% of Indigenous people aged 15 years and over and 13% of Indigenous children (3-14 years) spoke an Aboriginal or Torres Strait Islander language.
- 70% of Indigenous children (3-14 years) and 63% of Indigenous people aged 15 years and over were involved in cultural events, ceremonies or organisations in 2008.

Socioeconomic outcomes for Indigenous Australians continue to improve, but remain below those for non-Indigenous Australians:

- More Indigenous people completed Year 12 - 22% (of people aged 15 years and over) in 2008, up from 18% in 2002.
- The unemployment rate for Indigenous Australians fell from 23% in 2002 to 17% in 2008, but remained more than three times higher than the rate for non-Indigenous Australians (5% in 2008).



cial statistics

Y
Statistics Day, to raise
mised on the core values



World Statistics Day
20.10.2010


UNIVERSITY OF
CANBERRA
Australia's Capital University



World Statistics Day
20.10.2010



EDUCATION

- Educational attainment among Aboriginal and Torres Strait Islander Australians continues to improve:
- Apparent school retention rates for Indigenous full-time students from Year 7/8 to Year 12 increased from 35% in 1999 to 45% in 2009.
 - Nationally, the proportion of Indigenous people aged 15 years and over completing Year 12 increased from 18% in 2002 to 22% in 2008. The rate of Year 12 completion has also improved in all states and territories.
 - More Indigenous people are completing non-school qualifications, 40% of 25-64 year olds in 2008, up from 32% in 2002.
 - More Indigenous young people were fully engaged in work and/or study in 2008, just over half (54%) of Indigenous young people aged 15-24 years were either working full-time, studying full-time, or both working and studying; up from 47% in 2002.

Higher levels of educational attainment are associated with better health outcomes:

- In 2008, 55% of Indigenous people aged 15-34 years who had completed Year 12 reported excellent/very good self-assessed health compared with 49% of those who had left school early (Year 9 or below). For Indigenous people aged 35 years and over, the rates were 43% and 25% respectively.
- The likelihood of smoking also decreased with higher levels of schooling, 34% of Indigenous people aged 15-34 years who had completed Year 12 were current daily smokers compared with 68% of those who had left school early. For Indigenous people aged 35 years and over the rates were 36% and 48% respectively.



ADULT HEALTH

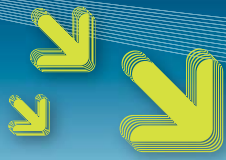
Aboriginal and Torres Strait Islander Australians have poorer self-assessed health and were more likely to report higher levels of psychological distress than non-Indigenous Australians:

- In 2008, 44% of Indigenous people aged 15 years and over reported excellent/very good health and 22% reported fair/poor health.
- Indigenous people were twice as likely as non-Indigenous people to report fair/poor health. This gap has remained unchanged since 2002.
- Nearly one-third (33%) of Indigenous people aged 18 years and over had experienced high/very high levels of psychological distress, which was more than twice the rate for non-Indigenous people.

Both tobacco smoking and excessive alcohol consumption are major health risk factors. Latest results show a decline in Indigenous smoking rates, while alcohol consumption remains steady:

- Between 2002 and 2008, the proportion of Indigenous current daily smokers fell from 49% to 45%, representing the first significant decline in smoking rates since 1994. However, Indigenous people remained twice as likely as non-Indigenous people to be current daily smokers.
- Around one in six Indigenous people aged 15 years and over (17%) drank alcohol at chronic risky/high risk levels, similar to the rate reported in 2002 (15%).





Interview // Peter Harper



WORLD STATISTICS DAY

World Statistics Day was designated by the United Nations to raise awareness of the many achievements of official statistics premised on the core values of service, professionalism and integrity. The Newsletter Editors are pleased to bring you this interview with Peter Harper, Chief Operating Officer of the Australian Bureau of Statistics as part of the Society's celebrations of World Statistics Day.

Interviewer: on the occasion of World Statistics Day, I'd like to start by asking you about how the ABS rates itself in comparison with the statistics agencies of comparable countries around the world.

Peter Harper: The ABS is recognised as one of the world leaders in statistics. We have this reputation both within Australia and internationally. While there are always areas where more information is required, we have an extensive program of statistics covering economic, social, population and environment matters. We lead the world in the introduction of new methodologies and standards, and our staff are highly sought for their knowledge, understanding and statistical innovation both internationally and domestically.

Interviewer: the World Statistics Day theme concentrates on service, professionalism and integrity. Let's focus on integrity, and the high degree of trust placed in ABS statistics by government and the community. How do you work to maintain that trust?

Peter Harper: The best way for us to maintain trust is for us to continue to produce high quality statistics that meet the needs of both government and the community, in a way that is clearly seen as being free from interference from political processes. We are fortunate that the various Federal Governments over the years have appreciated the importance of the ABS's independence, and that this is supported by the legislation we operate under. In order for us to produce high quality statistics it is crucial that we maintain the trust of those who provide their data to us. The strong assurance of confidentiality that we are able to provide is fundamental to this.

Interviewer: What would you regard as the biggest challenge facing the official statistics community in Australia?

Peter Harper: While official statistics in Australia are generally in good shape, there are emerging challenges that, if not dealt with properly, will pose a risk. The first is one of maintaining capability. We are in a very competitive market for staff with the skills we require, and if we cannot find ways to attract and retain staff our capability will be quickly eroded. Another challenge is that in the information world there continues to be an explosion in the demand for statistics, which is exacerbated by increasingly complex policy challenges. Our statistics must remain relevant and responsive. A third challenge is information management; this is not done nearly as well as it should be across official statistics and unless this issue is addressed the pressures on us will be exacerbated.

Interviewer: The ABS has existed for nearly 100 years. Do you think it will exist for the next 100 years? Will its form and function change in the medium to long term?

Peter Harper: I hope the ABS exists in 100 years, as it will be good evidence that we have continued to do our job of informing Australians well! I think the information requirements of Australians will continue to grow. I do not see the essential role of the ABS — which is to assist and encourage informed decision making by leading a high quality, objective and responsive national statistical service — changing dramatically. But the way in which we go about producing and disseminating statistics will change significantly. We will rely less on surveys, and more on integrating administrative and transactional data into comprehensive databases, with innovative techniques for deriving the statistics that people need. We will also make these databases available — subject to confidentiality constraints of course — so that users, or their computers, have much more freedom to produce the information that suits their purposes, and in a way that integrates statistical

information with other information, such as geospatial information. And we will 'value add' more at the end of the statistical process in helping users to understand the information that is available and how it can be used effectively in their decision making. That is, we'll move toward providing more tailor made solutions for our users.

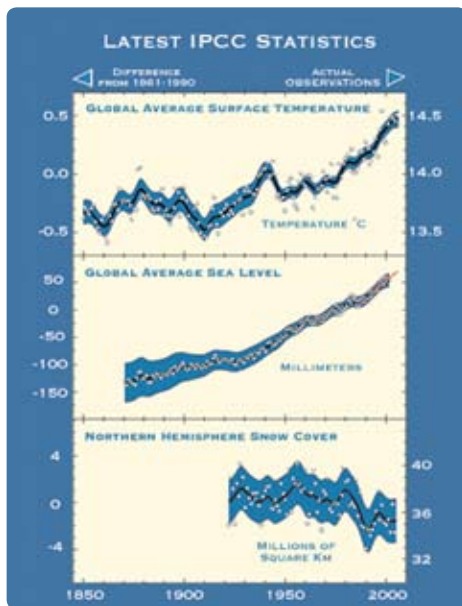
Interviewer: The ABS has to be one of the main employers of statistics graduates in Australia, and yet "concerns [have been] expressed by a variety of employers about the quantity and quality of suitably trained graduates available." (quote from the foreword of the Statistics at Universities review, December 2005, by Neville Bartlett). At the university level, have there been any early wins from the 2005 review conducted by the SSAI with input from the ABS and others?

Peter Harper: We remain concerned about the quantity and quality of suitably trained graduates, notwithstanding the increased attention that is being given to this problem. We will continue to work with Universities (and with the education sector more broadly) in association with professional bodies such as the SSAI to find solutions to this challenge. We need to inspire more people to want to study statistics or similar quantitative disciplines at the tertiary level, and this means we must increasingly reach into the schools as children begin to contemplate what they would like to study.

Interviewer: In conclusion, do you have a message for Statistical Society members from the ABS on the occasion of the first World Statistics Day?

Peter Harper: The ABS is delighted in the passion of Statistical Society Members for the study, application and good practice of statistical theory and methods and the benefits that this brings to statistics in Australia. World Statistics Day is a long over-due recognition of the critical importance of statistics, and statisticians. You should be very proud to be a member of this profession and the immense value that our objective and scientific approach provides in helping to make better lives for all Australians. ■

Come one, come all!



Example of Intergovernmental Panel on Climate Change (IPCC) statistics showing results of their climate trend modelling.

As a finale to the ASC2010, Fremantle, WA, the SSAI's Statistical Education SECTION has organised a discussion panel that seeks to debate the topic "Speaking of Climate change: Is the Forecast for Statistics Rain or Shine?"

The session will take place 15:40–16:30 on Thursday 9 Dec and will bridge both the ASC and the OZCOTS.

The session will inform, consider, and debate, the: needs of society, business and industry; existing merit of Statistics in Australia; recent changes to statistical education at the secondary level; aims and methods of educating at the tertiary level, and incite lively discussion on these topics.

Panellist speakers have been selected based on their knowledge and expertise and will address each of the above four

Statistical Education Section
Peter Howley and Michael Martin



interrelated topics under the following titles:

- 'Must we out-source for statisticians?' (a discussion of supply and demand)
- 'Do you measure up? Do we measure up?' (a discussion on the SSAI's accreditation assessment)
- 'How's school these days?' (a discussion of what's new and what's needed at the secondary school level and the school-tertiary interface)
- 'We teach x, y and z, do we need more of a, b and c?' (a discussion of what's in, what's out and what's needed at the tertiary level; both in the philosophy of content to teach and in who we should be teaching in order to address the supply and demand issues).

We look forward to your attendance. ■

Greenhouse 2011

Internship opportunities in climate change

Limited places

Expose your skill set to industry

AMSI is offering fully funded postgraduate scholarships on a competitive basis, which include flights, accommodation, registration and conference dinner to the Greenhouse 2011 conference at the Cairns Convention Centre in Queensland, 4–8 April 2011.

Applicants must:

- be willing to undertake an AMSI internship within 6 months of the conference, and
- help promote their skills and our internship program at the conference

To apply visit www.amsi.org.au/GH2011_intern.php





**Biostatistics
Section**
Co-Chair Ian Marschner

Recent successes and future vision

It is a pleasure to fill you in on the recent successes and future vision for the SSAI Biostatistics Section. The Biostatistics Section explores a wide range of health applications, including epidemiology, clinical trials and health policy, just to name a few. Our members come from a wide range of sectors including academia, government, hospitals and the pharmaceutical industry. The Section was re-formed around early 2010, and we would like to thank all of the members of SSAI who worked hard on our predecessor, the Medical Statistics Section.

It is a delight to see that every session of the ASC2010 program includes a session on biostatistics. These biostatistics sessions include presentations from the Biostatistics Collaboration of Australia, the Australian Pharmaceutical Biostatistics Group, and keynote presenter Gordon Smyth. We will also hold a brief Biostatistics Section business meeting at ASC2010 in order to showcase the activities that the Section has been involved in to date, and to explore together our vision for the future. This business meeting will be open to any delegate with an interest in Biostatistics.

A major activity for the Biostatistics Section is the Visiting Workshop Program, organized in collaboration with the American Statistical Association. Under this program the Section hosts a visit by an overseas workshop presenter roughly every six months. We were fortunate to have Liliana Orellana visit in early September 2010 and present a workshop in Brisbane on Causal Inference, and we look forward

to a visit by Scott Evans and Rui Wang in early December 2010 to co-incide with ASC2010 (where they will present a workshop entitled Hot Topics in Clinical Trials immediately preceding the main conference).

This year the Biostatistics Section made a successful bid to organize a session at the Joint Statistical Meeting in Vancouver, in August 2010. To our knowledge this is the first time that the SSAI (as an officially-recognised organization) has presented at this conference. The session was entitled Biostatistical Innovations in the Australasian Region, and we heard from speakers Niels Becker, Val GebSKI, and Ian Marschner. The Biostatistics Section is looking forward to an on-going visible presence at future Joint Statistical Meetings as well as the ASA's International Conference on Health Policy Statistics to be held in Ohio in October 2011.

The Section has also recently followed the Bayesian Section in creating a section email list. The biostatistics list will be used solely for advertising different biostatistics workshops and events that are taking place around Australia (with an approximately monthly newsletter). To add your name to this email list please visit <https://mail.lists.uq.edu.au/mailman/listinfo/ssai-biostatistics> or email Mark Griffin at m.griffin@uq.edu.au for further details.

The Biostatistics Section also enjoys a good relationship with Statistics Without Borders (a special-interest group under

the umbrella of the American Statistical Association). SWB is dedicated to providing pro bono statistical consultancy to developing nations. Through such a partnership the Biostatistics Section hosted its first workshop visit to Fiji in July this year for the training and nurturing of medical statisticians in the Pacific Island region. We are currently drafting up a more complete workshop and conference program in collaboration with our Pacific Island colleagues and the ASA, and look forward to announcing further details about these events shortly.

Finally, the Biostatistics Section looks forward to making our contribution to the SSAI Young Statisticians conference in mid-2011. Planning for this conference is well under-way, and we expect to host at least one visiting workshop presenter to organize a satellite workshop to this conference and to serve as a keynote speaker.

This is an exciting time to work in the biostatistics sector, and we look forward to growing the SSAI Biostatistics Section and to finding new ways to engage our members.

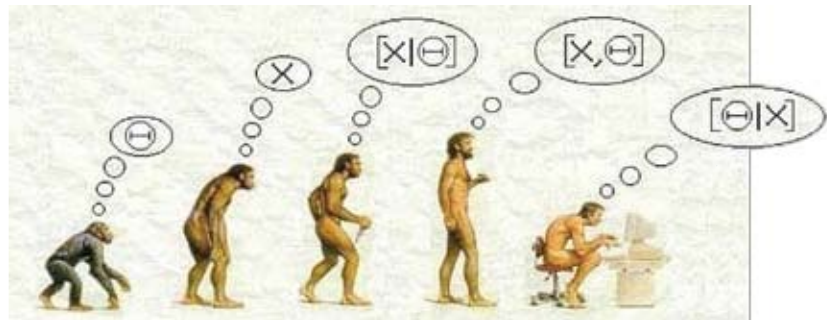
Ian Marschner ■



Biostatistics Section team, from the left – Niels Becker, Val GebSKI, Mark Griffin and Ian Marschner.

Catch-up on recent activity

Bayesian
Statistics Section
Scott Sisson and
Matt Falk 



Evolution of HomoBayesianus.

Bayesian statisticians made their way to the Surfers Paradise on the Gold Coast, Queensland for two days of presentations and posters at the Bayes on the Beach conference 2010. The event marked the 7th annual joint meeting of the Australasian Section of the International Society of Bayesian Analysis and the Bayesian Statistics Section of the SSAI. Delegates mainly from the east coast of Australia and New Zealand all participated, with keynote talks for the event given by Scott Sisson (University of New South Wales) and David Elston (Biomathematics and Statistics, Scotland).

A wide variety of Bayesian-related topics were discussed during the conference, with presentations on theoretical and methodological developments, as well as many applied areas such as finance, ecology and remote sensing. As well as presentations, delegates were given a tutorial in Approximate Bayesian Computation by Scott Sisson and on prior elicitation software by Sama Low-Choy. The poster session provided an opportunity for less formal interactions. The conference was a great success thanks to the enthusiasm of each one of the delegates in sharing their research and ideas.


For those who were unable to attend, more information and copies of presentations are available at <http://www.ccdamc.org.au/esmain/beachbayes/beachbayes2010.jsp>

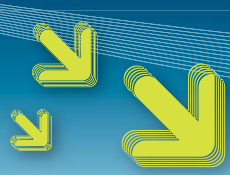
During 2010 the Bayesian Section has run a number of workshops around the country, with the aim of developing Bayesian capacity for research in Australia. The final workshop

this year will be held as a pre-conference workshop to the 2010 Australian Statistical Conference in Perth. "Bayes for Beginners" will be run by Prof. Kerrie Mengersen, a leading practitioner of Bayesian methods, and will be aimed at people who wish to analyse data in the Bayesian framework. For more details, see www.promaco.com.au/2010/asc.

The Bayesian Section maintains a mailing list for Bayesian-related events in the region, including job and scholarship announcements, conferences and workshops, and for general discussion of a Bayesian nature. To keep up-to-date on Bayesian happenings and for more information on joining the Bayes-info list, please visit <http://www.maths.unsw.edu.au/~scott/bayes-info.html>.

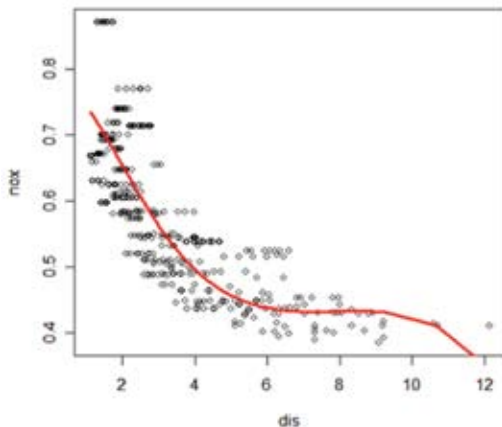
2010 has been a good year for the Bayesian Section, and we hope that 2011 will be even better. If you have suggestions, or ideas for Bayesian events in your area, please get in touch with us Scott.Sisson@unsw.edu.au, and we will try our best to make them happen.

Scott Sisson and Matt Falk 



Canberra Branch
Philip Kokic

Non-parametric and Semi-parametric M-Quantile Inference for Longitudinal Data



Ray Chambers from the University of Wollongong gave an engaging presentation in the September meeting of the Canberra Branch. The focus of his talk was on M-quantile spline regression, and how it may be extended to grouped hierarchical data. To begin, Ray acknowledged the contribution of his colleagues to this work including Nikos Tzavidis, University of Manchester, Nicola Salvanti, University of Pisa and Hukum Chandra, IASRI, New Delhi.

M-quantile regression is used to model the conditional distribution of a dependent variable given a set of covariates; unlike standard regression which just models the conditional mean. Effectively a set of regression lines are estimated that range across the conditional distribution according to a quantile parameter, $0 \leftarrow q \leftarrow 1$. Quantile regression is a special case of this, but quantiles are not necessarily unique; they are computationally demanding to estimate and sometimes the estimation procedures are instable. On the other hand it is possible to ensure the uniqueness of M-quantiles, and when this is the case they can be efficiently estimated using an iteratively reweighted least squares algorithm.

Ray presented a generalisation of M-quantile regression for grouped data. This can be used to model longitudinal data, where the magnitude of the random group effect also varies according to q , and the variance and skewness of the dependent variable changes according to the value of the covariates. When the functional form of the relationship between the response variable and the covariates is also unknown, there are at least two non-parametric

approaches that can be used. The first is based on the use of kernel smoothing which leads to geographically weighted M-quantile regression. The second approach, which Ray concentrated on in this presentation, incorporated a spline random effect term in addition to the group random effect in the model.

Ray showed how the spline model could be estimated by modifying the log likelihood of a mixed effect model, or by a penalised spline approach. The likelihood approach results in variance components and incorporates a modified M-loss function, whereas the penalised spline approach replaces the random effects with fixed effect terms and uses an estimating equation approach with penalty terms to estimate the parameters.

Simulation results presented by Ray illustrated that the penalised spline approach was generally a more efficient estimator of the conditional quantiles than a standard M-quantile approach that ignored the grouping structure, and it was only slightly less efficient than non-parametric M-regression when $q = 0.5$. When outliers were randomly added to the either the group level or individual level data, the penalised spline approach was considerably more efficient than all other approaches considered.

Finally at the end of his presentation there was some interesting discussion about representing spline terms in a mixed model as random effects.

Philip Kokic ■

Recent events in NSW

NSW Branch
Richard Gerlach



NSW Branch has held four seminars since the last report was written. Making up for our quiet June and July this year, we recently held seminars on August 24th, September 15th, September 29th and October 20th; while in early November there will be a 'Networking Nite' for the Young Statisticians in NSW, organised by our YS Council rep Leo Chow.

Our second talk in August, on **August 24th**, was given by Philippa Delahoy. She is Outcomes Research Statistical Lead, Pfizer Australia and Chair of the Australian Pharmaceutical Biostatistics Group (APBG), and spoke on "An Application of Survival Analysis to Health Technology Assessment in Oncology". Philippa gave us an interesting talk at Sydney Uni, followed by an even more interesting dinner (Thai in Newtown) where she revealed a few secrets about generic vs non-generic medicines and their promotion, or lack-of, by chemists. Changed my prescription medicine buying habits ☺, thanks Philippa!

On **15th September**, the eminent Dr Neil Gordon, Defence Science and Technology Organisation (DSTO), gave us an excellent talk on particle filters and wide area surveillance, held at UNSW. Though Neil couldn't show us (m)any applications, without giving away national security and military classified information, he did convey well the importance and power of the methods that he has had a large hand in developing over the last few decades. Dinner afterwards was well attended: Thai in Kensington.

On the **29th September** Dr Brian Jersky, from Macquarie University, gave us a talk at Sydney Uni attempting to answer the question "What do students learn in an introductory statistics class?", based on his own "experiments" on students in the US. We learnt about the website ARTIST (Assessment Resource Tools for Improving Statistical Thinking), which can help us



Website icon for ARTIST at
<https://app.gen.umn.edu/artist/>

conduct our own study into the question at hand and we learnt some interesting points that his class had, and had not, learnt during their Intro Stats unit. Any academics who need to think about "assurance of learning" take note. Dinner afterwards was a lovely Lebanese restaurant in Glebe.

On Wed **20th October**, partly to celebrate World Statistics Day, Dr Gab Abramowitz, from the Climate Change Research Centre at UNSW, gave us a very well attended and received seminar on combining predictions from climate models. I sat next to Gab at dinner afterwards, at the Spot, Randwick, at an Italian Bar & Grill, and those around us shared an entertaining discussion on climate models, climate data, the fast pace of change in the area (especially as new, previously unexplored data sources, e.g. cloud height, continually come online), debugging Fortran code (brought back a few nightmares for me), R vs Matlab, etc.

Finally, on **November 25th**, we will hold the annual J.B. Douglas Postgraduate Awards day and annual Branch dinner at the Macquarie Graduate School of Management. We consider this event the flagship event of the year in NSW, and apart from six PhD students presenting on their research, this year we also have former Branch President Dr Alun Pope speaking about analysing housing prices.

Richard Gerlach 



Queensland
Branch
Helen Johnson

QLD update



Professor Helen MacGillivray



Antony Skinner



Dr Andrea J Lanyon

The Queensland Branch recently celebrated the first World Statistics Day with a joint event between the ABS, the Office of Economic and Statistical Research (OESR) and the Institute of Social Science Research (ISSR) at UQ. The event was held at the offices of OESR and was attended by 55 people from a variety of backgrounds including government, academia and private industry.

The World Statistics Day event was opened by Antony Skinner, the Queensland Government Statistician. Antony welcomed us all to the very first World Statistics Day and then introduced the three speakers. The first speaker was Professor Harvey Goldstein who spoke on GETSTATS, which is an initiative of the Royal Statistical Society, and a ten year campaign for statistical literacy. Harvey spoke in detail on activities that the GETSTATS campaign will undertake, for example, using *Significance* articles in the classroom, together with data and software to support school statistics learning, as well as working with teacher and lecturer organisations to promote good learning practices. One of the most important issues was considered to be educating the media through engagement to help build

their statistical skills, as well as educating the wider public in their roles as consumers, voter, and parents. Unfortunately, the GETSTATS campaign was to be launched on World Statistics Day, which coincided with the British Government releasing details of their spending cuts; as such, it was feared that GETSTATS might get less air play than initially hoped for!

The second speaker was Professor Helen MacGillivray, who spoke on some national and international developments in statistics education. Helen's talk began with a look back over the history of the ISI and the formation of the International Association for Statistical Education in 1991 and discussed how large a role Australia and New Zealand play in the international statistical education arena. One of the highlights of Professor MacGillivray's presentation was in the discussion of the opportunities and challenges that the statistics education field faces, some of which are differences in educational culture, the reclamation of probability, and probability's link with the



Professor Harvey Goldstein

everyday and familiar through problem-solving.

The final speaker was Dr Andrea J Lanyon, Regional Director of the ABS in Brisbane. Dr Lanyon spoke about the OECD trust framework, and discussed how Australians have a high level of trust in the ABS and its statistical products. Further to this, Dr Lanyon discussed a new guide to evidence-based policy that was released on World Statistics Day, which was developed by the Statistical Literacy Unit (ABS) and provides an overview of how statistical information can be used to make well-informed policy decisions.

Antony Skinner closed the event, thanking the speakers for their participation and everyone for attending.

Helen Johnson ■

SA update

South Australia
Branch
Julian Whiting



MATHEMATICS IN SCHOOLS PROGRAM

The speaker at the July South Australian Branch meeting was Dr Rebecca Anderson, the SA Project Officer for the Mathematicians in Schools program. Mathematicians in Schools is an Australia-wide program which aims to create partnerships between practising mathematicians and school teachers (both primary and secondary schools). It is a sub-program of the Scientists in Schools program, a Commonwealth Government initiative managed by CSIRO Education. Rebecca's engaging talk not only described how the program operates, but also covered its background and how it can benefit both school communities and the individuals involved in partnerships.

To begin the talk Rebecca referred to the findings of the Group of Eight review into the teaching of mathematics, data science and quantitative disciplines. The report found that between 1995 and 2007 there was a 27% decline in the number of students studying advanced mathematics in high schools across Australia. It also reported that demand for mathematics and statistics graduates is predicted to grow by 3.5% per year until 2013. Mathematicians in Schools aims to raise awareness among teachers, parents and career advisors of the importance of mathematical skills across a range of career pathways.

Maths professionals get involved by registering their interest on the program's website. The state project officer then creates a partnership with a suitable teacher who has also expressed interest. The program takes a broad definition of a 'maths professional' – it encompasses anyone with a significant maths component to their university degree and who uses maths in their working life. This can include statisticians, economists, accountants, surveyors and mathematical scientists, among others.

One strength of Mathematicians in Schools is that it provides flexibility in how the

partnerships operate. Each teacher/mathematician partnership decides the frequency, mode and type of interaction provided by the partnership. For example, the partnership could involve talks to students about careers and applications of maths, working on a long-term maths project, leading demonstrations and activities, mentoring students or providing support and ideas to teachers. There are many resources, ideas and examples of partnerships on the website.

Partnerships do not necessarily need to involve face-to-face interaction; Rebecca described two long-distance partnerships that a maths professional based at ANSTO in Sydney has with teachers at schools in the Riverland and near Port Pirie. One of these teachers has commented that they like having a professional contact that is always available to them via email. He sends each of them interesting review articles and publications for their own interest and which they then discuss with some of their more senior high school students. Other South Australian partnerships exist within the metropolitan area in both primary and secondary schools. The keys to a successful partnership are frequent communication and interacting in a way which is stimulating for all parties involved.

Rebecca described how getting involved in Mathematicians in Schools offers several benefits for the maths professional. Inspiring young people provides a sense of achievement, and involvement can improve links with the local community or perhaps with the school of one's own child. There are also direct benefits such as improving one's communication skills and even raising enthusiasm for one's own work.

Mathematicians in Schools partnerships have been set up in all Australian States and Territories. More information about the program, including online registration, is available on the website www.mathematiciansinschools.edu.au.

THE INFLUENCE OF PRECARIOUS EMPLOYMENT ON AGE AT FIRST CHILDBIRTH: SOME EPIDEMIOLOGICAL AND STATISTICAL CONSIDERATIONS

The August meeting of the South Australian branch was a special joint meeting with the Australasian Epidemiological Association. The speakers were Drs Emily Steele and Lynne Giles from the Life Course and Intergenerational Health Research Group at the Robinson Institute at the University of Adelaide. Emily and Lynne talked about a research project which aims to provide a better understanding of the barriers for women, and their partners, to having children if and when they would like to. The focus of the talk was how 'precarious employment' - a social construct describing an individual's employment uncertainty - in early adulthood influences age at first childbirth.

Emily described key aspects of the study and the ensuing dataset. A cross-sectional retrospective study was conducted based on an existing cohort of women who were born between 1973 and 1975 at the Queen Elizabeth Hospital (n ~ 1000). Data were collected using an innovative calendar instrument regarding life domains such as pregnancies, partnering, employment and education, over a 20 year life course period and at the month-level of detail. Emily explained that this level of detail across the time dimension offers unique opportunities to explore the impact of different patterns of exposure to precarious employment over time.

Lynne described the survival analysis framework used to study the relationship between employment arrangements and the timing of first childbirth, taking into account other influential factors. Two distinct types of Cox proportional hazard models were applied. Time-constant >>



South Australia Branch News cont.

models were used to investigate how the *accumulation* of time spent in various employment states impact on the age of first childbirth. Time-varying covariate models investigated whether there are sensitive periods of time during which exposure to different employment arrangements have greater impact on the timing of childbirth than at other periods. Since educational attainment is a known predictor of age at first childbirth, relationships were explored within separate educational strata.

Lynne presented results from a subset analysis based on 230 women, all of whom had completed high school. Time-constant analyses suggest that for women without a tertiary qualification, experiences of casual employment arrangements are associated with older age at first childbirth. There were no significant findings based on the time-varying analyses. Emily and Lynne are currently extending the preliminary analyses to include the entire dataset of around 700 women, which will increase the statistical power to detect effects and should reduce some of the problems they faced with model convergence.

A variety of conceptual and statistical issues have arisen in the course of the research. For example, Lynne discussed how graphical diagnostics based on scaled Schoenfeld residuals showed non-proportional hazards for some of the covariates included in the models. She then described how these covariates were incorporated in the Cox models as stratification variables, which addressed this issue. For the sensitive periods analyses, the choice of time periods for the aggregation of monthly level data was critical. Results were presented based on aggregation to three year periods (e.g. 18 – 21, 22 – 25 years old, etc). Future analyses may explore other options, such as categorising life periods according to time since completion of full-time education.

The investigation is the first stage of a larger program of work, and Emily outlined key aspects of this program. Elements include exploration of other life course models (such as a combined cumulative and sensitive period approach),

investigation of the role of different elements of economic uncertainty on age at first childbirth (such as the role of higher education debt, and delayed home ownership), and policy stakeholder interviews to gauge responses to analytical findings. Emily and Lynne concluded by highlighting that the fusion of existing analytical techniques with contemporary life course epidemiological approaches can help to address novel research problems.

STATISTICAL MODELS OF IMPACT OF WOOLPUNDA SALT INTERCEPTION SCHEME ON THE RIVER MURRAY

The September meeting of the South Australian branch welcomed Tony Meissner from the Riverland town of Berri. Tony works for the Department for Water as a scientist in the Resources Monitoring Team. He presented a talk on the application of statistical models to estimate the impact of the Woolpunda salt interception scheme implemented on the River Murray. Providing robust estimates of the impact is important given the considerable financial investment into the scheme.

Tony began his talk by describing the salt interception scheme which was developed 20 years ago to reduce the salinity of the River Murray. The scheme operates between Lock 3 and Holder, a region of South Australia where the surrounding groundwater is highly saline. By pumping out the groundwater in this region and disposing it at a distant location, the interception scheme lowers the groundwater gradient to the river and prevents the saline water entering the Murray.

Over the eight-year time period between 1992 and 1999 salinity measurements were taken hourly intervals at two sites: Overland Corner located 14 km downstream from Lock 3, and at Holder a further 26 km downstream. The relative level of salinity

at the two sites indicates the effectiveness of the salt interception scheme.

Tony presented a variety of plots illustrating how salinity levels are affected by the rate of flow of the river, with higher salinity recorded at times of lower flow. The plots also show how the salinity and flow measurements fluctuated over the eight-year data collection period. This period covered two distinct phases to the project: an initial four-year period when there was a draw-down of the groundwater level, followed by a phase when the groundwater level reached a steady state.

Tony presented three alternative linear mixed models for estimating the difference between salinity at the two sites as a function of the flow. All the models treated flow as a random effect and also accounted for the phase as a dependent variable. The three models differed in how the salinity measurements at the two sites were used as the dependent and independent variables. The first model regressed salinity at the Holder site against salinity at Overland Corner; the second model used the difference between salinity at the two sites as the dependent variable; and the third approach modelled all salinity measures but treated the site as a factor variable. While discussing the models Tony presented plots explaining the rationale of each model and fit diagnostics.

Tony concluded the talk by comparing the models in terms of the estimates of difference between salinity at the two sites. Interestingly, the models produced distinctly different estimates, but all of these estimates were considerably different from the results of a previous analysis which used a less sophisticated analysis approach. Following the talk Tony discussed with the audience further analysis work which could be undertaken.

Julian Whiting ■

VIC update

It has been another busy year for the Victorian Branch. We have an active Council of 9 representatives from government, business and academia, and have continued the pattern of recent years of a monthly seminar program throughout the academic year, with content that is accessible by a wide audience.

This year activities will continue right up until Christmas — normally we finish the year with the annual Belz lecture, in October (details of this year's Belz lecture are given below). On November 23rd, Professor Alan Zaslavsky from Harvard Medical School will talk about "*Small-domain estimation from statistics with measurement error*". In late December, the Victorian Branch and the Australian Mathematical Sciences Institute will host a public lecture by Professor Denise Lievesley, King's College, London; Denise is well-known for her advocacy of the use of empirical evidence in developing social policy.

Seminar topics over the past two years have covered many areas — including health, education, economics, sport, security, information sharing and statistical literacy — and illustrated a range of statistical techniques in the process — randomized controlled trials, index development, mixtures models, multiple imputation, among others. Seminars have consistently attracted good audiences including people from outside the Society.

Next year's program will be just as interesting — if you are in Melbourne, **keep the 4th Tuesday evening in the month free**, starting from 22 March 2011 when Nicole Watson, from the Melbourne Institute of Applied Economic and Social Research, will speak on "*Causes and effects of non-monotonic attrition in a panel study*". We start all meetings with light refreshments and conclude with dinner at a local restaurant, for those who wish to continue conversation with the speaker and Council members.

YOUNG STATISTICIANS PRESENT ...

In August, we showcased the talents of three of Victoria's young statisticians. The summaries of their presentations highlight the diversity of work in applied statistics. The August seminar coincided with the AGM of the Statistical Society of Australia Incorporated, and the presentations were enjoyed by local branch members as well as Central Council representatives.

Pete Hickey, a recent graduate from The University of Melbourne, works in the Bioinformatics Division at the Walter and Eliza Hall Institute of Medical Research. Pete's presentation was on "*X chromosome testing in genome wide association studies*". Genome wide association studies (GWAS) have revealed fascinating insights into the genetics of complex diseases. These studies provide many statistical challenges but one problem that has received surprisingly little attention is the testing of associations between phenotype and genotype on the X chromosome. Pete discussed the particular challenges of the X chromosome and presented some results of a simulation study designed to compare several proposed methods for the analysis of X chromosome data.

"*Skills Acquisition in Badminton: A Visual Approach to training*" was the title of Minh Huynh's talk. Minh is a Masters student in Statistics and Operations Research at RMIT.

Currently, there are a number of training programs that attempt to improve decision making and awareness in badminton. However, these programs are extremely limited, and do not provide athletes with the necessary improvements needed to optimise their in-game performance. In developing and improving decision making, the ideal strategy would be to expose the athlete to all possible situations and scenarios that they may face. This allows them to retain certain responses in their subconsciousness; leading their bodies to instantaneously select the appropriate action to take in similar situations. Minh provided an overview of an electronic training program being developed to improve reaction time

Victoria Branch
Sue Finch and
Carol Soloff



and awareness in badminton players. Using this program, Minh hoped to be able to identify the players' awareness and attempt to improve their in-game performance and decision making.

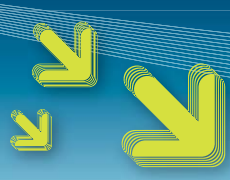
Martin Shield, a PhD student from The University of Melbourne, discussed the question of "*To check or not to check?*" in the context of inspection decisions. Consider an item which arrives at a check point, where it may be assessed against some benchmark before it can move on. Martin defined an "inspection decision" to be the choice between inspecting the item and allowing it to pass without inspection. Inspection decisions arise in many contexts. Examples include quality control in manufacturing, checking bags as customers leave department stores, and customs or quarantine inspections.

DEMOGRAPHIC FORECASTING USING FUNCTIONAL DATA ANALYSIS

The September seminar was presented by Professor Rob Hyndman, Professor of Statistics and Director, Business & Economic Forecasting Unit, at Monash >>



Professor Rob Hyndman after being awarded the Moran Medal for outstanding research in statistical science



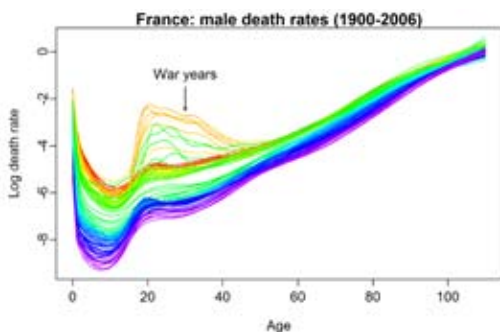
Victoria Branch News cont.

University. Rob is the co-author of *Forecasting: methods and applications*, a text widely used internationally and he has won numerous awards, including the Moran medal for Statistical Science in 2007, given to outstanding research by scientists under 40 years old.

Rob treated us to a very interesting presentation on demographic forecasting, talking us through a model that can forecast such measures as fertility and death rates, which then feed in to forecasts of populations and dependency ratios. A major feature of this modeling is that true prediction intervals can be calculated for the forecasts, and there is no need to select combinations of assumed rates for births, deaths and migration, as is done with official ABS projections.

As Rob pointed out, annual death rates, fertility rates and so on, when expressed as a function of age, are examples of functional time series (curves that are observed sequentially in time). Rob's presentation was about methods for describing, modelling and forecasting functional time series data.

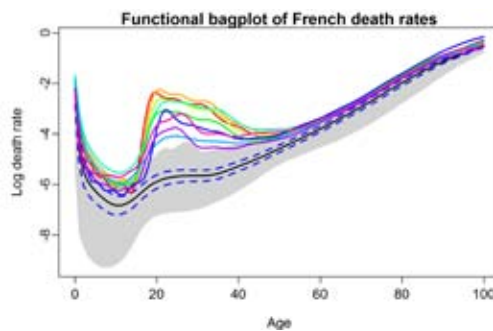
Rob plotted the log of the death rate by age, for each year 1900–2006, on the same graph (see below), where outliers were very apparent. The "rainbow principle" is used in the graph — red is used for the earliest year, moving through to violet for the latest year.



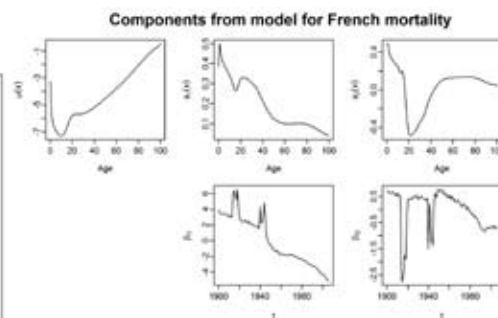
A dynamic version can be seen at <http://robjhyndman.com/researchtips/animations/>

Rob then applied a robust principal component algorithm to assist in the

development of a functional bagplot (this can be done using a package in R) as shown below, where the 95% confidence interval for the median is shown as dashed blue lines and the grey shaded area contains the data apart from outliers. The outliers are shown as individual colored curves. A similar process was followed to produce a functional HDR boxplot. Bagplots and boxplots are useful tools for identifying outliers.



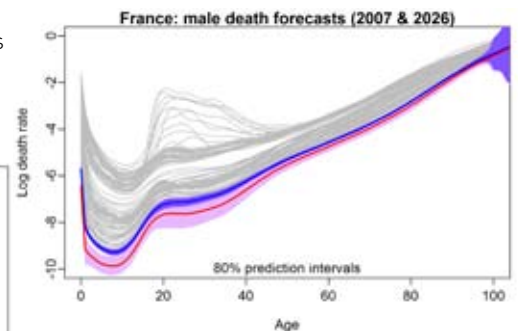
Rob outlined the functional linear model, which decomposes the data into time series coefficients and basis functions, and illustrated its use on these data. He showed graphs of the first and second basis functions which highlighted some of the characteristics of the time series (as shown below) – for example, significant wars showed as spikes in the graphs of the first and second coefficients by year.



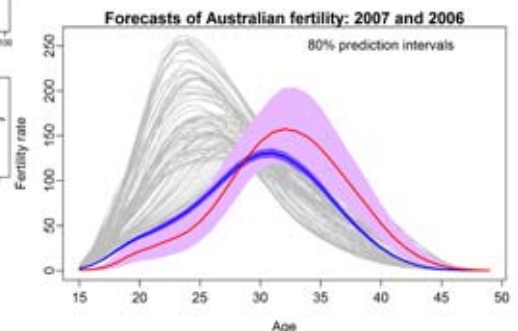
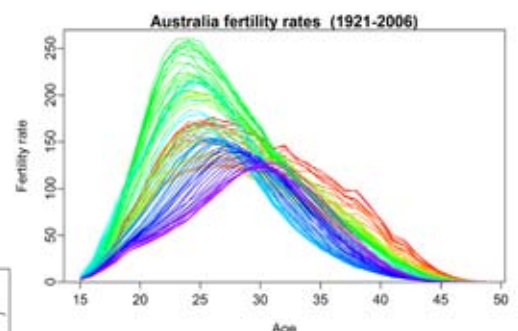
Rob then graphed the residuals for age by year (each time series curve is a vertical strip), looking for patterns which can indicate cohort effects.

Rob then moved on to look at functional forecasting, using the functional time series model. This led to the production

of mortality forecasts, as shown in the following graph, where the grey lines are the known rates, the blue line is the forecast for 2007, and the pink line is the forecast for 2026, with the relevant shaded areas the 80% prediction intervals.



Rob then went through the same process for Australian fertility rates. The first graph plots the known rates, and the second graph shows the forecasted rates and 80% prediction intervals for one year and 20 years hence. The forecasted values certainly look reasonable!

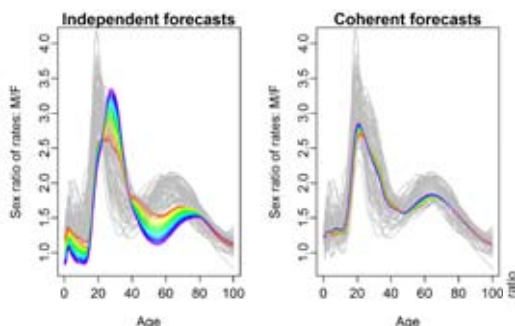


Rob went on to examine issues surrounding forecasting for related groups — for example, looking at both >>



male and female mortality. He noted that we expect the groups to behave similarly and want to make sure that the coherent forecasts do not diverge over time. But the existing functional models do not impose coherence. Rob's idea was to model the geometric mean and the mortality ratio, instead of the individual rates for each sex separately.

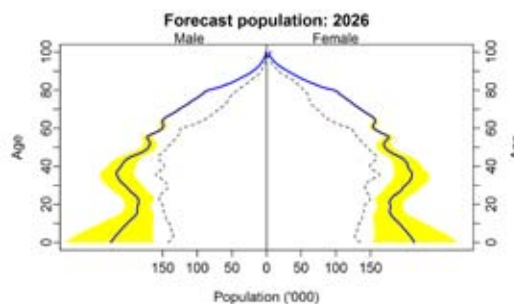
The following diagram compares the independent forecasts with the coherent ones – clearly illustrating how the coherent forecast ensures that the sex ratio of the rates stays within the historical ranges, as opposed to the independent forecasts which have periods and ages where the ratios take on values they have never had before.



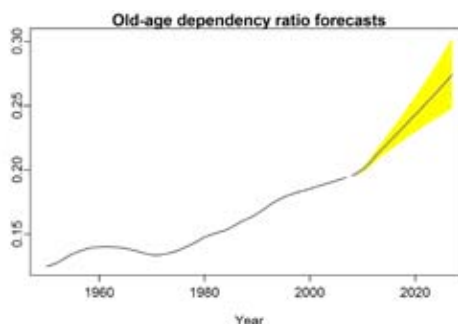
The final section of Rob's presentation moved on to population forecasting – as Rob said, "the fun stuff"! Starting with the demographic growth-balance equation, Rob then built a stochastic functional model for each of mortality, fertility and net migration. He treated all observed data as functional (smooth curves of age) rather than as discrete values, and used the models to simulate future sample paths of all components, giving the entire age distribution every year into the future. He then computed future births, deaths, net migrants and populations from simulated rates and combined the results to get age-specific stochastic population forecasts. (Rob noted that Australia has poor migration data at the age by sex level, but net migration can be derived by using births, deaths and population estimates.)

Applying all this to Australia, the following graph shows the forecast population

pyramid for 2026, along with the 80% prediction intervals; the dashed line is the actual population pyramid for 2006. The greater certainty for the older ages is of course due to the fact that most of these people are already there!



Old-age dependency ratio predictions can also be forecast – as shown in the following graph.



Rob concluded his presentation by noting the advantages of using functional data analysis to forecast age-specific mortality, fertility and net migration and stochastic age-specific cohort component simulation to forecast such demographic quantities and provide prediction intervals: a) there is no need to select combinations of assumed rates on which to base the forecast; and b) true prediction intervals can be obtained for the population and all derived variables, such as life expectancy, old-age dependencies etc. Rob is very keen to discuss his ideas with the ABS!

Rob's talk was followed by many questions from the audience, with our discussions continuing over dinner. For more details

of Rob's presentation, including a number of references, the slides can be viewed at <http://robjhyndman.com/talks/demographic-forecasting/>. Rob's website also contains considerable other material of interest.

Sue Finch and Carol Soloff 



**Western Australia
Branch**
WA Branch Committee

WA update

WA Branch members have recently received interesting talks from Michael Burton (August), Yun Li (September) and Felix Chan (October).

Michael Burton is professor at The University of Australia's School of Agricultural and Resource Economics, with a keen interest in Freakonomics. Michael opened debate into current trends of plagiarism in higher education, where there are many websites offering to complete student assignments for a fee. Who then among the student demographic is willing to pay that fee, what role do the consequences and likelihood of getting caught out play, and do "good" essays attract a price premium?

The illicit nature of the plagiarism "industry" means that students would be reluctant to reveal their past behaviour directly. A choice modelling approach with hypothetical choice experiments revealed that students were willing to pay up to \$400 an assignment, a willingness that declined with essay quality, risk, penalty and the ability of the student.

Dr Yun Li from CSIRO Mathematics, Informatics and Statistics gave the September branch talk with the title *A statistical downscaling model for southern Australia winter rainfall*. Dr Li has a statistical academic background and works in the fields of climatology and oceanography at CSIRO and the Chinese Academy of Sciences.

The downscaling model presented uses pressure patterns over a large geographical area to predict rainfall at local sites, in this case southern Australia. The first four principal components calculated from the pressure data are shown to adequately provide skill in predicting rainfall when used in a regression model. The rainfall predictions from this principal component regression based downscaling model are an improvement on the current raw climate model values and can be used to predict future rainfall based on trusted pressure forecasts. The model forecasts a continued reduction in rainfall for southern Australian sites later this century.

Dr Li showed that at least two of the pressure indices formed by the principal components appear to have nonlinear relationships with rainfall and he outlined ongoing work that can account for this nonlinearity.

Felix Chan is Associate Professor at the School of Economics and Finance, Curtin University of Technology. From his experience as a financial econometrician, Felix spoke of practical issues in the field such as choices of data frequency, the structure of noise and discrete versus continuous time models.

Felix presented how a maximum entropy density (MED) can be used to approximate the standardized residuals from an ARMA-GARCH model applied to assets traded in often highly volatile financial markets.



Rainfall data collected by the Bureau of Meteorology was analysed by CSIRO statisticians to create the SWAC index.

This results from the Quasi-Maximum Likelihood Estimator (QMLE) with normal density for the ARMA-GARCH being consistent and asymptotically normal under mild conditions. These models can then be used to calculate the one day ahead Value-at-Risk (VaR), and compared with other GARCH methods such as Maximum Entropy. Some issues relating to the Maximum Entropy approach were discussed including assumptions about the moments varying with time. Felix gave empirical results using data from four different exchange indexes.

The WA Branch is looking forward to seeing the large influx of statisticians into Perth for the ASC and OZCOTS conferences, and hopes to welcome all SSAI members here in December. On an off-beat, we have an Egyptian themed Christmas party on 30th November to put us in the mood for the festive season.

WA Branch Committee ■

Keep in touch with SSAI through our website

www.statsoc.org.au



Statistical Society of Australia – Home

<http://www.statsoc.org.au/>

Google

Design Direction Tabs Search...s and OLGA Apple .Mac Amazon eBay Yahoo! News (726) Apple (174) ABC Online



MEMBER LOGIN AREA

member #

password

LOGIN

RECOVER PASSWORD



The Statistical Society of Australia, Inc., represents Australian and overseas statisticians, providing an umbrella organisation for Branches in six States and Territories. The objective of the Society is to further the study, application and good practice of statistical theory and methods in all branches of learning and enterprise.

- ▶ HOME
- ▶ ABOUT US
- ▶ MEMBERSHIP
- ▶ SECTIONS
- ▶ BRANCHES
- ▶ EVENTS
- ▶ PROFESSIONAL ACCREDITATION
- ▶ YOUNG STATISTICIANS
- ▶ PUBLICATIONS
- ▶ RESOURCES
- ▶ CONTACT US

SEARCH

REGISTER FOR
EVENTS ALERTS

UPCOMING EVENTS

VIEW ALL EVENTS

ASC 2010

Statistics in the West

6 - 10 Dec 2010, Fremantle

MORE INFO

ASC2010 AUSTRALIAN STATISTICAL CONFERENCE
Statistics in the West: UNDERSTANDING OUR WORLD



6-10 December 2010 Esplanade Hotel, FREMANTLE, Western Australia

MEMBERSHIP BENEFITS



SSAI offers the opportunity to establish a network of national and international contacts throughout industry, government and academia. SSAI members have access to local and interstate events and conferences, receive four quarterly newsletters and four issues of the Australian and New Zealand Journal of Statistics. Members are kept up-to-date on the latest developments in the field of statistics.

SIGN UP

MORE INFO

YOUNG STATISTICIANS



The aim of the Young Statisticians' Network, an Australia-wide group, is to give early career statisticians and students studying statistics the opportunity to meet their peers. It provides a venue for the discussion and sharing of statistical work as well as career and academic guidance. Each state runs programs throughout the year, and a special Young Statisticians Conference is held every two years.

FIND OUT MORE

ARE YOU ACCREDITED?



SSAI offers a professional accreditation scheme, only available to its members. The Accredited Statistician (AStat) qualification indicates to the non-statistical community that its holder has achieved an acceptable level of professional competence in the area of statistics. For statisticians at an earlier stage in their career the Graduate Statistician (GStat) scheme is available.

BECOME ACCREDITED

[Home](#) | [About Us](#) | [Membership](#) | [Sections](#) | [Branches](#) | [Events](#) | [Professional Accreditation](#) | [Young Statisticians](#) | [Publications](#) | [Resources](#) | [Contact Us](#)

[Privacy Policy](#) | [Refund Policy](#) | [Security](#)
Copyright 2008 Statistical Society of Australia Inc | Website by LCubed

PUBLIC LECTURE

Professor PERSI DIACONIS

The Search for Randomness

FREE
Register your interest in
attending at
promaco@promaco.com.au

ESPLANADE HOTEL, 8 pm on 8 December 2010



PERSI DIACONIS

Mary Sunseri Professor of Mathematics and Statistics
Stanford University USA

Mathematician, statistician AND magician

What does it mean to say something is "random"? Persi Diaconis will take a close look at some of our most primitive images of random phenomena: tossing a coin, shuffling cards, and rolling a roulette wheel. While all these processes can achieve randomness, usually we are lazy. A bit of math and experiment shows that things are not so random after all.

At 14 Persi Diaconis had finished high school when he was invited by Dai Vernon, *the greatest magician in the US*, to go on tour with him. Diaconis dropped out of school and left home without telling his parents. At 16 he struck out on his own as a magician and did well doing magic, inventing tricks, giving lessons and living a very colorful life. When he came across a book on probability that he couldn't read he decided to enrol in a mathematics degree. He graduated two and a half years later. He has been at Stanford since he completed his PhD in 1974.

"The way I do magic is very similar to mathematics. Inventing a magic trick and inventing a theorem are very, very similar activities . . . One difference between magic and mathematics is the competition. The competition in mathematics is a lot stiffer than in magic."

Persi Diaconis, who is one of the world's most famous mathematicians, is well known for his talks on popular mathematics to non-specialist audiences. Come and enjoy an evening with him. Enquiries 9332 2900 or promaco@promaco.com.au.

He will be visiting Perth as an invited speaker at the Australian Statistics Conference and OZCOTS, the Australian Conference on Teaching Statistics (www.promaco.com.au/2010/asc/).

ASC2010 AUSTRALIAN
STATISTICAL
CONFERENCE
Statistics

in the **West: UNDERSTANDING OUR WORLD**

