The cases for and against an ISI strategy on accreditation of statisticians

Discussion Paper

This document explores the case for and against the ISI formulating and adopting strategies relating to the professional accreditation of statisticians. It may serve as a base for the debate for formulating an ISI strategy on accreditation of statisticians. The authors appreciate to receive feedback on the ideas in this paper.

The value chain

Information and knowledge contribute to decisions and actions

Most scientific research gathers data and uses statistical methods to analyse the results and generate findings. Ongoing operations in application fields as diverse as government, commerce, industry, finance, medicine, geography, sport, etc. result in an even greater volume of data being gathered and analysed. “Big data” including data arising from static and dynamic images, monitoring of natural and physical processes, and internet traffic are increasing dramatically in number and economic importance. Data gathering and analysis is fundamental to the creation of information, and the subsequent formation of knowledge. Knowledge and information, together with other factors, some tangible such as resources and capacity, and some intangible such as wisdom and judgement, can lead to decisions and actions which generate better outcomes. Questions arise: to whom should the stewardship, evaluation and interpretation of these data be trusted?

Statistical data and analysis contribute to information and knowledge only when they are trusted and used

Data and analysis finding only contribute to information and knowledge if they are accepted, and used appropriately. Appropriate use can only occur if the consumers of the statistics understand the need for quality statistics, and are able to assess that quality. Producers of statistics can help by making information about the quality of their data and analyses available, but the reality is that most consumers of statistics (in a sensible division of labour) will often delegate that judgement to the producer of the statistics, and decide whether or not to accept and use results based on the level of trust they have in the organisation or individual who produces them.

Competence contributes to trust

Trust is essentially an emotive judgement about relationships and behaviours built up or damaged over a period of time. However two important tangible prerequisites for trust in the
source of statistics are:

1. The integrity, ethics and independence of the producer, and
2. The competence of the producer

Competence can be assessed at the organisational and at the individual level. Even though organisational factors are important, one significant contributor is the competence of the individuals who are part of the organisation. And individual competence is obviously important if the trust is being placed directly in an individual, either by the end consumer or by an organisation which employs them to produce statistical data, analysis and research findings for subsequent delivery to end consumers, be they internal or external to the organisation.

**Education/training and expertise both contribute to competence**

In this context competence is about applying statistical methods and analysis in other fields of endeavour. It is subtly but importantly different from competence in undertaking fundamental research into statistical methodology in and of itself. It requires practical experience and expertise relevant to the use of statistics and statistical methodology in a particular field, as well as appropriate knowledge acquired from suitable education and training in statistics.

**The urgency**

The challenge of assessing the statistical competence of individuals producing statistics and analyses is becoming more urgent. IT developments have made data collection more feasible and software packages have made the application of statistical methods far more accessible. Individuals who lack an appreciation of the important issues underlying both data collection and statistical analysis can inadvertently (and often with the best intent) produce misleading conclusions and findings.

**The case for a role for the ISI in professional accreditation**

The ISI Mission is to promote the understanding, development and good practice of statistics worldwide. There is already a strategy about:

Fostering the appreciation in governments and the public at large of the true value of Statistics and statistical methods to all aspects of human endeavour.

There is an approved ISI Declaration of Professional Ethics. The Shared Professional Values declare explicitly that the value Professionalism implies Responsibility, Competence and Expert Knowledge and that we (statisticians) are continuously learning both about our own field as well as those to which we apply our methods.

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And there are strategies about:

- Promoting excellence in statistical research and research training.
- Promoting excellence in statistical education.
- Promoting excellence in the practice of Statistics.

The core purpose of an accreditation policy would be to support the ISI Mission. If successful it would also benefit employers of statisticians, and ISI members themselves. It could be a useful and practical way of implementing aspects of all these existing objectives.

However the merits and effectiveness of any professional accreditation policy would be diminished in the absence of success in raising government and public awareness of the true value of statistics. Without sufficient public appreciation of the value of statistics, and the dangers of poor and misleading analysis and data, there will be no acknowledgement of the need for competent statisticians, and no “market” for accreditation.

At least 4 National Statistical Societies have implemented voluntary professional accreditation schemes, the RSS (1993), the SSAI (1996), SSC (2004), and the ASA (2010). More details are available in Attachment 1. The ISI, through Ada Van Krimpen, has been participating in teleconferences between these 4 societies, which have discussed the processes and state of advancement of these schemes. The most recent teleconference was in June 2012.

The ISI’s position as the pre-eminent international statistical society would differentiate it from the professional accreditation schemes of National Statistical Societies, and offers the opportunity to add additional value to the profession of statistics, at an admittedly greater challenge.

The activities which ISI could take in regard of professional accreditation range over:

- Facilitate discussion amongst those National Statistical Societies (NSS) which have implemented or are interested in implementing an professional accreditation scheme
- Encourage all NSSs to consider adopting a professional accreditation scheme
- Establish a model process for NSSs who decide to implement a professional accreditation scheme
- Compare, contrast or even coordinate the professional accreditation standards which are established by NSSs
- Establish and recommend model professional accreditation standards to be adopted by NSSs
- Validate or accredit the professional accreditation processes adopted and implemented by NSSs
- Validate or accredit the professional accreditation standards implemented by NSSs
- Implement an ISI professional accreditation scheme
The case against—or proscribing—a role for the ISI in professional accreditation

Accreditation should be meaningful and relevant

*Meaningful* refers to the capacity of the accreditation process to distinguish superior or good performance from that which is mediocre or poor. *Relevant* refers to the value of the accreditation to the persons, organizations and societies served by accredited statisticians. These factors urge the premise that accreditation should be the responsibility of national or regional statistical associations expected to be more in tune with the expectations and needs of clients and society and the comparative capabilities of statisticians within the society.

Is (international) accreditation for statisticians needed and appropriate?

Certification is foundational in medicine (“board certified surgeon, psychiatrist, internist, …”), accounting (“certified public accountant”), and auditing. It could be argued that board examinations in law serve the purpose of certification. The pharmaceutical industry is looking into accreditation of pharmaceutical statisticians. But, most disciplines do not offer/use/require professional certification.

The ASA material about accreditation draws a distinction between mandatory “certification” (defined as a (legal) pre-requisite to practice a profession), and voluntary “accreditation” (defined as something which provides a measure of assurance to employers, contractors and collaborators of statisticians, and a mark of accomplishment to society at large about the professionalism of statistics and statisticians). Legal certification is not what is under consideration, but even so there are still many in the profession who question the value of accreditation, even at the national level.

Is international accreditation right for statistics, particularly at this stage of its national development?

Is accreditation relevant to organisations which employ large numbers of statisticians?

All the authors have experience working in (large) National Statistical Organisations. There seems to be a fairly widespread view amongst that community that accreditation is more likely to be of direct value to:

1. professional statisticians who work alone (eg consultants, or a lone statistician in organisations with a different primary focus)
2. professional statisticians who frequently work for different employers (eg consultants)
3. employers who only require statistical services infrequently

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Large (statistical) organisations such as NSOs provide their statisticians will in-depth professional training arguably as intensive as that related to national certification. The issue raised is whether accreditation is of value to, appropriate for, or desired by government statisticians and their employers.

More broadly this poses the question as to whether accreditation is of value to any organisation which makes substantial ongoing use of statisticians, and hence is already in a position to form judgements about the skills and professionalism of its current and potential employees?

**International accreditation within or across sub-specialities of the profession?**

For NSO’s, the international exchange of ideas, advances, and staff most frequently occurs with other NSO’s, ie within the sub-speciality of statistics known as Official Statistics. It seems plausible that the same may be true of other sub-disciplines of statistics, such as clinical trials in the pharmaceuticals industry. Currently national level accreditation schemes attest to the professionalism of statisticians within nation, but across specialities.

(As an aside, this lack of specificity may be confusing for unknowledgeable potential employers. In the case of the SSAI scheme it is dealt with via the ethical requirement on the accredited statistician to not provide advice outside their particular area of statistical expertise and competence.)

This poses the question, would international accreditation add more value to potential employers if it provided assurance and comparability across nations, but within sub-specialities? Of course, this could exacerbate the apparent fragmentation of the statistics profession in the eyes of the general public, which is not seen as desirable. However if “within sub-speciality across nation” accreditation were judged important, there then arises the substantial challenge of how this might be implemented in practice.

**A direct role in accreditation of statisticians would overwhelm ISI capabilities**

Is the effort sufficiently worth the burden? Can ISI shoulder this burden?

**Accreditation is often associated with increased membership fees**

Is the effort sufficiently worth having ISI enter that arena in these economic times?

**Recommendation**

ISI is invited to provide a clearing house of information and a forum for international discussion on accreditation.
There may come a time in the future when it would be worthwhile pursuing some of the more advanced/intensive options listed above.

Such a time will not arrive until there is a stronger and more demanding public awareness of the value of statistics, and the pitfalls of poor statistics. At this time any additional ISI effort would be better spent on strategies to increase this awareness, such working in a coordinated way with National Statistical Societies around the world to raise awareness of the value of statistics.

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*July 2012*

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**Attachment 1: References to Existing National Statistical Society accreditation schemes**

**Royal Statistical Society**


Chartered Statistician

Chartered Statistician (CStat) is the Society’s highest professional award. It provides formal recognition of an individual's statistical qualifications and professional training and experience. It was established on 1 January 1993, following the merger of the Royal Statistical Society and the Institute of Statisticians on that date.

The CStat award is a well regarded designation for professional statisticians and has clear benefits for professionally active statisticians and the wider professional world in which they work.

The general requirement for CStat status is an approved degree (or equivalent) and approved professional training and experience for at least five years. Those who have an appropriate degree but do not yet have the required training and experience may apply for Graduate Statistician status.

Full details of the requirements and information on how to apply are contained in the CStat applicants notes for guidance. The CStat application form is also available for download. These documents can also be obtained from the Society (email to qualifications@rss.org.uk).

Chartered Statisticians are required to abide by the Society's code of conduct. They are also expected to adhere to the Society's continuing professional development policy. A maintained
professional certificate is optionally available to give formal recognition of engagement in continuing professional development activities. At the end of 2011 the Professional Affairs Committee, which manages the professional awards, decided to introduce revalidation for the award.

Chartered Statisticians pay an additional subscription in addition to the basic annual rate. Full details can be found in the subscriptions section of our website. There is no charge for the application process.

Chartered Statisticians are eligible to apply for Chartered Scientist status. Please follow the link, which takes you to our own section on Chartered Scientist status.

Statistical Society of Australia (Inc)


What is Professional Accreditation?

Background

Following a lengthy consultation process with members, the Statistical Society of Australia Inc. (SSAI) instituted a scheme for accrediting statisticians in 1996. The necessary changes to the Rules and Regulations were endorsed at the 1996 Annual General Meeting of the SSAI.

The relevant regulations apply. The key elements of these are summarised in this Information Sheet.

The prime objective of the Accredited Statistician (AStat) scheme is to indicate to the non-statistical community that the holder has achieved an acceptable level of professional competence in the understanding and application of statistical methods and is bound by the Code of Conduct of the SSAI. It is important to the reputation of the statistical profession that only those persons who satisfy the specified criteria are accredited, otherwise the reputation of our profession is at risk. A member with the qualification of Accredited Statistician may use the abbreviation AStat.

The SSAI recognises that there will be relatively inexperienced but qualified statisticians who want some recognition to support their professional world. For this reason, we have introduced a Graduate Statistician (GStat) scheme. The GStat qualification is intended primarily to indicate that the holder has recently completed a course of study equivalent to a degree course with a Major in Statistics, including Graduate Diplomas.

To be able to apply for Accreditation, applicants must be members of the SSAI.

Evaluation of Applications

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An Accreditation Committee has been established to make recommendations to Council about applications for accreditation. The Committee comprises six members chosen to represent the Branches and interests of the Society, the statistical profession and various areas of statistical expertise. Except for the initial Committee, Committee members will serve for three years, with two members retiring each year.

The Accreditation Committee (or a sub-committee of it) will assess all applications on the basis of information provided, and reports by referees. The Committee reserves the right to seek additional material if it is felt desirable.

The recommendations of the Committee are sent to Council for approval. Explanations for non-acceptance will be made and are provided to applicants when notified in writing of the outcome.

Criteria for Accreditation as AStat

Accreditation as an Accredited Statistician is based on a combination for formal qualifications in statistics, relevant practical experience and demonstration of professional competence. At the time of application for accreditation, candidates must be actively involved in the practice of statistics. Holders of the Accredited Statistician qualification must meet at least one of the following requirements.

1. A pass degree of equivalent with a Statistics component equivalent to that of second or third level Statistics subjects or Mathematics majors in Australian universities, plus six years practical experience in applying statistics;

OR

2. A first or second class honours degree or equivalent in Statistics or in a subject containing substantial coverage of statistical methods or theory, plus four years practical experience in applying Statistics;

Graduate Diplomas in Statistics, depending on their origin, may fulfil the degree requirement under one or other of the above two categories. In the course requirements in 1. or 2. above, the Accreditation Committee shall judge the acceptability of the standard and level. Under exceptional circumstances applicants may be accredited who do not fulfil either of the degree requirements above, but who can demonstrate both a breadth of knowledge and understanding of both theoretical and applied Statistics equivalent to at least the degree requirement of the second category above, and at least ten years practical experience applying statistics.
Criteria for Accreditation as GStat

Holders of the qualification of Graduate Statistician shall meet at least the degree requirement of 1. above, provided no more than eight years have elapsed since the award of the degree or equivalent of requirement 2.

Maintenance of Accredited Qualification

Accredited qualification is rescinded on cessation of membership of the Society, but restored on resumption of membership of the Society within five years of membership cessation.

An accredited member may choose to terminate accreditation. Accreditation may be reinstated at the discretion of the Committee and Council, subject to the maintenance requirement below.

Accredited Statisticians shall provide to the Accreditation Committee every five years, including any years of cessation of membership of the Society or accredited membership a summary of their activities in those five years, to demonstrate at least continuing contact/involvement with statistics and the practice of statistics appropriate to them, plus the name of one referee to be contacted if the Committee so desires. The Committee will take into account temporary interruptions to employment including those for parental leave. The re-accreditation form is available to download as a pdf or Word document.

Appeals

An appeal against an unsuccessful application for accreditation may only be made on the basis of procedural error. An applicant has four weeks from the date of receipt of notification of the unsuccessful application to lodge an appeal with the Society Secretary. The appeals will be considered by the Executive of the Society. Their decision will be final.

Code of Conduct

Accredited Statisticians are required to comply with the SSAI's Code of Conduct. Those who do not in the opinion of the Accreditation Committee, comply with the Code of Conduct may be subject to disciplinary action.

Confidentiality

Applications and maintenance reports may be accessed by the Committee during considerations but are stored confidentially. Part or any of their contents may be released only with the consent of the member concerned. In the case of an appeal, Executive of the Society may also access the papers relevant to the appeal.

Disciplinary Issues

Accreditation may be revoked by Council, on the recommendation of the Accreditation Committee.
Committee if, in the opinion of the Accreditation Committee, an Accredited Statistician as refused or neglected to comply with the provisions of the SSAI's Rules, has wilfully acted in a manner prejudicial to the interests of the SSAI or the statistical profession, including non-compliance with the Code of Conduct, or has supplied incorrect information in an application for accreditation or maintenance.

A member whose accreditation has been revoked may appeal by lodging a notice with the Secretary of the SSAI within 7 days of receipt of notification that it has been revoked.

SSAI Accreditation Committee

July 2008

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At 19 June 2012 there were 116 SSAI financial members with current AStat status and 25 members with GStat status. Of all the members listed in the database (including expired memberships or expired AStat or GStat status), 136 have had AStat Accreditation and 68 have had GStat Accreditation.

An application costs AU$220 for AStat status, and AU$66 for GStat. A partial refund is made for unsuccessful applications. Annual fees are AU$44 for AStat, and nil for GStat.

University courses can be accredited, and this provides graduates with automatic status as a GStat, on application to SSAI.

Statistical Society of Canada


It is with great pleasure that the Statistical Society of Canada (SSC) announces the formal establishment of the program of SSC Accreditation for professional statisticians who practice in Canada. The Board of Directors of the Society approved the SSC Accreditation procedures on March 20, 2004.

Levels of Accreditation

The Statistical Society of Canada offers two levels of accreditation, the Professional Statistician (P.Stat.) and the Associate Statistician (A.Stat.). The qualification of A.Stat. is intended to indicate that the holder has completed a course of study equivalent to a major or honours degree in statistics, or in exceptional instances, has otherwise demonstrated an advanced understanding of statistical theory and its application. The qualification of P.Stat. is...
intended to indicate that the holder has the necessary academic qualifications and a minimum of six years of professional experience in the application of statistics.

Recognizing accredited individuals

A certificate of accreditation level and licensee number are issued to recipients of accredited status. The certificate indicates that the holder adheres to ethical practice, as defined by the SSC Code of Ethical Statistical Practice. The accredited statistician may affix the received designation to his/her list of professional qualifications.

Benefits of Accreditation

A summary of the benefits of Accreditation are available in a short brochure which can be used to advertise the existence of accreditation to prospective applicants and employers.

American Statistical Association

http://www.amstat.org/accreditation/index.cfm

Welcome to the ASA accreditation web page.

If you are considering applying for accreditation, please read the information below, then fill out the request for application form. This does not create any obligation, and you do not have to be an ASA member to complete this form, but you will need to join the ASA in order to actually apply for accreditation. Shortly after you submit the form, we'll contact you by email about how to apply. To see the elements of and the instructions for an application form, click here.

Accreditation brings value both to members of the profession and to those who benefit from the work of professional statisticians.

Viewed from the profession, accreditation testifies that there is a body of knowledge known as Statistics, that accredited practitioners of Statistics must be well versed in that knowledge at an advanced level, and must have applied it competently and ethically through practice for several years. And as rapidly as the theory and practice of Statistics evolves, so must professional statisticians continually stay abreast of new developments in their areas of expertise.

One does not have to be accredited to have these qualities, of course, but accreditation is one witness to the wider world that statisticians are professionals, akin to architects, doctors, engineers and lawyers.

Why is this important?

Many issues that have an impact our daily lives, such as our health and safety, our work, our standard of living, and the policies of our governments are crucially influenced by Statistics.
the collection, analysis, presentation and interpretation of quantitative data in the presence of uncertainty. Sound statistical practice informs sound decisions, leading to better policy and better outcomes. Incorrect or unethical use of Statistics can produce misleading results, poor advice and worse choices.

That is, the practice of Statistics is a job for skilled professionals. Accredited statisticians have been recognized by their peers as combining education, experience, competence, and commitment to ethics at a level that labels them as professionals. Accreditation provides a measure of assurance to employers, contractors and collaborators of statisticians, and a mark of accomplishment to society at large.

ASA accreditation is a voluntary credential offered to ASA members that provides peer recognition for all of the following:

• Having advanced statistical training and knowledge

• Having experience in applying statistical expertise competently

• Maintaining appropriate professional development

• Agreeing to abide by ethical standards of practice

• Being able to communicate effectively

The ASA’s accreditation program is modeled after programs in Australia, Canada, and the United Kingdom. Accreditation is a portfolio-based rather than an examination-based credential, and is renewable every five years. Accreditation is also voluntary; applicants seek accreditation because they believe the credential is worthwhile to them, but it is not a requirement for practice.

Accreditation applicants will submit materials to be reviewed by members of the ASA Accreditation Committee, peers who will evaluate submissions based on the ASA’s Guidelines for Accreditation. Those who meet these guidelines will be awarded the designation “accredited professional statistician.”

There is a fee to apply for and an annual fee to maintain accreditation. $85/yr

We invite all interested persons to read these guidelines and to provide comments, questions, and suggestions. While we will not be able to respond directly to all comments and questions, we will use them to shape future decisions and to prepare an FAQ on accreditation.

There are 166 ASA accredited PSTAT as at Jul 1 2012

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That includes 2 ex or incoming ASA Presidents and 1 Founders Award recipient

The scheme began as a pilot in Jun 2010 and became fully active in Jan 2011

ASA Accreditation costs US$85/yr