

ISI: Towards the 21st Century

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This article provides information about the current activities of the International Statistical Institute (ISI) and some of its future plans. As the world academy of statisticians, with its about 1900 elected members and the nearly 3500 additional statisticians working in its Sections – representing about 100 countries – ISI provides an interface to statisticians active in three key arenas: academia, governmental statistical activities, and the private sector. With its envisaged World Numeracy Program ISI, in addition to its traditional role in advancing the frontiers of statistical methods and applications, wishes to assist in the spreading of quantitative skills among all strata of the populations over the world.

1. Introduction

The International Statistical Institute (ISI), with its rich history, dates to the mid-1800s. An overview of the developments and an evaluation of the manifold ISI experiences would be too voluminous to be given here. Nevertheless, the ISI activities envisaged for the 21st century are best understood against the backdrop of their history.

1.1. The beginnings of ISI

The ISI is among the oldest international organizations, if not the oldest. Before its establishment in its present form in 1885, the predecessor organization of the Institute, the International Statistical Congress (ISC) had already been very active. The ISC was the initiative of Adolphe Quetelet from Belgium who promoted it at the 1851 World Exhibition in London's Crystal Palace. The first meeting of ISC was held in Bruxelles in 1853. It seems that only astronomers have a similarly long history of organized and formal international cooperation (Quetelet was also an astronomer).

There are good reasons for this similarity between astronomy and statistics. From early on astronomers from different countries understood the necessity of pooling their observations to map the heavens as seen from the different geographic angles. Statisticians also recognized, certainly by the end of the 1600s (as can be seen from the works of Gregory King and Sir William Petty), that they too had to pool data from different nations to map international economic and social conditions. (Petty and King were especially interested in comparing England with France and Holland.)

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1.2. The present state

Since 1851 international statistics have become a complex worldwide system. This system involves international organs such as the United Nations and its specialized agencies (FAO, ILO, UNESCO, WHO, etc.) as well as important regional organizations (OECD, the European Union, etc.). ISI, of course, belongs to the former category as both its wide membership and its activities (such as the biennial Sessions) cover the five continents. As discussed below, ISI worldwide coverage is somewhat uneven and this constitutes one of the challenges the Institute is trying to meet.

A unique feature of ISI's work is the attention paid to interfacing the three main categories of statisticians: those working at academic institutions; those active in the governmental and intergovernmental statistical agencies; and those involved in statistical tasks in the private sector.

1.3. Plans for the future

As described below, the plans of ISI involve further improvements in all of its traditional activities such as membership services, conference services, publications, research activities, and support services to its Sections and committees. In addition, special attention is now devoted to the integration of the statistical profession, which is increasingly sub-specialized and to the promotion of quantitative skills amongst all population strata in various countries. Nearly all ISI activities are coordinated with other international and national statistical organizations. Such cooperation frequently adds new dimension to the work and involves support from other organizations to the work of ISI. In this article, without going into great detail, references to such cooperation with other organizations are given regarding conferences, publications, research activities, etc.

2. World Membership

The two principal categories of ISI membership are the ordinary, or elected members and the ex-officio members. The latter category involves mainly chief statisticians of national and international statistical agencies, who hold their membership on account of their official position and can maintain such membership during their tenures as agency heads. In contrast, the ordinary members (who need to be nominated by five earlier elected members of the Institute), once elected, can maintain their memberships for the duration of their lives.

The distribution of the ISI membership by geography (continents) is shown in Table 1.

All in all, about 30 countries supply nearly 90% of the total ISI membership, while the remaining 60 countries provide approximately 10% of the total. Some countries, 6 of which have populations over 50 or even 100 million (such as Turkey, Indonesia, or the Ukraine) have only one, two, or three ISI members. Fourteen other countries also belong to this group, and they also have populations over 10 million (for example, Algeria, Cameroon, Chile, Colombia, Iraq, Kenya, Malaysia, Morocco, Portugal,

Table 1. *Elected ISI members by continents (October 1994)*

Africa	53
Asia	248
Australia	57
Europe	843
North America ¹	603
South America ²	38
TOTAL	1842

¹ Canada, the U.S.A., and Mexico² Including Central America and the Caribbean

and Venezuela). The level and intensity of statistical activities, of course, varies among countries. Nevertheless, it has been brought to our attention that in the majority of these countries deserving candidates could be found if the proper efforts are made.

Recently, in connection with the 7th Meeting of the Heads of National Statistical Services of East Asia held in Tokyo in October 1994, a tabulation was made about ISI membership in the countries represented at the meeting (Table 2).

The numbers speak for themselves: only 10% of the ordinary members of ISI come from the East Asian countries listed (percentages for the ISI Sections are similar). This is a very low percentage not only in terms of the population weight of East Asia in the world total, but also relative to the economic, cultural, and political significance of these countries in today's world. Moreover, some of the ISI members shown by nationality in Table 2 live – more or less permanently – in North America and Western Europe. However, it is hoped that as a result of the efforts now under way by the 2001 Session of the ISI (envisaged to be held in Seoul, Korea) statistical tables similar to Tables 1 and 2 above will show a more balanced distribution of the membership across continents and regions.

Good candidates from the developing countries, including the former socialist countries of Central and Eastern Europe, are sometimes unable to pay the ISI membership fees (or make hard currency remits for this purpose). For this reason the ISI

Table 2. *East Asian membership of ISI (October 1994)*

Japan	107
Brunei	—
China	47
Indonesia	3
Korea	11
Malaysia	2
Philippines	10
Singapore	1
Thailand	1
SUBTOTAL	182
Australia	54
Canada	93
USA	356
TOTAL MEMBERSHIP	1842

Executive Committee has agreed to provide extraordinary status to new members from these countries, if so requested. Such members are exempted for five years (extendable to three additional years) from paying their membership dues. These members have all the privileges of membership (voting rights, electability to office, reduced conference fees, etc.) however, receive only one ISI publication per year (the Annual Report on International Statistics, together with a calendar of conferences).

3. Conference Services

From its inception, ISI has organized well known meetings for its worldwide membership on a rotating basis in various countries of the world. These meetings – called Sessions – follow a well established pattern and the next one will be the 50th Session of the Institute (there were no Sessions held during the two World Wars). Recent Sessions were held in Tokyo (1987), Paris (1989), Cairo (1991), and Florence (1993). The Paris and Florence Sessions were particularly well attended (with about 1500 participants at each). In 1995 the Session will be held in Beijing and in 1997 in Istanbul. For 1999 the ISI Council agreed to hold the Session in Helsinki (pending final approval by the General Assembly in Beijing). Regarding 2001 the ISI Council warmly welcomed the interest of the Korean Statistical Association to hold the Session in Seoul. Preliminary contacts have been established for possibly organizing the 2003 Session in Germany and the 2005 Session in Australia. The ISI Council, at its last meeting, encouraged the German initiative, welcomed the Australian interest, and requested the Permanent Office to continue explorations about these matters. All Sessions involve significant activities by the National Organizing Committees regarding the meetings and the ensuing publications.

In addition to the Sessions which take place in odd-numbered years, specialized meetings are now held in even-numbered years. In 1992 a conference was organized on statistical confidentiality in Dublin and in 1994 on the long-term perspectives of international statistics in Voorburg. For 1996 a conference on timeliness and accuracy of economic statistics is under preparation in Washington, D.C. These conferences are organized in cooperation with national agencies in the locations in question (the Central Statistical Office in Ireland; Statistics Netherlands and the Central Planning Bureau in The Hague; the Bureau of Economic Analysis of the U.S. Department of Commerce in Washington, D.C.) as well as with international organizations (EUROSTAT has been involved in all three conferences mentioned).

Most recently the ISI Executive Committee decided to introduce in the future smaller-scale meetings called “Cutting Edge Conferences,” where latest research results on important topics of current interest will be discussed. Also, explorations are under way to develop and refine the publications which present applied work at ISI Sessions and in ISI publications. It is also envisaged to feature statistical work in biometrics, econometrics, psychometrics, and other areas of quantitative research and to regularly cooperate with organizations such as the International Biometric

Society, the Econometric Society, the International Standards Organization and others. It is hoped that by the 1997 Session of the ISI in Istanbul the program will reflect the increased emphasis of such contributions.

4. Publications

ISI publications go back to the 19th century. The volumes of the *Bulletin of the ISI* contain a veritable historical record of research reports and overviews of international statistical activities covering more than a hundred years. The volumes of the *Bulletin* (typically four volumes) are published every second year, in connection with the Sessions of the ISI.

The flagship journal of the ISI, the *International Statistical Review* (ISR) appears three times a year. It aims at a broad range of theoretical and applied statistical topics and wishes to provide reviews of wide interest to statisticians. Beginning with the first issue in 1995, in addition to the members of the ISI, all Sections will also provide this benefit to their members. This expansion of the services is made possible by the generous help of the Mexican statistical office (INEGI) which started printing the periodical in 1995.

The *Statistical Theory and Method Abstracts* (four issues per year) provides worldwide coverage of published articles on mathematical statistics and probability. The number of periodicals from which the articles are abstracted is considerable and comes from a large number of countries. ISI's *Short Book Reviews* provides a rapid book review service covering books on statistical and related subjects published throughout the world (three issues per year). The *ISI Newsletter*, which is published three times per year, provides an up-to-date account of the ongoing activities of the ISI and the Sections. These periodicals are under continuous review in order to improve each publication from the editorial viewpoint as well as regarding their format and attractiveness. As ISI moves towards the 21st century, the contents and the look of the publications are being adjusted to the changing requirements of the times; also electronic publishing options may become important additions to the currently available formats.

There are also important specialized periodicals published by the Sections of ISI and their number is growing, for example, the newly started *Bernoulli Journal*. A listing of these publications would go beyond the space available in this short review. However, the importance of these periodicals is already great in the ISI family of organizations and it is likely that additional Section publications will be borne during the next decade. ISI also publishes, from time to time, books and occasional papers and studies. The *Dictionary of Statistical Terms*, originally by Kendall and Buckland (first four editions) and more recently by Marriott (fifth edition), is probably the one most widely known. Within the Institute, of course, much use is made of the *Directory of the ISI* which lists members, national and international statistical agencies, and national and international statistical societies. Recently the *Directory* has been printed with the assistance of the Federal Statistical Office of Germany. The *Occasional Papers and Studies* series covers topics such as the description of the international statistical system (by W. Begeer); events of historical interest in statistics; ISI's research activities in population (by S. Kotz); the tasks of

integration of the statistical profession (by Z. Kenessey), etc. A recent addition to ISI's publications is the *Annual Report on International Statistics* which provides an overview of statistical activities for the past year and of plans for the subsequent year both within ISI and outside it. This new publication is printed and distributed with the help of the French national statistical office (INSEE).

5. Specialization and Integration

Traditionally ISI has been involved in promoting the specialized interests of groups of statisticians in the field of theoretical statistics, statistical computing, survey statistics, official statistics and statistical education: the existence of the specialized ISI associations is evidence of such an emphasis. Also, it has been recognized, especially since the Warsaw ISI Session in 1975, that efforts are needed to provide more interfacing and integration within the profession, including the increasingly narrow sub-specialities. In general, the work of the ISI towards specialization has been more successful than the work towards integration.

The intellectual and organizational gains from integration are expected to be important additions to the gains of specialization. The potential intellectual advantages of integration are, of course, quite obvious (if not easy to realize). With respect to organizational matters, a number of points can also be made. Among others, there being strength in numbers, in modern societies where many professional groups compete for resources and influence, a better integrated, more cohesive statistical profession has a greater chance of getting its messages across. The medical profession, for example, is quite specialized and has many journals and professional associations serving its needs. Yet, at least in the U.S.A., the American Medical Association provides a powerful interface for doctors and wields considerable influence in the interest of the entire medical profession.

Since the Florence Session of ISI the following measures to foster integration stand out:

- a. The designation of one of the ISI Vice Presidents as responsible for enhancing ISI relationships with the Sections;
- b. The work on the ISR to make it a true flagship journal of ISI which can command wide interest among statisticians. Editorial policy changes occurred (such as increased focus on review articles) as well as organizational measures have been taken (offering considerable space in the Review to Section contributions, appointing associate editors from Sections);
- c. Bringing the Section Presidents – and other Council members – as much as possible, to between Session ISI meetings (such as the 1994 March and September meetings of the EC/Council);

Recently a number of additional measures were approved:

- d. To provide, beginning in 1995, the ISR free of charge to all members of the ISI Sections (until now only ISI and Bernoulli Society members received it);
- e. To provide, beginning in 1994, the new ISI publication entitled *Annual Review on International Statistics* free of charge to every ISI and Section member.

Provision of the publications is made possible, in large part, owing to the generous help of INEGI (Mexico) and INSEE (France) by printing these publications for ISI. However, certain other costs related to the four items listed need to be covered from ISI's budget. This additional cost is estimated at approximately 20,000 Dutch Guilders per year. It was agreed to include these costs in the 1995 ISI budget for the sake of furthering the integration process discussed above.

Attention, of course, continues to the needs of specialized groups of statisticians. Many of their professional needs are taken care of by the five ISI Sections, namely:

- Bernoulli Society for Probability and Mathematical Statistics;
- International Association for Statistical Computing;
- International Association for Official Statistics;
- International Association for Statistical Computing;
- International Association of Survey Statisticians.

In addition, the ISI has various bodies which handle subjects not covered by the Sections. For example, there are the following committees: the Committee on Statistical Applications in Industry; the Gregor Mendel Committee on Agricultural Statistics; the Sports Statistics Committee; the Christiaan Huygens Committee on the History of Statistics; the Gerardus Mercator Committee on Geographical Information Systems; the Environment Statistics Committee.

6. Research

For financial reasons, the special ISI research group on population matters had to be discontinued in 1991, but the ISI research function has been maintained. In order to uphold prudent management of ISI resources, only projects with dedicated funding can be undertaken.

The materials of the Dynamic Data Base (DDB) – with significant help from UNFPA – have been archived and a CD-ROM edition of the public use surveys regarding fertility was published. The long-standing activities concerning statistics of large towns (in abeyance since 1971) have been resumed in cooperation with a number of interested bodies (UNSTAT, Habitat, IULA, and NUREC) and currently a large survey of cities is being conducted and processed at NUREC headquarters in Duisburg. Work has resumed on the multilingual glossary of statistical terms.

Attention has been paid to several important historical events and anniversaries, such as: the centenary of the International Classification of Diseases (first adopted at the Chicago Session of the ISI in 1893) which was commemorated jointly with WHO in Geneva in 1993; the 80th anniversary of the ISI Permanent Office in The Netherlands and the 50th anniversary of modern national accounting work both of which were celebrated in cooperation with Statistics Netherlands. ISI has initiated, at the meeting of the last two sessions of the UN Statistical Commission, activities to commemorate the 50th anniversary of the statistical work in the UN System in 1995.

In addition to commemorative events, shorter or longer papers have been prepared on historical subjects. Recently work has started on a roster of the "Great Statisticians of the Centuries". A book, to be edited by Professor Heyde, will be published which will deal with the greatest statisticians of the world since the 1600s. ISI receives important support for this activity from the Japanese Statistical Association. Other activities connected to research include explorations about life expectancy and the future of statistics and the activities of the ISI Education Center (ISEC) in Calcutta. The activities of ISEC are supported by the Government of India as well as UNESCO.

The ISI and the U.S. Bureau of the Census are sponsoring an annual lecture to commemorate and advance the work of W. Edwards Deming, an outstanding and long-standing member of ISI who died last year. The lectures will be held at the Census Bureau's Annual Research Conferences and the full published lecture paper will be distributed internationally.

It should be mentioned that another famous ISI member, the recently deceased Jan Tinbergen, will be commemorated as well. The awards given in the ISI Competition for Young Statisticians from the Developing Countries have been named the "Jan Tinbergen Awards." The competition is held before each ISI Session and is supported by The Netherlands. Three winners receive a 5,000 Dutch Guilder prize, travel costs and per diem to the ISI Session, an opportunity to present their papers at the Session, and the publication of their papers by ISI. The first competition and prizes will be held at the Beijing Session in 1995.

7. World Numeracy Program

The fight against illiteracy in the world – under the leadership of UNESCO – has achieved considerable success. Illiteracy is usually accompanied by weak quantitative skills. To strengthen quantitative skills in areas and populations which are most sorely in need of such knowledge, the ISI is establishing a World Numeracy Program (WNP). The program is needed because familiarity with the elements of quantitative thinking is as much a requirement of contemporary society as literacy. Nevertheless, the need for quantitative literacy is far less recognized and appreciated than the need for verbal literacy.

The ISI, as the international academy of statisticians, has promoted the development of the statistical sciences and scientific data collection practices since the organization's inception in the 19th century. Now, in view of the weaknesses observed in quantitative skills in many parts of the world, in addition to its more traditional tasks, the ISI wishes to mobilize its elected members (over 1800 persons) and the members of its Sections (about an additional 3200 persons) for establishing the WNP.

To achieve these goals various projects for a World Numeracy Programme are being explored, with special emphasis placed on young people. The programme is in many ways analogous to UNESCO's World Literacy Programme, albeit on a smaller scale. The creation and international dissemination of a series of television programmes, entitled "The World of Numbers" is being explored. Due to the ambitious nature of these undertakings, a time frame of at least three to five years

will be required for the implementation of the projects in WNP, depending on funding.

National numeracy programs are envisaged as parts of the overall effort and the cooperation of national statistical societies and national UNESCO committees is sought.

8. ISI Niches

In addition to the activities currently undertaken, the ISI wishes to promote greater cooperation among those statisticians – both within countries and at the international level – who today toil in a somewhat disjointed fashion in academia, in governmental institutions, and in the private sector. No other organization is focusing on this task but for the ISI it is an important concern.

Another niche in the ISI program is the advising of statistical policy makers about the current intricacies and the future possibilities of the entire international statistical system. Over the years the system has grown tremendously and its complexity can be baffling to newly appointed chief statisticians, especially if they come from academia, other fields of government, or the private sector. Therefore in recent years ISI has organized Briefing Seminars for new senior statisticians; from 1995 these seminars will be also part of the TES (Training European Statisticians) program of EUROSTAT. Further along these lines, a conference was held in September 1994 on the long-term future of international statistics. A volume including the studies prepared for this conference will appear in 1995. In recent years, the ISI has also spent considerable effort in promulgating a code of ethics for the statistical profession. This code is now widely accepted as a guiding norm internationally. On a related matter, the role of statisticians in today's world, a committee chaired by Professor Moriguti developed an important document, which was published in the *International Statistical Review* in December 1992 and was discussed at a special meeting at the 1993 Session of the ISI held in Florence, Italy.

9. Permanent Office

It has been long recognized that in order to provide a solid underpinning to the ISI activities, the Institute requires a stable headquarters. In 1993 the Permanent Office of ISI celebrated its 80th anniversary in The Netherlands. Statistics Netherlands (The Netherlands Central Bureau of Statistics) has been the host of the Permanent Office since 1913, first in The Hague, and in the last two decades in Voorburg. Statistics Netherlands has been a key supporter of ISI activities for more than eight decades. As already mentioned, ISI activities enjoy the help of numerous other national and international statistical organizations regarding organization of meetings, carrying out research activities, publishing ISI periodicals and other studies, etc. Nevertheless, during several years in the 1980s ISI was confronted by serious financial and administrative challenges. Fortunately, during the last three years it was possible to eliminate the financial deficits which threatened the future

of the Institute. Nevertheless only through continued fiscal prudence and close interaction with the international statistical community can ISI activities remain effective for furthering the goals of the ISI charter.

10. Conclusions

The ISI is entering the 21st century with the intention of maintaining its time-tested activities regarding membership services, conference services, research activities, publications, etc. At the same time, it also plans to enlarge its membership and expand its coverage and activities especially in Asia and those other regions of the world which are, as yet, less well served by the ISI. ISI also intends to increase its attentiveness to statisticians in the private sector and to interfacing statisticians in academia, government, and the private sector in new ways. While continuing its efforts to serve the needs of statisticians working in various specialized and sub-specialized areas through its Sections and committees, the promotion of the integration of the statistical profession is a task of high priority as the Institute moves towards the new century.