

A CHARACTERIZATION OF STATISTICIANS BY GENDER IN SEVERAL COUNTRIES

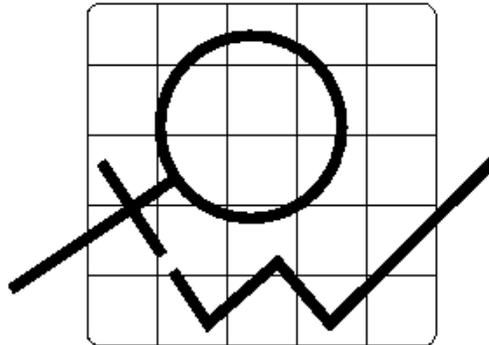
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1. SUMMARY

This is the final report of the project entitled "A Characterization of Statisticians by Gender in Several Countries", which the ISI Committee on Women in Statistics (referred to as CWS, or simply the Committee) decided to undertake in 1997.

The questions posed in the project formulation stage were:

- *What is meant by women statisticians (WS)?*
which includes the following questions:
 - *How many WS are there?*
 - *What do they have in common?*
 - *Where are they working and what are they doing?*

The authors hoped to find answers to such questions, and the initial aim of the project was to draw up a set of indicators for comparing the basic characteristics of women statisticians in various countries. The indicators proposed in the project were simple algorithms.

The project implementation entailed two stages because of operational problems. The first stage involved the search for answers to the questions mentioned above and the elaboration of selected indicators. It required mobilizing members of the ISI or its Sections, along with other colleagues in many countries. Despite the hard work done at this stage, there were many problems that could not be overcome with the resources available.

When the project was restarted, the target set for the second stage was to make recommendations to the Committee that could be useful for its future action in the light of its terms of reference. The Committee discussed the progress of this project on three occasions before presenting this Final Report.

It needs to be recognized that gender characterization is not an easy undertaking, as deep-seated prejudices held by some interlocutors need to be overcome. Investigating statistics by gender arouses attitudes of rejection in many situations.

This project received support from INDEC (National Institute of Statistics and Census) of Argentina, ECLAC (Santiago, Chile), ISI, Statistics Australia and a large number of women statisticians from many countries who participated in the project.

2. OBJECTIVES AND PROPOSALS OF THE PROJECT

This project related mainly to the following three objectives of the CWS:

- *to promote and strengthen the representation of women statisticians in the ISI and its Sections;*
- *to collect information on women in the statistical professions in different countries, and to facilitate the flow of information among women statisticians;*
- *to support the compilation of statistics on women, with a view to generating relevant studies concerning women's roles in the various activities in their countries.*

The project's objective can be summarized as aiming to answer the basic question - *What is meant by women statisticians?* This is a complex question, and the CWS decided to take specific action to find some answers to it.

There were certain features in the proposal that made it particularly interesting, including:

- it required appealing to colleagues in many countries;
- it helped to make known the creation of the CWS and its activities;
- it could have a mobilizing effect;

The essence of the project consisted of four specific and fundamental proposals:

- *to produce* in each country participating in the project the same set of simple and easily interpreted indicators;
- *to identify* the WS population targeted by the project in each country, along with the complementary MS population;
- *to determine* in each country the range of variation of each of the four variables indicated in the project and to apply the simple algorithms described therein;
- *to take up* the project in a mode similar to that applied in preliminary planning, i.e., extracting the utmost from the available information since there were no resources for special additional research.

3. PROJECT DEVELOPMENT

i) METHODOLOGY

From the conceptual standpoint, the project aimed to study the population of professional statisticians engaged in statistical activities in the different countries.

The population of women statisticians (WS) in each country consists of:

- a) Elected women members of ISI;
- b) Women members of one or more ISI sections, other than elected ISI members; and
- c) Other women professionals who participate in statistical activity in their country.

Male statisticians (MS) are the essential comparison population, consist analogously of:

- a) Elected male members of ISI;
- b) Male members of one or more ISI sections, other than elected ISI members; and
- c) Other male professionals who participate in statistical activity in their country.

The WS population thus defined is closely related to the country's educational, social, economic, juridical, political, institutional and other conditions. Thus, identifying that population is not a simple matter that can be approached using a standard search criterion applicable to all countries, but involves the life experience of the inhabitants of the country and those participating in the project.

There is general consensus that the typical statistician in one country is not strictly comparable to that of another country. It would be helpful, therefore, to devise a set of basic indicators with which to characterize the respective WS and MS populations in each country.

The project document proposed a battery of 12 indicators with simple algorithms that permit immediate interpretation, with which to prepare the characterizations.

The key features identified as desirable for characterizing women and men statisticians in each country were:

- *What is their initial degree training?*
- *In which sector of statistical activity of the country do they work professionally?*
- *What level of responsibility or hierarchy do they reach at work?*
- *What level do they reach in the salary scale pertaining to their professional activity?*

These four features gave rise to the following four concepts, which the document refers to as VARIABLES:

- Area of knowledge
- Sector of statistical activity
- Responsibility level of post held
- Earnings bracket in professional activity

The set of indicators proposed in the project document is given in Appendix 1.

ii) CREATION AND COORDINATION OF LOCAL GROUPS

The project involved the participation of many women members of the ISI. The group responsible for general co-ordination (GCG) made contact with over 60 colleagues from a similar number of countries. Just under 40 of them agreed to act as co-ordinators in their country (LGC), convening the respective local group (LG) and directing the tasks undertaken in accordance with the criteria set out in the project document.

The first replies were received from colleagues in a number of Eastern European countries (Slovenia, Hungary, Albania, the Russian Federation) and some from Asia. It is worth drawing attention to the efforts of several LGCs who agreed to cover a group of countries with few or no ISI members (Francophone African countries, Commonwealth Caribbean countries, English-speaking African countries).

Some developed countries responded positively without much delay (Italy, Finland, Sweden); in other cases, despite several attempts, it was impossible to find anyone willing to act as LGC (Great Britain, Japan). It was also impossible to find anyone in China.

It should be noted that, despite the high standards of current communications technology, it was more difficult in 1997 and 1998 than it is today to send and receive messages by e-mail. As a result, the time it took to locate LGCs meant that LG activities could not begin simultaneously in all countries.

These communication difficulties, plus delays in convening LGs in the different countries, compounded by a lack of organized information on statisticians in the different countries and other local factors, gave rise to complex coordination problems. As the delays in carrying out the tasks built up, the pace of work began to slacken in some LGs, and not all LGCs were able to submit their national reports in time for inclusion in the general report presented in 1999 in Helsinki.

Appendix 2 gives the list of local group coordinators (LGC) and other contacts for this project and shows the international scope of this report.

In each country a lively discussion was generated by the LG concerning:

* What is meant by a statistician?

* The need for a gender-based quantification of professionals engaged in statistical activities.

The GCG considers it highly productive that these discussions were generated, even though it has proved impossible to respond clearly to what was asked for in the country reports.

iii) CONCLUSIONS FROM THE COUNTRY REPORTS

The main points made in the eight most complete national reports are given in Appendix 3.

Based on the national reports presented by the LGs, the situation may be summarized as follows:

- In most countries, WS work mainly in the production and dissemination of statistics, although there are some important exceptions.
- Most statisticians working in higher-level teaching and research are men.

The information we have does not enable us to infer the causes for this. A survey that covers the work and family situations, besides the professional situation and in-depth analysis would be required to study the causes for this situation.

4. QUALITATIVE OPINION SURVEY

RATIONALE

Besides the quantitative approach established at the outset of the project, the GCG considered it very important to highlight the concerns raised by the LGs and create a means to enable women statisticians associated with the project, to express themselves on the issues that motivated it.

Accordingly, although from the outset it was intended to listen to women statisticians through a quantitative analysis or by interpreting the indicators proposed, it was subsequently decided to listen to them more directly through views expressed in a qualitative questionnaire circulated by GCG. The questionnaire sought the reasons for the poor representation of women in the ISI and its sections.

In other words, the aim was to address the practical considerations that would need to be taken into account in order to make recommendations to guide the Committee's future decision-making.

The responses to the questionnaire distributed amongst the LGCs in each country was as follows:

- Some of them responded by consolidating the opinions of their LG in a single questionnaire.
- Others only gave their personal opinions.
- Others asked women statistician colleagues in their country to answer one questionnaire each, with the result that there are more than one questionnaire per country.

It needs to be made very clear that the opinions expressed by the respondents are personal, and in no way represent the opinion of all the women statisticians in the country. The country itself is taken into account in the analysis because its type and characteristics provide important information for characterizing the answers.

Among the respondents to the questionnaire there were elected members of the ISI, members of one of the ISI sections and a few who are not members of the ISI or its sections. Obtaining the views of this last group through the questionnaire proved to be very useful.

The ISI needs to publicize its activities better to attract more women, especially from developing and transition countries. In the latter countries, there is a lack of awareness of the ISI and the benefits from joining it, and a perception that the benefits are not commensurate with the cost of membership and the difficulties in attending ISI sessions. Cultural traditions in the Eastern countries and the 'glass ceiling' in Western countries tend to hold back women statisticians in their professional careers and from participation in institutions such as the ISI. There are many women statisticians who could be candidates for ISI membership.

A copy of the questionnaire is given in Appendix 4.

5. CONCLUSIONS AND RECOMMENDATIONS

Initially it has to be admitted that the question "What is meant by women statisticians?" which gave rise to the project in the first place, still has no valid answer for the different countries participating, and goes beyond the simple gender division. In each country, the answer has its own scope and content and is closely related to the country's general conditions of organization and operation.

First Conclusion : Support efforts to increase the participation of women in the ISI. *Recommendations:*

- Encourage elected ISI members to boost the participation of female candidates in the activities of the ISI.
- Take actions to identify WS eligible for election as ordinary ISI members. Such actions could be carried out by appointing elected ISI members to be responsible for a region or country in this regard.
- Encourage ordinary members of each ISI Section to interest women members, distinguished by their qualifications, their participation in Section activities and so on, to apply for admission as elected members of ISI, and offer them sponsorship.
- As professionals in statistics can join ISI Sections on their own initiative, the most effective method of arousing their interest would be to run publicity campaigns on the benefits of joining these sections. Such campaigns could be based on the successful experience of such a campaign in a country and repeated in other countries with the adaptations necessary to the local conditions.
- The positive actions of the CWS should continue:
 - sponsor candidates from developing, transition or emergent countries
 - offer assistance with the application forms to all those WS applying for membership in the ISI.
- It would be useful to undertake a more in-depth analysis focusing on groups of professionals that are homogeneous in terms of the activity sectors in which they carry out their statistical activities. This could be done using a questionnaire to investigate variables that relate not only to the professional situation but also to work and family situations.

Second Conclusion : Promote WS participation at the regional level *Recommendations:*

- Take actions that will help improve the geographic balance in the membership of the ISI and its Sections, between the different regions of the world.

Third Conclusion : Request the ISI authority to incorporate gender into ISI records
Recommendations:

- It should be mandatory in the ISI and its Sections to compile and process gender information at the time of membership registration, presentation of papers, participation in events etc.,

Fourth Conclusion : Publicize information about the ISI and its activities in every nation of the world, especially in developing countries.

Recommendations:

- Support any action by any academic sector for fostering statistical literacy among social communicators.
- Publicize ISI activities in universities, statistical research and consultancy centres, and at central statistical agencies.
- Establish links with serious scientific magazines and journals to expand knowledge about the ISI and its activities, beyond its membership.
- Taking advantage of the globalization process, developed countries should share the progress they have already achieved with the developing, transition or emergent countries.
- Disseminate articles and documents of interest.
- Promote discussion forums

Fifth Conclusion : Creation of a world NETWORK of men and women statisticians
Recommendations:

- Set up a NETWORK of men and women statisticians with the objectives of :
 - Making known the activities of ISI and its Sections
 - Up dating members about events and statistical activities
 - Linking members with similar thematic interests and concerns
- The network could be based on the LOCAL GROUPS of the CWS project that agree to participate. These LGs would form the basic nucleus for sustaining the network. Although the basic network nucleus should be formed by WS, it should also expand to MS.
- Each LG should act as NETWORK propagators in their respective country.

Appendix 1.

PROPOSED INDICATORS

QUESTIONS		INDICATORS
INDICATOR 1: Which is the area of studies (VAR 1) that has the highest frequency in the "WS population"?		I(1): the area i of VAR 1 maximizing $[\text{WS}(\text{area } j)/\text{TWS}] \times 100$
INDICATOR 2: Which is the area of studies (VAR 1) that has the highest frequency in the "MS population"?		I(2): the area i of VAR 1 maximizing $[\text{MS}(\text{area } j)/\text{TMS}] \times 100$
INDICATOR 3: Which is the sector of statistical activity (VAR 2) that has the highest frequency of the "WS population"?		I(3): the sector i of VAR 2 maximizing $[\text{WS}(\text{sector } j)/\text{TWS}] \times 100$
INDICATOR 4: Which is the sector of statistical activity (VAR 2) that has the highest frequency of the "MS population"?		I(4): the sector i of VAR 2 maximizing $[\text{MS}(\text{sector } j)/\text{TMS}] \times 100$
INDICATOR 5: Which is the level of responsibility (VAR 3) that has the highest frequency in the "WS population"?		I(5): the level i of VAR 3 maximizing $[\text{WS}(\text{level } j)/\text{TWS}] \times 100$
INDICATOR 6: Which is the level of responsibility (VAR 3) that has the highest frequency in the "MS population"?		I(6): the level i of VAR 3 maximizing $[\text{MS}(\text{level } j)/\text{TMS}] \times 100$
INDICATOR 7: Which is the interval of income (VAR 4)(according to the income distribution of the country) that has the highest frequency in the "WS population"?		I(7): the i-th interval of income maximizing $[\text{WS}(j)/\text{TWS}] \times 100$

INDICATOR 8: Which is the interval of income (VAR 4)(according to the income distribution of the country) that has the highest frequency in the "MS population"?	I(8): the i-th interval of income maximizing $[MS(j)/TMS] \times 100$
INDICATOR 9: Which is the highest responsibility level (VAR 3) reached in the "WS population"?	I(9): the highest level of VAR 3 corresponding to at least one "WS"
INDICATOR 10: Which is the highest responsibility level (VAR 3) reached in the "MS population"?	I(10): the highest level of VAR 3 corresponding to at least one "MS"
INDICATOR 11: Which is the highest income level (VAR 4)(according to the distribution of income in the country) in the "WS population"?	I(11): The highest interval of VAR 4 corresponding to at least one "WS"
INDICATOR 12: Which is the highest income level (VAR 4)(according to the distribution of income in the country) in the "MS population"?	I(12): The highest interval of VAR 4 corresponding to at least one "MS"

Appendix 2.

LIST OF LOCAL GROUPS COORDINATORS (LGC) AND OTHER CONTACTS OF CWS PROJECT IN SEVERAL COUNTRIES

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Appendix 3.

THE MAIN POINTS MADE IN THE EIGHT MOST COMPLETE NATIONAL REPORTS

ARGENTINA

- The population is significantly large, and most statistics professionals are women.
- The leading areas in which the WS and MS populations are engaged are, firstly, higher-level university teaching and research, which accounts for 46%; and, secondly, the production and dissemination of statistical information, involving 36%. The consultancy sector accounts for a mere 4%.
- The gender composition of these groups, shows a preponderance of WS over MS in two sectors of statistical activity: teaching and official statistics.
- The fact that women account for a majority of the statistics profession does neither mean they hold high-ranking posts nor high income levels. These are largely held by men.

CROATIA

- Although it was impossible to obtain qualitative information on the WS and MS populations, or on the variables requested, LG members considered it illustrative to offer some personal opinions.
- No Croatian university offers degree courses in statistics.
- There are very few professional statisticians that graduated abroad.
- Statistics teaching tends to be done by mathematicians or specialists in the field of study in which statistics are applied.
- The situation is similar as regards statistical consultancy work.

EGYPT

- The WS and MS populations on which they reported are mainly found in the production and dissemination of statistical information in the official domain, which accounts for the majority, and higher university teaching and research which involves substantially fewer professional statisticians. No data are supplied on the statistical consultancy sector, but it is explained that this activity is carried out by private firms and research centres working in conjunction with universities, and they need approval from the Central Agency of Official Statistics to release data.
- In general, women are a majority, but women statisticians are heavily concentrated in the middle-ranking and operational responsibility levels.
- As regards sectors of statistical activity, most women are engaged in the production and dissemination of statistical information, while higher university teaching and research is mostly done by men.
- Generally speaking, the top responsibility levels are achieved by few statistics professionals but shared equally between women and men.
- As regards income levels, the situation is similar to that of responsibility levels mentioned in the previous point.

FINLAND

- The WS and MS populations referred to in the national report correspond to professionals working in Statistics Finland who hold a university degree. They are engaged in statistics production and dissemination. Both populations are similar in size. They come largely from the social science area of study, including statistics, economics sociology, etc.
- Although there are no data on professional statisticians working in university teaching and research, it is reported that most are men, and generally speaking they hold a university degree in statistics.
- The quality and quantity of information on professionals engaged in statistical consultancy work is poor.

FRANCE

- In France, statistics is not a recognized profession as such. · It is difficult to specify the size of the WS and MS populations.
- Advanced training in statistics is generally given as part of broader courses: mathematics, medicine, economics. Other professionals undertake statistical work:
 - "Fundamentalist" specialist theoreticians, particularly engaged in research.
 - Producers of data in public statistics. Priority given to data quality.
 - Econometricians, quantitative sociologists.
- The WS and MS universe in public statistics is easier to specify, although not all its staff have higher-level statistical studies.
- As regards data on the two populations, in public statistics 77.2% of women graduating from ENSAE are employed in the National Institute of Statistics and Economic Studies (INSEE) and other public-sector bodies, while 58.3% of men graduating from that organization are similarly employed.

GREECE

- Information is supplied only on the sizes of WS and MS populations working in the different areas of the Greek Statistical Institute. The gender distribution of those populations is 24% women and 76% men.

HUNGARY

- Studies of this type aimed at characterizing the WS and MS populations face two major obstacles:
 - There is no precise definition as to what a statistician is.
 - There is little data on this subpopulation. Nonetheless, there are several important information sources.
 - Firstly, the 1997 ISI Directory shows that most Hungarian members of ISI are men. - Then there is the Hungarian Statistical Association, membership of which is 56.9% WS and 43.1% MS, according to 1998 data.
 - Another source of information is the National Register of Expert-Statisticians which has 57 members altogether, of whom 39 are women. It is worth mentioning also that members of this register are also in the Hungarian Statistical Association.
- Some conclusions are that:
 - The majority of WS and MS populations are engaged in official statistics activities.
 - There are fewer opportunities for women. There is no wage equality between the sexes.
 - The report suggests to undertake research on a homogeneous group, for

example statistics teachers in university and colleges. The use of a voluntary questionnaire, based on standardized contents and precise definitions would make it possible to analyse variables such as: professional level, age, work experience, continuity of employment (and job changes), average time, family status, professional range, etc.

SLOVENIA

1. The WS population predominates over the MS population, accounting for 80% of the total, according to the data provided. Statistics is a predominantly female occupation in Slovenia.
2. Concentration by sector of activity is particularly strong in the production and dissemination of statistical information. As many as 98% of WS and 85% of MS work in this sector.
3. There are significant gender differences between statistics teachers in universities and secondary schools. University statistics teachers are predominantly men (75%), whereas women predominate in secondary schools, although to a lesser extent.
4. The background of Slovenian statisticians is firstly social sciences (60% WS and 40% MS), and secondly natural sciences. It is important to make clear that there are no specific statistics courses available in the country.
5. Generally speaking, MS tend to be employed at technical levels relatively more than WS, who mostly work at operational levels.

Appendix 4

QUALITATIVE QUESTIONNAIRE SECTION

A consists on a block of questions relates to ISI and its Sections:

- Q.1 - Are you or is anybody in the Local Group an ISI member?
- Q.2 - Are you or is anybody in the Local Group a member of any ISI Sections? If the answer is YES, please state which (IASS , IAOS , IASC , IARUS , Bernoulli Society , IASE)
- Q.3 - Are the activities of the ISI and its Sections known in your country? Please substantiate your answer.
- Q.4 - Do you know if there are any ISI section coordinators in your country? If so, which?
- Q.5 - Do you think there is any circumstance that could be an obstacle to statisticians joining ISI as ordinary members? (e.g. economic reasons, lack of information or contacts, or any other. Please specify).
- Q 6 - What could you say about female presence and participation in statistics at the professional level in your country?

- Q.7 - In your opinion, are there women statisticians at graduate or postgraduate level with well known performance and experience who could be candidates for ordinary membership of ISI?
- Q.8 - What is your opinion of the general panorama of women in leading professional roles in your country at the present time? (managerial level, academic level, official statistical area, researchers, etc.)

SECTION B seeks information on "academic centres offering statistics training at graduate or postgraduate level"

SECTION C enquires about "Associations of professionals in statistics"

SECTION D E-mail addresses of respondents and members of the LG

SECTION E Personal and job information from the respondents.