

Note e commenti

Italian Society of Statistics

History and Development¹

History

The Italian Society of Statistics (Società Italiana di Statistica, SIS) was founded in 1939, nearly one century after the foundation of two of the most distinguished and ancient statistical societies: the American Statistical Association (1839) and the Royal Statistical Society (1834). It should be noted, however, that after the Napoleonic crisis and the Restoration which followed (1815), Italy was still divided into many small independent States; a unified Kingdom of Italy was only established in 1861.

As a matter of fact, the idea of having an association to promote studies arose very early among Italian scholars, and in 1826 a Tuscan Society of Statistical Geography - the name already points out one of the areas where the statistical approach was initially being developed in Italy - was founded in the Grand Duchy of Tuscany. But at that time - the eve of the revolutionary movements that will bring unity to Italy - the government mistrusted data collection and distribution of any type as tinged with subversive intentions. Thus it is not surprising that the Tuscan Society of Statistical Geography received a warning from the authorities which caused its meetings to be suspended, never to be resumed. It was remarked that if the government of the Grand Duchy of Tuscany had not intervened, then perhaps Italy would now have one of the oldest scientific statistical societies,^[2].

¹ The authors were invited by Professor Campbell Read, Executive Editor of the Encyclopaedia of Statistical Sciences (ESS) - published by John Wiley & Sons, Inc. - to write an entry on SOCIETA' ITALIANA DI STATISTICA for the ESS Update Volumes. This paper represents the original version, which had to be reduced for editorial reasons, of the abridged contribution submitted by them to Wiley for publication.

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Italian statistics in the first part of the 19th Century: the origins of Italy's national statistical service

The absence of a statistical society, however, did not prevent the flourishing of a widespread interest in statistics during the 19th Century, initially in the various regional states, of which, as mentioned above, Italy was composed up to 1861, and later on in the united and centralised Kingdom of Italy. In this period in Italy, as was the case in many European states, the main subject of statistics was the quantitative study of manifold features of the new and complex reality of the emerging modern state. Perhaps we are not far from the truth if, consistent with the view current at that time among Italian scholars of statistics,^[4] we say that, until the last decade of the century, statistics in Italy was chiefly considered a branch of social sciences aimed at providing a quantitative description of significant aspects of state and society, ranging from territorial geography to meteorology, population census and growth, agriculture, arts and crafts, manufacturing and merchandising, civil service, health and social well-being, education, etc. In effect the unquestionable merit of early Italian statisticians was that of pointing out, discussing and classifying aspects of geography, population, society and state which could be subject to statistical description, of giving guidelines and suggestions for the corresponding data collection, elaboration and presentation and, thus, of fostering the production of official statistics,^[4].

In fact, the intellectual debate on the meaning and purpose of statistics - by the way, it may be interesting to mention that the early Italian statisticians were, by occupation, public administrators and officers, erudites at large but, also in non-negligible number, physicians - was accompanied by the development of official statistical bureaus. Thus a central Office of Statistics for Sicily and a Central Commission for Statistics for the Subalpine Kingdom were respectively created in 1832 in Palermo and in 1836 in Turin, while an Office of Statistics was established in Tuscany in 1848, in Naples in 1851, and in Rome in 1858, in the Papal State, etc. Finally in 1861, with the advent of a united Kingdom of Italy, a Central Office of Statistics, was established replacing all the former regional Central Statistical Offices. This Office, aided by a central Committee on Statistics, later called a Higher Council for Statistics, survived until 1926.

The task of the Central Office of Statistics was anything but easy given the deep cultural socio-economic and administrative differences among the former regional states of which the new Kingdom of Italy was composed. Thus after a rapid and valuable development in the early decades, this Office went through a long period of crisis. In 1926 the fascist government - obviously interested in the management of statistical information - promoted a new organisation of the official statistical service by replacing the old Central Office of Statistics with a new Central

Statistical Institute, which changed its constitution in 1989 and still exists as the official agency for statistics in Italy, (Istituto Nazionale di Statistica, ISTAT).

Further development in Italian statistical culture preceding the creation of the Italian Society of Statistics

In modern times, the presence of a scientific discipline in a particular University or Higher Education curriculum certainly plays an important role in the development of the discipline. In the united Italy, according to traditions inherited from some of the regional states, statistics was taught in the Law Faculties as a course of Geography and Statistics. After a period of uncertainty two government regulations in 1875-1876 certified the teaching of statistics in the Law Faculties, and since 1885 statistics became a compulsory subject of examination for graduating in Law, a regulation which remained unchanged until 1923. Statistics was also taught in the Higher Schools of Commerce, that were later transformed into the current Faculties of Economics and Commerce. We have to underline the importance of these Higher Schools of Commerce in offering incentives to a more technical development of Italian Statistics. Since the students of such schools were also trained in mathematics especially actuarial and financial this permitted the presentation and teaching of statistics which covered methodological aspects that had been previously neglected when the audience was the Law Faculty, where the students' background was purely humanistic. In the meantime, step by step, the debate on the fundamental nature and meaning of statistics led the major scholars in the field to sever the unconditional connection of statistics with the investigation of "causes and laws" in social sciences in general, and in economics and demography in particular, until then accepted, and to consider statistics certainly from the beginning of the 20th century - as an autonomous scientific discipline dealing with a methodology pertaining to the quantitative investigation of "mass phenomena" - whose principal characteristic is the presence of "random variability" - of any type. This view was developed and supported by Rodolfo Benini (1862-1956); by Corrado Gini (1884-1965), who was the most eminent personality in Italian statistics in the first decades of the 20th century; by Carlo E. Bonferroni (1892-1960), who added the slant of mathematical abstraction, and by Marcello Boldrini (1890-1969), who expanded this notion and came to affirm that statistics provides a methodology for all experimental sciences^[1]. A sign that this clarification was finally achieved defining the relation between the theoretical aspects of statistics, as a methodological discipline, and its branches and also with the field of probability - can be seen in the foundation, in 1936 on the initiative of Gini, of the first Faculty of Statistical Demographical and Actuarial Sciences at the University of Rome. At the beginning of the 20th century - to a large extent thanks to the powerful work

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of Gini - the theoretical paradigm was established that would highly influence the approach and the choice of much of the research work in methodological statistics carried out in Italy in the first half of the 20th century, leading strengthening of what was called "the Italian statistical tradition".

The paradigm clearly bore the imprint of the origins of Italian statistics. These, as briefly sketched above, were deeply intertwined with a real engagement in quantification of social and economic phenomena, from which and not, for instance, from the study of mass-production - the idea of "collective or mass phenomena" was first derived. Thus attention was focused on the methods of descriptive statistics that, with reference to a given set of "variable data", helps clarify its structure, typically through the use of appropriate indicators, with the view of formulating reasonable hypotheses about the phenomena under study. As a matter of fact, in recent years this approach had a noticeable revival on the international level through Tukey's "exploratory analysis" and the "analyse des données" of the French School. One typical line of research of the Italian School - at times leading to pioneering results that unfortunately would not always appear in the international literature - consisted of delving into the basic concepts and notions of descriptive statistics such as average, variability and heterogeneity in the case of qualitative characters - and concentration, with regard to univariate frequency distributions; of dissimilarity for pairs of frequency distributions; of association for double frequency distributions etc. The conceptual investigation was accompanied by the proposal and the study of pertinent measures or indices appropriate to quantify the distributional aspects considered, some of which have also become well-known outside Italy like, for example, Gini's concentration ratio and heterogeneity index. In the first 11 chapters of^[3] the interested reader can find a detailed account of the development up to 1987 of the contributions by the Italian School in the above mentioned area, which was gradually extended to cover the study of the probability distributions of the proposed indices in order to carry out significance tests.

Charter and organisation of the Italian Society of Statistics

The first charter of SIS was approved by the assembly of the foundation members on the 15th of January 1939. In the course of the years, due to the radical changes in the political and social climate, the original Charter underwent many modifications until the present fifth version - approved by Decree of the President of the Republic on the 19th of December 1983 - in which the principles of "democracy" are thoroughly affirmed. The present Charter begins by saying that "the Italian Society of Statistics, a non-profit organisation, has the task of promoting the development of statistical sciences and their applications". There are essentially two categories of membership: that of ordinary members and that of corporate

members which refers to corporate bodies and institutions. A few honorary members remain as a carryover from older Charters.

Ordinary membership is open to any scholar of statistics engaged in promoting the progress of statistical sciences; a candidate has to be proposed by five ordinary members who have to demonstrate his/her suitability for joining the Society. Members are named by the Council elected by the Assembly of all members; there were 902 ordinary members and 118 corporate members at the end of 1994. The Assembly, which is composed of all ordinary members and one representative of each corporate member, meets at least once a year and is responsible for the election of the governing bodies. These are the *President*, the *Secretary General*, the *Treasurer*, each directly elected for a four years term, and the *Council* which is composed of the President, the Secretary General, the Treasurer and eight counsellors, each of which is also elected for a four years term, with half up for election every two years. No one may be re-elected to the same position for consecutive terms.

Scientific sessions, meetings and other activities of the Italian Society of Statistics

The principal means by which the Society pursues its institutional objective are general *Scientific Sessions*, thematic *Meetings*, study *Committees* and *Working Groups*.

From the foundation of the Society up to the present (1995), 37 General Scientific Sessions and 16 thematic Meetings (also in the form of round tables, work-shops, etc.) have been held.

Between 1939 and 1965 there were 24 general Scientific Sessions, held annually - except during the war and post-war years - all but the first of which were held in Rome with a very low number of participants. During this period the Society was dominated by the personality of its president, Corrado Gini, who led it with a vertical approach which privileged an elite. Gini's remarkable efforts were in the direction of helping Italian statistics - through the newly founded Society - acquire an identity making it a completely autonomous science, in which, however, the theory had to be in constant dialectic relationship with the applications. Thus a distinctive mark of the Scientific Sessions between 1939-1965 was the coexistence of many contributions of an applicative nature, aimed at the solution of real practical problems, together with contributions of a purely methodological nature. The goal of the subsequent Presidents (Paolo Fortunati, 1965-1980, who died in 1980, Giuseppe Leti, 1980-1988, Alberto Zuliani, 1988-1992, Alfredo Rizzi 1992-) has been that of widening as much as possible the participation of its members in the Society's life, of opening the leadership to all members and of opening the Society to views and problems coming directly from the national community. Contacts with other scientific societies, Italian as well as foreign and

international, were also established; since 1967 the Italian Society of Statistics has been affiliated with the International Statistical Institute. The main characteristics of this more recent phase of the society's life have been a remarkable expansion - linked to a notable diffusion throughout the whole country -, the overcoming of divisions among scientific schools and disciplines and the entering of the Society into a context larger than the purely national one. Also the Society's scientific scope was expanded in a concrete way towards implementing the application of a broader conception of statistics that recognised its utilisation as relevant and fruitful as well when tackling problems arising in fields such as technology, environment, natural sciences, medicine, etc. During this latter period, which continues until now, the general Scientific Sessions of the Society - which become biennial, with a thematic Meeting in the in-between year, were held in different Italian cities and often had more than 700 participants - addressed important problems such as: the state and the future of statistics; the relationship between statistics and society; the relationship between statistics, on one side, and mathematics and probability theory, on the other; the instrumental role of statistics in the other sciences; in particular, the relationship between statistics and natural sciences and technology, between statistics and informatics, social sciences, economy, econometrics, demography, biomedical and clinical research, environmental sciences, etc. Special attention was also paid to the discussion of the role of statistics in experimental research at large, in cultural training and in professional activities. A whole session was also devoted to the problems of statistical forecasting.

Besides favouring discussion on general subjects such as those mentioned above, the Italian Society of Statistics did not neglect the fostering of an active participation of its members in the debate on some of the major issues concerning Italian public life. In this context the topics which were examined included: the structure and organisation of Italian public statistical agencies; the problems raised by the European integration process; the analysis of demographic, economic and social aspects in censuses; the relationship between current surveys and censuses; the quality of statistical data; the statistical evaluation of government work and of public policies; the evolution of the Italian production structure; and the analysis of national debt.

The debate on general and culturally and socially important topics, like those mentioned above, was accompanied and integrated within the Italian Society of Statistics by extensive technical research which led, we believe, to a notable progress of statistics, at least in Italy.

The general Scientific Sessions and the thematic Meetings of the Society offered the opportunity for a systematic presentation of thorough technical reviews on a variety of subjects - some of which were dealt with in more than one occasion - and the discussion of new results coming from related research.

In the *area of statistical methodology* some of topics considered were: the different approaches to statistical inference, methods of multivariate analysis, classification methods, bayesian robustness, sampling methods, variability measures, the analysis of spatial and temporal data, distances in statistics, multiple contingency tables, multi-way matrices, measurements and scales of measures, groups of transformations used in statistics, monitoring of rare events, the design of experiments, the dynamic approach to statistical process control and the dynamic models in the study of demographic longitudinal and pseudo-longitudinal data. In the *area of demography and social statistics* some specific subjects of investigation were: the basic problems in demographic analysis, fertility measuring, the structure and cycle of life of the family, the demographic development in the Mediterranean countries, the demographic analysis for countries with a statistics shortage, changes in demographic structure, business demography, social indicators, the stochastic models in social research, the labour force and professional and socio-economic stratification of society.

In the *area of business and economic statistics*, attention was in particular focused on: index numbers, the revision and modernisation of the national accounting system, problems of the measuring of income and wealth, the measuring of the submerged economy, statistical methods for process and production control, new methods of measuring economic aggregates, input-output models, the analysis of the national debt, the collecting of data on consumption, the statistical analysis of economic trends, companies databases and quality of economic statistics, statistical analysis in the insurance sector and in the credit and finance field. Thus the Italian Society of Statistics supported and co-ordinated the intense development shown by Italian Statistics from the end of the sixties onwards. At the same time, perhaps at the cost of losing some of its specific character with respect to Gini's period, Italian statistics expanded its scope to include all major methodological and applied subjects and trends which characterise modern statistics. This was also accompanied by a more extensive use of probability theory and models, within the framework of both the classical frequentist approach and the bayesian approach, the latter in strict connection with the flourishing of Bruno de Finetti's (1906-1985) school of subjective probability. In this period of change a merit of the Italian Society of Statistics - in keeping with the Italian statistical tradition - has certainly been that of ensuring a sufficient balance of emphasis and development between statistical methodology and the applied branches of statistics represented by social and economic statistics and demography. It is worth remembering that great attention was also reserved to the statistical cultural training in compulsory school and high school, that was completed by an extensive and general debate on the problems posed by the teaching of statistics at the different levels, ranging from compulsory school to University.

The scientific research work stimulated and co-ordinated by the Society through the Scientific Sessions and the thematic Meetings has been and still is supported by the activities of study *Committees* - whose number is not fixed devoted to specific topics. Typically these Committees remain in force for four years and conclude their work with the publication of a written report that presents the results obtained. For example, the Committees on "Time series", "Data quality", and "The analysis of spatial data" completed their work recently, while the Committees on "Statistical methods and econometrics", "Statistics and environment", and "Statistics and public administration" are still active (1995).

Finally we should mention the *Working Groups* which are not subject to rules regarding internal organisation and duration so strict as those which govern the Committees. Their goals only partially coincide with those of the Committees, in that they are also aimed at ensuring the Society's presence and co-ordination activity in areas of general interest that may involve people outside its members' community and, at times, other technical or scientific societies as well. For example, there is a Working Group on "Statistics in technology and industry", a permanent one on "Didactics of statistics and demography" and one for "Co-ordination of demographic studies".

The Society's publications consist of: 1) *SIS-Information*, first published in 1988, which is a monthly newsletter about topics of current interest; 2) *SIS-Bulletin*, first published in 1981, which is published semiannually and reports on all major events in the Society's life - Assemblies, Council meetings, Committees and Working Groups activities, etc. And on general issues, national as well as international, relating to the area of statistical sciences; 3) *Journal of the Italian Statistical Society*, first published in 1992, which is published every four months in English and is in particular aimed at helping Italian contributions to statistics enter into the international circuit. In addition, there are the *Proceedings* of the biennial scientific sessions - two or three volumes at a time - and of the monothematic Meetings, and also *technical reports and monographs* on special topics, which are published from time to time. Altogether over 100 volumes have been published up to 1994, which document the scientific work carried out within the Society in more than half a century of life.

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A. Zanella

G. Leti