

# Summaries of Articles in English

## The Role of Statistics in the Current Technology-Oriented Society

Kei Takeuchi

The field of statistics provides basic numerical information on an advanced technological society. In considering the role of statistics it is necessary for us to distinguish between “statistics” (in the traditional sense) and “statistical data”. Statistical data are obtained by observation or experimentation and are analyzed by statistical methods. Statistics (in the traditional sense) are quantitative descriptions of various social populations. The concept of statistical population must be adapted to the complications and dynamic changes in current society. Because of their public nature, statistics need to be made open and available by government as a public service. A compact summary of various statistics would be most useful to the public. It is important to make available as much individual information as possible and at the same time insure that individual privacy is protected.

## The Role of Official Statistics and Data Dissemination

Sadanori Nagayama

Due to the progress of computers, the use of statistical data is currently far more diversified than it has been in the past. In this article we will discuss how the government should cope with these diversified needs for statistical data. We will consider to what extent the government should collect data and in what manner the government should provide this data. Concerning the former problem, we think that in addition to collecting data for governmental purposes, the government should also consider the public needs for statistical data. In regard to the latter problem, government statistical organizations should provide both ready-made and tailor-made tables at the request of individual users. We will discuss four possible ways for doing this :

- 1) individual survey questionnaires made available to academic users for statistical purposes
- 2) provision of magnetic tape containing individual information sampled
- 3) tailor-made summaries provided by the government
- 4) tailor-made summaries provided by designated nongovernmental institutions

## Opinion Polling in Japan

Sigeki Nishihira

Probably the first opinion poll in Japan was the survey on the election of prefecture governors by Mainichi Newspaper in 1945. Since then, opinion polling in Japan has been done both by the central government and by mass communication companies. Recently, more and more local governments have conducted opinion polls. Generally these surveys are conducted with a well-planned sampling design and with intertemporal and often international comparison in mind. Currently, opinion polling in Japan faces the following problems: 1) reliable data are harder to obtain, 2) telephone surveys are often used, but there is little study to improve the reliability of this data, 3) the data are not well preserved.

## Public Dissemination and Ethical Aspects of Medical Research Data

Yasuo Ohashi

We illustrate and discuss the problems on the ethical implication of dissemination and disclosure of medical research data by using three examples. For investigating the efficacy of new drugs or treatments, clinical trials are usually required and the question rises regarding the policy of the timing and the form of disclosing the intermediate results. We illustrate this problem by introducing the Physicians' Health Study whose intermediate result was published in news papers before the publication in academic journals, thereby causing much controversy. Many studies with the same objectives are carried out all over the world, and those results may contradict one another. Meta-analysis is proposed for summarizing those results and widely used in cardiovascular and oncology area. In carrying out meta-analysis, there rises the problem of publication bias, i.e., papers with statistically significant results preferring new treatments are relatively easily published. As the second example, the problem of publication bias and the registration system of clinical trials for avoiding it are discussed. Development of anti-AIDS drugs is changing the traditional system of research and approval process for its seriousness and urgency. In the third example, an approval process of one anti-AIDS drug is discussed with special reference to methodology of clinical trials.

## The Availability of Personal and Household Information and its Utilization Problems

Tsutomu Noda

Personal and household information collected by the government statistical institutions consists of macro data based on major economic time series, micro data based on

individual households and corporations, and structural statistics. Structural statistics are compiled to show the differences in the economic status of households or enterprises, with a concern for keeping individual information secret. Recently, due to changes in economic structure and progress in information technology, the amount of statistical information for the private sector is increasing. Many of these statistics are available to large numbers of people. It will become increasingly necessary for statistics to be supplied to and by the private sector. It will also be necessary to reconsider the legal issues involved in the collection of individual data from the viewpoint of the need for protection of privacy.

## Disclosure of Corporate Information

Tadao Miyakawa

There is growing social demand for the public disclosure of corporate information, especially in regard to the much discussed problems of "keiretsu" business, compensation for security investment loss, product liability, and various other issues. Generally, it is desirable to have corporate information disclosed. However, the various aspects of the quality of information (i. e. preciseness, verifiability, completeness, timeliness and relevance) must be examined. These aspects are inter-related and are sometimes in a trade-off relationship. In addition, corporate information is an effective means of gaining competitive advantage and is costly to obtain and to provide. Therefore, social consensus and deep insight are necessary in the areas of legal regulation, incentive systems for disclosure, and corporate social responsibility.

## What Kind of Medical Information Should be Open to the Public ?

Isao Yoshimura

There are three kinds of users of medical information : patients, doctors and companies related to medicine. In this paper we will discuss the disclosure of medical information from the standpoint of the patient. Patients need medical information on a) mistreatments, b) side effects of drugs, c) effects of environmental pollution, d) informed consent, e) choice of drugs, treatments and doctors. Patients face difficulties in obtaining appropriate data, in understanding the meaning of data (due to insufficient knowledge), and in communicating with doctors. Since patients are also providers of information, a reasonable social consensus on the availability and use of medical information should be established.

## Policy Decisions Based on the Statistical Data

Kotaro Tsujimura

Japan is one of the world's most advanced countries in the field of statistics. Short term, mid-term and long term statistics cover the whole of national life. To make use of this rich information, philosophically and economically wise judgment on the national economy is indispensable. For example, the real economic growth rate for the years 1987 to 1991 was higher than the rate forecast by the government, while the labor market unemployment rate was lower. Depending on one's philosophy, one can interpret this data in one of two ways: 1) the growth rate was too high, or 2) the growth rate was appropriate but there was insufficient labor supply. For this period of economic growth there was apparently no sign of dangerous inflation reflected in the statistics, leaving economists puzzled. The reason for this lack, however, is that land prices are not included in the consumer and wholesale price indices, thus in reality an extreme hidden inflation of land prices occurred during this period. The oversight of these factors is one example of inappropriate economic judgment.

## The Computer Society and Statistical Data Processing

Hirotsugu Akaike

Computers are not equipped with superhuman intelligence. The real essence of a computer society is in the information which the society realizes by utilizing the precision and high speed communication capabilities of computers. A. M. Turing recognized the difficulty of equipping computers with originality and the capacity for human intelligence, notwithstanding the possibility of training them for specific abilities by a pleasure-pain system. Statistical data processing aims at realizing efficient searches for the solutions to concrete problems. Such efforts constitute an intelligent use of computers. By the introduction of AIC the basic theoretical difficulty in the search for models has been eliminated and the increase in the speed and capacity of computers can now be effectively utilized for statistical data processing. It is hoped that statistics will eventually occupy a secure position within the culture of the future.

## Future Development of Statistics

Toshiyuki Mizoguchi

In considering the future of statistics, the following four points must be taken in account: First, there must be a balance between the empirical approach and the theoretical

approach. The econometric method, which was created to overcome “measurement without theory” in economic prediction, could not successfully cope with the impact of the oil crisis. This led to a rebirth of the emirical approach in the form of time series analysis. These two approaches are complementary. Second, statistical analyses depend on the data which reflect the economic reality. This dependence has prevented the shift of statistical analysis to more sophisticated forms. Third, the precision of statistical data must be considered. The precision of data depends on the statistical environment. Fourth, statistics is interdisciplinary in nature; statisticians need to understand the problems of other fields as well as the experiences of other statisticians.

### Recent Developments of Statistical Graphics : Creation of Clients and Methods for Visual Representation

Masashi Goto, Shingo Shirahata, Tomoyuki Tarumi, Yasumasa Baba,  
Yoshizumi Yasuda, Yoshihiro Matsubara, Akio Yoden, and Kazumasa Wakimoto

Statistical graphics are now being used not only for descriptive and exploratory purposes but also for the whole process of data analysis. This includes model building and fitting and even statistical inference and decision. Needless to say, practical application is imperative in studying and developing statistical graphics. In this development process we must keep in mind that consummating the “ad hoc” nature of graphics is more important than aiming at universality. In this paper, we discuss statistical graphics from a viewpoint which attaches importance to their development, improvement, and application rather than placing a stress on their research. We review graphical techniques for data investigation, ordering of multivariate data, discriminant analysis and survival analysis. Statistical graphics enables an intuitive understanding of large amounts of qualitative and quantitative information in statistical data analysis. At the same time, statistical graphics are subject to various erroneous interpretations if used in a non-objective manner. Therefore, for an objective statistical analysis based on graphical representation of data, it is important to clarify how graphics affect the various aspects of human intuition and to measure these effects, using some numerical statistics. In this paper we interpret these statistics and consider how graphics and some nonparametric statistics are related. Further progress of statistical graphics depends on their methodological development and the enlargement of support of clients in many fields. In conclusion, we will briefly treat some recent trends in statistical graphics software, directions for the study and development of statistical graphics, and ways in which to create markets in these new areas.

A Statistical and Methodological Approach to Interchronological Study of  
Japanese National Character and Comparative Study of Belief Systems,  
the Way of Thinking and Emotional Attitudes of Peoples  
in Different Cultural Climates

Chikio Hayashi

The methodology of the international comparison of belief systems is discussed mainly in terms of the experience of the statistical study of the Japanese national character in the past 35 years (Committee on the Study of Japanese National Character at the Institute of Mathematical Statistics) and the results of a recent cross-societal study. The basic goal of the international comparison of belief systems is to clarify the similarities and the differences of these belief systems. Our study is centered upon achieving this goal using statistical methods. We stress the importance of the philosophy of the scientific survey, design of data, and analysis of data. We propose a "cultural link analysis" (CLA), which links different belief systems by their similarities and dissimilarities in the form of a chain. The motivations behind CLA and the experience of our international studies which are based on CLA is also considered.