

Submitted on 04/27/2013

Revised on 05/07/2013

Revised on 11/05/2013

Standards of Conduct for Statisticians

<Table of contents>

I. Preamble

II. Mission of statisticians and values to uphold

III. Standards of conduct

I. Preamble

1) Purpose for establishing Standards of Conduct

These Standards of Conduct were established for the purpose of presenting the mission of statisticians and the values to uphold as the basis for guiding practitioners, researchers, and students, who are currently or will in the future be engaged in fields that deal with statistical methods and data, to all consider and acquire principles that serve as the foundation for conducting their own practice and research.

Moreover, this document also aims to present explicitly the statisticians' standards of conduct to society, so that people in society can understand the responsibilities and activities of statisticians, recognize that statistical work and outcomes are reliable, and support statisticians to carry out properly their activities, and to develop an environment that facilitates such activities.

2) Duties and responsibilities of statisticians

Statistics refers to the process of quantifying various events through experiments, observations, and surveys, as well as data obtained through such activities. Statisticians collect data and draw conclusions after clarifying the degree of uncertainty in a quantitative fashion using statistical methods. They are experts who participate in decision making in various fields such as science, medicine, economics, and society, and contribute to the health and safety of people, to the promotion of welfare and environmental conservation, and to the stability and development of society and economy. Statisticians carry out work that has great impact on a person's life and livelihood as well as economic and cultural values, and assume an important role and responsibility to society. Therefore, they are expected to not only have expert knowledge and skills, but also to be aware of their social responsibility and act appropriately, recognize the public nature of their practice, and prioritize the interest of society rather than that of themselves or organizations.

3) The necessity of a professional group and establishment of Standards of Conduct

Statisticians work in diverse fields, and include those who are engaged in research and education at research facilities, as well as those who are in charge of practical operations at companies, governmental agencies, or local governments. Statisticians working in commercial organizations, in particular, may be subject to tangible and intangible pressures to prioritize the interests of their organizations. Moreover, at organizations that have a tradition of respecting such values as age and job title, one's proposal and opinion may be held back or dismissed, and those trying to fulfill legitimate work as statisticians might be put in a disadvantageous position or even lose their status. On the other hand, if it came to light that a statistician had acted in a way that prioritized their own interest or that of the organization, statisticians as a whole might lose the confidence of the public, and this could ultimately damage the interests of society as a whole. Given the responsibility of statisticians and characteristics of their work, they are expected to maintain independence and work autonomously as professionals.

To this end, it becomes necessary to form a professional group having autonomous functions, such as to guarantee the quality of work and secure one's position, and to establish principles that serve as the foundation for achieving these functions.

Fields in which statisticians work, such as science and economics, are fast-changing with rapid technological progress and shifts in trends, and as the degree of changes can be considerable, it is often the case that codified rules are not in place, or if they are, they might not be in tune with the times. Moreover, statisticians' work might influence the work of experts in other fields, and they might come under pressure to make choices between individual principles and rivaling values. As statisticians are required to make appropriate judgments and act according to the circumstances of the moment, they must have principles, that is, missions of statisticians, or values to uphold in order to achieve their missions, which could provide a foundation for determining how to act. These principles form the core of professionalism, do not sway by changing situations, and should be embraced by each statistician rather than being handed down from others. It is also expected that, by making these principles explicit to others (employers, clients, citizens, experts in other fields, etc.), the basic attitude of statisticians will be understood, and trust and respect for the entire community of statisticians will be earned.

Based on the above, the Standards of Conduct have been established to provide a general framework that will serve as the basis for guiding each statistician to consider and acquire their own principles, rather than as rules with which they are required to comply.

It is assumed that these Standards of Conduct will be used by individuals who perform statistical work as a whole, that is, those who are engaged in statistical research, those who are involved in statistical work, and those who will be engaged or involved in statistical research and work in the future, irrespective of whether they are making a living as a professional statistician. As these Standards describe aspects that are common to statisticians

in various fields, issues specific to each field must individually be examined and determined.

II. The mission of statisticians and values to uphold

<Mission of statisticians>

The mission of statisticians is to contribute to the maintenance and promotion of people's health, safety, and well-being, conservation of the environment, and the development of society and economy through work and research using statistics.

<Values to uphold>

Work of statisticians is characterized by acts of collecting information on individuals and groups, deriving results using statistical methods, and interpreting the obtained results; therefore, the following points need to be taken into consideration.

1) Respect human life and dignity, and the environment that surrounds them

Statisticians always act with consideration for peoples' lives, dignity, personality, and well-being, as well as the environment, and protect the privacy of study subjects and data providers in an appropriate manner while respecting them for who they are. In addition, if there is a possibility that obtained outcomes could work to the detriment of a specific group, the general public, or the environment, etc., they address the matter with sufficient care.

2) Responsibilities and skills

Statisticians have the responsibility to respond to the various demands and expectations of society by putting their expertise, skills, and experience to use, and to contribute to the promotion of social interests. They acquire expertise and skills necessary for carrying out their work, and strive to maintain and improve their expertise/skills.

Statisticians seek to draw highly objective conclusions by designing a meaningful study design, collecting high quality data, and performing analyses using methods that fit the purpose at hand. Risks predicted in the process of data collection/analysis and publication of results are properly assessed and dealt with appropriately.

Statisticians seek to earn the trust of society by explaining their roles and the significance of outcomes in a way that citizens can understand correctly.

3) Act with honesty and integrity

Statisticians act on their own initiative with honesty and integrity, and work in a way that enables them to ensure the appropriateness of their work, accuracy of results, and validity of the science.

Statisticians derive conclusions through scientific processes; therefore, they seek to build appropriate relationships with their employers and clients so as to avoid pressure or undue influence from others. Moreover, they avoid to be engaged in unreasonable work, commit acts

of misconduct such as fabrication and falsification, or be complicit in misconduct.

Statisticians describe their activities and outcomes, along with their grounds. Used data and analysis results are clarified to the extent possible, and the method used for the analysis are clearly described, including why it was adopted. In addition, statisticians provide fair assessment and sound criticism on outcomes obtained by their colleagues and others, and engage in active opinion exchange. When an error, etc. is pointed out, they shall respond positively to it.

When carrying out research or work, statisticians evaluate the performance of others, and respect intellectual property rights.

III. Standards of conduct

1. Exhibit professionalism

Statisticians acquire expertise, skills, judgment ability, and communication skills, and act responsibly. In order to produce high-quality outcomes, they shall strive to maintain and improve their knowledge and skills. The roles of statisticians also include providing appropriate education and training or advice to their colleagues, students, and those who are newly involved in statistical work, so that they can acquire knowledge and skills. The ability of each individual may vary depending on their education and training they received or qualifications, but work shall be performed within the range of their competence. They are aware of the possibility that work that exceeds their competence could cause disadvantages to society.

Statisticians realize that each person needs autonomy, and seek to resolve a problem and achieve a goal through independent thinking, expression of opinions, and dialogue with others. They strive to avoid conforming to a predetermined conclusion.

If a difficult problem arises that has not been experienced before, a working group consisting of experts should be formed to decide on new measures and policies based on discussions. The contents of discussions and the basis for results delivered shall be clearly presented. The same is true in cases where statisticians have differing opinions on a certain issue.

2. Carry out work properly

Statisticians give consideration to the following in carrying out their work:

- (1) Develop a meaningful plan: Develop a work plan or research plan that will contribute to an increase in knowledge in the relevant field.
- (2) Collect appropriate data: Collect data with the accuracy required to derive reasonable results. Unnecessary data shall not be collected.
- (3) Use appropriate methods to draw conclusions: Select and use appropriate methods to derive conclusions that are scientifically valid for the purpose intended. While statisticians should be acquainted with standard techniques, they strive to adopt or

develop new methods as appropriate, being conscious of the fact that statistical methods are constantly progressing.

(4) Publish and describe outcomes: Publish the obtained results from an objective standpoint. Statisticians avoid withholding results from publication on the grounds that desired conclusions could not be obtained. Realizing that data are finite, and that obtained conclusions have limitations, they strive to explain the uncertainty to others as well. While published results shall be made available across the widest possible range of the literature, care shall be exercised, such as to examine whether results might work against the interests of a specific group, etc. Moreover, statisticians seek to prevent their conclusions from being misinterpreted or misused, and try to correct misuses if they notice them.

3. Clarify roles and responsibility to others

Statisticians explain their roles and responsibility to others, such as their employers, clients, colleagues, experts in other fields, policy makers, investors, and journalists, and seek to improve their work environment by establishing fair relationships.

They provide accurate information that is neither too much nor too little, explain the information, and provide fair advice to policy planners and decision makers.

4. Publish and describe work and outcomes

Statisticians strive to clearly present and describe the content of their work, i.e., the dataset used, statistical methods, analysis results, and interpretation of the results, etc., so that a third party can verify them. As for outcomes, efforts shall be made to describe what their significance and impact are to people, organizations, and society.

Statisticians also take measures to communicate with the public in an easily understandable manner so that their roles, work, and outcomes can be accurately disseminated. To journalists and public relations officials, they seek to ensure that their work and outcomes will be conveyed correctly.

When new knowledge, such as a new method, is developed, it shall be communicated openly and actively.

5. Assess and prevent risks

Statisticians properly assess predictable risks when carrying out their work, after clarifying uncertainty. If there are possible risks to study subjects, a specific group, the general public, or the environment, etc., judgment shall be made by weighing their impact and benefit. If a significant risk to others is predicted, precautionary measures shall be taken to the extent possible, such as notifying those who are able to address the risk.

6. Handle information appropriately

Statisticians honor confidentiality regarding undisclosed data and information that they

come to learn or obtain in carrying out their work.

If information that greatly affects the health and safety of people or the development and stability of society is obtained, and if it is judged by those concerned including experts in the relevant field that publicizing the information would contribute to public interests, it is made public.

7. Comply with laws and guidelines

Statisticians respect and comply with laws and guidelines of other fields. Should there be a conflict between these guidelines and statisticians' values and principles, they make a sensible judgment on priorities and act accordingly. The process and rationale leading to their decision shall be explained clearly.

8. Respect human rights

Since statisticians accumulate and analyze information and data related to human health, livelihood, property, and safety, etc., they are aware of the possibility that their activities may themselves violate the rights of individuals and groups. Information obtained from study subjects and data providers are appropriately recorded, stored, and reused, including the timing and method of disposal. If necessary, appropriate measures shall be taken, such as obtaining consent from subjects. When publishing outcomes, they shall avoid disclosing information that may be used to identify individuals or organizations to the extent possible.

9. Prevent misconduct

Statisticians avoid to select and use illogical methods, engage in misconduct such as fabrication and falsification of data, or be complicit in misconduct. When such misconduct is detected, they point out the matter rather than overlook it, and seek to maintain an environment that prevents dishonest acts.

10. Prevent adverse effects of conflicts of interest

Statisticians predict various conflicts of interest (situations in which a certain act becomes one's benefit and another's disadvantage at the same time) that are likely to affect their work, and seek to guard against their adverse effects by taking preventive measures, or properly disclosing economic benefits, etc.

Materials: Background Note

Statistics is a field used as the basis of policy- and decision-making in various fields, and is essential for maintaining and improving people's health and safety. Thus, statisticians who carry out work and research are expected to produce high-quality outcomes. It is essential for statisticians to earn the trust of society, and have citizens submit data with a sense of security; for this purpose, they must first realize that their work is of a public nature and act responsibly with high ethical standards and autonomy.

In the past, Japan has experienced problems related to work involving statisticians, which included researchers interpreting the absence of significant difference as “equivalent” in the assessment of new drug efficacy in clinical studies of drugs, municipal officials falsifying the number of residents in national census surveys, or survey companies fabricating data without conducting surveys.

It is self-evident that, in order to show that activities and outcomes of statisticians working in a wide range of fields are dependable, and to meet the expectations of society, individual statisticians working in diverse fields, as well as the community of statisticians, must be aware of the need to function in an autonomous fashion, and to voluntarily formulate standards with which they comply. In 2012, the Biometric Society of Japan undertook a revision of the “Code of Ethics,” which was drawn up in 2008; seizing this opportunity, the Standards of Conduct were established upon approval from the Council of the Japanese Federation of Statistical Science Associations to formulate a code of conduct that applies more widely to statisticians in general, for common use by the associations.

<Reasons why “principles” rather than “rules” were adopted>

There are “rules” such as laws that specify what is permitted or prohibited (dos/don'ts), and “principles” that are embraced by each person as the foundation for considering how to act (shoulds/shouldn'ts OR do's/don'ts), both of which stipulate how people should behave.

Statistical work requires high expertise, so non-experts cannot judge whether the process or outcome is appropriate, and is characterized by the fact that much work is done single-handedly. As with other professionals, statisticians are expected to think and act proactively about issues and problems at hand, and thus, it is obvious that heteronomous rules—which inevitably promote a passive stance—would be of no use. Therefore, we formulated the basis for autonomous principles that urge statisticians to take an active stance. This document can be presented to others when statisticians are unduly influenced, and so can serve as a potential tool to protect statisticians themselves.

<Points considered and the background for formulation>

International guidelines relating to statistics include Ethical Guidelines for Practice of the American Statistical Association (ASA)¹, Declaration on Professional Ethics of the International Statistical Institute (ISI)², and the Code of Conduct of the Royal Statistical Society (RSS)³. Among these, ASA and ISI guidelines are proposed as principles. In

establishing the Standards of Conduct, we considered compliance with these guidelines, and further, we took into account issues that are specific to the history of statistical work and the environment surrounding the activities of statisticians in Japan.

The Working Group of the Biometric Society of Japan conducted interviews and discussions with statisticians, and identified the following problems: there are many cases in which wrong conclusions are drawn as a result of statisticians lacking professional knowledge or skills; opinions of statisticians are not valued due to their low position as an expert; and there are customs in the workplace that make it difficult for people with lower position or age to speak up, or for anyone to voice frank opinions as keeping harmony is valued. Accordingly, we mention in this document that statisticians need to be aware of the fact that insufficient knowledge and skills could work to the detriment of society and that they should carry out their work within their competence, and that in the workplace, each individual should be able to work as an independent statistician, and an environment needs to be created to achieve this.

The Working Group began its activities in May 2012, had several discussions, and prepared a draft in March 2013. Subsequently, the draft was submitted to the Council of the Japanese Federation of Statistical Science Associations in April 2013.

<Need for revision>

We hope that these Standards will constantly be reviewed and improved through periodic updating and amendment.

<Working Group members>

Keiko Sato (Kyoto Univ., Bioethics Specialist)

Manabu Iwasaki (Seikei Univ., The Japan Statistical Society)

Yoshiyuki Inaba (Keio Univ., The Japan Statistical Society)

Hideki Suganami (KOWA, Biometric Society of Japan)

Toshiya Sato (Kyoto Univ., Biometric Society of Japan)

Hiroe Tsubaki (The Institute of Statistical Mathematics, Biometric Society of Japan, Japanese Society of Applied Statistics)

Collaborators (members of the Ethics Committee of the Institute of Statistical Mathematics):

Takashi Nakamura, Tadahiko Maeda

<References>

1) <http://www.amstat.org/committees/ethics/index.html>

2) <http://www.isi-web.org/about-isi/professional-ethics/43-about/about/296-declarationprofessionalethics-2010uk>

3) <http://www.rss.org.uk/uploadedfiles/documentlibrary/142.pdf>