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ISI Declaration on Professional Ethics

Adopted: August 2009

Background note

The involvement of the International Statistical Institute in establishing a declaration on professional ethics has extended over the past quarter century. The Bureau of the Institute, in response to representations by members and a proposal by the Institute's Committee on Future Directions, initially established a Committee on a Code of Ethics for Statisticians in 1979, during the 42nd ISI Session in Manila.

That Committee¹ worked to prepare a plenary meeting at the Buenos Aires Session in 1981, during which a consensus in favour of drawing up a code developed: the 'code' was prepared for acceptance by the Institute during its Centenary Celebration in 1985.

The Declaration which emerged was the result of an extensive process of drafting and redrafting, of consultation with the entire ISI membership and with the ISI's Sections, and of open meetings and written consultations which occurred between December 1981 and August 1985. The drafting of the Declaration provoked much interest and genuine debate which continued into the week before it was placed before the General Assembly of the Institute for adoption.

After due consideration and deliberation the General Assembly adopted the following resolution on 21 August 1985: 'The General Assembly of the International Statistical Institute,

- recognising that the aim of the Declaration on Professional Ethics for Statisticians is to document shared professional values and experience as a means of providing guidance rather than regulation,
- adopts the Declaration as an affirmation of the membership's concern with these matters and of its resolve to promote knowledge and interest in professional ethics among statisticians worldwide;
- determines to send the Declaration to all members of the ISI and its Sections and to disseminate it, as appropriate, within the statistical profession;
- commends the Committee responsible for developing the Declaration for

¹ The Committee was chaired by Roger Jowell. Original members were W. Edwards Deming, Arno Donda, Helmut V. Muhsam and Edmund Rapaport, who subsequently were joined by Edmundo Berumen-Torres, Gilbert Motsemme and Rene Padieu.

its thorough, efficient and successful work during the last five years.'

In accordance with the spirit and letter of the resolution, in August 1985, the International Statistical Institute presented its members with the ISI Declaration on Professional Ethics.

With the passage of time, the Institute found itself revisiting the question of the need for an updating of the Declaration. For example, in July 2002, prior to the ISI international meetings in Berlin, a Conference on Professional Ethics was assembled to explore the issue and, in September of that year, produced a proposed, revised set of ethics, which does not seem to have gone any further. Nonetheless, the topic continued to be the focus of conversation in subsequent meetings of the Ethics Committee.

In July 2006, the Executive Committee specifically invited its standing Professional Ethics Committee² to revisit the ISI Declaration and, "should the occasion arise, (propose) updates to the ISI Declaration". Specifically, in regard to the ISI Declaration, the Committee was asked to propose, if merited, updates to the earlier Declaration and to catalogue new documents to illuminate the ethical practices of statisticians.

This the Committee has now done. After much discussion, an extensive exchange of ideas by phone, and email, writing and rewriting, a revised document was prepared for a meeting held in Paris, in March 2007, hosted by INSEE. This was followed by an open meeting at the ISI international meetings in Lisbon, in August 2007, at which the results of all these efforts were presented to the participants for their comments and reactions. That meeting led to agreement on many points, but a number of suggestions for further examination were suggested. This led to the addition of a Section on Core Values and further refinement in the content and format. This document is the result of these recent efforts.

In accordance with the spirit and letter of the original resolution, the International Statistical Institute is privileged to present to the reader this revised and updated Declaration on Professional Ethics, with the continued hope and belief that the new document will assist colleagues throughout the world in the pursuit of their professional goals and responsibilities.

² The current Committee is composed of David Morganstein (Chair), Margo Anderson, Edmundo Berumen, Steven Fienberg, Fred Ho, Roger Jowell, Olav Ljones, Bill Seltzer, and Jan-Robert Suesser. The Committee receives important support from an Ethics Advisory Group consisting of Jean-Louis Bodin, Oliver J.M. Chinganya, Howard Gabriels, Denise Lievesley, Dan Levine, Renee Padieu, Hrachya Petrosyan, and Norbert Victor..

Preamble

Statisticians work within a variety of economic, cultural, legal and political settings, each of which influences the emphasis and focus of statistical inquiry. They also work within one of several different branches of their discipline, each involving its own techniques and procedures and, possibly, its own ethical approach. Many statisticians work in fields such as economics, psychology, sociology, medicine, whose practitioners have ethical conventions that may influence the conduct of statisticians in their fields. Even within the same setting and branch of statistics, individuals may face various situations and constraints in which ethical questions arise. Thus, no declaration could successfully impose a rigid set of rules to which statisticians everywhere should be expected to adhere, and this document does not attempt to do so.

The aim of this declaration is to enable the statistician's individual ethical judgments and decisions to be informed by shared values and experience, rather than by rigid rules imposed by the profession. The declaration therefore seeks to document widely held principles of statistical inquiry and to identify the factors that obstruct their implementation. It is framed in the recognition that, on occasions, the operation of one principle will impede the operation of another, that statisticians - in common with other occupational groups - have competing obligations not all of which can be fulfilled simultaneously. Thus, implicit or explicit choices between principles will sometimes have to be made. The declaration does not attempt to resolve these choices or to allocate greater priority to one of its principles than to another. Instead it offers a framework within which the conscientious statistician should, for the most part, be able to work comfortably. Where departures from the framework of principles are contemplated, they should be the result of deliberation rather than of ignorance.

The declaration's first intention, thus, is to be informative and descriptive rather than authoritarian or prescriptive. Second, it is designed to be applicable as far as possible to the wide and changing areas of statistical methodology and application. For this reason, its provisions are drawn quite broadly. Third, although the principles are framed so as to have wider application to decisions than to the issues it specifically mentions, the declaration is by no means exhaustive. It is designed in the knowledge that it will require periodic updating and amendment, reflecting on the one hand developments in the generation of information and technical tools utilized by statisticians and, on the other hand, in the uses (and, consequently, misuses) of statistical outputs. Fourth, the values, principles, and the commentaries which follow acknowledge with the general written or unwritten rules or norms, such as compliance with the law or the need for probity. However, the declaration restricts itself insofar as possible to matters of specific concern to statistical inquiry.

Although not explicitly stated, the Principles inherently reflect the obligations and responsibilities of—as well as the resulting conflicts faced by -statisticians to forces and pressures outside of their own performance, namely to and from:

- Society,
- Employers, Clients, and Funders,

- Colleagues,
- Subjects

In carrying out his/her responsibilities, each statistician must be sensitive to the need to ensure that his/her actions are, first, consistent with the best interests of each group and, second, do not favor any group at the expense of any other, or conflict with any of the Principles.

The Principles are followed by short commentaries on the conflicts and difficulties inherent in their application. A link is provided for each ethical principle for those who wish to pursue the issues.. Similarly, a limited annotated bibliography is provided after the commentaries for those who wish to pursue the issues or consult more detailed texts.

CORE VALUES

Our core values are respect, professionalism, honesty and integrity.

1. Respect

We have an obligation to protect fundamental human rights, especially those of others about whom or from whom we collect data.

We should not suppress or improperly detract from the work of others.

We should avoid causing needless injury or harm to others.

We should act in ways that promote the welfare of other people.

We respect the privacy of others and promises of confidentiality given to them.

2. Professionalism

- a. Responsibility
- b. Competence and Expert Knowledge
- c. Informed judgment

We are responsible to our employers.

We work to understand our users' needs.

We use our statistical knowledge, data, and analyses to serve society and human well-being, i.e., fulfill the public interest.

We are responsible for the fitness of data and of methods for the purpose at hand.

We should obey the law and work to change laws we believe impede good statistical practice.

We need to assure that we do not have conflicts of interest in our work.

We are continuously learning both about our own field as well as those to which we apply our methods.

We develop new methods as appropriate.

We discuss difficult issues objectively and contribute to their resolution.

3. Honesty and Integrity

- a. Independence
- b. Objectivity
- c. Transparency

Our approaches and work products reflect the qualities of openness and clear purpose.

We are accountable for our actions.

We have respect for intellectual property.

We represent data and analyses honestly and openly.

We strive to collect and analyze data of the highest quality possible.

As scientists, we expect to pursue new ideas and criticize old ones.

We work towards the logical coherence and empirical adequacy of our data and conclusions.

We value "pre-established apersonal criteria" of assessment

I. ETHICAL PRINCIPLES

1. [Conflicting Interests](#)

The likely consequences of collecting and disseminating various types of data should be considered and explored, and efforts made to guard against predictable misinterpretation or misuse.

Findings should be communicated for the benefit of the widest possible community, yet attempt to ensure no harm to any population group..

2. [Pursuing Objectivity](#)

Statisticians should uphold their professional integrity without fear or favor, only selecting and using methods designed to produce the most accurate results, and presenting all the findings openly, completely, and in a transparent manner regardless of the outcomes. Statisticians should be particularly sensitive to the need to present findings when they challenge a preferred outcome.

3. [Clarifying Obligations and Roles](#)

The respective obligations of employer, client, or funder and statistician in regard to the roles and responsibility of each should be spelled out and fully understood in advance. In providing advice or guidance, statisticians should take care to stay within their area of competence, and seek advice, as appropriate, from others with the relevant expertise.

4. [Assessing Alternatives Impartially](#)

Available methods and procedures for addressing a proposed inquiry should be considered and an impartial assessment provided to the employer, client, or funder of the respective merits and limitations of alternatives, along with the proposed method.

5. [Avoiding Preempted Outcomes](#)

Any attempt to establish a predetermined outcome from a proposed statistical inquiry should be rejected, as should contractual conditions contingent upon such a requirement.

6. [Guarding Privileged Information](#)

Privileged information is to be kept confidential. This prohibition is not to be extended to statistical methods and procedures utilized to conduct the inquiry or produce published data.

7. [Exhibiting Professional Competence](#)

Statisticians shall seek to upgrade their professional knowledge and skills, and shall maintain awareness of technological developments, procedures, and standards which are relevant to their field, and shall encourage others to do the same.

8. [Maintaining Confidence in Statistics](#)

In order to promote and preserve the confidence of the public, statisticians should ensure that they accurately and correctly describe their results, including the explanatory power of their data. It is incumbent upon statisticians to alert potential users of the results to the limits of their reliability and applicability.

9. [Exposing and Reviewing Methods and Findings](#)

Adequate information should be provided to the public to permit the methods, procedures, techniques, and findings to be assessed independently.

10. [Communicating Ethical Principles](#)

In collaborating with colleagues and others in the same or other disciplines, it is necessary and important to ensure that the ethical principles of all participants are clear, understood, respected, and reflected in the undertaking.

11. [Bearing Responsibility for the Integrity of the Discipline](#)

Statisticians are subject to the general moral rules of scientific and scholarly conduct: they should not deceive or knowingly misrepresent or attempt to prevent reporting of misconduct or obstruct the scientific/scholarly research of others

12. [Avoiding Undue Intrusion](#)

The intrusive potential of some forms of statistical inquiry requires that they be undertaken only with great care, full justification of need, and notification of those involved.

13. [Ensuring Informed Consent](#)

Statistical inquiries involving the active participation of human subjects should be based, as far as practicable, on their freely given, informed consent, including their entitlement to understand the mandatory/voluntary status of their participation and the ability to refuse for whatever reason. Participation should be as informed as possible, and information that might affect the willingness to participate should not be withheld.

14. [Protecting the Interests of Subjects.](#)

Statisticians are obligated to protect subjects, individually and collectively, insofar as possible, against potentially harmful effects of participating, both to the subjects themselves and to their relationships with their environment. This responsibility is not absolved either by consent or the legal requirement to participate.

15. [Maintaining Confidentiality of Records](#)

The identities and records of all subjects or respondents, cooperating or not, should be kept confidential, whether or not confidentiality has been explicitly pledged.

16. [Inhibiting Disclosure of Identity](#)

Appropriate measures should be utilized to prevent data from being published or otherwise released in a form that would allow a subject or respondent's identity to be disclosed or inferred.

II. COMMENTARY

In reflecting on or in reacting to an Ethical Principle, the statistician must be cognizant of the fact that, in many cases, actions taken will reflect more than a single principle. For one example, the statistician must be sensitive to the possible consequences of the work product, given the knowledge that society's entitlement to know about its collective characteristics sometimes conflicts with the individual's entitlement to protect his or her privacy (or that of a group or community). Many such examples could be cited to illustrate the complexity and interrelationships of what, at first, may appear to be simple ethical issues.

1. Conflicting interests

The likely consequences of collecting and disseminating various types of data should be considered and explored, and efforts made to guard against predictable misinterpretation or misuse. Findings should be communicated for the benefit of the widest possible community.

Statistical inquiry is predicated on the belief that greater access to well-grounded information is beneficial to society. The fact that statistical information can be misconstrued or misused, or that its impact can be different on different groups, is not in itself a convincing argument against its collection and dissemination. Nonetheless, the statistician should consider the likely consequences of collecting and disseminating various types of data and should guard against predictable misinterpretations or misuse.

No generic formula or guidelines exist for assessing the likely benefit or risk of various types of statistical inquiry. Nonetheless, the statistician has to be sensitive to the possible consequences of his or her work, in the knowledge that society's entitlement to know about its collective characteristics sometimes conflicts with the individual's entitlement to protect his or her privacy.

All information, whether systematically collected or not, is subject to misuse. And no information is devoid of possible harm to one interest or another. Individuals may be harmed by their participation in statistical inquiries, or group interests may be damaged by certain findings. A particular district may, for instance, be negatively stereotyped by a statistical inquiry which finds that it contains a very high incidence of crime. A group interest may also be harmed by social or political action based on statistical findings. For instance, heavier policing of a district in which crime is found to be high may be introduced at the expense of lighter policing of a district in which crime is found to be high may be introduced at the expense of lighter policing in low crime districts. Such a move may be of aggregate benefit to society but to the detriment of some districts. Statisticians are not, however, in a position to prevent action based on statistical data. Indeed, to guard against the use of their findings would be to disparage the very purpose of much statistical inquiry. However, statisticians should act to the extent possible to inform the public if findings are misused or mislead.

2. Pursuing objectivity

Statisticians should uphold their professional integrity without fear or favor, only selecting and using methods designed to produce the most accurate results, consistent with accepted international practices,, presenting the findings openly, completely, and in a transparent manner. While statisticians operate within the value systems of their societies, they should not engage or collude in selecting methods designed to produce misleading results, or in misrepresenting statistical finds by commission or omission. .

The pursuit of objectivity is a goal of science, though in practice it may be difficult to achieve at all times. Statistics is no exception. The selection of topics for attention may reflect a systematic bias in favour of certain cultural or personal values, In addition, the employment base of the statistician, the source of funding, and a range of other factors may impose certain priorities, obligations, and prohibitions. Even so, the statistician is never free of a responsibility to pursue objectivity and to be open about known barriers to its achievement. In particular, statisticians are bound by a professional obligations to resist approaches to data collection, processing, analysis, interpretation, and publication that are likely (explicitly or implicitly) to misinform or to mislead, rather than to advance knowledge.

3. Clarifying obligations and roles

The respective obligations of employer, client, or funder, and statistician in regard to the roles and responsibility of each should be spelled out and fully understood in advance. In providing advice or guidance, statisticians should take care to stay within their area of competence, and seek advice, as appropriate, from others with the relevant expertise.

Statisticians should clarify in advance the respective obligations of employer, client, or funder and statistician; they should, for example, refer the employer or funder to the relevant parts of a professional code to which they adhere. Reports of the findings should (where appropriate) specify their role.

4. Assessing alternatives impartially

Available methods and procedures for addressing a proposed inquiry should be considered and an impartial assessment provided the employer, client, or funder of the respective merits and limitations of alternatives, along with the proposed method.

Statisticians should consider the available methods and procedures for addressing a proposed inquiry and should provide the funder or employer with an impartial assessment of the respective merits and demerits of alternatives.

Statisticians develop and use concepts and techniques for the collection, analysis or interpretation of data. Although they are not always in a position to determine the

scope of their work or the way in which their data are used and disseminated, they are frequently able to influence these matters. In addition, they are in a position to devise more efficient uses of resources through, for example, developing sampling techniques or introducing new uses for existing data.

Academic statisticians may enjoy the greatest degree of autonomy over the scope of their work and the dissemination of their results. Even so, they are generally dependent on the decisions of funders, on the one hand, and journal editors, on the other, for the direction and publication of their inquiries.

Statisticians employed in the public sector and those employed in commerce and industry tend to have even less autonomy over that they do or how their data are utilised. Rules of secrecy may apply; pressure may be exerted to withhold or delay the publication of findings (or of certain findings); statistical series may be introduced or discontinued for reasons that have little to do with technical considerations. In these cases the final authority for decisions about an inquiry may rest with the employer or client.

Statisticians are most likely to avoid restrictions being placed on their work when they are able to stipulate in advance the issues over which they should maintain control. Government statisticians may, for example, gain agreement to announce dates of publication for various statistical series, thus creating an obligation to publish the data on the due dates regardless of intervening political factors. Similarly, statisticians in commercial contracts may specify that control over at least some of the findings (or details of methods) will rest in their hands rather than with their clients. The greatest problems seem to occur when such issues remain unresolved until the data emerge.

5. Avoiding Preempted Outcomes

Any attempt from employer, client, or any source to establish a predetermined outcome from a proposed statistical inquiry should be rejected, as should contractual conditions contingent upon such a requirement.

Statisticians should not accept contractual conditions that are contingent upon a particular outcome from a proposed statistical inquiry.

6. Guarding Privileged Information

Statisticians are frequently furnished with information by the employer, client, or funder who may legitimately require it to be kept confidential. Statistical methods and procedures that have been utilised to produce published data should not, however, be kept confidential.

The independent statistician or consultant appears to enjoy greater latitude than the employee-statistician to insist on the application of certain professional principles. In the case of the independent statistician, each relationship with a funder may be subject to

a specific contract in which roles and obligations may be specified in advance, suggesting some greater latitude. In the employee's case, by contrast, his or her contract is not project-specific and generally comprises an explicit or implicit obligation to accept instructions from the employer. The employee-statistician in the public sector may be restricted further by statutory regulations covering such matters as compulsory surveys and official secrecy.

7. Exhibiting Professional Competence

Statisticians shall seek to upgrade their professional knowledge and skill and shall maintain awareness of technological developments, procedures, and standards which are relevant to their field, and shall encourage their colleagues to do likewise. They also shall offer to do work or provide services which are within their professional competence, and shall not claim competence not possessed, and any professional opinion given shall be objective and reliable. They shall not commit to produce results when, in their judgment, conditions to succeed are not met.

Above all, statisticians should attempt to ensure that employers, clients, and funders appreciate the obligations that statisticians have, not only to them, but also to society at large, to subjects, to professional colleagues and to collaborators.,

8. Maintaining Confidence in Statistics

In order to promote and preserve the confidence of the public, statisticians should ensure that they accurately and correctly describe their results, including the explanatory power of their data. It is incumbent upon statisticians to alert potential users of the results to the limits of their reliability and applicability.

Statisticians depend upon the confidence of the public. They should in their work attempt to promote and preserve such confidence without exaggerating the accuracy or explanatory power of their data.

9. Exposing and Reviewing Methods and Findings

Within the limits of confidentiality requirements, statisticians should provide adequate information to colleagues to permit their methods, procedures, techniques and findings to be assessed independently. Such assessments should be directed at the methods themselves rather than at the individuals who selected or used them.

10. Communicating Ethical Principles

In collaborating with colleagues and others in the same or other disciplines, it is necessary and important to ensure that the ethical principles of all participants are clear,

understood, respected, and reflected in the undertaking.

Each of these principles stems from the notion that statisticians derive their status and certain privileges of access to data not only by virtue of their personal standing but also by virtue of their professional citizenship. In acknowledging membership of a wider statistical community, statisticians owe various obligations to that community and can expect consideration from it.

The reputation of statistics will inevitably depend less on what professional bodies of statisticians assert about their ethical norms than on the actual conduct of individual statisticians. In considering the methods, procedures, content and reporting of their inquiries, statisticians should therefore try to ensure that they leave a research field in a state which permits further access by statisticians in the future.

Statistical inquiries are frequently collaborative efforts among colleagues of different levels of seniority and from different disciplines. The reputations and careers of all contributors need to be taken into account. The statistician should also attempt to ensure that statistical inquiries are conducted within an agreed ethical framework, perhaps incorporating principles or conventions from other disciplines, and that each contributor's role is sufficiently defined. The World Medical Association's Declaration of Helsinki (1975), for instance, gives guidance to statisticians in the field of medicine.

A principle of all scientific work is that it should be open to scrutiny, assessment and possible validation by fellow scientists. Particular attention should be given to this principle when using computer software packages for analysis by providing as much detail as possible. Any perceived advantage of withholding details of techniques or findings, say for competitive reasons, needs to be weighed against the potential disservice of such an action to the advancement of statistical knowledge.

One of the most important but difficult responsibilities of the statistician is that of alerting potential users of their data to the limits of their reliability and applicability. The twin dangers of either overstating or understating the validity or generalisability of data are nearly always present. No general guidelines can be drawn except for a counsel of caution. Confidence in statistical findings depends critically on their faithful representation. Attempts by statisticians to cover up errors (see Ryten, 1981), or to invite over-interpretation, may not only rebound on the statisticians concerned, but also on the reputation of statistical institutions, as well as on statistics in general.

11. Bearing Responsibility for the Integrity of the Discipline

Statisticians, in the exercise of their science and scholarship, are subject to the general moral rules of scientific and scholarly conduct: they should not deceive or knowingly misrepresent (i.e., fabricate, falsify, or plagiarize), or attempt to prevent reporting of misconduct or obstruct the scientific/scholarly research of others.

Further, they should publicly acknowledge assistance received in research and

preparation of their work, give appropriate credit for co-authorship or contribution, encourage publication by colleagues or students, and compensate justly those who assist or participate in professional activities

12. Avoiding Undue Intrusion

Statisticians should be aware of the intrusive potential of some of their work. They have no special entitlement to study all phenomena. The advancement of knowledge and the pursuit of information are not themselves sufficient justifications for overriding other social and cultural values.

Some forms of statistical inquiry appear to be more intrusive than others. For instance, statistical samples may be selected without the knowledge or consent of their members; contact may be sought with subjects without advance warning; questions may be asked which cause distress or offence; people may be observed or information collected without their knowledge; or information may be obtained from third parties. In essence, people may be inconvenienced or aggrieved by statistical inquiries in a variety of ways, many of which are difficult to avoid.

One way of avoiding inconvenience to potential subjects is to make more use of available data instead of embarking on a new inquiry. For instance, by making greater statistical use of administrative records, or by linking records, information about society may be produced that would otherwise have to be collected afresh. Although some subjects may have objections to the data's being used for a different purpose from that intended, they should not be adversely affected by such uses, provided that their identities are protected and that the purpose is statistical, not administrative.

As Cassell (1982) argues, people can feel wronged without being harmed by research: they may feel they have been treated as objects of measurement without respect for their individual values and sense of privacy. In many of the statistical inquiries that have caused controversy, the issue has had more to do with intrusion into subjects' private and personal domains, or with overburdening subjects by collecting 'too much' information, rather than with whether or not subjects have been harmed. By exposing subjects to a sense of being wronged, perhaps by the method of selection or by causing them to acquire self-knowledge that they did not seek or want, statisticians are vulnerable to criticism. Resistance to statistical inquiries in general may also increase.

13. Ensuring Informed Consent

Statistical inquiries involving the active participation of human subjects should be based as far as practicable on their freely given informed consent. Even if participation is required by law, it should still be as informed as possible. In voluntary inquiries, subjects should not be under the impression that they are required to participate; they should be

aware of their entitlement to refuse at any stage for whatever reason and to withdraw data just supplied. Information that would be likely to affect a subject's willingness to participate should not be deliberately withheld.

The principle of informed consent from subjects is necessarily vague, since it depends for its interpretation on unstated assumptions about the amount of information and the nature of consent required to constitute acceptable practice. The amount of information needed to ensure that a subject is adequately informed about the purpose and nature of an inquiry is bound to vary from study to study. No universal rules can be framed. At one extreme it is inappropriate to overwhelm potential subjects with unwanted and incomprehensible details about the origins and content of a statistical inquiry. At the other extreme it is inappropriate to withhold material facts or to mislead subjects about such matters. The appropriate information requirement clearly falls somewhere between these positions but its precise location depends on circumstances. The clarity and comprehensibility of the information provided are as important as the quantity.

An assessment needs to be made of which items of information are likely to be material to a subject's willingness to participate. The statistician should consider not only those items that he or she regards as material, but those which the potential subject is likely to regard as such. Each party may well have special (and different) interests. As a means of supplementing the information selected, the statistician may choose to give potential subjects a declaration of their entitlement (see Jowell, 1981) which informs them of their right to information but leaves the selection of extra details in the subject's control.

Just as the specification of adequate information varies, so does the specification of adequate consent. A subject's participation in a study may be based on reluctant acquiescence rather than on enthusiastic co-operation. In some cases, the statistician may feel it is appropriate to encourage a sense of duty to participate in order to minimise volunteer bias. The boundary between tactical persuasion and duress is sometimes very fine and is probably easier to recognise than to stipulate. In any event, the most specific generic statement that can be made about adequate consent is that it falls short both of implied coercion and full-hearted participation.

On occasions, a 'gatekeeper' blocks access to subjects so that statisticians cannot approach them directly for their participation without the gatekeeper's permission. While respecting the gatekeeper's legitimate interests statisticians should still adhere to the principle of obtaining informed consent directly from subjects once they have gained access to them. In these cases, statisticians should not devolve their responsibility to protect the subject's interests onto the gatekeeper. They should also be wary of inadvertently disturbing the relationship between subject and gatekeeper.

The principle of informed consent is, in essence, an expression of belief in the need for truthful and respectful exchanges between statisticians and human subjects. It is clearly not a precondition of all statistical inquiry. Nonetheless, the acceptability of statistics depends increasingly not only on technical considerations but also on the

willingness of statisticians to accord respect to their subjects and to treat them with consideration. Statisticians should attempt to ensure that subjects appreciate the purpose of a statistical inquiry, even when the subject's participation is required by law.

Qualifications to Informed Consent

On occasions, technical or practical considerations inhibit the achievement of prior informed consent. In these cases, the subjects' interests should be safeguarded in other ways. For example:

(a) Respecting rights in observation studies. In observation studies, where behaviour patterns are recorded without the subject's knowledge, statisticians should take care not to infringe what may be referred to as the 'private space' of an individual or group. This will vary from culture to culture.

(b) Dealing with proxies. In cases where a 'proxy' is utilised to answer questions on behalf of a subject, say because access to the subject is uneconomic or because the subject is too ill or too young to participate directly, care should be taken not to infringe the 'private space' of the subject or to disturb the relationship between the subject and the proxy. Where indications exist or emerge that the subject would object to certain information being disclosed, such information should not be sought by proxy.

(c) Secondary use of records. In cases where a statistician has been granted access to, say, administrative or medical records or other research material for a new or supplementary inquiry, the custodian's permission to use the records should not relieve the statistician from having to consider the likely reactions, sensitivities and interests of the subjects concerned, including their entitlement to anonymity.

(d) Misleading potential subjects. In studies where the measurement objectives preclude the prior disclosure of material information to subjects, statisticians should weigh the likely consequences of any proposed deception. To withhold material information from, or to misinform, subjects involves a deceit, whether by omission or commission, temporarily or permanently, which will face legitimate censure unless it can be justified.

Where informed consent cannot be acquired in advance, there is a case, where practicable, for seeking it post hoc, once the methodological advantage - of covert observation, of deception, or of withholding information - has been achieved.

14. Protecting the Interests of Subjects

Neither consent from subjects nor the legal requirement to participate absolves the statistician from an obligation to protect the subject as far as possible against potentially harmful effects of participating. The statistician should try to minimise disturbance both to subjects themselves, to the subjects' relationships with their environment, and to the

group of which the subject is part.

Harm to subjects may arise from undue stress through participation, loss of self-esteem, psychological injury or other side effects. Various factors may be important in assessing the risk-benefit ratio of a particular inquiry, such as the probability of risk, the number of people at risk, the severity of the potential harm, the anticipated utility of the findings, few of which are usually quantifiable.

When the probability or potential severity of harm is great, statisticians face a more serious dilemma. A statistician may, for instance, be involved in a medical experiment in which risks to subjects of some magnitude are present. If volunteers can be found who have been told of the risks, and if the statistician is convinced of the importance of the experiment, should he or she nonetheless oppose the experiment in view of the risks? In these circumstances, probably the best advice is to seek advice - from colleagues and others, especially from those who are not themselves parties to the study or experiment.

The interests of subjects may also be harmed by virtue of their membership of a group or section of society.. So statisticians can rarely claim that a prospective inquiry is devoid of possible harm to subjects. They may be able to claim that, as individuals, subjects will be protected by the device of anonymity. But, as members of a group or indeed as members of society itself, no subject can be exempted from the possible effects of policy decisions based on statistical findings.

15. Maintaining Confidentiality of Records

Statistical data are unconcerned with individual identities. They are collected to answer questions such as 'how many?' or 'what proportion?', not 'who?'. The identities and records of co-operating (or non-cooperating) subjects should therefore be kept confidential, whether or not confidentiality has been explicitly pledged. If for any reason the confidentiality of individual records is breached, subjects should be notified.

16. Inhibiting Disclosure of Identity

Statisticians should take appropriate measures to prevent their data from being published or otherwise released in a form that would allow any subject's identity to be disclosed or inferred.

There can be no absolute safeguards against breaches of confidentiality, that is, the disclosure of identified or identifiable data in contravention of an implicit or explicit obligation to the source. Many methods exist for lessening the likelihood of such breaches, the most common and potentially secure of which is anonymity. Its virtue as a security system is that it helps to prevent unwitting breaches of confidentiality. As long as data travel incognito, they are more difficult to attach to individuals or organisations.

There is a powerful case for identifiable statistical data to be granted 'privileged' status in law so that access to them by third parties is legally blocked in the absence of the permission of the responsible statistician (or his or her subjects). Even without such legal protection, however, it is the statistician's responsibility to ensure that the identities of subjects are protected.

Anonymity alone is by no means a guarantee of confidentiality. A particular configuration of attributes can, like a fingerprint, frequently identify its owner beyond reasonable doubt. So statisticians need to counteract the opportunities for others to infer identities from their data. They may decide to group data in such a way as to disguise identities, or to employ a variety of available measures that seek to impede the detection of identities without inflicting very serious damage to the aggregate dataset. Some damage to analysis possibilities is unavoidable in these circumstances, but it needs to be weighed against the potential damage to the sources of data in the absence of such action.

The widespread use of computers is often regarded as a threat to individuals and organisations because it provides new methods of disclosing and linking identified records. It is the responsibility of the statistician to exploit the impressive capacity of computers to disguise identities and to enhance data security, thus allowing society to benefit from its impressive capabilities.

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Codes of Ethics: Selected Statistical Associations

1. ISI Declaration on Professional Ethics (Proposed)
2. ISI Declaration on Professional Ethics (Current)
<http://isi.cbs.nl/ethics.htm>
3. UN: Principles Governing International Statistical Activities
http://unstats.un.org/unsd/methods/statorg/Principles_stat_activities/principles_stat_activities.htm
4. American Statistical Association: Ethical Guidelines for Statistical Practice
<http://www.amstat.org/profession/index.cfm?fuseaction=ethicalstatistics>
5. ASA: Privacy, Confidentiality, and Data Security Web Site
<http://www.amstat.org/comm/cmtepc/index.cfm?fuseaction=content>
6. AAPOR: Code of Professional Ethics and Practices
http://aapor.org/pdfs/AAPOR_Code_2005.pdf
7. WAPOR Code of Professional Ethics and Practices
<http://www.unl.edu/wapor/ethics.html>
8. European Society for Opinion and Marketing Research (ESOMAR)
<http://www.esomar.org/>
9. Royal Statistical Society Code of Conduct
<http://www.rss.org.uk/main.asp?page=1875>
10. Respect Project: Code of Practice for Socio-Economic Research
<http://www.respectproject.org/code/index.php>
11. Statistical Society of Canada: Code of Ethical Statistical Practice
http://www.ssc.ca/main/new/ethics_e.html
12. Mexican Association of Market Research and Public Opinion (AMAI) (in Spanish)
http://www.amai.org/pdfs/revista-amai/revista-amai-articulo-20050428_103924.pdf
13. ACM Software Engineering
<http://www.acm.org/serving/se/code.htm>
14. Misc:
Comparative Table of Ethical Practices, for selected professional organizations

AMSTAT Article: Making Statistical Ethics Work for You, of Course
<http://www.amstat.org/careers/feb02cc.pdf>

Codes of Ethics: Selected Non-statistical Associations

15. American Sociological Association
http://www.asanet.org/cs/root/leftnav/ethics/code_of_ethics_table_of_contents
16. Public Health Leadership Society
<http://209.9.235.208/CMSuploads/PHLSethicsbrochure-40103.pdf>
17. Society for Public Health Education
<http://www.Sophe.org/content/ethics.asp>
18. World Medical Association
<http://www.wma.net/e/policy/c8.htm>
19. Medical Research Council (UK)
<http://www.mrc.ac.uk/PolicyGuidance/EthicsAndGovernance/index.htm>
20. American Political Science Association
<http://apsanet.org/imgtest/ethicsguideweb.pdf>
21. American Anthropological Association
<http://Aaanet.org/committees/ethics/ethcode.htm>
22. Association for Computing Machinery
<http://www.acm.org/constitution/code.html>
23. ACM Software Engineering
<http://www.acm.org/serving/se/code.htm>
24. Online ethics.org
<http://www.onlineethics.org/CMS/profpractice/ethcodes.aspx>

III BIBLIOGRAPHY