Ethical Guidelines
for Statistical Practice

Prepared by the Committee
on Professional Ethics of the
American Statistical Association
Approved by the ASA Board in February 2022

Contents

Purpose of the Guidelines

The American Statistical Association's Ethical Guidelines for Statistical Practice are intended to help statistical practitioners make decisions ethically. In these guidelines, "statistical practice" includes activities such as designing the collection of, summarizing, processing, analyzing, interpreting, or presenting data and model or algorithm development and deployment. Throughout these guidelines, the term "statistical practitioner" includes all those who engage in statistical practice, regardless of job title, profession, level, or field of degree. The guidelines are intended for individuals, but these principles are also relevant to organizations that engage in statistical practice.

The ethical guidelines aim to promote accountability by informing those who rely on any aspects of statistical practice of the standards they should expect. Society benefits from informed judgments supported by ethical statistical practice.

All statistical practitioners are expected to follow these guidelines and encourage others to do the same.

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In some situations, guideline principles may require balancing competing interests. If an unexpected ethical challenge arises, the ethical practitioner seeks guidance, not exceptions, in the guidelines. To justify unethical behaviors, or to exploit gaps in the guidelines, is unprofessional and inconsistent with these guidelines.

A. Professional Integrity and Accountability

Professional integrity and accountability require taking responsibility for one's work. Ethical statistical practice supports valid and prudent decision-making with appropriate methodology. The ethical statistical practitioner represents their capabilities and activities honestly and treats others with respect.

The ethical statistical practitioner:

1. Takes responsibility for evaluating potential tasks, assessing whether they have (or can attain) sufficient competence to execute each task and that the work and timeline are feasible. Does not solicit or deliver work for which they are not qualified or that they would not be willing to have peer reviewed.

2. Uses methodology and data that are valid, relevant, and appropriate, without favoritism or prejudice, and in a manner intended to produce valid, interpretable, and reproducible results.

3. Does not knowingly conduct statistical practices that exploit vulnerable populations or create or perpetuate unfair outcomes.

4. Opposes efforts to predetermine or influence the results of statistical practices and resists pressure to selectively interpret data.

5. Accepts full responsibility for their own work, does not take credit for the work of others, and gives credit to those who contribute. Respects and acknowledges the intellectual property of others.

6. Strives to follow, and encourages all collaborators to follow, an established protocol for authorship. Advocates for recognition commensurate with each person's contribution to the work. Recognizes that inclusion as an author does imply, while acknowledgment may imply, endorsement of the work.

7. Discloses conflicts of interest, financial and otherwise, and manages or resolves them according to established policies, regulations, and laws.

8. Promotes the dignity and fair treatment of all people. Neither engages in nor condones discrimination based on personal characteristics. Respects personal boundaries in interactions and avoids harassment, including sexual harassment, bullying, and other abuses of power or authority.

9. Takes appropriate action when aware of deviations from these guidelines by others.

10. Acquires and maintains competence through upgrading of skills as needed to maintain a high standard of practice.

11. Follows applicable policies, regulations, and laws relating to their professional work, unless there is a compelling ethical justification to do otherwise.

12. Upholds, respects, and promotes these guidelines. Those who teach, train, or mentor in statistical practice have a special obligation to promote behavior that is consistent with these guidelines.

B. Integrity of Data and Methods

The ethical statistical practitioner seeks to understand and mitigate known or suspected limitations, defects, or biases in the data or methods and communicates potential impacts on the interpretation, conclusions, recommendations, decisions, or other results of statistical practices.

The ethical statistical practitioner:

1. Communicates data sources and fitness for use, including data generation and collection processes and known biases. Discloses and manages any conflicts of interest relating to the data sources. Communicates data processing and transformation procedures, including missing data handling.

2. Is transparent about assumptions made in the execution and interpretation of statistical practices, including methods used, limitations, possible sources of error, and algorithmic biases. Conveys results or applications of statistical practices in ways that are honest and meaningful.

3. Communicates the stated purpose and the intended use of statistical practices. Is transparent regarding a priori versus post hoc objectives and planned versus unplanned statistical practices. Discloses when multiple comparisons are conducted and any relevant adjustments.

4. Meets obligations to share the data used in the statistical practices (e.g., for peer review and replication) as allowable. Respects expectations of data contributors when using or sharing data. Exercises due caution to protect proprietary and confidential data, including all data that might inappropriately harm data subjects.

5. Strives to promptly correct substantive errors discovered after publication or implementation. As appropriate, disseminates the correction publicly and/or to others relying on the results.

6. For models and algorithms designed to inform or implement decisions repeatedly, develops and/or implements plans to validate assumptions and assess performance over time, as needed. Considers criteria and mitigation plans for model or algorithm failure and retirement.

7. Explores and describes the effect of variation in human characteristics and groups on statistical practice when feasible and relevant.

C. Responsibilities to Stakeholders

Those who fund, contribute to, use, or are affected by statistical practices are considered stakeholders. The ethical statistical practitioner respects the interests of stakeholders while practicing in compliance with these guidelines.

The ethical statistical practitioner:

1. Seeks to establish what stakeholders hope to obtain from any specific project. Strives to obtain sufficient subject-matter knowledge to conduct meaningful and relevant statistical practice.

2. Regardless of personal or institutional interests or external pressures, does not use statistical practices to mislead any stakeholder.

3. Uses practices appropriate to exploratory and confirmatory phases of a project, differentiating findings from each so the stakeholders can understand and apply the results.

4. Informs stakeholders of the potential limitations on use and re-use of statistical practices in different contexts and offers guidance and alternatives, where appropriate, about scope, cost, and precision considerations that affect the utility of the statistical practice.

5. Explains any expected adverse consequences from failing to follow through on an agreed-upon sampling or analytic plan.

6. Strives to make new methodological knowledge widely available to provide benefits to society at large. Presents relevant findings, when possible, to advance public knowledge.

7. Understands and conforms to confidentiality requirements for data collection, release, and dissemination and any restrictions on its use established by the data provider (to the extent legally required). Protects the use and disclosure of data accordingly. Safeguards privileged information of the employer, client, or funder.

8. Prioritizes both scientific integrity and the principles outlined in these guidelines when interests are in conflict.

D. Responsibilities to Research Subjects, Data Subjects, or Those Directly Affected by Statistical Practices

The ethical statistical practitioner does not misuse or condone the misuse of data. They protect and respect the rights and interests of human and animal subjects. These responsibilities extend to those who will be directly affected by statistical practices.

The ethical statistical practitioner:

1. Keeps informed about and adheres to applicable rules, approvals, and guidelines for the protection and welfare of human and animal subjects. Knows when work requires ethical review and oversight.[1]

2. Makes informed recommendations for sample size and statistical practice methodology to avoid the use of excessive or inadequate numbers of subjects and excessive risk to subjects.

3. For animal studies, seeks to leverage statistical practice to reduce the number of animals used, refine experiments to increase the humane treatment of animals, and replace animal use where possible.

4. Protects people's privacy and the confidentiality of data concerning them, whether obtained from the individuals directly, other persons, or existing records. Knows and adheres to applicable rules, consents, and guidelines to protect private information.

5. Uses data only as permitted by data subjects' consent, when applicable, or considers their interests and welfare when consent is not required. This includes primary and secondary uses, use of repurposed data, sharing data, and linking data with additional data sets.

6. Considers the impact of statistical practice on society, groups, and individuals. Recognizes that statistical practice could adversely affect groups or the public perception of groups, including marginalized groups. Considers approaches to minimize negative impacts in applications or in framing results in reporting.

7. Refrains from collecting or using more data than is necessary. Uses confidential information only when permitted and only to the extent necessary. Seeks to minimize the risk of re-identification when sharing de-identified data or results where there is an expectation of confidentiality. Explains any impact of de-identification on accuracy of results.

8. To maximize contributions of data subjects, considers how best to use available data sources for exploration, training, testing, validation, or replication as needed for the application. The ethical statistical practitioner appropriately discloses how the data is used for these purposes and any limitations.

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1 Examples of ethical review and oversight include an institutional review board (IRB), an institutional animal care and use committee (IACUC), or a compliance assessment.

9. Knows the legal limitations on privacy and confidentiality assurances and does not over-promise or assume legal privacy and confidentiality protections where they may not apply.

10. Understands the provenance of the data—including origins, revisions, and any restrictions on usage—and fitness for use prior to conducting statistical practices.

11. Does not conduct statistical practice that could reasonably be interpreted by subjects as sanctioning a violation of their rights. Seeks to use statistical practices to promote the just and impartial treatment of all individuals.

E. Responsibilities to Members of Multidisciplinary Teams

Statistical practice is often conducted in teams made up of professionals with different professional standards. The statistical practitioner must know how to work ethically in this environment.

The ethical statistical practitioner:

1. Recognizes and respects that other professions may have different ethical standards and obligations. Dissonance in ethics may still arise, even if all members feel they are working toward the same goal. It is essential to have a respectful exchange of views.

2. Prioritizes these guidelines for the conduct of statistical practice in cases where ethical guidelines conflict.

3. Ensures all communications regarding statistical practices are consistent with these guidelines. Promotes transparency in all statistical practices.

4. Avoids compromising validity for expediency. Regardless of pressure on or within the team, does not use inappropriate statistical practices.

F. Responsibilities to Fellow Statistical Practitioners and the Profession

Statistical practices occur in a wide range of contexts. Irrespective of job title and training, those who practice statistics have a responsibility to treat statistical practitioners, and the profession, with respect. Responsibilities to other practitioners and the profession include honest communication and engagement that can strengthen the work of others and the profession.

The ethical statistical practitioner:

1. Recognizes that statistical practitioners may have different expertise and experiences, which may lead to divergent judgments about statistical practices and results. Constructive discourse with mutual respect focuses on scientific principles and methodology and not personal attributes.

2. Helps strengthen, and does not undermine, the work of others through appropriate peer review or consultation. Provides feedback or advice that is impartial, constructive, and objective.

3. Takes full responsibility for their contributions as instructors, mentors, and supervisors of statistical practice by ensuring their best teaching and advising—regardless of an academic or nonacademic setting—to ensure developing practitioners are guided effectively as they learn and grow in their careers.

4. Promotes reproducibility and replication, whether results are "significant" or not, by sharing data, methods, and documentation to the extent possible.

5. Serves as an ambassador for statistical practice by promoting thoughtful choices about data acquisition, analytic procedures, and data structures among nonpractitioners and students. Instills appreciation for the concepts and methods of statistical practice.

G. Responsibilities of Leaders, Supervisors, and Mentors in Statistical Practice

Statistical practitioners leading, supervising, and/or mentoring people in statistical practice have specific obligations to follow and promote these ethical guidelines. Their support for, and insistence on, ethical statistical practice are essential for the integrity of the practice and profession of statistics, as well as the practitioners themselves.

Those leading, supervising, or mentoring statistical practitioners are expected to:

1. Ensure appropriate statistical practice that is consistent with these guidelines. Protect the statistical practitioners who comply with these guidelines and advocate for a culture that supports ethical statistical practice.

2. Promote a respectful, safe, and productive work environment. Encourage constructive engagement to improve statistical practice.

3. Identify and/or create opportunities for team members/mentees to develop professionally and maintain their proficiency.

4. Advocate for appropriate, timely, inclusion and participation of statistical practitioners as contributors/collaborators. Promote appropriate recognition of the contributions of statistical practitioners, including authorship if applicable.

5. Establish a culture that values validation of assumptions and assessment of model/algorithm performance over time and across relevant subgroups, as needed. Communicate with relevant stakeholders regarding model or algorithm maintenance, failure, or actual or proposed modifications.

H. Responsibilities Regarding Potential Misconduct

The ethical statistical practitioner understands that questions may arise concerning potential misconduct related to statistical, scientific, or professional practice. At times, a practitioner may accuse someone of misconduct or be accused by others. At other times, a practitioner may be involved in the investigation of others' behavior. Allegations of misconduct may arise within different institutions with different standards and potentially different outcomes. The elements that follow relate specifically to allegations of statistical, scientific, and professional misconduct.

Those ethical statistical practitioner:

1. Knows the definitions of and procedures relating to misconduct in their institutional setting. Seeks to clarify facts and intent before alleging misconduct by others. Recognizes that differences of opinion and honest error do not constitute unethical behavior.

2. Avoids condoning or appearing to condone statistical, scientific, or professional misconduct. Encourages other practitioners to avoid misconduct or the appearance of misconduct.

3. Does not make allegations that are poorly founded or intended to intimidate. Recognizes such allegations as potential ethics violations.

4. Lodges complaints of misconduct discreetly and to the relevant institutional body. Does not act on allegations of misconduct without appropriate institutional referral, including those allegations originating from social media accounts or email listservs.

5. Insists upon a transparent and fair process to adjudicate claims of misconduct. Maintains confidentiality when participating in an investigation. Discloses the investigation results honestly to appropriate parties and stakeholders once they are available.

6. Refuses to publicly question or discredit the reputation of a person based on a specific accusation of misconduct while due process continues to unfold.

7. Following an investigation of misconduct, supports the efforts of all parties involved to resume their careers in as normal a manner as possible, consistent with the outcome of the investigation.

8. Avoids and acts to discourage retaliation against or damage to the employability of those who responsibly call attention to possible misconduct.

Appendix

Responsibilities of Organizations/ Institutions

Whenever organizations and institutions design the collection of, summarize, process, analyze, interpret, or present data or develop and/or deploy models or algorithms, they have responsibilities to use statistical practice in ways that are consistent with these guidelines, as well as to promote ethical statistical practice.

Organizations and institutions engage in and promote ethical statistical practice by:

1. Expecting and encouraging all employees and vendors who conduct statistical practice to adhere to these guidelines. Promoting a workplace where the ethical practitioner may apply the guidelines without being intimidated or coerced. Protecting statistical practitioners who comply with these guidelines.

2. Engaging competent personnel to conduct statistical practice and promote a productive work environment.

3. Promoting the professional development and maintenance of proficiency for employed statistical practitioners.

4. Supporting statistical practice that is objective and transparent. Not allowing organizational objectives or expectations to encourage unethical statistical practice by its employees.

5. Recognizing that the inclusion of statistical practitioners as authors, or acknowledgment of their contributions to projects or publications, requires their explicit permission because it may imply endorsement of the work.

6. Avoiding statistical practices that exploit vulnerable populations or create or perpetuate discrimination or unjust outcomes. Considering both scientific validity and impact on societal and human well-being that results from the organization's statistical practice.

7. Using professional qualifications and contributions as the basis for decisions regarding statistical practitioners' hiring, firing, promotion, work assignments, publications and presentations, candidacy for offices and awards, funding or approval of research, and other professional matters.

Those in leadership, supervisory, or managerial positions who oversee statistical practitioners promote ethical statistical practice by following Principle G and:

8. Recognizing it is contrary to these guidelines to report or follow only those results that conform to expectations without explicitly acknowledging competing findings and the basis for choices regarding which results to report, use, and/or cite.

9. Recognizing the results of valid statistical studies cannot be guaranteed to conform to the expectations or desires of those commissioning the study or employing/supervising the statistical practitioner(s).

10. Objectively, accurately, and efficiently communicating a team's or practitioners' statistical work throughout the organization.

11. In cases where ethical issues are raised, representing them fairly within the organization's leadership team.

12. Managing resources and organizational strategy to direct teams of statistical practitioners along the most productive lines in light of the ethical standards contained in these guidelines.