

INTRODUCTION TO ETHICAL PRACTICE IN STATISTICS AND DATA SCIENCE

Ethics in Statistics and Data Science: “With great power comes great responsibility”

- *Michiko I. Wolcott (Msight Analytics)*

Statistical ethics takes the stage: Exploring ethical thinking through role play

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Joint Statistical Meetings
Introductory Overview Lecture
August 2, 2026

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SESSION OUTLINE

- **Overview Part 1:** Introduction
- **Role Play 1** (Government): “Before the Storm: Disclosure versus Vulnerable Population Safety at the Office of Emergency”
- **Overview Part 2:** The Nature of Ethics
- **Role Play 2** (Academia/Research): “What We Owe the Community”
- **Overview Part 3:** Considerations for Ethical Practice
- **Role Play 3** (Industry): “Vibe Targets: Speed, Reach, and Uneven Opportunity”
- **Overview Part 4:** Putting Ethics into Practice

- **Floor Discussion**

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ETHICS, ETHICS EVERYWHERE

EXAMPLES OF WELL-KNOWN CASES IN ETHICS

- Cambridge Analytica Facebook data
- Amazon's hiring algorithm
- Planning a mass shooting with ChatGPT
- Target predictive marketing model



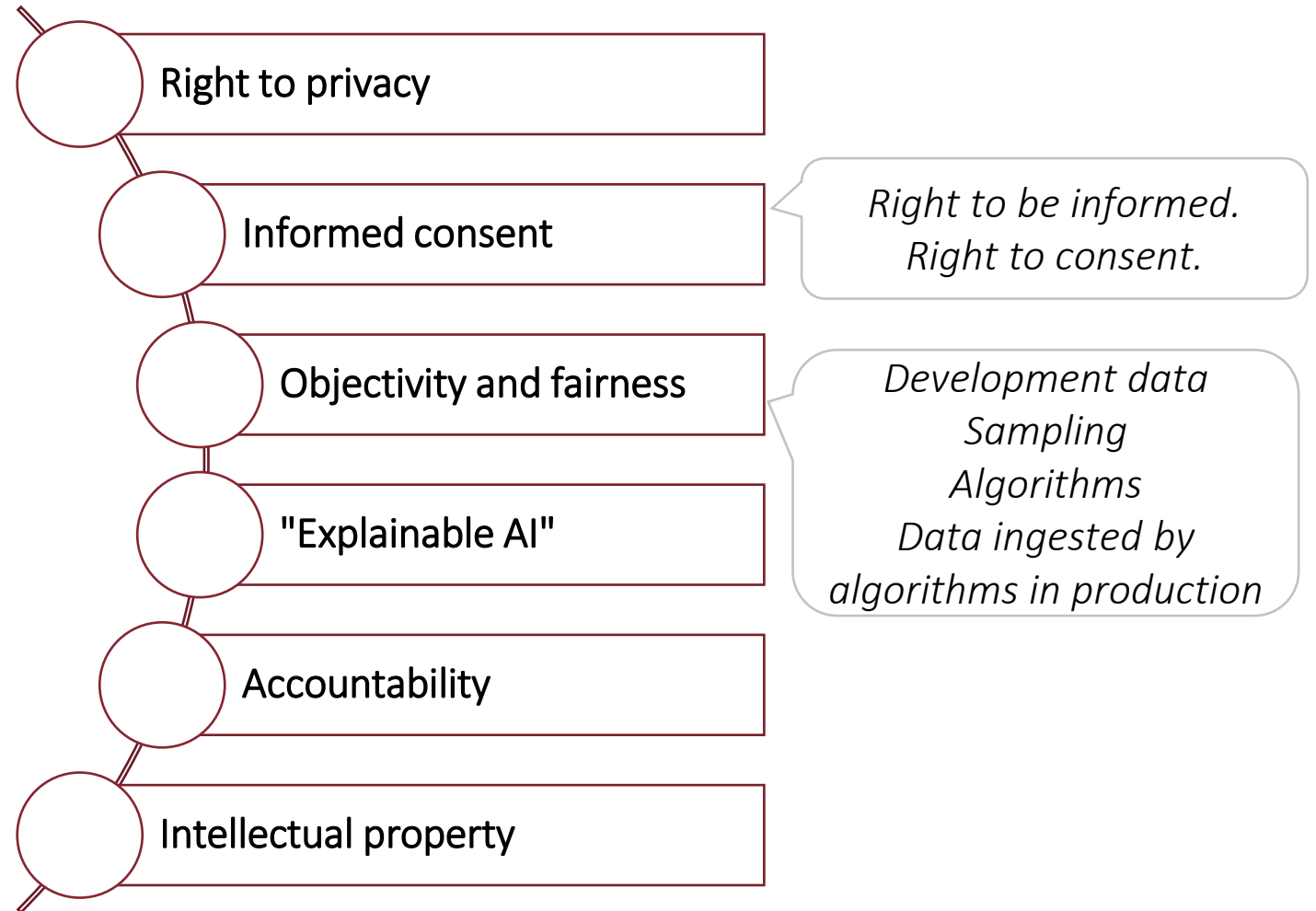
ETHICS IN DATA AND ANALYTICS

SOME HOT TOPICS

Responsible AI: The practice of designing, developing, and deploying artificial intelligence systems in ways that are ethical, transparent, fair, and aligned with human values and societal well-being.

Responsible data: The ethical and secure handling of data to ensure privacy, fairness, transparency, and accountability throughout its lifecycle.

**According to Microsoft Copilot*



IMPLEMENTATIONS OF ETHICAL STANDARDS

CURRENT LANDSCAPE

- Regulations: Data, algorithms
- Research ethics review
- Industry standards and frameworks
- Certifications
- Professional guidelines and codes of ethics
- Organizational policies and practices
- Working groups, conferences, etc.

- *Respect for stakeholders: data subjects, clients, colleagues/collaborators, users, and the general public*
- *Professional competency*
- *Respect for the profession*
- *Obligation to assume responsibility as a professional*
- *Avoidance of harm*
- *Honesty/transparency*
- *Fairness*
- *Privacy/confidentiality*

ASA ETHICAL GUIDELINES FOR STATISTICAL PRACTICE

- A. Professional Integrity and Accountability
 - B. Integrity of Data and Methods
 - C. Responsibilities to Stakeholders
 - D. Responsibilities to Research Subjects, Data Subjects, or Those Directly Affected by Statistical Practices
 - E. Responsibilities to Members of Multidisciplinary Teams
 - F. Responsibilities to Fellow Statistical Practitioners and the Profession
 - G. Responsibilities of Leaders, Supervisors, and Mentors in Statistical Practice
 - H. Responsibilities Regarding Potential Misconduct
- Appendix: Responsibilities of Organizations/Institutions

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THE NATURE OF ETHICAL DILEMMAS

ETHICS IS NOT EASY



Ethical vs. Legal



Conflicting values



Ambiguity

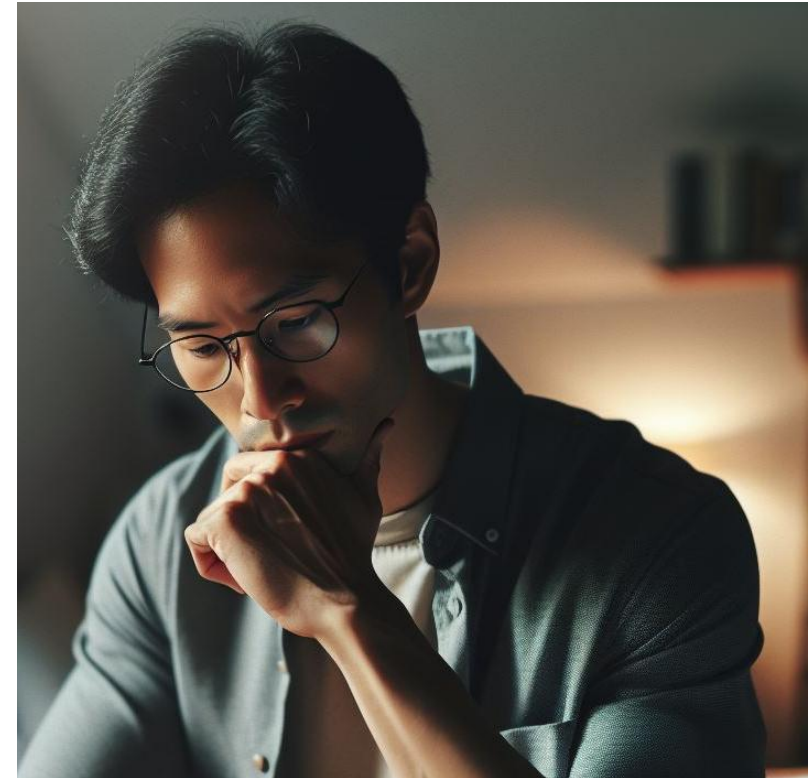


Careful and critical thinking

ETHICAL ISSUES FOR STATISTICIANS AND DATA SCIENTISTS

IT'S ABOUT WHAT YOU DO, NOT WHAT HAPPENS TO YOU

- "Can" vs. "should"
 - Knowing when to do something
 - when NOT to do something.
- Different aspects: Objective, data, algorithms, use.
- Fairness vs. bias
 - Global/social bias vs. personal bias
 - Theory vs. reality
 - Open biases vs. hidden biases
 - Bias in: (1) data, (2) algorithms, (3) users
- Intentionality and justification
 - Do you know what you are doing?
 - How can you demonstrate it?
- Building trust
 - How do we demonstrate our commitment to ethical principles?



ETHICAL ISSUES FOR STATISTICIANS AND DATA SCIENTISTS

THERE IS A LOT TO CONSIDER IN EACH OF THE FOUR ASPECTS

Objective of the solution

- Should we develop it?
- Targeting vs. fairness
- Experimentation vs. manipulation
- Details of the intended uses
- Potential unintended uses
- Scope of its impact

Data: In development and in production

- Anonymization and encryption are necessary but not sufficient to protect privacy
- Use of data only for defined purposes
- Data minimization
- Inherent biases in modern data sources
- Intellectual property in data

ETHICAL ISSUES FOR STATISTICIANS AND DATA SCIENTISTS

THERE IS A LOT TO CONSIDER IN EACH OF THE FOUR ASPECTS

Algorithms

- The selection of the technique: Performance vs. transparency
- Model architecture: variables/features, segmentation, treatments, etc.
- Reducing the cost of misinformation
- Incorporating fairness and eliminating biases

Use of the solution

- Unintended consequences of intended uses
 - Risks and costs of misinformation
 - Consequences of naive uses
- Uses beyond those originally intended
 - Naivety? Manipulation? Malice?
- Perpetuating or worsening bias
- Intellectual properties and ownership

HOW DO I PUT ALL THIS INTO PRACTICE?

INITIAL FRAMING QUESTIONS



Is it consistent with laws, regulations, and standards?



What are the risks?



Whom does it compromise?



To whom does the information belong?



Whom does it put at risk?



What are the possible consequences?



Is it moral? For whom?



Whom does it benefit?



Does it work as intended for all stakeholders?

Legal/regulatory • Moral • Financial • Reputational • Physical • Psychological • Direct/indirect • Etc.

How do you know? How have you demonstrated it?

HOW DO I PUT ALL THIS INTO PRACTICE?

TAKE THE TIME AND EFFORT TO DO THE RIGHT THING BY RESPECTING PRINCIPLES AND GUIDELINES



Do no harm.



Be fair.



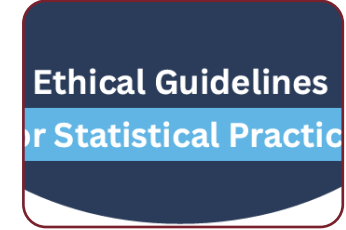
Be honest and
transparent.



Take
responsibility.



Respect and
protect others.



Use the ASA
Ethical
Guidelines!

- Be intentional in everything you do.
- Identify and disclose any conflict of interest.
- Be aware of all shortcomings.
- Recognize conflict in values is an integral part of ethical decision making. Being ethical is hard.
- Document all decisions and justifications.
- Monitor and correct methodologies, practices, and products: biases, misinformation.
- Take responsibility for own actions and decisions.



FLOOR DISCUSSION

Get your copy of the
ASA Ethical Guidelines



Session sponsored by **ASA Committee on Professional Ethics**

CoPE website: <https://community.amstat.org/ethics/home>

- The slides from this presentation and supporting materials are available under **Resources > Supporting Material**
- Additional resources on ethical statistical practice available

The **DEPICT paper referenced in the session:** <https://rdcu.be/fyyMO>

Van Mullekom, J., Davidson, M. DEPICT: A Framework for Ethical Reasoning in Statistics and Data Science with Case-Study Applications. *J Stat Theory Pract* **19**, 30 (2025). <https://doi.org/10.1007/s42519-025-00442-6>

Questions about the presentation/session?

Contact Michiko I. Wolcott, Organizer at michiko.wolcott@msightanalytics.com

REFERENCES

(Examples; not exhaustive)

EXAMPLES OF REGULATIONS AND STANDARDS

Jurisdiction	Name	URL
European Union	General Data Protection Regulation (GDPR)	https://gdpr.eu/tag/gdpr/
European Union	EU Artificial Intelligence Act	https://artificialintelligenceact.eu/
United Kingdom	UK GDPR and Data Protection Act	https://ico.org.uk/for-organisations/data-protection-and-the-eu/data-protection-and-the-eu-in-detail/the-uk-gdpr/
California, USA	California Consumer Privacy Act (CCPA)	https://oag.ca.gov/privacy/ccpa
Mexico	Federal Law on the Protection of Personal Data Held by Private Parties (LFPDPPP)	https://www.gob.mx/indesol/documentos/ley-federal-de-proteccion-de-datos-personales-en-posesion-de-los-particulares
Canada	Personal Information Protection and Electronic Documents Act (PIPEDA)	https://www.priv.gc.ca/en/privacy-topics/privacy-laws-in-canada/the-personal-information-protection-and-electronic-documents-act-pipeda/
Brazil	General Data Protection Law (LGPD)	https://www.gov.br/esporte/pt-br/acesso-a-informacao/lgpd
Argentina	Personal Data Protection Law	https://servicios.infoleg.gob.ar/infolegInternet/anexos/60000-64999/64790/norma.htm
India	Digital Personal Data Protection Act (DPDP Act)	https://egazette.gov.in/WriteReadData/2023/248045.pdf

EXAMPLES OF FRAMEWORKS AND STANDARDS

Name	Entity	URL
International Compilation of Human Research Standards	Office of Human Research Protections, U.S. Health and Human Services (HHS)	https://www.hhs.gov/ohrp/international/compilation-human-research-standards/index.html
Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research	Office of Human Research Protections, U.S. Department of Health and Human Services (HHS)	https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/index.html https://www.hhs.gov/sites/default/files/informe-belmont-spanish.pdf
Privacy by Design	Information and Privacy Commissioner of Ontario	https://en.wikipedia.org/wiki/Privacy_by_design
Ethics Guidelines for Trustworthy AI	European Commission	https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai
AI Risk Management Framework	National Institute of Standards and Technology (NIST)	https://www.nist.gov/itl/ai-risk-management-framework
ISO/IEC 42001	International Standards Organization (ISO)	https://www.iso.org/standard/81230.html
IEEE 7000	IEEE Standards Association	https://standards.ieee.org/ieee/7000/6781/
Artificial Intelligence Governance Professional (AIGP) Certification	International Association of Privacy Professionals (IAPP)	https://iapp.org/certify/aigp/

EXAMPLES OF PROFESSIONAL GUIDELINES AND CODES OF ETHICS

Organization	Name	URL
American Statistical Association (ASA)	Ethical Guidelines for Statistical Practice	https://www.amstat.org/your-career/ethical-guidelines-for-statistical-practice
American Statistical Association (ASA)	Statement on Ethical AI Principles for Statistical Practitioners	https://www.amstat.org/docs/default-source/amstat-documents/asa-statement-on-ethical-ai-principles-for-statistical-practitioners.pdf
Association for Computing Machinery (ACM)	Code of Ethics	https://www.acm.org/code-of-ethics
Institute of Management Consultants USA (IMC USA)	Code of Ethics	https://imcusa.org/about/ethics/code-of-ethics/

EXAMPLES OF ETHICAL CASES

- “Facebook-Cambridge Analytica Data Scandal”: https://en.wikipedia.org/wiki/Facebook%E2%80%93Cambridge_Analytica_data_scandal
- “Lawsuit blames ChatGPT maker OpenAI for helping plan a school shooting”: <https://apnews.com/article/openai-chatgpt-lawsuit-mass-shooting-florida-1a8071ee49ad0220348d3eb55f60e648>
- “Judge denies Apple’s attempt to dismiss a class-action lawsuit over AirTag stalking”: <https://apnews.com/article/apple-airtags-stalking-lawsuits-e59166988920c4ba1e82956ea85c1677>
- “Insight - Amazon scraps secret AI recruiting tool that showed bias against women”: <https://www.reuters.com/article/world/insight-amazon-scraps-secret-ai-recruiting-tool-that-showed-bias-against-women-idUSKCN1MK0AG/>
- “NYC’s AI Chatbot Tells Businesses to Break the Law”: <https://themarkup.org/news/2024/03/29/nycs-ai-chatbot-tells-businesses-to-break-the-law>
- “How Companies Learn Your Secrets”: <https://www.nytimes.com/2012/02/19/magazine/shopping-habits.html?pagewanted=1&r=1&hp#>
- “Artificial Intelligence Bot Becomes Racist And Homophobic After Learning From Humans”: <https://oecd.ai/en/incidents/16537>
- “New York lawyers sanctioned for using fake ChatGPT cases in legal brief”: <https://storage.courtlistener.com/recap/gov.uscourts.nysd.575368/gov.uscourts.nysd.575368.31.0.pdf>
- “Racial Bias Found in a Major Health Care Risk Algorithm”: <https://www.scientificamerican.com/article/racial-bias-found-in-a-major-health-care-risk-algorithm/>