International Statistical Institute

Statistical Science for a Better World

Professional Ethics for Statistical Practices

ISBIS WEBINAR 21. JAN 2025

WALTER J. RADERMACHER

What can you expect from this webinar?

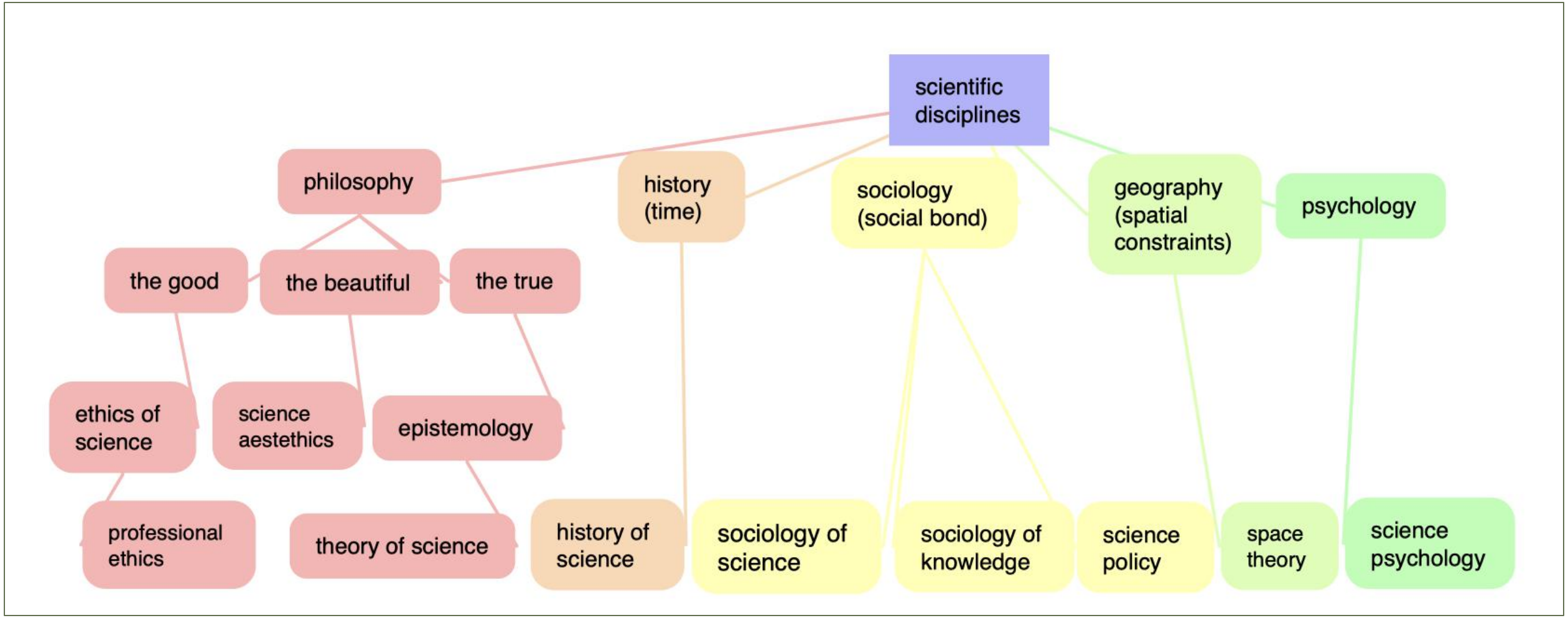
Not a cookbook of recipes

- Ethics is not about black and white, do this, don't do that
- Reality often presents a tricky situation, requiring us to deal with conflicts, compromises and conventions.

We look at application in practice, so after we have been expelled from the paradise of (neutral) method development.

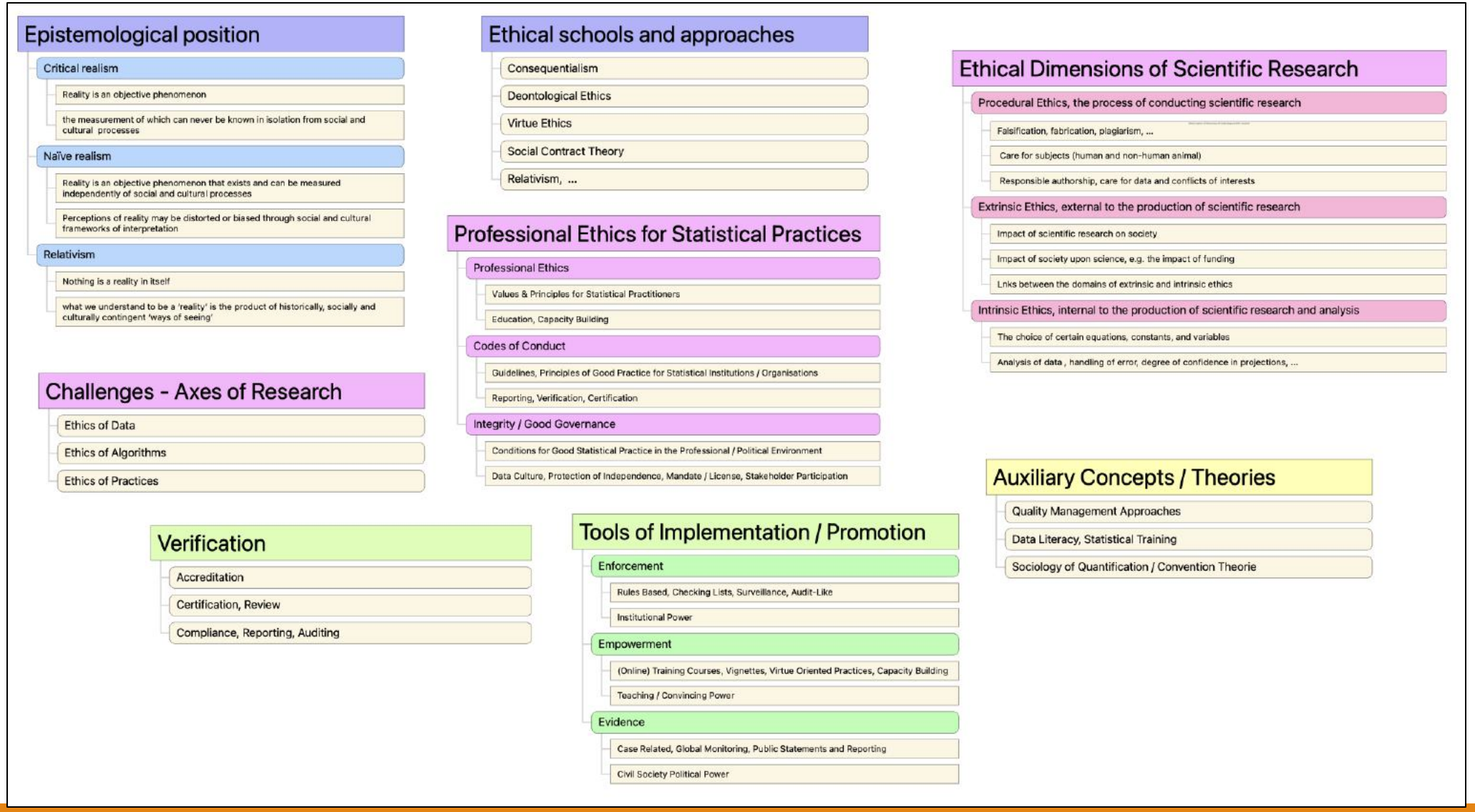
Ethics is based on science, in this case philosophy or sociology.

Philosophy of Sciences et al.



Adapted from: Kühne, O. / Berr, K. 2022. 'Philosophy of Science—Philosophical Foundations and Positions.' in Kühne / Berr (eds.), *Science, Space, Society: An Overview of the Social Production of Knowledge* (Springer Fachmedien: Wiesbaden). https://doi.org/10.1007/978-3-658-39140-9_3

Mapping Ethics



Home › Science › Mathematics

Science & Tech

statistics

science

Statistics, the science of collecting, analyzing, presenting, and interpreting data. Governmental needs for census data as well as information about a variety of economic activities provided much of the early impetus for the field of statistics. Currently the need to turn the large amounts of data available in many applied fields into useful information has stimulated both theoretical and practical developments in statistics.

Williams, Thomas A. , Anderson, David R. and Sweeney, Dennis J.. "statistics". Encyclopedia Britannica, 15 Feb. 2024, https://www.britannica.com/science/statistics. Accessed 30 March 2024.

Epistemology

WHAT DO WE KNOW? WHAT CAN WE KNOW?

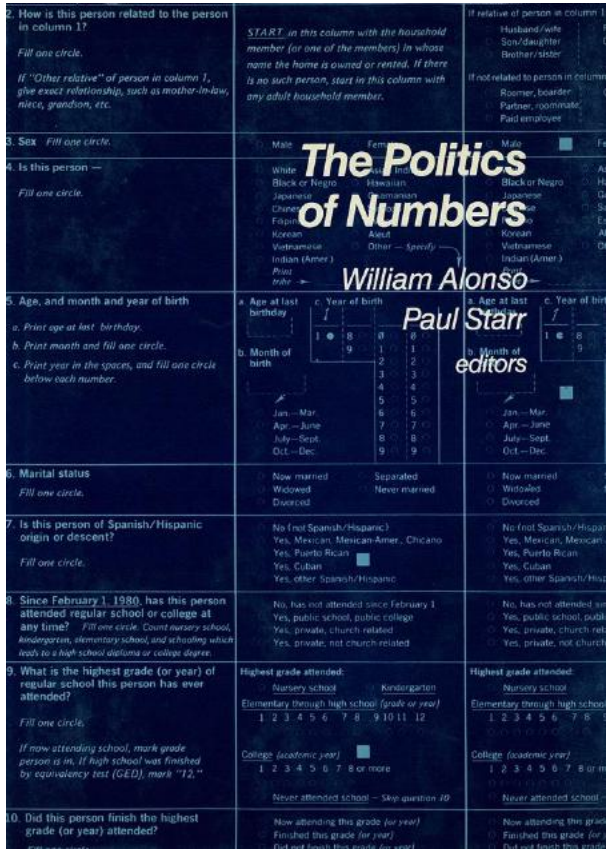
Epistemological approaches

Position	ontological	epistemological	statistical
Naïve realism / Positivism	Reality is an objective phenomenon that exists and	can be measured independently of social and cultural processes	Measurement, sampling frame, management of errors, response bias, etc. + relationship of reality and the measurement of reality, management of design / communication, co-design
Critical realism	Reality is an objective phenomenon	the measurement of which is inevitably mediated through social and cultural processes and can never be known in isolation from these processes	
Relativism	Nothing is a reality in itself	what we understand to be a 'reality' is the product of historically, socially and culturally contingent 'ways of seeing'	discourses and practices around measurement and how they operate as part of governmental strategies / rationalities

Lupton, D. 2023. Risk (Routledge: New York). https://www.taylorfrancis.com/books/mono/10.4324/9781003316299/risk-deborah-lupton

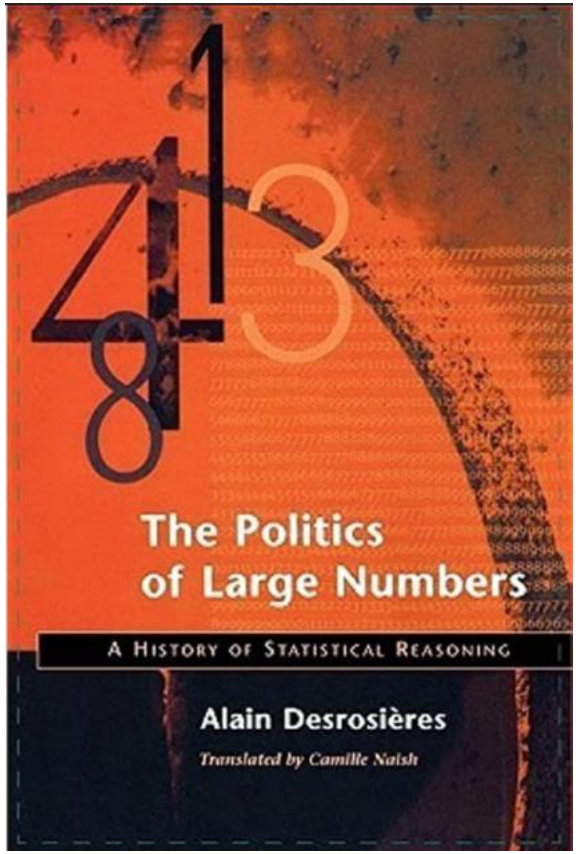
Sociology of Quantification

STANDARDS,CLASSIFICATIONS IN STATISTICS AND THEIR MEANING



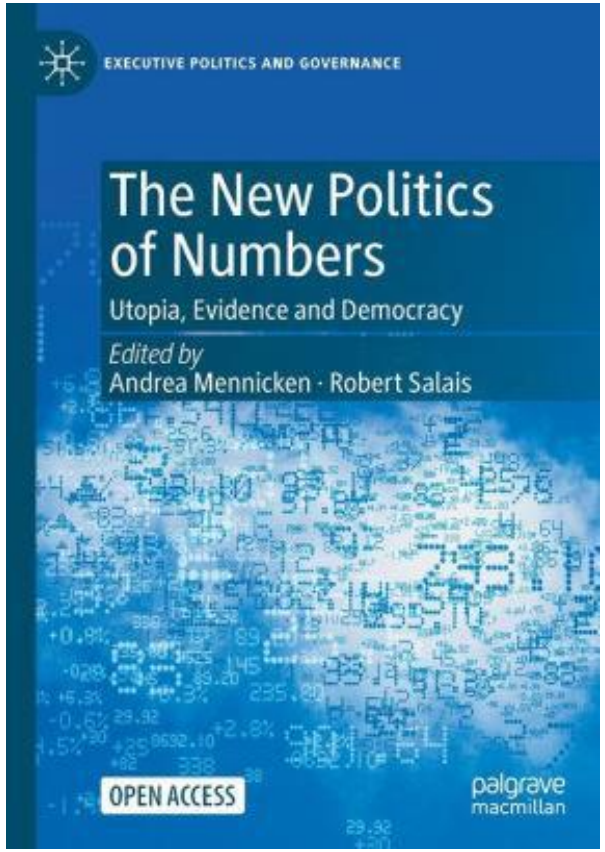
1987

Alonso, W., and P. Starr. 1987. *The Politics of Numbers* (Russell Sage Foundation).



1998

Desrosières, Alain. 1998. *The Politics of Large Numbers - A History of Statistical Reasoning* (Harvard University Press: Cambridge Massachusetts).



2022

Mennicken, Andrea, and Robert Salais. 2022. *The New Politics of Numbers: Utopia, Evidence and Democracy* (Palgrave Macmillan: Cham).

Theodore Porter

"To measure for public purposes is rarely so simple as to apply a meter stick casually to an object."

Porter, Theodore M. 1995. Trust in numbers : the pursuit of objectivity in science and public life (Princeton University Press: Princeton, N.J. ; Chichester) https://press.princeton.edu/books/ebook/9780691210544/trust-in-numbers-0

Numbers are

- *a technology whose authority derives from their value in helping resolve the fundamental problem of people wishing to communicate across sometimes vast distances that may be social, geographical and political.*
- *Quantification offers a shared language and discipline that transcends other forms of differences that threaten collective or competing social projects.*
- *Especially in collaborations characterized by conflict, divided expert opinion, dispersed parties, distrust, or when parties' actions are politicized or subject to close scrutiny from powerful others, numbers offer a valuable form of authority which Porter characterizes as 'mechanical objectivity.'"*

Sheila Jasanoff

Technologies of hubris

vs.

Technologies of humility

"Science fixes our attention on the knowable, leading to an over-dependence on fact-finding. Even when scientists recognize the limits of their own inquiries, as they often do, the policy world, implicitly encouraged by scientists, asks for more research. For most complex problems, the pursuit of perfect knowledge is asymptotic. Uncertainty, ignorance and indeterminacy are always present."

Jasanoff, S. 2007. 'Technologies of humility', nature, 450. https://www.nature.com/articles/450033a#citeas

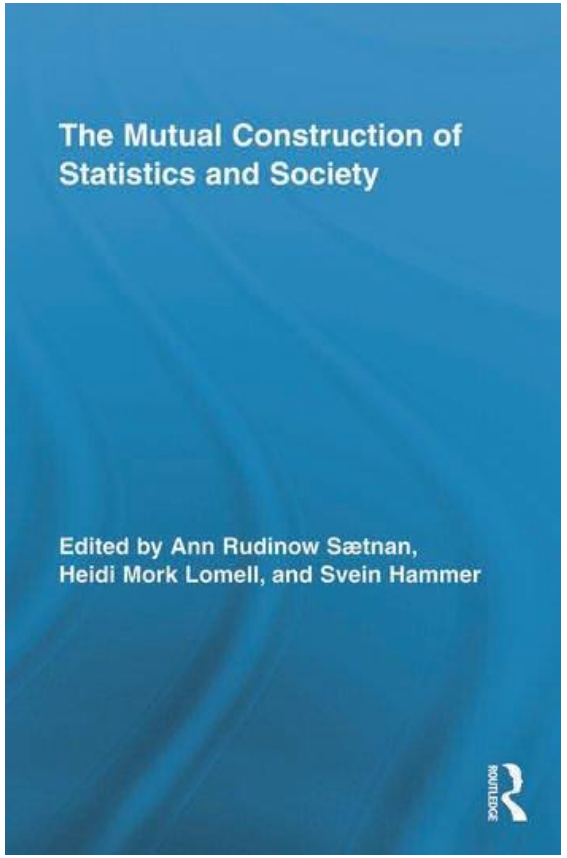
Charles Goodhart

Goodhart's Law

"When a measure becomes a target, it ceases to be a good measure."

https://en.wikipedia.org/wiki/Goodhart's_law

Statistics and Society

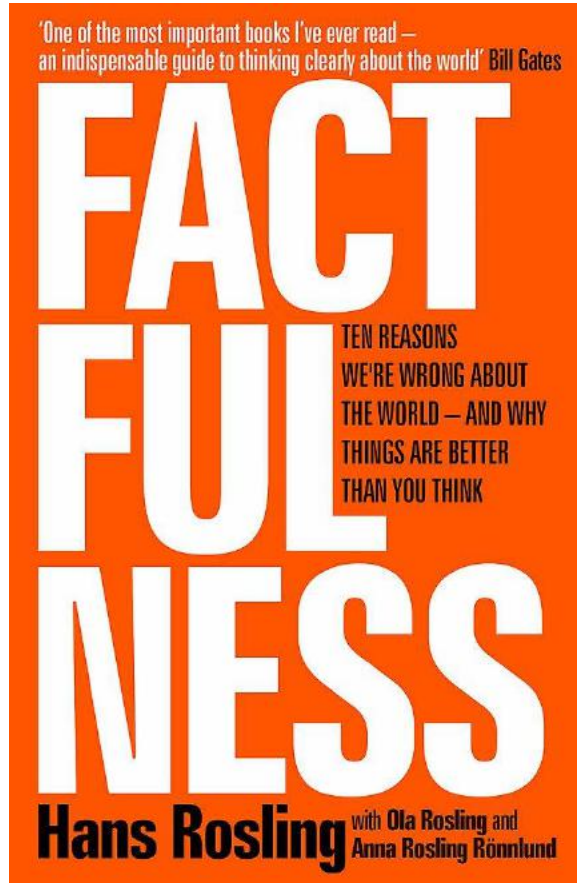


"Statistics are often seen as simple, straightforward, and objective descriptions of society. However, what we choose to count, what we choose not to count, who does the counting, and the categories and values we choose to apply when counting, matter"

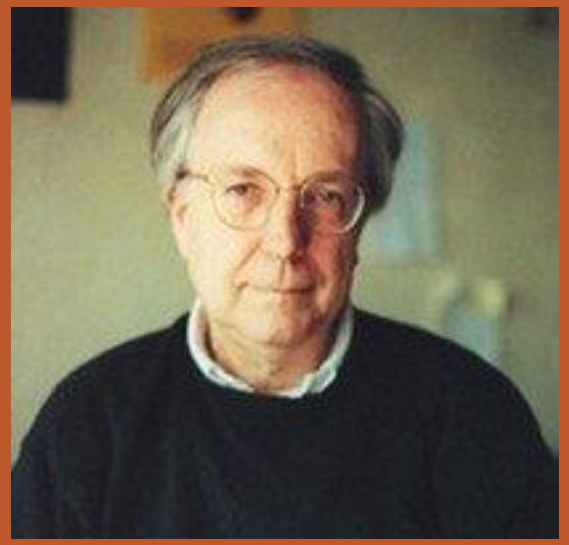
Saetnan, Ann Rudinow, Heidi Mork Lomell, and Svein Hammer. 2010. *The mutual construction of statistics and society* (Routledge: New York, NY). https://www.taylorfrancis.com/books/edit/10.4324/9780203846612/mutual-construction-statistics-society-ann-rudinow-saetnan-svein-hammer-heidi-mork-lomell

Artefacts

DESIGN OF STATISTICAL PRODUCTS - CONVENTIONS



Alain Desrosières



“to quantify’ ≠ ‘to measure’“

“quantify implies a translation, i.e. a transformative action, resulting from a series of inscriptions, codifications and calculations, leading to the making of numbers”

Aspects of statistics

- “that of quantification properly speaking, the making of numbers,
- that of the uses of numbers as variables, and finally,
- the prospective inscription of variables in more complex constructions, models”

Desrosières, Alain. 2010. A Politics of Knowledge-Tools—The Case of Statistics. In Between Enlightenment and Disaster, ed. Linda Sangolt. Brussels: P.I.E. Peter Lang. https://www.peterlang.com/document/1044019

Andrea Saltelli

Give me a number!

“The pandemic has also shown that the act of quantifying, either by a model or by an algorithm, increasingly nourishes the science–policy interface with the opportunity to outsource decision-making authority to number-based decision-making , when momentous political decisions are delegated to the purported neutrality of model generated numbers.”

Ethics of Quantification needed

- symbiotic relationship between quantification and trust
- defence against statistical abuses
- helps to apportion responsibilities
- can assist in realising that “The technique is never neutral”
- ….

Saltelli, Andrea, and Monica Di Fiore. 2020. 'From sociology of quantification to ethics of quantification', Humanities and Social Sciences Communications, 7: 1-8. https://www.nature.com/articles/s41599-020-00557-0

Ethics of Quantification

STANDARDS,CLASSIFICATIONS IN STATISTICS AND THEIR MEANING

Ethical codes for data collection, manipulation, and use (David Hand)

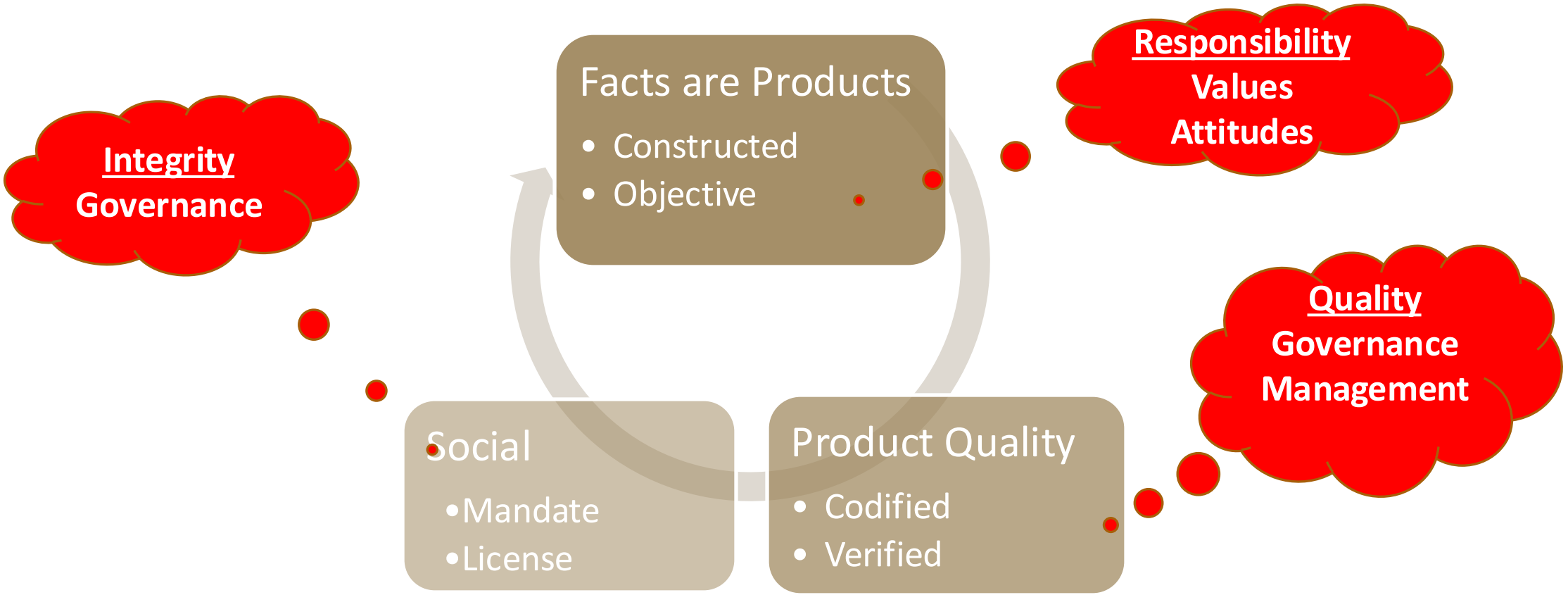
“have various functions, including things such as the following:

- providing guidance on how to behave in difficult circumstances;
- preserving privacy in a way that users and the public will find acceptable;
- ensuring that data are used in such a way as to benefit the public;
- reassuring customers, the public, and others about an organization’s integrity; and
- reassuring employees that they work for a trust-worthy organization.”

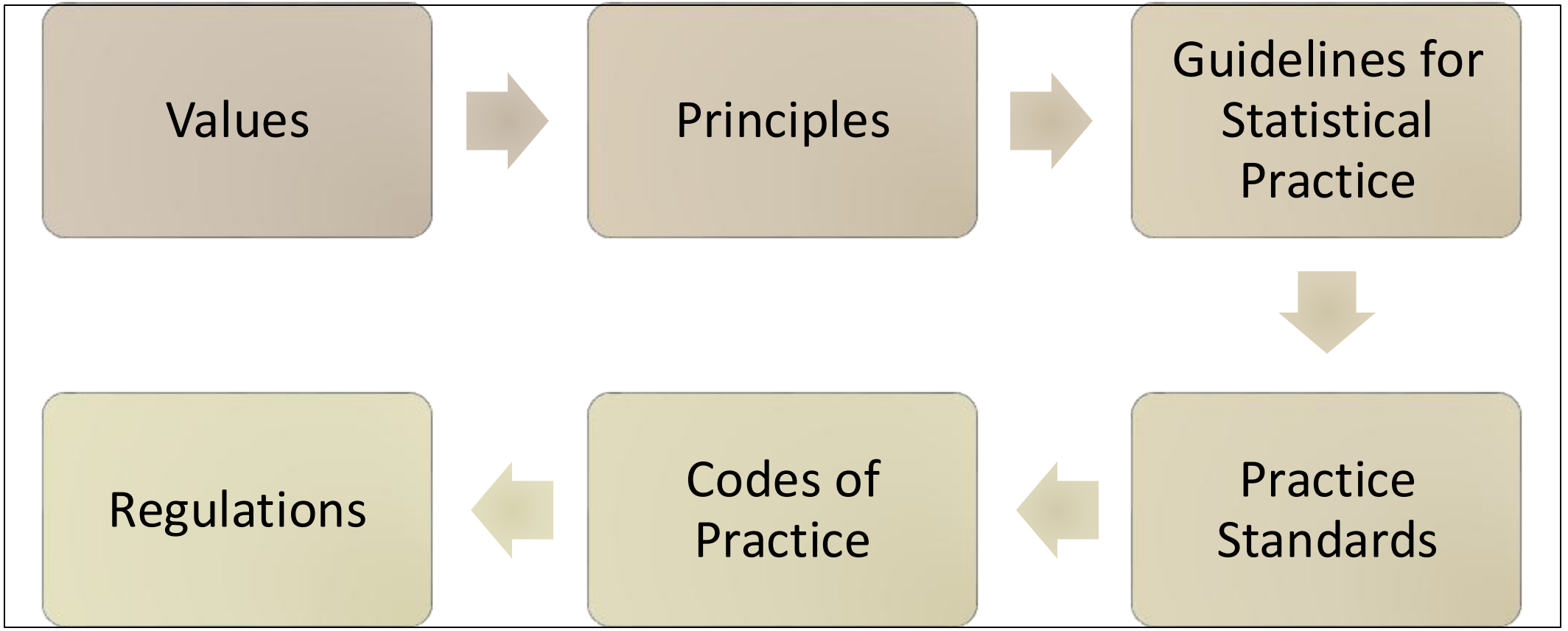
"However, the context of data science is so vast and diverse, and is changing so rapidly over time, that we cannot hope to put in place precise regulations. There cannot be a single and simple universal set of rules, and unexpected and unforeseen circumstances are certain to arise. The best we can hope for are some ethical principles that have to be interpreted or instantiated in particular applications. That is, the principles must be mapped to low-level guidance, and this is likely to be application specific.”

Hand, D. J. 2018. 'Aspects of Data Ethics in a Changing World: Where Are We Now?', Big Data, 6. https://www.liebertpub.com/doi/pdfplus/10.1089/big.2018.0083

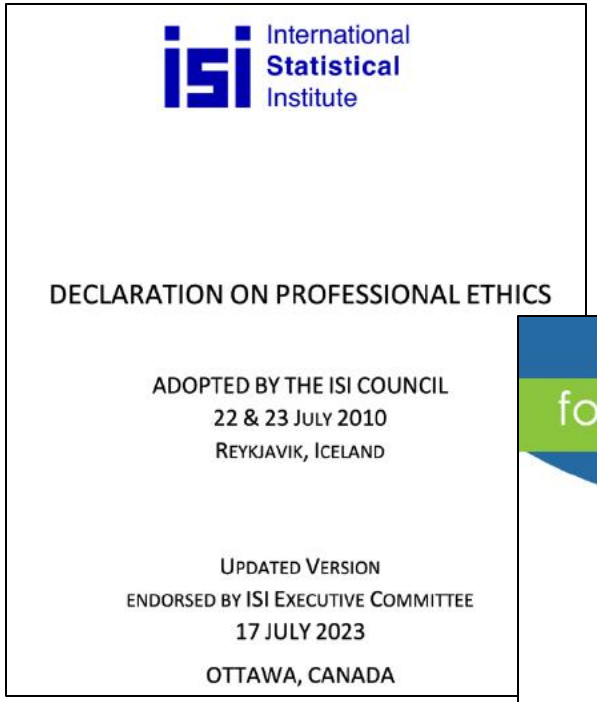
Ethics in Statistics: Aspects, Addressees

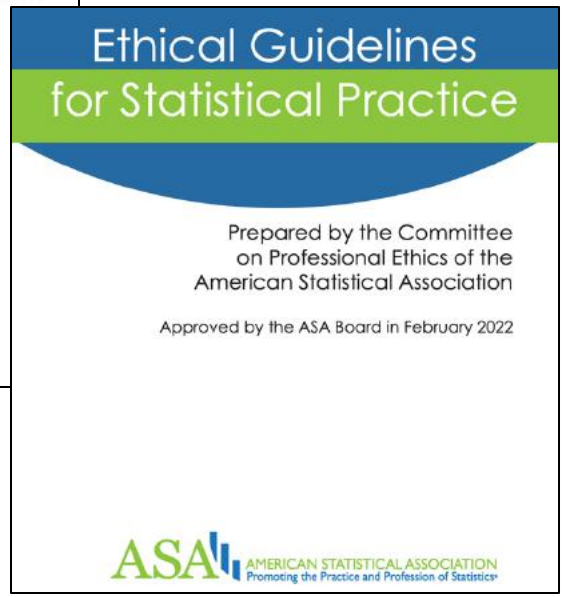


A kind of hierarchy

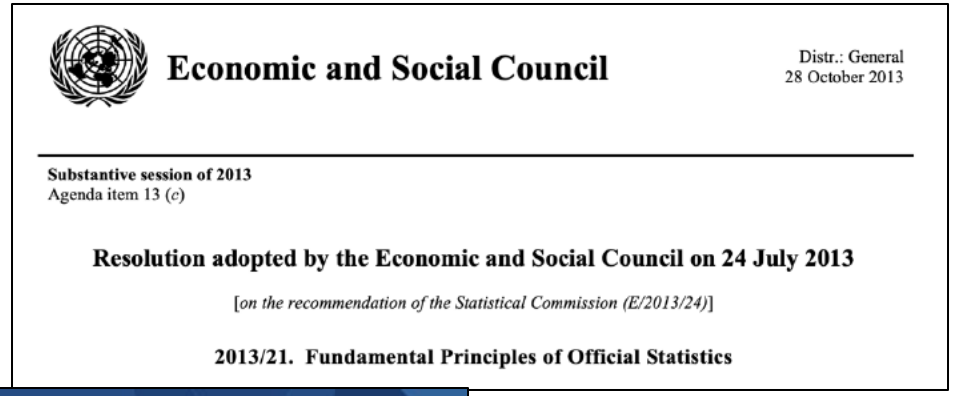


Ethics





Codes of Conduct



ISI Advisory Board on Ethics

https://isi-web.org/committee/advisory-board-ethics

Last Name	First Name	Association	Country
Radermacher	Walter	ISI, IAOS, IASE, TIES	Germany
Arrow	Jairo	ISI, IASS	South Africa
Belkindas	Misha	ISI, IAOS	USA/Lithuania
Bilgin	Ayse	ISI, IASE	Australia
Borovcnik	Maciej	ISI, IASE	Austria
Brzezinski	Manfred	IFC	Poland
Chuwa	Albina	ISI, IAOS	Tanzania
Das	Sonali	ISBIS	South Africa
Habibullah	Saleha	ISI, IASE, IASS	Pakistan
Olhede	Sofia	Bernoulli Society	Switzerland/Sweden
Rancourt	Eric	ISI, IASS, IAOS	Canada
Suesser	Jan Robert	ISI, IAOS	France
Terán	Teresita Evelina	IASE	Argentina
Tractenberg	Rochelle E.	ISI	USA
Trewin	Dennis	ISI, IASS, IAOS	Australia
Tzavidis	Nikos	ISI, IASS	United Kingdom
Vukovich	Gabriella	ISI, IAOS	Hungary
Yu	Philip Leung-ho	ISI, IASC	Hong Kong, China

Activities Advisory Board on Ethics

Advise on ethical or integrity issues

Programme of work

- Co-design of statistics and society; Indigenous Data Sovereignty
- Education, online training courses, promotion of the principles,
- Big data, data sciences, artificial intelligence
- Reflexive components in statistics education, research, conferences etc.
- Improving evidence, global monitoring of integrity

Liaison with other associations (ASA, RSS, IRC, FENStatS, …) and ISI branches (Capacity Building Committee, …)

Activities for the ISI World Statistics Congresses, webinars, …

ISI Declaration on Professional Ethics

https://isi-web.org/declaration-professional-ethics

Responsibility

https://isi-web.org/declaration-professional-ethics

Ethical 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.

Values

https://isi-web.org/declaration-professional-ethics

1. Respect
   - We respect the privacy of others and the promises of confidentiality given to them.
   - …
2. Professionalism
   - The value Professionalism implies Responsibility, Competence and Expert Knowledge, and Informed Judgement.
   - We work to understand our users' needs and develop relevant solutions.
   - We use our statistical knowledge, data, and analyses for the Common Good to serve the society.
   - …
3. Truthfulness and Integrity
   - The values of Truthfulness and Integrity are reflected in our work processes, that rely on Independence, Objectivity and Transparency.
   - We produce statistical results using our science and are not influenced by pressure from politicians or funders
   - …

Principles

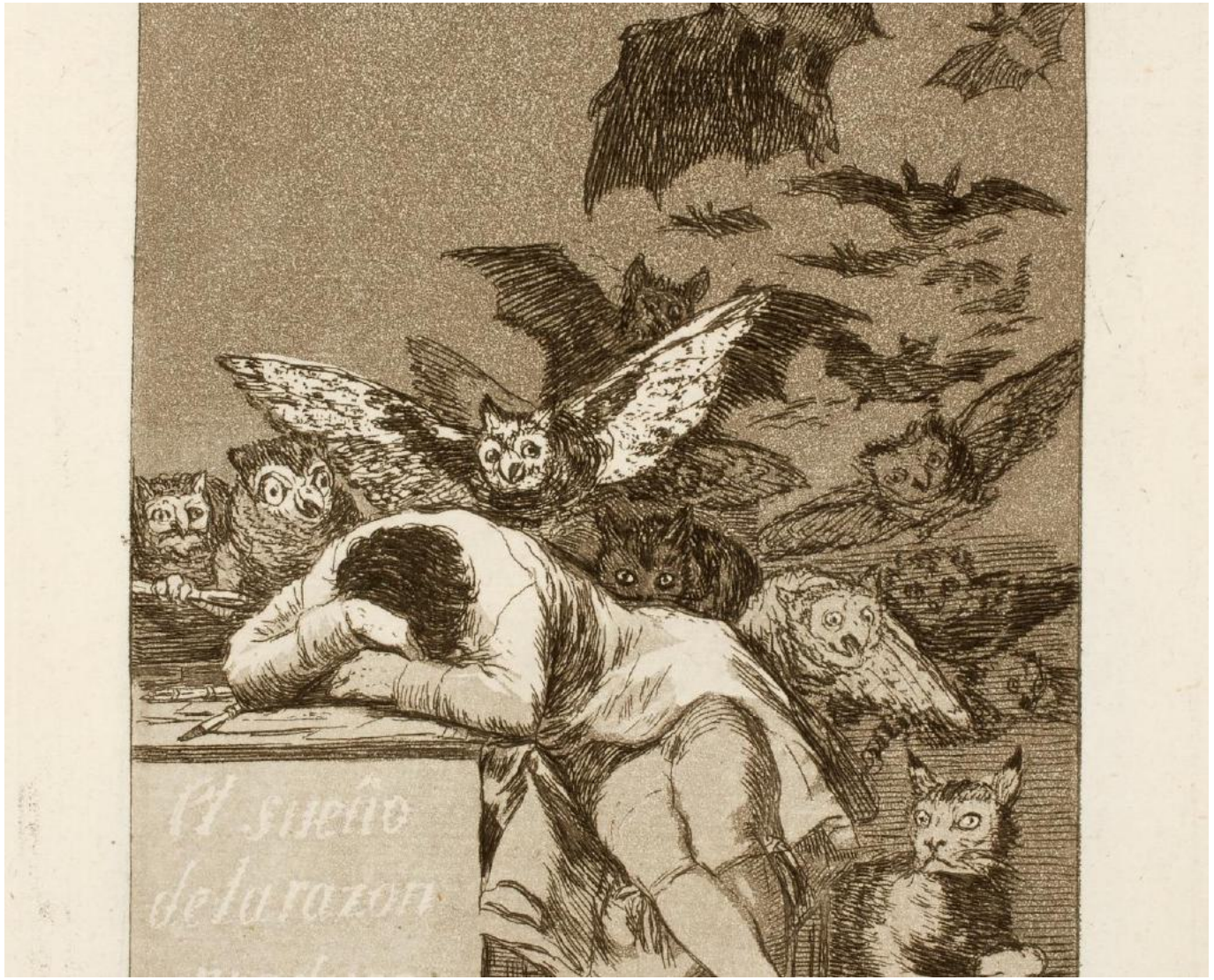
https://isi-web.org/declaration-professional-ethics

Pursuing Objectivity	Clarifying Obligations and Roles	Assessing Alternatives Impartially	Conflicting Interests
Avoiding Preempted Outcomes	Guarding Privileged Information	Exhibiting Professional Competence	Maintaining Confidence in Statistics
Exposing and Reviewing Methods and Findings	Communicating Ethical Principles	Bearing Responsibility for the Integrity of the Discipline	Protecting the Interests of Subjects

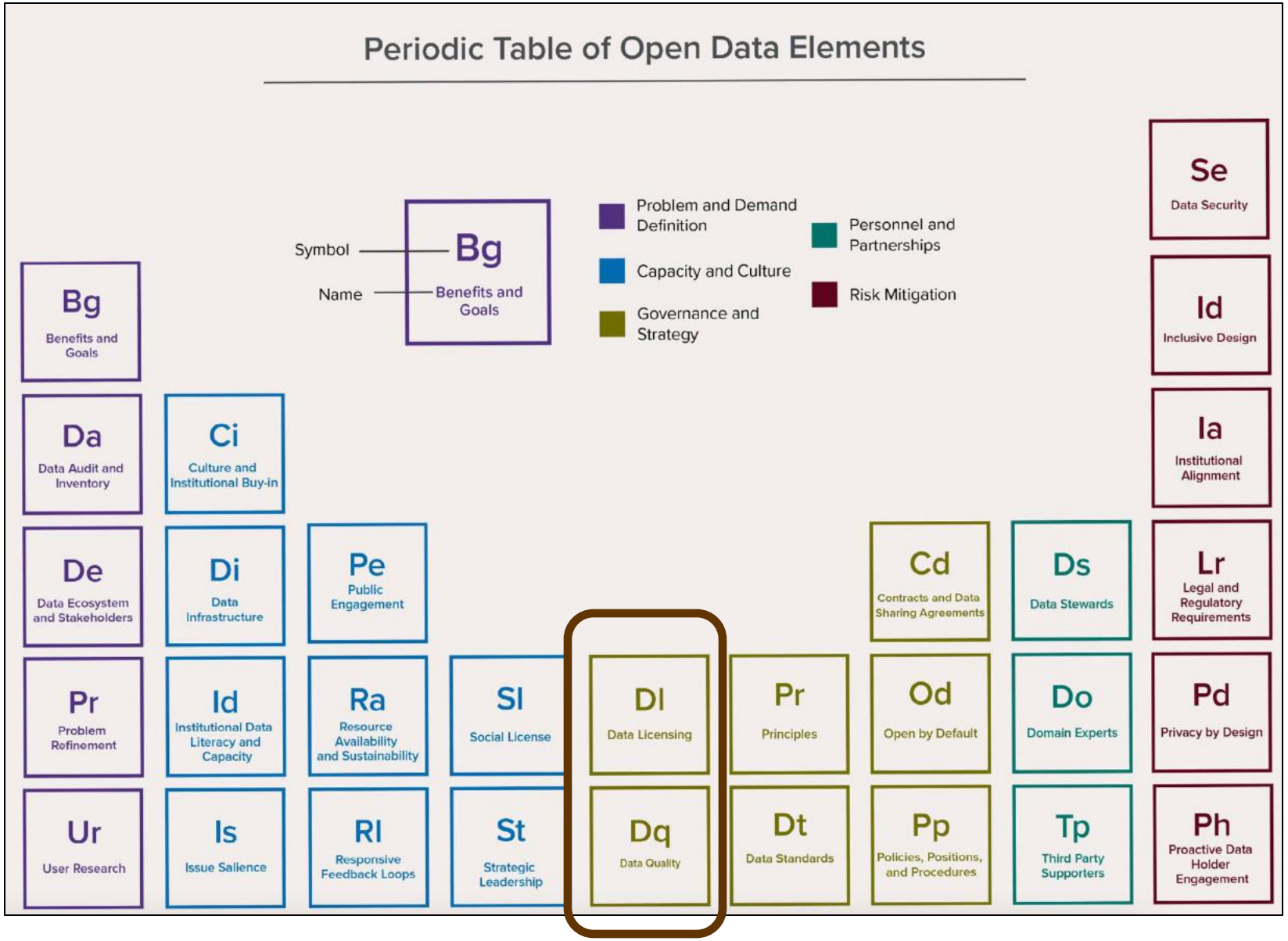
Promotion of Ethics, e.g. in Education

The Sleep of Reason Produces Monsters

GOYA Y LUCIENTES, FRANCISCO DE Museo Prado



https://emuseum.mfah.org/internal/media/dispatcher/400488/full



https://periodictable.opendatapolicylab.org/files/periodic-table_userguide.pdf

Governance and Standards

Governance and standards are about how an organization makes decisions about the open data projects it manages and oversees. These elements relate to larger systems, structures, and organizing principles.

***

Data Licensing

Is there a robust data licensing regime that can protect and promote the re-use of data by outlining the conditions under which practitioners can use and re-use data?

Importance

1	2	3	4
Not Important	Somewhat Unimportant	Somewhat Important	Very Important

Data Quality

Has the data been assessed for quality to allow individuals to derive meaningful insights from it?

Importance

1	2	3	4
Not Important	Somewhat Unimportant	Somewhat Important	Very Important

AIRIES:

An educational tool for enhancing ethical and statistical literacy in project planning

The **AIRIES (AI Risk & Impact Evaluation System)** tool helps students learn ethical and statistical principles by guiding them through real-world scenarios that simulate complex decision-making. While AIRIES is first and foremost an educational resource, its features also make it a valuable tool for professionals—such as statisticians, developers, and decision-makers—looking to plan ethical and data-driven projects.

https://iase-web.org/islp/documents/Newsletters/ISLP%20Newsletter%20Vol%2016.2%20December%202024.pdf

Verification

- Accreditation
- Certification, Review
- Compliance, Reporting, Auditing

Accreditation

Active Accreditation programmes

Royal Statistical Society

Statistical Society of Australia

Statistical Society of Canada

American Statistical Association

FENStatS

FENStatS
Federation of European National Statistical Societies

European Statistical Accreditation

FENStatS executive committee has finalized the system for accreditation of statisticians, according to the proposal of the accreditation committee. The next step is for the national associations to adopt the system, name at least three auditors, and start receiving the applications.

Once your national statistical association has adopted the system, you can start submitting your applications using the Application portal.
The list of European Accredited Statisticians is here.

Codes of Conduct

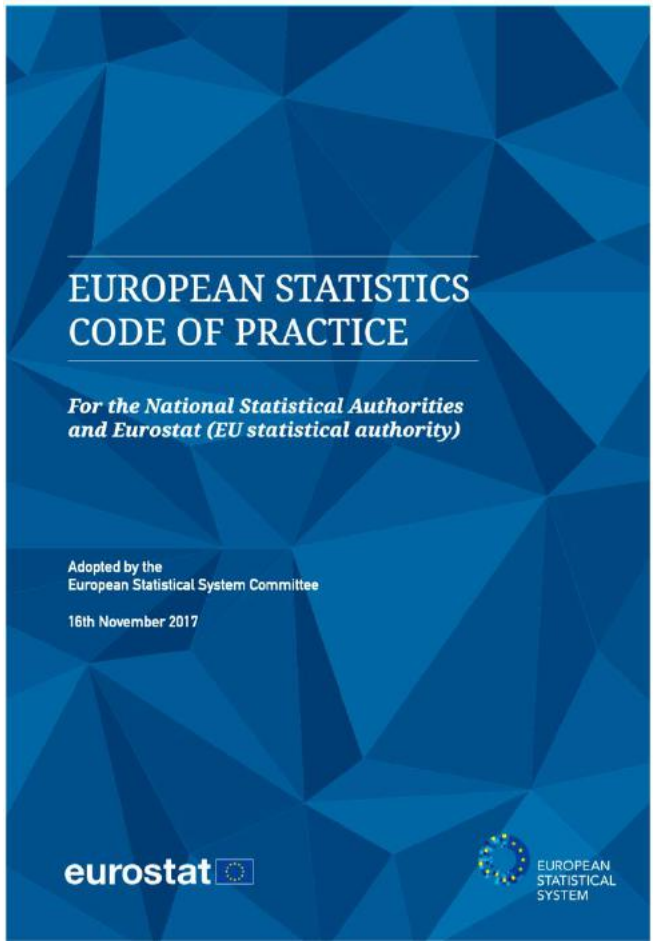
QUALITY

UN Fundamental Principles of Official Statistics

https://unstats.un.org/unsd/dnss/gp/FP-New-E.pdf

1. Official statistics provide an indispensable element in the information system of a democratic society …..
2. To retain trust …, the statistical agencies need to decide according to strictly professional considerations …
3. … the statistical agencies are to present information according to scientific standards …
4. The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.
5. Data for statistical purposes may be drawn from all types of sources …
6. Individual data collected … are to be strictly confidential and used exclusively for statistical purposes.
7. The laws, regulations and measures under which the statistical systems operate are to be made public.
8. Coordination among statistical agencies within countries …
9. The use by statistical agencies in each country of international concepts, classifications and methods …
10. Bilateral and multilateral cooperation …

Codification: EU Statistics



Institutional environment	Statistical processes	Statistical output
1. Professional independence 1bis. Coordination and cooperation 1. Mandate for data collection 2. Adequacy of resources 3. Commitment to quality 4. Statistical confidentiality 5. Impartiality and objectivity	7. Sound methodology 8. Appropriate statistical procedures 9. Non-excessive burden on respondents 10. Cost-effectiveness	11. Relevance 12. Accuracy and reliability 13. Timeliness and punctuality 14. Coherence and comparability 15. Accessibility and clarity

https://ec.europa.eu/eurostat/web/products-catalogues/-/KS-02-18-142

Integrity

GOOD GOVERNANCE

International Statistical Institute

Statistical Science for a Better World

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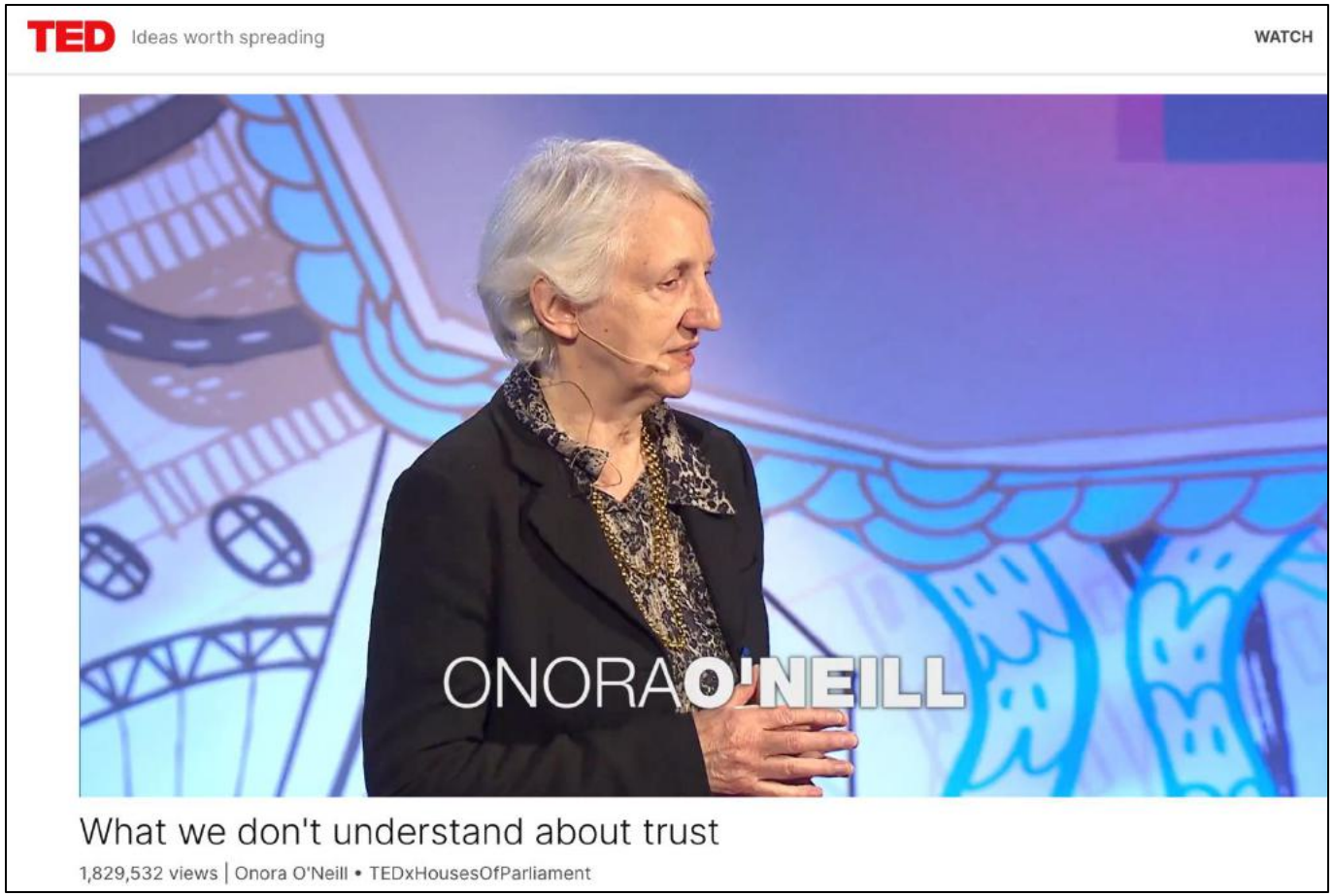
OTHER NEWS

Global Statistical Organisations Express Concerns Over Leadership Changes in Poland

07 January 2025

https://isi-web.org/article/global-statistical-organisations-express-concerns-over-leadership-changes-poland

Trustworthiness

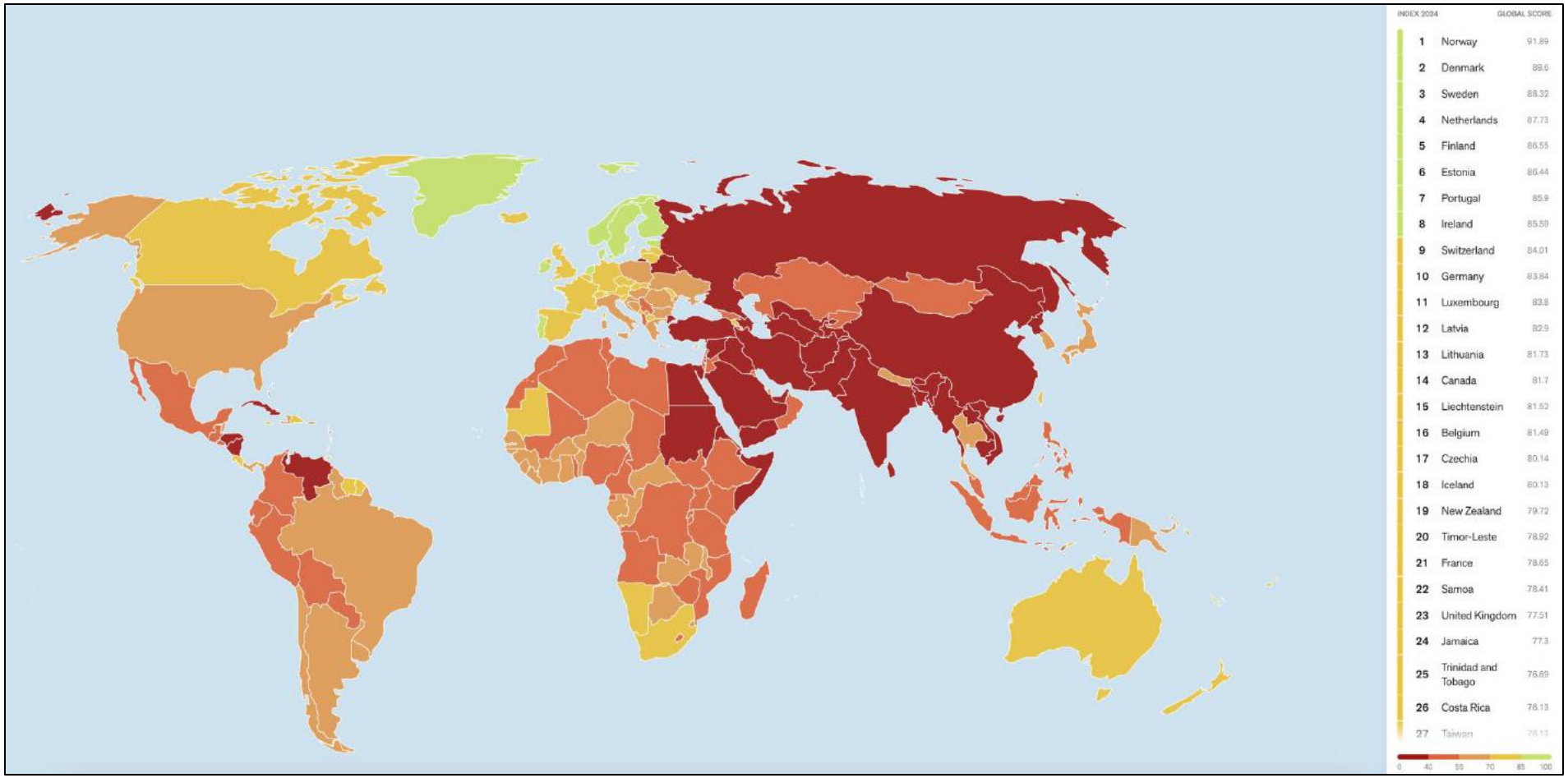


Competence

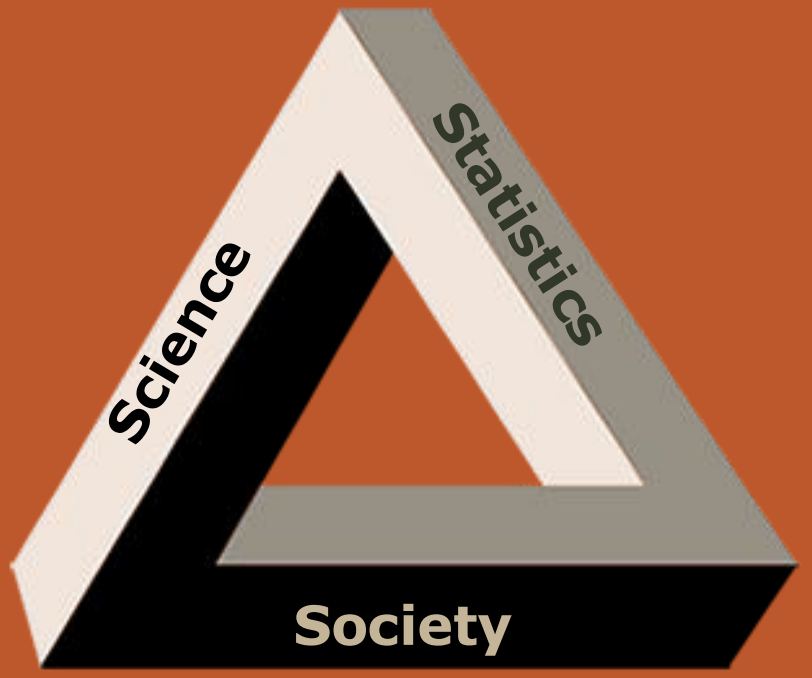
Reliabilitiy

Honesty

World Press Freedom Index 2024



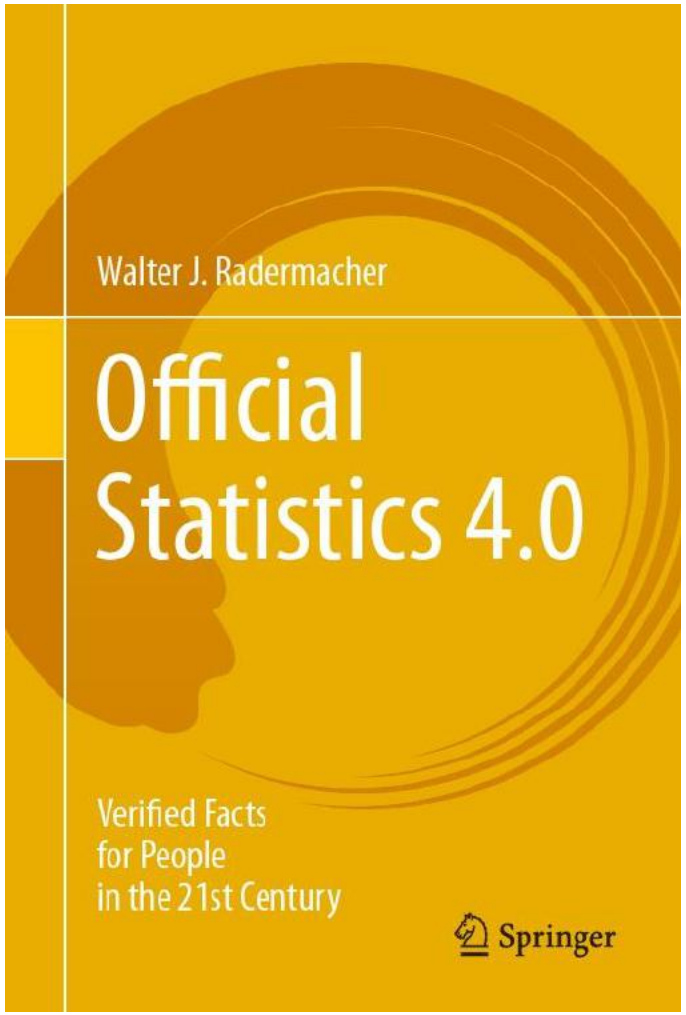
https://rsf.org/en/index



What should be done?

- Sociology and ethics of quantification should have a well-established place in the academic world of statistics and data science, in research and teaching
- AI/ML: new challenges for ethics and good governance AND new opportunities for education of ethics in statistics and data sciences
- Improve advocacy for integrity, professionalism, scientific independence, transparency, do no harm
- Interdisciplinary, interinstitutional co-operation
- Branding good statistics and good statisticians helps to distinguish

MUCHAS GRACIAS
MUITO OBRIGADO
VIELEN DANK
THANK YOU
MERCI BIEN



https://www.springer.com/gp/book/9783030314910

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