LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

EMOS WEBINAR FEBRUARY 2023

Statistics for the Public Good

W.J.Radermacher

Webinar Content

Statistics and the state - infrastructure, language for public discourse

Beyond GDP: long-term programmatic lines of development and information needs

What is statistics? How is quality created and how is it assured?

Data Literacy: Today's ABC D

Data Culture: Value creation and appreciation

MELDUNG · HEIMAT & INTEGRATION · 20.01.2023

Faeser: "Statistik ist zentrale Grundlage für staatliches Handeln"

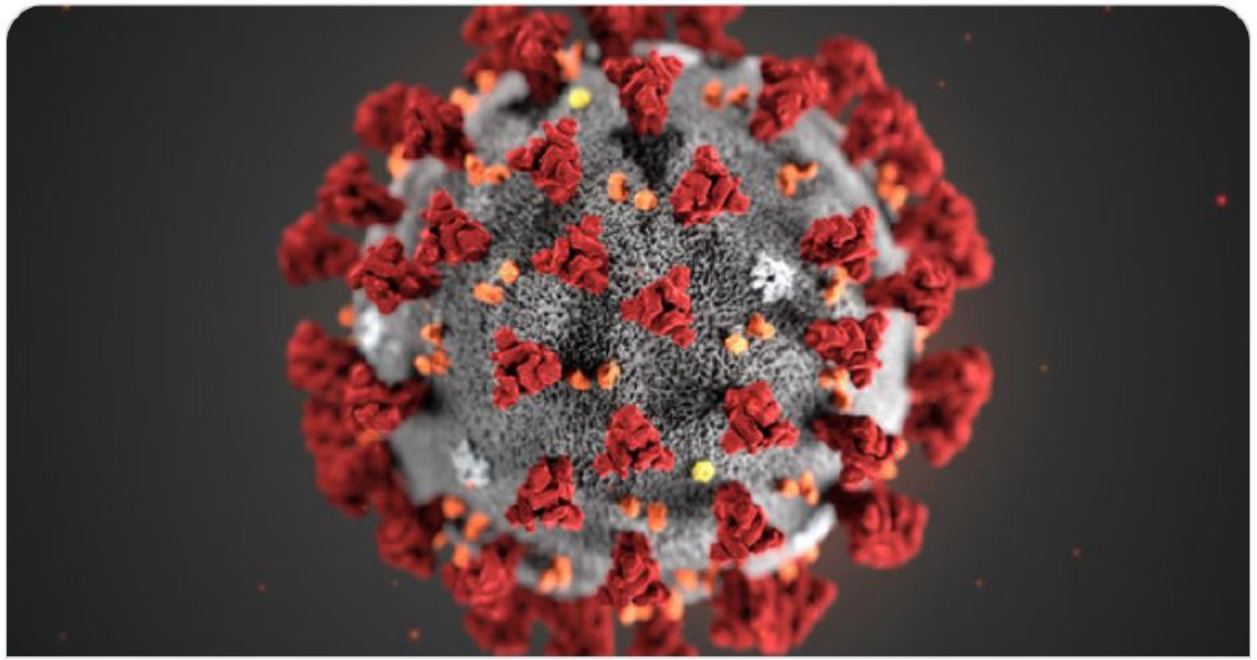
Gerade in Krisenzeiten brauchen Demokratien solide Daten, um sich mit Wissenschaft und Fakten gegen Populismus zu wehren.

https://www.bmi.bund.de/SharedDocs/kurzmeldungen/DE/2023/01/praesidentin-destatis.html

António Guterres
@antonioguterres

Our common enemy is #COVID19, but our enemy is also an "infodemic" of misinformation.

To overcome the #coronavirus, we need to urgently promote facts & science, hope & solidarity over despair & division.



https://www.un.org/en/un-coronavirus-communications-team/un-tackling-%E2%80%98infodemic%E2%80%99-misinformation-and-cybercrime-covid-19

Beyond GDP

PROGRESS, WELLBEING, SUSTAINABLE DEVELOPMENT AND OTHER CHALLENGES FOR STATISTICS

1992 Rio Conference

United Nations
Sustainable Development

United Nations Conference on Environment & Development
Rio de Janerio, Brazil, 3 to 14 June 1992

AGENDA 21

Agenda 21 – Chapter 40
INFORMATION FOR DECISION-MAKING

40.1. In sustainable development, everyone is a user and provider of information considered in the broad sense. That includes data, information, appropriately packaged experience and knowledge. The need for information arises at all levels, from that of senior decision makers at the national and international levels to the grass-roots and individual levels. The following two programme areas need to be implemented to ensure that decisions are based increasingly on sound information:

a. Bridging the data gap;

b. Improving information availability.

https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf

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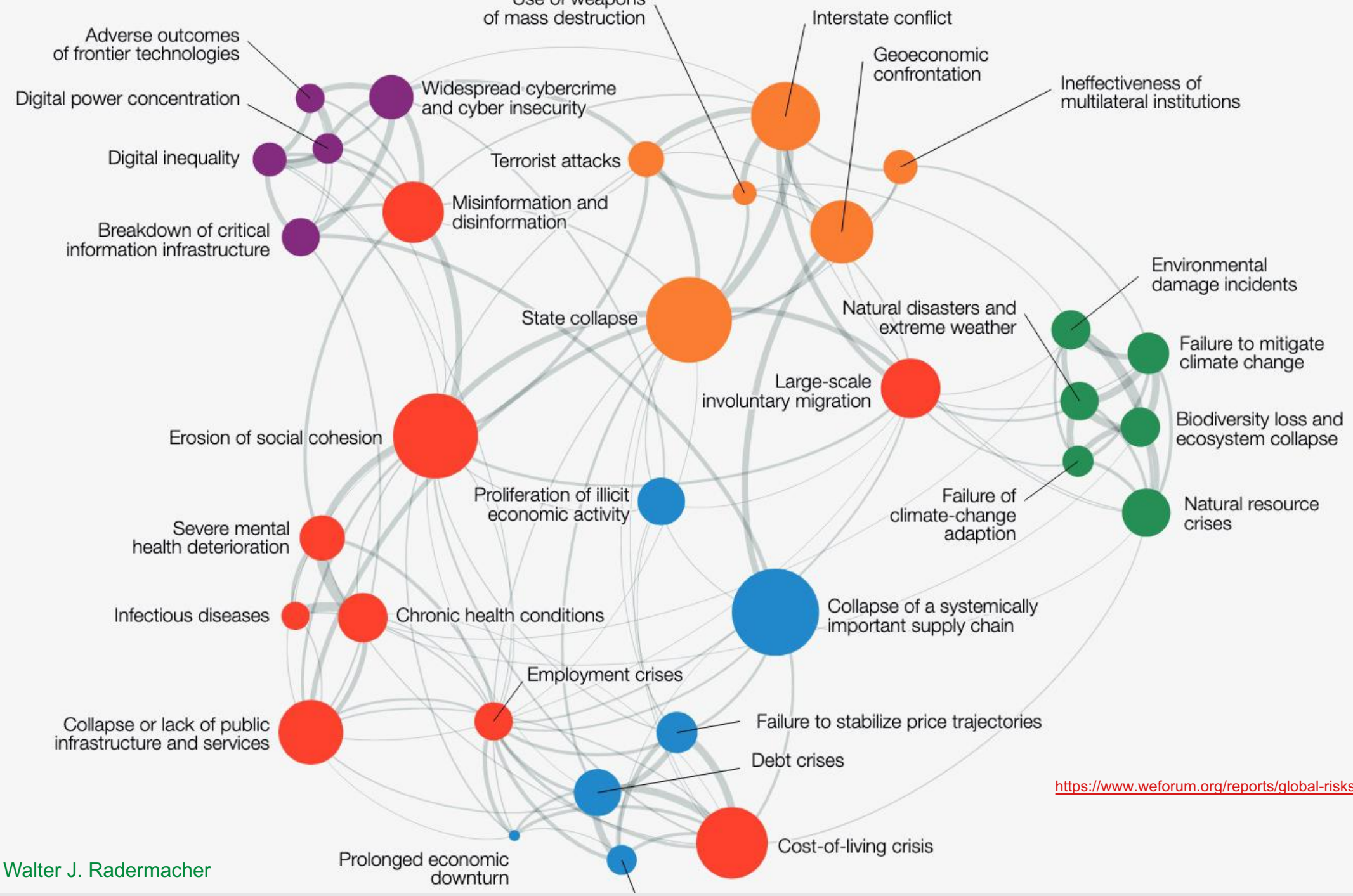
Global Risks Report 2023

Top 10 Risks

"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period"

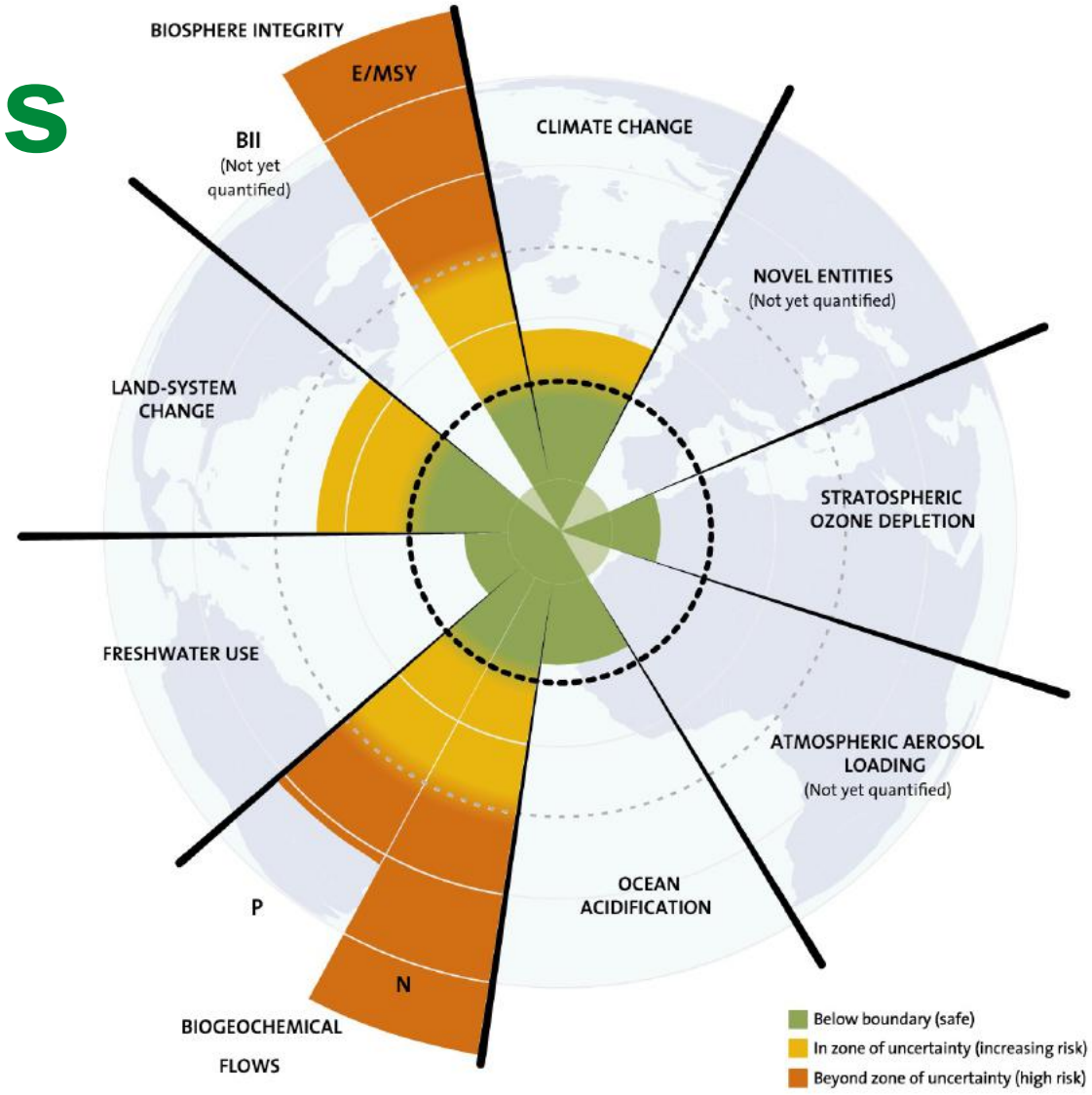
WORLD ECONOMIC FORUM

https://www.weforum.org/reports/global-risks-report-2023/digest



https://www.weforum.org/reports/global-risks-report-2023/digest

Planetary Boundaries

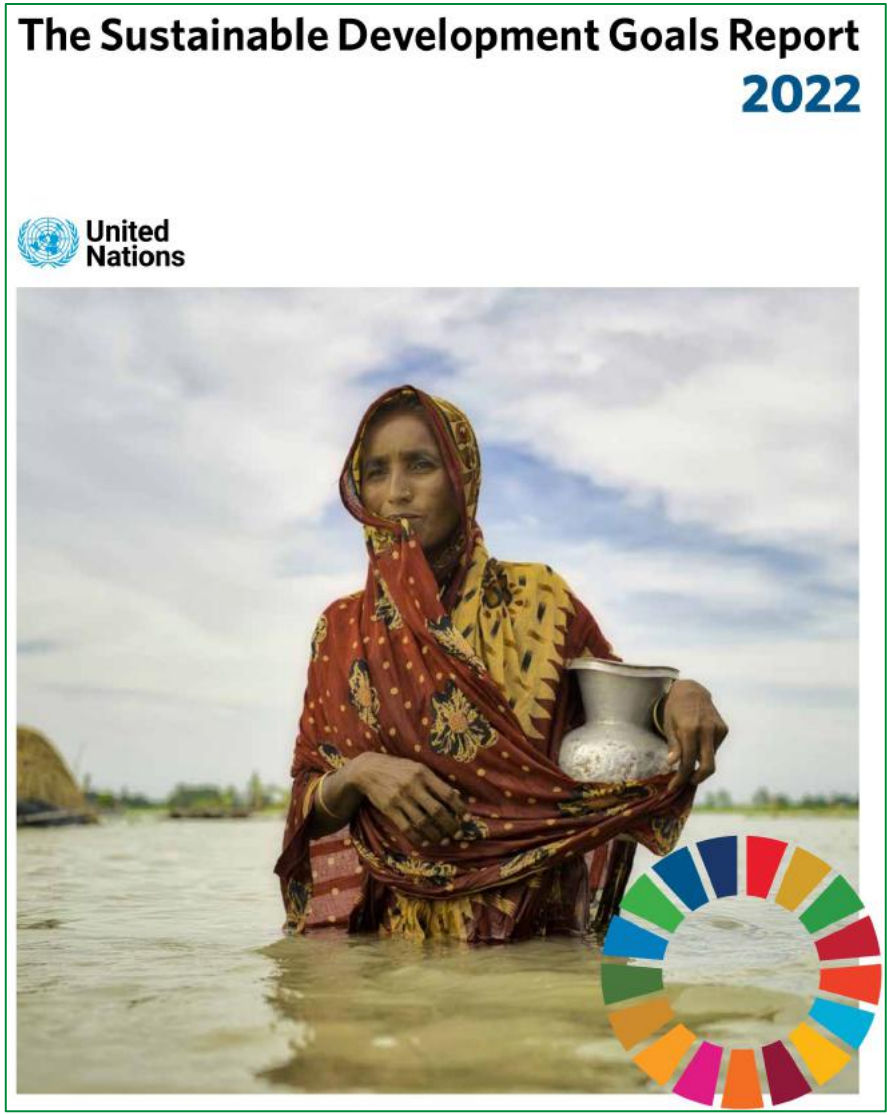


Randers, Jorgen, et al. 2018. *Transformation is feasible - How to achieve the Sustainable Development Goals within Planetary Boundaries - A report to the Club of Rome, for its 50 years anniversary 17 October 2018* (Stockholm Resilience Centre, Stockholm University, Norwegian Business School, Global Challenges Foundation: Stockholm) https://www.stockholmresilience.org/download/18.51d83659166367a9a16353/1539675518425/Report_Achieving%20the%20Sustainable%20Development%20Goals_WEB.pdf

- Politics
- 17 Goals (qualitative)
- 169 Targets
  (qualitative and quantitative)

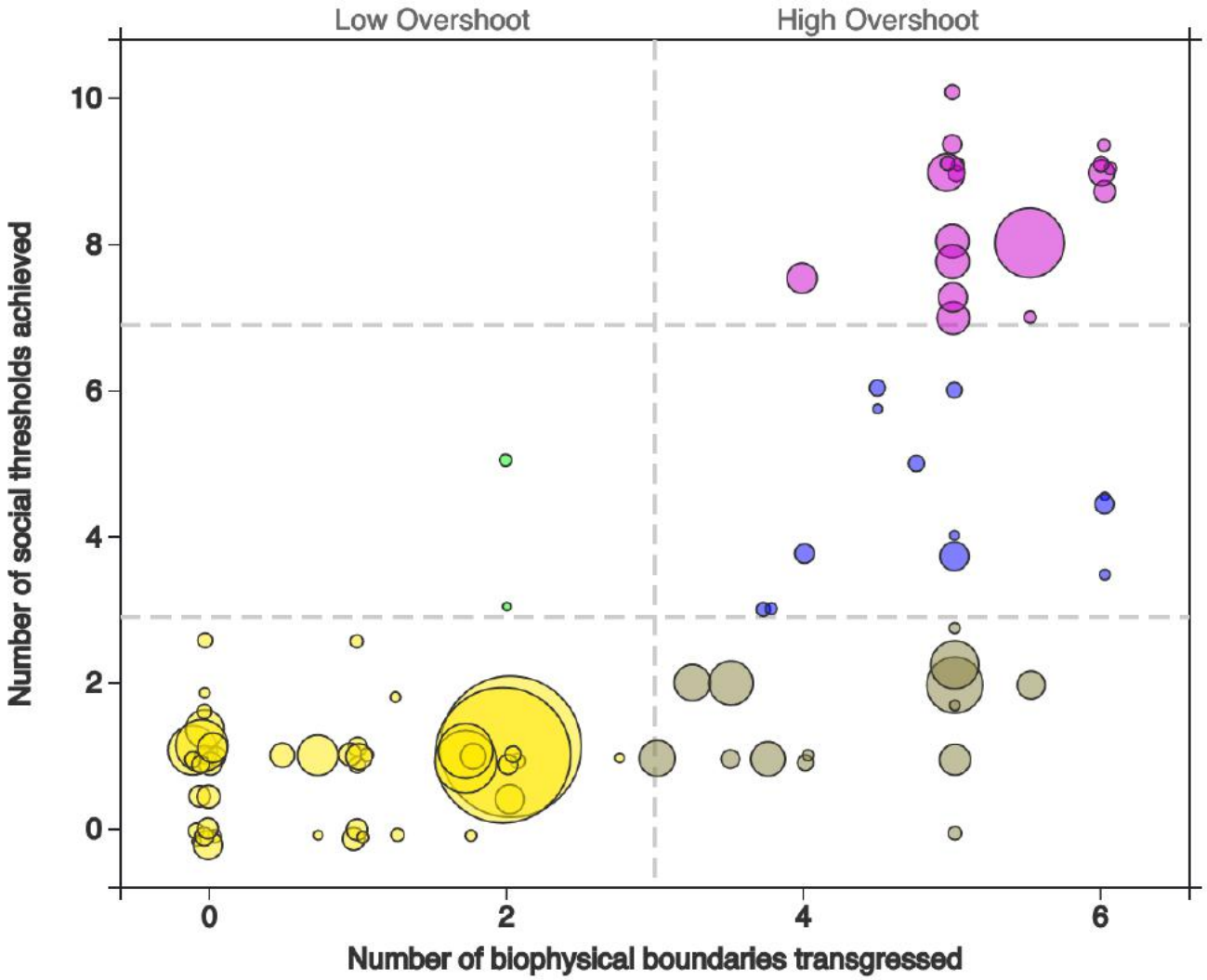
→ Statistics

← 231 Indicators



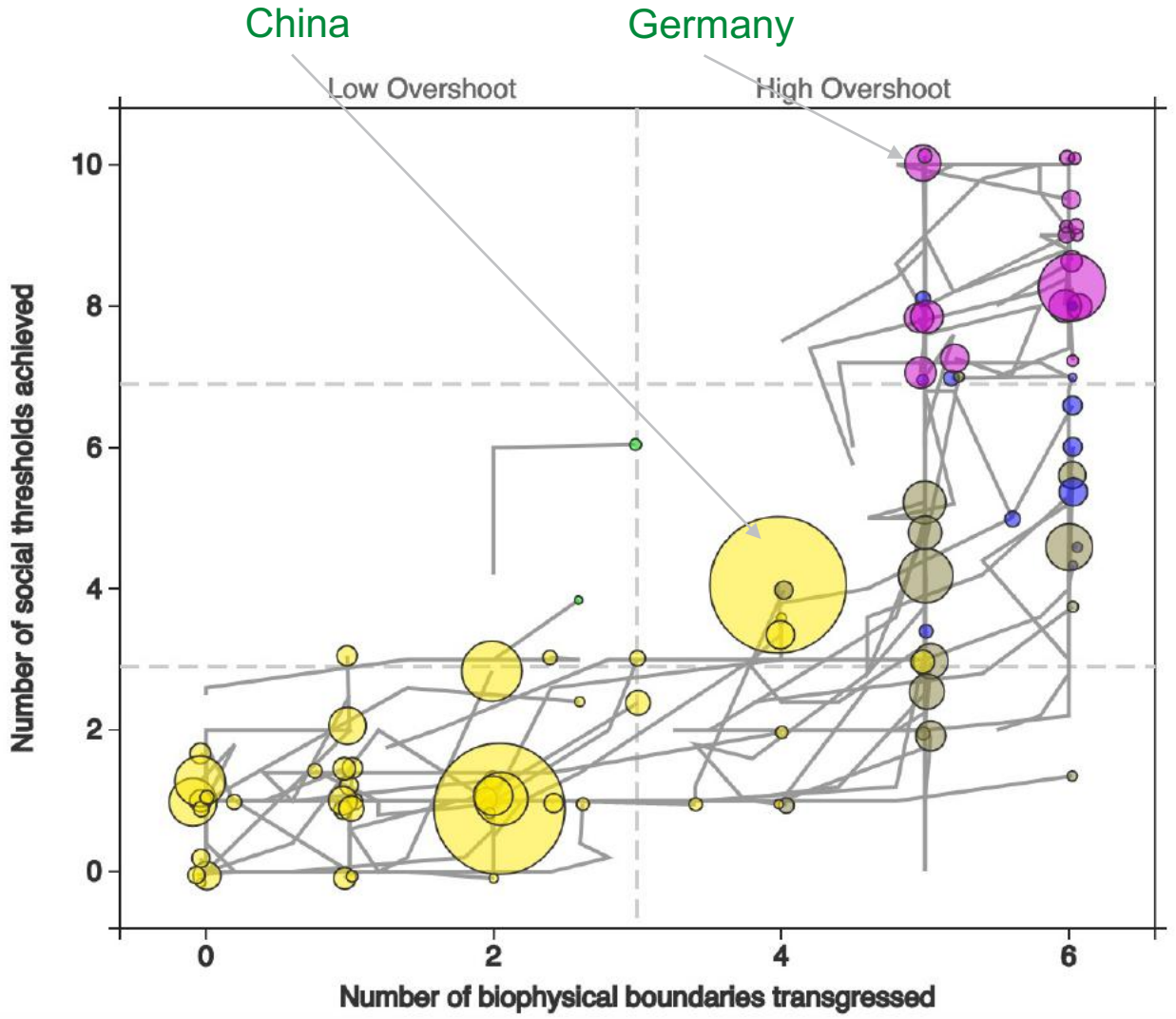
https://www.un.org/development/desa/dspd/2022/07/sdgs-report/

The Social Shortfall and Ecological Overshoot of Nations 1995



Source https://goodlife.leeds.ac.uk/national-trends/pathways/
https://www.nature.com/articles/s41893-021-00799-z

The Social Shortfall and Ecological Overshoot of Nations 2015



Source https://goodlife.leeds.ac.uk/national-trends/pathways/
https://www.nature.com/articles/s41893-021-00799-z

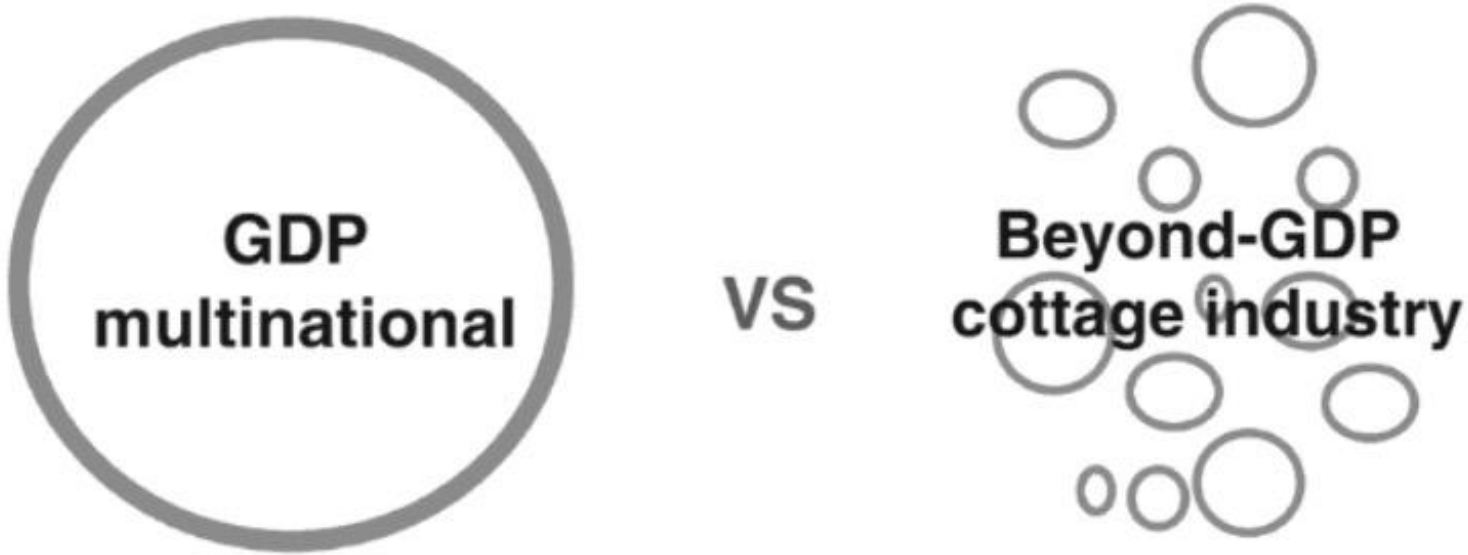


FIGURE 1.1 GDP multinational versus Beyond-GDP cottage industry

Hoekstra, Rutger. 2019. *Replacing GDP by 2030: Towards a Common Language for the Well-being and Sustainability Community* (Cambridge University Press). https://www.cambridge.org/de/academic/subjects/economics/economic-development-and-growth/replacing-gdp-2030-towards-common-language-well-being-and-sustainability-community?format=HB&isbn=9781108497336

Indicators, condensed

https://ec.europa.eu/eurostat/web/products-catalogues/-/KS-06-22-017

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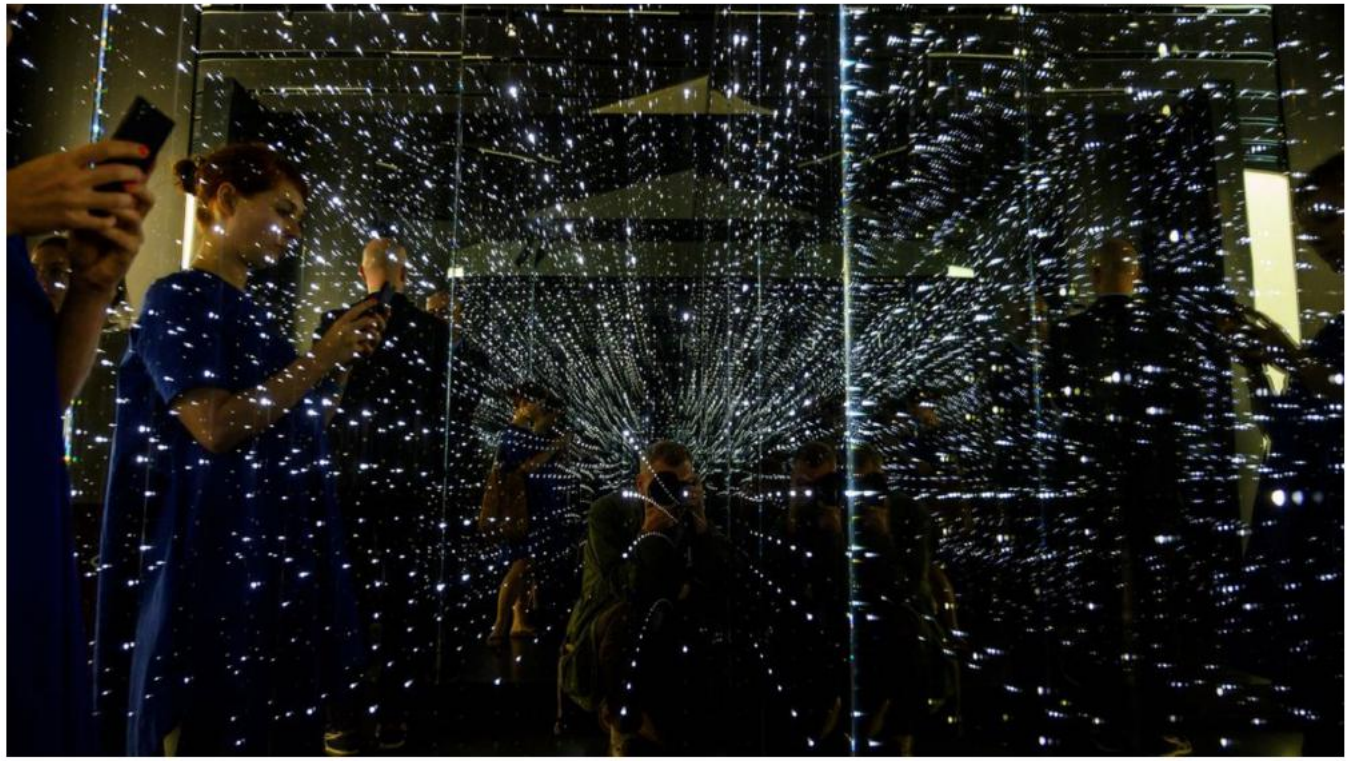
What is statistics?

by Professor David Hand FBA

23 OCT 2020



https://www.thebritishacademy.ac.uk/blog/what-is-statistics/

Artefacts

DESIGN OF STATISTICAL PRODUCTS

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Statistical Information

Facts = Products

Design = f(Conventions)

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Statistics

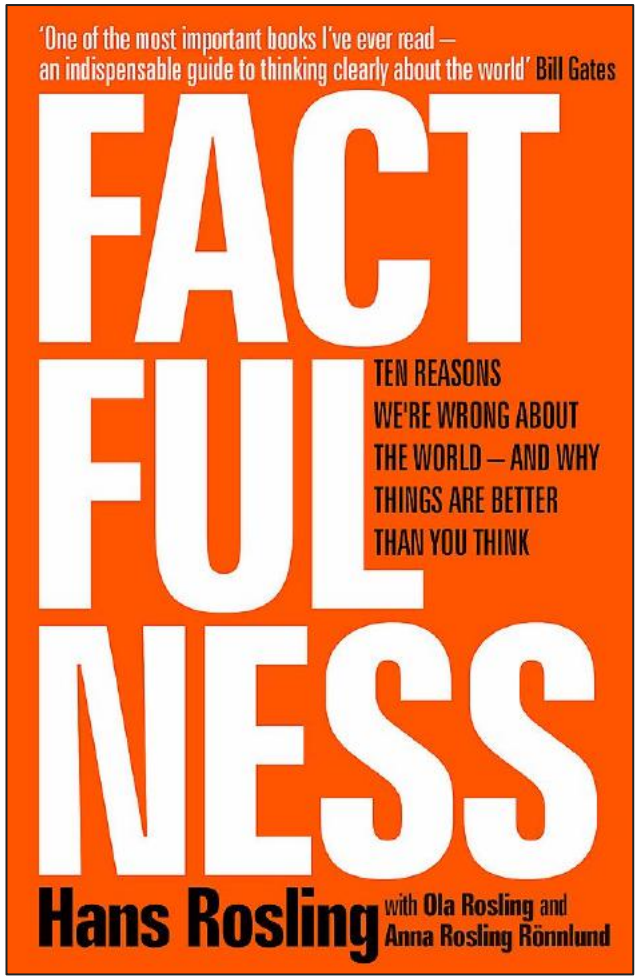
GOOD MATHEMATICAL-STATISTICAL **METHODOLOGY**

MODERN **TECHNOLOGY**, RELIABLE DATA SOURCES, EFFICIENT PROCESSING METHODS

SUSTAINABLY MAINTAINED **INFRASTRUCTURE**

COMMON **LANGUAGE** OF PRODUCERS AND USERS

VALUES, ETHICS, INTEGRITY



Hannah Arendt: Truth and Politics

The New Yorker. February 25, 1967

"Factual truth … is political by nature. Facts and opinions, though they must be kept apart, are not antagonistic to each other; they belong to the same realm. … Seen from the viewpoint of politics, truth has a despotic character. It is therefore hated by tyrants, who rightly fear the competition of a coercive force they cannot monopolize, and it enjoys a rather precarious status in the eyes of governments that rest on consent and abhor coercion. Facts are beyond agreement and consent, and all talk about them – all exchanges of opinion based on correct information – will contribute nothing to their establishment. Unwelcome opinion can be argued with, rejected, or compromised upon, but unwelcome facts possess an infuriating stubbornness that nothing can move except plain lies."

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INFORMATION QUALITY SCALE	
Zone 1	
True statement	Verified facts
ZONE 2	
Distorted statements	Framing, acute angles, omission, “selected facts”
Unsubstantiated statements	Rumors (maybe true, maybe false)
ZONE 3	
False statements	False rendering of facts, in contradiction to these lies
Bullshit	False rendering of one's own motives and goals, misrepresentation, faking, dissolution of the separation between true and false
Fake News	Fake news, false reproduction of motifs and goals with simulation of journalism and thus truthfulness

Hendricks, Vincent F.; Vestergaard, Mads, 2018, "Post faktisch”, München

Statistics are products

‘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”

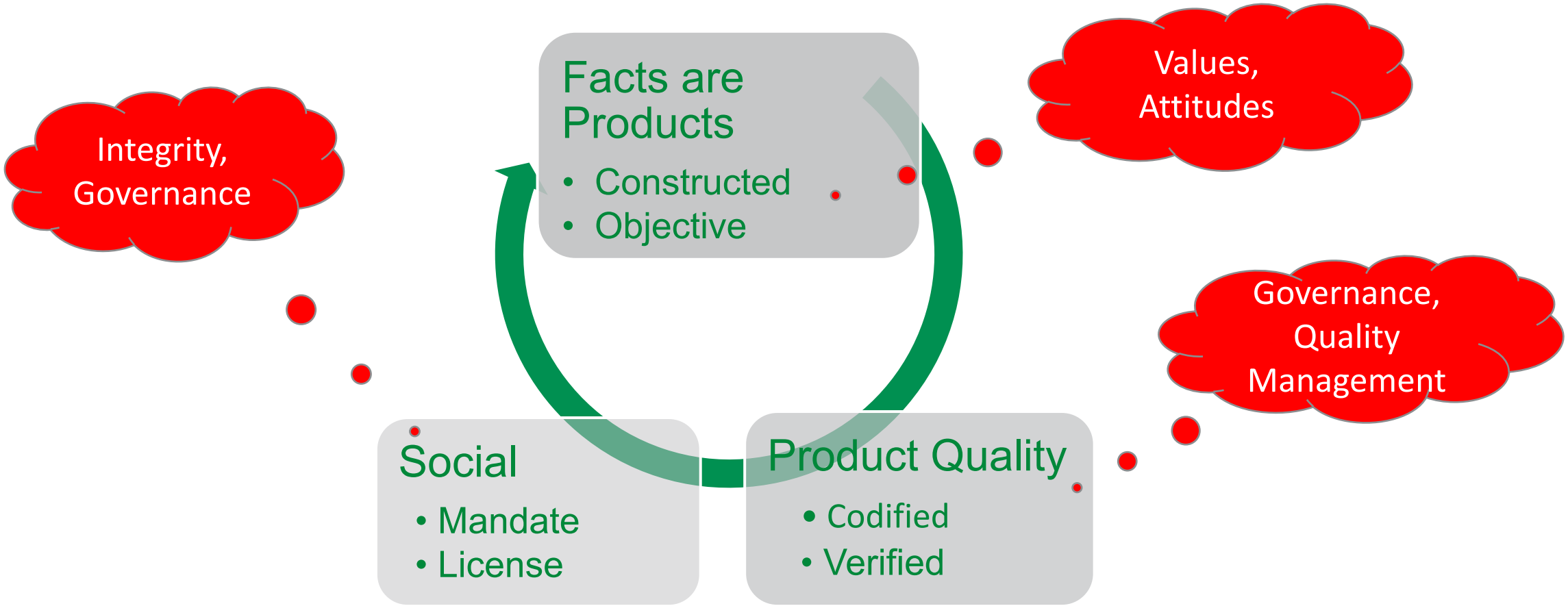
Aspects of statistics (Desrosières, 2010)

“(1) that of quantification properly speaking, the making of numbers,

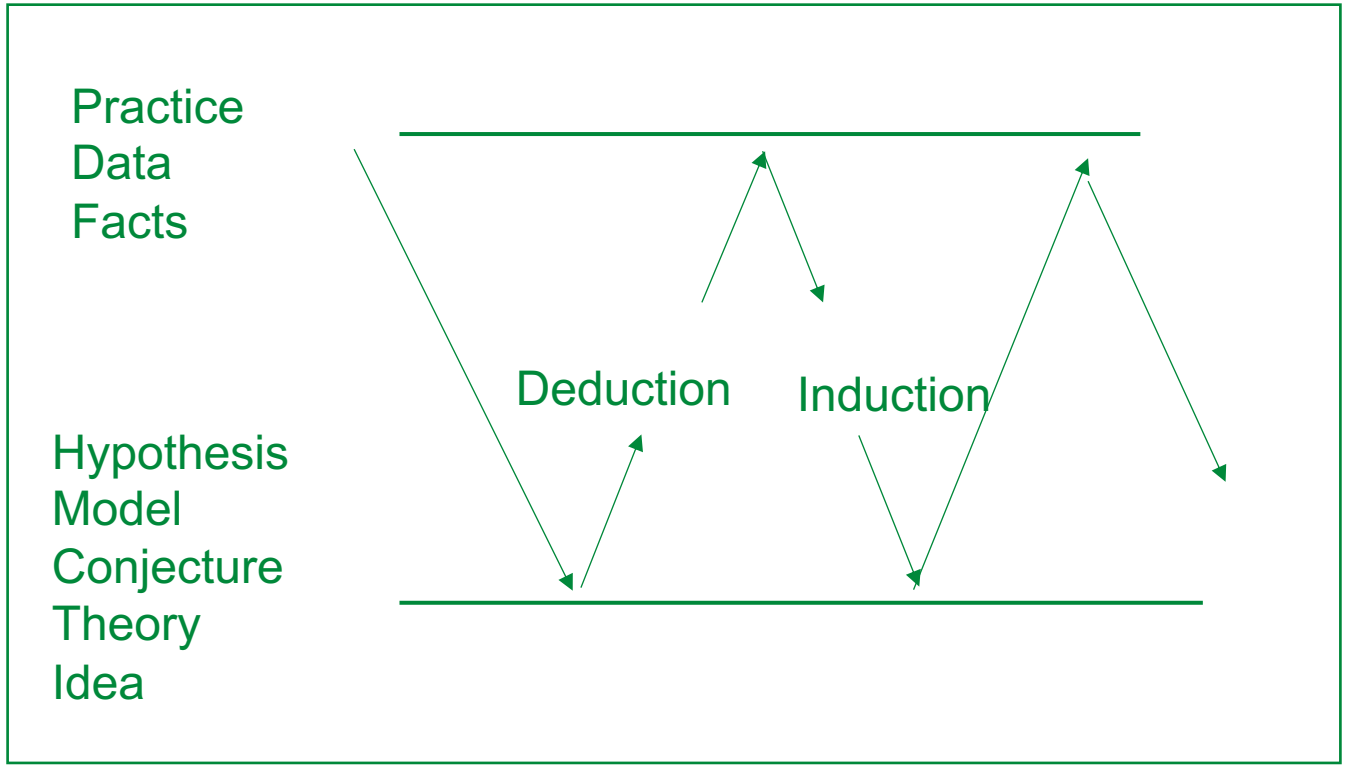
(2) that of the uses of numbers as variables, and finally,

(3) the prospective inscription of variables in more complex constructions, models”

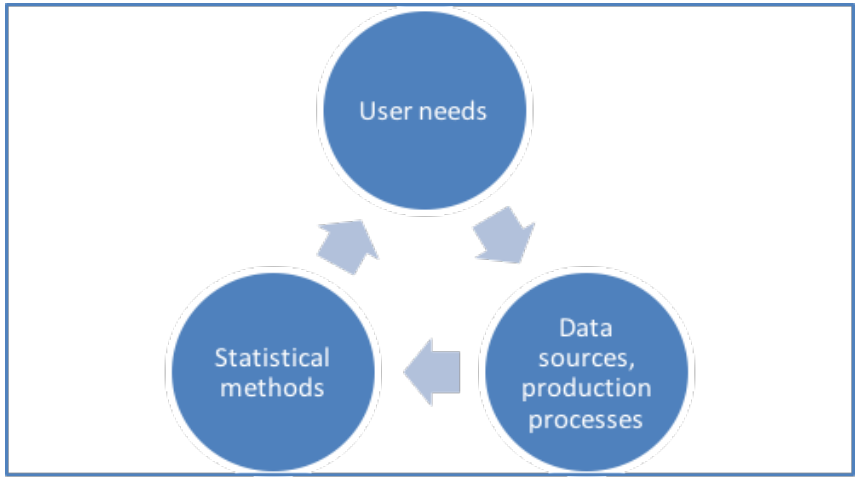
Ethics and Governance in Statistics



Statistical learning & iteration btw deduction and induction

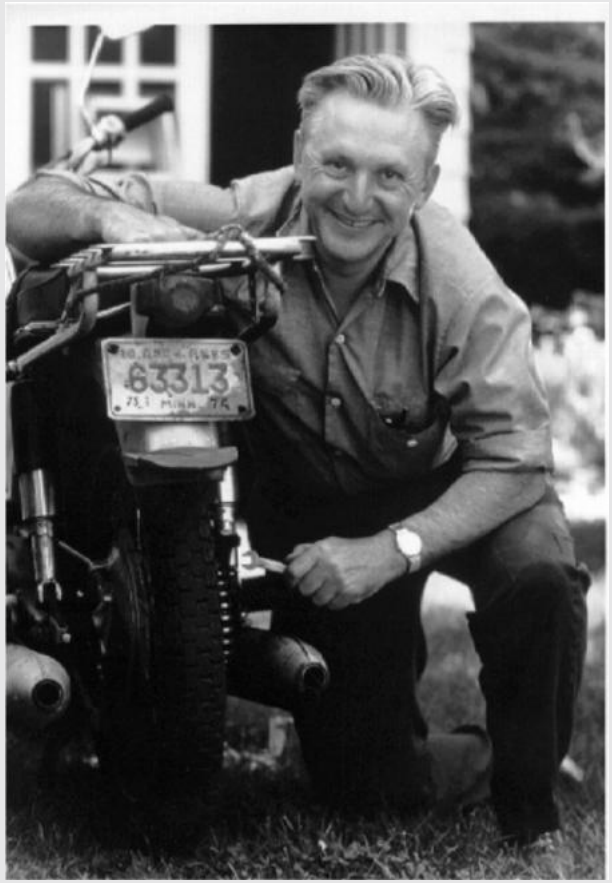


Box, George E. P. 1976. 'Science and Statistics', *Journal of the American Statistical Association*, 71: 791-99.

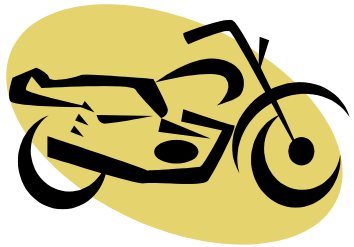


Walter J. Radermacher

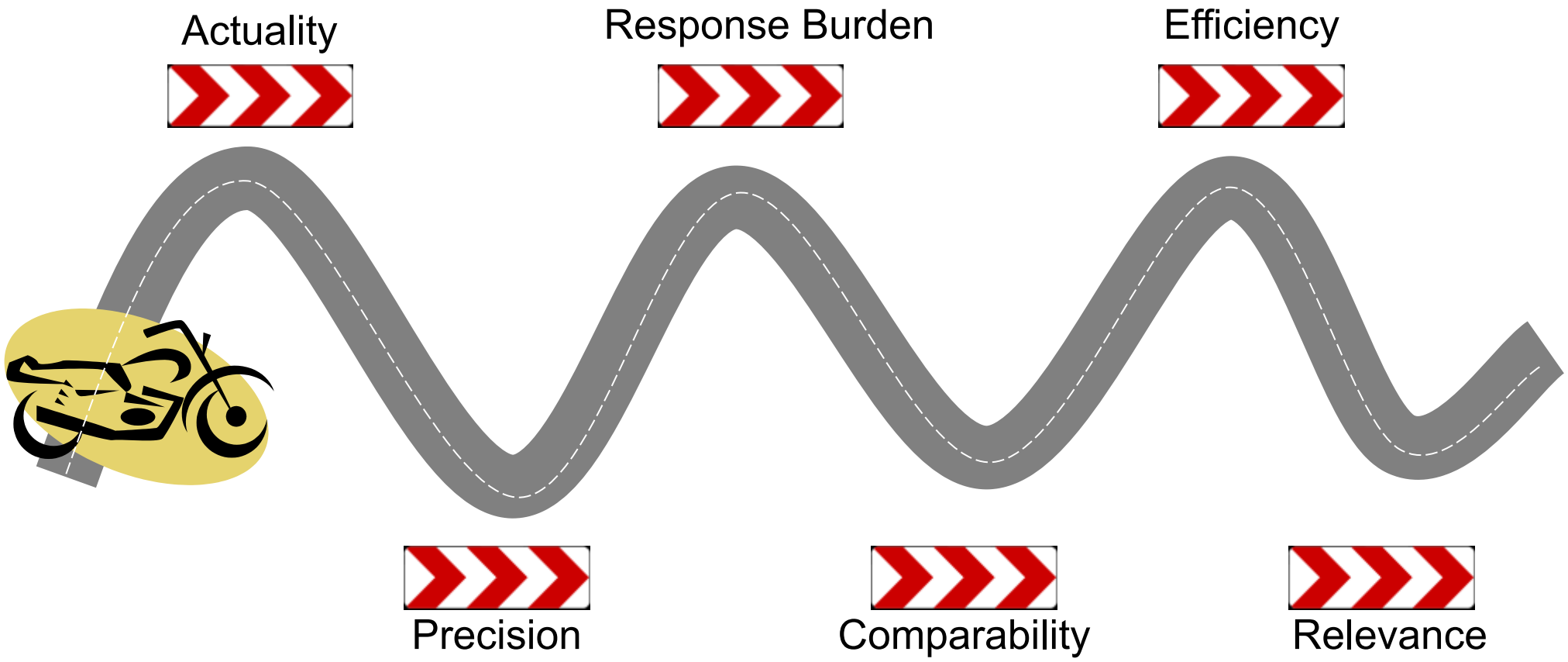
Robert M. Pirsig:



Zen or
the art of
motorcycle maintenance



The art of statistical design



Ethics, Good Governance Principles, e.g.

DECLARATION ON PROFESSIONAL ETHICS

https://www.isi-web.org/files/docs/declaration-on-professional-ethics_2010.pdf

Recent challenges

- Needs for updated guidance on transparency, uncertainty quantification, reproducibility, quality characteristics, privacy of data etc.:
  - Increasing availability of digitised data that can be used for statistical purposes. They are often large and complex data sets (‘big data’) and the data generation process may be unknown.
  - Computational capacity has increased rapidly enabling the use of computer intensive techniques such as artificial intelligence.
- Problems with the integrity and independence of statistics in various regions and states
- Changes in the task and role of public statistics
  - Statistics for the public good
  - New services (e.g. data steward) in the digital society
- Knowledge, dissemination and application of ethical principles and standards in the increasingly diverse landscape of data communities and the developing world

Ethics

RESPONSIBILITY

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Responsibility

„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."

https://www.isi-web.org/files/docs/declaration-on-professional-ethics_2010.pdf

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ISI Values

https://www.isi-web.org/files/docs/declaration-on-professional-ethics_2010.pdf

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 Judgment.
   - ...
3. Truthfulness and Integrity
   - By Truthfulness and Integrity, we mean Independence, Objectivity and Transparency.
   - ...

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ISI Ethical Principles

https://www.isi-web.org/files/docs/declaration-on-professional-ethics_2010.pdf

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

ISI Advisory Board on Ethics

The ISI Advisory Board on Ethics (ABE) was established in 2010.

Board Objectives

The ABE advises the Executive Committee and Council on relevant ethical issues, and recommends or undertakes activities for promoting observance of ethical principles in statistics. The work of the Board is based on the *ISI Declaration on Professional Ethics*

https://www.isi-web.org/isi-community/committees/advisory-board-on-ethics

Last Name	First Name	Association	Country
Radermacher	Walter	ISI, IAOS, IASE, TIES	FENStatS (President)
Arrow	Jairo	ISI, IASS	South Africa
Belkindas	Misha	ISI, IAOS (President)	USA/Lithuania
Bilgin	Ayse	ISI, IASE (President)	Australia
Chuwa	Albina	ISI, IAOS	Tanzania
Fung	Hing Wang	ISI, IASS, IAOS	Hong Kong
Habibullah	Saleha	ISI, IASE, IASS	Pakistan
v.Oppeln-Bronikowski	Sibylle	ISI, IAOS	Germany
Rancourt	Eric	ISI, IASS, IAOS	Canada
Stapel-Weber	Silke	ISI, IAOS, IFC	Germany
Suesser	Jan Robert	ISI, IAOS	France
Terán	Teresita Evelina	IASE	Argentina
Trewin	Dennis	ISI, IASS, IAOS	Australia
Tzavidis	Nikos	ISI, IASS	United Kingdom
Vukovich	Gabriella	ISI, IAOS	Hungary
van Dijk-Timbol	Olivia	ISI (Liaison Officer)	ISI

ISI WSC.2023 Ottawa

- IPS Statistical learning and ethical artificial intelligence.1
  - Walter J. Radermacher, Eric Rancour, Stefaan Verhulst, Katharina Schueller, Paolo Guidici
- IPS Statistical learning and ethical artificial intelligence.2
  - Walter J. Radermacher, Jan Robert Suesser, Pieter Elias, Rochelle Tractenberg, Emanuele Baldacci
- IPS Validating the Independence and Integrity of Statistics around the World
  - Panel: Silke Stapel-Weber, VDem Institute, ISI, ASA, RSS, Eurostat
- IPS Ethical Principles in the Statistical Profession: Challenges faced by Developing Countries
  - Saleha Naghmi Habibullah, Teresita Teran, Amjad Javaid Sandhu, Joyce Akinyi Otieno, Awe Olushina Olawale, Manfred Borovcnik
- IPS Do principles and ethics of official statistics need to be adjusted to national circumstances?
  - Hallgrimur Snorrason, Andreas V. Georgiou, Walter J. Radermacher, Gerry O'Hanlon, Pali Lehohla
- Workshop Revision of the ISI Declaration on Professional Ethics

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Trustworthy Artificial Intelligence

A trustworthy application of AI must satisfy key principles:

- it should lead to accurate predictions (Accuracy);
- it should be sustainable: computationally efficient and ethically acceptable (Sustainability);
- it should be stable with respect to variations in the input data (Robustness);
- it should be interpretable in terms of its drivers (Explainability);
- it should not discriminate by age, ethnicity, gender or other population groups (Fairness).

Good Governance

QUALITY

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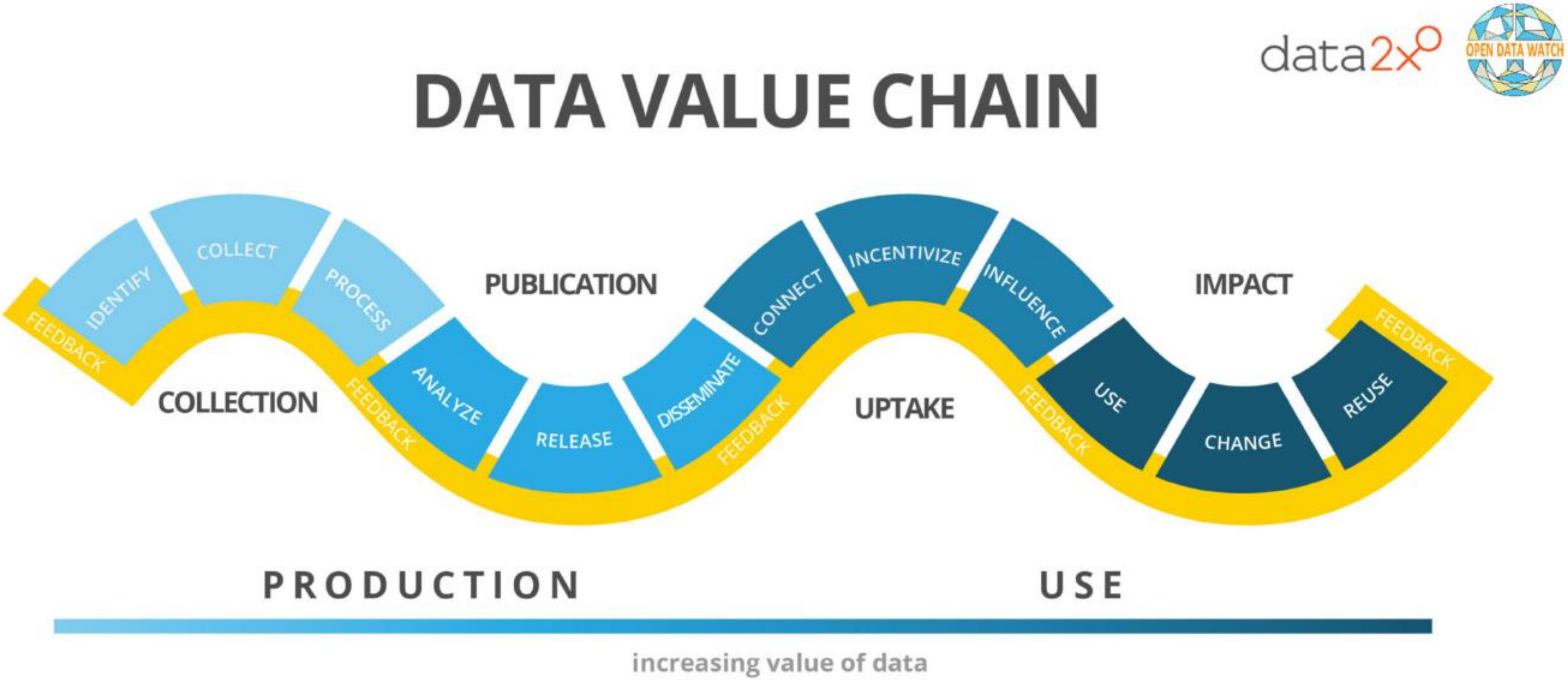
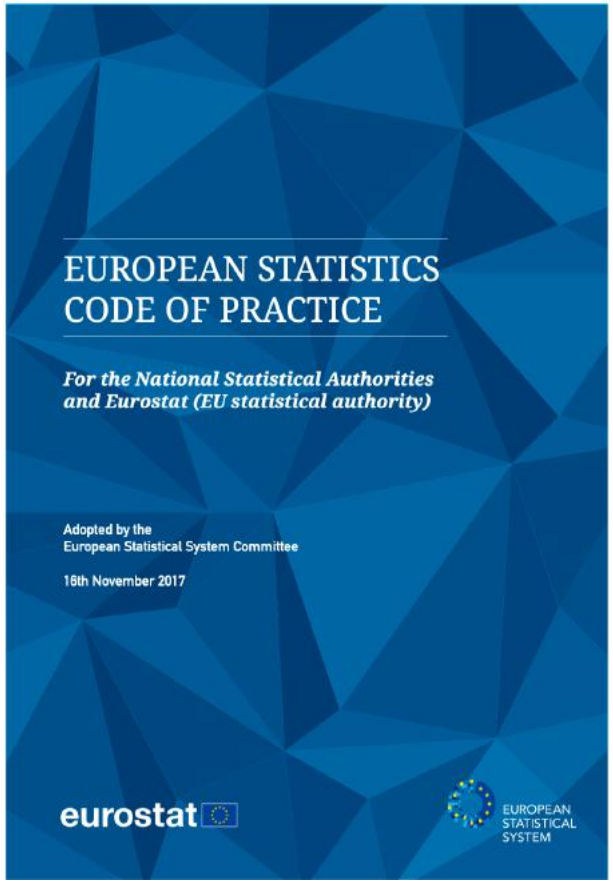


https://opendatawatch.com/reference/the-data-value-chain-executive-summary/

Codification: EU Statistics

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



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

UN Fundamental Principles of Official Statistics (UNFPOS)

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 …

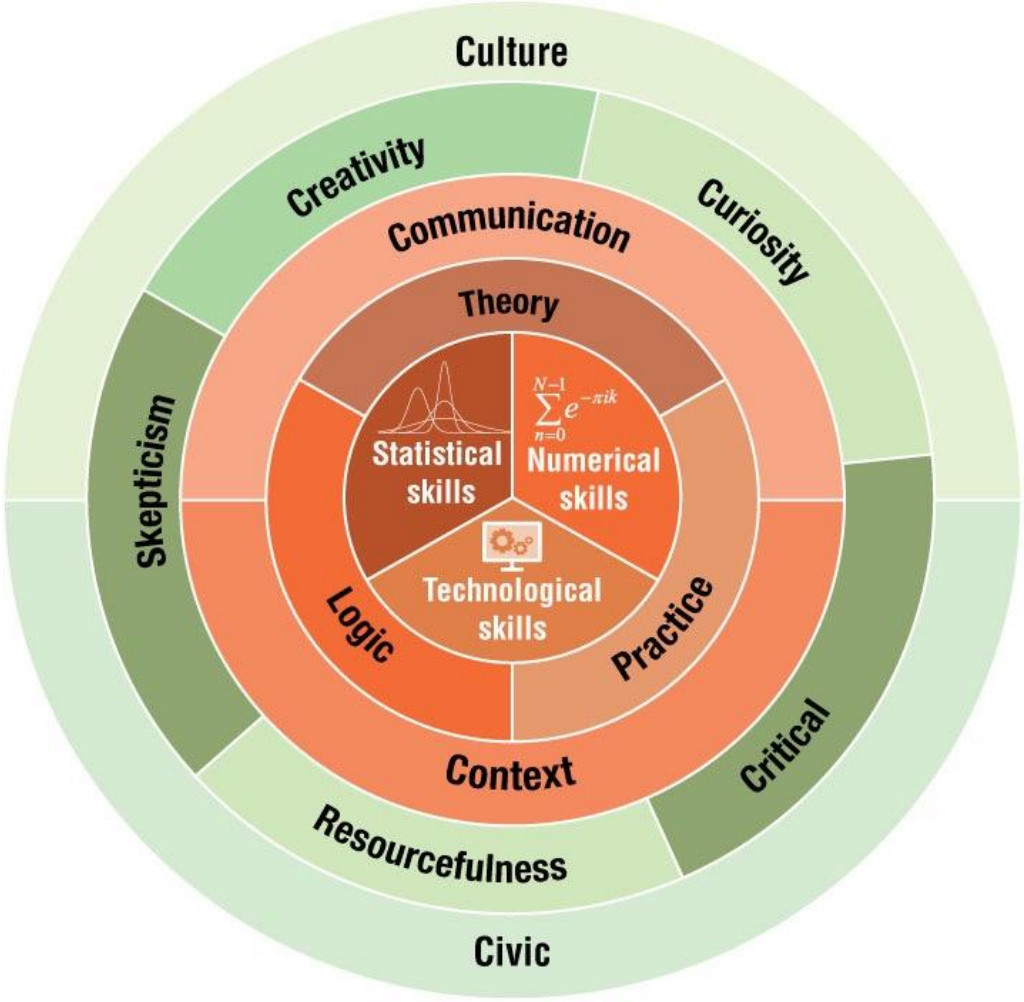
Data/statistical literacy

BEYOND SKILLS AND TECHNOLOGY

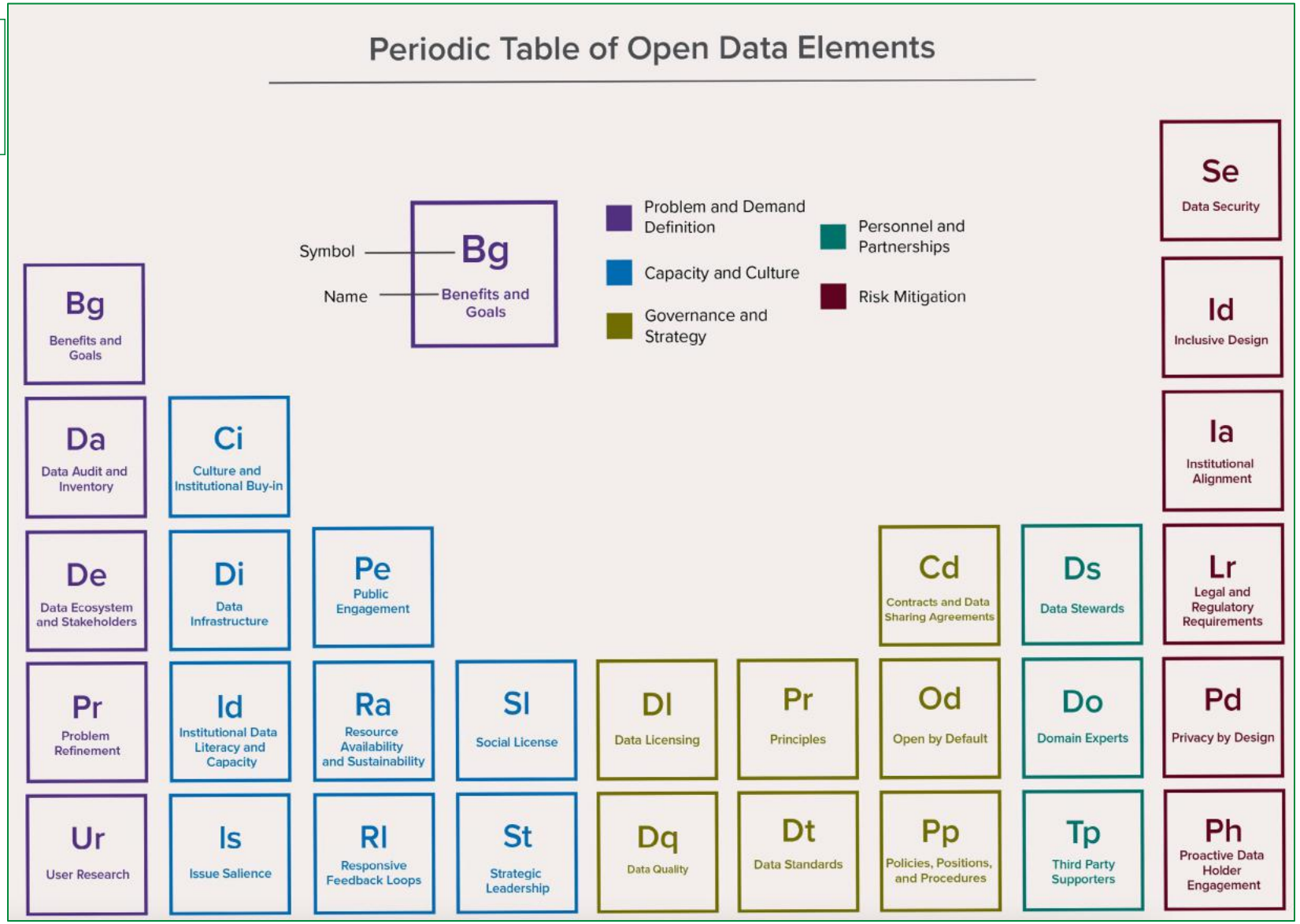
Beyond ‘STEM’: conceptual basics

What is (public) statistics?	What is statistics’ role in the public discourse?	What is data/statistical literacy?
• A public infrastructure, a factory, a product, a language, all based on scientific methods • Concept: Total Quality Management à la W.E. Deming	• Providing verified facts • Being policy relevant without being politically driven • Concept: Économie des Conventions à la A. Desrosières Th. Porter Science & Technology Studies à la Sheila Jasanoff	• All dimensions of competence: knowledge, aptitudes, skills, motivation and attitude • All stages of the knowledge creation process from data • Concept: Data Literacy Framework à la K. Schüller

Skills and competencies of a data scientist / statistician



Damouras, Sotirios, Alison Gibbs, and Steve MacFeely. 2021. 'Training official statisticians for adaptive statistical practice', *Statistical Journal of the IAOS*, 37: 887-98.
https://content.iospress.com/articles/statistical-journal-of-the-iaos/sji210851



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

Trust ≠ Blind Faith

TRUST IS BUILT ON KNOWLEDGE AND EXPERIENCE

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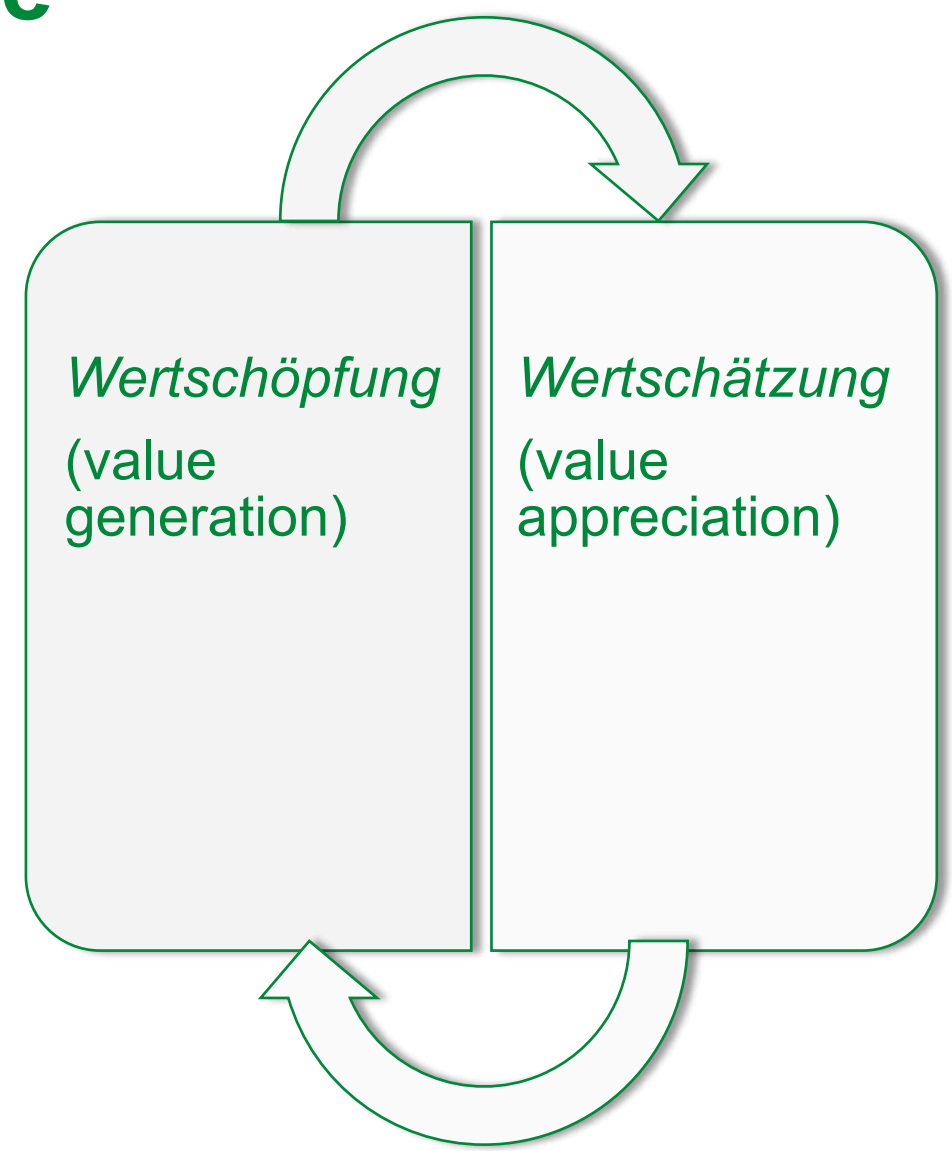
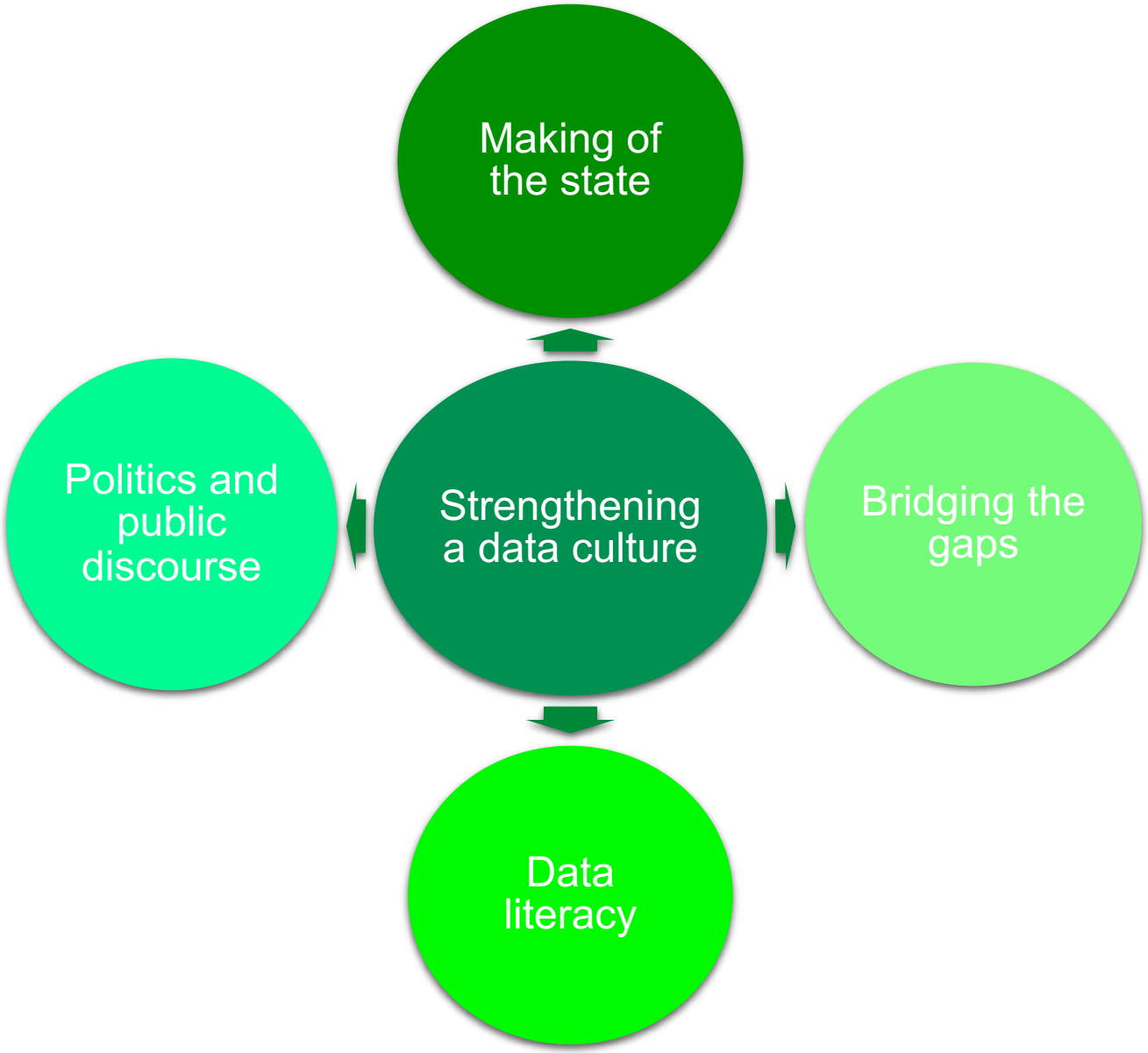
Data Culture




Making of the state
Politics and public discourse
Strengthening a data culture
Bridging the gaps
Data literacy

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Strengthening a data culture

Making of the state	Bridging the gaps
• understand generating knowledge from data under today's conditions • analyse the relationship between statistics and state, between data and society in a sociology of quantification • be aware of different cultures in data worlds on both producers' and users' side	• promote mutual understanding and interest between different data worlds of data sciences • offer easy-to-understand, yet solid forms for the communication of facts and figures • involve citizens in the design and production of statistics

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Strengthening a data culture ctd.

Data literacy
• develop an adequate structure of educational programmes, geared to the different stages / actors in the data value chain • not only teach the knowledge and the skills, but also values and attitudes • review principles for ethics, good governance and quality in statistics, aiming at broader relevance for data sciences

Politics and public discourse
• advocate for the inclusion of statistical expertise in expert policy bodies • cooperate with data journalists • compile evidence on trust, statistical literacy and integrity of statistics • defend against unethical behaviour, abuse and other threats to the integrity of statistics

Statistics = professional discipline

The community of statisticians should take up the task of proactively making its contribution to solving the upcoming critical transformation processes in the crises of the coming years

Statistics has a lot to offer in terms of possible solutions

With power comes responsibility

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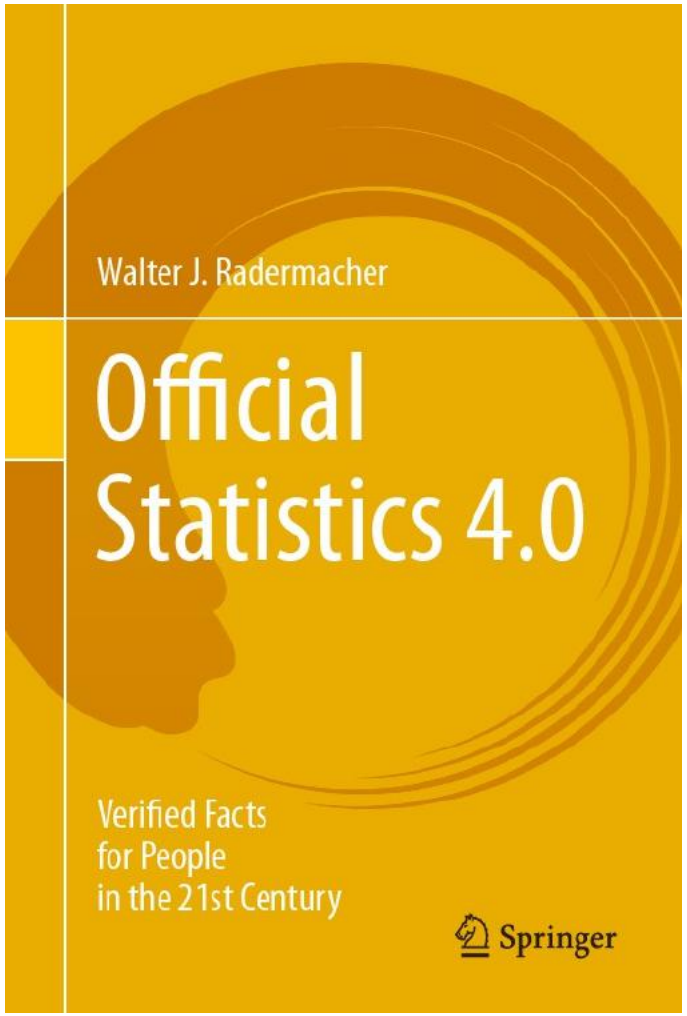
MUCHAS
GRACIAS
MUITO
OBRIGADO
VIELEN DANK
THANK YOU
MERCI BIEN



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

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