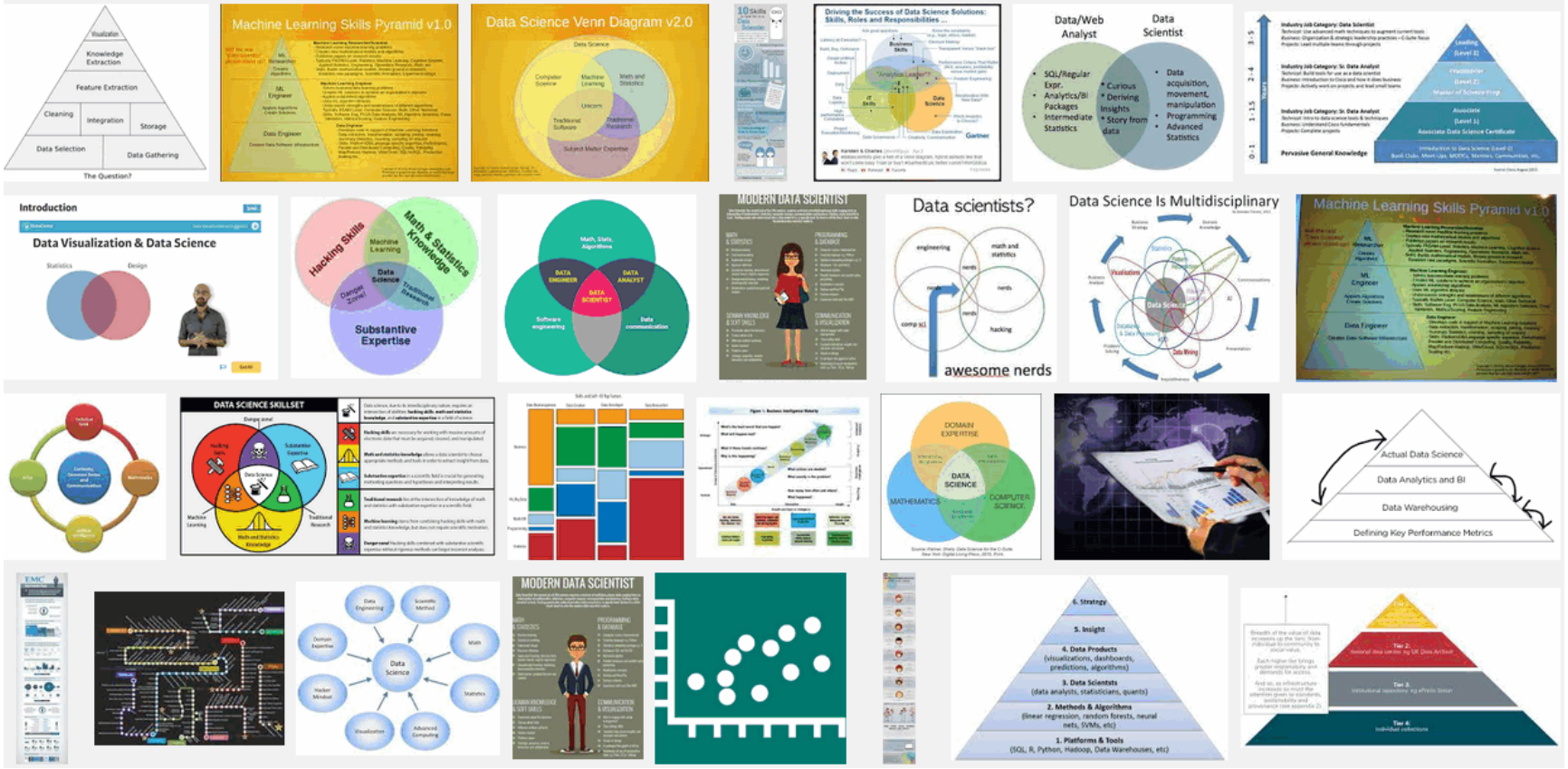
3Σ
Science Statistics Society

European Data Science Conference
Luxembourg 7. Nov. 2016

Walter J. Radermacher, Eurostat

Data scientist: the engineering view



Is this the full picture?

- *Co-production of statistics and society*
- *The power and distribution of knowledge and missing knowledge*
- *S&T*
- *The double use of information*
- *Technosphere and democracy*
- *Risk-society*
- *Globalisation*
- *Individualisation*
- *Ethical dilemmas*
- *Privacy and confidentiality*

which one?

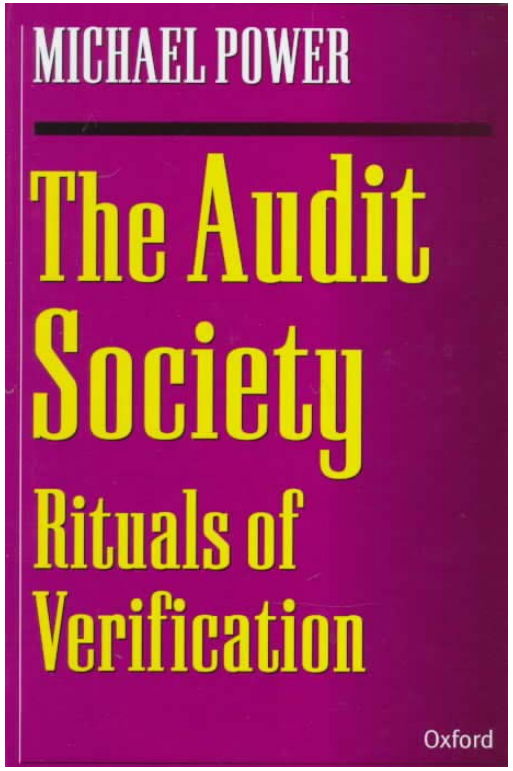
DATA REVOLUTION

1. Big data

Data revolution: "What steam was to the 19th century, and oil has been to the 20th, data is to the 21th." *(http://www.rss.org.uk/Images/PDF/influencing-change/rss-data-manifesto-2014.pdf)*

2. **Evidence based decision making**: "if you can't measure it, you can't manage it."

(https://blog.deming.org/2015/08/myth-if-you-cant-measure-it-you-cant-manage-it/)



http://www.institutjeanlecanuet.org/content/vers-homo-algorithmus

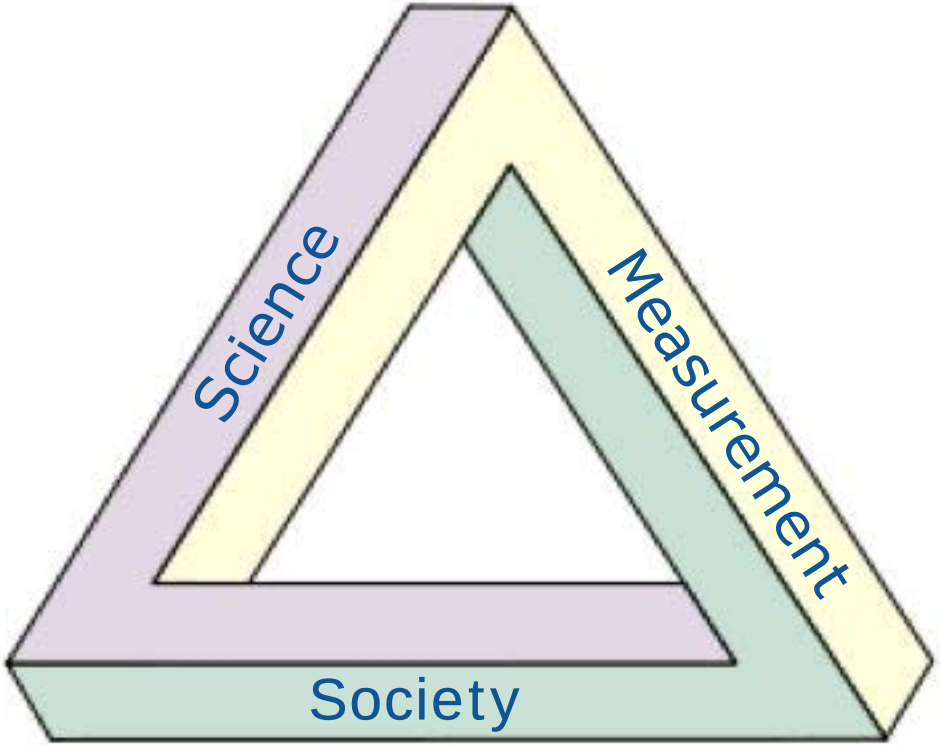
3. Post-truth-politics

"The 5% Unemployment Figure Is One Of The Biggest Hoaxes In Modern Politics."
(https://www.youtube.com/watch?v=QMmk3oQ0QiI)

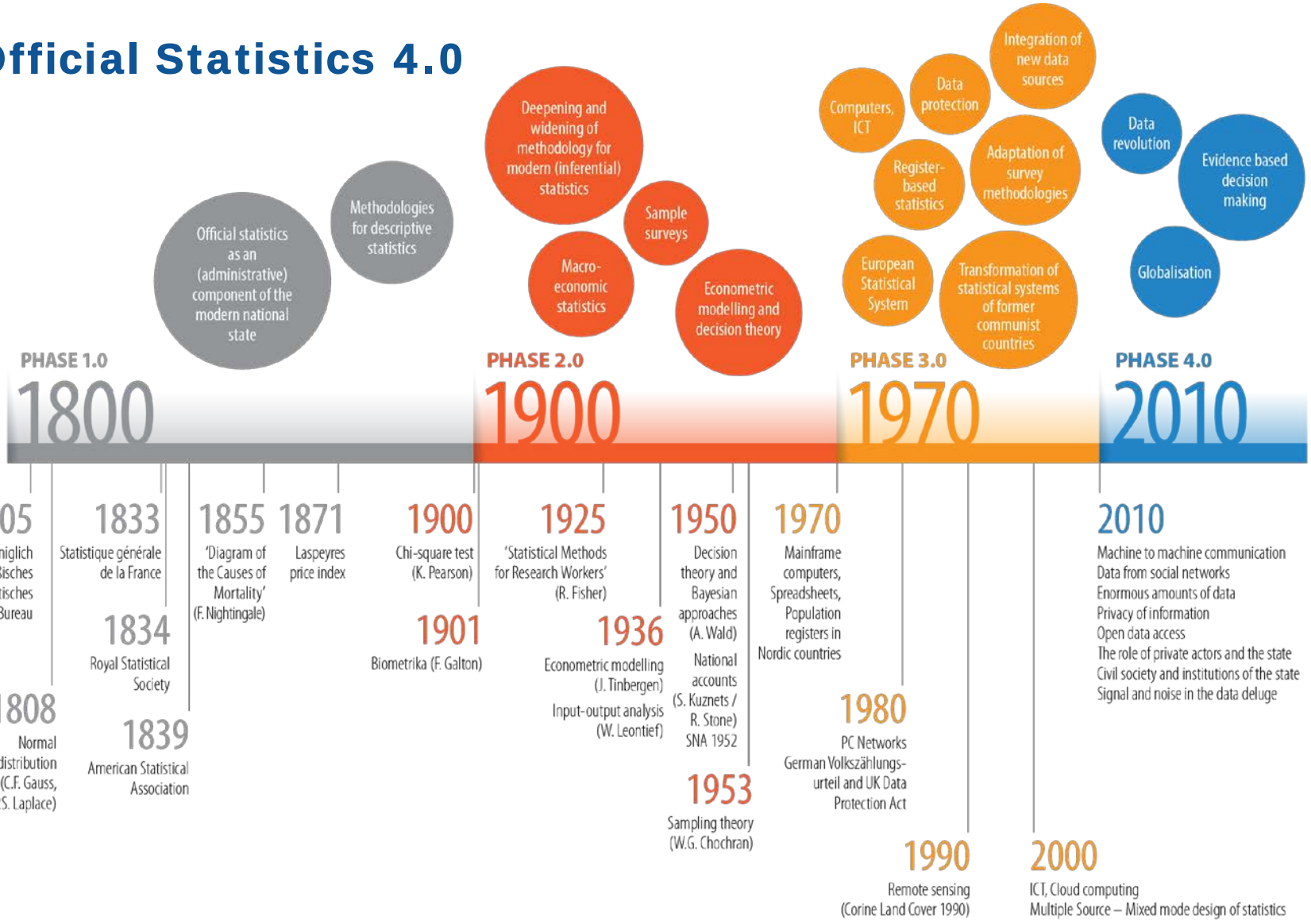
learning to prepare for the future

HISTORY

Driving forces



Official Statistics 4.0



A. Desrosières, Words and Numbers, in The mutual construction of statistics and society, New York, 2011 pg. 45

Table 2.1 The State, the Market, and Statistics

	Conceptualization of Society and of the Economy	Mode of Action	Forms of Statistics
Engineer State Production and people (since the seventeenth century)	Hierarchically structured institution, rationally organized France, from Colbert to De Gaulle; USSR.	Optimization under constraint. Reduction of costs. Planning. Technocracy. Major work projects. Long term vision.	Demography. Production in physical quantity. Input-output table. Material balance.
Liberal State Trade and prices (since the eighteenth century)	Physiocracy. An extensive market. Free competition	Fight against corporatism. Free-trade philosophy. Anti-trust laws protecting competition.	Statistics promoting market transparency: (e.g., American agriculture). Measurement of possible dominant position. Market shares.
Welfare State Waged work and its protection (since the end of the nineteenth century)	The labor market is not a market like any other, it has to be protected.	Laws on working hours, accidents, unemployment, and retirement benefits. Compulsory insurance systems ensuring social rights.	Labor statistics. Wage, employment, unemployment. Sampling surveys of workers' household budgets. Consumer price indexes.
Keynesian State Global demand and its components (since the 1940's)	The market cannot function on its own without generating crises. It must be regulated at a global level.	Supervising and managing the occasional gap between global supply and demand through monetary and budgetary policies.	National accounting. Analysis of the economic situation. Economic budgets.
Neoliberal State Polycentrism, incentives; Benchmarking (since the 1990's)	An extensive market. Free and undistorted competition Financialization Distributing the decision-making centers into a network.	Moving from rights to incentives: e.g., bonus-malus, polluting-rights market. Turning administrations into agencies. Contractualization Coordination by emulation: e.g., the European OMC	Objectification of new areas of equivalence Objectification of statistics. Construction and use of indicators to evaluate and classify performance. Benchmarking supplements, or replaces, directives and regulations.

Learning lessons

- *Statistics = learning from data*
- *Official Statistics‘ history = learning from data and science in societal context*
- *Official Statistics 4.0 = f (big data, data science and new societal conditions)*

Risk Society - Reflexive Modernisation*

- *The individual*
  - in a risk society
  - faced with a risk economy and
  - embedded in a risk environment
- *Drivers of risk and uncertainty (e.g. globalisation, externalities and by-products of the modern life, distribution of the known and unknown facts)*
- *Limited solution powers of national states*
- *Trust and mistrust vis-à-vis political decision making mechanisms, technical experts, media etc.*

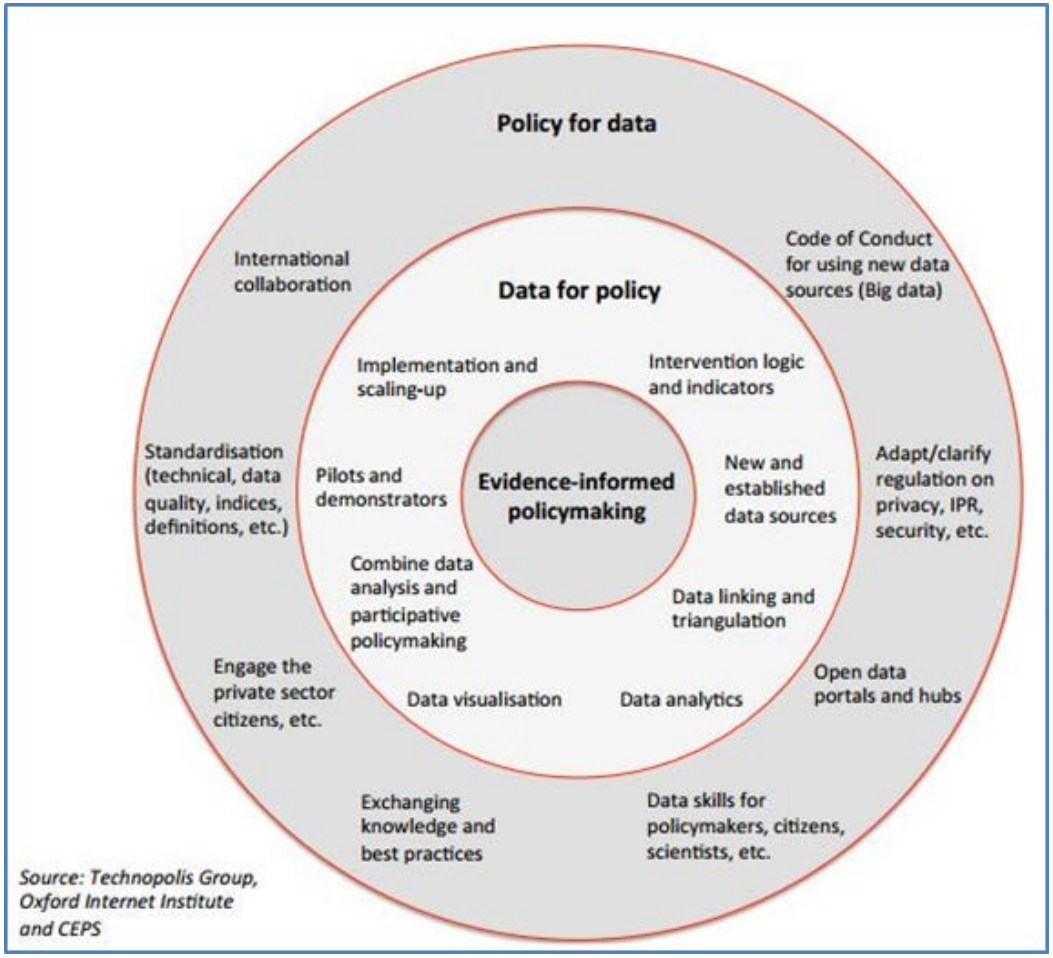
* Zinn, J.O.: Social Theories of Risk and Uncertainty: An Introduction, Malden 2008

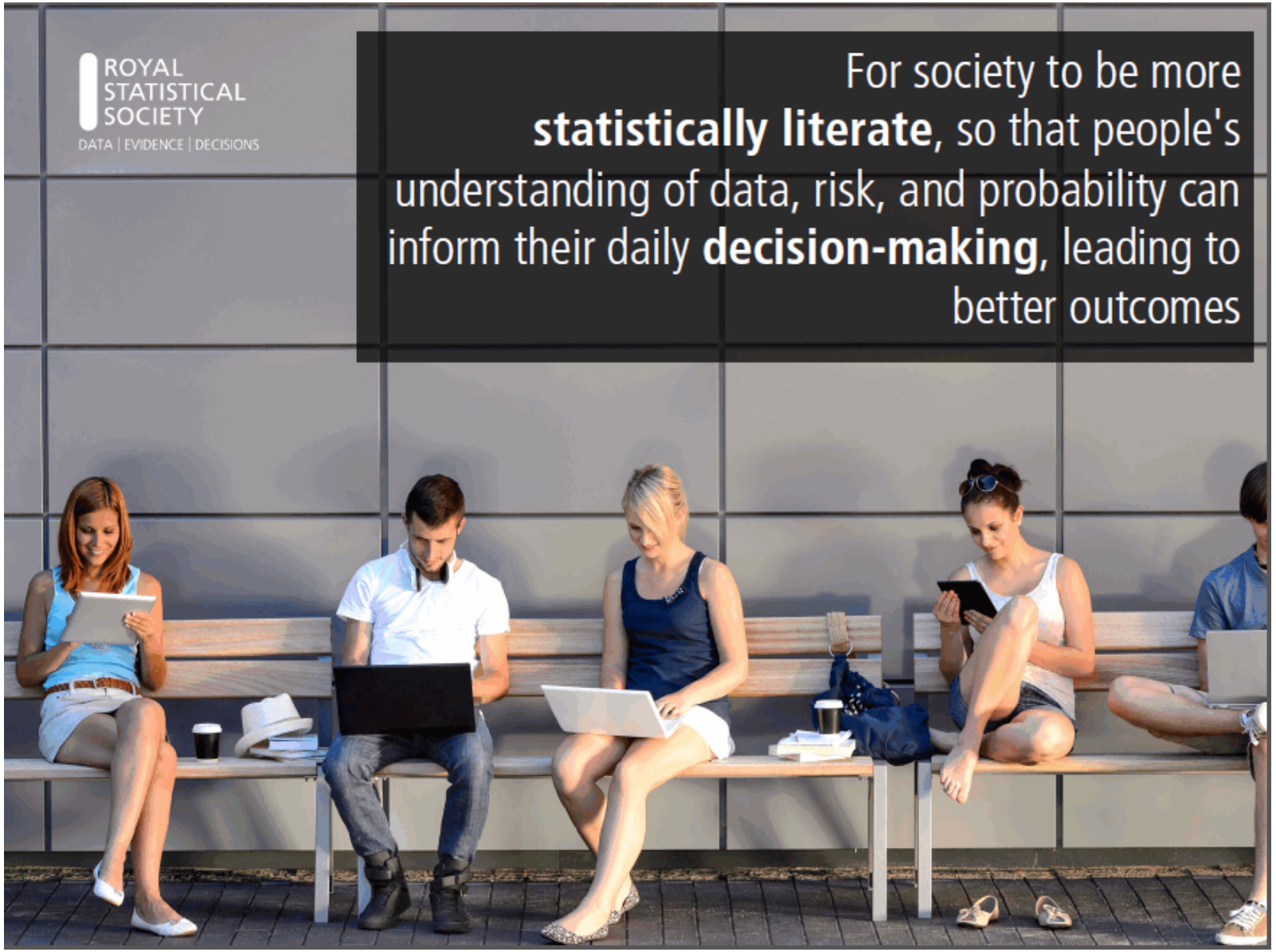
appreciated?

QUALITY

Quality of information

Data4Policy



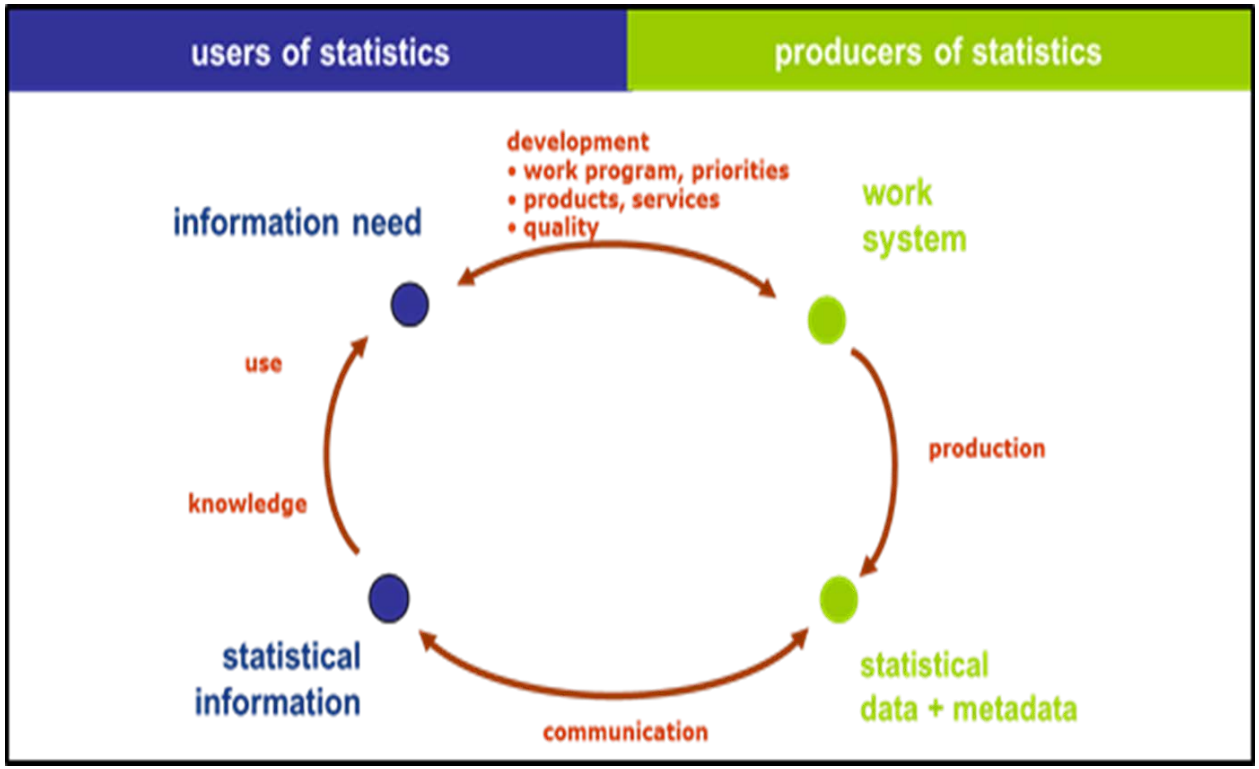


http://www.ksh.hu/cess2016/pdf/cess2016_a12_1703.pdf

Indicators: from evidence to decision

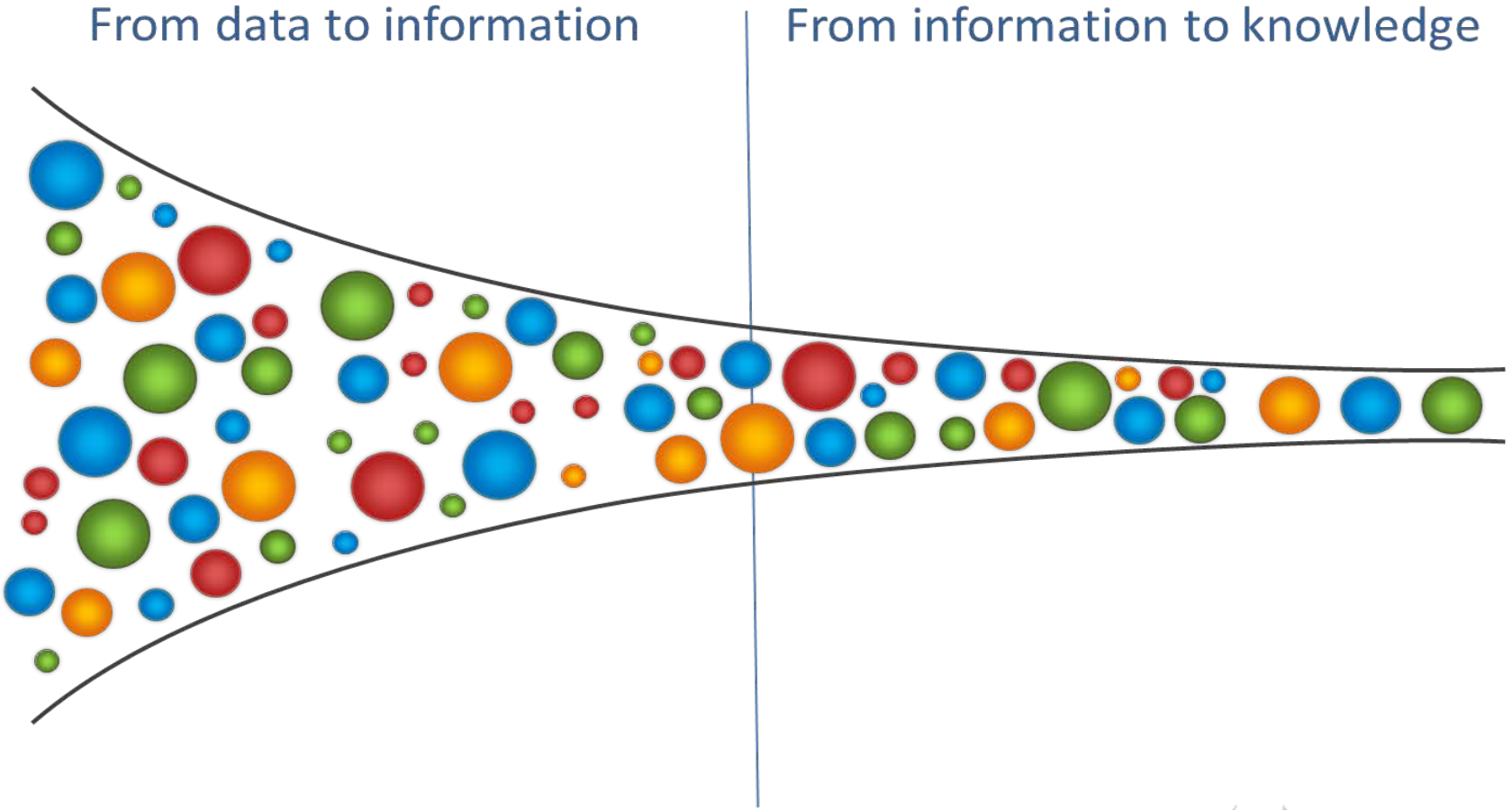
ACTORS: SCIENCE, POLICY, STATISTICS

User-producer-interaction

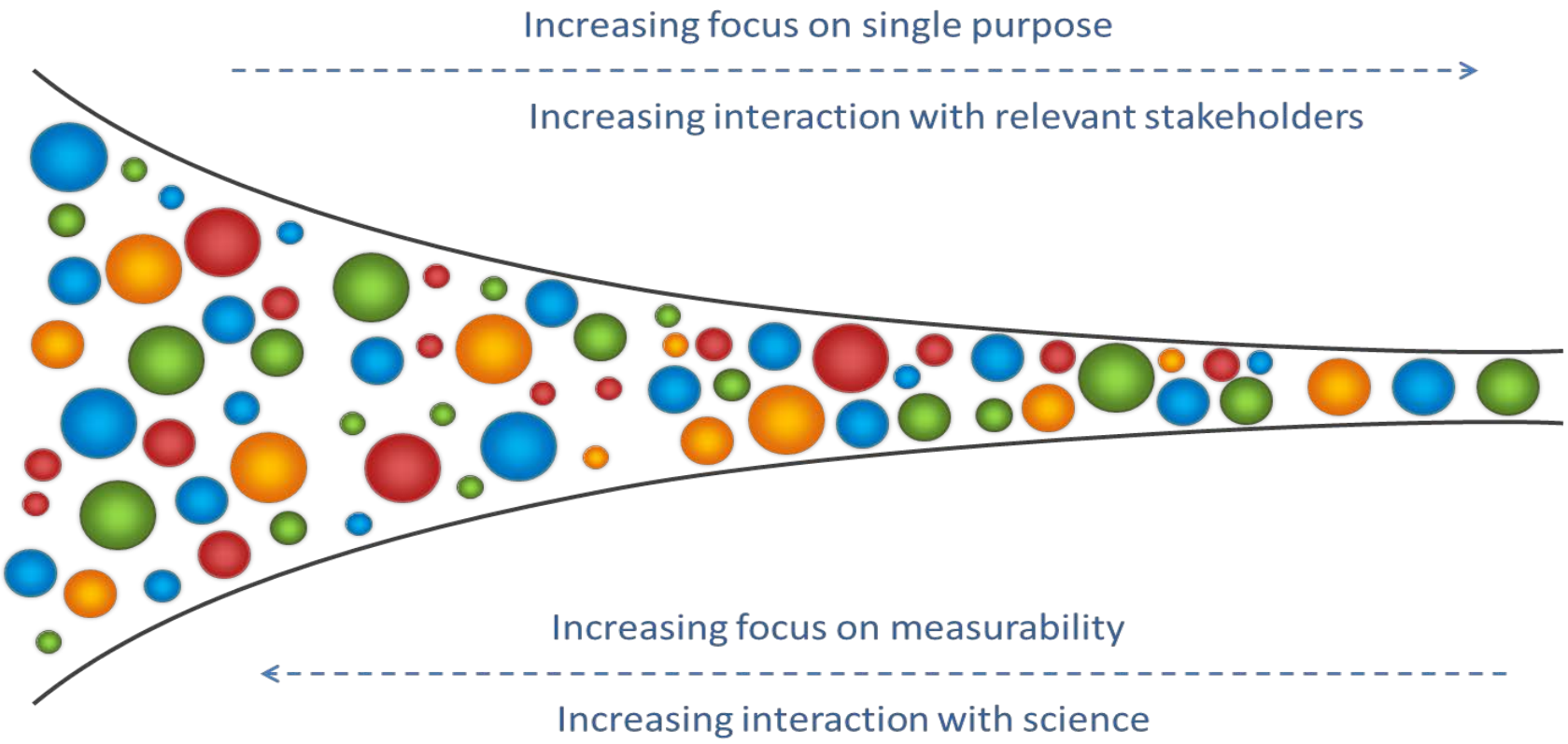


Quality = multidimensional

Reduction of complexity



Reduction of complexity



Indicators: from evidence to decision

RISKS

Interaction between statistical indicators and public policies: possible stress!

Goodhart's Law

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

Evidence based decision-making what can go wrong?

- *Consequences on evidence gathering*
  - Searching under the lamp post
  - Measurement of success and failure = definition of strong incentives – who sets the norms?
  - Measurement bureaucracy (administrative activism)
  - Myopic orientation / system design

Evidence based decision-making what can go wrong?

- *Consequences for decision-making*
  - Adaptations - behavioural consequences of a measurement culture
  - Filter in public perception and political debate (e.g. GDP)
  - 'Beyond GDP': Measure the non-measured! Simulate markets (if they don’t exist)!
  - Misuse (financial crisis, rating, bubbles)

Evidence based decision-making what can go wrong?

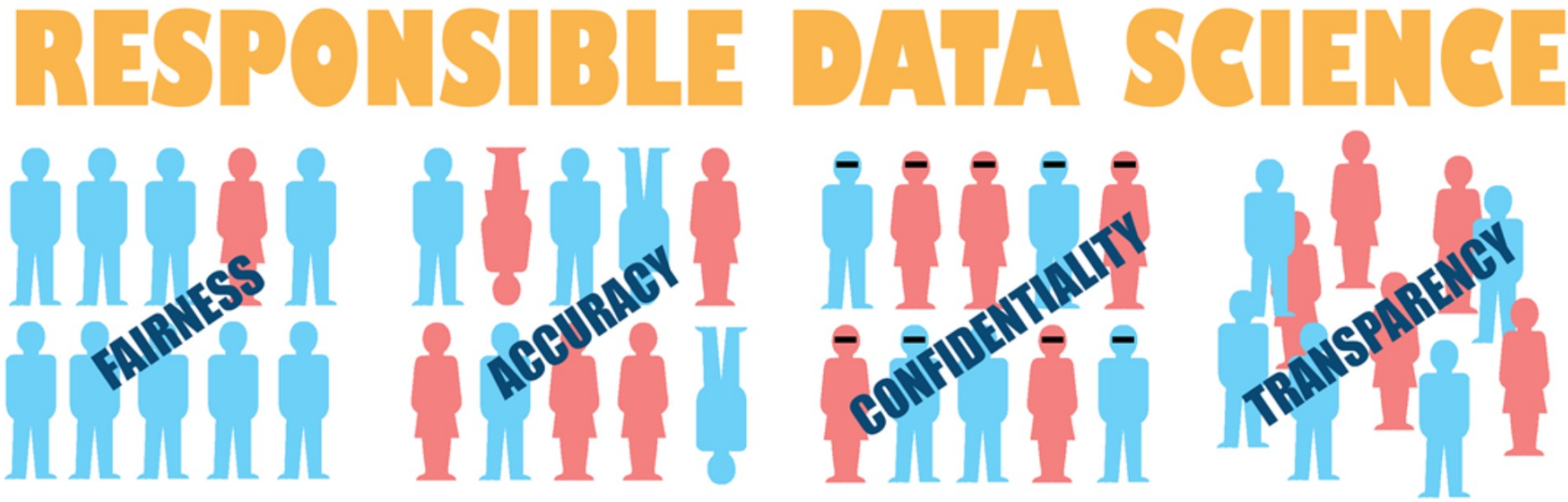
- *Long-term consequences*
  - Cultural impacts (e.g. Bologna reform)
  - Democratic impacts, dominance of technocrats (measurement mandarins), in-transparency, loss of participation
- *Feed-back loops*
  - Measuring the unmeasured (and unmeasurable)
  - Decision based evidence making
  - Evidence instead of decision making

Knowing the limits, stamping the quality

- *Understand better the 'mutual construction of statistics and society' (see https://www.routledge.com/products/9780415873703)*
- *Codify the evidence based decision making process*
- *Expand research and standard-setting for indicator methodology, both from the statistical and the political science side*
- *Principles for an undisturbed interaction between producers and users of evidence*
- *Engage stakeholders in the entire construction process*
- *Learn from language theories*
- *Learn from other disciplines (e.g. engineering)*

review and modernisation

ETHICS / GOOD ADMINISTRATION

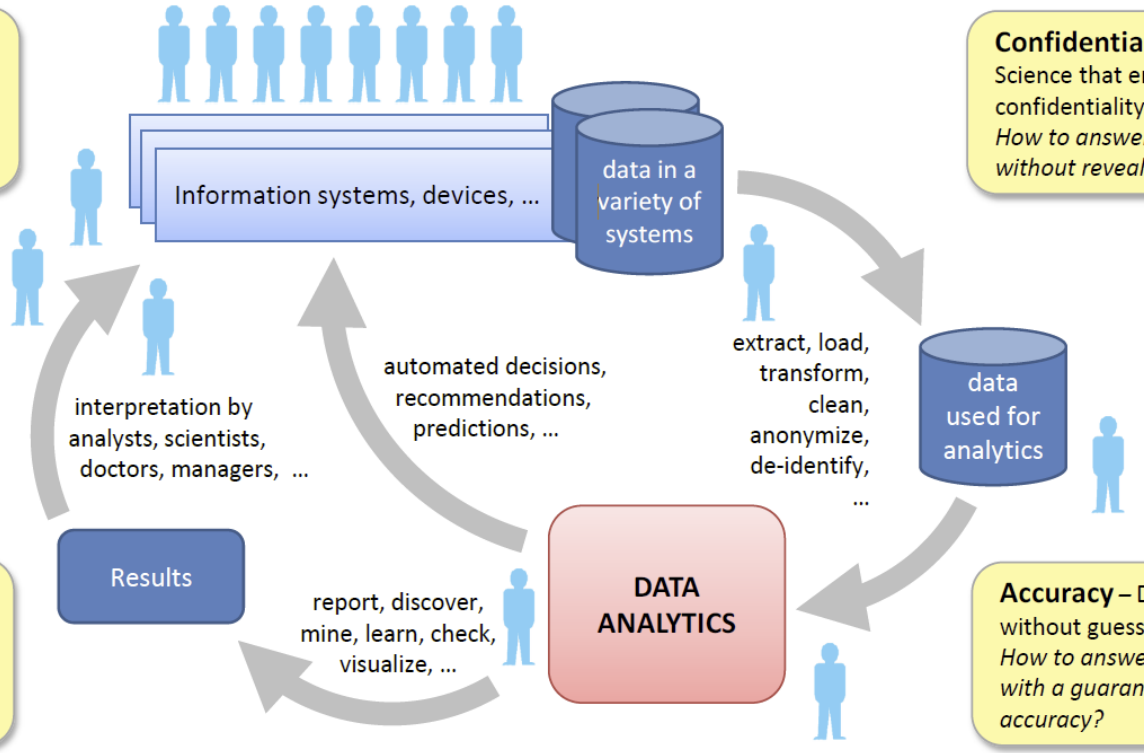


http://www.responsibledatascience.org

Responsible data science

Transparency – Data Science that provides transparency: *How to clarify answers such that they become indisputable?*

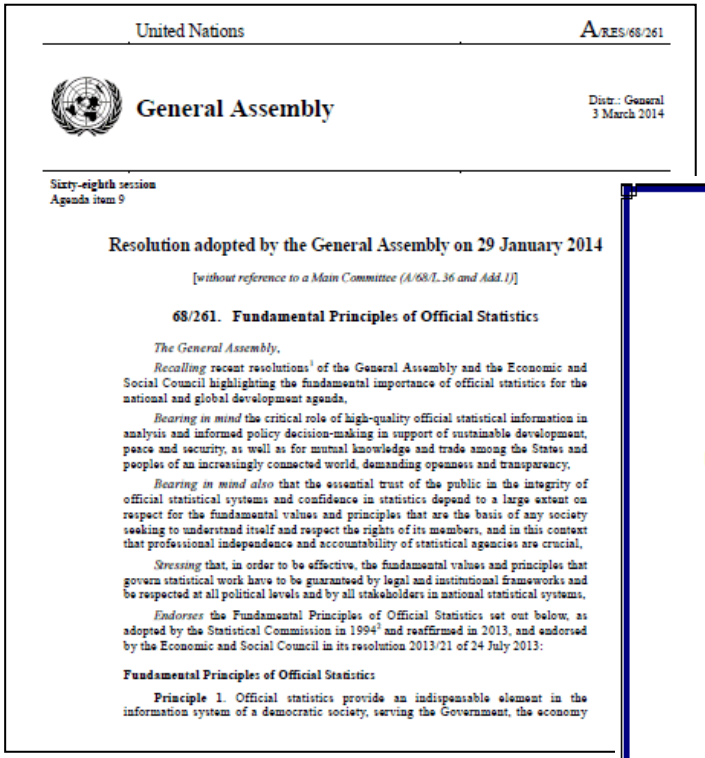
Confidentiality – Data Science that ensures confidentiality: *How to answer questions without revealing secrets?*



Fairness – Data Science without prejudice: *How to avoid unfair conclusions even if they are true?*

Accuracy – Data Science without guesswork: *How to answer questions with a guaranteed level of accuracy?*

Ethical standards in Official Statistics



United Nations A/RES/68/261

General Assembly

Distr.: General
3 March 2014

Sixty-eighth session
Agenda item 9

Resolution adopted by the General Assembly on 29 January 2014

[*without reference to a Main Committee (A/68/L.36 and Add.1)*]

68/261. Fundamental Principles of Official Statistics

The General Assembly,

Recalling recent resolutions[1] of the General Assembly and the Economic and Social Council highlighting the fundamental importance of official statistics for the national and global development agenda,

Bearing in mind the critical role of high-quality official statistical information in analysis and informed policy decision-making in support of sustainable development, peace and security, as well as for mutual knowledge and trade among the States and peoples of an increasingly connected world, demanding openness and transparency,

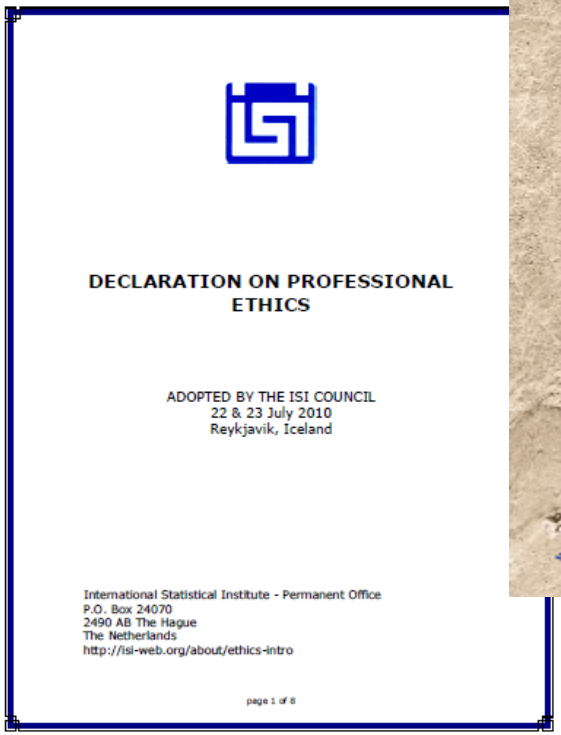
Bearing in mind also that the essential trust of the public in the integrity of official statistical systems and confidence in statistics depend to a large extent on respect for the fundamental values and principles that are the basis of any society seeking to understand itself and respect the rights of its members, and in this context that professional independence and accountability of statistical agencies are crucial,

Stressing that, in order to be effective, the fundamental values and principles that govern statistical work have to be guaranteed by legal and institutional frameworks and be respected at all political levels and by all stakeholders in national statistical systems,

Endorses the Fundamental Principles of Official Statistics set out below, as adopted by the Statistical Commission in 1994[2] and reaffirmed in 2013, and endorsed by the Economic and Social Council in its resolution 2013/21 of 24 July 2013:

Fundamental Principles of Official Statistics

Principle 1. Official statistics provide an indispensable element in the information system of a democratic society, serving the Government, the economy



DECLARATION ON PROFESSIONAL ETHICS

ADOPTED BY THE ISI COUNCIL
22 & 23 July 2010
Reykjavik, Iceland

International Statistical Institute - Permanent Office
P.O. Box 24070
2490 AB The Hague
The Netherlands
http://isi-web.org/about/ethics-intro

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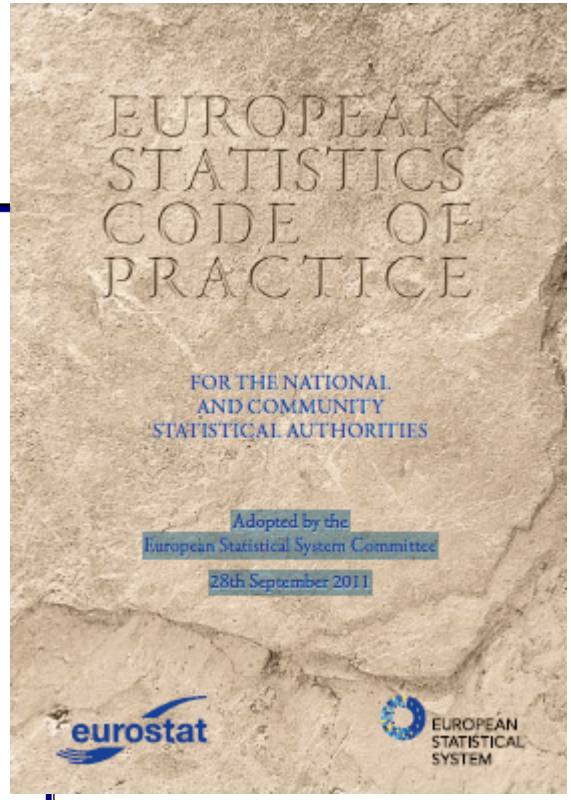

throughout the entire value chain

COMMUNICATION

Promoting statistical literacy

http://memespp.com/homer-gdp-meme-generator-gdp-what-is-gdp-ea675c-jpg-1327467092-jpg/assets.diylol.com*hfs*d39*9e2*f7e*resized*homer-gdp-meme-generator-gdp-what-is-gdp-ea675c.jpg1327467092.jpg/diylol.com*memegenerator*homergdp2*memes*gdpwhatisgdp3/

Interaction, consultation, participation

- *In the development and design: take civil society on board as early as possible*
  - Case: SDIs
- *In production: Is shared production possible?*
  - Case: Eye on earth http://www.eoesummit.org/about-eye-on-earth/declaration-of-principles/)
- *In dissemination: segmentation of user groups, new tools, quality labelling*
- *Close the feedback loop and improve continuously*
- *Invest in literacy and learning*

Official Statistics for Democratic Societies

- Statistics is a key for people empowerment
- Open data are fundamental for open societies
- Datacy is a key enabler for citizens
- The future is smart statistics
- More influence means more responsibilities

http://www.ksh.hu/cess2016/cess6016_dinner_speech.pdf

http://ec.europa.eu/eurostat

https://www.researchgate.net/project/3-Science-Statistics-Society

THANKS FOR YOUR ATTENTION