



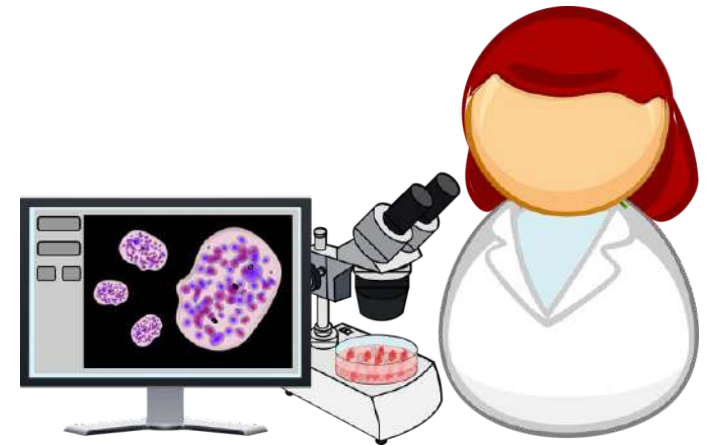
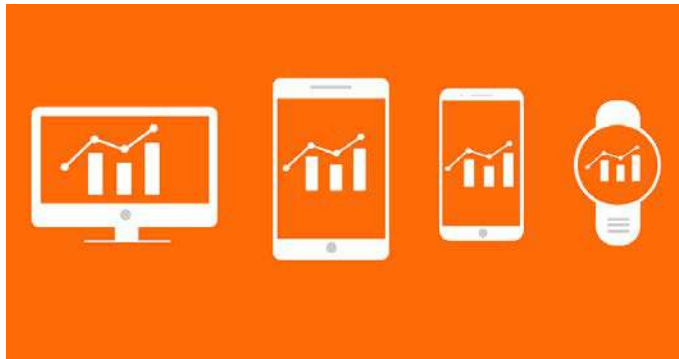
**Higher Education Institutions
& Responsible Research and Innovation**



Higher Education Institutions and Responsible Research and Innovation

Prof. Ana Marušić, MD PhD



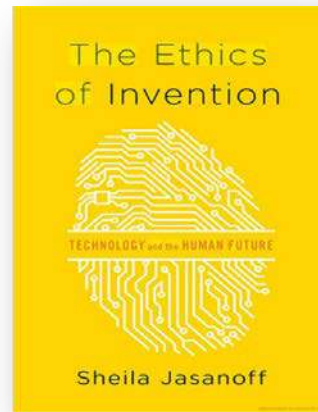


Science and technology bring knowledge, generate well-being and contribute to development...

... but they also pose ethical dilemmas, they lead to undesirable effects and they generate new challenges



Sheila Jasanoff (2016).
The Ethics of Invention:
Technology and the
Human Future. *Norton &
Company Inc. New York*



<https://www.youtube.com/watch?v=aT1djsHSxMY>

Some Fallacies and Myths:

- **The Determinism Fallacy:** Technology possesses an unstoppable momentum, reshaping society to fit its insatiable demands.
- **The Myth of Technocracy.** “Technocracy” recognizes that technological inventions are controlled by human actors, but only those with specialist knowledge and skills can rise to the task.
- **Unintended Consequences.** Technologies fail, but it is who should be blamed for failures and under what circumstances?

SHARE



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Italian researcher Rodolfo Soncini-Sessa has worked with stakeholders to develop a water management strategy for the Red River delta in Vietnam, shown here after a 1996 flood. His work is part of the emerging Responsible Research and Innovation movement, which emphasizes breaking down the walls between scientists and society.

LOIS RAIMONDO/ASSOCIATED PRESS

To be a responsible researcher, reach out and listen

By Elisabeth Pain | Jan. 17, 2017, 2:45 PM

nature

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NATURE | EDITORIAL

Why researchers should resolve to engage in 2017

Debates over climate change and genome editing present the need for researchers to venture beyond their comfort zones to engage with citizens — and they should receive credit for doing so.

04 January 2017

During the whole process of R&D&I,
multiple decisions must be made:

Some questions affect
the WHAT and WHEN
→ Scientific AGENDA.

Which questions should
be solved first?

What to research?

What innovations
should be promoted?

What is more
urgent? What
can wait?

What are the
priorities?

How do we decide on the
distribution of resources
for R&D&I?



Other questions have to do with the HOW:

Apart from respecting legal and ethical principles, **do I consider other shared social values**, such as inclusiveness and sustainability?

Do I reflect upon the **long term impact** of my research? And upon the impact of my field? Can I **anticipate and improve** said impact?

Does my organisation or the S&T system have them in mind?

Do I share my research with experts from **other fields**? And with **end users** or different **stakeholders**? Do I consider other opinions?



WHO MAKES THE DECISIONS

Nowadays, the main decisions on **SCIENTIFIC AGENDA** (research priorities) follow different patterns. These are the main three:

- A. Someone with funding capacity (**governments, financing agencies, some charities**) determines the priority areas, and researchers make specific proposals to obtain resources.
- B. **Researchers** receive financing without fixed objectives and they decide on what to use it.
- C. Someone with business or commercial interest (**companies, businesses, investors**) establishes their priorities and directly finances specific R&I activities

DIFFERENT CRITERIA ARE CONSIDERED

- Contribution to knowledge
- Need to solve big challenges
- Possibilities of individual/business economic benefit
- Contribution to economic development
- “Scientific excellence”
- Strategic criteria

The measure in which **some criteria weigh more or less** in the decisions on R&D&I generally depends on **who** makes the decision (researchers, governments, financing agencies, charities, businesses, etc.)

Decisions solely based on **market response** or economic development

- **Ethical dilemmas.** Some decisions pose ethical dilemmas, such as the increase of inequality in access to knowledge.
- **Waste of opportunities.** If potential users are not consulted, it is difficult to know what they want, need or expect. Some opportunities can be missed.
- **Unwanted effects.** If stakeholders are not consulted, unexpected situations may arise: rejection once the technology reaches the market, unexpected success with displacement of other technologies, unexpected uses, etc.

Decisions solely based on “Scientific excellence”

- “Scientific excellence” is insufficient as the sole criteria for scientific agenda decisions or in evaluating individual or group careers
- It tends to be based on **bibliometric criteria**:
 - These criteria don’t measure societal impact of research
 - It cannot be stated that the most referenced articles are those that have contributed the most to knowledge, advancement of science or solving big humanity problems
 - Publishing cannot become a goal *per se*
 - Bibliometric indicators affect scientific decisions, but their misuse is also high.

Some examples:

1. Rejection of a technology once it has reached the market

- In Europe, **GMFood's opponents** outnumber supporters 3 to 1

The 2010 Eurobarometer on the life sciences

George Gaskell, Agnes Allansdottir, Nick Allum, Paula Castro, Yilmaz Esmer, Claude Fischler, Jonathan Jackson, Nicole Kronberger, Jurgen Hampel, Niels Mejlgaard, Alex Quintanilha, Andu Rammer, Gemma Revuelta, Sally Stares, Helge Torgersen & Wolfgang Wager

Affiliations | Corresponding author

Nature Biotechnology **29**, 113–114 (2011) | doi:10.1038/nbt.1771

Published online 07 February 2011

www.nature.com/nbt/journal/v29/n2/full/nbt.1771.html

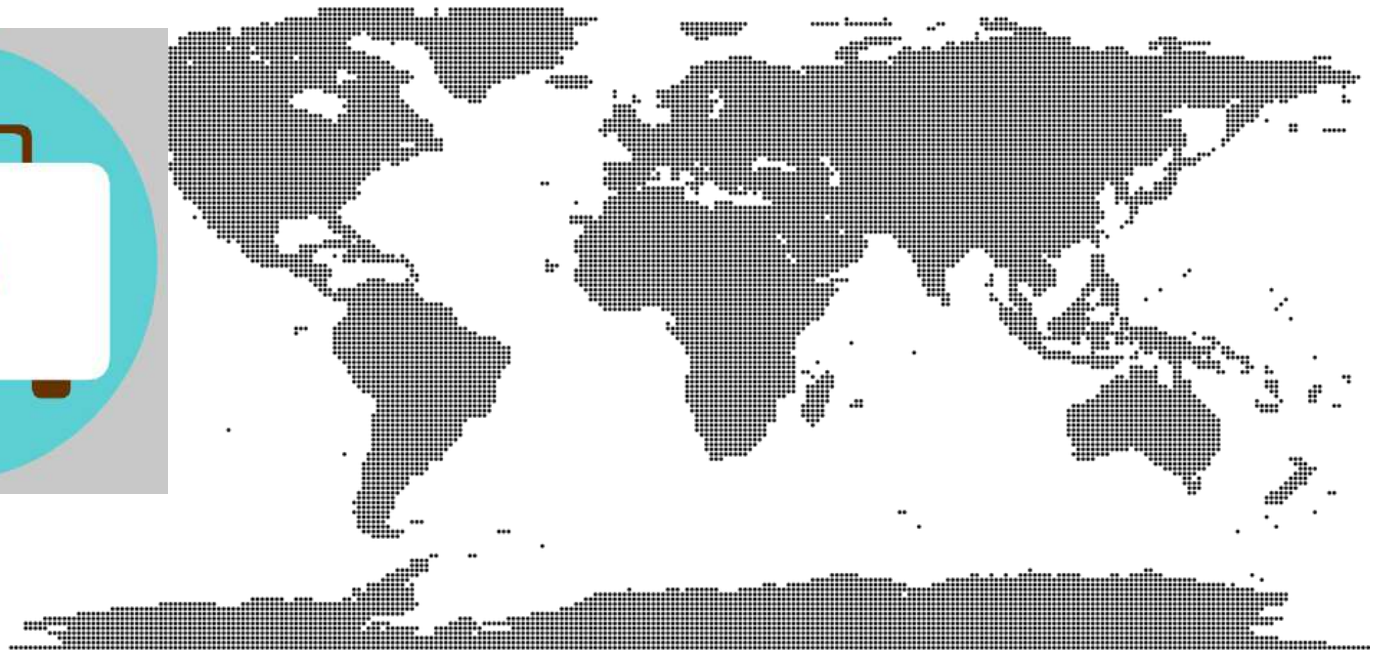


<http://maxpixel.freegreatpicture.com/Stop-Health-Gmo-Sign-Well-Food-Science-Wellness-254539>

Some examples:

2. R&D&I decisions that increase inequality

- **10/90 Health Gap.** Less than 10% of worldwide resources devoted to health research are put towards health in developing countries, where over 90% of all preventable deaths worldwide occur (Global Forum for Health Research).



Some examples:

3. Journal Impact Factor (JIF) as “excellent science”

- Editorial (2005). Not so deep impact. *Nature* 435, 1003–1004.
- Vanclay, J.K. (2012) Impact Factor: Outdated artefact or stepping-stone to journal certification. *Scientometric* 92, 211–238.
- The PLoS Medicine Editors (2006). The impact factor game. *PLoS Med* 3(6): e291
doi:10.1371/journal.pmed.0030291.



- A group of editors of highly regarded journals that publish in the biomedical sciences met recently to discuss limitations of the two-year JIF and how the JIF and other metrics might be better used by the scientific community. **We hope to educate the scientific community regarding the misuse of journal-specific metrics in evaluating science and scientists**
(www.ascb.org/dora/a-letter-to-thompson-reuters/)

*Because the community is led (as it should be) by individuals who have succeeded in the status quo ante, **investigators at early stages of their careers might judge** (perhaps wrongly) that the best chances of success (as defined by their peers) will come from working within and for the system, not by **challenging it**.*

Biomedical research: increasing value, reducing waste

[http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(13\)62329-6.pdf](http://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(13)62329-6.pdf)

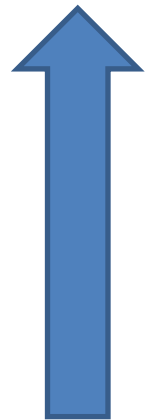
Can we do it better?

Good Science is a Matter

The road to RRI
**“Responsible Research
and Innovation”**

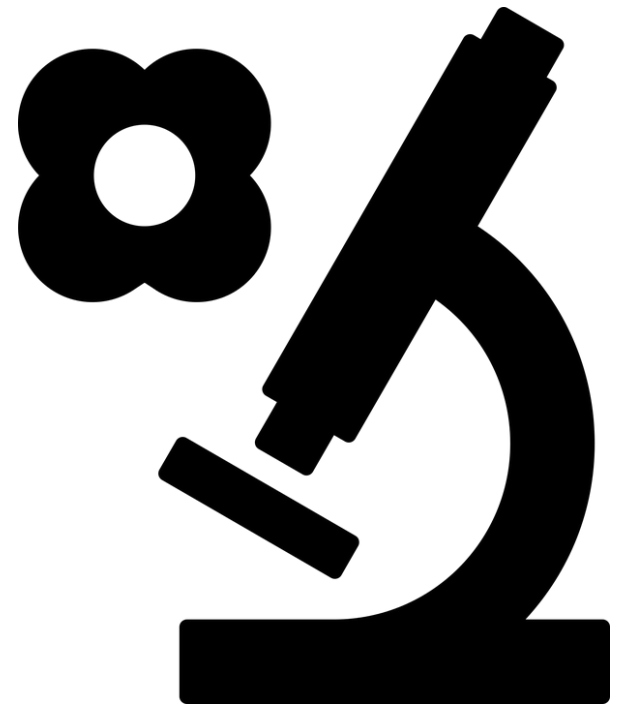
On one hand,
RRI arises from a Bottom-Up process

- RRI arose from the confluence of various academic disciplines and from initiatives led by academics, representatives of civil society and the industrial sector, science communicators, etc.
- So RRI parts from a **Bottom-Up** force.



Reflection on R&D&I is not new

- Various disciplines, initiatives and movements address it:
 - ✓ Some are decades or centuries old (like ethics), and some are more recent
 - ✓ Disciplines easily overlap and intersect, even if they have their own theoretical base, methodologies and tools.



Main **disciplines, initiatives and movement** that address (completely or partially) the processes, results and impacts of R&D&I, with the aim to **improve them**, are:

Science Ethics & Bioethics

Research Integrity

Public Engagement

Sustainable Development

Open Innovation

Public Participation

Technology Assessment

Gender Equality

Corporate Social Responsibility

Participatory Research

Ethical, Legal, and Social Assessment (ELSA)

Participatory Assessment

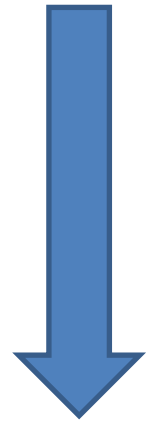


Some focus on:

- stakeholder inclusion
- science's social compromise
- society's principles and values
- responsiveness
- specific aspects: gender, open access, sustainability, etc.

On the other hand,
RRI is determined by a Top-Down process

- Some large organizations and governments are playing a crucial role in the definition of RRI and its dissemination and integration.
- So there is also a **Top-Down** force that promotes RRI.



RRI (Responsible Research and Innovation) is an emerging principle of research and innovation policy.

RRI is a “philosophical” concept, but also an EU/EC concept

Towards a definition

What is RRI?

Von Schomberg (2011). Definition of RRI

The most referenced definition of RRI, both in literature and in EU/EC speech, is probably that of René Von Schomberg:

Responsible Research and Innovation is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society).

Von Schomberg (2011) ' Prospects for Technology Assessment in a framework of responsible research and innovation ' in: M. Dusseldorp and R. Beecroft (eds). Technikfolgen abschätzen lehren: Bildungspotenziale transdisziplinärer Methoden, Wiesbaden: Vs Verlag, in print.

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But really...What is RRI?

- transparent and interactive process: Research process is open to lay public to see and influence the aims, according to their opinions and current needs.
- mutual responsibility: In this way, both scientists and lay public are responsible for research results and new innovations
- ethical acceptability, sustainability and societal desirability of research: Besides current needs, it is important to see the consequences of innovations in a long run

Stilgoe et al. (2013) Four dimensions of RI

The four dimensions of responsible innovation we propose provide a framework for raising, discussing and responding to such questions:

- Anticipation
- Reflexivity
- Inclusion
- Responsiveness

GREAT project:

Five common ingredients of RRI

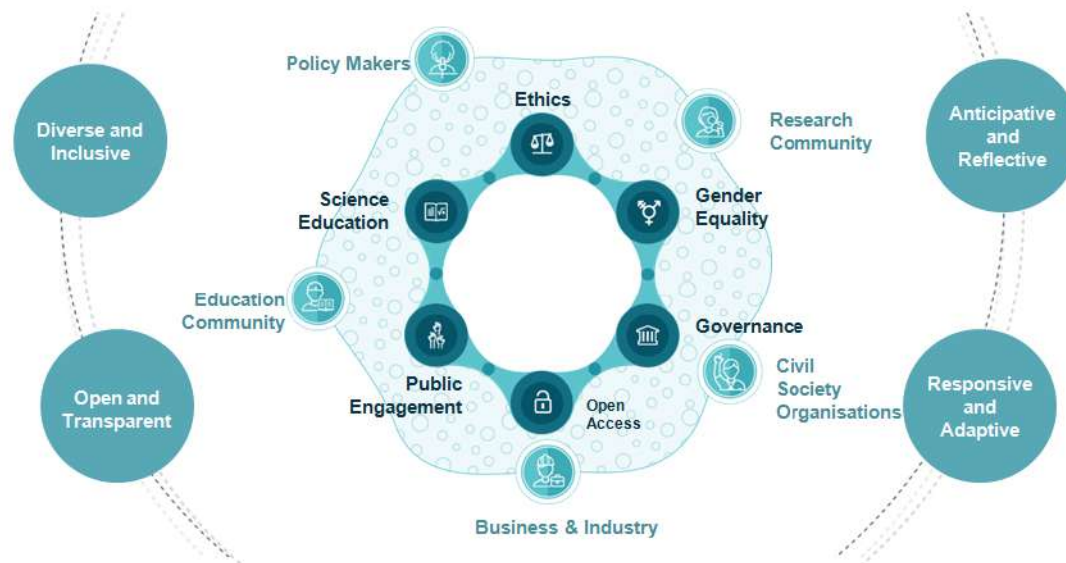
Recent perspectives on RRI agree on **its five common ingredients** (similar to the 4 dimensions by Stilgoe et al. 2013).

- 1. Anticipation**
- 2. Transparency**
- 3. Responsiveness**
- 4. Reflexive stance** (a system's capacity to adapt and change)
- 5. Inclusion of stakeholders**, which should help:
 - a) defining actors' values, ends and purposes they assign to S&T,
 - b) co-establishing norms from these values,
 - c) shaping the design of innovation and research processes and outputs

Source: GREAT project. Theoretical Landscape. http://www.great-project.eu/deliverables_files/deliverables03

RRI Tools project: Integrating the 6 key issues (EC) and the 4 dimensions (Stilgoe et al.) into the same framework

RRI is about including all actors,
considering specific key issues and integrating some
process dimensions in the R&I practice



Working together towards ethically acceptable, socially desirable
and environmentally sustainable products and services

Source: <https://www.rri-tools.eu/>

RRI in everyday research practice

Examples of RRI perspectives in everyday research practices involve:

- Securing the anonymity of interviewees
- Storing and treating personal survey data responsibly
- Avoiding plagiarism
- Promoting a dialogue among involved stakeholders
- ...