RESPONSIBLE INNOVATION IN NEUROTECHNOLOGY
Recommendation of the OECD council
adopted on 11 December 2019

About the Recommendation

The first international standard on Responsible Innovation in Neurotechnology sets out to guide governments and innovators to anticipate and address the ethical, legal and social challenges raised by novel neurotechnologies while promoting innovation in the field.

On the proposal of the Committee for Scientific and Technological Policy (CSTP), the Recommendation was adopted by the OECD Council in December 2019. It resulted from a five-year project of the Working Party on Biotechnology, Nanotechnology and Converging Technologies (BNCT).

Aim

The Recommendation seeks to provide guidance at each step of the innovation process – e.g. research, technology transfer, investment, commercialisation, regulation - so that benefits are maximised and risks minimised. It articulates the importance of (1) high-level values such as stewardship, trust, safety, and privacy in this technological context, (2) building the capacity of key institutions like foresight, oversight and advice bodies, and (3) processes of societal deliberation, inclusive innovation, and collaboration.

Governance and stakeholders

Governance in neurotechnology has implications across the entire innovation pipeline, from fundamental brain research and cognitive neuroscience to questions of commercialisation and marketing. To that end, the Recommendation is aimed not only at governments, but also universities, companies and investors – all of whom play a key role in ensuring the responsible development and governance of neurotechnologies.

The principles

The Recommendation embodies nine principles:

1. Promote responsible innovation in neurotechnology to address health challenges.

2. Prioritise assessing safety in the development and use of neurotechnology.

3. Promote the inclusivity of neurotechnology for health.

4. Foster scientific collaboration in neurotechnology innovation across countries, sectors, and disciplines.

5. Enable societal deliberation on neurotechnology.

6. Enable the capacity of oversight and advisory bodies to address novel issues in neurotechnology.

7. Safeguard personal brain data and other information gained through neurotechnology.

8. Promote cultures of stewardship and trust in neurotechnology across the public and private sector.

9. Anticipate and monitor the potential unintended use and/or misuse of neurotechnology.

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Technological innovation is a major engine of productivity, economic growth, and well-being. In many parts of the world, people live longer, healthier, and more comfortable lives because of the fruits of innovation. While essential for addressing some of society’s most pressing challenges, innovation can also have negative consequences for individuals and societies, as witnessed in previous waves of the industrial revolution or in current debates around digitization, data privacy, and artificial intelligence. There are also problems of public acceptance of technology and technology divides which threaten to exacerbate inequalities.

Good governance can help manage the downsides of technology while enhancing benefits. But at the heart of technology governance lies a dilemma: governing too early can stifle innovation but governing further downstream may be too late to influence how technology operates in society.

The Recommendation embodies a “Responsible Innovation” approach that could address this dilemma and serve as a normative framework for technology governance moving forward. These elements can enhance societal capacities to shape technology through its course of development so that it might advance under conditions of trust. Design principles include:

**Anticipation:** experiment with anticipatory forms of governance – e.g. test-beds, regulatory sandboxes, new technology assessment methods and foresight strategies – in order to make governance more agile and responsive to stakeholders

**Inclusivity:** address technological divides and inequality of access. Encourage the inclusion of stakeholders, citizens, and diverse publics within the innovation process to drive innovation.

**Goal orientation:** seek to better align research, commercialisation and societal needs through goal-oriented policies, agency co-ordination and public engagement.


The OECD is a unique forum where governments work together to address the economic, social and environmental challenges of globalisation. The Organisation compares policy experiences, seeks answers to common problems, identifies good practice and works to co-ordinate domestic and international policies.

The Working Party on Biotechnology, Nanotechnology and Converging Technologies (BNCT) is leading the work on the development and implementation of this Recommendation. The BNCT is part of the Directorate for Science, Technology and Innovation (STI) at the OECD. The work of the BNCT focuses on policy issues in emerging technology fields related to Bio, Nano and Converging Technologies. Particular themes include: the bioeconomy and sustainability solutions, health innovation, and good governance of technology.