

EDITORIAL

The UNESCO draft Recommendations on ethics of Neurotechnology — A commentary

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The United Nations Educational, Scientific and Cultural Organization (UNESCO) released a draft of the Recommendations on Ethics of Neurotechnology (henceforth, 'the Recommendations') in October 2024 [1]. It was accompanied by a preliminary report on the process leading to the draft Recommendations. The Recommendations define neurotechnology as "devices, systems and procedures — encompassing both hardware and software — that directly access, monitor, analyse, predict or modulate the nervous system to understand, influence, restore, or anticipate its structure, activity, function, or intentions (speech, motor)" [1: p 4].

The UNESCO set up an Ad Hoc Expert Group (AHEG) to prepare a first draft of the Recommendations. The AHEG consisted of 24 independent experts from all of UNESCO's regions, aiming for geographical and gender balance and including complementary disciplines. The revised draft, after a multi-stakeholder consultation and after integrating inputs from the Member States, will be placed before the 43rd session of the UNESCO General Conference in November 2025.

The preliminary report situates the Recommendations in the current technological context where the implications of neurotechnology could go beyond the clinical or research arenas. It recognises neurotechnology's potential to pose threats to human dignity and integrity and fundamental freedoms such as freedom of thought. This risk emerges from the convergence of neurotechnology with Artificial Intelligence (AI), where data about the nervous system of an individual are processed with other data concerning the individual.

The Recommendations are comprehensive in their coverage of the intersections of ethical principles and human rights. They propose, in addition to addressing the aforesaid issues, to address the challenges posed by the integration of AI with neurotechnology because it can magnify ethical threats like breaches of cybersecurity, lack of transparency, the potential for algorithmic bias, risk to autonomy and mental privacy, and manipulation, even while it has potential for immense benefits for human health.

Technological innovations do not await the development of ethical frameworks for their use. It is usually societies that gradually begin to recognise the need for ethical analysis after a specific technology has been put to use in specific contexts, and the challenges it poses for communities become explicit. Against this backdrop, the draft Recommendations are a welcome step towards offering an initial ethics framework to deal with issues arising out of the fast-paced advances in neurotechnology and its increasing integration with AI.

What do the Recommendations not cover?

Regardless of the efforts made to cover a wide range of ethical challenges, the Recommendations do have some gaps. I highlight three of these as examples.

The Recommendations carefully eschew the use of the word "equity", more particularly "global inequities", merely alluding to them in the context of the special attention needed for low- and middle-income countries (LMICs), least developed countries (LDCs), and land-locked developing countries (LLDCs). They call for cooperation and solidarity to mitigate the power imbalances that shape such global inequities. Neurotechnology has the potential to exacerbate global inequities because the required technical skills are concentrated in a few countries. About 87% of the IP5* patents in this field during the period 2000-2020 were from six countries — the United States, South Korea, China, Japan, Germany and France [2: p 11]. But the need for the use of neurotechnology will be universal. The Covid-19 pandemic and the inequities in access to vaccines across LMICs — in spite of the efforts of the World Health Organization (WHO) and global health NGOs — should be an eye opener as to how existing structural inequalities perpetuate them further [3, 4].

The Recommendations mention the ethical principles and human rights that need to be balanced in the promotion of neurotechnology. However, they do not mention the precautionary principle to be considered while listing proportionality, balance and legitimacy. This should be included because neurotechnology use for well-being and human health promotion may have unforeseen consequences. Therefore, interventions in these areas, even after licensing, should require ongoing or frequent (as appropriate) monitoring in order to detect and correct the unforeseen (undesirable or otherwise) consequences of

these interventions. The application of this precautionary principle also addresses the principle of justice (or fairness). This is because the initial individual users of the technology are, in a sense, pioneers, whose corporeal bodies will provide the information for further development of the technology through corrections or improvements. Given this potential, regulations can offer them the necessary protection. This is mentioned in Section IV.11. Health and Health Research, sections 124 and 127, but only within a research frame of reference. This protection also needs to be extended to initial users, like a form of neuro-vigilance, along the lines of pharmacovigilance of drugs.

With respect to intellectual property (IP), the Recommendations highlight what member states should do, such as prevent human activity derivatives of neuro and cognitive biometric data from being brought under proprietary rights. They require member states to adopt IP management rights that foster an open innovation ecosystem [1: p.14]. However, the document is silent on enforcing a ban on unethical actions by member states such as using exploitative or predatory processes that foster new forms of colonisation. Such actions can be carried out by those with the capability to develop neurotechnological innovations. By its silence, the document sidesteps the recognition of power inequalities across member states, even while advocating for recognising them within states.

Neurorights under Indian law

Neurorights are defined “as the ethical, legal, social, or natural principles of freedom or entitlement related to a person’s cerebral and mental domain; that is, the fundamental normative rules for the protection and preservation of the human brain and mind.”[5] Neurotechnology can be used to link the anonymous neural data of individuals with their biometric data (which is personal and therefore protected), violating their right to privacy. A legal framework that recognises neurorights can offer protection against such violations.

Under Indian law, the Digital Personal Data Protection Act (DPDP Act), 2023, recognises personal data in digital form as requiring protection. However, it allows the use of anonymised data for research purposes under Chapter IV, section 17-2-(b) of the Act [6]:

The provisions of this Act shall not apply in respect of the processing of personal data— (b) necessary for research, archiving or statistical purposes if the personal data is not to be used to take any decision specific to a Data Principal and such processing is carried on in accordance with such standards as may be prescribed.

Once archived, in an anonymised form, the data may be available for alternative use or re-interpretation.

Existing regulations and the DPDP Act do not cover neural rights and there is a need for comprehensive legislation in this context [7]. There have been suggestions regarding possible amendments to the Act to accommodate neurorights within the context of Indian law [7: pp 40-41].

Need for guidance in the Indian context

In terms of publications in neuroscience, India ranks 18th when considering all publications (regardless of their impact factor) and ranks 20th when the high-impact sub-sample is considered. While this may seem commendable, we need to keep in mind the fact that the top 10 countries in the list account for more than 80 percent of high impact publications [2]. Therefore, even as the country builds mechanisms to strengthen science, technology, engineering and mathematics (STEM) through multiple initiatives [8], it also needs to gear itself up for governance of the emerging neuro technologies.

While envisaging regulations on neuro technologies in the Indian context, there is a need to recognise that technological developments can overtake both the regulations in development, and the nascent understanding of these technologies’ moral implications. The UNESCO draft Recommendations on Ethics of Neurotechnology provide a basis for developing regulations that take into account both Indian law and international guidance.

In the Indian situation, we need to recognise that market forces using legal loopholes can be used to create technologies that exploit existing inequities across the population.

Existing global inequities will shape access to and use of neurotechnologies across the world and thus, within India. We have the example of the Chilean constitutional amendment which sought to protect the right to life and physical and psychic health. The amendment specified that “Scientific and technological development shall be at the service of the people and conducted with respect for life and physical and psychic health.” It also added, “... the law shall regulate the requirements, conditions and restrictions for its use on persons and with special safeguards for cerebral activity as well as information derived from it.” [9] As in the case of climate change and genetic therapies, using a precautionary approach may be the way to go. India has the capabilities to develop and revise ethics guidelines in keeping with emerging needs in biomedical research. In addition to these skills, we need critical scholarship across all disciplines which is crucial to the development and use of neurotechnologies. Developing ethical guidelines for neurotechnologies may require inputs from a multi-disciplinary and multi-sectoral team in

order to ensure that they are not rooted only in medical technology or law — or only in both these — and that they encompass AI engineers, ethicists, lay persons, and others whose inputs would contribute to the development of such legislation.

***Note:** IP5 is a forum of the five largest intellectual property offices internationally, ie, those of Europe, Japan, Korea, China and the United States, which share patent data with each other.

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