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Promotion and protection of human rights: human rights questions, including alternative approaches for improving the effective enjoyment of human rights and fundamental freedoms

Human rights in the administration of justice

Report of the Secretary-General**

Summary

The present report is submitted pursuant to General Assembly resolution [79/172](#), in which the General Assembly requested the Secretary-General to prepare a report on the latest developments, challenges and good practices in human rights in the administration of justice, including on the latest developments, risks and required safeguards regarding the potential use of neurotechnology and other emerging technologies. The report includes the latest developments in and applications of neurotechnology, their impact on human rights, including on specific groups, developments regarding national regulation, emerging guidelines and conclusions and recommendations.

* [A/81/150](#).

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I. Introduction

1. The present report is submitted pursuant to General Assembly resolution 79/172. It builds on the prior thematic report submitted by the Secretary-General to the General Assembly at its seventy-ninth session and on other reports and resolutions.¹ The report draws on information received from Member States, United Nations entities, human rights mechanisms and civil society and on external research.²

2. Neurotechnology has advanced rapidly since the Secretary-General first referred to it in his report entitled “Our Common Agenda” as a frontier issue requiring the clarification of applicable human rights frameworks and standards (see A/75/982). Devices that were until recently confined to clinical or research environments are now entering, or may enter, consumer markets, workplaces, schools, public services, law enforcement and justice systems.³ The convergence of neurotechnology with artificial intelligence is expanding the capacity to process and interpret neural data and to derive increasingly complex inferences from it.

3. These developments hold significant promise, particularly for medical and assistive applications. Neurotechnology has already delivered major benefits in healthcare, notably in neurorehabilitation, where brain-computer interfaces aid movement, communication and recovery. However, the developments also raise profound questions for the protection of human rights, especially in the administration of justice. When applied in the administration of justice, these technologies serve different purposes and pose distinct legal and human rights risks, especially as tools and data developed for medical use are repurposed without appropriate safeguards being in place.

II. Latest developments and applications of neurotechnology and other emerging technologies

A. Neurotechnology and neural data

4. For the purposes of the present report, neurotechnology is understood as “devices, systems and procedures – encompassing both hardware and software – that directly measure, access, monitor, analyse, predict or modulate the nervous system to understand, influence, restore or anticipate its structure, activity and function”.⁴ Neurotechnologies may be invasive or non-invasive: non-invasive techniques, such as electroencephalography, rely on external sensors, whereas invasive technologies involve the surgical implantation of electrodes or other devices. They serve two principal functions. The first is to measure and analyse nervous system activity such as: electroencephalographs used to record the brain’s electrical activity; functional magnetic resonance imaging, a form of neuroimaging used to measure brain activity by detecting changes in blood flow; and brain-computer interfaces, used to translate brain signals into commands for devices. The second function is to intervene in or

¹ See A/79/296, A/HRC/57/61, A/HRC/58/58, A/80/283, A/HRC/60/63, A/HRC/58/6 and Human Rights Council resolution 51/3.

² All submissions received in response to the call for input are available at <https://www.ohchr.org/en/calls-for-input/2026/call-input-human-rights-administration-justice-neurotechnology-and-other>.

³ Geneva Academy of International Humanitarian Law and Human Rights, “Guiding principles for businesses on protecting human rights throughout the neurotechnology lifecycle”, working paper, December 2025.

⁴ United Nations Educational, Scientific and Cultural Organization (UNESCO), Recommendation on the Ethics of Neurotechnology, adopted by the General Conference of UNESCO on 11 November 2025.

modulate neural activity through neuromodulation, such as deep brain stimulation. Invasive neurotechnologies generally must be licensed medical devices, and the data that they gather are generally protected under national health data privacy laws. Non-invasive neurotechnologies used in general consumer markets are generally subject to little or no regulation, even though wearable devices are also medical-grade, and the data that they collect are extremely sensitive.⁵

5. The operation of neurotechnology can generate neural data, defined as “qualitative and quantitative data about the structure, activity and function of the nervous system gathered through neurotechnology”.⁶ There is broad consensus that neural data are highly sensitive, providing unprecedented access to internal mental states, and that they require heightened ethical and legal protection.⁷

B. Neurotechnology in the administration of justice

Neuroimaging as medical or expert evidence

6. At present, the most common use of neurotechnology in judicial contexts is the introduction of neuroimaging as medical or expert evidence. In criminal proceedings, neuroimaging is most frequently presented to support mitigation claims at sentencing, and to corroborate claims of psychosocial disability or claims related to capacity. Where accepted, such material is generally treated as corroborative rather than determinative. In civil proceedings, neuroimaging is used to assess non-pecuniary damages, corroborate claims of chronic pain or cognitive impairment, and in the examination of legal capacity.

7. While the admissibility and evidentiary weight of neuroimaging remain contested,⁸ several jurisdictions permit its limited and carefully circumscribed use: in Brazil, it remains largely confined to clinical mental health expertise;⁹ in at least two decisions in the Kingdom of the Netherlands, courts of appeal have accepted neuroimaging and neuropsychological evidence as corroborative material;¹⁰ in the United States of America, since an early case in 1992,¹¹ criminal defendants have been increasingly introducing neurobiological evidence to challenge their own competency and the effectiveness of defence counsel at trial, and to mitigate punishment;¹² at least two decisions in Italian courts have relied on neuroimaging including at the appellate stage;¹³ in at least two cases, the Court of Appeal of England and Wales has accepted neuroscientific evidence as corroborative – using it to support rather than determine assessments of culpability and sentencing;¹⁴ and in Canada,

⁵ Submission from the Neurorights Foundation.

⁶ UNESCO, Recommendation on the Ethics of Neurotechnology.

⁷ See [A/HRC/58/58](#); Łukasz Szoszkiewicz and Rafael Yuste, “Mental privacy: navigating risks, rights and regulation”, *EMBO Reports*, vol. 26 (2025); Jared Genser, Stephen Damianos and Rafael Yuste, *Safeguarding Brain Data: Assessing the Privacy Practices of Consumer Neurotechnology Companies* (New York, Neurorights Foundation, 2024).

⁸ Lyn M. Gaudet and Gary E. Marchant, “Under the radar: neuroimaging evidence in the criminal courtroom”, *Drake Law Review*, vol. 64, No. 3 (2016); and Nita A. Farahany, “Neuroscience and behavioral genetics in US criminal law: an empirical analysis”, *Journal of Law and the Biosciences*, vol. 2, No. 3 (November 2015).

⁹ Submission from Brazil.

¹⁰ Court of Appeal of The Hague, case No. 22-003669-16, Decision, 29 October 2025; and Court of Appeal of ‘s-Hertogenbosch, case No. HD 200.011.012 T6, Judgment, 12 February 2013.

¹¹ Supreme Court of New York, *People v. Weinstein*, Decision, 8 October 1992.

¹² Farahany, “Neuroscience and behavioral genetics”.

¹³ Appellate Court of Assizes of Trieste, judgment No. 5/2009 (*Bayout*); and Court of Como, judgment No. 536/2011 (*Albertani*).

¹⁴ Court of Appeal of England and Wales, Criminal Division, *R. v. Hendy*, Judgment, 12 April 2006; and Court of Appeal of England and Wales, Criminal Division, *R. v. Gilbert*, Judgment, 21 November 2012.

neuroscientific evidence has been used in both criminal and civil proceedings, including in end-of-life decision-making, but is not treated as determinative.¹⁵

Brain-based deception technologies

8. Less commonly, neurotechnology has been used in interrogation contexts, especially for brain-based deception detection. This is an umbrella term for technologies that measure central nervous system activity with the goal of “detecting deception”. From the neural data retrieved, probabilistic inferences are drawn about certain mental states and about cognitive processes, like memory or recognition of a place. The most discussed application is the use of functional magnetic resonance imaging for “lie detection”. Other related but distinct techniques are “guilty knowledge” or “concealed information” testing, which are commercialized under labels such as “brain fingerprinting” and brain electrical oscillation signature profiling. These techniques measure physiological or brain responses to determine whether a person recognizes concealed or crime-related information.

9. These brain-based deception detection techniques raise serious concerns regarding consent, coercion, reliability, and the privilege against self-incrimination. No brain-based deception detection method has achieved general acceptance for courtroom use. A United States federal appeals court excluded lie detection evidence based on functional magnetic resonance imaging, finding it insufficiently reliable and not generally accepted under evidentiary standards.¹⁶ The Supreme Court of India held that the involuntary administration of brain electrical oscillation signature profiling tests violates the constitutional protection against self-incrimination and renders the resulting evidence inadmissible.¹⁷ However, voluntary use appears to have continued in practice.¹⁸

Predictive technologies, “decoding”, surveillance and neurostimulation

10. Looking ahead, potential applications of neurotechnology in the administration of justice are increasingly discussed, although most applications remain experimental. Some research claims that certain neurotechnologies can assess the risk of recidivism and, when combined with artificial intelligence, could produce individualized psychological profiles based on neural markers, that could be used to predict behaviour.¹⁹ The prospect of identifying individuals as future offenders before an offence has been committed raises particularly serious human rights concerns, including related to the presumption of innocence.

11. Neurotechnology is also likely to be explored for use in interrogations through the process of “decoding”, in which artificial-intelligence algorithms attempt to translate brain signals into readable information about thoughts, intentions or memories. Whether such approaches will, at some point, be able to produce information that is sufficiently reliable to be used in the administration of justice is

¹⁵ Supreme Court of British Columbia, *Ng v. Ng*, Judgment, 24 January 2013; and Jennifer A. Chandler, “The use of neuroscientific evidence in Canadian criminal proceedings”, *Journal of Law and the Biosciences*, vol. 2, No. 3 (November 2015).

¹⁶ United States Court of Appeals, Sixth Circuit, *United States v. Semrau*, Decision, 12 April 2012.

¹⁷ Supreme Court of India, *Selvi v. State of Karnataka*, Judgment, 5 May 2010.

¹⁸ Jonathan Moens, “Mind reader?”, *Science*, vol. 388, No. 6748 (May 2025).

¹⁹ See [A/HRC/57/61](#); Eyal Aharoni and others, “Neuroprediction of future rearrest”, *Proceedings of the National Academy of Sciences*, vol. 110, No. 15 (2013); and Vaughn R. Steele and others, “Machine learning of functional magnetic resonance imaging network connectivity predicts substance abuse treatment completion”, *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, vol. 3, No. 2 (February 2018).

unknown. If they were able to be deployed, they would likely have an impact on a range of human rights, including privacy and freedom of thought.²⁰

12. Other anticipated developments include the use of wearable neurotechnology, including for the surveillance and monitoring of offenders outside custodial settings.²¹ This application would significantly expand State oversight of individuals' inner lives. There is also research on the use of neurostimulation to modulate neural processes associated with aggression or impulse control.²² Both of these technologies, if ever considered for use in the administration of justice, would likely raise complex human rights issues that should be addressed before the technologies are deployed.

13. A key concern regarding the use of neurotechnologies in the administration of justice is the reliability of neuroscientific evidence in court. While such technologies produce detailed data, their accurate application in legal settings remains challenging. Brain data are complex and uncertain, and links between brain activity and behaviour can be misunderstood, potentially leading to incorrect conclusions about an individual's mental state. Particular caution is warranted when translating findings established at the group or population level into conclusions about individual persons, given intra- and inter-individual variability and the probabilistic nature of many neuroscientific findings. Problems are worsened by the gap between controlled laboratory conditions and real-world settings, and by the lack of a shared understanding between lawyers and scientists, which makes it difficult for courts to assess the probative value of such evidence.²³

14. A further concern is that, as neurotechnology becomes increasingly commercialized, large volumes of neural data are reportedly being collected by consumer technology companies.²⁴ Wearable electroencephalography devices, marketed for wellness, gaming or productivity, are widely available. Such consumer data may reportedly be accessed by State authorities or introduced as evidence in legal proceedings without recognition of its uniquely sensitive character, a risk amplified in counter-terrorism and national security contexts, where legal thresholds for data access and admissibility are often significantly lower.²⁵

III. Legal framework and State obligations

15. The human rights framework governing the administration of justice includes the Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights. Neurotechnology use in justice may engage rights to freedom from torture and ill-treatment, liberty and security of person, equality before courts, a fair trial, privacy, freedom of thought, expression and opinion, non-discrimination and an effective remedy.²⁶ Other relevant treaties include the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment, the

²⁰ Australian Human Rights Commission, *Protecting Cognition: Background Paper on Human Rights and Neurotechnology* (Sydney, 2024); and Marcello Ienca and Roberto Andorno, "Towards new human rights in the age of neuroscience and neurotechnology", *Life Sciences, Society and Policy*, vol. 13, No. 5 (2017).

²¹ Submission from the Neurorights Foundation.

²² Submissions from Law and Ethics of Neurotechnology in Criminal Justice, the European Expert Group on Human Rights and Emerging Technologies and the Australian Human Rights Commission. See also [A/HRC/57/61](#).

²³ Submission from Slovenia.

²⁴ Genser, Damianos and Yuste, *Safeguarding Brain Data*.

²⁵ Szoszkiewicz and Yuste, "Mental privacy: navigating risks, rights and regulation"; and Krisztine Huszti-Orbán and Fionnuala Ní Aoláin, "Use of biometric data to identify terrorists: best practice or risky business?", (Human Rights Centre, University of Minnesota, 2020), pp. 4, 8–10 and 17.

²⁶ International Covenant on Civil and Political Rights, arts. 2, 6, 7, 9, 14, 17, 18, 19, 21 and 22.

International Convention on the Elimination of All Forms of Racial Discrimination, the Convention on the Rights of the Child, the Convention on the Elimination of All Forms of Discrimination against Women and the Convention on the Rights of Persons with Disabilities.

16. The Secretary-General and the Human Rights Council have emphasized that the use of technology by Member States must be consistent with international human rights standards.²⁷ The Human Rights Committee has clarified that States Parties to the International Covenant on Civil and Political Rights should put in place a framework that prevents human rights violations, holds those responsible to account and provides remedies, in relation to both the actions and the omissions of States.²⁸ Under the principle of due diligence, States Parties are required to take measures to protect individuals from harm by third parties, including business enterprises. Business enterprises, in turn, have responsibilities regarding respect for human rights, which should guide the design, development and deployment of neurotechnology, in accordance with the Guiding Principles on Business and Human Rights (A/HRC/17/31, annex). While some contend that the challenges of neurotechnology may require development of new legal frameworks, others affirm that the risks of misuse or abuse of neurotechnology may be addressed within the existing international human rights law framework, including through potential further interpretations and clarifications that might be undertaken by United Nations human rights mechanisms.²⁹

IV. Impact of neurotechnology on human rights

17. Neurotechnology and the processing of neural data have been addressed by a growing number of United Nations resolutions and reports underscoring their relevance, associated risks, and the need for regulatory frameworks to protect human rights.³⁰ The potential for misuse of neurotechnology to result in large-scale human rights violations is an increasing concern.³¹

A. Human dignity

18. Neurotechnology accesses, measures and analyses brain signals. If these signals are treated as direct indicators of thoughts, intentions or truthfulness, the use of neural data points could undermine how we understand and value each of us as human beings. The Universal Declaration of Human Rights affirms that all human beings are born free and equal in dignity and rights and are endowed with reason and conscience.³² Many treaties give expression to dignity in particular settings,³³ and article 3 of the Universal Declaration on Bioethics and Human Rights of the United

²⁷ A/79/296, para. 3; and Human Rights Council resolutions 53/29 and 47/23.

²⁸ Human Rights Committee, general comment No. 31 (2004) on the nature of the general legal obligation imposed on States Parties to the Covenant, paras. 5 and 8.

²⁹ See A/HRC/57/61; Christoph Bublitz, “Neurotechnologies and human rights: restating and reaffirming the multi-layered protection of the person”, *The International Journal of Human Rights*, vol. 28, No. 5 (2024); and submissions from Bethany Shiner and the Neurorights Foundation.

³⁰ See A/79/296; A/HRC/57/61; A/HRC/58/58; A/80/283; A/HRC/60/63; A/HRC/58/6; Human Rights Council resolution 51/3; and Scientific Advisory Board, “Brief of the Scientific Advisory Board on neurotechnology”, Brief No. 1, 14 January 2025.

³¹ Scientific Advisory Board, “Brief of the Scientific Advisory Board on neurotechnology”.

³² Universal Declaration of Human Rights, art. 1; International Covenant on Civil and Political Rights, art. 10; and Universal Declaration on Bioethics and Human Rights, art. 3.

³³ International Covenant on Civil and Political Rights, art. 10 (1); and Convention on the Rights of Persons with Disabilities, arts. 1, 3, 8, 16, 24 and 25.

Nations Educational, Scientific and Cultural Organization (UNESCO) affirms that the interests and welfare of the individual should have priority over the sole interest of science or society.

19. In the context of neurotechnology, the Special Rapporteur on the right to privacy identifies human dignity as a fundamental guiding principle for the regulation of neurotechnology (see [A/HRC/58/58](#)). UNESCO also identifies human dignity as a cardinal value guiding the whole life cycle of neurotechnology.³⁴ According to research, dignity logically requires that persons be treated as autonomous subjects rather than as biological objects to be decoded or manipulated.³⁵ At the same time, dignity is enhanced when for example neurotechnology is used to restore autonomy and inclusion, such as when assistive brain-computer interfaces enable persons with significant physical impairments to communicate or move.

B. Freedom of thought and opinion

20. Neurotechnologies used to infer mental states, memory or recognition, through brain-based deception detection technology or decoding, could reveal information that the person has not chosen to disclose. Coercive neuromodulation technologies can alter brain activity and shape how thoughts occur. Such technologies could thus have a profound impact on the freedom of thought, recognized in article 18 of the International Covenant on Civil and Political Rights. The Human Rights Committee has affirmed that the freedom of thought, conscience and religion is “far-reaching and profound; it encompasses freedom of thought on all matters”, and that the freedom of thought and conscience “does not permit any limitations”.³⁶ The fundamental character of the right is reflected in the fact that derogation from article 18 is prohibited, even in time of public emergency, and the Committee has considered that States may not make reservations to this provision.³⁷

21. The Special Rapporteur on freedom of religion or belief stated that “despite its proclaimed importance and absolute nature”, the scope and content of the right to freedom of thought “remain largely underdeveloped and poorly understood” ([A/76/380](#), para. 4). Experts emphasize the urgent need to address this gap, particularly given neurotechnologies’ potential to access mental content and influence cognition, emotion, and behaviour.³⁸ Acts that seek to alter thoughts, such as “ideology conversion” programmes, may violate the right to freedom of thought and opinion,³⁹ and “no one can be compelled to reveal his thoughts”.⁴⁰ The main element of the right to freedom of thought and conscience has been identified as the right of everyone to develop thoughts and conscience autonomously, free from impermissible external interference or alteration.⁴¹ Experts have argued that four pillars of freedom

³⁴ UNESCO, Recommendation on the Ethics of Neurotechnology.

³⁵ Bublitz, “Neurotechnologies and human rights”.

³⁶ Human Rights Committee, general comment No. 22 (1993) on the right to freedom of thought, conscience and religion, paras. 1 and 3.

³⁷ Human Rights Committee, general comment No. 24 (1994) on issues relating to reservations made upon ratification or accession to the Covenant or the Optional Protocols thereto, or in relation to the declarations under article 41 of the Covenant, para. 8; and International Covenant on Civil and Political Rights, art. 4 (2).

³⁸ Susie Alegre and Aaron Shull, “Freedom of thought: reviving and protecting a forgotten human right”, Centre for International Governance Innovation, 4 September 2024; Christoph Bublitz, “The human right to freedom of thought”, n.d.; and [A/76/380](#).

³⁹ See *Yong Joo-Kang v. Republic of Korea* ([CCPR/C/78/D/878/1999](#)); and [A/76/380](#).

⁴⁰ Human Rights Committee, general comment No. 22 (1993), para. 3.

⁴¹ See [A/76/380](#); William A. Schabas, *U.N. International Covenant on Civil and Political Rights: Nowak’s CCPR Commentary*, 3rd revised ed. (N.P. Engel, 2019), p. 503; and Bublitz, “Neurotechnologies and human rights”.

of thought are most relevant to neurotechnology: the freedom not to disclose thoughts; freedom from punishment for thoughts, real or inferred; freedom from impermissible alteration of thoughts; and an enabling environment for free thought.⁴²

22. Neurotechnology may potentially affect all four pillars of freedom of thought. Neurotechnologies capable of inferring mental states and revealing information that the person has not chosen to disclose may impact the freedom not to disclose thoughts. While neurotechnology is not capable at present of “mind-reading”, it is reportedly capable of inferring emotions and internal reactions based on neural data (see [A/HRC/57/61](#)). The freedom from punishment for thoughts could be threatened should such inference result in sanctions. Individuals have an unlimited right to think whatever they wish, whether in terms of actual thoughts or inferred ones (see [A/76/380](#)). The freedom from impermissible alteration of thoughts could be impacted by coercive neuromodulation, which may alter or shape a person’s thoughts.

23. Freedom of thought contributes to freedom of opinion in that opinions usually represent the result of a thought process.⁴³ Given the overlapping nature of these freedoms, representing part of the “forum internum”, neurotechnology presents similar risks to freedom of opinion as to thought. Article 19 (1) of the International Covenant on Civil and Political Rights protects the right to have and form opinions without interference. According to the Human Rights Committee, this right is one to which the Covenant permits no exception or restriction, and protects all forms of opinion, including political, scientific, historical, moral and religious opinions. Harassment, intimidation or stigmatization of a person on account of opinions held is forbidden.⁴⁴ Forced neurological interventions, indoctrination programmes or threats of violence designed to compel individuals to form particular opinions or change their opinion would violate this freedom (see [A/73/348](#)). The Constitutional Court of Spain decided that “ideological freedom” is a combination of the freedoms of thought and opinion, protecting the mind from technologies capable of modulating or manipulating political beliefs.⁴⁵

C. Privacy

24. Neurotechnologies can access the brain to collect and record highly sensitive information and affect physical and mental privacy by exposing the individual’s private space and integrity. Articles 17 of the International Covenant on Civil and Political Rights and article 16 of the Convention on the Rights of the Child protect individuals from arbitrary or unlawful interference with their privacy. Neurotechnology introduces new threats to privacy by significantly increasing the level of possible interference. According to the Human Rights Committee, if an interference is unlawful, or arbitrary – interpreted broadly to include elements of inappropriateness, injustice, lack of predictability and due process of law, as well as elements of reasonableness, necessity and proportionality⁴⁶ – it could amount to a violation of the right to privacy.

⁴² See [A/76/380](#); and Australian Human Rights Commission, *Peace of Mind: Navigating the Ethical Frontiers of Neurotechnology and Human Rights* (Sydney, 2024), chap. 6.

⁴³ Schabas, *U.N. International Covenant on Civil and Political Rights*, p. 545.

⁴⁴ International Covenant on Civil and Political Rights, art. 19; and Human Rights Committee, general comment No. 34 (2011) on the freedoms of opinion and expression.

⁴⁵ Constitutional Court of Spain, Judgment 76/2019, 22 May 2019; and Australian Human Rights Commission, *Peace of Mind*.

⁴⁶ Human Rights Committee, general comment No. 35 (2014) on liberty and security of person, para. 12.

25. As emphasized by the Human Rights Committee, the right to privacy protects personal data, communications and the integrity of private life.⁴⁷ This protection would include neural data. Neural data are uniquely revealing since they are capable of disclosing certain aspects of identity and personality. Consumer neurotechnology companies already collect unknown quantities of users' personal data, with the expectation that such data will become more decipherable in the future.⁴⁸ Neural data is biometric in character and may reportedly be re-identified across data sets and yield insights that were not foreseeable at the time of collection.⁴⁹ According to research, it is also reportedly often unclear to consumers whether or how their data can be deleted once collected.⁵⁰

26. For the purposes of protecting the right to privacy, the Human Rights Committee has emphasized that: the gathering and holding of personal information must be regulated by law; that effective measures must ensure that such information does not reach unauthorized persons; and that every individual must be able to ascertain whether, and if so what, personal data is stored, for what purposes and by whom, and to seek rectification or elimination of incorrect data.⁵¹ These requirements would also apply to neural data and other information retrieved through the use of neurotechnologies.

27. The Special Rapporteur on the right to privacy has set out, in detail, the foundations and principles for the regulation of neurotechnology and the processing of neural data, including the protection of human dignity and mental privacy.⁵² The Rapporteur also detailed a framework for national enforcement through a model law (see [A/80/283](#)).

D. Prohibition of torture and other cruel, inhuman or degrading treatment or punishment

28. The prohibition of torture and other cruel, inhuman or degrading treatment or punishment is absolute and non-derogable and extends not only to physical pain but also to acts that cause mental suffering.⁵³ Persons in detention also have the right to be "treated with humanity and with respect for the inherent dignity of the human person".⁵⁴ The use of brain-based lie detection, decoding of readable information about thoughts, intentions or memories, coercive interrogation techniques, and neuromodulation, applied in detention or investigative contexts, may result in mental or physical suffering contravening the protection provided under articles 7 and 10 (1) of the International Covenant on Civil and Political Rights.⁵⁵

⁴⁷ Human Rights Committee, general comment No. 16 (1988) on the right to privacy.

⁴⁸ Organization for Security and Cooperation in Europe and Office for Democratic Institutions and Human Rights, *Think Again: Freedom of Thought in the Age of Artificial Intelligence – Policy Brief* (Warsaw, 2025). See also [A/HRC/57/61](#) and [A/HRC/58/58](#).

⁴⁹ Genser, Damianos and Yuste, *Safeguarding Brain Data*.

⁵⁰ Ibid.

⁵¹ International Covenant on Civil and Political Rights, art. 17; and Human Rights Committee, general comment No. 16 (1988).

⁵² See [A/HRC/58/58](#) and [A/HRC/57/61](#).

⁵³ International Covenant on Civil and Political Rights, art. 7; Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment, arts. 1, 2 and 16; and Human Rights Committee, general comment No. 20 (1992) on the prohibition of torture or other cruel, inhuman or degrading treatment or punishment.

⁵⁴ International Covenant on Civil and Political Rights, art. 10 (1).

⁵⁵ For instance, *Selvi v. State of Karnataka*, Judgment, 5 May 2010, established a landmark precedent by prohibiting coercive neuro-imaging techniques as a form of degrading treatment. See also [A/HRC/57/61](#).

29. The Human Rights Council Advisory Committee is of the view that the use of neuromodulation techniques intended to alter the brain activity of offenders to reduce aggression or impulsivity may constitute treatment contrary to articles 7 or 10 of the Covenant when imposed without genuinely free and informed consent (see [A/HRC/57/61](#)). In custodial settings, the pronounced power imbalance between the State and the individual may call into question the genuineness of consent. Experts affirm that where such techniques are presented in connection with prospects such as early release or favourable parole outcomes, there is a significant risk that consent may not be fully free or voluntary.⁵⁶ Article 7 of the Covenant “expressly prohibits medical or scientific experimentation without the free consent of the person concerned”.⁵⁷ The difficulty of establishing that consent is genuinely free given the particularly vulnerable status of those who are detained has been acknowledged by the Human Rights Committee.⁵⁸

30. The application of neurotechnology in places of detention, from passive cognitive surveillance to neuromodulation, would pose unique challenges to the right under article 10 (1) of the Covenant of all those deprived of their liberty to be treated with humanity and dignity. “Humanity” means that detainees should not be subjected to any hardship or constraint other than that resulting from the deprivation of liberty itself.⁵⁹ Constant monitoring of the brains of those detained as a form of surveillance could cause mental distress.⁶⁰

E. Judicial independence and fair trial

31. The introduction of neurotechnology, particularly in combination with artificial intelligence, poses significant risks to judicial independence, protected under article 14 of the International Covenant on Civil and Political Rights. This article stipulates that everyone is entitled to a fair and public hearing by a competent, independent and impartial tribunal established by law. When the design, implementation and oversight of artificial intelligence-enhanced tools are the responsibility of the executive branch alone, or when such systems are outsourced to private companies whose proprietary models are shielded by intellectual property safeguards, the independence of the judiciary may be jeopardized.⁶¹ The phenomenon of automation bias – the tendency to accept uncritically the outputs of technological systems – can represent a further threat to independent judicial reasoning.

32. The right to a fair trial is engaged in multiple ways by the use of neurotechnology. The coercive use of brain-based lie detection could call into question the privilege against self-incrimination, protected under article 14 (3) (g) of the Covenant. This privilege is an absolute guarantee and any direct or indirect physical or psychological pressure on the accused with a view to obtaining a confession of guilt is prohibited.⁶² The Supreme Court of India, in *Selvi v. State of Karnataka*, held that the involuntary administration of brain electrical oscillation signature profiling tests, a form of brain-based lie detection, violates the

⁵⁶ Submission from the United Nations Office on Drugs and Crime. See also Australian Human Rights Commission, *Peace of Mind*.

⁵⁷ Human Rights Committee, general comment No. 20 (1992), para. 7.

⁵⁸ Ibid.

⁵⁹ International Covenant on Civil and Political Rights, art. 10; and Human Rights Committee, general comment No. 21 (1992) on humane treatment of persons deprived of their liberty.

⁶⁰ See [A/79/296](#); and submissions from IHCL, Brazil and Slovenia.

⁶¹ See [A/HRC/53/31](#) and [A/79/296](#).

⁶² Human Rights Committee, general comment No. 32 (2007) on the right to equality before courts and tribunals and to a fair trial.

constitutional protection against self-incrimination.⁶³ In addition, under the exclusionary rule, statements or other evidence obtained in violation of the prohibition of torture or ill-treatment may not be invoked as evidence in any proceedings.⁶⁴ This could apply to evidence obtained through the coercive use of neurotechnologies.

33. Beyond the privilege against self-incrimination, the use of predictive neurotechnology purporting to assess future criminality may also undermine the presumption of innocence. Neurotechnology may also pose substantial challenges to the principle of equality of arms, which would require the defence to have access to the scientific expertise and proprietary data needed to interpret and challenge neurotechnology-derived evidence. According to submissions and research, the right to a fair trial also depends on requiring that any neurotechnology-based evidence admitted in court meets the highest standards of scientific validation, transparency and contestability.⁶⁵

F. Liberty and security

34. Neurotechnologies claiming to assess the risk of recidivism, and the use of brain-based deception technologies to determine whether a person should be detained, may lead to arbitrary detention under article 9 of the International Covenant on Civil and Political Rights. This right protects liberty of person, meaning freedom from confinement of the body, and security of person, meaning freedom from injury to the body and the mind. Bodily and mental integrity is also protected by article 7 of the Covenant.⁶⁶ The prohibition of arbitrary detention under article 9 means that the decision to detain, or continue to detain, a person must be based on reasons specific to that individual.⁶⁷ Neurotechnologies used for risk assessments often rely on statistical correlations from non-representative data sets, potentially leading to prolonged or preventive detention based on what a person might do rather than what the person has done. Detention based on neural data may also be considered arbitrary, when the right to challenge confinement is undermined by the untransparent and obscure nature of such systems – sometimes referred to as a “black box” – making it difficult for legal professionals or the accused to understand the rationale behind detention decisions (see [A/79/296](#)).

G. Equality before the law and recognition as a person before the law

35. Neurotechnology claiming to assess the potential for recidivism risks prioritizing biological determinism over recognition of the individual as a legal subject. Several human rights treaties protect the right to recognition as a person before the law.⁶⁸ This means that every human being must be acknowledged as a “legal person” everywhere, with the capacity to hold rights and duties under the law.

⁶³ Supreme Court of India, *Selvi v. State of Karnataka*, Judgment, 5 May 2010, paras. 215–224; European Parliamentary Research Service, *The Protection of Mental Privacy in the Area of Neuroscience: Societal, Legal and Ethical Challenges*, PE 757.807 (Brussels, European Union, 2024).

⁶⁴ Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment, art. 15; and Human Rights Committee, general comment No. 20 (1992).

⁶⁵ See [A/79/296](#). See also submission from IHCL; and UNESCO, Recommendation on the Ethics of Neurotechnology.

⁶⁶ Human Rights Committee, general comments No. 35 (2014) and No. 20 (1992).

⁶⁷ Human Rights Committee, general comment No. 35 (2014).

⁶⁸ International Covenant on Civil and Political Rights, art. 16; Convention on the Elimination of All Forms of Discrimination against Women, art. 15; Convention on the Rights of Persons with Disabilities, art. 12; and [A/HRC/57/61](#).

They must be treated as subjects rather than objects of the law, something that could be undermined by such use of neurotechnology. Use of coercive neuromodulation that alters personality, affective responses or cognitive recall could also constitute a direct threat to the right to recognition as a person before the law. At the same time, neurotechnology can be used to enable people to exercise and claim their rights, as assistive brain-computer interfaces allow persons with certain disabilities to express their will and preferences, thereby supporting legal agency.⁶⁹

H. Right to an effective remedy and accountability

36. The opaque nature of many neurotechnological and algorithmic systems may frustrate the right to an effective remedy, protected under article 2 (3) of the Covenant on Civil and Political Rights, by making it difficult for people to understand or contest the rationale behind decisions that may affect their liberty or other human rights. The unique challenges posed by neurotechnology may mean that affected persons may not even become aware that a violation has occurred, potentially rendering the right to a remedy “illusory, inaccessible or ineffective” and raising accountability issues ([A/HRC/57/61](#), para. 72).

I. Potential for disproportionate impact

37. The Human Rights Council Advisory Committee has identified “groups experiencing structural discrimination and marginalized people or those in positions of socioeconomic disadvantage” as being particularly vulnerable to negative impacts of the use of neurotechnology in the administration of justice ([A/HRC/57/61](#), para. 37). Addressing these risks requires specific legislative and policy responses. Discrimination stems from biased training data, tools validated on limited populations and structural inequalities in criminal justice systems. These technologies may disproportionately affect women by reinforcing gender stereotypes and institutional biases, as they often rely on non-representative, male-centric data sets that can distort assessments of veracity or recidivism risk.⁷⁰

38. Neurotechnology may affect Indigenous Peoples collectively, having an impact beyond an individual rights framework. Protection should therefore recognize their rights to self-determination, cultural heritage and traditional knowledge under the United Nations Declaration on the Rights of Indigenous Peoples. The collection, storage, processing and sharing of neural data of Indigenous Peoples may raise concerns similar to those relating to genetic resources and digital data and should be governed in accordance with Indigenous Peoples’ rights to own and control such data and to consent to and benefit from their use, which includes protection against misuse and exploitation by States or business enterprises (see [A/HRC/60/66](#)).

39. Technology is never neutral, but reflects the values and interests of those who influence its design and use, and is fundamentally shaped by the same structures of inequality that operate in society (see [A/HRC/44/57](#)). People of African descent and racialized minorities are disproportionately affected by algorithmic bias in data sets that underrepresent them and by predictive tools that mirror and amplify historical

⁶⁹ Convention on the Rights of Persons with Disabilities, arts. 9, 12 and 21; UNESCO, Recommendation on the Ethics of Neurotechnology; and Committee on the Rights of Persons with Disabilities, general comment No. 1 (2014) on equal recognition before the law.

⁷⁰ Submission from IHCL.

discrimination.⁷¹ Indigenous Peoples, minorities and people of African descent may also be disproportionately exposed to the deployment of neurotechnology, given their disproportionate representation in criminal justice systems (see [A/HRC/60/75](#)). Inclusive validation, cultural competence, community-based governance, accountability and the meaningful participation of affected groups are essential preconditions for the lawful deployment of neurotechnology, including in the administration of justice.

40. Children's heightened brain plasticity makes them especially vulnerable to coercive alteration and to permanent labelling on the basis of predictive risk assessments before their personalities are fully formed.⁷² States are urged to identify, define and prohibit digital practices that manipulate or interfere with children's freedom of thought, in the administration of justice.⁷³

41. While neurotechnology can enable accessibility communication and inclusion when developed in partnership with organizations representing persons with disabilities and is based on free and informed consent, persons with disabilities and neurodivergent individuals may experience misinterpretation of atypical neural patterns, pressure towards forced "normalization" and discrimination on the basis of neurological difference.⁷⁴

V. National and regional regulation and emerging guidelines

42. At the national level, the regulatory response to the human rights challenges posed by neurotechnology is still nascent and uneven (see [A/HRC/57/61](#)).

43. In Chile, in 2023, the Supreme Court applied the 2021 constitutional amendment, to protect brain activity and derived data, holding unlawful a company's practices involving a portable brain-monitoring device. The ruling was among the first globally to address neural data under the rights to mental privacy and physical and mental integrity.⁷⁵ In Mexico, a proposed general law on neurorights and neurotechnologies would establish a national commission of neuroethics and neurolaw.⁷⁶ In Brazil, neural data is classified as sensitive personal data, and Rio Grande do Sul has enshrined "neurorights" protections in its state constitution.⁷⁷

44. In the European Union, under the Artificial Intelligence Act of 2024, artificial intelligence-driven neurotechnologies and emotion-recognition systems may be classified as high-risk where they involve profiling or affect fundamental rights and they are subject to strict compliance requirements. The León Declaration on European Neurotechnology, signed by European Union ministers in 2023, affirms a human-centred and rights-based approach. In France, a law on bioethics adopted in 2021 permits decrees banning activities that modify cerebral activity and present a serious or suspected health risk. In Spain, the non-binding Charter of Digital Rights, adopted

⁷¹ See General Assembly resolution [69/16](#), [A/HRC/56/68](#), [A/HRC/57/70](#) and Committee on the Elimination of Racial Discrimination, general recommendation No. 36 (2020) on preventing and combating racial profiling by law enforcement officials.

⁷² Submission from the United Nations Children's Fund.

⁷³ Committee on the Rights of the Child, general comment No. 25 (2021) on children's rights in relation to the digital environment.

⁷⁴ Submission from Ammar Younas.

⁷⁵ Chile, Act No. 21.383 of 2021 amending art. 19 of the Constitution in order to introduce neurorights protections; and Supreme Court of Chile, *Girardi v. Emotiv Inc.*, Judgment, 9 August 2023.

⁷⁶ Karen Herrera-Ferrá and others, "The regulation of neurotechnology: the neurorights bill in Mexico", *The Lancet: Psychiatry*, vol. 12, No. 2 (2025), p. 88.

⁷⁷ Brazil, Constitutional Amendment of the State of Rio Grande do Sul No. 85 of 26 February 2015.

in 2021, addresses neurotechnology and mental privacy, while submissions received from Austria, Italy, Slovenia and Ukraine described adaptations of data protection and bioethics frameworks.⁷⁸

45. In 2024, China adopted ethical guidelines for brain-computer interface research covering research integrity, scientific validity and informed consent. While the United States has no federal neurotechnology-specific laws, California, Colorado and Montana have extended sensitive data protections to neural data,⁷⁹ and the American Medical Association has defined neural data as information obtained through neurotechnology.⁸⁰ Submissions received from Morocco and Uzbekistan describe ongoing legislative and policy efforts on neurotechnology within the broader context of data protection and digital health reforms.⁸¹

46. The Inter-American Declaration of Principles regarding Neuroscience, Neurotechnologies and Human Rights of 2023 adopts a human rights-based approach. At the international level, the General Conference of UNESCO adopted its Recommendation on the Ethics of Neurotechnology in 2025, which calls for national coordinating bodies for neurotechnology, among other measures. In 2019, the Organisation for Economic Co-operation and Development adopted a recommendation on responsible innovation in neurotechnology containing nine guiding principles, such as the safeguarding of personal brain data.⁸² The Human Rights Council has tasked its Advisory Committee with drafting guidelines on applying existing human rights standards throughout the neurotechnology life cycle for consideration at its sixty-fourth session.⁸³ In 2025, the United Nations Office on Drugs and Crime and the International Criminal Police Organization launched a collaboration to explore the potential uses of neurotechnology in law enforcement and criminal justice, and the associated risks.⁸⁴

VI. Conclusions and recommendations

47. Neurotechnology, including new and emerging forms, raises profound human rights challenges when applied to the administration of justice. Its expansion beyond clinical settings into investigative, judicial and correctional contexts introduces significant risks, alongside potential benefits. By enabling access to and possible interference with the brain, its use may affect a wide spectrum of human rights, including the rights to human dignity, privacy, freedom of thought, a fair trial, protection against self-incrimination and the presumption of innocence, as well as the prohibition of torture and other cruel, inhuman or degrading treatment or punishment. At the same time, the evidentiary use of neuroscientific data remains contested. Its technical complexity, probabilistic nature and potential for misinterpretation pose significant risks, particularly in legal settings that lack a robust scientific or legal frameworks.

⁷⁸ See also Council of Europe, Strategic Action Plan on Human Rights and Technologies in Biomedicine (2020–2025).

⁷⁹ State of Colorado, House Bill No. 24-1058 (2024); State of California, Senate Bill No. 1223 (2024); and State of Montana, Senate Bill No. 163 (2025).

⁸⁰ American Medical Association, House of Delegates resolution 503, adopted on 11 June 2025.

⁸¹ Submissions from Morocco and Uzbekistan.

⁸² Organisation for Economic Co-operation and Development, Recommendation of the Council on Responsible Innovation in Neurotechnology, document OECD/LEGAL/0457, 11 December 2019, principle 7.

⁸³ Human Rights Council resolution [58/6](#).

⁸⁴ Submission from the International Criminal Police Organization.

48. International human rights law provides an applicable framework to address the risks of neurotechnology, but further clarification and consistent application are needed. International human rights law mechanisms, including those of the United Nations human rights mechanisms, should, within the scope of their respective mandates, consider the implications of the use of neurotechnologies in the administration of justice in order to provide guidance to States to ensure that their use of such technologies is aligned with their human rights obligations.

49. Neural data, as uniquely sensitive personal data, demand heightened protection, especially considering their increasing collection by private actors and potential reuse in legal proceedings. Current regulatory approaches remain fragmented and insufficient, underscoring the need for comprehensive, human rights-based governance.

50. I recommend that Member States:

(a) Establish regulatory frameworks, consistent with international human rights law and relevant international standards and guidance provided by United Nations human rights mechanisms, governing the development, deployment and use of neurotechnologies in the administration of justice, including their development by business enterprises or other entities. This could include mapping existing national frameworks applicable to neurotechnology in the administration of justice and adopting legislative and policy measures to address identified gaps. Regulation should require the conduct of human rights impact assessments and due diligence across the entire life cycle of neurotechnologies, including data-testing protocols and thresholds to identify and mitigate risks of algorithmic bias;

(b) Recognize neural data as highly sensitive personal data subject to the highest level of legal protection; impose clear limitations on its collection, processing, sale, storage, retention, reuse and sharing; and provide accessible mechanisms for remedy in the event of infringement and effective judicial and independent oversight;

(c) Prohibit the compulsory or coercive use of neurotechnologies in the administration of justice, including brain-based deception detection, predictive applications, decoding applications to “read” thoughts, intentions or memories, neuromodulation and arbitrary or unlawful cognitive surveillance and monitoring;

(d) Prohibit the use of neurotechnology as a means of torture or other cruel, inhuman or degrading treatment or punishment, or for any kind of social control or coercive behavioural conformity. Prohibit the use of neural data obtained through torture or ill-treatment, or in violation of the rights to freedom of thought and opinion, as evidence in any proceedings;

(e) Require free, prior, informed, explicit and revocable consent for any potential use of neurotechnology in the administration of justice, accompanied by full transparency regarding risks, access to independent legal counsel of one’s own choice and effective avenues for redress. Given the constrained and coercive nature of justice settings, any consent should be subject to the highest evidentiary standards and rigorous scrutiny;

(f) Require rigorous independent scientific review and validation of any neurotechnology-derived evidence proposed for admission in court, including assessment, as appropriate, of its safety, validity, reliability, reproducibility, known limitations and suitability for the specific context and population in which

it is applied. Accompany any lawful deployment of neurotechnology in the administration of justice with effective oversight, accountability and governance mechanisms and incorporate continuous monitoring and evaluation, transparency and public reporting;

(g) Ensure enhanced safeguards for children, detainees, persons with disabilities, women, older persons, persons belonging to particular racial or ethnic groups, including people of African descent, Indigenous Peoples and persons in situations of vulnerability, with particular attention to the conditions of consent and the potentially disproportionate or discriminatory impact of these technologies on specific groups. Consult with and actively involve all affected communities or groups with regard to policies on or the use of such technologies;

(h) Ensure that the development and deployment of neurotechnology respects the rights of Indigenous Peoples, including the requirement of free, prior and informed consent, and the protection of their collective rights, cultural integrity and self-determination under the United Nations Declaration on the Rights of Indigenous Peoples;

(i) Urge all business enterprises involved in neurotechnology to take all steps to meet their responsibility to respect human rights through operationalization of the Guiding Principles on Business and Human Rights, including through human rights due diligence, transparency, plain-language consumer information, safety-by-design approaches and access to effective remedy;

(j) Invest in human rights-based public education in neurotechnology literacy, as well as specialized training for law enforcement officials, prosecutors, judges and defence counsel, including risk evaluation and responsible decision-making.
