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**Presentation on the White Book on the Ethics of AI Applied to Life Sciences**

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Artificial Intelligence (AI) is strongly present in all areas of life sciences, specifically in the human sphere and particularly in medicine, where it has been introduced at an accelerated pace in a growing diversity of areas of activity, medical specialties, and clinical acts. For this reason, the National Council of Ethics for Life Sciences (Portugal) considered that it was essential to develop a *White Book on the Ethics of AI Applied to Life Sciences*.

To this end, the National Council of Ethics for Life Sciences created a working group<sup>1</sup> dedicated to its preparation and submitted successive versions to public discussion held throughout the country. The *White Book on the Ethics of AI Applied to Life Sciences* is structured into five major areas of intervention, distinct but intersecting: biomedical research, clinical care, hospital management, public health administration, and health teaching/education. It highlights, in each of these areas, a few of the AI intervention modalities that becomes particularly preponderant in the targeted space. At the same time, the most determining ethical concerns that are formulated in each of the structured areas are outlined. The fundamental ethical principles of our society are taken as evaluation criteria, such as human dignity and social justice, also highlighting respect for autonomy, responsibility, vulnerability, and solidarity, principles directly involved in the field of health, namely in research and clinical practice. Non-human ethics was also considered.

In summation, the gains from AI are indisputable and are in continuous development, but the transmutation of underlying values is evident. Its disruptive nature implies profound and highly impactful transformations that, as such, require prudent consideration of the expected benefits and potential risks. In addition, it is necessary to ensure responsible regulation and supervision, through, for example, the European Union's AI Act, so that artificial intelligence is always considered trustworthy and at the service of humanity. To accomplish these goals the National Council of Ethics for Life Sciences made some recommendations regarding the ethical and trustworthy use of IA in health and life sciences:

**1. Biomedical research**, in which it is important to:

- a) safeguard the intellectual creativity of researchers, allowing and not penalizing the knowledge process through trial and error;

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<sup>1</sup> The Working Group is constituted by Rui Nunes (coordinator), Inês Godinho, Miguel Ricou and Maria do Céu Patrão Neves.



- b) preserve the replicability and explicability of the processes of research and knowledge production, developing specific measures to overcome the crisis of replication in science caused by AI;
- c) strengthen the protection of the massive volume of personal data used by AI, through new ways of anonymization and innovative strategies;
- d) keep, as a paramount concern, the individual privacy and confidentiality of personal data, such as the use of synthetic data generated by AI;
- e) review the doctrine and practice of informed consent so that, in line with its aim of expression of personal autonomy, it is tailored to the profound digital transition brought about by AI;
- f) reassess the criteria for the attribution of scientific authorship and institutional policies of scientific integrity when considering possible interventions of generative AI.

**2. Digital clinical assistance**, in which it is important to:

- a) formulate measures to maintain and deepen trust in a clinical practice associated with the use of digital media;
- b) prevent a decrease in the competence of health professionals that could result from the loss of clinical practice associated with the widespread use of AI, as well as excessive reliance on intelligent robotics;
- c) check the verification of digital systems in diagnosis and therapy, as well as the explicability of the professional decision-making process, seeking to avoid possible dilution of responsibilities;
- d) adapt the processes and models for registering the individual's expressed will, in particular when obtaining informed consent, to the context of AI;
- e) ensure the right to personal privacy and the protection of personal data in all applications of AI systems in health.

**3. Health administration, hospital management, and remote intervention (telehealth)**, in which it is important to:

- a) benefit from the contribution of AI to achieve full integration and coordination of care provision, and optimize access to health services and systems;
- b) avoid the potential worsening of existing asymmetries that may arise from the use of AI, and protect the most vulnerable people and groups;
- c) ensure respect for the autonomy and privacy of people, in the intelligent operational management of health units, and maintain an ethical and humanizing relationship between health professionals and people;
- d) strictly comply with the rules of evidence-based medicine, without losing sight of the need for human and personalised contact in the undertaking of telehealth;
- e) promote the integrated management of electronic health records, given their enormous potential to strengthen personal autonomy by providing health information in real-time and in a consolidated way;



- f) make sure that the medical prescription resulting from integrated management in the interface with generative AI is reliable, verifiable, and respects personal autonomy.

**4. Public health administration and data coding**, in which it is important to

- a) use AI in public health administration where it can help identify and monitor outbreaks in real-time and enable epidemiological surveillance through predictive analysis while making sure that such monitoring does not affect individual privacy and data security;
- b) develop the integration of data coding automation in health information and communication technologies, fostering cybersecurity of AI systems;
- c) be wary of the risk of data colonization phenomena, through the creation of storage systems that obey the principle of public interest, maintaining respect for people in their multiple dimensions;
- d) invest in the digital literacy of citizens, endowing them with skills so that automation processes can be an effective and consciously assumed contribution to public health.

**5. Health education and virtual reality**, in which it is important to

- a) implement the innovative opportunities that AI and virtual reality open up for training health professionals, for example by creating realistic scenarios tailored to the individual needs of students, thus contributing to a more ethical and effective training;
- b) carry out research in the use of these technologies when training professionals, to enhance learning processes and decrease the likelihood of biases associated with a lower representation of human diversity;
- c) protect the possible loss of health professional's ability to provide care that considers the psychological and social dimensions of each person, conceivably resulting from the use of AI and virtual reality;
- d) continuously cultivate the relationship of treatment and trust between the patient and the health professional, reinforcing the training and awareness of students and professionals in this sense;
- e) take into account that effective incorporation of AI and virtual reality requires an adequate level of technological preparation and digital literacy among health professionals;
- f) provide professionals with communication skills and critical capacity in the context of using the potential and applications of new technologies and encourage a culture of integrity that discourages fraudulent practices.