
Editorial: Governance of emerging health-related technologies

Editorial

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We are witnessing a rapid development and implementation of new technologies, with a promise to greatly improve many aspects of health care and the public health system (diagnosis and treatment, surveillance and outbreak response, drug and medical devices development). Among the health-related innovations are human genome editing, artificial intelligence (AI) and telemedicine. But these transformative technologies “simultaneously raise important ethical and social issues, including how to fairly distribute their benefits and risks” ([National Academies of Sciences Engineering and Medicine and National Academy of Medicine, 2023](#)).

There are a variety of tools to govern that are used in modern health care systems (e.g. transparent and effective accountability mechanisms, public-private task forces, national targets and performance measures, policies and operational guidelines, citizen advisory committees, rules and decrees, codes of conduct, performance standards, “hard” and “soft” laws and many others) ([Barbazzza and Tello, 2014](#)).

The problem is that current health-related governance structures and tools have been “largely built for research, development, and market landscape that have changed substantially in the recent years” ([Mathews et al., 2022a](#)). So, they might not always be adequate and effective in a new environment, which is characterized by such features such as interdisciplinary approach, public-private and multi-organizational collaborations, diffusion of technologies across boundaries when no single regulating agency has a complete jurisdiction over it, acceleration of technology transfer and knowledge sharing, technologies affecting groups and populations in uneven ways and many innovations raising fundamental moral and ethical questions ([The WHO Council on the Economics of Health for All, 2021](#); [Mathews et al., 2022a](#)).

This means that new governance tools should:

- (1) Span multiple sectors;
- (2) Put ethics and human rights at the heart of design, deployment and use of emerging technologies and
- (3) Prevent potential society-wide harms.

Recent national, international and global initiatives on emerging technologies in health emphasize the need for strengthening governance and suggest approaches to develop new governance tools and frameworks. Specifically,

- (1) *The National Academy of Medicine Leadership Consortium Project to Develop Health Care AI Code of Conduct (2023/2025)* (USA) is aimed at providing a guiding framework to ensure that AI algorithms and their application in health, health care and biomedical science perform accurately, safely, reliably and ethically in the service of better health for all ([NAM, 2023b](#)). The planned outputs are: (1) a harmonized and broadly supported Code of Conduct; (2) a comprehensive landscape assessment that includes a systematic review of the literature; a review of the guidelines/frameworks/blueprints from federal agencies; and the guidelines issued by medical specialty societies; (3) a description of the roles and responsibilities of each stakeholder at each stage of the AI lifecycle; (4) a description of the national architecture needed to support responsible health care AI and (5) identification of priority actions going forward;



International Journal of Health
Governance
Vol. 29 No. 1, 2024
pp. 1-4
© Emerald Publishing Limited
2059-4631
DOI 10.1108/IJHG-03-2024-161

- (2) The National Academies of Sciences, Engineering and Medicine, in collaboration with the National Academy of Medicine (NAM), established the *Committee on Creating a Framework for Emerging Science, Technology and Innovation in Health and Medicine (CESTI)* to provide leadership and engage broad communities in developing a framework for aligning the development and use of transformative technologies with ethical and equitable principles ([Mathews et al., 2022a, b](#));
- (3) *Health AI Partnership (HAIP)* (Duke University School of Medicine, USA) aims to better define the requirements for adequate organizational governance of AI systems in healthcare settings and support health system leaders to make more informed decisions around AI adoption ([Kim et al., 2023](#));
- (4) *The Governance of Emerging Technologies (GET) research program at the Oxford Internet Institute (2019–2024)* (UK) investigates legal, ethical and social aspects of AI, machine learning and other emerging information technologies; research projects include issues such as data protection and inferential analytics, algorithmic bias, fairness, diversity and nondiscrimination as well as explainable and accountable AI.
- (5) *The NHS Artificial Intelligence Laboratory (NHS AI Lab)* (UK) was established in 2019 to address that challenge by bringing together government, health and care providers, academics and technology companies, identifying gaps and opportunities for international governance and coherence towards ensuring AI-driven technologies are properly governed, regulated and used for maximal benefit in health systems.
- (6) *The Center for Advanced Studies in Bioscience Innovation Law* (Denmark) explores the legal challenges and the rapid developments in the biotechnological area. The center brings together scholars from the world's leading research institutions in interdisciplinary collaboration while also engaging stakeholders from industry, government and civil society.

Quite a few tools and frameworks are already available that aim to guide different stakeholders in the governance of emerging technologies, for example:

- (1) *WHO guidance on Ethics and Governance of Artificial Intelligence for Health*, which identifies the ethical challenges and risks with the use of artificial intelligence for health and formulates six consensus principles to ensure AI works to the public benefit of all countries. It also contains a set of recommendations that can ensure the governance of AI for health “maximizes the promise of the technology and holds all stakeholders – in the public and private sector – accountable and responsive to the healthcare workers who will rely on these technologies and the communities and individuals whose health will be affected by its use” ([WHO, 2021](#)).
- (2) *WHO Human genome editing: a framework for governance* – identifies values and principles that help explain why governance measures may be needed and how those charged with reviewing or strengthening governance measures may undertake such a task. It reviews a set of tools, institutions and processes and puts forward seven scenarios to demonstrate how the various components of the governance framework come together in practice ([WHO Expert Advisory Committee on Developing Global Standards for Governance and Oversight of Human Genome Editing, 2021](#)).
- (3) *Framework for Emerging Science, Technology and Innovation in Health and Medicine*. The CESTI-resulting report describes a governance framework for decisions throughout the innovation life cycle ([National Academies of Sciences Engineering and Medicine and National Academy of Medicine, 2023](#)). It is also supported by the

Action guide, which provides high-level summary of needed actions and desired outcomes for major stakeholders (NAM, 2023a);

- (4) White paper *AI for healthcare: Creating an international approach together* (The National Strategy for AI in Health and Social Care, UK) was a step toward providing policy guidance to the international health community. Building on rapid literature and policy reviews, interviews with GDHP member countries and a focus group with experts in digital health, the white paper includes a set of policy recommendations on how best to support and facilitate the use of AI-driven technologies within health systems. The policy recommendations are presented at a high level, so they are applicable regardless of a country's digital health maturity level. The international health community can use the policy recommendations as a base as they create national and regional approaches to developing and using AI-driven technologies in their health system (NHS, 2020).

All these are just a few examples of the variety of projects and initiatives being developed now across the globe. We therefore turn to our readers, asking any of you engaged in emerging technology governance efforts to share your progress, experience and insights. Your approaches may inspire or inform others in their emerging technologies governance journeys, or your national plans and projects may benefit from the international reactions that publication in this journal can produce.

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Additional resources

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- CeBIL available at: <https://jura.ku.dk/cebil/research/>