Indian Journal of Medical Ethics Published online first on July 9, 2026

COMMENTARY

Responsible Health-AI: Complex scenarios from a humanities perspective

SIBY K GEORGE

Abstract

The mega-cultural age of artificial intelligence (AI) is theorised in this paper referring to the Heideggerian phenomenology of technology and cybernetics. Arguing that resisting the logic of its age is beyond a subfield of ethics, the paper draws attention to the way medical ethics can reassess from within the framework of the age the new ethical dilemmas and complex scenarios brought about by health-AI. Two moral situations are discussed in this context: using Electronic Health Records for non-health-related purposes such as solving mystery crimes and using health-AI for new drug development and improved treatment protocols. The purpose of the discussion is to reexamine medical ethics in the age of AI without overlooking the complexities health-AI can engender.

Keywords: *Health-AI, ethical dilemma, EHR, drug development, Heidegger, cybernetics*

From all accounts available so far, the age of artificial intelligence (AI) appears to be a planetary epoch of mega-cultural transformation that affects all aspects of human existence and people everywhere. Because of their ubiquitous character, such epochal changes are neither good nor evil. In fact, they redefine good and evil, destabilise prevalent practices, and open up unforeseen possibilities. Owing to this, these changes generate previously unexperienced dilemmas and ambivalences. When a physician makes an error of judgement, it is clear who is responsible. But when a physician uses an AI-aid that makes an error, it is difficult to decide who is responsible — whether it is the physician, the developer of the AI-aid, or the institution that purchased it. This paper discusses the complex scenarios and ethical dilemmas arising from the age of AI — health-AI, to be precise. But the aim of the paper is not to idly generate new medical ethics riddles but to ponder over our new reality. This aim is non-normative for sure, but for that reason it is not unrelated to normative ethics. My concerns will be to show how complex, dilemmatic, and intractable the new moral scenario is in healthcare practice and how our present moral imagination and conceptual apparatuses are insufficient to deal with them. One of the important tasks of medical humanities, a phenomenological task if you will, is (as I see it) not to prescribe norms, but to shed light on the medical situation as it is experienced by the careful onlooker, away from its maddening urgencies without sacrificing its complexity and radical newness.

This paper will first develop a Heideggerian philosophical perspective on mega-cultural technological transformations — in this instance the revolutionising changes wrought by health-AI. Martin Heidegger, a twentieth-century German phenomenologist, is a pivotal thinker of the technological age, whose musings on the inchoate early stage of the cyber age are well-known. After developing this framing perspective in the first section, I will dwell briefly in the second section on the dilemmas and anticipations of the age of Health-AI. I will then discuss two scenarios of ethical dilemmas in medical situations. Section two will be on dilemmatic aspects of using Electronic Health Records (I) of private individuals (subjects of medical research or treatment or both) for non-health-related purposes. Section three will be on dilemmas in the use of AI for the discovery and development of new drugs and improved treatment. I will conclude with a few remarks on ethical dilemmas.

The mega-cultural epoch of AI

Human technological capability (as rudimentary tool-making) is generally believed to have predated human speech. This also means that the earliest forms of scientific thinking (generic explanation of phenomena) were of much later origin. However, modern mathematical physics chronologically came before modern machine technology. While technology (as the Greek *technē*) stands for the whole sphere of human making and human-assisted production (*poiēsis*), modern machine technology, Heidegger argues, emerged as a peculiar cultural development in Europe with deep roots in ancient Greek thought. Machine technology for him is not a mere application of mathematical physics to human making, but "an autonomous transformation of praxis… wherein praxis first demands the employment of mathematical physical science" [1: p 116]. That is to say, although chronologically modern science appeared first, what demands its appearance in culture is what Heidegger calls the essence of modern technology, which for him is identical with the essence of modern metaphysics or the modern epoch as such.

Mega-cultural epochs such as modernity are, Heidegger maintains, various modes of revealing of the meaning of phenomena as a whole in their unity (or Being) in different historical contexts. The metaphysics or philosophical underpinnings of an age depend on the revealed sense of Being. "Metaphysics grounds an age," he writes, as it grants the interpretive basis for historical phenomena [1: p 115]. Hence, metaphysics consists of a unified essential understanding of Being, and the metaphysics of the modern age, for Heidegger, comprises the fact that all phenomena

are revealed to human beings, for the most part, simply as resources for their gratification. He terms such appearance or revelation of all reality to human beings in a technologically/instrumentally manipulable way as *Gestell* (enframing), which is thus the essence of modern technology, and he calls the object of such appearance or what appears *Bestand* (standing-reserve or resource). To illustrate, owing to the modern framework of *Gestell,* patients in a hospital or their health data appear as a capitalisable, minable resource for the health industry. Further, the urgency of the techno-scientific age to apply precise mathematical physics to modern technology is also due to the framework of *Gestell. Gestell* for Heidegger is not a human construct or a mindset that humans engineer for themselves. It is a framework of appearance of Being in human history. That is to say, meaning emerges in history and makes its appearance to human beings, who are not the creators of the meaning of Being.

Entrenchment of the mega-cultural frame of modern technology, Heidegger writes, leads to "the planetary imperialism of technologically organized man" whereby "the subjectivism of man attains its acme, from which point it will descend to the level of organized uniformity and there firmly establish itself. This uniformity becomes the surest instrument of total, ie, technological, rule over the earth" [1: p 152]. But, as the modern age of enframing exhausts its own cultural logic, the human subject falls from the pedestal of "lord-of-the-earth" and becomes a mere object of technological manipulation. If the human being was initially "the orderer of the standing-reserve (*Bestand*)," they gradually come "to the very brink of a precipitous fall; that is, he comes to the point where he himself will have to be taken as standing-reserve" [1: p 27]. The opposition in subject-object relation, which is crucial to modern humanism, is thus neutralised and all phenomena are seen as exploitable material and "both the subject and the object are sucked up as standing-reserves" [1: p 173].

The AI-revolution — including health-AI — is the fuller development, amplification, exhaustion, and mega-cultural transformation of the latent potential of the age of technoscientific enframing. The unimaginable possibilities of this age became sufficiently clear in a culturally significant way only when 35000 AI-technologists, entrepreneurs, and concerned citizens published an open letter in 2023, demanding a pause on further AI-development due to the risks that such AI-programmes as ChatGPT posed for human wellbeing [2: p 15]. Heidegger had premonitions about the age of AI. Learning about the Massachusetts Institute of Technology (MIT) computer scientist Norbert Wiener's concept of cybernetics in the 1960s, he began to think of it as the philosophical underpinning of the modern age that completes "the metaphysical ideal of a universal language that can be applied to all spheres of life and knowledge" [3: p 104]. Cybernetics for Wiener is the study of controlling and commanding a system, whether mechanical or biological, through communication or the transmission of information. Heidegger argues that the victory of the modern scientific method, not science *per se* — which is about disclosing the truth of phenomena, finally completes itself in subjecting every being and its meaning to calculation, prediction, and control. In this way, human control of all beings is sealed and in turn they themselves become subjected to the control of the system of calculation. The view of any being as an information device, decipherable through symbol manipulation, Heidegger argues, gives rise to "the firm expectation that one day we shall be able to master the scientific-technological production and breeding of the human being" [4: p 124]. Splitting of atoms by nuclear physics and reading of the genetic structure of the human cell by biochemistry are both part of the same victory of the scientific method over science. Our current use of the term "cyber" to mean connected to a computer network is only a part of Wiener's use of the Greek sense of cybernetics (from *kybernetes* or steersman) to mean steering and controlling of mechanical and biological systems through information transfer [5: p 180]. In other words, the information age and its magical forms such as ChatGPT are further developments of the essence of modern technology or *Gestell.*

Anticipations and dilemmas of the Age of Health-AI

This mega-cultural perspective of the AI-revolution is important for taking a non-deceptive view of things. The commonsense view that technology is a human creation and an instrument for human advancement, over which they have absolute control is a misreading from such a standpoint. For example, as the Heideggerian philosopher Hubert Dreyfus used to remind his students, the real danger is not that robots would become human or humanlike; it is the reverse — that "we will become more like them… we will become accustomed to their level of creative output and lower our expectations about both them and ourselves to that level" [5: p 62]. Heidegger's argument is also that the human essence (that which we consider as quintessentially human) is not something made for good, but a biohistorical byproduct of the give-and-take process of human interaction with material-cultural phenomena. The AI-revolution, in this sense, has the capacity to transform the essence of the human being. That is, human abilities depend for their meaning and reality on epochal cultural trends. We cannot change these trends but there can be thoughtful ways of responding to them.

The informed prescience that the AI-revolution is not a fantastical science fiction anymore is an important first step in responding to the age of AI. Heidegger remarked in 1955 that the technological upsurge of his era was "only a crude start (for the human being) ... In all areas of his existence… these forces, since man has not made them, have moved long since beyond his will and have outgrown his capacity for decision" [6: p 51]. Indeed, many AI-forecasts are not real yet, but we can be certain that they are no more merely fanciful and that it is pointless to prohibit AI. In fact,

humanity's record at banning dangerous technologies is rather poor; the atom bomb is still there and ticking, though no actual use of it is reported in the last 80 years. Experts today are aware that self-learning, self-correcting, creative/generative AI can become smarter than humans in many ways, swallow all possible data available on the world, produce amazing content quickly and convincing arguments, create lies and conspiracy theories, misinform the public, and disrupt sociopolitical life. We are living at a time when it is possible to realistically imagine AI drivers, poets, script-writers, programmers, teachers, physicians, and perhaps even AI nurses replacing the whole population of human professionals. It is not (and will not be) the first time that such replacement of human labour by machine is (and would be) taking place [7]. And we cannot be too sure whether such displacement of human labour is a purely bad or a purely good thing. It is no use, therefore, vilifying AI. The AI-revolution will create many undecidable ambiguities since it opens several possibilities to human social living and social practices of healthcare that were unavailable before.

We can speak of responsible AI in this vein with respect to medical ethics, fully aware of the modern epochal rationality that drives and sustains AI. This being so, the concern with responsible health-AI is a way of responding to the cultural logic of our epoch with no ambition to transform it. AI-usage is spreading rapidly and inescapably. The question in this scenario is how to make the best use of it in the pivotal sphere of human health in a minimally restrictive way — that is, responsibly and ethically. The humanities and social sciences can contribute to the AI-debate by helping to understand AI without deception — critically, that is — and talking about responsibility from that limited and non-deceptive perspective. Ethical rulebooks and manuals for managing and steering various aspects of health-AI are available today such as the 2023 Indian Council of Medical Research (ICMR) document "Ethical Guidelines for Application of Artificial Intelligence in Biomedical Research and Healthcare". NITI Ayog has the 2018 "National Strategy for AI" and the 2021 "Principles of Responsible AI and the Operationalizing Principles of Responsible AI". The Government of India promulgated the 2023 Digital Personal Data Protection Act. There is also the World Health Organization's Guideline *Recommendations on Digital Interventions for Health System Strengthening* (2019). Instead of returning to their normative framework again, I will raise in the rest of this paper two larger non-normative concerns that nevertheless raise critical questions for the normative sphere of responsible practice of health-AI. What I have in mind are thoroughly dilemmatic moral situations that reveal the ethical complexity of the new human situation wrought by the AI-revolution.

Dilemma 1: Use of EHRs for non-healthcare purposes

Amassing baseline demographics and health-related information, of both patients in hospitals and people in general, as part of public health initiatives of governments is an essential part of modern healthcare practice. There is also the emerging drive to voluntarily donate private health data online to discussion and analysis forums and communities. Electronic Health Records (EHR)-data can be shared by authorised practitioners and other stakeholders across interoperable digital platforms unlike electronic medical records. AI programmes or algorithms can screen large chunks of EHR-data quickly and make complex analyses efficiently, both for the healthcare provider and for authorised players of health-related activities such as clinical trials, research, drug development, and public health monitoring. This can help not only diagnose, treat, and follow up individual patients accurately and effectively, but also help control public health hazards and epidemics, and contribute to conducting clinical trials and development of new drugs and fresh lines of treatment [8, 9]. On the face of it, amassing EHR-data is a healthy way of participating in the age of AI and exploiting its advantages in an ethically acceptable manner. But modern individuals are seriously concerned about privacy, and modern ethics considers it as a right, a sacred value, that must be preserved. Breach of privacy has increased manifold with EHRs because apparently "EHRs lack safeguards" [10: p 59]. This has not stopped the amassing of EHRs by healthcare providers, both because of the perceived virtues of the EHR-system and because the age of AI is rather unstoppable. However, ambivalence surrounding the current healthcare practice of amassing EHRs can be pointed out. For example, what if the database so created is used by the police for solving unsolved criminal cases? Use of phone and internet data for this purpose is already widespread. Why not EHR-data?

In the year 2016, a 6.5 cm malleolar screw found on the ankle joints of a skeleton in Kochi, Kerala, helped the police solve a murder mystery, using hospital records [11]. This is, however, the traditional method of solving murder mysteries. Now, let us suppose that the interoperable EHR-repositories of hospitals could be accessed by the police on a single digital platform or network on demand, which is highly likely as it is for the moral purpose of locating a criminal. Investigative advantage and social utility here are tremendous. The police can save precious resources and time, and crack the case with the help of a skilled analyst. But ethical dilemmas of the age of AI are of a completely different order: instantaneous algorithmic accessibility of data across platforms, leading possibly to totalitarian efficiency. It is now a scenario of accessing the EHRs of private individuals for non-health-related purposes, although patients voluntarily entrust such sensitive personal information to the hospital solely for health-related purposes. Had they known that their health records could possibly be used for criminal inquiry and knowing the highhanded ways of the police, they might not have voluntarily parted with their personal data. It is like anonymous journalistic sources losing their right to protection in crunch situations.

This is potentially an explosive and dangerous situation. A medical database of the citizens of a nation, writes the celebrity futurist Yuval Noah Harari, would help the cause of healthcare advancement, prevention of epidemics, and development of new drugs. But if the police could access this databank, Harari warns, that would be dangerous. It would make the doctor ultra-efficient but "such hyper-efficiency can easily pave the way for totalitarianism" [12: p 312]. A perfectly efficient system is totalitarian by design. Democracy, privacy, freedom — these values demand the right dose of inefficiency, chaos, and withholding of some information from the state. A democracy of hyper-healthy people is dangerously close to a totalitarian state of health-information-transparency, or efficient surveillance of the citizens' health. Streamlining of health in such ways takes away freedom. A hyper-healthy utopian society might only require AI-physicians or AI-equipped human physicians, who can be seamlessly connected to live updated global health-data to make perfect medical choices in each given scenario.

What would be the right medical ethics judgment in such a scenario? Medical ethics would certainly demand protection of healthcare information from misuse. That is, using medical information for the purpose for which it was gathered in the first place, and preventing it from non-health-related uses. This response would be in line with the upshot of our previous sections: making the best of health-AI under reasonable ethical restrictions of responsible usage. Contemporary medical ethics has generated a vibrant discussion on ethically problematic uses of EHRs. But discussions are often concerned with (i) confidentiality issues such as unauthorised health professionals peeping into celebrity health records, (ii) data security issues such as medical identity theft, and (iii) data integrity issues such as human errors at data entry, and intentional or unintentional data manipulation/ corruption as it is transferred across systems [13]. But ambivalent and dilemmatic ethical and political situations like the one we have discussed in this section do not often find a place in medical ethics discussion platforms. These situations arise frequently in apparently ethical and innocuous ways such as police requirement to solve murder cases. But a Pandora's box indeed opens up when healthcare information is made available to non-healthcare agencies, who will always demand it because it is the easiest way. However, I think that it is rather difficult and even impossible to resolve such ethical dilemmas because of the moral discourse that the other party (security agencies in this case) would use to break the impasse (unsolved murders). Even anonymised information can easily be non-anonymised with forensic data analysis skills. Such moral conundrums are sure to confront us in the near-future because the AI-revolution is only going to speed up, diversify, and get more and more advanced and complex.

In this connection, I want to suggest two helpful critical attitudes. First, the recognition that health-AI is not a one-size-fit-all solution to all problems of modern medicine. In the following ethics thought experiment devised by the Dutch philosopher Filippo Santoni de Sio, we are asked to imagine that a robot is employed in a hi-tech hospital for the collection of urine samples from the inpatient department for the sake of protecting patient privacy and relieving the human health professional of the ostensibly dirty, uninteresting, and risky part of their job. The health professional, however, remains the responsible agent in the whole operation, oversees all the arrangements, and makes sure that patient trust is maintained. According to Santoni de Sio, this picture of the situation could become far more complex, for the contribution of the human professional could only increase in such a scenario, creating "specific extra tasks and psychological burdens for the human agents, typically those involved in the supervision of the automated agents and the overall coordination of the new team" [14: p 99]. Just as in the automated modern aircraft the pilot is extra-cautious, so also in an automated situation of health-AI, the health professional is actually not relieved of their responsibility. If anything, their situation is more anxiety-generating and precarious if they are morally and professionally serious about the tasks associated with caring.

The second helpful attitude is the recognition that large databases may not always be better databases and mining them may not always be the better method to arrive at conclusions. American professors Sharona Hoffman (Law) and Andy Podgurski (Computer Science), in their study of big-data-based biomedical research, caution against the use of such studies for policy making and legal argument. I want to pick out two of their observations to make my larger point. One, they refer to a *New York Times* article which finds that "automated features of EHR systems make it easy for doctors to exaggerate the care they provided for purposes of Medicare (health-insurance) reimbursement" [15: p 501]. Two, they warn against politically inclined interpreters, who use data "for the purpose of manipulating public opinion and swaying policy decisions" [15: p 502]. Their example is of pro-life activists using questionable scientific data for legal advocacy. Hence, they recommend the careful use of large databases, that is, only when the data-interpreter is geared up for it with necessary statistical literacy skills and after verifying data-integrity, especially for making causal claims.

These critical attitudes and many others are required, I would argue, for responding to the age of health-AI with minimal preparedness. The question of the use of medical data for non-medical purposes may have unresolvable political ramifications when we address the problem as a whole. But this may not be the case when they are addressed on a case-by-case basis. Nevertheless, legal activism of the medical community and society at large might become necessary, for example, if a national network of biomedical data is envisaged as accessible to responsible medical and security professionals on an equal footing. In such campaigns of the medical community to protect large-

scale biomedical data from non-biomedical uses, a thoroughly critical approach towards big-data can be imagined as a minimal starting point.

Dilemma 2: Use of health-AI for drug development

The second ethical dilemma I want to address is the use of AI for the discovery and development of new drugs and improved treatment. Tons of datasets can be analysed quickly, intricately, and efficiently today with the help of Large Language Model (LLM)-based programmes of deep learning. What human experience and expertise can take hundreds of years to develop and analyse, AI can do in a short span of time and more efficiently. AI-programmes can be suitably customised to predict molecular interactions more accurately. They can apparently tell more precisely what targets are likely to be responsive to treatment, and can read and predict microbial structures and behaviours crucial for innovations in treatment. They can simulate models of medical equipment with razor-sharp accuracy. These and many other uses and functions of AI, which are supposedly already on the upswing in the industry, can help reduce research costs of pharmaceutical industries and of publicly funded projects [16: p 51].

At the same time, flourishing AI-use in drug discovery has generated a lively scholarly discussion on the ethical facets of the new shift in pharmaceutical research. One facet is the problem of systemic bias. That is, social prejudices could be reproduced by AI, couched in its neutral-sounding machine language. These biases "could be found in unrepresentative datasets or through AI models that overrepresent some populations, organisations, and countries to the detriment of others" [17: p 3]. Biases could be geographic (example: predominance of English-speaking countries) or demographic (example: over-representation of Caucasians). AI, for example, can reflect the bias towards well-off people in well-off countries who can afford medical care. One example pointed out repeatedly in the literature is AI-based melanoma (a form of skin cancer) prediction models. The dataset of the Melanoma Project is apparently biased towards "light-skinned images from patients in the US, Europe, and Australia (imbalanced sample bias)" and does not predict accurately for persons with darker skin colour [18: p 4]. Some of these biases, one may argue, are unavoidable in any study, whether AI-based or human. However, the ethical demand is to make concerted efforts to mitigate biases and minimise their impact before AI-generated models are integrated into actual medical practice. When we treat "algorithmic bias as a simple technical issue, we have only engineering solutions, but without solving the real problem—the inequalities of data and values" [19: pp 2-3]. The bias problem is at least reducible with conscious effort from all stakeholders involved.

There are, as I see it, bigger ethical problems pertaining to the use of AI for drug development. One such problem is the reluctance of pharmaceutical companies to share publicly the anonymised data of their clinical trials. Leading international medical journals today ask authors to declare openly whether they are willing to share this information pertaining to their study, a ploy that increasingly nudges them to do so. Similarly, there is today a Good Pharma Scorecard (GPS) that is goading big pharma MNCs also to do so [20]. This is crucial, as the major chunk of medical research spending has shifted from the state to the industry [21].

A still bigger and more dilemmatic ethical question concerns the game of the smart pharma players who can best exploit the Big Data boom for drug discovery. That means the profit hunt is going to intensify in the emerging context of data mining. Here is a market forecast reported in rbccm.com (Royal Bank of Canada Capital Markets): "Whoever is best able to utilize every individual's digital health record, fed by his or her 'data-ome' (data that utilizes the Open Microscopy Environment or OME framework), will capture significant new profit pools and disrupt existing ones" [22]. This scenario has predictably incentivised the future takeover or outpacing of traditional pharma giants like Pfizer by big tech-titans like Amazon, Microsoft, and Apple as they are fully equipped to manage and take advantage of the era of data mining. This "Googlisation" of biomedical research is also due to the huge quantity of data of which the tech-titans are in possession. Because these companies have no connection with the principles and methodologies of biomedical research, Santoni de Sio argues, their "generic logic of data analytics and the profit-based business model" may come into conflict with the best practices of the field and "unduly influence the research and investment agenda in the healthcare and biomedical field" [14: p 108]. This might also affect, he continues, the culture, ethos, and politics of independence of traditional research settings like universities and public research institutions. A major ethical concern in big-data-driven pharmaceutical research is the opaqueness and inexplicability of AI algorithms and the leads they provide in drug discovery. Vera Lúcia Raposo is sceptical that the emerging trend of explainable AI (XAI) models in drug development — white rather than black box, as it were — will succeed in making AI-solutions sufficiently transparent. "There remains a level of obscurity in how these systems arrive at certain conclusions, posing a challenge for validation, accountability, and ethical oversight" [23: p 11].

Hence, from all signs available, the data game is in no way going to be played on a level playing field and in the interest of human health. Clinical trials as such are increasingly driven by the special commercial interest of pharma companies and not by public interest [24]. Therefore, an important and difficult question of health-AI ethics and politics is: What interests are creating, maintaining, using, and profiting from Big Data and the new AI-tools? Vigilance over these commercial interests messing up and tweaking the system from within is becoming rather impossible

because most parts of their labyrinthine operations and implications are intractable and ambiguous. And to that extent, ethical dilemmas of the new age of health-AI continue unabated. The argument in support is always humanistic and is expressive of moral urgency, making the context of ethical decision doubly dilemmatic. Yet, to respond responsibly to the quickly changing scene of human health, ability and preparedness of the community of health professionals to be adept in the use of the new AI-tools seems to be a minimum requirement. This new professional responsibility supports, to the extent possible, constant vigilance and ethical guardianship of the integrity of the drug development process.

In a similar vein, many other aspects of health-AI such as AI-based analysis that supports diagnosis and robotic assistance in patient care can be studied, taking into account several ethically problematic angles that do not immediately meet the eye. Ethics in practice always involves many such dilemmas because ethics is actually not a question of following the rule but a question of bringing about the good proactively by acting. The very act of researching on or treating humans is dilemmatic — whether to desist from contributing to human wellbeing or to desist from harming/ inconveniencing them as research/ treatment subjects. An ethical dilemma poses a difficulty in making a choice because contrasting options of a human situation may appear, or be made to appear, equally moral or immoral. Health professionals usually follow laid down norms, best practices or choose the most rationally and affectively compelling option in a given situation. This is why professional medical ethics incessantly compiles and analyses difficult and dilemmatic cases. But, when there is a mega-cultural or epochal change that affects all aspects of human existence (as the initial Heideggerian section of this essay showed), we do not yet have, for that situation, the store of best practices and laid down principles to go by in order to resolve dilemmas. It is, therefore, urgent that we begin reflecting on the newly emerging scenarios of healthcare in all their complexity and gradually begin to compose new ethical manuals, principles, and best practices as the guide (and not the prescription) for action. The emerging age of health-AI is one such moment in history, as this paper has argued, referring to a few concrete scenarios. In this context, I have provisionally indicated two important agendas for the medical community in general: (i) a thoroughly critical approach towards Big Data, especially vigilance regarding non-biomedical usages of biomedical data; and (ii) skilled, morally alert preparedness in the use of the new AI-tools.

Author: Siby K George (kgsiby@hss.iitb.ac.in, https://orcid.org/0000-0002-9387-086X), Professor of Philosophy, HSS Department, IIT Bombay, Powai, Mumbai – 400076, INDIA.

Conflict of Interest: None declared **Funding:** None

To cite: George SK. Responsible Health-AI: Complex scenarios from a humanities perspective. *Indian J Med Ethics.* Published online first on July 9, 2026. DOI: 10.20529/IJME.2026.042

Submission received: August 29, 2025

Submission accepted: April 2, 2026

Manuscript Editor: Sunita Bandewar, Manjulika Vaz

Peer Reviewers: An anonymous reviewer

References

1. Heidegger M. *The Question Concerning Technology and Other Essays.* Lovitt W (translator). New York: Harper & Row; 1977.
2. Thomson ID. *Heidegger on Technology's Danger and Promise in the Age of AI.* Cambridge: Cambridge University Press; 2025.
3. Beistegui M. *The New Heidegger.* London: Continuum; 2005.
4. Heidegger M. The provenance of art and the destination of thought. Latsis D (translator). *J Br Soc Phenomenology.* 2013; 44(2): 119-128. https://doi.org/10.1080/00071773.2013.11006794
5. Polt R. A Heideggerian Critique of Cyberbeing. In: Pedersen H, Altman M (eds). *Horizons of authenticity in phenomenology, existentialism, and moral psychology: Essays in honor of Charles Guignon.* Dordrecht: Springer; 2015; pp 179-197.
6. Heidegger M. *Discourse on thinking.* Anderson JM and Freund EH (translators). New York: Harper & Row; 1966.
7. Dolan SL, Raich M, Morán PCM. Reimagining employment: Navigating the promises and perils of artificial intelligence. *Eur Bus Rev.* 2025 July10 [cited 2026 Jan 18]: pp 100-105. Available from: https://www.europeanbusinessreview.com/reimagining-employment-navigating-the-promises-and-perils-of-artificial-intelligence/
8. Wicks P, Little M. The virtuous circle of the quantified self: A human computational approach to improved health outcomes. In: Michelucci P (ed). *Handbook of human computation.* New York: Springer; 2013; pp 105-129. https://doi.org/10.1007/978-1-4614-8806-4_12
9. Coorevits P, Sundgren M, Klein GO, Bahr A, Claerhout B, Daniel C, et al. Electronic health records: New opportunities for clinical research. *J Intern Med.* 2013; 274(6): 547-60. https://doi.org/10.1111/joim.12119
10. Wallace IM. Is patient confidentiality compromised with the electronic health record?: A position paper. *Computers, Informatics, Nursing.* 2015 Feb; 33(2): 58-62. https://doi.org/10.1097/CIN.0000000000000126
11. Varma V. How a 6.5-cm screw helped Kochi police crack gruesome murder case. *Indian Express.* 16 March 2018 [cited 2026 Jan 10]. https://indianexpress.com/article/india/how-a-6-5-cm-long-malleolar-screw-helped-kochi-police-crack-gruesome-murder-case-5099244/
12. Harari YN. *Nexus: A brief history of information networks from the stone age to AI.* London: Penguin; 2024.
13. Harman LB, Flite CA, Bond K. Electronic health records: Privacy, confidentiality, and security. *Virtual Mentor.* 2012 Sep; 14(9): 712-9. https://doi.org/10.1001/virtualmentor.2012.14.9.stas1-1209
14. Santoni de Sio F. *Human freedom in the age of AI.* New York: Routledge; 2024.
15. Hoffman S, Podgurski A. The use and misuse of biomedical data: Is bigger really better? *Am J Law Med.* 2013; 39(4): 497-538. https://doi.org/10.1177/009885881303900401
16. Topol EJ. High-performance medicine: The convergence of human and artificial intelligence. *Nat Med.* 2019 Jan; 25(1): 44-56. https://doi.org/10.1038/s41591-018-0300-7
17. Nwebonyi N, McKay F. Exploring bias risks in artificial intelligence and targeted medicines manufacturing. *BMC Med Ethics.* 2024 Oct; 25(1)113:1-10. https://doi.org/10.1186/s12910-024-01112-1
18. Cross JL, Choma MA, Onofrey JA. Bias in medical AI: Implications for clinical decision-making. *PLOS Digit Health.* 2024 Nov; 3(11): 1-19. https://doi.org/10.1371/journal.pdig.0000651
19. Livieri G, Anastasopoulou C, Briola K, Nikolopoulou P, Efthymiou IP. Ethical issues arising from the use of AI in drug discovery. *J Polit Ethics New Technol AI.* 2024 Feb; 3(1): 1-7. https://doi.org/10.12681/jpentai.37093
20. Millar A. Why is pharma so bad at sharing clinical trial data? *Pharmaceutical Technology.* 2019, Oct 21 [cited 2026 Jan 20].

Available from: https://www.pharmaceutical-technology.com/features/sharing-clinical-trial-data/
21. Mervis J. Data check: U.S. government share of basic research funding falls below 50%. 2017 Mar 9 [cited 2026 Jan 22]. *Science.org*. Available from: https://www.science.org/content/article/data-check-us-government-share-basic-research-funding-falls-below-50
22. Wiederrecht G, Darwish S, Callaway A. Seismic shifts in healthcare. *RBCCM.com* [cited 2026 Jan 20. Available from: https://www.rbccm.com/en/gib/healthcare/episode/big_tech_vs_big_pharma#content-panel
23. Raposo VL. How is unexplainable' and non-transparent AI affecting healthcare delivery? *Oslo Law Review*. 2024 Oct; 11(1): 1-12. https://doi.org/10.18261/olr.11.1.6
24. Berger E. Ghostwriters, data manipulation and dollar diplomacy: How drug companies pull the strings in clinical research. *Ann Emerg Med*. 2008 Aug; 52(2): 137-139. https://doi.org/10.1016/j.annemergmed.2008.06.009