

## LETTER to the EDITOR

Editorial Process: Submission:06/30/2025 Acceptance:04/06/2026 Published:04/07/2026

**Blockchain in Cancer Care: Toward Evidence-Based and Inclusive Practice***Asian Pac J Cancer Prev*, 27 (4), 1147-1148**Dear Editor**

The recently published article titled “Enhancing Cancer Care through Blockchain Technology” by Nezameslami A et al. [1] demonstrates the transformative potential of blockchain technology in addressing critical challenges in oncology care, including data interoperability, patient empowerment, and clinical trial efficiency. However, several methodological and contextual limitations merit attention to bolster the article’s academic rigor and practical applicability.

First, the article cites specific quantitative improvements, such as a “30% reduction in data discrepancies” and “25% reduction in administrative errors,” without linking these figures to primary sources. For instance, the “30% reduction” is attributed to a “study published in the *Journal of Oncology*,” yet no such study is listed in the references. The closest related citation Singh et al. [2] discusses EHR optimization broadly, not blockchain-specific outcomes. Similarly, the “25% error reduction” cites Dubovitskaya et al. [3], which describes the ACTION-EHR framework but does not quantify error rates.

Second, several claims are misaligned with their cited references. For example, the assertion that “IBM Watson for Oncology integrated with blockchain improved data sharing” cites Ali et al. [4], a paper focused on blockchain-deep learning hybrids rather than IBM Watson. Similarly, the claim that “Deloitte estimates \$100M annual savings” cites Justinia [5], a theoretical discussion, rather than Deloitte’s 2020 report [6] on blockchain cost efficiency. Correcting these mismatches is critical to maintaining scholarly integrity.

Third, the article overlooks pivotal technical and ethical challenges. Blockchain’s environmental impact, particularly with energy-intensive Proof-of-Work (PoW) systems, conflicts with global sustainability goals. According to the Cambridge Bitcoin Electricity Consumption Index (CBECI), Bitcoin’s annual energy consumption in 2023 reached ~ 121 TWh [7], a concern absent from the original article. Transitioning to energy-efficient consensus models like Proof-of-Stake (PoS), as demonstrated by Ethereum’s 2022 “Merge” transition, which reduced the network’s energy footprint by over 99% [8], should be considered and discussed. Scalability remains another significant oversight: blockchain systems struggle with large-scale medical data (e.g., genomic sequences), and hybrid architectures combining on-chain metadata with off-chain encrypted storage represent a

viable solution for healthcare data management [9], as extensively reviewed in recent literature. Additionally, blockchain’s immutability complicates error correction in clinical records; misdiagnoses recorded on-chain cannot be deleted, risking clinical confusion. Solutions employing smart contract-based logical flagging that mask erroneous entries while preserving full audit trails should be proposed and evaluated [10].

Equity concerns are also unaddressed. Marginalised populations may lack digital literacy or infrastructure to engage with blockchain systems, exacerbating existing health disparities. The WHO Global Strategy on Digital Health 2020-2025 [11] provides a comprehensive and actionable framework for equitable digital health adoption and explicitly emphasises the need for inclusive health technology strategies. Regulatory ambiguities further complicate adoption: liability for smart contract errors in cancer treatment protocols remains undefined. Referencing the European Commission’s proposed regulatory frameworks for decentralised technologies and AI liability, including the AI Liability Directive (2022) and the European Blockchain Partnership’s ongoing policy work [12], would substantially strengthen this section of the discussion.

Finally, accessibility issues plague key references. Patel [13], cited for genomic data sharing, is paywalled and focuses on medical imaging rather than oncology. Replacing such sources with open-access, peer-reviewed studies like Mackey et al. [14], which directly evaluates genomic data sharing in oncology, is essential. While the article effectively advocates for blockchain’s role in cancer care, addressing these gaps, empirical validation of claims, technical nuance, equity considerations, and citation accuracy, will enhance its impact. We urge the authors to refine the manuscript with these revisions to ensure it serves as a comprehensive, evidence-based resource for clinicians and policymakers navigating blockchain’s integration into oncology.

**References**

1. Nezameslami A, Shahbazi A, Nezameslami R, Rashnavadi H, Pourkazemi M, Jayervand F, et al. Enhancing cancer care through blockchain technology. *Asian Pac J Cancer Prev*. 2025;26(4):1139-53. <https://doi.org/10.31557/apjcp.2025.26.4.1139>.
2. Singh AP, Balogh EP, Carlson RW, Huizinga MM, Malin BA, Melamed A, et al. Re-envisioning electronic health records to optimize patient-centered cancer care, quality, surveillance, and research. *JCO Oncol Pract*. 2025;21(2):128-35. <https://doi.org/10.1200/JCO.2024.21.2.128>. *Asian Pacific Journal of Cancer Prevention*, Vol 27 **1147**

- doi.org/10.1200/op.24.00260.
3. Dubovitskaya A, Baig F, Xu Z, Shukla R, Zambani PS, Swaminathan A, et al. Action-ehr: Patient-centric blockchain-based electronic health record data management for cancer care. *J Med Internet Res.* 2020;22(8):e13598. <https://doi.org/10.2196/13598>.
  4. Ali A, Ali H, Saeed A, Ahmed Khan A, Tin TT, Assam M, et al. Blockchain-powered healthcare systems: Enhancing scalability and security with hybrid deep learning. *Sensors (Basel).* 2023;23(18). <https://doi.org/10.3390/s23187740>.
  5. Justinia T. Blockchain technologies: Opportunities for solving real-world problems in healthcare and biomedical sciences. *Acta Inform Med.* 2019;27(4):284-91. <https://doi.org/10.5455/aim.2019.27.284-291>.
  6. Deloitte. *Global Blockchain Survey 2020: From promise to reality.* Deloitte; 2020
  7. Cambridge Centre for Alternative Finance (CCAF). *Cambridge Bitcoin Electricity Consumption Index (CBECI): Yearly Electricity Consumption Data.* Cambridge: University of Cambridge; 2023.
  8. Asif R, Hassan SR. Shaping the future of Ethereum: exploring energy consumption in Proof-of-Work and Proof-of-Stake consensus. *Front Blockchain.* 2023;6:1151724. <https://doi.org/10.3389/fbloc.2023.1151724>
  9. Thantharate P, Anurag T. MedBlock: Privacy-Preserving Framework for Next-Generation Electronic Health Records. In *Blockchain for Biomedical Research and Healthcare: Concept, Trends, and Future Implications 2024 Sep 1* (pp. 123-143). Singapore: Springer Nature Singapore. [https://doi.org/10.1007/978-981-97-4268-4\\_6](https://doi.org/10.1007/978-981-97-4268-4_6).
  10. Ullah F, He J, Zhu N, Wajahat A, Nazir A, Qureshi S, et al. Blockchain-enabled ehr access auditing: Enhancing healthcare data security. *Heliyon.* 2024;10(16):e34407. <https://doi.org/10.1016/j.heliyon.2024.e34407>
  11. World Health Organization. *Global Strategy on Digital Health 2020–2025.* Geneva: WHO; 2021.
  12. European Commission. *Proposal for a Directive on adapting non-contractual civil liability rules to artificial intelligence (AI Liability Directive).* Brussels: European Commission; 2022.
  13. Patel V. A framework for secure and decentralized sharing of medical imaging data via blockchain consensus. *Health Informatics J.* 2019;25(4):1398-411. <https://doi.org/10.1177/1460458218769699>
  14. Mackey TK, Kuo TT, Gummadi B, Clauson KA, Church G, Grishin D, et al. 'Fit-for-purpose?' - challenges and opportunities for applications of blockchain technology in the future of healthcare. *BMC Med.* 2019;17(1):68. <https://doi.org/10.1186/s12916-019-1296-7>.

## Sabyasachi Shukla, Pratap Kumar Jena\*

*School of Public Health, KIIT-Deemed to be University, Bhubaneswar, Odisha, India.*

*\*For Correspondence: drpratapjena@gmail.com*