



Review Article

Can AI Heal Public Health? A Critical Examination of Promise and Pitfalls

***¹Nickolas Panahi, ²Veronika karpina, ³Soren Falkner**

¹King's College London School of Biomedical Engineering & Imaging Science Becket House, 1 Lambeth Palace Road, London SE1 7EU, United Kingdom

^{2,3}Vienna University of Technology, Faculty of Computer Engineering, Vienna, Austria

***Corresponding Author:** Nickolas Panahi, King's College London School of Biomedical Engineering & Imaging Science Becket House, 1 Lambeth Palace Road, London SE1 7EU, United Kingdom

Citation: Nickolas Panahi, The AI-Augmented Era: A Paradigm Shift in Modern Medical Life V1(1), 2025

Copyright: ©2025 Nickolas Panahi, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Received date: May 22, 2025; **Accepted date:** May 28, 2025; **Published date:** June 05, 2025

Keywords: Artificial Intelligence in Healthcare, Clinical Decision Support, Medical Imaging Analysis, Predictive Analytics, Digital Health Transformation, Algorithmic Bias, Translational Medicine.

Abstract

The integration of artificial intelligence (AI) into public health represents a paradigm shift with the potential to fundamentally reshape global health outcomes. This paper contends that AI possesses significant power to "heal" public health by transforming it from a reactive to a proactive and predictive discipline. We examine the multifaceted applications of AI, from accelerating pandemic preparedness and enabling precision prevention to democratizing early crisis detection and optimizing healthcare systems. However, this promise is inextricably linked to profound challenges. Success is not guaranteed by algorithms alone but is contingent upon a deliberate and sustained commitment to equity, robust governance, and human-centered implementation. This paper provides a comprehensive 10-page analysis of how AI is being deployed across the public health spectrum, critically evaluates the evidence of its impact, and outlines the essential policy and ethical imperatives required to ensure that AI becomes a tool for universal health improvement rather than a source of deeper disparity

Introduction

Public health faces unprecedented challenges: the persistent threat of pandemics, the rising burden of chronic diseases, entrenched health inequities, and systems strained by cost and complexity. Artificial intelligence emerges as a potentially transformative force to address these challenges. AI, particularly in its advanced forms like generative and agentic AI, offers capabilities in data synthesis, pattern recognition, and predictive analytics at a scale and speed beyond human capacity. These tools promise to move public health from monitoring outbreaks after they occur to predicting and preventing them, and from population-

The core argument of this paper is that AI can indeed heal public health, but this healing is conditional. The technology itself is neutral; its impact therapeutic or harmful is determined by the frameworks within which it is developed and deployed. A parallel is drawn to the evolution of the health tech industry itself. The current "Health Tech 2.0" generation, distinguished by strong unit economics and clinical integration, is successfully rebuilding

market trust after the hype-driven disappointments of its predecessors. Similarly, AI in public health must move beyond proof-of-concept hype to demonstrate sustainable, equitable, and measurable improvements in population health outcomes. This paper will explore this journey by first mapping AI's application across key public health domains, then analyzing the critical barriers to its beneficial adoption, and finally proposing a roadmap for responsible and effective integration (42,59).

The Transformative Applications: How AI Is Augmenting Public Health

AI is not a monolithic tool but a suite of technologies being applied across the entire public health continuum. Its applications demonstrate a shift from administrative support to core, life-saving functions.

Pandemic Preparedness and Intelligent Surveillance

The COVID-19 pandemic served as a catalyst, proving AI's utility in infectious disease control. AI-driven surveillance systems like EPIWATCH scan vast volumes of open-source data (news reports, social media, official alerts) using natural language processing to provide early warnings of outbreaks, often before official health authorities detect them. Retrospective

analysis showed EPIWATCH could have flagged signals of COVID-19 a month prior to its official reporting. This capability compresses the critical window for containment (60,76).

Looking forward, next-generation platforms are creating end-to-end digital ecosystems. The Pandemic Preparedness Engine (PPX) and the Global Pathogen Analysis Platform (GPAP), incubated by the World Economic Forum, aim to create a seamless pipeline from pathogen detection to vaccine design. These platforms use agentic AI to integrate disparate datasets genomic sequences, epidemiological models, clinical trial data to identify pandemic threats and propose vaccine candidates in days rather than months, directly supporting the ambitious "100 Days Mission" for vaccine development. Furthermore, AI enhances hospital-based surveillance. Systems like the Enhanced Detection System for Healthcare-Associated Transmission (EDS-HAT) combine machine learning with electronic health records and genomic sequencing to identify hidden transmission routes of infections, reportedly preventing up to 40% of hospital-borne infections in one multi-site study.

Precision Prevention and Tackling Social Determinants

AI's greatest long-term impact may lie in preventing disease before it starts. This moves public health upstream, addressing the social, environmental, and behavioral drivers that account for an estimated 80-90% of health outcomes. Initiatives like AI4HealthyCities exemplify this approach. By aggregating and analyzing non-traditional data such as housing quality, access to green space, income levels, and transportation AI models can identify the specific combinations of factors driving health disparities in cardiovascular disease at a neighborhood or even census-tract level. This provides policymakers with actionable insights to design targeted interventions, such as improving food access in a specific "food desert" or investing in pedestrian infrastructure in areas with high obesity rates.

This aligns with the broader trend of precision public health. As patients increasingly use wearables and health apps, AI can synthesize this real-world data with genetic and clinical information to predict individual risks for conditions like Alzheimer's or kidney disease years before symptoms appear, enabling truly personalized preventive care plans (77, 99).

Early Detection and Mental Health

AI is also creating new frontiers in detecting non-communicable conditions, particularly in mental health. Research demonstrates that multimodal AI models can analyze linguistic patterns and behavioral changes in public social media posts to identify early signs of a mental health crisis such as depressive episodes or suicidal ideation with high accuracy (over

89%) and an average lead time of 7.2 days before traditional identification. These models have shown consistent performance across multiple languages and platforms, offering a scalable tool for population-level mental health monitoring. While fraught with ethical complexity, this application highlights AI's potential to reach individuals who may not yet be engaged with traditional healthcare systems (100,121).

System Efficiency and Augmenting the Workforce

Within healthcare delivery systems, AI is acting as a force multiplier to alleviate administrative burdens and enhance clinical decision-making. AI co-pilots and ambient scribes listen to patient-clinician conversations and automatically draft clinical notes, dramatically reducing documentation time. At Mass General Brigham, the rollout of such tools led to a 40% relative reduction in burnout among early-adopter providers, with 80% reporting they could pay more attention to patients. Furthermore, AI agents are poised to accelerate biomedical research, compressing drug discovery timelines "from years to months" by generating and simulating novel molecules. These efficiency gains are critical for freeing up scarce human resources and intellectual capital to focus on complex care, empathy, and system innovation (122, 139).

The Critical Imperatives: Barriers to Equitable Healing

For AI to heal public health without causing harm, several formidable challenges must be overcome. These are not technical hurdles but primarily socio-ethical and systemic ones.

The Paramount Challenge of Equity and Bias

The risk of AI exacerbating health inequities is the single most significant threat to its positive impact. Bias can be embedded at multiple levels

Data Bias: AI models trained on non-representative data (e.g., overrepresenting certain demographics) will produce skewed and potentially dangerous outputs for underrepresented groups. Historical health data often reflects existing biases in care delivery, which AI can passively perpetuate

Algorithmic Bias: Even with fair data, model design can introduce bias if not carefully audited for fairness across subpopulations

Access Bias: The high cost of developing and implementing advanced AI tools can create a "digital divide." Well-funded health systems and wealthy nations may accelerate ahead, while under-resourced clinics and low-income countries are left further behind, unable to afford technologies that could improve their populations' health. CEPI explicitly notes

this risk with AI-powered vaccine development, warning it could "widen the gap between nations"(140,158).

The Governance, Privacy, and "Black Box" Dilemma

The effective use of AI in public health requires navigating a complex landscape of privacy concerns and ethical governance. Monitoring social media for mental health signals or aggregating urban data for precision prevention raises serious questions about informed consent, data sovereignty, and individual privacy. Furthermore, the "black box" problem where even developers cannot fully explain how a complex AI model arrived at a specific conclusion is antithetical to public health's need for transparency and accountability. Robust, privacy-preserving techniques like federated learning (where models are trained on decentralized data) and "biosecurity-by-design" architectures with embedded monitoring agents are emerging as essential safeguards (159, 170).

Implementation and the Human-in-the-Loop

Technology alone cannot heal systems. Successful adoption follows the 10-20-70 rule: 10% of effort on algorithms, 20% on technology, and 70% on people and process change. Public health practitioners may be wary of AI systems, and their integration into daily practice remains low. This requires comprehensive workforce training, change management, and a steadfast commitment to the "human-in-the-loop" principle. AI should augment, not replace, professional judgment. As one expert notes, AI's role is to "enhance and augment the human workforce," requiring organizations to plan for upskilling and role redesign (171, 181).

A Roadmap for Responsible Healing: Policy and Practice Recommendations

To harness AI's healing potential while mitigating its risks, a coordinated, multi-stakeholder approach is essential. The following recommendations provide a framework for action.

For Policymakers and Global Health Institutions:

Mandate Equity-by-Design: Regulators should require that AI public health tools demonstrate fairness audits across diverse demographic groups before deployment. Funding for AI initiatives should be contingent on explicit plans to address and monitor equity outcomes.

Foster Global Public Goods: Support and fund AI platforms designed as global public goods, like PPX and GPAP, which prioritize equitable access through federated computing networks and respect data sovereignty

Modernize Public Health Training: Integrate digital and AI literacy core curricula into schools of public health

and field epidemiology training programs (FETPs) to build a workforce capable of critically using these tools.

For Healthcare Leaders and Implementers:

Adopt the 10-20-70 Framework: Prioritize investments in change management, workflow redesign, and continuous staff engagement over the procurement of technology alone.

· **Establish Multidisciplinary Oversight:** Create ethics review boards for AI projects that include clinicians, data scientists, ethicists, and community representatives to oversee development, validation, and ongoing monitoring for drift and bias

Prioritize High-Impact, Focused Pilots: Instead of dozens of scattered experiments, concentrate resources on a few strategic areas with transformative potential, such as precision prevention programs or AI-augmented clinical workflows, to build concrete evidence and organizational competency.

For Developers and Technology Partners

Conclusion

Healing as a Choice, Not an Inevitability

The question "Can AI heal public health?" must be reframed. The evidence presented here demonstrates that AI can provide the tools for profound healing: it can help us foresee and stop pandemics, pinpoint and address the root causes of chronic disease, reach individuals in invisible crisis, and unburden our healthcare heroes. The technical capability is increasingly proven

Therefore, healing is not an automatic outcome of technological advancement but a conscious choice. It is a choice to prioritize equity as the "North Star" for all AI initiatives. It is a choice to build shared, global infrastructure rather than proprietary, siloed advantages. It is a choice to invest in people and processes with the same vigor as we invest in algorithms. The path forward requires moving from isolated pilots to systemic integration, from discussing ethics in abstract to implementing concrete governance, and from a focus on technological hype to a dedication on measurable human outcomes. If we make these choices deliberately, AI can indeed become one of the most powerful instruments ever wielded in the service of public health, helping to build a world where health equity is not an aspiration but a measurable achievement.

References

- 1.
2. Panahi, U., & Bayılmış, C. (2023). Enabling secure data transmission for wireless sensor

- networks based IoT applications. *Ain Shams Engineering Journal*, 14(2), 101866.
3. Omid Panahi, and Uras Panahi. AI-Powered IoT: Transforming Diagnostics and Treatment Planning in Oral Implantology. *J AdvArtifIntell Mach Learn*. 2025; 1(1): 1-4.
 4. Panahi U. (2025). *AD HOC Networks: Applications, Challenges, Future Directions*, Scholars' Press. ISBN: 978-3-639-76170-2.
 5. Panahi, P., & Dehghan, M. (2008, May). Multipath Video Transmission Over Ad Hoc Networks Using Layer Coding And Video Caches. In *ICEE2008, 16th Iranian Conference On Electrical Engineering*, (May 2008) (pp. 50-55).
 6. Omid Panahi.(2021) Система исследований в информационных системах управления здравоохранением, M Gholizadeh - Scienza Scripts Publishing.
 7. UrasPanahi. AI-Powered IoT: 54, O Panahi - Transforming Diagnostics and Treatment Planning in, 2025.
 8. DrMansourehZeynali. Will AI Replace Your Dentist? The Future of Dental Practice. *OnJ Dent & Oral Health*. 8 (3): 2025, DO Panahi, DA Ezzati - OJDOH. MS. ID.
 9. A New Frontier in 60, O Panahi, A Intelligence - Periodontology. *Mod Res Dent*.
 10. AI in der modernen 48, DO Panahi, DS Dadkhah - Zahnmedizin.
 11. Panahi, U. (2025). *Redes AD HOC: Aplicações, Desafios, Direções Futuras*. Edições Nosso Conhecimento. ISBN 978-620-8-72962-2.
 12. Panahi, U. (2025). *AD HOC networks: Applications. Challenges, Future Paths. Our Knowledge*.
 13. Panahi, U. (2022). Nesnelerin interneti için hafif siklet kriptoloji algoritmalarına dayalı güvenli haberleşme modeli tasarımı [Design of a lightweight cryptography-based secure communication model for the Internet of Things]. Sakarya Üniversitesi.
 14. Koyuncu, B., & Panahi, P. (2014). Kalman filtering of link quality indicator values for position detection by using WSNS. *International Journal of Computing, Communications & Instrumentation Engineering*, 1.
 15. Koyuncu, B., Gökçe, A., & Panahi, P. (2015). Archaeological site bir arkeolojik sit alanının rekonstrüksiyonundaki bütünleştirici oyun motoru tanıtımı. In *SOMA 2015*.
 16. Panahi O, Eslamlou SF. *Peridonio: Struttura, funzione e gestione clinica*. ISBN: 978-620-8-74559-2.
 17. Panahi O, Dadkhah S. *AI in der modernen Zahnmedizin*. ISBN:978-620-8-74877-7.
 18. Panahi O. *Cellules souches de la pulpe dentaire*. ISBN: 978-620-4-05358-5.
 19. Omid Panahi, Faezeh Esmaili, Sasan Kargarnezhad. Искусственный интеллект в стоматологии. SCIENTIA SCRIPTS Publishing. 2024.
 20. Panahi O, Melody FR. (2011). A Novel Scheme About Extraction Orthodontic and Orthotherapy. *International Journal of Academic Research*. 3(2).
 21. Panahi O. The evolving partnership: surgeons and robots in the maxillofacial operating room of the future. *J Dent Sci Oral Care*. 2025; 1: 1-7.
 22. Panahi O, Dadkhah S, Sztuczna inteligencja w nowoczesnej stomatologii. ISBN:978-620-8-74884-5.
 23. Panahi O. The Future of Medicine: Converging Technologies and Human Health. *Journal of Bio-Med and Clinical Research*. RPC Publishers. 2025; 2.
 24. Panahi O, Raouf MF, Patrik K. (2011) The Evaluation Between Pregnancy and Periodontal Therapy. *Int J Acad Res*. 3: 1057-1058.
 25. Panahi O, Nunag GM, Nourinezhad Siyahtan A. (2011). *Molecular Pathology: P-115: Correlation of Helicobacter Pylori and Prevalent Infections in Oral Cavity*. *Cell Journal (Yakhteh)*, 12(Supplement 1 (The 1st International Student Congress On Cell and Molecular Medicine)). pp. 91-92. SID.
 26. Panahi O. The Age of Longevity: Medical Advances and The Extension of Human Life. *Journal of Bio-Med and Clinical Research*. RPC Publishers. 2025; 2.
 27. Panahi O, Eslamlou SF. *Peridonio: Estructura, función y manejo clínico*. ISBN: 978-620-8-74557-8.
 28. Omid Panahi, Sevil Farrokh. Building Healthier Communities: The Intersection of AI, IT, and Community Medicine. *Int J Nurs Health Care*. 2025; 1(1):1-4.
 29. Dr Omid Panahi, Стволовые клетки пульпы зуба, ISBN: 978-620-4-05357-8.

30. Panahi O. Nanomedicine: Tiny Technologies, Big Impact on Health. *Journal of Bio-Med and Clinical Research*. RPC Publishers. 2025; 2.
31. Dr Omid Panahi* and Dr Amirreza Amirloo. AI-Enabled IT Systems for Improved Dental Practice Management. *On J Dent & Oral Health*. 8(4): 2025. OJDOH.MS.ID.000691. DOI: 10.33552/OJDOH.2025.08.000691.
32. Panahi O. (2013). Comparison between unripe Makopa fruit extract on bleeding and clotting time. *International Journal of Paediatric Dentistry*. 23:205
33. Panahi O, Eslamlou SF. *Peridontium: Struktura, funkcja I postępowanie kliniczne*. ISBN: 978-620-8-74560-8.
34. Panahi, O., & Eslamlou, S. F. (2025). Artificial Intelligence in Oral Surgery: Enhancing Diagnostics, Treatment, and Patient Care. *J Clin Den & Oral Care*, 3(1), 01-05.
35. Panahi O, Eslamlou SF, Jabbarzadeh M. *Odontoiatria digitale e intelligenza artificiale*. ISBN: 978-620-8-73913-3.
36. Omid P, Soren F. (2025). The Digital Double: Data Privacy, Security, and Consent in AI Implants. *Digit J Eng Sci Technol*. 2(1):105.
37. Panahi O, Eslamlou SF, Jabbarzadeh M. *Medicina dentária digital e inteligência artificial*. ISBN: 978-620-8-73915-7.
38. Panahi O. *Stammzellen aus dem Zahnmark*. ISBN: 978-620-4-05355-4.
39. Panahi O. (2025). AI-Enhanced Case Reports: Integrating Medical Imaging for Diagnostic Insights. *J Case Rep Clin Images*. 8(1):1161.
40. Panahi O. (2025). Navigating the AI Landscape in Healthcare and Public Health. *Mathews J Nurs*. 7(1):5.
41. Panahi O. (2025). The Role of Artificial Intelligence in Shaping Future Health Planning. *Int J Health Policy Plann*. 4(1):01-05.
42. Panahi O, Falkner S. (2025). Telemedicine, AI, and the Future of Public Health. *Western J Med Sci & Res*. 2(1):10.
43. Panahi O, Azarfardin A. Computer-Aided Implant Planning: Utilizing AI for Precise Placement and Predictable Outcomes. *Journal of Dentistry and Oral Health*. 2(1).
44. Panahi O. (2025). AI in Health Policy: Navigating Implementation and Ethical Considerations. *Int J Health Policy Plann*. 4(1):01-05.
45. Panahi O, Eslamlou SF, Jabbarzadeh M. *Stomatologia cyfrowa i sztuczna inteligencja*. ISBN: 978-620-8-73914-0.
46. Panahi O. (2025). Innovative Biomaterials for Sustainable Medical Implants: A Circular Economy Approach. *European Journal of Innovative Studies and Sustainability*. 1(2):1-5.
47. Panahi O (2024) Bridging the Gap: AI-Driven Solutions for Dental Tissue Regeneration. *Austin J Dent* 11(2): 1185.
48. Panahi O, Eslamlou SF, Jabbarzadeh M. *Dentisterie numérique et intelligence artificielle*. ISBN: 978-620-8-73912-6.
49. Panahi O, Zeinalddin M (2024) The Convergence of Precision Medicine and Dentistry: An AI and Robotics Perspective. *Austin J Dent* 11(2): 1186.
50. Omid P, Mohammad Z (2024) "The Remote Monitoring Toothbrush for Early Cavity Detection using Artificial Intelligence (AI)", *IJDSIR* 7(4): 173-178.
51. Omid P (2024) Modern Sinus Lift Techniques: Aided by AI. *Glob J Oto* 26(4): 556198.
52. Panahi O (2024) The Rising Tide: Artificial Intelligence Reshaping Healthcare Management. *S J Public Hlth* 1(1) :1-3.
53. Panahi P (2008) Multipath Local Error Management Technique Over Ad Hoc Networks. In 2008 International Conference on Automated Solutions for Cross Media Content and Multi-Channel Distribution pp187-194.
54. Panahi O, Eslamlou SF, Jabbarzadeh M. *Digitale Zahnmedizin und künstliche Intelligenz*. ISBN: 978-620-8-73910-2.
55. Panahi U. (2025). *AD HOC Networks: Applications, Challenges, Future Directions*, Scholars' Press. ISBN: 978-3-639-76170-2.
56. Panahi U. *AD HOC-Netze: Anwendungen, Herausforderungen, zukünftige Wege*, Verlag Unser Wissen. ISBN: 978-620-8-72963-9.
57. Panahi O, Eslamlou SF, Jabbarzadeh M. *Odontología digital e inteligencia artificial*. ISBN: 978-620-8-73911-9.
58. Koyuncu, B., Gokce, A., & Panahi, P. (2015, November). The use of the Unity game engine in the reconstruction of an archeological site. In 19th Symposium on Mediterranean Archaeology (SOMA 2015) (pp. 95–103).

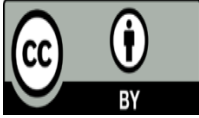
59. Koyuncu, B., Meral, E., & Panahi, P. (2015). Real time geolocation tracking by using GPS+GPRS and Arduino based SIM908. *IFRSA International Journal of Electronics Circuits and Systems (IJIECS)*, 4(2), 148-150.
60. Warnakulasuriya, S. (2020). Oral potentially malignant disorders: A comprehensive review on clinical aspects and management. *Oral Oncology*, 102, 104550.
61. Gupta, N., Gupta, R., Acharya, A. K., et al. (2021). Changing trends in oral cancer - a global scenario. *Nepal Journal of Epidemiology*, 11(4), 1035-1057.
62. Sung, H., Ferlay, J., Siegel, R. L., et al. (2021). Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA: A Cancer Journal for Clinicians*, 71(3), 209-249.
63. Siegel, R. L., Giaquinto, A. N., & Jemal, A. (2024). Cancer statistics, 2024. *CA: A Cancer Journal for Clinicians*, 74(1), 12-49.
64. Chow, L. Q. M. (2020). Head and Neck Cancer. *New England Journal of Medicine*, 382(1), 60-72.
65. Hashibe, M., Brennan, P., Chuang, S. C., et al. (2009). Interaction between tobacco and alcohol use and the risk of head and neck cancer: pooled analysis in the International Head and Neck Cancer Epidemiology Consortium. *Cancer Epidemiology, Biomarkers & Prevention*, 18(2), 541-550.
66. Koyuncu, B., Uğur, B., & Panahi, P. (2013). Indoor location determination by using RFIDs. *International Journal of Mobile and Adhoc Network (IJMAN)*, 3(1), 7-11.
67. Uras Panahi. *Redes AD HOC: Aplicações, Desafios, Direcções Futuras. Edições Nosso Conhecimento*. 2025.
68. Panahi, P., & Dehghan, M. (2008, May). Multipath Video Transmission Over Ad Hoc Networks Using Layer Coding And Video Caches. In *ICEE2008, 16th Iranian Conference On Electrical Engineering*, (May 2008) (pp. 50-55).
69. Panahi DU. *HOC A Networks: Applications. Challenges, Future Directions*. Scholars' Press. 2025.
70. Panahi O, Esmaili F, Kargarnezhad S. (2024). *Artificial Intelligence in Dentistry*. Scholars Press Publishing. ISBN: 978-620-6772118.
71. Omid P. (2011). Relevance between gingival hyperplasia and leukemia. *Int J Acad Res*. 3:493-49.
72. Panahi O. (2025). Secure IoT for Healthcare. *European Journal of Innovative Studies and Sustainability*. 1(1):1-5.
73. Panahi O. (2025). Deep Learning in Diagnostics. *Journal of Medical Discoveries*. 2(1).
74. Omid P. *Artificial Intelligence in Oral Implantology, Its Applications, Impact and Challenges*. *Adv Dent & Oral Health*. 2024; 17(4): 555966. DOI: 10.19080/ADOH.2024.17.555966.
75. Omid Panahi (2024) *Teledentistry: Expanding Access to Oral Healthcare*. *Journal of Dental Science Research Reviews & Reports*. SRC/JDSR-203.
76. Omid P. *Empowering Dental Public Health: Leveraging Artificial Intelligence for Improved Oral Healthcare Access and Outcomes*. *JOJ Pub Health*. 2024; 9(1): 555754. DOI: 10.19080/JOJPH.2024.09.555754.
77. Kevin Thamson, Omid Panahi (2025) *Bridging the Gap: AI as a Collaborative Tool Between Clinicians and Researchers*. *J. of Bio Adv Sci Research*, 1(2):1-08. WMJ/JBASR-112.
78. Panahi O. (2025). *Algorithmic Medicine*. *Journal of Medical Discoveries*. 2(1).
79. Panahi O. (2025). *The Future of Healthcare: AI, Public Health and the Digital Revolution*. *MediClin Case Rep J*. 3(1):763-766.
80. Kevin Thamson, Omid Panahi (2025) *Challenges and Opportunities for Implementing AI in Clinical Trials*. *J. of Bio Adv Sci Research*, 1(2):1-08. WMJ/JBASR-113.
81. Kevin Thamson, Omid Panahi (2025) *Ethical Considerations and Future Directions of AI in Dental Healthcare*. *J. of Bio Adv Sci Research*, 1(2):1-07. WMJ/JBASR-114.
82. Kevin Thamson, Omid Panahi (2025) *Bridging the Gap: AI, Data Science, and Evidence-Based Dentistry*. *J. of Bio Adv Sci Research*, 1(2):1-13. WMJ/JBASR-115.
83. *Research system in health management information systems*, M Gholizadeh, O Panahi - 2021 - *Sciencia Scripts Publishing*.
84. *L'intelligence artificielle dans l'odontologie*, O Panahi, F Esmaili, S Kargarnezhad -

- EDITION NOTRE SAVOIR Publishing. ISBN, 2024.
85. 66.(2024), Искусственный интеллект в стоматологии, DO Panahi, DF Esmaili, DS Kargarnezhad - SCIENCIA SCRIPTS Publishing.
 86. AI-Powered IoT: Transforming Diagnostics and Treatment Planning in Oral Implantology, UP Omid Panahi - J AdvArtifIntell Mach Learn, 2025.
 - Periodontium: Structure, O Panahi, SF Eslamlou - Function and Clinical Management.
 87. Periodontium: Structure, O Panahi, SF Eslamlou - Function and Clinical Management.
 88. AI in dental-medicine: Current applications & future directions. Open Access Journal of Clinical Images, 2 (1), 1-5, O Panahi, A Ezzati - 2025.
 89. Mitigating aflatoxin contamination in grains: The importance of postharvest management practices. Advances in Biotechnology & Microbiology, 18 (5), O Panahi, S Dadkhah - 2025.
 90. Empowering Dental Public Health: Leveraging Artificial Intelligence for Improved Oral Healthcare Access and Outcomes, O Panahi - JOJ Pub Health, 2024.
 91. Nano Technology, P Omid, KC Fatmanur - Regenerative Medicine and, Tissue Bio-Engineering, 2023.
 92. Chaturvedi, A. K., Mbulaiteye, S. M., & Engels, E. A. (2021). HPV-Associated Cancers in the United States Over the Last 15 Years: Has Screening or Vaccination Made Any Difference? *The Oncologist*, 26*(7), e1130-e1135.
 93. Lalla, R. V., Saunders, D. P., & Peterson, D. E. (2014). Chemotherapy or radiation-induced oral mucositis. *Dental Clinics*, 58(2), 341-349.
 94. Vissink, A., Jansma, J., Spijkervet, F. K., et al. (2003). Oral sequelae of head and neck radiotherapy. *Critical Reviews in Oral Biology & Medicine*, 14(3), 199-212.
 95. Peterson, D. E., Doerr, W., Hovan, A., et al. (2010). Osteoradionecrosis in cancer patients: the evidence base for treatment-dependent frequency, current management strategies, and future studies. *Supportive Care in Cancer*, 18(8), 1089-1103.
 96. Buglione, M., Cavagnini, R., Di Rosario, F., et al. (2016). Oral toxicity management in head and neck cancer patients treated with chemotherapy and radiation: Xerostomia and trismus (Part 2). Literature review and consensus statement. *Critical Reviews in Oncology/Hematology*, 102, 47-54.
 97. The American Academy of Oral Medicine. (2017). *Dental Management of the Oral Complications of Cancer Treatment*. AAOM Professional Resource.
 98. Panahi O. The Algorithmic Healer: AI's Impact on Public Health Delivery. *Medi Clin Case Rep J* 2025;3(1):759-762. DOI: doi.org/10.51219/MCCRJ/Omid-Panahi/197.
 99. Omid Panahi. "AI: A New Frontier in Oral and Maxillofacial Surgery". *Acta Scientific Dental Sciences* 8.6 (2024): 40-42.
 100. Panahi O and Falkner S (2025) Telemedicine, AI, and the Future of Public Health. *Western J Med Sci & Res* 2(1): 102.
 - Искусственный интеллект в стоматологии. DO Panahi, DF Esmaili, DS Kargarnezhad - 2024 - SCIENCIA SCRIPTS Publishing.
 101. Application of Clay's in Drug Delivery in Dental Medicine. DS Esmailzadeh, DO Panahi, DFK Çay - 2020 - Scholars' Press.
 102. NanoTechnology, Regenerative Medicine and Tissue Bio-Engineering. DO Panahi - 2019 - Scholars' Press.
 103. La IA en la odontología moderna. DO Panahi, DS Dadkhah - 2025 - ISBN.
 104. Inteligencia artificial en odontología, NUESTRO CONOC. DO Panahi, DF Esmaili, DS Kargarnezhad - 2024 - Mento Publishing. ISBN.
 105. Intelligenza artificiale in odontoiatria. O Panahi, DF Esmaili, DS Kargarnezhad - 2024 - SAPIENZA Publishing. ISBN.
 106. L'IA dans la dentisterie moderne. DO Panahi, DS Dadkhah - 2025 - ISBN
 107. Panahi, O., & Eslamlou, S. F. (2025). Artificial Intelligence in Oral Surgery: Enhancing Diagnostics, Treatment, and Patient Care. *J Clin Den & Oral Care*, 3(1), 01-05.
 108. Omid P, Soren F. (2025). The Digital Double: Data Privacy, Security, and Consent in AI Implants. *Digit J Eng Sci Technol*. 2(1):105.
 109. Le périodontium: Structure, fonction et gestion clinique. DO Panahi, DSF Eslamlou - 2025 - ISBN.

110. Sztuczna inteligencja w nowoczesnej stomatologii. DO Panahi, DS Dadkhah - 2025 – ISBN.
111. Panahi, O. (2025). The Role of Artificial Intelligence in Shaping Future Health Planning. *Int J Health Policy Plann*, 4(1), 01-05.
112. AI-enabled IT systems for improved dental practice management. O Panahi, A Amirloo - *On J Dent & Oral Health*, 2025.
113. A IA na medicina dentária moderna. DO Panahi, DS Dadkhah - 2025 – ISBN.
114. L'intelligenza artificiale nell'odontoiatria moderna. DO Panahi, DS Dadkhah – ISBN.
115. Medicina dentária digital e inteligência artificial. O Panahi, SF Eslamlou, M Jabbarzadeh - 2025 – ISBN.
116. Cellule staminali della polpa dentaria. DO Panahi - 2021 – ISBN.
117. Células madre de la pulpa dental. O Panahi - 2021 - Ediciones Nuestro Conocimiento.
118. Panahi O. AI-Enhanced Case Reports: Integrating Medical Imaging for Diagnostic Insights. *J Case Rep Clin Images*. 2025; 8(1): 1161.
119. Panahi O. (2025). Navigating the AI Landscape in Healthcare and Public Health. *Mathews J Nurs*. 7(1):56.
120. Panahi O. Innovative Biomaterials for Sustainable Medical Implants: A Circular Economy Approach. *European Journal of Innovative Studies and Sustainability*. 2025;1(2):1-5.
121. Стволовые клетки пульпы зуба. DO Panahi.
122. Omid Panahi, Alireza Azarfardin. Computer-Aided Implant Planning: Utilizing AI for Precise Placement and Predictable Outcomes. *Journal of Dentistry and Oral Health*. 2(1). <https://doi.org/10.61615/JDOH/2025/MAR027140329>.
123. Panahi O. The Rising Tide: Artificial Intelligence Reshaping Healthcare Management. *S J Public Hlth*. 2024 ;1(1) :1-3. DOI : 10.51626/sjph.2024.01.00002.
124. Panahi, O. (2025). AI in Health Policy: Navigating Implementation and Ethical Considerations. *Int J Health Policy Plann*, 4(1), 01-05.
125. Panahi O. Bridging the Gap: AI-Driven Solutions for Dental Tissue Regeneration. *Austin J Dent*. 2024; 11(2): 1185.
126. Panahi O, Zeinalddin M. The Convergence of Precision Medicine and Dentistry: An AI and Robotics Perspective. *Austin J Dent*. 2024; 11(2): 1186.
127. Omid P. Modern Sinus Lift Techniques: Aided by AI. *Glob J Oto*, 2024; 26 (4): 556198. DOI:10.19080/GJO.2024.26.556198.
128. The remote monitoring toothbrush for early cavity detection using artificial intelligence (AI). O Panahi, M Zeinalddin - *IJDSIR*, 2024.
129. Stammzellen aus dem Zahnmark. O Panahi - 2021 - Verlag Unser Wissen.
130. Stomatologia cyfrowa i sztuczna inteligencja. O Panahi, SF Eslamlou, M Jabbarzadeh - ISBN.
131. Odontoiatria digitale e intelligenza artificiale. O Panahi, SF Eslamlou, M Jabbarzadeh - 2025 - ISBN.
132. Dentisterie numérique et intelligence artificielle. O Panahi, SF Eslamlou, M Jabbarzadeh - 2025 - ISBN.
133. Odontología digital e inteligencia artificial. O Panahi, SF Eslamlou, M Jabbarzadeh - 2025 - ISBN.
134. Digitale Zahnmedizin und künstliche Intelligenz. O Panahi, SF Eslamlou, M Jabbarzadeh - 2025 - ISBN.
135. Panahi O. Predictive Health in Communities: Leveraging AI for Early Intervention and Prevention. *Ann Community Med Prim Health Care*. 2025; 3(1): 1027.
136. The remote monitoring toothbrush for early cavity detection using artificial intelligence (AI). O Panahi, M Zeinalddin - *IJDSIR*, 2024.
137. Stammzellen aus dem Zahnmark. O Panahi - 2021 - Verlag Unser Wissen.
138. Stomatologia cyfrowa i sztuczna inteligencja. O Panahi, SF Eslamlou, M Jabbarzadeh - ISBN.
139. Panahi O. Smart Materials and Sensors: Integrating Technology into Dental Restorations for Real-Time Monitoring. *J Dent Oral Health*. 2025 Mar;2(1).

- doi:10.61415/JD004/2025/NAR0271-0833.
140. Omid Panahi, Mohammad Zeinalddin. The remote monitoring toothbrush for early cavity detection using artificial intelligence (AI). *IJDSIR*. 2024;7(4):173-178.
 141. Artificial Intelligence in Dentistry, Unser wissen Publishing [https://www.blackwell.co.uk/bookshop/product/Knstliche ...](https://www.blackwell.co.uk/bookshop/product/Knstliche...), 2024.
 142. Panahi O. (2025). Deep Learning in Diagnostics. *Journal of Medical Discoveries*. 2(1).
 143. Panahi O. (2025). Algorithmic Medicine. *Journal of Medical Discoveries*. 2(1).
 144. Panahi O. (2025). The Future of Healthcare: AI, Public Health and the Digital Revolution. *MediClin Case Rep J*. 3(1):763-766.
 145. Omid P. Artificial Intelligence in Oral Implantology, Its Applications, Impact and Challenges. *Adv Dent & Oral Health*. 2024; 17: 555966.
 146. Omid P. (2011). Relevance between gingival hyperplasia and leukemia. *Int J Acad Res*. 3:493-494.
 147. Panahi O. Teledentistry: Expanding Access to Oral Healthcare. *Journal of Dental Science Research Reviews & Reports*. *J Dental Sci Res Rep*. 2024; 6: 2-3.
 148. Panahi O, Ezzati A. (2025). AI in Dental-Medicine: Current Applications & Future Directions. *Open Access J Clin Images*. 2(1):1-5.
 149. Odontoiatria digitale e intelligenza artificiale. O Panahi, SF Eslamlou, M Jabbarzadeh - 2025 - ISBN.
 150. Dentisterie numérique et intelligence artificielle. O Panahi, SF Eslamlou, M Jabbarzadeh - 2025 - ISBN.
 151. Odontología digital e inteligencia artificial. O Panahi, SF Eslamlou, M Jabbarzadeh - 2025 - ISBN.
 152. Digitale Zahnmedizin und künstliche Intelligenz. O Panahi, SF Eslamlou, M Jabbarzadeh - 2025 - ISBN.
 153. Panahi O. Predictive Health in Communities: Leveraging AI for Early Intervention and Prevention. *Ann Community Med Prim Health Care*. 2025; 3(1): 1027.
 154. Panahi, P., Bayılmış, C., Çavuşoğlu, U., & Kaçar, S. (2021). Performance evaluation of lightweight encryption algorithms for IoT-based applications. *Arabian Journal for Science and Engineering*, 46(4), 4015-4037.
 155. Dr Omid Panahi* and Dr Masoumeh Jabbarzadeh. The Expanding Role of Artificial Intelligence in Modern Dentistry. *On J Dent & Oral Health*. 8(3): 2025. OJDOH.MS.ID.000690. DOI: 10.33552/OJDOH.2025.08.000690.
 156. Panahi, O. (2025). Wearable Sensors and Personalized Sustainability: Monitoring Health and Environmental Exposures in Real-Time. *European Journal of Innovative Studies and Sustainability*, 1(2), 1-19. [https://doi.org/10.59324/ejiss.2025.1\(2\).02](https://doi.org/10.59324/ejiss.2025.1(2).02)
 157. Dr Leila Ostovar, Dr Kamal Khadem Vatan, Dr Omid Panahi, (2020). *Clinical Outcome of Thrombolytic Therapy*, Scholars Press Academic Publishing. ISBN: 978-613-8- 92417-3.
 158. Omid P, Sevil Farrokh E. Bioengineering Innovations in Dental Implantology. *Curr Trends Biomedical Eng&Biosci*. 2025; 23(3): 556111. DOI: 10.19080/CTBEB.2025.23.5560111
 159. Omid Panahi. Artificial Intelligence: A New Frontier in Periodontology. *Mod Res Dent*. 8(1). MRD. 000680. 2024. DOI: 10.31031/MRD.2024.08.000680.
 160. Panahi O, Melody FR, Kennet P, Tamson MK. Drug induced (calcium channel blockers) gingival hyperplasia. *JMBS* 2011;2(1):10-2.
 161. Dr Omid Panahi* and Dr Amirreza Amirloo. AI-Enabled IT Systems for Improved Dental Practice Management. *On J Dent & Oral Health*. 8(4): 2025. OJDOH.MS.ID.000691. DOI: 10.33552/OJDOH.2025.08.000691.
 162. Dentistry. *Adv Biotech & Micro*. 2024; 18(2): 555981. DOI: 10.19080/AIBM.2024.17.555981 Panahi, O., & Zeinaldin, M. (2024). AI-Assisted Detection of Oral Cancer: A Comparative Analysis. *Austin J Pathol Lab Med*, 10(1), 1037.
 163. Panahi, O., & Zeinaldin, M. (2024). AI-Assisted Detection of Oral Cancer: A Comparative Analysis. *Austin J Pathol Lab Med*, 10(1), 1037.
 164. Omid Panahi, Sevil Farrokh. USAG-1-Based Therapies: A Paradigm Shift in

- Dental Medicine. *Int J Nurs Health Care*. 2024;1(1):1-4.
165. Omid Panahi, Sevil Farrokh. Can AI Heal Us? The Promise of AI-Driven Tissue Engineering. *Int J Nurs Health Care*. 2024; 1(1):1-4.
166. Maryam Gholizadeh, Dr Omid Panahi, (2021), *Investigating System in Health Management Information Systems*, Scholars Press Academic Publishing. ISBN: 978- 613-8-95240-4.
167. Omid Panahi. "AI Ushering in a New Era of Digital Dental-Medicine". *Acta Scientific Medical Sciences* 8.8 (2024): 131-134.
168. Panahi, O., & Farrokh, S. (2025a). The use of machine learning for personalized dental-medicine treatment. *Global Journal of Medical and Biomedical Case Reports*, 1, 001.
169. Maryam Gholizadeh, Dr Omid Panahi, (2021), *Sistema de investigación en sistemas de información de gestión sanitaria*, NUESTRO CONOC, MENTO Publishing. ISBN: 978-620-3-67047-9.
170. Maryam Gholizadeh, Dr Omid Panahi, (2021), *Untersuchungssystem im Gesundheitsmanagement Informations systeme*, Unser wissen Publishing. ISBN: 978-620-3-67046-2.
171. Panahi O, Zeinaldin M. Digital Dentistry: Revolutionizing Dental Care. *J Dent App*. 2024; 10 (1):1121.
172. Omid P, Evil Farrokh E. Beyond the Scalpel: AI, Alternative Medicine, and the Future of Personalized Dental Care. *J Complement Med Alt Healthcare*. 2024; 13(2): 555860. DOI: 10.19080/JCMAH.2024.12.555860.
173. Panahi, O. (2024). Dental Implants & the Rise of AI. *On J Dent & Oral Health*, 8(1), 2024.
174. Maryam Gholizadeh, Dr Omid Panahi, (2021), *Indagare il sistema nei sistemi informativi di gestione della salute*, SAPIENZA Publishing. ISBN: 978-620-3-67049-3.
175. Panahi O, et al. (2025). Smart Robotics for Personalized Dental Implant Solutions. *Dental*. 7(1):21.
176. Dr Omid Panahi, Dr Sevil Farrokh Eslamlou, Dr Masoumeh Jabbarzadeh, *Medicina dentária digital e inteligência artificial*, ISBN: 978-620-8-73915-7.
177. Panahi O. AI in Surgical Robotics: Case Studies. *Austin J Clin Case Rep*. 2024; 11(7): 1342.
178. Omid Panahi*and Reza Safaralizadeh. AI and Dental Tissue Engineering: A Potential Powerhouse for Regeneration. *Mod Res Dent*. 8(2). MRD. 000682. 2024.DOI:10.31031/MRD.2024.08.000682.
179. Maryam Gholizadeh, Dr Omid Panahi, (2021), *Systeemonderzoek in Informatiesystemen voor Gezondheidsbeheer*, ONZE KENNIS Publishing. ISBN: 978-620-3-67050-9.
180. Maryam Gholizadeh, Dr Omid Panahi, (2021), *Sistema de Investigação em Sistemas de Informação de Gestão de Saúde*, NOSSO CONHECIMENTO Publishing. ISBN: 978-620-3-67052-3.
181. Maryam Gholizadeh, Dr Omid Panahi, (2021), *System badawczy w systemach informacyjnych zarządzania zdrowiem*, NAZSA WIEDZA Publishing. ISBN: 978-620-3-67051-6.



This work is licensed under Creative Commons Attribution 4.0 License
DOI:10/JIMRCR/2025/002

Your next submission with

Olites Publishers will reach you through the following assets

- We follow principles of publication led by the Committee on Publication Ethics (COPE).
- Double-blind peer review process which is just as well as constructive.
- Permanent archiving of your article on our website
- Quality Editorial service
- Manuscript accessibility in different formats (PDF, Full Text)
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

Learn more: [Journal of Innovations in Medical Research and Clinical case Reports – Olites Publishers \(olitespublishing.com\)](https://olitespublishing.com/)